

| Oswald optimal colours (o) of maximum (m) C <sub>AB</sub> for D65, Y <sub>w</sub> =100, Y <sub>m</sub> =520_770, LINYAB data          |                                 |                  |                  |                  |                 |        |         |                 |                                 |                                 |      |  |   | % |
|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------|------------------|------------------|-----------------|--------|---------|-----------------|---------------------------------|---------------------------------|------|--|---|---|
| i <sub>1</sub> , λ <sub>1</sub>                                                                                                       | i <sub>2</sub> , λ <sub>2</sub> | Y <sub>100</sub> | A <sub>100</sub> | B <sub>100</sub> | C <sub>AB</sub> | a      | b       | h <sub>AB</sub> | i <sub>d</sub> , λ <sub>d</sub> | i <sub>c</sub> , λ <sub>c</sub> | Code |  | % |   |
| 0 405                                                                                                                                 | 32 561                          | 58.2             | -22.74           | -17.89           | 28.94           | 0.5596 | -0.743  | 218.1           | 16 483                          | 37 589                          | Cm   |  | % |   |
| 6 435                                                                                                                                 | 32 562                          | 58.79            | -26.78           | -9.88            | 28.55           | 0.4948 | -0.6036 | 200.2           | 17 486                          | 42 610                          |      |  | % |   |
| 10 450                                                                                                                                | 32 563                          | 59.42            | -33.54           | 4.93             | 33.9            | 0.3859 | -0.3525 | 171.6           | 19 496                          | -1 496c                         |      |  | % |   |
| 12 460                                                                                                                                | 33 565                          | 60.32            | -36.45           | 12.66            | 38.58           | 0.3461 | -0.2256 | 160.8           | 21 505                          | -1 505c                         |      |  | % |   |
| 12 465                                                                                                                                | 33 567                          | 61.66            | -36.65           | 13.24            | 38.97           | 0.356  | -0.2207 | 160.1           | 21 506                          | -1 506c                         |      |  | % |   |
| 14 470                                                                                                                                | 33 569                          | 62.72            | -38.14           | 19.32            | 42.76           | 0.3422 | -0.1274 | 153.1           | 24 520                          | -1 520c                         |      |  | % |   |
| 15 475                                                                                                                                | 34 573                          | 65.29            | -38.28           | 22.47            | 44.39           | 0.364  | -0.0913 | 149.5           | 25 528                          | -1 528c                         | Gm   |  | % |   |
| 16 480                                                                                                                                | 36 580                          | 69.95            | -37.48           | 26.04            | 45.64           | 0.4146 | -0.0632 | 145.2           | 27 537                          | -1 537c                         |      |  | % |   |
| 17 485                                                                                                                                | 39 595                          | 78.75            | -32.73           | 31.0             | 45.09           | 0.5347 | -0.0418 | 136.5           | 29 548                          | -1 548c                         |      |  | % |   |
| 18 490                                                                                                                                | -1 490c                         | 93.8             | -12.06           | 38.4             | 40.25           | 0.8218 | -0.0261 | 107.4           | 33 565                          | 11 459                          | max  |  | % |   |
| 19 495                                                                                                                                | -1 495c                         | 92.3             | -10.68           | 38.39            | 39.85           | 0.8346 | -0.0195 | 105.5           | 33 566                          | 12 462                          |      |  | % |   |
| 20 500                                                                                                                                | -1 500c                         | 90.42            | -8.91            | 38.07            | 39.1            | 0.8518 | -0.0144 | 103.1           | 33 567                          | 12 464                          |      |  | % |   |
| 22 510                                                                                                                                | -1 510c                         | 85.27            | -4.15            | 36.48            | 36.72           | 0.9016 | -0.0076 | 96.5            | 33 569                          | 13 469                          |      |  | % |   |
| 23 520                                                                                                                                | -1 519c                         | 81.98            | -1.26            | 35.24            | 35.26           | 0.935  | -0.0056 | 92.0            | 34 570                          | 14 471                          | Ym   |  | % |   |
| 25 530                                                                                                                                | -1 529c                         | 74.04            | 5.15             | 32.02            | 32.43           | 1.0201 | -0.0031 | 80.8            | 34 573                          | 15 475                          |      |  | % |   |
| 27 540                                                                                                                                | -1 539c                         | 64.9             | 11.57            | 28.16            | 30.44           | 1.1288 | -0.0016 | 67.6            | 35 577                          | 15 478                          |      |  | % |   |
| 28 545                                                                                                                                | -1 544c                         | 60.13            | 14.5             | 26.11            | 29.87           | 1.1917 | -0.0012 | 60.9            | 35 579                          | 15 479                          |      |  | % |   |
| 29 550                                                                                                                                | -1 549c                         | 55.26            | 17.18            | 24.01            | 29.53           | 1.2613 | -0.0009 | 54.4            | 36 582                          | 16 480                          |      |  | % |   |
| 30 555                                                                                                                                | -1 554c                         | 50.4             | 19.49            | 21.91            | 29.33           | 1.3372 | -0.0007 | 48.3            | 36 584                          | 16 481                          |      |  | % |   |
| 32 560                                                                                                                                | -1 560c                         | 41.0             | 22.8             | 17.83            | 28.95           | 1.5064 | -0.0005 | 38.0            | 37 589                          | 16 483                          |      |  | % |   |
| 380                                                                                                                                   | 770                             | 100.0            | 0.0              | 0.0              | 0.01            | 0.9504 | -0.4355 | 0.0             |                                 |                                 |      |  | % |   |
| Oswald optimal colours (o) of maximum (m) C <sub>AB</sub> for D65, Y <sub>w</sub> =100, Y <sub>m</sub> =770_520, LINYAB complementary |                                 |                  |                  |                  |                 |        |         |                 |                                 |                                 |      |  |   | % |
| i <sub>1</sub> , λ <sub>1</sub>                                                                                                       | i <sub>2</sub> , λ <sub>2</sub> | Y <sub>100</sub> | A <sub>100</sub> | B <sub>100</sub> | C <sub>AB</sub> | a      | b       | h <sub>AB</sub> | i <sub>d</sub> , λ <sub>d</sub> | i <sub>c</sub> , λ <sub>c</sub> | Code |  | % |   |
| 32 561                                                                                                                                | 0 405                           | 41.79            | 22.74            | 17.89            | 28.94           | 1.4946 | -0.0072 | 38.1            | 37 589                          | 16 483                          | Rm   |  | % |   |
| 32 562                                                                                                                                | 6 435                           | 41.2             | 26.78            | 9.88             | 28.55           | 1.6006 | -0.1956 | 20.2            | 42 610                          | 17 486                          |      |  | % |   |
| 32 563                                                                                                                                | 10 450                          | 40.57            | 33.54            | -4.93            | 33.9            | 1.7771 | -0.557  | 351.6           | -1 496c                         | 19 496                          |      |  | % |   |
| 33 565                                                                                                                                | 12 460                          | 39.67            | 36.45            | -12.66           | 38.58           | 1.8691 | -0.7547 | 340.8           | -1 505c                         | 21 505                          |      |  | % |   |
| 33 567                                                                                                                                | 12 465                          | 38.33            | 36.65            | -13.24           | 38.97           | 1.9064 | -0.781  | 340.1           | -1 506c                         | 21 506                          |      |  | % |   |
| 33 569                                                                                                                                | 14 470                          | 37.27            | 38.14            | -19.32           | 42.76           | 1.9738 | -0.954  | 333.1           | -1 520c                         | 24 520                          |      |  | % |   |
| 34 573                                                                                                                                | 15 475                          | 34.7             | 38.28            | -22.47           | 44.39           | 2.0536 | -1.083  | 329.5           | -1 528c                         | 25 528                          | Mm   |  | % |   |
| 36 580                                                                                                                                | 16 480                          | 30.04            | 37.48            | -26.04           | 45.64           | 2.1982 | -1.3026 | 325.2           | -1 537c                         | 27 537                          |      |  | % |   |
| 39 595                                                                                                                                | 17 485                          | 21.24            | 32.73            | -31.0            | 45.09           | 2.4914 | -1.8952 | 316.5           | -1 548c                         | 29 548                          |      |  | % |   |
| -1 490c                                                                                                                               | 18 490                          | 6.19             | 12.06            | -38.4            | 40.25           | 2.899  | -6.6372 | 287.4           | 11 459                          | 33 565                          | min  |  | % |   |
| -1 495c                                                                                                                               | 19 495                          | 7.69             | 10.68            | -38.39           | 39.85           | 2.3392 | -5.4245 | 285.5           | 12 462                          | 33 566                          |      |  | % |   |
| -1 500c                                                                                                                               | 20 500                          | 9.57             | 8.91             | -38.07           | 39.1            | 1.8814 | -4.4105 | 283.1           | 12 464                          | 33 567                          |      |  | % |   |
| -1 510c                                                                                                                               | 22 510                          | 14.72            | 4.15             | -36.48           | 36.72           | 1.2328 | -2.9143 | 276.5           | 13 469                          | 33 569                          |      |  | % |   |
| -1 519c                                                                                                                               | 23 520                          | 18.01            | 1.26             | -35.24           | 35.26           | 1.0204 | -2.3925 | 272.0           | 14 471                          | 34 570                          | Bm   |  | % |   |
| -1 529c                                                                                                                               | 25 530                          | 25.95            | -5.15            | -32.02           | 32.43           | 0.7516 | -1.6693 | 260.8           | 15 475                          | 34 573                          |      |  | % |   |
| -1 539c                                                                                                                               | 27 540                          | 35.09            | -11.57           | -28.16           | 30.44           | 0.6205 | -1.238  | 247.6           | 15 478                          | 35 577                          |      |  | % |   |
| -1 544c                                                                                                                               | 28 545                          | 39.86            | -14.5            | -26.11           | 29.87           | 0.5865 | -1.0906 | 240.9           | 15 479                          | 35 579                          |      |  | % |   |
| -1 549c                                                                                                                               | 29 550                          | 44.73            | -17.18           | -24.01           | 29.53           | 0.5663 | -0.9725 | 234.4           | 16 480                          | 36 582                          |      |  | % |   |
| -1 554c                                                                                                                               | 30 555                          | 49.59            | -19.49           | -21.91           | 29.33           | 0.5572 | -0.8774 | 228.3           | 16 481                          | 36 584                          |      |  | % |   |
| -1 560c                                                                                                                               | 32 560                          | 58.99            | -22.8            | -17.83           | 28.95           | 0.5638 | -0.7379 | 218.0           | 16 483                          | 37 589                          |      |  | % |   |
| 380                                                                                                                                   | 770                             | 100.0            | 0.0              | 0.0              | 0.01            | 0.9504 | -0.4355 | 0.0             |                                 |                                 |      |  | % |   |

| rgb* <sub>AB</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                                                                |                         |          |          |          |          |                        |          |          |                        |                        |            |            |            |                          |                        |                            |                           |      |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------|----------|----------|----------|------------------------|----------|----------|------------------------|------------------------|------------|------------|------------|--------------------------|------------------------|----------------------------|---------------------------|------|-------|
| Yxy, <i>c</i> <sub>AB</sub> <sub>AB</sub> <i>ABC</i> <sub>AB</sub> <i>LabC</i> * <sub>ab</sub> <sub>ab</sub> data for relative spacing of elementary hue <i>h</i> <sub>AB</sub> of <i>LIN</i> YAB for CIE 2 degree observer |                         |          |          |          |          |                        |          |          |                        |                        |            |            |            |                          |                        |                            |                           |      |       |
| Elementary hue circle with 4 intended elementary hue angles: <i>h</i> <sub>AB</sub> = 17.7, 93.3, 159.1, 270.8 of <i>LIN</i> YAB; 90 intended hue angles:                                                                   |                         |          |          |          |          |                        |          |          |                        |                        |            |            |            |                          |                        |                            |                           |      |       |
| 00.001, ..., 089, <i>LIN</i> YAB data of CIE test colours 9 (R): 11.2 9.9 3.1, 10 (Y): 59.0 -1.2 20.9, 11 (G): 20.3 -7.2 12.7, 12 (B): 6.4 0.1 -8.2                                                                         |                         |          |          |          |          |                        |          |          |                        |                        |            |            |            |                          |                        |                            |                           |      |       |
| <i>no</i>                                                                                                                                                                                                                   | <i>no</i> <sub>AB</sub> | <i>x</i> | <i>y</i> | <i>a</i> | <i>b</i> | <i>c</i> <sub>AB</sub> | <i>A</i> | <i>B</i> | <i>C</i> <sub>AB</sub> | <i>h</i> <sub>AB</sub> | <i>L</i> * | <i>a</i> * | <i>b</i> * | <i>C</i> * <sub>ab</sub> | <i>h</i> <sub>ab</sub> | <i>rgb</i> * <sub>AB</sub> | <i>Code</i> <sub>AB</sub> |      |       |
| 000                                                                                                                                                                                                                         | 40.7                    | 0.447    | 0.259    | 1.727    | -0.453   | 0.777                  | 31.6     | -0.7     | 31.6                   | 358.7                  | 70.0       | 81.6       | -1.9       | 81.7                     | 359.6                  | 1.00                       | 0.00                      | 0.39 | #B80R |
| 001                                                                                                                                                                                                                         | 40.8                    | 0.45     | 0.261    | 1.72     | -0.44    | 0.77                   | 31.4     | -0.1     | 31.4                   | 359.6                  | 70.0       | 81.1       | -0.5       | 81.1                     | 359.6                  | 1.00                       | 0.00                      | 0.37 | #B81R |
| 002                                                                                                                                                                                                                         | 40.8                    | 0.453    | 0.264    | 1.714    | -0.427   | 0.764                  | 31.1     | 0.3      | 31.2                   | 0.6                    | 70.0       | 80.6       | 0.9        | 80.6                     | 0.6                    | 1.00                       | 0.00                      | 0.35 | #B82R |
| 003                                                                                                                                                                                                                         | 40.8                    | 0.456    | 0.267    | 1.708    | -0.414   | 0.758                  | 30.9     | 0.8      | 30.9                   | 1.6                    | 70.0       | 80.0       | 2.4        | 80.1                     | 1.7                    | 1.00                       | 0.00                      | 0.33 | #B83R |
| 004                                                                                                                                                                                                                         | 40.8                    | 0.459    | 0.269    | 1.701    | -0.4     | 0.752                  | 30.7     | 1.4      | 30.7                   | 2.6                    | 70.0       | 79.5       | 4.0        | 79.6                     | 2.9                    | 1.00                       | 0.00                      | 0.3  | #B84R |
| 005                                                                                                                                                                                                                         | 40.8                    | 0.462    | 0.272    | 1.695    | -0.387   | 0.746                  | 30.4     | 1.9      | 30.5                   | 3.6                    | 70.1       | 78.9       | 5.6        | 79.1                     | 4.0                    | 1.00                       | 0.00                      | 0.28 | #B85R |
| 006                                                                                                                                                                                                                         | 40.9                    | 0.465    | 0.275    | 1.689    | -0.374   | 0.741                  | 30.2     | 2.4      | 30.3                   | 4.7                    | 70.1       | 78.4       | 7.2        | 78.7                     | 5.2                    | 1.00                       | 0.00                      | 0.26 | #B86R |
| 007                                                                                                                                                                                                                         | 40.9                    | 0.469    | 0.278    | 1.682    | -0.361   | 0.736                  | 29.9     | 3.0      | 30.1                   | 5.7                    | 70.1       | 77.8       | 8.9        | 78.3                     | 6.5                    | 1.00                       | 0.00                      | 0.24 | #B87R |
| 008                                                                                                                                                                                                                         | 40.9                    | 0.481    | 0.287    | 1.668    | -0.348   | 0.729                  | 29.7     | 3.5      | 29.9                   | 6.9                    | 70.1       | 77.0       | 10.6       | 77.4                     | 7.8                    | 1.00                       | 0.00                      | 0.22 | #B88R |
| 009                                                                                                                                                                                                                         | 40.9                    | 0.475    | 0.284    | 1.67     | -0.335   | 0.726                  | 29.4     | 4.1      | 29.7                   | 7.9                    | 70.1       | 76.7       | 12.3       | 77.7                     | 9.1                    | 1.00                       | 0.00                      | 0.19 | #B89R |
| 010                                                                                                                                                                                                                         | 40.9                    | 0.479    | 0.288    | 1.663    | -0.322   | 0.722                  | 29.2     | 4.6      | 29.6                   | 9.0                    | 70.1       | 76.1       | 14.1       | 77.5                     | 10.5                   | 1.00                       | 0.00                      | 0.17 | #B91R |
| 011                                                                                                                                                                                                                         | 41.0                    | 0.483    | 0.291    | 1.657    | -0.309   | 0.718                  | 28.9     | 5.1      | 29.4                   | 10.1                   | 70.1       | 75.6       | 15.9       | 77.3                     | 11.9                   | 1.00                       | 0.00                      | 0.15 | #B92R |
| 012                                                                                                                                                                                                                         | 41.0                    | 0.486    | 0.294    | 1.65     | -0.296   | 0.714                  | 28.7     | 5.6      | 29.3                   | 11.2                   | 70.2       | 75.0       | 17.8       | 77.1                     | 13.3                   | 1.00                       | 0.00                      | 0.12 | #B93R |
| 013                                                                                                                                                                                                                         | 41.0                    | 0.49     | 0.298    | 1.644    | -0.283   | 0.71                   | 28.5     | 6.2      | 29.1                   | 12.3                   | 70.2       | 74.5       | 19.7       | 77.0                     | 14.8                   | 1.00                       | 0.00                      | 0.1  | #B94R |
| 014                                                                                                                                                                                                                         | 41.0                    | 0.493    | 0.301    | 1.638    | -0.271   | 0.707                  | 28.2     | 6.7      | 29.0                   | 13.4                   | 70.2       | 73.9       | 21.6       | 77.0                     | 16.3                   | 1.00                       | 0.00                      | 0.08 | #B95R |
| 015                                                                                                                                                                                                                         | 41.0                    | 0.497    | 0.304    | 1.632    | -0.258   | 0.704                  | 28.0     | 7.2      | 28.9                   | 14.5                   | 70.2       | 73.4       | 23.6       | 77.1                     | 17.8                   | 1.00                       | 0.00                      | 0.06 | #B96R |
| 016                                                                                                                                                                                                                         | 41.1                    | 0.501    | 0.308    | 1.626    | -0.246   | 0.701                  | 27.7     | 7.7      | 28.8                   | 15.6                   | 70.2       | 72.8       | 25.7       | 77.2                     | 19.4                   | 1.00                       | 0.00                      | 0.03 | #B98R |
| 017                                                                                                                                                                                                                         | 41.1                    | 0.505    | 0.311    | 1.619    | -0.234   | 0.699                  | 27.5     | 8.2      | 28.7                   | 16.7                   | 70.2       | 72.3       | 27.7       | 77.4                     | 21.0                   | 1.00                       | 0.00                      | 0.01 | #B99R |
| 018                                                                                                                                                                                                                         | 41.1                    | 0.509    | 0.315    | 1.613    | -0.222   | 0.697                  | 27.3     | 8.7      | 28.6                   | 17.8                   | 70.2       | 71.7       | 29.9       | 77.7                     | 22.6                   | 1.00                       | 0.0                       | 0.00 | #R00Y |
| 019                                                                                                                                                                                                                         | 41.1                    | 0.513    | 0.319    | 1.607    | -0.21    | 0.695                  | 27.0     | 9.2      | 28.6                   | 18.9                   | 70.3       | 71.2       | 32.0       | 78.1                     | 24.2                   | 1.00                       | 0.01                      | 0.00 | #R01Y |
| 020                                                                                                                                                                                                                         | 41.1                    | 0.517    | 0.322    | 1.602    | -0.198   | 0.693                  | 26.8     | 9.7      | 28.5                   | 19.9                   | 70.3       | 70.7       | 34.2       | 78.5                     | 25.8                   | 1.00                       | 0.02                      | 0.00 | #R02Y |
| 021                                                                                                                                                                                                                         | 41.2                    | 0.521    | 0.327    | 1.594    | -0.184   | 0.691                  | 26.5     | 10.3     | 28.5                   | 21.3                   | 70.3       | 70.0       | 37.1       | 79.2                     | 27.9                   | 1.00                       | 0.04                      | 0.00 | #R04Y |
| 022                                                                                                                                                                                                                         | 41.2                    | 0.527    | 0.332    | 1.586    | -0.169   | 0.689                  | 26.2     | 10.9     | 28.4                   | 22.7                   | 70.3       | 69.3       | 40.1       | 80.1                     | 30.1                   | 1.00                       | 0.05                      | 0.00 | #R05Y |
| 023                                                                                                                                                                                                                         | 41.3                    | 0.532    | 0.337    | 1.578    | -0.155   | 0.687                  | 25.9     | 11.5     | 28.4                   | 24.0                   | 70.4       | 68.6       | 43.1       | 81.1                     | 32.2                   | 1.00                       | 0.06                      | 0.00 | #R06Y |
| 024                                                                                                                                                                                                                         | 41.3                    | 0.537    | 0.341    | 1.57     | -0.141   | 0.686                  | 25.6     | 12.1     | 28.4                   | 25.3                   | 70.4       | 67.9       | 46.5       | 82.3                     | 34.4                   | 1.00                       | 0.08                      | 0.00 | #R08Y |
| 025                                                                                                                                                                                                                         | 41.4                    | 0.542    | 0.346    | 1.563    | -0.128   | 0.685                  | 25.3     | 12.7     | 28.4                   | 26.5                   | 70.4       | 67.2       | 49.8       | 83.7                     | 36.5                   | 1.00                       | 0.09                      | 0.00 | #R09Y |
| 026                                                                                                                                                                                                                         | 41.4                    | 0.546    | 0.351    | 1.556    | -0.115   | 0.685                  | 25.1     | 13.2     | 28.4                   | 27.8                   | 70.5       | 66.6       | 53.1       | 85.2                     | 38.5                   | 1.00                       | 0.1                       | 0.00 | #R10Y |
| 027                                                                                                                                                                                                                         | 41.5                    | 0.551    | 0.355    | 1.549    | -0.103   | 0.685                  | 24.8     | 13.7     | 28.4                   | 28.9                   | 70.5       | 66.0       | 56.6       | 86.9                     | 40.6                   | 1.00                       | 0.12                      | 0.00 | #R12Y |
| 028                                                                                                                                                                                                                         | 41.5                    | 0.556    | 0.36     | 1.543    | -0.092   | 0.685                  | 24.6     | 14.2     | 28.4                   | 30.0                   | 70.5       | 65.4       | 60.1       | 88.8                     | 42.6                   | 1.00                       | 0.13                      | 0.00 | #R13Y |
| 029                                                                                                                                                                                                                         | 41.5                    | 0.56     | 0.364    | 1.537    | -0.081   | 0.685                  | 24.3     | 14.7     | 28.4                   | 31.1                   | 70.5       | 64.8       | 63.8       | 91.0                     | 44.5                   | 1.00                       | 0.14                      | 0.00 | #R14Y |
| 030                                                                                                                                                                                                                         | 41.6                    | 0.565    | 0.369    | 1.531    | -0.071   | 0.685                  | 24.1     | 15.1     | 28.5                   | 32.1                   | 70.6       | 64.3       | 67.6       | 93.3                     | 46.4                   | 1.00                       | 0.16                      | 0.00 | #R16Y |
| 031                                                                                                                                                                                                                         | 41.6                    | 0.569    | 0.373    | 1.525    | -0.061   | 0.686                  | 23.9     | 15.5     | 28.5                   | 33.0                   | 70.6       | 63.7       | 71.5       | 95.8                     | 48.2                   | 1.00                       | 0.17                      | 0.00 | #R17Y |
| 032                                                                                                                                                                                                                         | 41.6                    | 0.573    | 0.377    | 1.52     | -0.052   | 0.686                  | 23.7     | 15.9     | 28.6                   | 33.9                   | 70.6       | 63.2       | 75.7       | 98.6                     | 50.1                   | 1.00                       | 0.18                      | 0.00 | #R18Y |
| 033                                                                                                                                                                                                                         | 41.7                    | 0.577    | 0.381    | 1.515    | -0.043   | 0.687                  | 23.5     | 16.3     | 28.6                   | 34.7                   | 70.6       | 62.8       | 80.8       | 101.7                    | 51.8                   | 1.00                       | 0.2                       | 0.00 | #R20Y |
| 034                                                                                                                                                                                                                         | 41.7                    | 0.581    | 0.384    | 1.51     | -0.035   | 0.688                  | 23.3     | 16.7     | 28.7                   | 35.5                   | 70.6       | 62.3       | 84.6       | 105.1                    | 53.6                   | 1.00                       | 0.21                      | 0.00 | #R21Y |
| 035                                                                                                                                                                                                                         | 41.7                    | 0.584    | 0.388    | 1.506    | -0.027   | 0.689                  | 23.2     | 17.0     | 28.7                   | 36.2                   | 70.7       | 61.9       | 89.6       | 109.0                    | 55.3                   | 1.00                       | 0.22                      | 0.00 | #R22Y |
| 036                                                                                                                                                                                                                         | 41.7                    | 0.588    | 0.391    | 1.502    | -0.02    | 0.69                   | 23.0     | 17.3     | 28.8                   | 36.9                   | 70.7       | 61.6       | 95.2       | 113.4                    | 57.0                   | 1.00                       | 0.24                      | 0.00 | #R24Y |
| 037                                                                                                                                                                                                                         | 41.7                    | 0.591    | 0.394    | 1.498    | -0.014   | 0.691                  | 22.9     | 17.6     | 28.8                   | 37.5                   | 70.7       | 61.2       | 101.5      | 118.5                    | 58.8                   | 1.00                       | 0.25                      | 0.00 | #R25Y |
| 038                                                                                                                                                                                                                         | 41.7                    | 0.594    | 0.397    | 1.495    | -0.008   | 0.692                  | 22.7     | 17.8     | 28.9                   | 38.0                   | 70.7       | 60.9       | 108.2      | 124.2                    | 60.6                   | 1.00                       | 0.26                      | 0.00 | #R26Y |
| 039                                                                                                                                                                                                                         | 41.6                    | 0.598    | 0.401    | 1.491    | 0.0      | 0.694                  | 22.5     | 18.1     | 28.9                   | 38.7                   | 70.6       | 60.5       | 121.1      | 135.4                    | 63.4                   | 1.00                       | 0.28                      | 0.00 | #R27Y |
| 040                                                                                                                                                                                                                         | 42.4                    | 0.595    | 0.403    | 1.475    | 0.0      | 0.682                  | 22.2     | 18.4     | 28.9                   | 39.6                   | 71.1       | 59.3       | 122.2      | 135.9                    | 64.1                   | 1.00                       | 0.29                      | 0.00 | #R29Y |
| 041                                                                                                                                                                                                                         | 43.3                    | 0.593    | 0.406    | 1.458    | 0.0      | 0.669                  | 22.0     | 18.8     | 28.9                   | 40.5                   | 71.7       | 58.0       | 123.3      | 136.3                    | 64.8                   | 1.00                       | 0.3                       | 0.00 | #R30Y |
| 042                                                                                                                                                                                                                         | 44.2                    | 0.59     | 0.409    | 1.44     | 0.0      | 0.655                  | 21.6     | 19.2     | 29.0                   | 41.5                   | 72.3       | 56.6       | 124.4      | 136.7                    | 65.5                   | 1.00                       | 0.32                      | 0.00 | #R32Y |
| 043                                                                                                                                                                                                                         | 45.1                    | 0.587    | 0.412    | 1.423    | 0.0      | 0.642                  | 21.3     | 19.6     | 29.0                   | 42.6                   | 73.0       | 55.2       | 125.4      | 137.0                    | 66.2                   | 1.00                       | 0.33                      | 0.00 | #R33Y |
| 044                                                                                                                                                                                                                         | 46.1                    | 0.584    | 0.415    | 1.405    | 0.0      | 0.63                   | 21.0     | 20.0     | 29.0                   | 43.6                   | 73.6       | 53.8       | 126.4      | 137.4                    | 66.9                   | 1.00                       | 0.34                      | 0.00 | #R34Y |
| 045                                                                                                                                                                                                                         | 47.1                    | 0.581    | 0.418    | 1.388    | 0.0      | 0.617                  | 20.6     | 20.5     | 29.1                   | 44.7                   | 74.2       | 52.4       | 127.3      | 137.7                    | 67.6                   | 1.00                       | 0.36                      | 0.00 | #R36Y |
| 046                                                                                                                                                                                                                         | 48.1                    | 0.578    | 0.421    | 1.372    | 0.0      | 0.606                  | 20.3     | 20.9     | 29.1                   | 45.8                   | 74.9       | 51.0       | 128.2      | 138.0                    | 68.2                   | 1.00                       | 0.37                      | 0.00 | #R37Y |
| 047                                                                                                                                                                                                                         | 49.1                    | 0.575    | 0.424    | 1.356    | 0.0      | 0.595                  | 19.9     | 21.3     | 29.2                   | 46.9                   | 75.5       | 49.7       | 129.0      | 138.3                    | 69.0                   | 1.00                       | 0.38                      | 0.00 | #R38Y |
| 048                                                                                                                                                                                                                         | 50.0                    | 0.572    | 0.426    | 1.342    | 0.0      | 0.585                  | 19.6     | 21.7     | 29.3                   | 47.9                   | 76.1       | 48.3       | 129.8      | 138.5                    | 69.5                   | 1.00                       | 0.4                       | 0.00 | #R40Y |
| 049                                                                                                                                                                                                                         | 51.0                    | 0.569    | 0.429    | 1.326    | 0.0      | 0.575                  | 19.2     | 22.2     | 29.3                   | 49.1                   | 76.7       | 47.0       | 130.7      | 138.9                    | 70.2                   | 1.00                       | 0.41                      | 0.00 | #R41Y |
| 050                                                                                                                                                                                                                         | 51.9                    | 0.567    | 0.432    | 1.312    | 0.0      | 0.565                  | 18.8     | 22.6     | 29.4                   | 50.2                   | 77.2       | 45.6       | 131.6      | 139.3                    | 70.8                   | 1.00                       | 0.42                      | 0.00 | #R42Y |
| 051                                                                                                                                                                                                                         | 52.8                    | 0.564    | 0.434    | 1.299    | 0.0      | 0.557                  | 18.4     | 22.9     | 29.4                   | 51.2                   | 77.7       | 44.4       | 132.3      | 139.6                    | 71.4                   | 1.00                       | 0.43                      | 0.00 | #R43Y |
| 052                                                                                                                                                                                                                         | 53.5                    | 0.562    | 0.436    | 1.287    | 0.0      | 0.55                   | 18.0     | 23.2     | 29.4                   | 52.1                   | 78.2       | 43.2       | 133.0      | 139.9                    | 71.9                   | 1.00                       | 0.45                      | 0.00 | #R45Y |
| 053                                                                                                                                                                                                                         | 54.2                    | 0.56     | 0.438    | 1.276    | 0.0      | 0.543                  | 17.7     | 23.6     | 29.5                   | 53.1                   | 78.6       | 42.1       | 133.6      | 140.1                    | 72.5                   | 1.00                       | 0.46                      | 0.00 | #R46Y |
| 054                                                                                                                                                                                                                         | 54.9                    | 0.558    | 0.44     | 1.265    | 0.0      | 0.537                  | 17.3     | 23.8     | 29.5                   | 54.0                   | 79.0       | 41.0       | 134.2      | 140.4                    | 73.0                   | 1.00                       | 0.47                      | 0.00 | #R47Y |
| 055                                                                                                                                                                                                                         | 55.6                    | 0.555    | 0.443    | 1.254    | 0.0      | 0.53                   | 16.9     | 24.2     | 29.5                   | 54.9                   | 79.4       | 39.9       | 134.8      | 140.6                    | 73.5                   | 1.00                       | 0.49                      | 0.00 | #R49Y |
| 056                                                                                                                                                                                                                         | 56.4                    | 0.553    | 0.445    | 1.243    | -0.001   | 0.524                  | 16.5     | 24.5     | 29.5                   | 55.9                   | 79.8       | 38.7       | 135.5      | 140.9                    | 74.0                   | 1.00                       | 0.5                       | 0.00 | #R50Y |
| 057                                                                                                                                                                                                                         | 57.1                    | 0.551    | 0.447    | 1.233    | -0.001   | 0.518                  | 16.1     | 24.8     | 29.6                   | 56.9                   | 80.2       | 37.6       | 136.1      | 141.2                    | 74.5                   | 1.00                       | 0.51                      | 0.00 | #R51Y |
| 058                                                                                                                                                                                                                         | 57.9                    | 0.549    | 0.449    |          |          |                        |          |          |                        |                        |            |            |            |                          |                        |                            |                           |      |       |



| rgb* <sub>AB</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                                  |                 |       |       |       |        |                 |       |       |                 |                 |        |        |       |                  |                 |                    |      |                    |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|-------|-------|--------|-----------------|-------|-------|-----------------|-----------------|--------|--------|-------|------------------|-----------------|--------------------|------|--------------------|------|
| Yxy, c <sub>AB</sub> AB, ABC <sub>AB</sub> , LabC* <sub>ab</sub> AB data for relative spacing of elementary hue h <sub>AB</sub> of L <sub>1</sub> Y <sub>1</sub> AB for CIE 2 degree observer |                 |       |       |       |        |                 |       |       |                 |                 |        |        |       |                  |                 |                    |      |                    |      |
| Elementary hue circle with 4 intended elementary hue angles: h <sub>AB</sub> = 17.7, 93.3, 159.1, 270.8 of L <sub>1</sub> Y <sub>1</sub> AB, and 90 intended hue angles:                      |                 |       |       |       |        |                 |       |       |                 |                 |        |        |       |                  |                 |                    |      |                    |      |
| 180, 181, ..., 269, L <sub>1</sub> Y <sub>1</sub> AB data of CIE test colours 9 (R): 11.2 9.9 3.1, 10 (Y): 59.0 -1.2 20.9, 11 (G): 20.3 -7.2 12.7, 12 (B): 6.4 0.1 -8.2                       |                 |       |       |       |        |                 |       |       |                 |                 |        |        |       |                  |                 |                    |      |                    |      |
| no.                                                                                                                                                                                           | AB <sub>Y</sub> | x     | y     | a     | b      | c <sub>AB</sub> | A     | B     | C <sub>AB</sub> | h <sub>AB</sub> | L*     | a*     | b*    | C* <sub>ab</sub> | h <sub>ab</sub> | rgb* <sub>AB</sub> | AB   | Code <sub>AB</sub> |      |
| 180                                                                                                                                                                                           | 59.2            | 0.167 | 0.404 | 0.415 | -0.423 | 0.535           | -31.6 | 0.7   | 31.6            | 178.7           | 81.4   | -101.1 | 1.5   | 181.1            | 179.7           | 1.00               | 1.00 | 0.37               | G180 |
| 181                                                                                                                                                                                           | 59.1            | 0.167 | 0.399 | 0.419 | -0.432 | 0.531           | -31.4 | 0.1   | 31.4            | 179.6           | 81.4   | -100.9 | 0.4   | 180.1            | 179.7           | 1.00               | 1.00 | 0.39               | G198 |
| 182                                                                                                                                                                                           | 59.1            | 0.167 | 0.395 | 0.423 | -0.441 | 0.527           | -31.1 | -0.3  | 31.2            | 180.6           | 81.3   | -99.2  | -0.7  | 99.2             | 180.4           | 0.00               | 1.00 | 0.4                | G208 |
| 183                                                                                                                                                                                           | 59.1            | 0.167 | 0.391 | 0.427 | -0.45  | 0.523           | -30.9 | -0.8  | 30.9            | 181.6           | 81.3   | -98.2  | -1.8  | 98.2             | 181.0           | 0.00               | 1.00 | 0.42               | G218 |
| 184                                                                                                                                                                                           | 59.1            | 0.167 | 0.387 | 0.431 | -0.459 | 0.52            | -30.7 | -1.4  | 30.7            | 182.6           | 81.3   | -97.2  | -3.0  | 97.2             | 181.7           | 0.00               | 1.00 | 0.44               | G228 |
| 185                                                                                                                                                                                           | 59.1            | 0.166 | 0.383 | 0.434 | -0.468 | 0.516           | -30.4 | -1.9  | 30.5            | 183.6           | 81.3   | -96.2  | -4.1  | 96.3             | 182.4           | 0.00               | 1.00 | 0.46               | G238 |
| 186                                                                                                                                                                                           | 59.0            | 0.166 | 0.379 | 0.438 | -0.477 | 0.513           | -30.2 | -2.4  | 30.3            | 184.7           | 81.3   | -95.2  | -5.2  | 95.3             | 183.1           | 0.00               | 1.00 | 0.48               | G248 |
| 187                                                                                                                                                                                           | 59.0            | 0.166 | 0.375 | 0.442 | -0.486 | 0.505           | -29.9 | -3.0  | 30.1            | 185.7           | 81.3   | -94.2  | -6.3  | 94.4             | 183.8           | 0.00               | 1.00 | 0.49               | G258 |
| 188                                                                                                                                                                                           | 59.0            | 0.166 | 0.372 | 0.446 | -0.495 | 0.507           | -29.7 | -3.7  | 29.9            | 186.8           | 81.3   | -93.2  | -7.4  | 93.7             | 184.5           | 0.00               | 1.00 | 0.51               | G268 |
| 189                                                                                                                                                                                           | 59.0            | 0.166 | 0.368 | 0.45  | -0.505 | 0.504           | -29.4 | -4.1  | 29.7            | 187.9           | 81.3   | -92.2  | -8.4  | 92.6             | 185.2           | 0.00               | 1.00 | 0.53               | G278 |
| 190                                                                                                                                                                                           | 59.0            | 0.166 | 0.364 | 0.454 | -0.514 | 0.501           | -29.2 | -4.6  | 29.6            | 189.0           | 81.2   | -91.3  | -9.5  | 91.8             | 185.9           | 0.00               | 1.00 | 0.55               | G278 |
| 191                                                                                                                                                                                           | 58.9            | 0.165 | 0.361 | 0.458 | -0.523 | 0.499           | -28.9 | -5.1  | 29.4            | 190.1           | 81.2   | -90.3  | -10.5 | 90.9             | 186.6           | 0.00               | 1.00 | 0.57               | G288 |
| 192                                                                                                                                                                                           | 58.9            | 0.165 | 0.357 | 0.462 | -0.532 | 0.497           | -28.7 | -5.6  | 29.3            | 191.2           | 81.2   | -89.3  | -11.5 | 90.1             | 187.3           | 0.00               | 1.00 | 0.58               | G298 |
| 193                                                                                                                                                                                           | 58.9            | 0.165 | 0.354 | 0.466 | -0.541 | 0.495           | -28.5 | -6.2  | 29.1            | 192.3           | 81.2   | -88.4  | -12.5 | 89.3             | 188.0           | 0.00               | 1.00 | 0.6                | G308 |
| 194                                                                                                                                                                                           | 58.9            | 0.165 | 0.351 | 0.47  | -0.55  | 0.493           | -28.2 | -6.7  | 29.0            | 193.4           | 81.2   | -87.4  | -13.5 | 88.5             | 188.8           | 0.00               | 1.00 | 0.62               | G318 |
| 195                                                                                                                                                                                           | 58.8            | 0.165 | 0.348 | 0.474 | -0.558 | 0.491           | -28.0 | -7.2  | 28.8            | 194.5           | 81.2   | -86.5  | -14.5 | 87.7             | 189.5           | 0.00               | 1.00 | 0.64               | G328 |
| 196                                                                                                                                                                                           | 58.8            | 0.165 | 0.345 | 0.478 | -0.567 | 0.488           | -27.7 | -7.7  | 28.8            | 195.6           | 81.2   | -85.5  | -15.4 | 87.0             | 190.2           | 0.00               | 1.00 | 0.65               | G338 |
| 197                                                                                                                                                                                           | 58.8            | 0.165 | 0.342 | 0.482 | -0.576 | 0.481           | -27.5 | -8.2  | 28.7            | 196.7           | 81.2   | -84.7  | -16.3 | 86.3             | 190.9           | 0.00               | 1.00 | 0.67               | G338 |
| 198                                                                                                                                                                                           | 58.8            | 0.164 | 0.339 | 0.486 | -0.584 | 0.487           | -27.3 | -8.7  | 28.6            | 197.8           | 81.2   | -83.8  | -17.2 | 85.6             | 191.6           | 0.00               | 1.00 | 0.69               | G348 |
| 199                                                                                                                                                                                           | 58.8            | 0.164 | 0.336 | 0.49  | -0.593 | 0.486           | -27.0 | -9.2  | 28.6            | 198.9           | 81.1   | -82.9  | -18.1 | 84.9             | 192.3           | 0.00               | 1.00 | 0.71               | G358 |
| 200                                                                                                                                                                                           | 58.8            | 0.164 | 0.333 | 0.493 | -0.601 | 0.485           | -26.8 | -9.7  | 28.5            | 199.9           | 81.1   | -82.1  | -19.0 | 84.2             | 193.0           | 0.00               | 1.00 | 0.73               | G368 |
| 201                                                                                                                                                                                           | 58.7            | 0.164 | 0.33  | 0.498 | -0.611 | 0.485           | -26.5 | -10.3 | 28.5            | 201.3           | 81.1   | -81.0  | -20.0 | 83.4             | 193.9           | 0.00               | 1.00 | 0.74               | G378 |
| 202                                                                                                                                                                                           | 58.7            | 0.164 | 0.326 | 0.503 | -0.622 | 0.484           | -26.2 | -10.9 | 28.4            | 202.7           | 81.1   | -79.9  | -21.1 | 82.6             | 194.8           | 0.00               | 1.00 | 0.76               | G388 |
| 203                                                                                                                                                                                           | 58.6            | 0.164 | 0.323 | 0.507 | -0.632 | 0.484           | -25.9 | -11.5 | 28.4            | 204.0           | 81.1   | -78.8  | -22.2 | 81.9             | 195.7           | 0.00               | 1.00 | 0.78               | G398 |
| 204                                                                                                                                                                                           | 58.6            | 0.164 | 0.32  | 0.512 | -0.643 | 0.484           | -25.6 | -12.1 | 28.4            | 205.3           | 81.0   | -77.8  | -23.3 | 81.2             | 196.5           | 0.00               | 1.00 | 0.8                | G408 |
| 205                                                                                                                                                                                           | 58.5            | 0.164 | 0.317 | 0.516 | -0.652 | 0.484           | -25.3 | -12.7 | 28.4            | 206.6           | 81.0   | -76.8  | -24.1 | 80.5             | 197.4           | 0.00               | 1.00 | 0.82               | G418 |
| 206                                                                                                                                                                                           | 58.5            | 0.164 | 0.314 | 0.521 | -0.661 | 0.485           | -25.1 | -13.2 | 28.4            | 207.8           | 81.0   | -75.9  | -25.0 | 79.9             | 198.2           | 0.00               | 1.00 | 0.83               | G418 |
| 207                                                                                                                                                                                           | 58.4            | 0.164 | 0.312 | 0.525 | -0.67  | 0.486           | -24.8 | -13.7 | 28.4            | 208.8           | 81.0   | -75.0  | -25.8 | 79.3             | 199.0           | 0.00               | 1.00 | 0.85               | G428 |
| 208                                                                                                                                                                                           | 58.4            | 0.163 | 0.309 | 0.529 | -0.679 | 0.486           | -24.6 | -14.2 | 28.4            | 210.0           | 80.9   | -74.1  | -26.7 | 78.8             | 199.8           | 0.00               | 1.00 | 0.87               | G438 |
| 209                                                                                                                                                                                           | 58.4            | 0.163 | 0.307 | 0.532 | -0.687 | 0.487           | -24.3 | -14.7 | 28.4            | 211.1           | 80.9   | -73.3  | -27.4 | 78.2             | 200.5           | 0.00               | 1.00 | 0.89               | G448 |
| 210                                                                                                                                                                                           | 58.3            | 0.163 | 0.305 | 0.536 | -0.695 | 0.488           | -24.1 | -15.1 | 28.5            | 212.1           | 80.9   | -72.5  | -28.1 | 77.8             | 201.2           | 0.00               | 1.00 | 0.91               | G458 |
| 211                                                                                                                                                                                           | 58.3            | 0.163 | 0.303 | 0.539 | -0.702 | 0.489           | -23.9 | -15.5 | 28.5            | 213.0           | 80.9   | -71.7  | -28.8 | 77.3             | 201.9           | 0.00               | 1.00 | 0.92               | G468 |
| 212                                                                                                                                                                                           | 58.3            | 0.163 | 0.301 | 0.543 | -0.709 | 0.49            | -23.7 | -15.9 | 28.6            | 214.0           | 80.9   | -71.0  | -29.5 | 76.9             | 202.6           | 0.00               | 1.00 | 0.94               | G478 |
| 213                                                                                                                                                                                           | 58.2            | 0.163 | 0.299 | 0.546 | -0.716 | 0.492           | -23.5 | -16.3 | 28.6            | 214.7           | 80.9   | -70.3  | -30.1 | 76.5             | 203.1           | 0.00               | 1.00 | 0.96               | G488 |
| 214                                                                                                                                                                                           | 58.2            | 0.163 | 0.298 | 0.549 | -0.722 | 0.493           | -23.3 | -16.7 | 28.7            | 215.5           | 80.8   | -69.7  | -30.6 | 76.1             | 203.7           | 0.00               | 1.00 | 0.98               | G498 |
| 215                                                                                                                                                                                           | 58.2            | 0.163 | 0.296 | 0.552 | -0.727 | 0.494           | -23.2 | -17.0 | 28.7            | 216.2           | 80.8   | -69.1  | -31.1 | 75.8             | 204.2           | 0.00               | 1.00 | 0.99               | G508 |
| 216                                                                                                                                                                                           | 58.2            | 0.163 | 0.295 | 0.554 | -0.733 | 0.495           | -23.0 | -17.3 | 28.8            | 216.9           | 80.8   | -68.6  | -31.6 | 75.5             | 204.7           | 0.00               | 1.00 | 0.99               | G508 |
| 217                                                                                                                                                                                           | 58.2            | 0.163 | 0.293 | 0.557 | -0.737 | 0.496           | -22.9 | -17.6 | 28.8            | 217.5           | 80.8   | -68.1  | -32.0 | 75.2             | 205.2           | 0.00               | 1.00 | 0.96               | G518 |
| 218                                                                                                                                                                                           | 58.2            | 0.163 | 0.292 | 0.559 | -0.742 | 0.497           | -22.7 | -17.8 | 28.9            | 218.0           | 80.8   | -67.6  | -32.4 | 75.0             | 205.6           | 0.00               | 1.00 | 0.94               | G528 |
| 219                                                                                                                                                                                           | 58.3            | 0.164 | 0.291 | 0.563 | -0.746 | 0.496           | -22.5 | -18.1 | 28.9            | 218.7           | 80.9   | -66.8  | -32.8 | 74.4             | 206.2           | 0.00               | 1.00 | 0.92               | G538 |
| 220                                                                                                                                                                                           | 57.5            | 0.162 | 0.289 | 0.562 | -0.756 | 0.503           | -22.3 | -18.4 | 28.9            | 219.4           | 80.9   | -66.0  | -33.3 | 74.6             | 206.7           | 0.00               | 1.00 | 0.91               | G548 |
| 221                                                                                                                                                                                           | 56.6            | 0.161 | 0.287 | 0.562 | -0.768 | 0.511           | -22.0 | -18.8 | 28.9            | 220.5           | 80.0   | -66.4  | -34.4 | 74.8             | 207.4           | 0.00               | 1.00 | 0.89               | G558 |
| 222                                                                                                                                                                                           | 55.7            | 0.159 | 0.284 | 0.561 | -0.78  | 0.52            | -21.6 | -19.2 | 29.0            | 221.5           | 79.4   | -66.2  | -35.3 | 75.0             | 208.0           | 0.00               | 1.00 | 0.87               | G568 |
| 223                                                                                                                                                                                           | 54.8            | 0.158 | 0.281 | 0.56  | -0.794 | 0.529           | -21.3 | -19.6 | 29.0            | 222.6           | 78.9   | -65.9  | -36.2 | 75.3             | 208.8           | 0.00               | 1.00 | 0.85               | G578 |
| 224                                                                                                                                                                                           | 53.8            | 0.156 | 0.279 | 0.56  | -0.808 | 0.54            | -21.0 | -20.0 | 29.0            | 223.6           | 78.3   | -65.7  | -37.2 | 75.5             | 209.5           | 0.00               | 1.00 | 0.83               | G588 |
| 225                                                                                                                                                                                           | 52.8            | 0.154 | 0.276 | 0.559 | -0.823 | 0.551           | -20.6 | -20.5 | 29.1            | 224.7           | 77.7   | -65.4  | -38.2 | 75.8             | 210.2           | 0.00               | 1.00 | 0.82               | G598 |
| 226                                                                                                                                                                                           | 51.8            | 0.152 | 0.273 | 0.558 | -0.839 | 0.562           | -20.3 | -20.9 | 29.1            | 225.7           | 77.2   | -65.2  | -39.2 | 76.1             | 211.0           | 0.00               | 1.00 | 0.8                | G598 |
| 227                                                                                                                                                                                           | 50.7            | 0.15  | 0.27  | 0.557 | -0.855 | 0.574           | -19.9 | -21.3 | 29.2            | 226.6           | 76.6   | -64.9  | -40.2 | 76.4             | 211.8           | 0.00               | 1.00 | 0.78               | G608 |
| 228                                                                                                                                                                                           | 49.9            | 0.149 | 0.267 | 0.557 | -0.871 | 0.587           | -19.6 | -21.7 | 29.3            | 227.7           | 76.0   | -64.6  | -41.2 | 76.6             | 212.5           | 0.00               | 1.00 | 0.76               | G618 |
| 229                                                                                                                                                                                           | 49.9            | 0.147 | 0.264 | 0.557 | -0.889 | 0.6             | -19.2 | -22.2 | 29.3            | 229.1           | 75.4   | -64.1  | -42.3 | 76.8             | 213.2           | 0.00               | 1.00 | 0.74               | G628 |
| 230                                                                                                                                                                                           | 48.0            | 0.146 | 0.261 | 0.558 | -0.906 | 0.612           | -18.8 | -22.6 | 29.4            | 230.2           | 74.8   | -63.6  | -43.3 | 76.9             | 214.2           | 0.00               | 1.00 | 0.73               | G638 |
| 231                                                                                                                                                                                           | 47.1            | 0.144 | 0.258 | 0.559 | -0.922 | 0.624           | -18.4 | -22.9 | 29.4            | 231.2           | 74.3   | -63.0  | -44.2 | 76.9             | 215.0           | 0.00               | 1.00 | 0.71               | G648 |
| 232                                                                                                                                                                                           | 46.4            | 0.143 | 0.256 | 0.561 | -0.937 | 0.635           | -18.0 | -23.2 | 29.4            | 232.1           | 73.8   | -62.3  | -45.0 | 76.9             | 215.8           | 0.00               | 1.00 | 0.69               | G658 |
| 233                                                                                                                                                                                           | 45.7            | 0.142 | 0.253 | 0.563 | -0.951 | 0.645           | -17.7 | -23.6 | 29.5            | 233.1           | 73.3   | -61.6  | -45.8 | 76.8             | 216.6           | 0.00               | 1.00 | 0.67               | G668 |
| 234                                                                                                                                                                                           | 45.0            | 0.141 | 0.251 | 0.565 | -0.966 | 0.655           | -17.3 | -23.8 | 29.5            | 234.0           | 72.9   | -60.9  | -46.6 | 76.7             | 217.4           | 0.00               | 1.00 | 0.65               | G678 |
| 235                                                                                                                                                                                           | 44.3            | 0.141 | 0.248 | 0.567 | -0.981 | 0.667           | -16.9 | -24.2 | 29.5            | 234.9           | 72.4   | -60.1  | -47.4 | 76.6             | 218.2           | 0.00               | 1.00 | 0.64               | G678 |
| 236                                                                                                                                                                                           | 43.5            | 0.14  | 0.245 | 0.57  | -0.998 | 0.679           | -16.5 | -24.5 | 29.5            | 235.9           | 71.9   | -59.3  | -48.3 | 76.5             | 219.1           | 0.00               | 1.00 | 0.62               | G688 |
| 237                                                                                                                                                                                           | 42.8            | 0.139 | 0.243 | 0.572 | -1.016 | 0.692           | -16.1 | -24.8 | 29.6            | 236.9           | 71.49. |        |       |                  |                 |                    |      |                    |      |

| rgb <sub>AB</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                                        |          |          |          |          |          |                        |          |          |                        |            |                       |                       |                       |                                     |            |                          |                           |      |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|------------------------|----------|----------|------------------------|------------|-----------------------|-----------------------|-----------------------|-------------------------------------|------------|--------------------------|---------------------------|------|--------|
| Yxy, <i>abc</i> <sub>AB</sub> , <i>ABC</i> <sub>AB</sub> , <i>LabC</i> <sub>ab</sub> <i>hAB</i> data for relative spacing of elementary hue <i>hAB</i> of <i>LIN</i> YAB for CIE 2 degree observer |          |          |          |          |          |                        |          |          |                        |            |                       |                       |                       |                                     |            |                          |                           |      |        |
| Elementary hue circle with 4 intended elementary hue angles: <i>hAB</i> = 17.7, 93.3, 159.1, 270.8 of <i>LIN</i> YAB, and 90 intended hue angles:                                                  |          |          |          |          |          |                        |          |          |                        |            |                       |                       |                       |                                     |            |                          |                           |      |        |
| 270, 271, ..., 360, <i>LIN</i> YAB data of CIE test colours 9 (R): 11.2 9.9 3.1, 10 (Y): 59.0 59.0 1.2 20.9, 11 (G): 20.3 -7.2 12.7, 12 (B): 6.4 0.1 -8.2                                          |          |          |          |          |          |                        |          |          |                        |            |                       |                       |                       |                                     |            |                          |                           |      |        |
| <i>no.</i> <sub>AB</sub>                                                                                                                                                                           | <i>Y</i> | <i>x</i> | <i>y</i> | <i>a</i> | <i>b</i> | <i>c</i> <sub>AB</sub> | <i>A</i> | <i>B</i> | <i>C</i> <sub>AB</sub> | <i>hAB</i> | <i>L</i> <sup>*</sup> | <i>a</i> <sup>*</sup> | <i>b</i> <sup>*</sup> | <i>C</i> <sup>*</sup> <sub>ab</sub> | <i>hAB</i> | <i>rgb</i> <sub>ab</sub> | <i>Code</i> <sub>AB</sub> |      |        |
| 270                                                                                                                                                                                                | 19.2     | 0.127    | 0.132    | 0.963    | -2.244   | 1.889                  | 0.2      | -34.7    | 34.7                   | 270.4      | 50.9                  | 1.2                   | -83.9                 | 83.9                                | 270.8      | 0.00                     | 0.01                      | 1.00 | % G99B |
| 271                                                                                                                                                                                                | 18.6     | 0.127    | 0.128    | 0.99     | -2.316   | 1.881                  | 0.7      | -35.0    | 35.0                   | 271.2      | 50.2                  | 4.0                   | -85.1                 | 85.2                                | 272.6      | 0.0                      | 0.0                       | 1.00 | % R00R |
| 272                                                                                                                                                                                                | 18.0     | 0.127    | 0.125    | 1.019    | -2.389   | 1.954                  | 1.2      | -35.2    | 35.2                   | 272.0      | 49.5                  | 6.6                   | -86.2                 | 86.5                                | 274.4      | 0.02                     | 0.00                      | 1.00 | % B01R |
| 273                                                                                                                                                                                                | 17.1     | 0.127    | 0.119    | 1.066    | -2.512   | 2.08                   | 1.9      | -35.5    | 35.6                   | 273.2      | 48.4                  | 10.8                  | -88.1                 | 88.8                                | 277.0      | 0.04                     | 0.00                      | 1.00 | % B02R |
| 274                                                                                                                                                                                                | 16.3     | 0.128    | 0.115    | 1.111    | -2.627   | 2.197                  | 2.6      | -35.8    | 35.9                   | 274.2      | 47.4                  | 14.6                  | -89.7                 | 90.9                                | 279.2      | 0.05                     | 0.00                      | 1.00 | % B02R |
| 275                                                                                                                                                                                                | 15.7     | 0.128    | 0.115    | 1.156    | -2.736   | 2.309                  | 3.2      | -36.1    | 36.2                   | 275.1      | 46.6                  | 18.2                  | -91.1                 | 93.0                                | 281.3      | 0.07                     | 0.00                      | 1.00 | % B03R |
| 276                                                                                                                                                                                                | 15.0     | 0.129    | 0.107    | 1.205    | -2.85    | 2.428                  | 3.8      | -36.3    | 36.5                   | 276.0      | 45.7                  | 21.9                  | -92.6                 | 95.1                                | 283.3      | 0.09                     | 0.00                      | 1.00 | % B04R |
| 277                                                                                                                                                                                                | 14.3     | 0.129    | 0.102    | 1.264    | -2.989   | 2.575                  | 4.5      | -36.6    | 36.8                   | 277.0      | 44.7                  | 26.1                  | -94.2                 | 97.7                                | 285.5      | 0.11                     | 0.00                      | 1.00 | % B05R |
| 278                                                                                                                                                                                                | 13.5     | 0.13     | 0.097    | 1.336    | -3.157   | 2.749                  | 5.2      | -36.8    | 37.2                   | 278.0      | 43.5                  | 30.9                  | -96.0                 | 100.9                               | 287.8      | 0.13                     | 0.00                      | 1.00 | % B06R |
| 279                                                                                                                                                                                                | 12.7     | 0.131    | 0.092    | 1.419    | -3.349   | 2.951                  | 5.9      | -37.1    | 37.6                   | 279.1      | 42.3                  | 36.0                  | -99.7                 | 104.3                               | 290.1      | 0.15                     | 0.00                      | 1.00 | % B07R |
| 280                                                                                                                                                                                                | 11.9     | 0.132    | 0.087    | 1.513    | -3.567   | 3.182                  | 6.7      | -37.3    | 37.9                   | 280.2      | 41.1                  | 41.3                  | -99.9                 | 108.1                               | 292.4      | 0.17                     | 0.00                      | 1.00 | % B08R |
| 281                                                                                                                                                                                                | 11.1     | 0.133    | 0.082    | 1.616    | -3.809   | 3.44                   | 7.4      | -37.6    | 38.3                   | 281.2      | 39.8                  | 46.7                  | -102.0                | 112.2                               | 294.6      | 0.19                     | 0.00                      | 1.00 | % B09R |
| 282                                                                                                                                                                                                | 10.3     | 0.134    | 0.077    | 1.734    | -4.075   | 3.723                  | 8.1      | -37.8    | 38.7                   | 282.1      | 38.5                  | 52.1                  | -104.0                | 116.4                               | 296.6      | 0.2                      | 0.00                      | 1.00 | % B10R |
| 283                                                                                                                                                                                                | 9.6      | 0.135    | 0.072    | 1.858    | -4.357   | 4.025                  | 8.8      | -38.0    | 39.0                   | 283.0      | 37.3                  | 57.5                  | -106.0                | 120.6                               | 298.4      | 0.22                     | 0.00                      | 1.00 | % B11R |
| 284                                                                                                                                                                                                | 8.7      | 0.136    | 0.066    | 1.968    | -4.831   | 4.535                  | 9.7      | -38.2    | 39.4                   | 284.2      | 35.4                  | 65.5                  | -109.0                | 127.2                               | 300.8      | 0.24                     | 0.00                      | 1.00 | % B12R |
| 285                                                                                                                                                                                                | 7.9      | 0.137    | 0.061    | 2.251    | -5.235   | 4.973                  | 10.4     | -38.3    | 39.7                   | 285.0      | 33.9                  | 71.7                  | -111.2                | 132.3                               | 302.8      | 0.26                     | 0.00                      | 1.00 | % B13R |
| 286                                                                                                                                                                                                | 7.6      | 0.136    | 0.052    | 2.482    | -5.602   | 5.396                  | 10.3     | -38.4    | 40.0                   | 286.0      | 31.1                  | 76.8                  | -115.6                | 138.8                               | 303.5      | 0.28                     | 0.00                      | 1.00 | % B14R |
| 287                                                                                                                                                                                                | 5.6      | 0.128    | 0.045    | 2.848    | -7.295   | 7.117                  | 10.7     | -38.8    | 40.2                   | 285.8      | 28.5                  | 84.7                  | -119.6                | 146.5                               | 305.3      | 0.3                      | 0.00                      | 1.00 | % B15R |
| 288                                                                                                                                                                                                | 6.3      | 0.144    | 0.05     | 2.887    | -6.421   | 6.291                  | 12.3     | -38.2    | 40.2                   | 287.9      | 30.4                  | 89.6                  | -116.1                | 146.6                               | 307.6      | 0.32                     | 0.00                      | 1.00 | % B16R |
| 289                                                                                                                                                                                                | 6.7      | 0.15     | 0.052    | 2.866    | -6.055   | 5.937                  | 12.9     | -38.1    | 40.2                   | 288.8      | 31.3                  | 90.6                  | -114.5                | 146.0                               | 308.3      | 0.34                     | 0.00                      | 1.00 | % B17R |
| 290                                                                                                                                                                                                | 7.1      | 0.157    | 0.055    | 2.846    | -5.713   | 5.697                  | 13.6     | -37.9    | 40.2                   | 289.7      | 32.2                  | 91.7                  | -112.8                | 145.4                               | 309.0      | 0.35                     | 0.00                      | 1.00 | % B17R |
| 291                                                                                                                                                                                                | 7.6      | 0.163    | 0.057    | 2.865    | -5.395   | 5.362                  | 14.2     | -37.6    | 40.3                   | 290.9      | 33.1                  | 92.7                  | -111.2                | 144.8                               | 309.8      | 0.37                     | 0.00                      | 1.00 | % B18R |
| 292                                                                                                                                                                                                | 8.0      | 0.169    | 0.06     | 2.887    | -5.099   | 5.02                   | 14.9     | -37.4    | 40.3                   | 291.7      | 34.0                  | 93.7                  | -109.6                | 144.2                               | 310.5      | 0.39                     | 0.00                      | 1.00 | % B19R |
| 293                                                                                                                                                                                                | 8.4      | 0.175    | 0.063    | 2.788    | -4.826   | 4.64                   | 15.6     | -37.2    | 40.3                   | 292.3      | 34.9                  | 94.7                  | -108.0                | 143.7                               | 311.2      | 0.41                     | 0.00                      | 1.00 | % B20R |
| 294                                                                                                                                                                                                | 8.9      | 0.18     | 0.065    | 2.77     | -4.572   | 4.52                   | 16.2     | -37.0    | 40.4                   | 293.7      | 35.9                  | 95.8                  | -106.4                | 143.1                               | 311.9      | 0.43                     | 0.00                      | 1.00 | % B21R |
| 295                                                                                                                                                                                                | 9.4      | 0.188    | 0.068    | 2.753    | -4.338   | 4.298                  | 16.9     | -36.7    | 40.5                   | 294.7      | 36.8                  | 96.7                  | -104.8                | 142.6                               | 312.7      | 0.45                     | 0.00                      | 1.00 | % B22R |
| 296                                                                                                                                                                                                | 9.9      | 0.194    | 0.071    | 2.736    | -4.12    | 4.095                  | 17.7     | -36.5    | 40.6                   | 295.8      | 37.7                  | 97.7                  | -103.2                | 142.1                               | 313.4      | 0.47                     | 0.00                      | 1.00 | % B23R |
| 297                                                                                                                                                                                                | 10.4     | 0.201    | 0.073    | 2.72     | -3.919   | 3.997                  | 18.4     | -36.3    | 40.7                   | 296.9      | 38.6                  | 98.7                  | -101.6                | 141.4                               | 314.1      | 0.48                     | 0.00                      | 1.00 | % B24R |
| 298                                                                                                                                                                                                | 10.9     | 0.207    | 0.076    | 2.704    | -3.733   | 3.735                  | 19.1     | -36.0    | 40.8                   | 298.0      | 39.4                  | 99.6                  | -100.0                | 141.2                               | 314.8      | 0.5                      | 0.00                      | 1.00 | % B25R |
| 299                                                                                                                                                                                                | 11.4     | 0.213    | 0.079    | 2.689    | -3.56    | 3.576                  | 19.9     | -35.8    | 40.9                   | 299.0      | 40.3                  | 100.6                 | -98.5                 | 140.8                               | 315.6      | 0.52                     | 0.00                      | 1.00 | % B26R |
| 300                                                                                                                                                                                                | 11.9     | 0.219    | 0.082    | 2.675    | -3.4     | 3.429                  | 20.6     | -35.5    | 41.1                   | 300.1      | 41.2                  | 101.5                 | -96.9                 | 140.4                               | 316.3      | 0.54                     | 0.00                      | 1.00 | % B27R |
| 301                                                                                                                                                                                                | 12.5     | 0.225    | 0.084    | 2.661    | -3.251   | 3.294                  | 21.4     | -35.2    | 41.2                   | 300.2      | 42.0                  | 102.4                 | -95.4                 | 140.0                               | 316.9      | 0.56                     | 0.00                      | 1.00 | % B28R |
| 302                                                                                                                                                                                                | 13.0     | 0.231    | 0.087    | 2.647    | -3.113   | 3.17                   | 22.1     | -35.0    | 41.4                   | 302.3      | 42.8                  | 103.2                 | -94.0                 | 139.6                               | 317.5      | 0.58                     | 0.00                      | 1.00 | % B29R |
| 303                                                                                                                                                                                                | 13.6     | 0.237    | 0.09     | 2.634    | -2.985   | 3.055                  | 22.9     | -34.7    | 41.6                   | 303.4      | 43.7                  | 104.1                 | -92.9                 | 139.3                               | 318.3      | 0.6                      | 0.00                      | 1.00 | % B30R |
| 304                                                                                                                                                                                                | 14.1     | 0.243    | 0.092    | 2.622    | -2.865   | 2.949                  | 23.7     | -34.4    | 41.8                   | 304.5      | 44.5                  | 104.9                 | -91.1                 | 138.9                               | 319.0      | 0.62                     | 0.00                      | 1.00 | % B31R |
| 305                                                                                                                                                                                                | 14.7     | 0.248    | 0.095    | 2.61     | -2.754   | 2.851                  | 24.4     | -34.1    | 42.0                   | 305.5      | 45.3                  | 105.7                 | -89.7                 | 138.6                               | 319.6      | 0.63                     | 0.00                      | 1.00 | % B31R |
| 306                                                                                                                                                                                                | 15.3     | 0.254    | 0.097    | 2.598    | -2.65    | 2.761                  | 25.2     | -33.9    | 42.2                   | 306.6      | 46.0                  | 106.5                 | -88.3                 | 138.3                               | 320.3      | 0.65                     | 0.00                      | 1.00 | % B32R |
| 307                                                                                                                                                                                                | 15.8     | 0.259    | 0.1      | 2.586    | -2.554   | 2.677                  | 25.9     | -33.6    | 42.5                   | 307.6      | 46.8                  | 107.2                 | -86.9                 | 138.0                               | 320.9      | 0.67                     | 0.00                      | 1.00 | % B33R |
| 308                                                                                                                                                                                                | 16.4     | 0.264    | 0.102    | 2.575    | -2.464   | 2.599                  | 26.7     | -33.3    | 42.7                   | 308.7      | 47.5                  | 107.9                 | -85.6                 | 137.8                               | 321.5      | 0.69                     | 0.00                      | 1.00 | % B34R |
| 309                                                                                                                                                                                                | 17.0     | 0.269    | 0.105    | 2.565    | -2.379   | 2.527                  | 27.4     | -33.0    | 43.0                   | 309.7      | 48.2                  | 108.6                 | -84.3                 | 137.5                               | 322.1      | 0.71                     | 0.00                      | 1.00 | % B35R |
| 310                                                                                                                                                                                                | 17.5     | 0.274    | 0.107    | 2.554    | -2.291   | 2.474                  | 28.1     | -32.8    | 43.2                   | 310.7      | 49.0                  | 109.3                 | -83.0                 | 137.2                               | 322.7      | 0.73                     | 0.00                      | 1.00 | % B36R |
| 311                                                                                                                                                                                                | 18.1     | 0.279    | 0.109    | 2.544    | -2.227   | 2.398                  | 28.9     | -32.5    | 43.5                   | 311.6      | 49.6                  | 109.9                 | -81.8                 | 137.0                               | 323.3      | 0.75                     | 0.00                      | 1.00 | % B37R |
| 312                                                                                                                                                                                                | 18.7     | 0.283    | 0.111    | 2.534    | -2.158   | 2.34                   | 29.6     | -32.2    | 43.8                   | 312.5      | 50.3                  | 110.5                 | -80.6                 | 136.8                               | 323.9      | 0.77                     | 0.00                      | 1.00 | % B38R |
| 313                                                                                                                                                                                                | 19.2     | 0.288    | 0.114    | 2.524    | -2.093   | 2.286                  | 30.3     | -31.9    | 44.0                   | 313.5      | 51.0                  | 111.1                 | -79.4                 | 136.6                               | 324.4      | 0.78                     | 0.00                      | 1.00 | % B39R |
| 314                                                                                                                                                                                                | 19.8     | 0.292    | 0.116    | 2.515    | -2.033   | 2.236                  | 31.0     | -31.7    | 44.3                   | 314.4      | 51.6                  | 111.7                 | -78.2                 | 136.4                               | 324.9      | 0.8                      | 0.00                      | 1.00 | % B40R |
| 315                                                                                                                                                                                                | 20.3     | 0.296    | 0.118    | 2.505    | -1.976   | 2.189                  | 31.7     | -31.4    | 44.6                   | 315.2      | 52.2                  | 112.2                 | -77.1                 | 136.2                               | 325.4      | 0.82                     | 0.00                      | 1.00 | % B41R |
| 316                                                                                                                                                                                                | 20.9     | 0.3      | 0.12     | 2.496    | -1.923   | 2.145                  | 32.3     | -31.1    | 44.9                   | 316.1      | 52.8                  | 112.7                 | -76.0                 | 136.0                               | 325.9      | 0.84                     | 0.00                      | 1.00 | % B42R |
| 317                                                                                                                                                                                                | 21.23    | 0.296    | 0.123    | 2.484    | -1.861   | 2.173                  | 33.0     | -30.7    | 45.2                   | 317.0      | 53.8                  | 113.4                 | -74.3                 | 135.2                               | 326.6      | 0.86                     | 0.00                      | 1.00 | % B43R |
| 318                                                                                                                                                                                                | 21.6     | 0.313    | 0.128    | 2.436    | -1.781   | 2.174                  | 34.3     | -30.0    | 45.6                   | 318.8      | 55.1                  | 113.9                 | -71.8                 | 133.9                               | 327.5      | 0.88                     | 0.00                      | 1.00 | % B44R |
| 319                                                                                                                                                                                                | 24.2     | 0.319    | 0.133    | 2.399    | -1.646   | 1.888                  | 35.1     | -29.4    | 45.8                   | 320.1      | 56.3                  | 112.7                 | -69.5                 | 132.5                               | 328.3      | 0.9                      | 0.00                      | 1.00 | % B45R |
| 320                                                                                                                                                                                                | 25.3     | 0.324    | 0.137    | 2.363    | -1.57    | 1.812                  | 35.8     | -28.7    | 45.9                   | 322.2      | 57.4                  | 112.3                 | -67.5                 | 131.0                               | 328.9      | 0.91                     | 0.00                      | 1.00 | % B46R |
| 321                                                                                                                                                                                                | 26.4     | 0.328    | 0.141    | 2.328    | -1.504   | 1.744                  | 36.4     | -28.0    | 46.0                   | 322.2      | 58.4                  | 111.6                 | -65.6                 | 129.5                               | 329.5      | 0.93                     | 0.00                      | 1.00 | % B46R |
| 322                                                                                                                                                                                                | 27.3     | 0.332    | 0.144    | 2.295    | -1.446   | 1.682                  | 36.8     | -27.6    | 46.0                   | 323.0      | 59.3                  | 110.9                 | -63.8                 | 127.9                               | 330.0      | 0.95                     | 0.00                      | 1.00 | % B47R |
| 323                                                                                                                                                                                                | 28.2     | 0.335    | 0.148    | 2.263    | -1.395   | 1.626                  | 37.1     | -27.1    | 45.9                   | 323.8      | 60.1                  | 110.0                 | -62.2                 | 126.4                               | 330.5      | 0.97                     | 0.00                      | 1.00 | % B48R |
| 324                                                                                                                                                                                                | 29.1     | 0.337    | 0.151    | 2.232    | -1.35    | 1.575                  | 37.3     | -26.6    | 45.8                   | 324.4      | 60.8                  | 109.1                 | -60.7                 | 124.8                               | 330.9      | 1.00                     | 0.00                      | 1.00 | % B49R |
| 325                                                                                                                                                                                                | 29.9     | 0.34     | 0.1      |          |          |                        |          |          |                        |            |                       |                       |                       |                                     |            |                          |                           |      |        |

| Oswald optimal colours (o) of maximum (m) C <sub>AB</sub> for D65, Y <sub>w,10</sub> =100, Y <sub>m</sub> =520_770, LINYAB data          |                                 |                  |                  |                  |                 |        |         |                 |                                 |                                 |      |  |   | % |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------|------------------|------------------|-----------------|--------|---------|-----------------|---------------------------------|---------------------------------|------|--|---|---|
| i <sub>1</sub> , λ <sub>1</sub>                                                                                                          | i <sub>2</sub> , λ <sub>2</sub> | Y <sub>100</sub> | A <sub>100</sub> | B <sub>100</sub> | C <sub>AB</sub> | a      | b       | h <sub>AB</sub> | i <sub>d</sub> , λ <sub>d</sub> | i <sub>c</sub> , λ <sub>c</sub> | Code |  | % |   |
| 0 405                                                                                                                                    | 31 556                          | 56.57            | −21.89           | −18.32           | 28.54           | 0.5611 | −0.7532 | 219.9           | 15 476                          | 37 585                          | Cm   |  | % |   |
| 6 435                                                                                                                                    | 31 557                          | 57.41            | −26.44           | −8.79            | 27.86           | 0.4876 | −0.5825 | 198.4           | 16 480                          | 44 621                          |      |  | % |   |
| 10 450                                                                                                                                   | 31 559                          | 57.53            | −32.48           | 6.09             | 33.05           | 0.3834 | −0.3234 | 169.3           | 18 491                          | −1 491c                         |      |  | % |   |
| 11 460                                                                                                                                   | 32 562                          | 59.27            | −33.9            | 10.52            | 35.5            | 0.3761 | −0.2517 | 162.7           | 19 498                          | −1 498c                         |      |  | % |   |
| 12 465                                                                                                                                   | 33 565                          | 60.91            | −34.93           | 14.56            | 37.84           | 0.3747 | −0.1903 | 157.3           | 21 506                          | −1 506c                         |      |  | % |   |
| 14 470                                                                                                                                   | 34 570                          | 63.07            | −35.18           | 20.67            | 40.8            | 0.3903 | −0.1016 | 149.5           | 24 522                          | −1 522c                         |      |  | % |   |
| 15 475                                                                                                                                   | 35 579                          | 68.64            | −33.55           | 24.85            | 41.75           | 0.4593 | −0.0672 | 143.4           | 26 533                          | −1 533c                         | Gm   |  | % |   |
| 16 480                                                                                                                                   | 41 606                          | 81.94            | −23.65           | 31.88            | 39.7            | 0.6594 | −0.0401 | 126.5           | 30 550                          | −1 550c                         |      |  | % |   |
| 16 485                                                                                                                                   | −1 484c                         | 92.3             | −10.45           | 36.33            | 37.8            | 0.8348 | −0.0356 | 106.0           | 32 560                          | 10 454                          |      |  | % |   |
| 18 490                                                                                                                                   | −1 490c                         | 89.06            | −7.57            | 36.55            | 37.33           | 0.863  | −0.0188 | 101.7           | 32 562                          | 11 459                          | max  |  | % |   |
| 19 495                                                                                                                                   | −1 495c                         | 87.05            | −5.68            | 36.18            | 36.62           | 0.8828 | −0.0136 | 98.9            | 32 563                          | 12 461                          |      |  | % |   |
| 19 500                                                                                                                                   | −1 499c                         | 87.05            | −5.68            | 36.18            | 36.62           | 0.8828 | −0.0136 | 98.9            | 32 563                          | 12 461                          |      |  | % |   |
| 22 510                                                                                                                                   | −1 510c                         | 79.1             | 1.43             | 33.55            | 33.58           | 0.9662 | −0.0051 | 87.5            | 33 567                          | 13 466                          |      |  | % |   |
| 23 520                                                                                                                                   | −1 519c                         | 75.81            | 4.11             | 32.27            | 32.53           | 1.0024 | −0.0036 | 82.7            | 33 568                          | 13 468                          | Ym   |  | % |   |
| 26 530                                                                                                                                   | −1 530c                         | 64.17            | 12.31            | 27.48            | 30.11           | 1.14   | −0.001  | 65.8            | 34 573                          | 14 472                          |      |  | % |   |
| 27 540                                                                                                                                   | −1 539c                         | 59.9             | 14.81            | 25.68            | 29.65           | 1.1955 | −0.0005 | 60.0            | 35 576                          | 14 473                          |      |  | % |   |
| 28 545                                                                                                                                   | −1 544c                         | 55.54            | 17.09            | 23.83            | 29.32           | 1.2559 | −0.0002 | 54.3            | 35 578                          | 14 474                          |      |  | % |   |
| 29 550                                                                                                                                   | −1 549c                         | 51.12            | 19.09            | 21.94            | 29.08           | 1.3215 | −0.0001 | 48.9            | 36 580                          | 15 475                          |      |  | % |   |
| 31 555                                                                                                                                   | −1 555c                         | 42.37            | 21.98            | 18.19            | 28.53           | 1.4668 | 0.0     | 39.6            | 37 586                          | 15 476                          |      |  | % |   |
| 32 560                                                                                                                                   | 10 451                          | 40.04            | 32.52            | −6.18            | 33.11           | 1.7604 | −0.5838 | 349.2           | −1 492c                         | 18 492                          |      |  | % |   |
| 380                                                                                                                                      | 770                             | 100.0            | 0.0              | 0.0              | 0.01            | 0.9481 | −0.4293 | 0.0             |                                 |                                 |      |  | % |   |
| Oswald optimal colours (o) of maximum (m) C <sub>AB</sub> for D65, Y <sub>w,10</sub> =100, Y <sub>m</sub> =770_520, LINYAB complementary |                                 |                  |                  |                  |                 |        |         |                 |                                 |                                 |      |  |   | % |
| i <sub>1</sub> , λ <sub>1</sub>                                                                                                          | i <sub>2</sub> , λ <sub>2</sub> | Y <sub>100</sub> | A <sub>100</sub> | B <sub>100</sub> | C <sub>AB</sub> | a      | b       | h <sub>AB</sub> | i <sub>d</sub> , λ <sub>d</sub> | i <sub>c</sub> , λ <sub>c</sub> | Code |  | % |   |
| 31 556                                                                                                                                   | 0 405                           | 43.42            | 21.89            | 18.32            | 28.54           | 1.4522 | −0.0074 | 39.9            | 37 585                          | 15 476                          | Rm   |  | % |   |
| 31 557                                                                                                                                   | 6 435                           | 42.58            | 26.44            | 8.79             | 27.86           | 1.5691 | −0.2226 | 18.4            | 44 621                          | 16 480                          |      |  | % |   |
| 31 559                                                                                                                                   | 10 450                          | 42.46            | 32.48            | −6.09            | 33.05           | 1.713  | −0.5727 | 349.3           | −1 491c                         | 18 491                          |      |  | % |   |
| 32 562                                                                                                                                   | 11 460                          | 40.72            | 33.9             | −10.52           | 35.5            | 1.7807 | −0.6879 | 342.7           | −1 498c                         | 19 498                          |      |  | % |   |
| 33 565                                                                                                                                   | 12 465                          | 39.08            | 34.93            | −14.56           | 37.84           | 1.8419 | −0.8019 | 337.3           | −1 506c                         | 21 506                          |      |  | % |   |
| 34 570                                                                                                                                   | 14 470                          | 36.92            | 35.18            | −20.67           | 40.8            | 1.901  | −0.9891 | 329.5           | −1 522c                         | 24 522                          |      |  | % |   |
| 35 579                                                                                                                                   | 15 475                          | 31.35            | 33.55            | −24.85           | 41.75           | 2.0184 | −1.2222 | 323.4           | −1 533c                         | 26 533                          | Mm   |  | % |   |
| 41 606                                                                                                                                   | 16 480                          | 18.05            | 23.65            | −31.88           | 39.7            | 2.2587 | −2.1959 | 306.5           | −1 550c                         | 30 550                          |      |  | % |   |
| −1 484c                                                                                                                                  | 16 485                          | 7.69             | 10.45            | −36.33           | 37.8            | 2.306  | −5.1484 | 286.0           | 10 454                          | 32 560                          |      |  | % |   |
| −1 490c                                                                                                                                  | 18 490                          | 10.93            | 7.57             | −36.55           | 37.33           | 1.6407 | −3.7725 | 281.7           | 11 459                          | 32 562                          | min  |  | % |   |
| −1 495c                                                                                                                                  | 19 495                          | 12.94            | 5.68             | −36.18           | 36.62           | 1.3873 | −3.2239 | 278.9           | 12 461                          | 32 563                          |      |  | % |   |
| −1 499c                                                                                                                                  | 19 500                          | 12.94            | 5.68             | −36.18           | 36.62           | 1.3873 | −3.2239 | 278.9           | 12 461                          | 32 563                          |      |  | % |   |
| −1 510c                                                                                                                                  | 22 510                          | 20.89            | −1.43            | −33.55           | 33.58           | 0.8795 | −2.035  | 267.5           | 13 466                          | 33 567                          |      |  | % |   |
| −1 519c                                                                                                                                  | 23 520                          | 24.18            | −4.12            | −32.27           | 32.53           | 0.7777 | −1.7639 | 262.7           | 13 468                          | 33 568                          | Bm   |  | % |   |
| −1 530c                                                                                                                                  | 26 530                          | 35.82            | −12.31           | −27.48           | 30.11           | 0.6044 | −1.1965 | 245.8           | 14 472                          | 34 573                          |      |  | % |   |
| −1 539c                                                                                                                                  | 27 540                          | 40.09            | −14.81           | −25.68           | 29.65           | 0.5785 | −1.0699 | 240.0           | 14 473                          | 35 576                          |      |  | % |   |
| −1 544c                                                                                                                                  | 28 545                          | 44.45            | −17.09           | −23.83           | 29.32           | 0.5635 | −0.9653 | 234.3           | 14 474                          | 35 578                          |      |  | % |   |
| −1 549c                                                                                                                                  | 29 550                          | 48.87            | −19.09           | −21.94           | 29.08           | 0.5575 | −0.8782 | 228.9           | 15 475                          | 36 580                          |      |  | % |   |
| −1 555c                                                                                                                                  | 31 555                          | 57.62            | −21.98           | −18.19           | 28.53           | 0.5667 | −0.745  | 219.6           | 15 476                          | 37 586                          |      |  | % |   |
| 10 451                                                                                                                                   | 32 560                          | 59.95            | −32.52           | 6.18             | 33.11           | 0.4056 | −0.3261 | 169.2           | 18 492                          | −1 492c                         |      |  | % |   |
| 380                                                                                                                                      | 770                             | 100.0            | 0.0              | 0.0              | 0.01            | 0.9481 | −0.4293 | 0.0             |                                 |                                 |      |  | % |   |

| rgb <sub>LAB</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                                    |      |                 |                 |                 |                 |                    |                 |                 |                    |                    |                  |      |       |       |                    |                   |                       |      |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------|-----------------|-----------------|-----------------|--------------------|-----------------|-----------------|--------------------|--------------------|------------------|------|-------|-------|--------------------|-------------------|-----------------------|------|------|
| Yxy, abc <sub>AB</sub> , ABC <sub>AB</sub> , LabC <sub>ab</sub> , h <sub>AB</sub> data for relative spacing of elementary hue h <sub>AB</sub> of L <sub>IN</sub> YAB for CIE 10 degree observer |      |                 |                 |                 |                 |                    |                 |                 |                    |                    |                  |      |       |       |                    |                   |                       |      |      |
| Elementary hue circle with 4 intended elementary hues 9 (R): 10.8 8.7 2.8, 10 (Y): 55.9 1.2 19.6, 11 (G): 20.4 -6.8 3.0, 12 (B): 7.8 -1.2 -7.2                                                  |      |                 |                 |                 |                 |                    |                 |                 |                    |                    |                  |      |       |       |                    |                   |                       |      |      |
| no.                                                                                                                                                                                             | AB   | X <sub>10</sub> | Y <sub>10</sub> | a <sub>10</sub> | b <sub>10</sub> | c <sub>AB</sub> 10 | A <sub>10</sub> | B <sub>10</sub> | C <sub>AB</sub> 10 | h <sub>AB</sub> 10 | L* <sub>10</sub> | a*   | b*    | c*    | h <sub>AB</sub> 10 | rgb <sub>AB</sub> | Code <sub>AB</sub> 10 |      |      |
| 000                                                                                                                                                                                             | 48.0 | 0.434           | 0.252           | 1.724           | -0.497          | 0.779              | 31.0            | -2.7            | 31.1               | 354.9              | 69.5             | 81.2 | -7.3  | 81.6  | 354.7              | 1.00              | 0.00                  | 0.36 | B81R |
| 001                                                                                                                                                                                             | 48.0 | 0.436           | 0.253           | 1.719           | -0.487          | 0.773              | 30.8            | -2.3            | 30.9               | 355.7              | 69.5             | 80.8 | -6.3  | 81.1  | 355.5              | 1.00              | 0.00                  | 0.34 | B82R |
| 002                                                                                                                                                                                             | 48.0 | 0.439           | 0.256           | 1.714           | -0.476          | 0.768              | 30.7            | -1.8            | 30.7               | 356.4              | 69.5             | 80.4 | -5.2  | 80.6  | 356.3              | 1.00              | 0.00                  | 0.32 | B83R |
| 003                                                                                                                                                                                             | 48.0 | 0.441           | 0.258           | 1.709           | -0.465          | 0.762              | 30.5            | -1.4            | 30.5               | 357.2              | 69.5             | 80.0 | -4.0  | 80.1  | 357.1              | 1.00              | 0.00                  | 0.3  | B84R |
| 004                                                                                                                                                                                             | 48.1 | 0.443           | 0.26            | 1.704           | -0.454          | 0.757              | 30.3            | -1.0            | 30.3               | 358.1              | 69.5             | 79.6 | -2.8  | 79.6  | 357.9              | 1.00              | 0.00                  | 0.28 | B85R |
| 005                                                                                                                                                                                             | 48.1 | 0.446           | 0.262           | 1.699           | -0.442          | 0.751              | 30.1            | -0.5            | 30.1               | 358.9              | 69.5             | 79.1 | -1.5  | 79.1  | 358.8              | 1.00              | 0.00                  | 0.26 | B86R |
| 006                                                                                                                                                                                             | 48.1 | 0.449           | 0.265           | 1.694           | -0.431          | 0.745              | 29.9            | 0.0             | 29.9               | 359.8              | 69.5             | 78.7 | -0.2  | 78.7  | 359.8              | 1.00              | 0.00                  | 0.24 | B87R |
| 007                                                                                                                                                                                             | 48.1 | 0.451           | 0.267           | 1.688           | -0.419          | 0.737              | 29.7            | 0.4             | 29.7               | 0.7                | 69.6             | 78.2 | 1.1   | 78.2  | 0.8                | 1.00              | 0.00                  | 0.22 | B88R |
| 008                                                                                                                                                                                             | 48.2 | 0.454           | 0.27            | 1.682           | -0.408          | 0.734              | 29.5            | 0.8             | 29.5               | 1.0                | 69.7             | 77.2 | 2.7   | 77.2  | 1.8                | 1.00              | 0.00                  | 0.2  | B89R |
| 009                                                                                                                                                                                             | 48.2 | 0.457           | 0.272           | 1.676           | -0.394          | 0.729              | 29.3            | 1.3             | 29.3               | 2.7                | 69.6             | 77.2 | 4.0   | 77.3  | 3.0                | 1.00              | 0.00                  | 0.18 | B90R |
| 010                                                                                                                                                                                             | 48.2 | 0.46            | 0.275           | 1.67            | -0.382          | 0.724              | 29.1            | 1.9             | 29.1               | 3.7                | 69.6             | 76.7 | 5.6   | 76.9  | 4.1                | 1.00              | 0.00                  | 0.16 | B91R |
| 011                                                                                                                                                                                             | 48.3 | 0.463           | 0.278           | 1.664           | -0.369          | 0.719              | 28.8            | 2.4             | 28.9               | 4.7                | 69.6             | 76.2 | 7.2   | 76.5  | 5.4                | 1.00              | 0.00                  | 0.14 | B92R |
| 012                                                                                                                                                                                             | 48.3 | 0.467           | 0.281           | 1.658           | -0.356          | 0.714              | 28.6            | 2.9             | 28.8               | 5.8                | 69.7             | 75.6 | 8.8   | 76.2  | 6.7                | 1.00              | 0.00                  | 0.12 | B93R |
| 013                                                                                                                                                                                             | 48.3 | 0.47            | 0.284           | 1.652           | -0.343          | 0.709              | 28.4            | 3.4             | 28.6               | 6.9                | 69.7             | 75.1 | 10.6  | 75.8  | 8.0                | 1.00              | 0.00                  | 0.1  | B94R |
| 014                                                                                                                                                                                             | 48.4 | 0.474           | 0.288           | 1.646           | -0.33           | 0.704              | 28.1            | 4.0             | 28.4               | 8.0                | 69.7             | 74.5 | 12.3  | 75.6  | 9.4                | 1.00              | 0.00                  | 0.08 | B95R |
| 015                                                                                                                                                                                             | 48.4 | 0.477           | 0.291           | 1.639           | -0.316          | 0.7                | 27.9            | 4.5             | 28.3               | 9.2                | 69.8             | 74.0 | 14.2  | 75.3  | 10.8               | 1.00              | 0.00                  | 0.06 | B96R |
| 016                                                                                                                                                                                             | 48.5 | 0.481           | 0.294           | 1.632           | -0.303          | 0.695              | 27.7            | 5.0             | 28.5               | 10.4               | 69.8             | 73.5 | 16.1  | 75.2  | 12.3               | 1.00              | 0.00                  | 0.04 | B97R |
| 017                                                                                                                                                                                             | 48.5 | 0.485           | 0.298           | 1.625           | -0.29           | 0.691              | 27.4            | 5.6             | 28.0               | 11.6               | 69.8             | 72.8 | 18.1  | 75.0  | 13.9               | 1.00              | 0.00                  | 0.02 | B98R |
| 018                                                                                                                                                                                             | 48.6 | 0.489           | 0.302           | 1.618           | -0.276          | 0.687              | 27.2            | 6.2             | 27.9               | 12.8               | 69.9             | 72.2 | 20.1  | 75.0  | 15.6               | 1.00              | 0.00                  | 0.0  | B99R |
| 019                                                                                                                                                                                             | 48.6 | 0.493           | 0.305           | 1.611           | -0.263          | 0.684              | 27.0            | 6.7             | 27.8               | 14.0               | 69.9             | 71.6 | 22.3  | 75.0  | 17.2               | 1.00              | 0.01                  | 0.00 | R01Y |
| 020                                                                                                                                                                                             | 48.7 | 0.497           | 0.309           | 1.605           | -0.249          | 0.681              | 26.7            | 7.3             | 27.7               | 15.3               | 70.0             | 71.0 | 24.5  | 75.2  | 19.0               | 1.00              | 0.02                  | 0.00 | R02Y |
| 021                                                                                                                                                                                             | 48.8 | 0.501           | 0.313           | 1.598           | -0.235          | 0.678              | 26.5            | 7.8             | 27.6               | 16.5               | 70.0             | 70.4 | 26.8  | 75.4  | 20.8               | 1.00              | 0.04                  | 0.00 | R04Y |
| 022                                                                                                                                                                                             | 48.8 | 0.505           | 0.317           | 1.591           | -0.222          | 0.675              | 26.2            | 8.4             | 27.6               | 17.8               | 70.0             | 69.8 | 29.2  | 75.7  | 22.6               | 1.00              | 0.05                  | 0.00 | R05Y |
| 023                                                                                                                                                                                             | 48.9 | 0.509           | 0.321           | 1.583           | -0.208          | 0.673              | 26.0            | 9.0             | 27.5               | 19.1               | 70.1             | 69.2 | 31.7  | 75.6  | 24.6               | 1.00              | 0.06                  | 0.00 | R06Y |
| 024                                                                                                                                                                                             | 48.9 | 0.514           | 0.326           | 1.575           | -0.195          | 0.67               | 25.7            | 9.5             | 27.5               | 20.4               | 70.1             | 68.6 | 34.3  | 75.7  | 26.5               | 1.00              | 0.08                  | 0.00 | R07Y |
| 025                                                                                                                                                                                             | 49.0 | 0.519           | 0.33            | 1.569           | -0.181          | 0.669              | 25.5            | 10.1            | 27.4               | 21.7               | 70.2             | 68.0 | 37.0  | 77.4  | 28.5               | 1.00              | 0.09                  | 0.00 | R09Y |
| 026                                                                                                                                                                                             | 49.1 | 0.523           | 0.335           | 1.562           | -0.168          | 0.667              | 25.2            | 10.7            | 27.4               | 23.0               | 70.2             | 67.3 | 39.8  | 78.2  | 30.6               | 1.00              | 0.11                  | 0.00 | R11Y |
| 027                                                                                                                                                                                             | 49.1 | 0.528           | 0.339           | 1.555           | -0.155          | 0.666              | 25.0            | 11.3            | 27.4               | 24.3               | 70.3             | 66.7 | 42.8  | 79.3  | 32.6               | 1.00              | 0.12                  | 0.00 | R12Y |
| 028                                                                                                                                                                                             | 49.2 | 0.533           | 0.344           | 1.548           | -0.141          | 0.665              | 24.7            | 11.8            | 27.4               | 25.6               | 70.3             | 66.1 | 45.9  | 80.5  | 34.8               | 1.00              | 0.14                  | 0.00 | R14Y |
| 029                                                                                                                                                                                             | 49.3 | 0.538           | 0.349           | 1.541           | -0.128          | 0.664              | 24.5            | 12.4            | 27.5               | 26.8               | 70.4             | 65.4 | 49.2  | 81.9  | 36.9               | 1.00              | 0.15                  | 0.00 | R15Y |
| 030                                                                                                                                                                                             | 49.4 | 0.543           | 0.354           | 1.533           | -0.115          | 0.664              | 24.2            | 13.0            | 27.5               | 28.1               | 70.4             | 64.8 | 52.7  | 83.6  | 39.1               | 1.00              | 0.17                  | 0.00 | R17Y |
| 031                                                                                                                                                                                             | 49.5 | 0.548           | 0.359           | 1.526           | -0.102          | 0.664              | 24.0            | 13.5            | 27.6               | 29.4               | 70.5             | 64.2 | 56.5  | 85.5  | 41.3               | 1.00              | 0.18                  | 0.00 | R18Y |
| 032                                                                                                                                                                                             | 49.6 | 0.553           | 0.364           | 1.519           | -0.089          | 0.664              | 23.7            | 14.0            | 27.6               | 30.6               | 70.6             | 63.5 | 60.5  | 87.8  | 43.6               | 1.00              | 0.2                   | 0.00 | R20Y |
| 033                                                                                                                                                                                             | 49.7 | 0.558           | 0.369           | 1.512           | -0.077          | 0.665              | 23.5            | 14.6            | 27.7               | 31.9               | 70.6             | 62.9 | 64.9  | 89.4  | 45.8               | 1.00              | 0.23                  | 0.00 | R21Y |
| 034                                                                                                                                                                                             | 49.8 | 0.564           | 0.374           | 1.505           | -0.065          | 0.665              | 23.3            | 15.2            | 27.8               | 33.1               | 70.7             | 62.3 | 69.7  | 93.5  | 48.2               | 1.00              | 0.23                  | 0.00 | R23Y |
| 035                                                                                                                                                                                             | 49.9 | 0.569           | 0.38            | 1.498           | -0.053          | 0.666              | 23.0            | 15.7            | 27.9               | 34.3               | 70.8             | 61.6 | 75.0  | 97.1  | 50.5               | 1.00              | 0.24                  | 0.00 | R24Y |
| 036                                                                                                                                                                                             | 49.9 | 0.574           | 0.385           | 1.491           | -0.041          | 0.667              | 22.8            | 16.3            | 28.0               | 35.5               | 70.8             | 61.0 | 81.1  | 101.5 | 53.0               | 1.00              | 0.26                  | 0.00 | R26Y |
| 037                                                                                                                                                                                             | 49.8 | 0.58            | 0.39            | 1.484           | -0.029          | 0.669              | 22.5            | 16.8            | 28.1               | 36.6               | 70.9             | 60.4 | 88.4  | 107.1 | 55.6               | 1.00              | 0.27                  | 0.00 | R27Y |
| 038                                                                                                                                                                                             | 49.2 | 0.585           | 0.396           | 1.477           | -0.017          | 0.67               | 22.3            | 17.3            | 28.3               | 37.8               | 71.0             | 59.7 | 97.8  | 114.6 | 58.5               | 1.00              | 0.29                  | 0.00 | R29Y |
| 039                                                                                                                                                                                             | 49.2 | 0.591           | 0.401           | 1.471           | -0.006          | 0.672              | 22.1            | 17.8            | 28.4               | 38.9               | 71.0             | 59.1 | 111.4 | 126.1 | 62.0               | 1.00              | 0.3                   | 0.00 | R30Y |
| 040                                                                                                                                                                                             | 49.2 | 0.597           | 0.407           | 1.465           | 0.007           | 0.673              | 21.9            | 18.3            | 28.5               | 40.0               | 71.1             | 58.4 | 118.8 | 133.2 | 64.9               | 1.00              | 0.31                  | 0.00 | R31Y |
| 041                                                                                                                                                                                             | 49.5 | 0.602           | 0.419           | 1.458           | 0.02            | 0.663              | 21.2            | 19.5            | 28.8               | 42.2               | 71.9             | 56.2 | 159.2 | 169.0 | 70.5               | 1.00              | 0.33                  | 0.00 | R33Y |
| 042                                                                                                                                                                                             | 44.4 | 0.64            | 0.426           | 1.416           | 0.029           | 0.655              | 20.7            | 20.3            | 29.0               | 44.7               | 72.5             | 54.5 | 175.2 | 183.5 | 72.7               | 1.00              | 0.34                  | 0.00 | R34Y |
| 043                                                                                                                                                                                             | 45.3 | 0.603           | 0.431           | 1.397           | 0.032           | 0.644              | 20.4            | 20.9            | 29.2               | 45.7               | 73.1             | 53.0 | 183.4 | 199.9 | 73.8               | 1.00              | 0.36                  | 0.00 | R36Y |
| 044                                                                                                                                                                                             | 46.3 | 0.6             | 0.434           | 1.381           | 0.032           | 0.633              | 20.0            | 21.3            | 29.3               | 46.7               | 73.7             | 51.7 | 184.9 | 192.0 | 74.3               | 1.00              | 0.37                  | 0.00 | R37Y |
| 045                                                                                                                                                                                             | 47.3 | 0.595           | 0.435           | 1.366           | 0.028           | 0.62               | 19.8            | 21.6            | 29.3               | 47.5               | 74.3             | 50.5 | 180.9 | 187.8 | 74.4               | 1.00              | 0.39                  | 0.00 | R39Y |
| 046                                                                                                                                                                                             | 48.2 | 0.589           | 0.435           | 1.353           | 0.022           | 0.607              | 19.5            | 21.8            | 29.3               | 48.1               | 75.0             | 49.4 | 172.5 | 179.5 | 74.0               | 1.00              | 0.4                   | 0.00 | R40Y |
| 047                                                                                                                                                                                             | 49.2 | 0.582           | 0.434           | 1.341           | 0.015           | 0.584              | 19.3            | 21.9            | 29.2               | 48.5               | 75.6             | 48.4 | 160.8 | 167.9 | 74.2               | 1.00              | 0.42                  | 0.00 | R42Y |
| 048                                                                                                                                                                                             | 50.2 | 0.575           | 0.432           | 1.331           | 0.007           | 0.581              | 19.2            | 21.9            | 29.1               | 48.7               | 76.2             | 47.5 | 146.8 | 154.3 | 72.0               | 1.00              | 0.43                  | 0.00 | R43Y |
| 049                                                                                                                                                                                             | 51.1 | 0.569           | 0.43            | 1.321           | 0.0             | 0.568              | 19.0            | 21.9            | 29.0               | 49.0               | 76.7             | 46.7 | 132.1 | 140.9 | 71.5               | 1.00              | 0.45                  | 0.00 | R45Y |
| 050                                                                                                                                                                                             | 52.1 | 0.566           | 0.433           | 1.306           | 0.0             | 0.559              | 18.8            | 22.3            | 29.1               | 50.1               | 77.3             | 45.3 | 133.1 | 140.6 | 71.1               | 1.00              | 0.46                  | 0.00 | R46Y |
| 051                                                                                                                                                                                             | 53.0 | 0.563           | 0.436           | 1.292           | 0.0             | 0.55               | 18.2            | 22.7            | 29.2               | 51.2               | 77.9             | 44.0 | 134.0 | 141.0 | 71.7               | 1.00              | 0.48                  | 0.00 | R48Y |
| 052                                                                                                                                                                                             | 53.8 | 0.561           | 0.438           | 1.281           | 0.0             | 0.543              | 17.9            | 23.1            | 29.2               | 52.1               | 78.3             | 42.9 | 134.7 | 141.4 | 72.3               | 1.00              | 0.49                  | 0.00 | R49Y |
| 053                                                                                                                                                                                             | 54.6 | 0.559           | 0.44            | 1.269           | 0.0             | 0.536              | 17.5            | 23.4            | 29.2               | 53.1               | 78.8             | 41.8 | 135.4 | 141.7 | 72.8               | 1.00              | 0.51                  | 0.00 | R51Y |
| 054                                                                                                                                                                                             | 55.3 | 0.557           | 0.442           | 1.259           | 0.0             | 0.53               | 17.2            | 23.7            | 29.3               | 54.0               | 79.2             | 40.7 | 135.9 | 141.9 | 73.3               | 1.00              | 0.52                  | 0.00 | R52Y |
| 055                                                                                                                                                                                             | 56.0 | 0.555           | 0.444           | 1.248           | 0.0             | 0.523              | 16.8            | 24.0            | 29.3               | 54.9               | 79.6             | 39.6 | 136.6 | 142.2 | 73.8               | 1.00              | 0.53                  | 0.00 | R53Y |
| 056                                                                                                                                                                                             | 56.8 | 0.552           | 0.446           | 1.237           | 0.0             | 0.517              | 16.4            | 24.3            | 29.4               | 55.9               | 80.0             | 38.4 | 137.2 | 142.5 | 74.3               | 1.00              | 0.55                  | 0.00 | R55Y |
| 057                                                                                                                                                                                             | 57.5 | 0.55            | 0.448           | 1.227           | 0.0             | 0.511              | 16.0            |                 |                    |                    |                  |      |       |       |                    |                   |                       |      |      |

| rgb <sub>AB</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                      |                  |                 |                 |                 |                 |                 |                   |                 |                 |                   |                   |                 |                 |                 |                   |                   |                   |                  |      |                  |  |  |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-----------------|-----------------|-------------------|-------------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|------------------|------|------------------|--|--|--|--|--|
| Yxy, c <sub>AB</sub> AB, ABC <sub>AB</sub> , LabC <sub>ab</sub> ab data for relative spacing of elementary hue h <sub>AB</sub> of L <sub>IN</sub> YAB for CIE 10 degree observer |                  |                 |                 |                 |                 |                 |                   |                 |                 |                   |                   |                 |                 |                 |                   |                   |                   |                  |      |                  |  |  |  |  |  |
| Elementary hue circle with 4 intended elementary hues h <sub>AB</sub> : 10.8, 8.7, 2.8, 10 (Y): 55.9, 1.2, 19.6, 11 (G): 20.4, -6.8, 30, 12 (B): 7.8, -1.2, -7.2                 |                  |                 |                 |                 |                 |                 |                   |                 |                 |                   |                   |                 |                 |                 |                   |                   |                   |                  |      |                  |  |  |  |  |  |
| no.                                                                                                                                                                              | AB <sub>10</sub> | x <sub>10</sub> | y <sub>10</sub> | L <sub>10</sub> | a <sub>10</sub> | b <sub>10</sub> | c <sub>AB10</sub> | A <sub>10</sub> | B <sub>10</sub> | C <sub>AB10</sub> | h <sub>AB10</sub> | L <sub>10</sub> | a <sub>10</sub> | b <sub>10</sub> | c <sub>AB10</sub> | h <sub>AB10</sub> | rgb <sub>AB</sub> | AB <sub>10</sub> | Code | AB <sub>10</sub> |  |  |  |  |  |
| 090                                                                                                                                                                              | 88.8             | 0.481           | 0.509           | 0.946           | -0.007          | 0.422           | -0.1              | 34.1            | 34.1            | 90.1              | 92.0              | -0.2            | 138.8           | 138.8           | 90.0              | 0.94              | 1.00              | 0.00             | 0.00 | Y05G             |  |  |  |  |  |
| 091                                                                                                                                                                              | 81.5             | 0.479           | 0.51            | 0.938           | -0.007          | 0.421           | -0.7              | 34.1            | 34.4            | 91.3              | 92.4              | -1.5            | 137.5           | 137.5           | 90.6              | 0.93              | 1.00              | 0.00             | 0.00 | Y06G             |  |  |  |  |  |
| 092                                                                                                                                                                              | 82.3             | 0.476           | 0.512           | 0.93            | -0.008          | 0.421           | -1.4              | 34.6            | 34.6            | 92.4              | 92.7              | -2.9            | 136.3           | 136.3           | 91.2              | 0.91              | 1.00              | 0.00             | 0.00 | Y08G             |  |  |  |  |  |
| 093                                                                                                                                                                              | 83.1             | 0.473           | 0.513           | 0.922           | -0.009          | 0.42            | -2.1              | 34.8            | 34.9            | 93.4              | 93.0              | -4.2            | 135.1           | 135.2           | 91.8              | 0.9               | 1.00              | 0.00             | 0.00 | Y09G             |  |  |  |  |  |
| 094                                                                                                                                                                              | 83.8             | 0.471           | 0.515           | 0.914           | -0.01           | 0.42            | -2.7              | 35.1            | 35.2            | 94.4              | 93.3              | -5.5            | 134.1           | 134.2           | 92.3              | 0.88              | 1.00              | 0.00             | 0.00 | Y11G             |  |  |  |  |  |
| 095                                                                                                                                                                              | 84.5             | 0.468           | 0.516           | 0.907           | -0.011          | 0.42            | -3.4              | 35.3            | 35.5            | 95.5              | 93.6              | -6.8            | 133.1           | 133.3           | 92.9              | 0.87              | 1.00              | 0.00             | 0.00 | Y12G             |  |  |  |  |  |
| 096                                                                                                                                                                              | 85.2             | 0.466           | 0.518           | 0.9             | -0.011          | 0.42            | -4.0              | 35.5            | 35.8            | 96.5              | 93.9              | -8.0            | 132.3           | 132.5           | 93.4              | 0.86              | 1.00              | 0.00             | 0.00 | Y13G             |  |  |  |  |  |
| 097                                                                                                                                                                              | 85.9             | 0.464           | 0.519           | 0.883           | -0.012          | 0.42            | -4.6              | 35.8            | 36.1            | 97.4              | 94.2              | -9.2            | 131.5           | 131.8           | 94.0              | 0.84              | 1.00              | 0.00             | 0.00 | Y15G             |  |  |  |  |  |
| 098                                                                                                                                                                              | 86.5             | 0.462           | 0.52            | 0.887           | -0.013          | 0.42            | -5.2              | 36.0            | 36.3            | 98.2              | 94.4              | -10.3           | 130.8           | 131.3           | 94.5              | 0.83              | 1.00              | 0.00             | 0.00 | Y16G             |  |  |  |  |  |
| 099                                                                                                                                                                              | 87.0             | 0.46            | 0.521           | 0.882           | -0.013          | 0.42            | -5.7              | 36.1            | 36.6            | 98.9              | 94.7              | -11.2           | 130.3           | 130.7           | 94.9              | 0.81              | 1.00              | 0.00             | 0.00 | Y18G             |  |  |  |  |  |
| 100                                                                                                                                                                              | 87.6             | 0.458           | 0.522           | 0.876           | -0.014          | 0.42            | -6.2              | 36.3            | 36.8            | 99.7              | 95.0              | -12.2           | 129.1           | 129.7           | 95.4              | 0.8               | 1.00              | 0.00             | 0.00 | Y19G             |  |  |  |  |  |
| 101                                                                                                                                                                              | 88.4             | 0.454           | 0.523           | 0.869           | -0.016          | 0.42            | -6.9              | 36.4            | 37.1            | 100.8             | 95.3              | -13.6           | 128.8           | 127.6           | 96.1              | 0.78              | 1.00              | 0.00             | 0.00 | Y21G             |  |  |  |  |  |
| 102                                                                                                                                                                              | 89.4             | 0.451           | 0.522           | 0.862           | -0.019          | 0.418           | -7.6              | 36.6            | 37.3            | 101.7             | 95.7              | -14.9           | 128.3           | 124.2           | 96.8              | 0.77              | 1.00              | 0.00             | 0.00 | Y22G             |  |  |  |  |  |
| 103                                                                                                                                                                              | 90.5             | 0.448           | 0.52            | 0.86            | -0.023          | 0.414           | -7.9              | 36.7            | 37.5            | 102.1             | 96.2              | -15.3           | 119.5           | 120.5           | 97.3              | 0.76              | 1.00              | 0.00             | 0.00 | Y23G             |  |  |  |  |  |
| 104                                                                                                                                                                              | 91.5             | 0.444           | 0.519           | 0.856           | -0.028          | 0.411           | -8.3              | 36.7            | 37.6            | 102.8             | 96.6              | -16.1           | 119.9           | 117.0           | 97.9              | 0.74              | 1.00              | 0.00             | 0.00 | Y25G             |  |  |  |  |  |
| 105                                                                                                                                                                              | 92.2             | 0.44            | 0.518           | 0.848           | -0.031          | 0.409           | -9.1              | 36.6            | 37.7            | 103.4             | 96.9              | -17.6           | 119.2           | 114.1           | 98.0              | 0.73              | 1.00              | 0.00             | 0.00 | Y26G             |  |  |  |  |  |
| 106                                                                                                                                                                              | 92.9             | 0.434           | 0.518           | 0.839           | -0.033          | 0.409           | -9.3              | 36.7            | 37.8            | 103.9             | 96.9              | -18.2           | 118.9           | 111.6           | 100.3             | 0.71              | 1.00              | 0.00             | 0.00 | Y28G             |  |  |  |  |  |
| 107                                                                                                                                                                              | 92.0             | 0.432           | 0.521           | 0.829           | -0.035          | 0.411           | -10.9             | 36.2            | 37.8            | 106.8             | 96.8              | -21.2           | 109.4           | 111.4           | 109.9             | 0.7               | 1.00              | 0.00             | 0.00 | Y29G             |  |  |  |  |  |
| 108                                                                                                                                                                              | 91.7             | 0.43            | 0.522           | 0.823           | -0.036          | 0.412           | -11.4             | 36.6            | 37.8            | 107.6             | 96.7              | -22.3           | 109.1           | 111.3           | 101.5             | 0.68              | 1.00              | 0.00             | 0.00 | Y31G             |  |  |  |  |  |
| 109                                                                                                                                                                              | 91.4             | 0.428           | 0.524           | 0.816           | -0.036          | 0.414           | -12.0             | 35.9            | 37.8            | 108.5             | 96.5              | -23.5           | 108.8           | 111.3           | 102.2             | 0.67              | 1.00              | 0.00             | 0.00 | Y32G             |  |  |  |  |  |
| 110                                                                                                                                                                              | 91.0             | 0.425           | 0.526           | 0.809           | -0.036          | 0.416           | -12.6             | 35.7            | 37.9            | 109.4             | 96.4              | -24.8           | 108.5           | 111.3           | 102.9             | 0.66              | 1.00              | 0.00             | 0.00 | Y33G             |  |  |  |  |  |
| 111                                                                                                                                                                              | 90.6             | 0.423           | 0.527           | 0.802           | -0.036          | 0.418           | -13.2             | 35.5            | 37.9            | 110.3             | 96.2              | -26.1           | 108.2           | 111.3           | 103.5             | 0.64              | 1.00              | 0.00             | 0.00 | Y35G             |  |  |  |  |  |
| 112                                                                                                                                                                              | 90.2             | 0.421           | 0.529           | 0.794           | -0.036          | 0.421           | -13.8             | 35.4            | 38.0            | 111.3             | 96.0              | -27.5           | 107.9           | 111.3           | 104.3             | 0.63              | 1.00              | 0.00             | 0.00 | Y36G             |  |  |  |  |  |
| 113                                                                                                                                                                              | 89.7             | 0.418           | 0.531           | 0.787           | -0.037          | 0.424           | -14.4             | 35.2            | 38.0            | 112.3             | 95.9              | -29.0           | 107.6           | 111.4           | 105.0             | 0.61              | 1.00              | 0.00             | 0.00 | Y38G             |  |  |  |  |  |
| 114                                                                                                                                                                              | 89.3             | 0.416           | 0.534           | 0.779           | -0.037          | 0.427           | -15.0             | 35.0            | 38.1            | 113.3             | 95.7              | -30.4           | 107.3           | 111.5           | 105.8             | 0.6               | 1.00              | 0.00             | 0.00 | Y39G             |  |  |  |  |  |
| 115                                                                                                                                                                              | 88.8             | 0.413           | 0.536           | 0.77            | -0.037          | 0.43            | -15.7             | 34.8            | 38.2            | 114.3             | 95.5              | -32.0           | 107.0           | 111.7           | 106.6             | 0.58              | 1.00              | 0.00             | 0.00 | Y41G             |  |  |  |  |  |
| 116                                                                                                                                                                              | 88.3             | 0.41            | 0.538           | 0.762           | -0.037          | 0.433           | -16.4             | 34.6            | 38.2            | 115.3             | 95.3              | -33.6           | 106.7           | 111.8           | 107.4             | 0.57              | 1.00              | 0.00             | 0.00 | Y42G             |  |  |  |  |  |
| 117                                                                                                                                                                              | 87.7             | 0.407           | 0.541           | 0.753           | -0.037          | 0.437           | -17.0             | 34.3            | 38.3            | 116.4             | 95.0              | -35.2           | 106.3           | 112.0           | 108.3             | 0.56              | 1.00              | 0.00             | 0.00 | Y43G             |  |  |  |  |  |
| 118                                                                                                                                                                              | 87.2             | 0.404           | 0.543           | 0.744           | -0.037          | 0.441           | -17.7             | 34.1            | 38.4            | 117.4             | 94.8              | -36.9           | 106.0           | 112.2           | 109.2             | 0.54              | 1.00              | 0.00             | 0.00 | Y45G             |  |  |  |  |  |
| 119                                                                                                                                                                              | 86.6             | 0.401           | 0.546           | 0.735           | -0.038          | 0.445           | -18.4             | 33.9            | 38.6            | 118.5             | 94.6              | -38.7           | 105.6           | 112.5           | 110.1             | 0.53              | 1.00              | 0.00             | 0.00 | Y46G             |  |  |  |  |  |
| 120                                                                                                                                                                              | 86.0             | 0.398           | 0.549           | 0.725           | -0.038          | 0.449           | -19.1             | 33.6            | 38.7            | 119.6             | 94.3              | -40.5           | 105.2           | 112.8           | 111.0             | 0.51              | 1.00              | 0.00             | 0.00 | Y48G             |  |  |  |  |  |
| 121                                                                                                                                                                              | 85.4             | 0.395           | 0.551           | 0.716           | -0.038          | 0.454           | -19.8             | 33.4            | 38.8            | 120.6             | 94.1              | -42.3           | 104.8           | 113.1           | 111.9             | 0.5               | 1.00              | 0.00             | 0.00 | Y49G             |  |  |  |  |  |
| 122                                                                                                                                                                              | 84.8             | 0.391           | 0.554           | 0.706           | -0.038          | 0.459           | -20.5             | 33.2            | 38.9            | 121.6             | 93.9              | -44.2           | 104.4           | 113.4           | 112.9             | 0.48              | 1.00              | 0.00             | 0.00 | Y51G             |  |  |  |  |  |
| 123                                                                                                                                                                              | 84.2             | 0.388           | 0.557           | 0.696           | -0.038          | 0.464           | -21.2             | 32.8            | 39.1            | 122.8             | 93.5              | -46.1           | 103.9           | 113.7           | 113.9             | 0.47              | 1.00              | 0.00             | 0.00 | Y52G             |  |  |  |  |  |
| 124                                                                                                                                                                              | 83.6             | 0.384           | 0.56            | 0.686           | -0.039          | 0.469           | -21.9             | 32.6            | 39.2            | 123.8             | 93.2              | -48.1           | 103.5           | 114.1           | 114.9             | 0.46              | 1.00              | 0.00             | 0.00 | Y53G             |  |  |  |  |  |
| 125                                                                                                                                                                              | 82.9             | 0.38            | 0.563           | 0.675           | -0.039          | 0.475           | -22.5             | 32.3            | 39.4            | 124.9             | 93.0              | -50.1           | 103.0           | 114.5           | 115.9             | 0.44              | 1.00              | 0.00             | 0.00 | Y55G             |  |  |  |  |  |
| 126                                                                                                                                                                              | 82.3             | 0.376           | 0.566           | 0.665           | -0.039          | 0.481           | -23.2             | 32.0            | 39.6            | 125.9             | 92.7              | -52.1           | 102.4           | 114.9           | 116.9             | 0.43              | 1.00              | 0.00             | 0.00 | Y56G             |  |  |  |  |  |
| 127                                                                                                                                                                              | 81.6             | 0.372           | 0.569           | 0.654           | -0.04           | 0.487           | -23.9             | 31.7            | 39.7            | 127.0             | 92.4              | -54.3           | 101.7           | 115.2           | 118.1             | 0.41              | 1.00              | 0.00             | 0.00 | Y58G             |  |  |  |  |  |
| 128                                                                                                                                                                              | 80.7             | 0.367           | 0.572           | 0.642           | -0.041          | 0.493           | -24.6             | 31.3            | 39.8            | 128.9             | 92.2              | -56.6           | 100.6           | 115.4           | 119.3             | 0.4               | 1.00              | 0.00             | 0.00 | Y59G             |  |  |  |  |  |
| 129                                                                                                                                                                              | 79.9             | 0.362           | 0.575           | 0.63            | -0.042          | 0.498           | -25.4             | 30.9            | 40.0            | 129.9             | 91.6              | -59.0           | 99.5            | 115.7           | 120.6             | 0.38              | 1.00              | 0.00             | 0.00 | Y61G             |  |  |  |  |  |
| 130                                                                                                                                                                              | 79.3             | 0.359           | 0.578           | 0.618           | -0.044          | 0.507           | -26.3             | 30.4            | 40.1            | 131.5             | 91.3              | -61.8           | 98.3            | 116.3           | 121.3             | 0.37              | 1.00              | 0.00             | 0.00 | Y62G             |  |  |  |  |  |
| 131                                                                                                                                                                              | 78.3             | 0.352           | 0.581           | 0.606           | -0.045          | 0.514           | -26.7             | 30.0            | 40.2            | 133.6             | 90.9              | -63.8           | 97.2            | 116.2           | 122.2             | 0.36              | 1.00              | 0.00             | 0.00 | Y63G             |  |  |  |  |  |
| 132                                                                                                                                                                              | 77.4             | 0.347           | 0.584           | 0.594           | -0.046          | 0.521           | -27.4             | 29.6            | 40.3            | 132.7             | 90.5              | -66.2           | 96.0            | 116.6           | 124.6             | 0.34              | 1.00              | 0.00             | 0.00 | Y65G             |  |  |  |  |  |
| 133                                                                                                                                                                              | 76.6             | 0.341           | 0.587           | 0.581           | -0.048          | 0.528           | -28.0             | 29.2            | 40.5            | 133.8             | 90.1              | -68.7           | 94.7            | 117.0           | 125.9             | 0.33              | 1.00              | 0.00             | 0.00 | Y66G             |  |  |  |  |  |
| 134                                                                                                                                                                              | 75.8             | 0.336           | 0.59            | 0.569           | -0.049          | 0.536           | -28.7             | 28.7            | 40.6            | 134.9             | 89.7              | -71.2           | 93.5            | 117.5           | 127.2             | 0.31              | 1.00              | 0.00             | 0.00 | Y68G             |  |  |  |  |  |
| 135                                                                                                                                                                              | 75.0             | 0.33            | 0.593           | 0.557           | -0.051          | 0.543           | -29.3             | 28.3            | 40.7            | 135.9             | 89.4              | -73.7           | 92.2            | 118.0           | 128.6             | 0.3               | 1.00              | 0.00             | 0.00 | Y69G             |  |  |  |  |  |
| 136                                                                                                                                                                              | 74.2             | 0.325           | 0.596           | 0.545           | -0.052          | 0.551           | -29.9             | 27.9            | 40.9            | 136.9             | 89.0              | -76.2           | 90.9            | 118.6           | 129.9             | 0.28              | 1.00              | 0.00             | 0.00 | Y71G             |  |  |  |  |  |
| 137                                                                                                                                                                              | 73.4             | 0.319           | 0.598           | 0.533           | -0.054          | 0.558           | -30.4             | 27.5            | 41.0            | 137.9             | 88.6              | -78.7           | 89.6            | 119.3           | 131.3             | 0.27              | 1.00              | 0.00             | 0.00 | Y72G             |  |  |  |  |  |
| 138                                                                                                                                                                              | 72.6             | 0.313           | 0.601           | 0.521           | -0.056          | 0.567           | -31.0             | 27.0            | 41.1            | 138.8             | 88.0              | -81.2           | 88.3            | 120.0           | 132.6             | 0.26              | 1.00              | 0.00             | 0.00 | Y73G             |  |  |  |  |  |
| 139                                                                                                                                                                              | 71.8             | 0.307           | 0.604           | 0.509           | -0.058          | 0.574           | -31.5             | 26.6            | 41.2            | 139.7             | 87.9              | -83.8           | 87.0            | 120.8           | 133.9             | 0.24              | 1.00              | 0.00             | 0.00 | Y75G             |  |  |  |  |  |
| 140                                                                                                                                                                              | 71.0             | 0.301           | 0.606           | 0.497           | -0.06           | 0.582           | -32.0             | 26.2            | 41.4            | 140.6             | 87.5              | -86.2           | 85.7            | 121.6           | 135.1             | 0.23              | 1.00              | 0.00             | 0.00 | Y76G             |  |  |  |  |  |
| 141                                                                                                                                                                              | 70.3             | 0.296           | 0.609           | 0.486           | -0.062          | 0.59            | -32.5             | 25.8            | 41.5            | 141.5             | 87.1              | -88.7           | 84.4            | 122.5           | 136.4             | 0.21              | 1.00              | 0.00             | 0.00 | Y78G             |  |  |  |  |  |
| 142                                                                                                                                                                              | 69.6             | 0.29            | 0.611           | 0.475           | -0.064          | 0.597           | -32.9             | 25.4            | 41.6            | 142.3             | 86.8              | -91.1           | 83.1            | 123.4           | 137.6             | 0.2               | 1.00              | 0.00             | 0.00 | Y79G             |  |  |  |  |  |
| 143                                                                                                                                                                              | 68.9             | 0.284           | 0.613           | 0.464           | -0.066          | 0.605           | -33.3             | 25.0            | 41.7            | 143.1             | 86.4              | -93.5           | 81.9            | 124.3           | 138.7             | 0.18              | 1.00              | 0.00             | 0.00 | Y81G             |  |  |  |  |  |
| 144                                                                                                                                                                              | 68.2             | 0.279           | 0.617           | 0.453           | -0.068          | 0.614           | -33.7             | 24.6            | 41.8            | 144.0             | 86.0              |                 |                 |                 |                   |                   |                   |                  |      |                  |  |  |  |  |  |

| rgb* <sub>AB</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                                                                     |                         |                        |                        |                        |                        |                           |                        |                        |                           |                           |                          |                          |                          |                             |                           |                               |                              |      |      |      |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|---------------------------|------------------------|------------------------|---------------------------|---------------------------|--------------------------|--------------------------|--------------------------|-----------------------------|---------------------------|-------------------------------|------------------------------|------|------|------|------|
| Yxy, <i>abc</i> <sub>AB</sub> , <i>ABC</i> <sub>AB</sub> , <i>LabC</i> * <sub>ab</sub> , <i>ab</i> <sub>ab</sub> data for relative spacing of elementary hue <i>h</i> <sub>AB</sub> of <i>LIN</i> YAB for CIE 10 degree observer |                         |                        |                        |                        |                        |                           |                        |                        |                           |                           |                          |                          |                          |                             |                           |                               |                              |      |      |      |      |
| Elementary hue circle with 40 divided elementary hue angles: <i>h</i> <sub>AB</sub> = 18.2, 86.3, 156.2, 260.1 of <i>LIN</i> YAB, and 90 intended hue angles:                                                                    |                         |                        |                        |                        |                        |                           |                        |                        |                           |                           |                          |                          |                          |                             |                           |                               |                              |      |      |      |      |
| 180, 181, ..., 269, <i>LIN</i> YAB data of CIE test colours 9 (R): 10.8 8.7 2.8, 10 (Y): 55.9 1.2 19.6, 11 (G): 20.4 -6.8 3.0, 12 (B): 7.8 -1.2 -7.2                                                                             |                         |                        |                        |                        |                        |                           |                        |                        |                           |                           |                          |                          |                          |                             |                           |                               |                              |      |      |      |      |
| <i>no.</i>                                                                                                                                                                                                                       | <i>AB</i> <sub>10</sub> | <i>X</i> <sub>10</sub> | <i>Y</i> <sub>10</sub> | <i>a</i> <sub>10</sub> | <i>b</i> <sub>10</sub> | <i>C</i> <sub>AB,10</sub> | <i>A</i> <sub>10</sub> | <i>B</i> <sub>10</sub> | <i>C</i> <sub>AB,10</sub> | <i>h</i> <sub>AB,10</sub> | <i>L</i> * <sub>10</sub> | <i>a</i> * <sub>10</sub> | <i>b</i> * <sub>10</sub> | <i>C</i> * <sub>ab,10</sub> | <i>h</i> <sub>ab,10</sub> | <i>rgb</i> * <sub>AB,10</sub> | <i>Code</i> <sub>AB,10</sub> |      |      |      |      |
| 180                                                                                                                                                                                                                              | 41.8                    | 0.485                  | 0.304                  | 1.593                  | -0.274                 | 0.664                     | 27.0                   | 6.4                    | 27.7                      | 13.4                      | 70.7                     | 79.6                     | 29.6                     | 73.6                        | 16.2                      | 0.00                          | 1.00                         | 0.45 | G22B | 0.00 | 0.00 |
| 181                                                                                                                                                                                                                              | 41.8                    | 0.485                  | 0.304                  | 1.593                  | -0.276                 | 0.664                     | 27.0                   | 6.3                    | 27.7                      | 13.2                      | 70.7                     | 79.7                     | 29.6                     | 73.6                        | 16.0                      | 0.00                          | 1.00                         | 0.47 | G23B | 0.00 | 0.00 |
| 182                                                                                                                                                                                                                              | 41.7                    | 0.484                  | 0.303                  | 1.596                  | -0.279                 | 0.665                     | 27.0                   | 6.2                    | 27.8                      | 13.0                      | 70.7                     | 79.8                     | 19.9                     | 73.6                        | 15.7                      | 0.00                          | 1.00                         | 0.49 | G24B | 0.00 | 0.00 |
| 183                                                                                                                                                                                                                              | 41.7                    | 0.484                  | 0.302                  | 1.597                  | -0.281                 | 0.666                     | 27.1                   | 6.1                    | 27.8                      | 12.8                      | 70.7                     | 79.9                     | 19.6                     | 73.6                        | 15.4                      | 0.00                          | 1.00                         | 0.51 | G25B | 0.00 | 0.00 |
| 184                                                                                                                                                                                                                              | 41.7                    | 0.483                  | 0.302                  | 1.598                  | -0.283                 | 0.666                     | 27.1                   | 6.0                    | 27.8                      | 12.6                      | 70.7                     | 71.0                     | 19.3                     | 73.6                        | 15.2                      | 0.00                          | 1.00                         | 0.53 | G26B | 0.00 | 0.00 |
| 185                                                                                                                                                                                                                              | 41.7                    | 0.482                  | 0.301                  | 1.599                  | -0.285                 | 0.667                     | 27.2                   | 6.0                    | 27.8                      | 12.4                      | 70.7                     | 71.1                     | 19.0                     | 73.6                        | 14.9                      | 0.00                          | 1.00                         | 0.55 | G27B | 0.00 | 0.00 |
| 186                                                                                                                                                                                                                              | 41.7                    | 0.482                  | 0.301                  | 1.6                    | -0.287                 | 0.667                     | 27.2                   | 5.9                    | 27.8                      | 12.2                      | 70.7                     | 71.2                     | 18.6                     | 73.6                        | 14.6                      | 0.00                          | 1.00                         | 0.57 | G28B | 0.00 | 0.00 |
| 187                                                                                                                                                                                                                              | 41.7                    | 0.481                  | 0.3                    | 1.601                  | -0.289                 | 0.668                     | 27.2                   | 5.8                    | 27.9                      | 12.0                      | 70.6                     | 71.3                     | 18.3                     | 73.6                        | 14.4                      | 0.00                          | 1.00                         | 0.59 | G29B | 0.00 | 0.00 |
| 188                                                                                                                                                                                                                              | 41.7                    | 0.481                  | 0.3                    | 1.603                  | -0.291                 | 0.668                     | 27.3                   | 5.7                    | 27.9                      | 11.8                      | 70.6                     | 71.4                     | 18.0                     | 73.7                        | 14.1                      | 0.00                          | 1.00                         | 0.61 | G30B | 0.00 | 0.00 |
| 189                                                                                                                                                                                                                              | 41.7                    | 0.48                   | 0.299                  | 1.604                  | -0.294                 | 0.669                     | 27.3                   | 5.6                    | 27.9                      | 11.6                      | 70.6                     | 71.5                     | 17.7                     | 73.7                        | 13.9                      | 0.00                          | 1.00                         | 0.63 | G31B | 0.00 | 0.00 |
| 190                                                                                                                                                                                                                              | 41.6                    | 0.479                  | 0.298                  | 1.605                  | -0.296                 | 0.67                      | 27.4                   | 5.5                    | 27.9                      | 11.4                      | 70.6                     | 71.6                     | 17.3                     | 73.7                        | 13.6                      | 0.00                          | 1.00                         | 0.64 | G32B | 0.00 | 0.00 |
| 191                                                                                                                                                                                                                              | 41.6                    | 0.479                  | 0.298                  | 1.606                  | -0.298                 | 0.671                     | 27.4                   | 5.4                    | 27.9                      | 11.2                      | 70.6                     | 71.7                     | 17.0                     | 73.7                        | 13.3                      | 0.00                          | 1.00                         | 0.66 | G33B | 0.00 | 0.00 |
| 192                                                                                                                                                                                                                              | 41.6                    | 0.478                  | 0.297                  | 1.607                  | -0.3                   | 0.672                     | 27.4                   | 5.3                    | 28.0                      | 11.0                      | 70.6                     | 71.8                     | 16.7                     | 73.7                        | 13.1                      | 0.00                          | 1.00                         | 0.68 | G34B | 0.00 | 0.00 |
| 193                                                                                                                                                                                                                              | 41.6                    | 0.478                  | 0.297                  | 1.608                  | -0.302                 | 0.672                     | 27.5                   | 5.2                    | 28.0                      | 10.8                      | 70.6                     | 71.9                     | 16.4                     | 73.8                        | 12.8                      | 0.00                          | 1.00                         | 0.7  | G35B | 0.00 | 0.00 |
| 194                                                                                                                                                                                                                              | 41.6                    | 0.477                  | 0.296                  | 1.609                  | -0.304                 | 0.673                     | 27.5                   | 5.1                    | 28.0                      | 10.6                      | 70.6                     | 72.0                     | 16.1                     | 73.8                        | 12.6                      | 0.00                          | 1.00                         | 0.72 | G36B | 0.00 | 0.00 |
| 195                                                                                                                                                                                                                              | 41.6                    | 0.476                  | 0.296                  | 1.611                  | -0.306                 | 0.674                     | 27.6                   | 5.1                    | 28.0                      | 10.4                      | 70.6                     | 72.1                     | 15.8                     | 73.8                        | 12.3                      | 0.00                          | 1.00                         | 0.74 | G37B | 0.00 | 0.00 |
| 196                                                                                                                                                                                                                              | 41.6                    | 0.476                  | 0.295                  | 1.612                  | -0.308                 | 0.674                     | 27.6                   | 5.0                    | 28.0                      | 10.2                      | 70.6                     | 72.2                     | 15.5                     | 73.8                        | 12.1                      | 0.00                          | 1.00                         | 0.76 | G38B | 0.00 | 0.00 |
| 197                                                                                                                                                                                                                              | 41.6                    | 0.475                  | 0.294                  | 1.613                  | -0.311                 | 0.675                     | 27.6                   | 4.9                    | 28.1                      | 10.0                      | 70.6                     | 72.3                     | 15.1                     | 73.9                        | 11.8                      | 0.00                          | 1.00                         | 0.78 | G39B | 0.00 | 0.00 |
| 198                                                                                                                                                                                                                              | 41.5                    | 0.475                  | 0.294                  | 1.614                  | -0.313                 | 0.676                     | 27.7                   | 4.8                    | 28.1                      | 9.8                       | 70.6                     | 72.4                     | 14.8                     | 73.9                        | 11.6                      | 0.00                          | 1.00                         | 0.8  | G40B | 0.00 | 0.00 |
| 199                                                                                                                                                                                                                              | 41.5                    | 0.474                  | 0.293                  | 1.615                  | -0.315                 | 0.677                     | 27.7                   | 4.7                    | 28.1                      | 9.6                       | 70.5                     | 72.5                     | 14.5                     | 74.0                        | 11.3                      | 0.00                          | 1.00                         | 0.82 | G41B | 0.00 | 0.00 |
| 200                                                                                                                                                                                                                              | 41.5                    | 0.474                  | 0.293                  | 1.616                  | -0.317                 | 0.677                     | 27.7                   | 4.6                    | 28.1                      | 9.4                       | 70.5                     | 72.6                     | 14.2                     | 74.0                        | 11.1                      | 0.00                          | 1.00                         | 0.84 | G42B | 0.00 | 0.00 |
| 201                                                                                                                                                                                                                              | 41.5                    | 0.473                  | 0.292                  | 1.617                  | -0.319                 | 0.678                     | 27.8                   | 4.5                    | 28.2                      | 9.3                       | 70.5                     | 72.7                     | 13.9                     | 74.0                        | 10.8                      | 0.00                          | 1.00                         | 0.86 | G43B | 0.00 | 0.00 |
| 202                                                                                                                                                                                                                              | 41.5                    | 0.472                  | 0.292                  | 1.619                  | -0.321                 | 0.679                     | 27.8                   | 4.4                    | 28.2                      | 9.1                       | 70.5                     | 72.8                     | 13.6                     | 74.1                        | 10.6                      | 0.00                          | 1.00                         | 0.88 | G44B | 0.00 | 0.00 |
| 203                                                                                                                                                                                                                              | 41.5                    | 0.472                  | 0.291                  | 1.621                  | -0.323                 | 0.681                     | 27.9                   | 4.3                    | 28.2                      | 8.9                       | 70.5                     | 72.9                     | 13.3                     | 74.1                        | 10.3                      | 0.00                          | 1.00                         | 0.9  | G45B | 0.00 | 0.00 |
| 204                                                                                                                                                                                                                              | 41.5                    | 0.471                  | 0.291                  | 1.621                  | -0.326                 | 0.681                     | 27.9                   | 4.2                    | 28.2                      | 8.7                       | 70.5                     | 73.0                     | 13.0                     | 74.1                        | 10.1                      | 0.00                          | 1.00                         | 0.91 | G45B | 0.00 | 0.00 |
| 205                                                                                                                                                                                                                              | 41.5                    | 0.471                  | 0.29                   | 1.622                  | -0.328                 | 0.681                     | 27.9                   | 4.2                    | 28.3                      | 8.5                       | 70.5                     | 73.1                     | 12.7                     | 74.2                        | 9.9                       | 0.00                          | 1.00                         | 0.93 | G46B | 0.00 | 0.00 |
| 206                                                                                                                                                                                                                              | 41.5                    | 0.47                   | 0.289                  | 1.623                  | -0.33                  | 0.682                     | 28.0                   | 4.1                    | 28.3                      | 8.3                       | 70.5                     | 73.2                     | 12.4                     | 74.2                        | 9.6                       | 0.00                          | 1.00                         | 0.95 | G47B | 0.00 | 0.00 |
| 207                                                                                                                                                                                                                              | 41.4                    | 0.47                   | 0.289                  | 1.624                  | -0.332                 | 0.683                     | 28.0                   | 4.0                    | 28.3                      | 8.1                       | 70.5                     | 73.3                     | 12.1                     | 74.3                        | 9.4                       | 0.00                          | 1.00                         | 0.97 | G48B | 0.00 | 0.00 |
| 208                                                                                                                                                                                                                              | 41.4                    | 0.469                  | 0.288                  | 1.625                  | -0.334                 | 0.684                     | 28.1                   | 3.9                    | 28.3                      | 7.9                       | 70.5                     | 73.4                     | 11.9                     | 74.3                        | 9.2                       | 0.00                          | 1.00                         | 0.99 | G49B | 0.00 | 0.00 |
| 209                                                                                                                                                                                                                              | 41.4                    | 0.469                  | 0.288                  | 1.626                  | -0.336                 | 0.685                     | 28.1                   | 3.8                    | 28.4                      | 7.7                       | 70.5                     | 73.5                     | 11.6                     | 74.4                        | 8.9                       | 0.00                          | 1.00                         | 1.00 | G50B | 0.00 | 0.00 |
| 210                                                                                                                                                                                                                              | 41.4                    | 0.468                  | 0.287                  | 1.628                  | -0.338                 | 0.686                     | 28.1                   | 3.7                    | 28.4                      | 7.5                       | 70.4                     | 73.6                     | 11.3                     | 74.4                        | 8.7                       | 0.00                          | 1.00                         | 1.00 | G51B | 0.00 | 0.00 |
| 211                                                                                                                                                                                                                              | 41.4                    | 0.467                  | 0.287                  | 1.629                  | -0.34                  | 0.686                     | 28.2                   | 3.6                    | 28.4                      | 7.4                       | 70.4                     | 73.7                     | 11.0                     | 74.5                        | 8.5                       | 0.00                          | 1.00                         | 1.00 | G52B | 0.00 | 0.00 |
| 212                                                                                                                                                                                                                              | 41.4                    | 0.467                  | 0.286                  | 1.63                   | -0.342                 | 0.687                     | 28.2                   | 3.5                    | 28.4                      | 7.2                       | 70.4                     | 73.8                     | 10.7                     | 74.5                        | 8.2                       | 0.00                          | 1.00                         | 1.00 | G53B | 0.00 | 0.00 |
| 213                                                                                                                                                                                                                              | 41.4                    | 0.466                  | 0.286                  | 1.631                  | -0.345                 | 0.688                     | 28.3                   | 3.4                    | 28.5                      | 7.0                       | 70.4                     | 73.9                     | 10.4                     | 74.6                        | 8.0                       | 0.00                          | 1.00                         | 1.00 | G54B | 0.00 | 0.00 |
| 214                                                                                                                                                                                                                              | 41.4                    | 0.466                  | 0.285                  | 1.632                  | -0.347                 | 0.689                     | 28.3                   | 3.4                    | 28.5                      | 6.8                       | 70.4                     | 73.9                     | 10.1                     | 74.6                        | 7.8                       | 0.00                          | 1.00                         | 1.00 | G55B | 0.00 | 0.00 |
| 215                                                                                                                                                                                                                              | 41.3                    | 0.465                  | 0.285                  | 1.633                  | -0.349                 | 0.69                      | 28.3                   | 3.3                    | 28.5                      | 6.6                       | 70.4                     | 74.0                     | 9.9                      | 74.7                        | 7.6                       | 0.00                          | 1.00                         | 1.00 | G56B | 0.00 | 0.00 |
| 216                                                                                                                                                                                                                              | 41.3                    | 0.465                  | 0.284                  | 1.634                  | -0.351                 | 0.691                     | 28.4                   | 3.2                    | 28.5                      | 6.4                       | 70.4                     | 74.1                     | 9.6                      | 74.8                        | 7.3                       | 0.00                          | 1.00                         | 1.00 | G57B | 0.00 | 0.00 |
| 217                                                                                                                                                                                                                              | 41.3                    | 0.464                  | 0.284                  | 1.635                  | -0.353                 | 0.692                     | 28.4                   | 3.1                    | 28.6                      | 6.2                       | 70.4                     | 74.2                     | 9.3                      | 74.8                        | 7.1                       | 0.00                          | 1.00                         | 1.00 | G58B | 0.00 | 0.00 |
| 218                                                                                                                                                                                                                              | 41.3                    | 0.464                  | 0.283                  | 1.637                  | -0.355                 | 0.693                     | 28.5                   | 3.0                    | 28.6                      | 6.0                       | 70.4                     | 74.3                     | 9.0                      | 74.9                        | 6.9                       | 0.00                          | 1.00                         | 1.00 | G59B | 0.00 | 0.00 |
| 219                                                                                                                                                                                                                              | 41.3                    | 0.463                  | 0.283                  | 1.638                  | -0.357                 | 0.693                     | 28.5                   | 2.9                    | 28.6                      | 5.9                       | 70.4                     | 74.4                     | 8.7                      | 74.9                        | 6.7                       | 0.00                          | 1.00                         | 1.00 | G60B | 0.00 | 0.00 |
| 220                                                                                                                                                                                                                              | 41.3                    | 0.463                  | 0.282                  | 1.639                  | -0.359                 | 0.694                     | 28.5                   | 2.8                    | 28.7                      | 5.7                       | 70.4                     | 74.5                     | 8.5                      | 75.0                        | 6.5                       | 0.00                          | 1.00                         | 1.00 | G61B | 0.00 | 0.00 |
| 221                                                                                                                                                                                                                              | 41.3                    | 0.462                  | 0.282                  | 1.64                   | -0.361                 | 0.695                     | 28.6                   | 2.7                    | 28.7                      | 5.5                       | 70.4                     | 74.6                     | 8.2                      | 75.1                        | 6.2                       | 0.00                          | 1.00                         | 1.00 | G62B | 0.00 | 0.00 |
| 222                                                                                                                                                                                                                              | 41.3                    | 0.462                  | 0.281                  | 1.641                  | -0.364                 | 0.696                     | 28.6                   | 2.6                    | 28.7                      | 5.3                       | 70.3                     | 74.7                     | 7.9                      | 75.1                        | 6.0                       | 0.00                          | 1.00                         | 1.00 | G63B | 0.00 | 0.00 |
| 223                                                                                                                                                                                                                              | 41.2                    | 0.461                  | 0.281                  | 1.642                  | -0.366                 | 0.697                     | 28.6                   | 2.6                    | 28.8                      | 5.2                       | 70.3                     | 74.7                     | 7.7                      | 75.2                        | 5.8                       | 0.00                          | 1.00                         | 1.00 | G64B | 0.00 | 0.00 |
| 224                                                                                                                                                                                                                              | 41.2                    | 0.461                  | 0.28                   | 1.643                  | -0.368                 | 0.698                     | 28.7                   | 2.5                    | 28.8                      | 5.0                       | 70.3                     | 74.9                     | 7.4                      | 75.3                        | 5.6                       | 0.00                          | 1.00                         | 1.00 | G65B | 0.00 | 0.00 |
| 225                                                                                                                                                                                                                              | 41.2                    | 0.46                   | 0.28                   | 1.644                  | -0.37                  | 0.699                     | 28.7                   | 2.4                    | 28.8                      | 4.8                       | 70.3                     | 75.0                     | 7.1                      | 75.3                        | 5.4                       | 0.00                          | 1.00                         | 1.00 | G66B | 0.00 | 0.00 |
| 226                                                                                                                                                                                                                              | 41.2                    | 0.46                   | 0.279                  | 1.646                  | -0.372                 | 0.7                       | 28.7                   | 2.3                    | 28.8                      | 4.6                       | 70.3                     | 75.1                     | 6.8                      | 75.4                        | 5.2                       | 0.00                          | 1.00                         | 1.00 | G67B | 0.00 | 0.00 |
| 227                                                                                                                                                                                                                              | 41.2                    | 0.459                  | 0.279                  | 1.647                  | -0.374                 | 0.701                     | 28.8                   | 2.2                    | 28.9                      | 4.4                       | 70.3                     | 75.2                     | 6.6                      | 75.5                        | 5.0                       | 0.00                          | 1.00                         | 1.00 | G68B | 0.00 | 0.00 |
| 228                                                                                                                                                                                                                              | 41.2                    | 0.459                  | 0.278                  | 1.648                  | -0.376                 | 0.702                     | 28.8                   | 2.1                    | 28.9                      | 4.3                       | 70.3                     | 75.3                     | 6.3                      | 75.6                        | 4.8                       | 0.00                          | 1.00                         | 1.00 | G69B | 0.00 | 0.00 |
| 229                                                                                                                                                                                                                              | 41.2                    | 0.458                  | 0.278                  | 1.649                  | -0.378                 | 0.703                     | 28.9                   | 2.0                    | 28.9                      | 4.1                       | 70.3                     | 75.4                     | 6.1                      | 75.6                        | 4.6                       | 0.00                          | 1.00                         | 1.00 | G70B | 0.00 | 0.00 |
| 230                                                                                                                                                                                                                              | 41.2                    | 0.458                  | 0.277                  | 1.65                   | -0.38                  | 0.704                     | 28.9                   | 2.0                    | 28.9                      | 3.9                       | 70.3                     | 75.5                     | 5.8                      | 75.7                        | 4.4                       | 0.00                          | 1.00                         | 1.00 | G71B | 0.00 | 0.00 |
| 231                                                                                                                                                                                                                              | 41.2                    | 0.457                  | 0.277                  | 1.651                  | -0.382                 | 0.705                     | 28.9                   | 1.9                    | 29.0                      | 3.7                       | 70.3                     | 75.6                     | 5.5                      | 75.8                        | 4.2                       | 0.00                          | 1.00                         | 1.00 | G71B | 0.00 | 0.00 |
| 232                                                                                                                                                                                                                              | 41.1                    | 0.457                  | 0.276                  | 1.652                  | -0.384                 | 0.706                     | 29.0                   | 1.8                    | 29.0                      | 3.6                       | 70.3                     | 75.6                     | 5.3                      | 75.8                        | 4.0                       | 0.00                          | 1.00                         | 1.00 | G72B | 0.00 | 0.00 |
| 233                                                                                                                                                                                                                              | 41.1                    | 0.456                  | 0.276                  | 1.653                  | -0.386                 | 0.707                     | 29.0                   | 1.7                    | 29.1                      | 3.4                       | 70.3                     | 75.7                     | 5.0                      | 75.9                        | 3.8                       | 0.00                          | 1.00                         | 1.00 | G733 |      |      |

| rgb <sub>AB</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                                            |                  |                 |                 |                 |                 |              |                 |                 |                               |                               |                  |                  |                  |                                |                               |                   |                  |      |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|-----------------|-----------------|-----------------|--------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------|------------------|------------------|--------------------------------|-------------------------------|-------------------|------------------|------|------------------|
| Yxy, abc <sub>AB</sub> , ABC <sub>AB</sub> , LabC <sub>ab</sub> <sub>AB</sub> data for relative spacing of elementary hue h <sub>AB</sub> of L <sub>1</sub> Y <sub>AB</sub> for CIE 10 degree observer |                  |                 |                 |                 |                 |              |                 |                 |                               |                               |                  |                  |                  |                                |                               |                   |                  |      |                  |
| Elementary hue circle with 4 intended elementary hue angles: h <sub>AB</sub> = 18.2, 86.3, 156.2, 260.1 of L <sub>1</sub> Y <sub>AB</sub> , and 90 intended hue angles:                                |                  |                 |                 |                 |                 |              |                 |                 |                               |                               |                  |                  |                  |                                |                               |                   |                  |      |                  |
| 270, 271, ..., 360, L <sub>1</sub> Y <sub>AB</sub> data of CIE test colours 9 (R): 10.8 8.7 2.8, 10 (Y): 55.9 1.2 19.6, 11 (G): 20.4 -6.8 3.0, 12 (B): 7.8 -1.2 -7.2                                   |                  |                 |                 |                 |                 |              |                 |                 |                               |                               |                  |                  |                  |                                |                               |                   |                  |      |                  |
| no.                                                                                                                                                                                                    | AB <sub>10</sub> | X <sub>10</sub> | Y <sub>10</sub> | a <sub>10</sub> | b <sub>10</sub> | test colours | A <sub>10</sub> | B <sub>10</sub> | C <sub>AB</sub> <sub>10</sub> | h <sub>AB</sub> <sub>10</sub> | L* <sub>10</sub> | a* <sub>10</sub> | b* <sub>10</sub> | C* <sub>AB</sub> <sub>10</sub> | h <sub>AB</sub> <sub>10</sub> | rgb <sub>AB</sub> | AB <sub>10</sub> | Code | AB <sub>10</sub> |
| 270                                                                                                                                                                                                    | 40.7             | 0.44            | 0.26            | 1.693           | -0.46           | 0.745        | 30.3            | -1.2            | 30.3                          | 357.6                         | 70.0             | 79.0             | -3.4             | 79.1                           | 357.4                         | 0.16              | 0.00             | 1.00 | 0080R            |
| 271                                                                                                                                                                                                    | 40.7             | 0.44            | 0.259           | 1.694           | -0.462          | 0.746        | 30.4            | -1.3            | 30.4                          | 357.7                         | 70.0             | 79.1             | -3.6             | 79.2                           | 357.3                         | 0.18              | 0.00             | 1.00 | 0080R            |
| 272                                                                                                                                                                                                    | 40.7             | 0.439           | 0.259           | 1.695           | -0.464          | 0.747        | 30.4            | -1.4            | 30.4                          | 357.3                         | 70.0             | 79.2             | -3.8             | 79.3                           | 357.1                         | 0.2               | 0.00             | 1.00 | 010R             |
| 273                                                                                                                                                                                                    | 40.7             | 0.439           | 0.259           | 1.696           | -0.465          | 0.749        | 30.4            | -1.4            | 30.5                          | 357.2                         | 69.9             | 79.2             | -4.0             | 79.3                           | 357.0                         | 0.21              | 0.00             | 1.00 | 010R             |
| 274                                                                                                                                                                                                    | 40.7             | 0.438           | 0.258           | 1.697           | -0.467          | 0.75         | 30.5            | -1.5            | 30.5                          | 357.0                         | 69.9             | 79.3             | -4.2             | 79.4                           | 356.9                         | 0.23              | 0.00             | 1.00 | 011R             |
| 275                                                                                                                                                                                                    | 40.7             | 0.438           | 0.258           | 1.698           | -0.469          | 0.751        | 30.5            | -1.6            | 30.5                          | 356.9                         | 69.9             | 79.4             | -4.4             | 79.5                           | 356.7                         | 0.25              | 0.00             | 1.00 | 012R             |
| 276                                                                                                                                                                                                    | 40.6             | 0.438           | 0.257           | 1.699           | -0.471          | 0.752        | 30.5            | -1.7            | 30.6                          | 356.7                         | 69.9             | 79.5             | -4.6             | 79.6                           | 356.6                         | 0.26              | 0.00             | 1.00 | 013R             |
| 277                                                                                                                                                                                                    | 40.6             | 0.437           | 0.257           | 1.7             | -0.473          | 0.753        | 30.6            | -1.7            | 30.6                          | 356.6                         | 69.9             | 79.6             | -4.8             | 79.7                           | 356.4                         | 0.28              | 0.00             | 1.00 | 014R             |
| 278                                                                                                                                                                                                    | 40.6             | 0.437           | 0.257           | 1.701           | -0.475          | 0.754        | 30.6            | -1.8            | 30.6                          | 356.5                         | 69.9             | 79.7             | -5.0             | 79.8                           | 356.3                         | 0.3               | 0.00             | 1.00 | 015R             |
| 279                                                                                                                                                                                                    | 40.6             | 0.437           | 0.256           | 1.702           | -0.476          | 0.755        | 30.6            | -1.9            | 30.7                          | 356.3                         | 69.9             | 79.7             | -5.2             | 79.9                           | 356.2                         | 0.31              | 0.00             | 1.00 | 015R             |
| 280                                                                                                                                                                                                    | 40.6             | 0.436           | 0.256           | 1.703           | -0.478          | 0.756        | 30.6            | -2.0            | 30.7                          | 356.2                         | 69.9             | 79.8             | -5.4             | 80.0                           | 356.0                         | 0.33              | 0.00             | 1.00 | 016R             |
| 281                                                                                                                                                                                                    | 40.6             | 0.436           | 0.256           | 1.704           | -0.48           | 0.757        | 30.7            | -2.0            | 30.8                          | 356.1                         | 69.9             | 79.9             | -5.6             | 80.1                           | 355.9                         | 0.35              | 0.00             | 1.00 | 017R             |
| 282                                                                                                                                                                                                    | 40.6             | 0.435           | 0.255           | 1.705           | -0.482          | 0.758        | 30.7            | -2.1            | 30.8                          | 355.9                         | 69.9             | 80.0             | -5.8             | 80.2                           | 355.8                         | 0.37              | 0.00             | 1.00 | 018R             |
| 283                                                                                                                                                                                                    | 40.6             | 0.435           | 0.255           | 1.706           | -0.484          | 0.76         | 30.7            | -2.2            | 30.8                          | 355.8                         | 69.9             | 80.0             | -6.0             | 80.3                           | 355.6                         | 0.38              | 0.00             | 1.00 | 019R             |
| 284                                                                                                                                                                                                    | 40.6             | 0.435           | 0.254           | 1.707           | -0.486          | 0.761        | 30.8            | -2.3            | 30.9                          | 355.7                         | 69.9             | 80.1             | -6.2             | 80.4                           | 355.5                         | 0.4               | 0.00             | 1.00 | 020R             |
| 285                                                                                                                                                                                                    | 40.6             | 0.434           | 0.254           | 1.708           | -0.487          | 0.762        | 30.8            | -2.3            | 30.9                          | 355.6                         | 69.9             | 80.2             | -6.4             | 80.5                           | 355.4                         | 0.42              | 0.00             | 1.00 | 021R             |
| 286                                                                                                                                                                                                    | 40.5             | 0.434           | 0.254           | 1.709           | -0.489          | 0.763        | 30.8            | -2.4            | 30.9                          | 355.4                         | 69.8             | 80.3             | -6.6             | 80.6                           | 355.2                         | 0.43              | 0.00             | 1.00 | 021R             |
| 287                                                                                                                                                                                                    | 40.5             | 0.434           | 0.253           | 1.71            | -0.491          | 0.764        | 30.9            | -2.5            | 31.0                          | 355.3                         | 69.8             | 80.4             | -6.8             | 80.6                           | 355.1                         | 0.45              | 0.00             | 1.00 | 022R             |
| 288                                                                                                                                                                                                    | 40.5             | 0.433           | 0.253           | 1.71            | -0.493          | 0.765        | 30.9            | -2.5            | 31.0                          | 355.2                         | 69.8             | 80.4             | -6.9             | 80.7                           | 355.0                         | 0.47              | 0.00             | 1.00 | 023R             |
| 289                                                                                                                                                                                                    | 40.5             | 0.433           | 0.253           | 1.711           | -0.494          | 0.766        | 30.9            | -2.6            | 31.0                          | 355.0                         | 69.8             | 80.5             | -7.1             | 80.8                           | 354.9                         | 0.48              | 0.00             | 1.00 | 024R             |
| 290                                                                                                                                                                                                    | 40.5             | 0.433           | 0.252           | 1.712           | -0.496          | 0.767        | 31.0            | -2.7            | 31.1                          | 354.9                         | 69.8             | 80.6             | -7.3             | 80.9                           | 354.7                         | 0.5               | 0.00             | 1.00 | 025R             |
| 291                                                                                                                                                                                                    | 40.5             | 0.432           | 0.252           | 1.713           | -0.498          | 0.768        | 31.0            | -2.7            | 31.1                          | 354.8                         | 69.8             | 80.7             | -7.5             | 81.0                           | 354.6                         | 0.52              | 0.00             | 1.00 | 026R             |
| 292                                                                                                                                                                                                    | 40.5             | 0.432           | 0.252           | 1.714           | -0.5            | 0.769        | 31.0            | -2.8            | 31.2                          | 354.7                         | 69.8             | 80.7             | -7.7             | 81.1                           | 354.5                         | 0.53              | 0.00             | 1.00 | 026R             |
| 293                                                                                                                                                                                                    | 40.5             | 0.432           | 0.251           | 1.715           | -0.501          | 0.771        | 31.1            | -2.9            | 31.2                          | 354.6                         | 69.8             | 80.8             | -7.9             | 81.2                           | 354.4                         | 0.55              | 0.00             | 1.00 | 027R             |
| 294                                                                                                                                                                                                    | 40.5             | 0.431           | 0.251           | 1.716           | -0.503          | 0.772        | 31.1            | -3.0            | 31.2                          | 354.4                         | 69.8             | 80.9             | -8.0             | 81.3                           | 354.2                         | 0.57              | 0.00             | 1.00 | 028R             |
| 295                                                                                                                                                                                                    | 40.5             | 0.431           | 0.251           | 1.717           | -0.505          | 0.773        | 31.1            | -3.0            | 31.3                          | 354.3                         | 69.8             | 81.0             | -8.2             | 81.4                           | 354.1                         | 0.59              | 0.00             | 1.00 | 029R             |
| 296                                                                                                                                                                                                    | 40.4             | 0.431           | 0.25            | 1.718           | -0.507          | 0.774        | 31.1            | -3.1            | 31.3                          | 354.2                         | 69.8             | 81.0             | -8.4             | 81.5                           | 354.0                         | 0.6               | 0.00             | 1.00 | 030R             |
| 297                                                                                                                                                                                                    | 40.4             | 0.43            | 0.25            | 1.719           | -0.508          | 0.775        | 31.2            | -3.2            | 31.3                          | 354.1                         | 69.8             | 81.1             | -8.6             | 81.6                           | 353.9                         | 0.62              | 0.00             | 1.00 | 031R             |
| 298                                                                                                                                                                                                    | 40.4             | 0.43            | 0.25            | 1.72            | -0.51           | 0.776        | 31.2            | -3.2            | 31.4                          | 354.0                         | 69.8             | 81.2             | -8.7             | 81.7                           | 353.8                         | 0.64              | 0.00             | 1.00 | 032R             |
| 299                                                                                                                                                                                                    | 40.4             | 0.43            | 0.249           | 1.721           | -0.512          | 0.777        | 31.2            | -3.3            | 31.4                          | 353.8                         | 69.8             | 81.3             | -8.9             | 81.8                           | 353.7                         | 0.65              | 0.00             | 1.00 | 032R             |
| 300                                                                                                                                                                                                    | 40.4             | 0.429           | 0.249           | 1.722           | -0.513          | 0.778        | 31.3            | -3.4            | 31.4                          | 353.7                         | 69.7             | 81.3             | -9.1             | 81.8                           | 353.6                         | 0.67              | 0.00             | 1.00 | 033R             |
| 301                                                                                                                                                                                                    | 40.4             | 0.429           | 0.249           | 1.723           | -0.515          | 0.779        | 31.3            | -3.4            | 31.5                          | 353.6                         | 69.7             | 81.4             | -9.2             | 81.9                           | 353.4                         | 0.69              | 0.00             | 1.00 | 034R             |
| 302                                                                                                                                                                                                    | 40.4             | 0.429           | 0.248           | 1.723           | -0.517          | 0.78         | 31.3            | -3.5            | 31.5                          | 353.5                         | 69.7             | 81.5             | -9.4             | 82.0                           | 353.3                         | 0.7               | 0.00             | 1.00 | 035R             |
| 303                                                                                                                                                                                                    | 40.4             | 0.428           | 0.248           | 1.724           | -0.518          | 0.781        | 31.3            | -3.6            | 31.6                          | 353.4                         | 69.7             | 81.6             | -9.6             | 82.1                           | 353.2                         | 0.72              | 0.00             | 1.00 | 036R             |
| 304                                                                                                                                                                                                    | 40.4             | 0.428           | 0.248           | 1.725           | -0.52           | 0.782        | 31.4            | -3.6            | 31.6                          | 353.3                         | 69.7             | 81.6             | -9.7             | 82.2                           | 353.1                         | 0.74              | 0.00             | 1.00 | 037R             |
| 305                                                                                                                                                                                                    | 40.4             | 0.428           | 0.248           | 1.726           | -0.521          | 0.784        | 31.4            | -3.7            | 31.6                          | 353.2                         | 69.7             | 81.7             | -9.9             | 82.3                           | 353.0                         | 0.75              | 0.00             | 1.00 | 037R             |
| 306                                                                                                                                                                                                    | 40.3             | 0.427           | 0.247           | 1.727           | -0.523          | 0.785        | 31.4            | -3.8            | 31.7                          | 353.1                         | 69.7             | 81.8             | -10.1            | 82.4                           | 352.9                         | 0.77              | 0.00             | 1.00 | 038R             |
| 307                                                                                                                                                                                                    | 40.3             | 0.427           | 0.247           | 1.728           | -0.525          | 0.786        | 31.5            | -3.8            | 31.7                          | 352.9                         | 69.7             | 81.8             | -10.2            | 82.5                           | 352.8                         | 0.79              | 0.00             | 1.00 | 039R             |
| 308                                                                                                                                                                                                    | 40.3             | 0.427           | 0.247           | 1.729           | -0.526          | 0.787        | 31.5            | -3.9            | 31.7                          | 352.8                         | 69.7             | 81.9             | -10.4            | 82.6                           | 352.7                         | 0.81              | 0.00             | 1.00 | 040R             |
| 309                                                                                                                                                                                                    | 40.3             | 0.427           | 0.246           | 1.73            | -0.528          | 0.788        | 31.5            | -3.9            | 31.8                          | 352.7                         | 69.7             | 82.0             | -10.5            | 82.7                           | 352.6                         | 0.82              | 0.00             | 1.00 | 041R             |
| 310                                                                                                                                                                                                    | 40.3             | 0.426           | 0.246           | 1.731           | -0.529          | 0.789        | 31.5            | -4.0            | 31.8                          | 352.6                         | 69.7             | 82.0             | -10.7            | 82.7                           | 352.5                         | 0.84              | 0.00             | 1.00 | 042R             |
| 311                                                                                                                                                                                                    | 40.3             | 0.426           | 0.246           | 1.731           | -0.531          | 0.79         | 31.6            | -4.1            | 31.8                          | 352.5                         | 69.7             | 82.1             | -10.9            | 82.8                           | 352.4                         | 0.86              | 0.00             | 1.00 | 043R             |
| 312                                                                                                                                                                                                    | 40.3             | 0.426           | 0.245           | 1.732           | -0.533          | 0.791        | 31.6            | -4.1            | 31.9                          | 352.4                         | 69.7             | 82.2             | -11.0            | 82.9                           | 352.3                         | 0.87              | 0.00             | 1.00 | 044R             |
| 313                                                                                                                                                                                                    | 40.3             | 0.425           | 0.245           | 1.733           | -0.534          | 0.792        | 31.6            | -4.2            | 31.9                          | 352.3                         | 69.7             | 82.2             | -11.2            | 83.0                           | 352.2                         | 0.89              | 0.00             | 1.00 | 044R             |
| 314                                                                                                                                                                                                    | 40.3             | 0.425           | 0.245           | 1.734           | -0.536          | 0.793        | 31.7            | -4.3            | 31.9                          | 352.2                         | 69.7             | 82.3             | -11.3            | 83.1                           | 352.1                         | 0.91              | 0.00             | 1.00 | 045R             |
| 315                                                                                                                                                                                                    | 40.3             | 0.425           | 0.245           | 1.735           | -0.537          | 0.794        | 31.7            | -4.3            | 32.0                          | 352.1                         | 69.7             | 82.4             | -11.5            | 83.2                           | 352.0                         | 0.92              | 0.00             | 1.00 | 046R             |
| 316                                                                                                                                                                                                    | 40.3             | 0.425           | 0.244           | 1.736           | -0.539          | 0.795        | 31.7            | -4.4            | 32.0                          | 352.0                         | 69.6             | 82.4             | -11.6            | 83.3                           | 351.9                         | 0.94              | 0.00             | 1.00 | 047R             |
| 317                                                                                                                                                                                                    | 40.2             | 0.424           | 0.244           | 1.736           | -0.54           | 0.796        | 31.7            | -4.4            | 32.0                          | 351.9                         | 69.6             | 82.5             | -11.8            | 83.4                           | 351.8                         | 0.96              | 0.00             | 1.00 | 048R             |
| 318                                                                                                                                                                                                    | 40.2             | 0.424           | 0.244           | 1.737           | -0.542          | 0.797        | 31.8            | -4.5            | 32.1                          | 351.8                         | 69.6             | 82.6             | -11.9            | 83.4                           | 351.7                         | 0.97              | 0.00             | 1.00 | 048R             |
| 319                                                                                                                                                                                                    | 40.2             | 0.424           | 0.244           | 1.738           | -0.543          | 0.798        | 31.8            | -4.6            | 32.1                          | 351.7                         | 69.6             | 82.6             | -12.1            | 83.5                           | 351.6                         | 0.99              | 0.00             | 1.00 | 049R             |
| 320                                                                                                                                                                                                    | 40.2             | 0.423           | 0.243           | 1.739           | -0.545          | 0.799        | 31.8            | -4.6            | 32.2                          | 351.6                         | 69.6             | 82.7             | -12.2            | 83.6                           | 351.5                         | 1.00              | 0.00             | 0.98 | 050R             |
| 321                                                                                                                                                                                                    | 40.2             | 0.423           | 0.243           | 1.74            | -0.546          | 0.8          | 31.8            | -4.7            | 32.2                          | 351.5                         | 69.6             | 82.8             | -12.3            | 83.7                           | 351.4                         | 1.00              | 0.00             | 0.96 | 051R             |
| 322                                                                                                                                                                                                    | 40.2             | 0.423           | 0.243           | 1.741           | -0.548          | 0.801        | 31.9            | -4.7            | 32.2                          | 351.4                         | 69.6             | 82.8             | -12.5            | 83.8                           | 351.4                         | 1.00              | 0.00             | 0.95 | 052R             |
| 323                                                                                                                                                                                                    | 40.2             | 0.423           | 0.242           | 1.742           | -0.549          | 0.802        | 31.9            | -4.8            | 32.3                          | 351.3                         | 69.6             | 82.9             | -12.6            | 83.9                           | 351.3                         | 1.00              | 0.00             | 0.93 | 053R             |
| 324                                                                                                                                                                                                    | 40.2             | 0.422           | 0.242           | 1.742           | -0.551          | 0.803        | 31.9            | -4.9            | 32.3                          | 351.2                         | 69.6             | 83.0             | -12.8            | 83.9                           | 351.2                         | 1.00              | 0.00             | 0.91 | 054R             |
| 325                                                                                                                                                                                                    | 40.2             | 0.422           | 0.242           | 1.743           | -0.552          | 0.804        | 31.9            | -4.9            | 32.3                          | 351.1                         | 69.6             | 83.0             | -12.9            | 84.0                           | 351.1                         | 1.00              | 0.00             | 0.9  | 054R             |
| 326                                                                                                                                                                                                    | 40.2             | 0.422           | 0.242           | 1.744           | -0.553          | 0.805        | 32.0            | -5.0            | 32.4                          | 351.0                         | 69.6             | 83.1             | -13.0            | 84.1                           | 351.0                         | 1.00              | 0.00             | 0.88 | 055R             |

| Ostwald optimal colours (o) of maximum (m) C <sub>AB</sub> for D65, Y <sub>w</sub> =100, Y <sub>m</sub> =520_770, CIELAB data          |                                 |                   |                   |                   |                  |        |         |                 |                                 |                                 |      |   | % |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------|-------------------|-------------------|------------------|--------|---------|-----------------|---------------------------------|---------------------------------|------|---|---|
| i <sub>1</sub> , λ <sub>1</sub>                                                                                                        | i <sub>2</sub> , λ <sub>2</sub> | L* <sub>100</sub> | a* <sub>100</sub> | b* <sub>100</sub> | C* <sub>ab</sub> | a'     | b'      | h <sub>ab</sub> | i <sub>d</sub> , λ <sub>d</sub> | i <sub>c</sub> , λ <sub>c</sub> | Code | % |   |
| 0 405                                                                                                                                  | 32 561                          | 80.85             | −67.55            | −32.54            | 74.98            | 0.1805 | −0.1029 | 205.7           | 16 483                          | 37 589                          | Cm   | % |   |
| 6 435                                                                                                                                  | 32 562                          | 81.18             | −81.89            | −19.25            | 84.12            | 0.1732 | −0.096  | 193.2           | 17 486                          | 42 610                          |      | % |   |
| 10 450                                                                                                                                 | 32 563                          | 81.52             | −109.06           | 11.43             | 109.66           | 0.1595 | −0.0803 | 174.0           | 19 496                          | −1 496c                         |      | % |   |
| 12 460                                                                                                                                 | 33 565                          | 82.01             | −120.74           | 33.26             | 125.23           | 0.1538 | −0.0692 | 164.5           | 21 505                          | −1 505c                         |      | % |   |
| 12 465                                                                                                                                 | 33 567                          | 82.73             | −118.76           | 34.5              | 123.67           | 0.1552 | −0.0687 | 163.8           | 21 506                          | −1 506c                         |      | % |   |
| 14 470                                                                                                                                 | 33 569                          | 83.3              | −123.47           | 57.53             | 136.22           | 0.1532 | −0.0572 | 155.0           | 24 520                          | −1 520c                         |      | % |   |
| 15 475                                                                                                                                 | 34 573                          | 84.63             | −118.73           | 70.39             | 138.03           | 0.1564 | −0.0512 | 149.3           | 25 528                          | −1 528c                         | Gm   | % |   |
| 16 480                                                                                                                                 | 36 580                          | 86.98             | −107.21           | 84.2              | 136.33           | 0.1633 | −0.0452 | 141.8           | 27 537                          | −1 537c                         |      | % |   |
| 17 485                                                                                                                                 | 39 595                          | 91.12             | −80.53            | 100.07            | 128.45           | 0.1778 | −0.0394 | 128.8           | 29 548                          | −1 548c                         |      | % |   |
| 18 490                                                                                                                                 | −1 490c                         | 97.55             | −23.15            | 119.05            | 121.28           | 0.2052 | −0.0337 | 101.0           | 33 565                          | 11 459                          | max  | % |   |
| 19 495                                                                                                                                 | −1 495c                         | 96.94             | −20.63            | 125.42            | 127.1            | 0.2062 | −0.0306 | 99.3            | 33 566                          | 12 462                          |      | % |   |
| 20 500                                                                                                                                 | −1 500c                         | 96.17             | −17.33            | 131.15            | 132.29           | 0.2076 | −0.0277 | 97.5            | 33 567                          | 12 464                          |      | % |   |
| 22 510                                                                                                                                 | −1 510c                         | 94.0              | −8.24             | 140.17            | 140.41           | 0.2116 | −0.0224 | 93.3            | 33 569                          | 13 469                          |      | % |   |
| 23 520                                                                                                                                 | −1 519c                         | 92.57             | −2.53             | 142.99            | 143.01           | 0.2142 | −0.0202 | 91.0            | 34 570                          | 14 471                          | Ym   | % |   |
| 25 530                                                                                                                                 | −1 529c                         | 88.94             | 10.79             | 144.39            | 144.79           | 0.2205 | −0.0165 | 85.7            | 34 573                          | 15 475                          |      | % |   |
| 27 540                                                                                                                                 | −1 539c                         | 84.43             | 25.54             | 141.4             | 143.69           | 0.2281 | −0.0134 | 79.7            | 35 577                          | 15 478                          |      | % |   |
| 28 545                                                                                                                                 | −1 544c                         | 81.91             | 33.05             | 138.34            | 142.24           | 0.2322 | −0.0121 | 76.5            | 35 579                          | 15 479                          |      | % |   |
| 29 550                                                                                                                                 | −1 549c                         | 79.2              | 40.58             | 134.51            | 140.5            | 0.2367 | −0.0111 | 73.2            | 36 582                          | 16 480                          |      | % |   |
| 30 555                                                                                                                                 | −1 554c                         | 76.32             | 47.96             | 130.1             | 138.66           | 0.2413 | −0.0103 | 69.7            | 36 584                          | 16 481                          |      | % |   |
| 32 560                                                                                                                                 | −1 560c                         | 70.18             | 61.63             | 120.13            | 135.02           | 0.2511 | −0.0093 | 62.8            | 37 589                          | 16 483                          |      | % |   |
| 380                                                                                                                                    | 770                             | 100.0             | 0.0               | 0.0               | 0.0              | 0.2154 | −0.0861 | 0.0             |                                 |                                 |      | % |   |
| Ostwald optimal colours (o) of maximum (m) C <sub>AB</sub> for D65, Y <sub>w</sub> =100, Y <sub>m</sub> =770_520, CIELAB complementary |                                 |                   |                   |                   |                  |        |         |                 |                                 |                                 |      |   | % |
| i <sub>1</sub> , λ <sub>1</sub>                                                                                                        | i <sub>2</sub> , λ <sub>2</sub> | L* <sub>100</sub> | a* <sub>100</sub> | b* <sub>100</sub> | C* <sub>ab</sub> | a'     | b'      | h <sub>ab</sub> | i <sub>d</sub> , λ <sub>d</sub> | i <sub>c</sub> , λ <sub>c</sub> | Code | % |   |
| 32 561                                                                                                                                 | 0 405                           | 70.73             | 60.88             | 110.08            | 125.79           | 0.2505 | −0.022  | 61.0            | 37 589                          | 16 483                          | Rm   | % |   |
| 32 562                                                                                                                                 | 6 435                           | 70.32             | 70.58             | 34.83             | 78.71            | 0.2562 | −0.0659 | 26.2            | 42 610                          | 17 486                          |      | % |   |
| 32 563                                                                                                                                 | 10 450                          | 69.88             | 85.85             | −12.65            | 86.78            | 0.2653 | −0.0935 | 351.6           | −1 496c                         | 19 496                          |      | % |   |
| 33 565                                                                                                                                 | 12 460                          | 69.24             | 92.89             | −29.55            | 97.48            | 0.2698 | −0.1035 | 342.3           | −1 505c                         | 21 505                          |      | % |   |
| 33 567                                                                                                                                 | 12 465                          | 68.27             | 94.84             | −31.22            | 99.85            | 0.2716 | −0.1046 | 341.7           | −1 506c                         | 21 506                          |      | % |   |
| 33 569                                                                                                                                 | 14 470                          | 67.49             | 99.24             | −42.98            | 108.15           | 0.2748 | −0.1119 | 336.5           | −1 520c                         | 24 520                          |      | % |   |
| 34 573                                                                                                                                 | 15 475                          | 65.52             | 102.87            | −49.85            | 114.31           | 0.2784 | −0.1167 | 334.1           | −1 528c                         | 25 528                          | Mm   | % |   |
| 36 580                                                                                                                                 | 16 480                          | 61.69             | 107.96            | −59.02            | 123.05           | 0.2848 | −0.1241 | 331.3           | −1 537c                         | 27 537                          |      | % |   |
| 39 595                                                                                                                                 | 17 485                          | 53.22             | 112.99            | −75.47            | 135.88           | 0.297  | −0.1406 | 326.2           | −1 548c                         | 29 548                          |      | % |   |
| −1 490c                                                                                                                                | 18 490                          | 29.91             | 89.01             | −117.0            | 147.01           | 0.3124 | −0.2136 | 307.2           | 11 459                          | 33 565                          | min  | % |   |
| −1 495c                                                                                                                                | 19 495                          | 33.36             | 74.42             | −112.09           | 134.55           | 0.2908 | −0.1997 | 303.5           | 12 462                          | 33 566                          |      | % |   |
| −1 500c                                                                                                                                | 20 500                          | 37.09             | 58.44             | −106.44           | 121.43           | 0.2704 | −0.1864 | 298.7           | 12 464                          | 33 567                          |      | % |   |
| −1 510c                                                                                                                                | 22 510                          | 45.26             | 23.9              | −93.37            | 96.38            | 0.2349 | −0.1623 | 284.3           | 13 469                          | 33 569                          |      | % |   |
| −1 519c                                                                                                                                | 23 520                          | 49.52             | 6.76              | −86.32            | 86.58            | 0.2205 | −0.152  | 274.4           | 14 471                          | 34 570                          | Bm   | % |   |
| −1 529c                                                                                                                                | 25 530                          | 58.0              | −23.98            | −72.06            | 75.95            | 0.1992 | −0.1348 | 251.5           | 15 475                          | 34 573                          |      | % |   |
| −1 539c                                                                                                                                | 27 540                          | 65.83             | −46.7             | −58.75            | 75.05            | 0.1868 | −0.122  | 231.5           | 15 478                          | 35 577                          |      | % |   |
| −1 544c                                                                                                                                | 28 545                          | 69.38             | −54.68            | −52.68            | 75.93            | 0.1833 | −0.117  | 223.9           | 15 479                          | 35 579                          |      | % |   |
| −1 549c                                                                                                                                | 29 550                          | 72.72             | −60.59            | −46.95            | 76.65            | 0.1812 | −0.1126 | 217.7           | 16 480                          | 36 582                          |      | % |   |
| −1 554c                                                                                                                                | 30 555                          | 75.82             | −64.5             | −41.62            | 76.77            | 0.1803 | −0.1088 | 212.8           | 16 481                          | 36 584                          |      | % |   |
| −1 560c                                                                                                                                | 32 560                          | 81.29             | −66.96            | −32.22            | 74.32            | 0.181  | −0.1027 | 205.6           | 16 483                          | 37 589                          |      | % |   |
| 380                                                                                                                                    | 770                             | 100.0             | 0.0               | 0.0               | 0.0              | 0.2154 | −0.0861 | 0.0             |                                 |                                 |      | % |   |

| rgb <sub>cab</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                                                       |          |          |          |          |          |                        |          |          |                        |                       |          |            |            |            |                       |                          |                           |      |      |      |      |      |      |      |      |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|------------------------|----------|----------|------------------------|-----------------------|----------|------------|------------|------------|-----------------------|--------------------------|---------------------------|------|------|------|------|------|------|------|------|------|
| Yxy, <i>abc</i> <sub>AB</sub> , <i>ABC</i> <sub>AB</sub> , <i>LabC</i> <sub>ab</sub> , <i>h<sub>ab</sub></i> data for relative spacing of elementary hue <i>h<sub>ab</sub></i> of CIELAB for CIE 2 degree observer |          |          |          |          |          |                        |          |          |                        |                       |          |            |            |            |                       |                          |                           |      |      |      |      |      |      |      |      |      |
| Elementary hue circle with 4 intended elementary hue angles: <i>h<sub>ab</sub></i> = 25.6, 92.4, 162.1, 271.5 of CIELAB, and 90 intended hue angles:                                                               |          |          |          |          |          |                        |          |          |                        |                       |          |            |            |            |                       |                          |                           |      |      |      |      |      |      |      |      |      |
| 000, 001, ..., 089, CIELAB data of CIE test colours 9 (R): 40.0 58.9 28.3, 10 (Y): 81.3 -3.0 71.8, 11 (G): 52.2 -42.3 13.6, 12 (B): 30.5 1.2 -46.3                                                                 |          |          |          |          |          |                        |          |          |                        |                       |          |            |            |            |                       |                          |                           |      |      |      |      |      |      |      |      |      |
| <i>no.</i> <sub>ab</sub>                                                                                                                                                                                           | <i>Y</i> | <i>x</i> | <i>y</i> | <i>a</i> | <i>b</i> | <i>c</i> <sub>AB</sub> | <i>A</i> | <i>B</i> | <i>C</i> <sub>AB</sub> | <i>h<sub>ab</sub></i> | <i>L</i> | <i>a</i> * | <i>b</i> * | <i>C</i> * | <i>h<sub>ab</sub></i> | <i>rgb</i> <sub>ab</sub> | <i>Code</i> <sub>ab</sub> |      |      |      |      |      |      |      |      |      |
| 000                                                                                                                                                                                                                | 40.7     | 0.443    | 0.255    | 1.735    | -0.47    | 0.785                  | 31.9     | -1.4     | 32.0                   | 357.4                 | 70.0     | 82.3       | -3.8       | 82.4       | 357.3                 | 1.00                     | 0.00                      | 0.58 | 0.58 | 0.79 | 0.8  | 0.00 | 0.58 | 0.79 | 0.8  | 0.00 |
| 001                                                                                                                                                                                                                | 40.7     | 0.445    | 0.257    | 1.73     | -0.459   | 0.78                   | 31.7     | -0.9     | 31.8                   | 358.2                 | 70.0     | 81.9       | -2.6       | 81.9       | 358.1                 | 1.00                     | 0.00                      | 0.55 | 0.55 | 0.72 | 0.8  | 0.00 | 0.55 | 0.72 | 0.8  | 0.00 |
| 002                                                                                                                                                                                                                | 40.7     | 0.448    | 0.259    | 1.725    | -0.448   | 0.774                  | 31.6     | -0.5     | 31.6                   | 359.0                 | 70.0     | 81.5       | -1.5       | 81.5       | 358.9                 | 1.00                     | 0.00                      | 0.53 | 0.53 | 0.73 | 0.8  | 0.00 | 0.53 | 0.73 | 0.8  | 0.00 |
| 003                                                                                                                                                                                                                | 40.8     | 0.45     | 0.262    | 1.719    | -0.438   | 0.769                  | 31.4     | -0.1     | 31.4                   | 359.8                 | 70.0     | 81.0       | -0.2       | 81.0       | 359.7                 | 1.00                     | 0.00                      | 0.51 | 0.51 | 0.74 | 0.8  | 0.00 | 0.51 | 0.74 | 0.8  | 0.00 |
| 004                                                                                                                                                                                                                | 40.8     | 0.453    | 0.264    | 1.714    | -0.427   | 0.764                  | 31.2     | 0.3      | 31.2                   | 0.6                   | 70.0     | 80.6       | 0.9        | 80.6       | 0.6                   | 1.00                     | 0.00                      | 0.48 | 0.48 | 0.75 | 0.8  | 0.00 | 0.48 | 0.75 | 0.8  | 0.00 |
| 005                                                                                                                                                                                                                | 40.8     | 0.455    | 0.266    | 1.709    | -0.416   | 0.759                  | 31.0     | 0.7      | 31.0                   | 1.4                   | 70.0     | 80.1       | 2.2        | 80.2       | 1.5                   | 1.00                     | 0.00                      | 0.46 | 0.46 | 0.76 | 0.8  | 0.00 | 0.46 | 0.76 | 0.8  | 0.00 |
| 006                                                                                                                                                                                                                | 40.8     | 0.458    | 0.268    | 1.704    | -0.405   | 0.754                  | 30.8     | 1.2      | 30.8                   | 2.2                   | 70.0     | 79.7       | 3.5        | 79.8       | 2.5                   | 1.00                     | 0.00                      | 0.44 | 0.44 | 0.77 | 0.8  | 0.00 | 0.44 | 0.77 | 0.8  | 0.00 |
| 007                                                                                                                                                                                                                | 40.8     | 0.461    | 0.271    | 1.698    | -0.394   | 0.749                  | 30.6     | 1.6      | 30.6                   | 3.1                   | 70.0     | 79.2       | 4.8        | 79.4       | 3.4                   | 1.00                     | 0.00                      | 0.42 | 0.42 | 0.78 | 0.8  | 0.00 | 0.42 | 0.78 | 0.8  | 0.00 |
| 008                                                                                                                                                                                                                | 40.9     | 0.463    | 0.273    | 1.693    | -0.383   | 0.745                  | 30.4     | 2.1      | 30.4                   | 4.0                   | 70.1     | 78.8       | 6.1        | 79.0       | 4.4                   | 1.00                     | 0.00                      | 0.39 | 0.39 | 0.80 | 0.8  | 0.00 | 0.39 | 0.80 | 0.8  | 0.00 |
| 009                                                                                                                                                                                                                | 40.9     | 0.466    | 0.276    | 1.688    | -0.372   | 0.74                   | 30.1     | 2.5      | 30.3                   | 4.8                   | 70.1     | 78.3       | 7.5        | 78.7       | 5.4                   | 1.00                     | 0.00                      | 0.37 | 0.37 | 0.81 | 0.8  | 0.00 | 0.37 | 0.81 | 0.8  | 0.00 |
| 010                                                                                                                                                                                                                | 40.9     | 0.469    | 0.278    | 1.683    | -0.361   | 0.736                  | 29.9     | 3.0      | 30.1                   | 5.7                   | 70.1     | 77.9       | 8.9        | 78.4       | 6.5                   | 1.00                     | 0.00                      | 0.35 | 0.35 | 0.82 | 0.8  | 0.00 | 0.35 | 0.82 | 0.8  | 0.00 |
| 011                                                                                                                                                                                                                | 40.9     | 0.471    | 0.281    | 1.677    | -0.35    | 0.732                  | 29.7     | 3.4      | 29.9                   | 6.6                   | 70.1     | 77.4       | 10.3       | 78.1       | 7.5                   | 1.00                     | 0.00                      | 0.33 | 0.33 | 0.83 | 0.8  | 0.00 | 0.33 | 0.83 | 0.8  | 0.00 |
| 012                                                                                                                                                                                                                | 40.9     | 0.474    | 0.283    | 1.672    | -0.34    | 0.728                  | 29.5     | 3.9      | 29.8                   | 7.5                   | 70.1     | 76.9       | 11.7       | 77.8       | 8.6                   | 1.00                     | 0.00                      | 0.3  | 0.3  | 0.84 | 0.8  | 0.00 | 0.3  | 0.84 | 0.8  | 0.00 |
| 013                                                                                                                                                                                                                | 40.9     | 0.477    | 0.286    | 1.667    | -0.329   | 0.724                  | 29.3     | 4.3      | 29.7                   | 8.4                   | 70.1     | 76.5       | 13.2       | 77.6       | 9.8                   | 1.00                     | 0.00                      | 0.28 | 0.28 | 0.85 | 0.8  | 0.00 | 0.28 | 0.85 | 0.8  | 0.00 |
| 014                                                                                                                                                                                                                | 41.0     | 0.48     | 0.289    | 1.662    | -0.318   | 0.721                  | 29.1     | 4.7      | 29.5                   | 9.3                   | 70.1     | 76.0       | 14.7       | 77.4       | 10.9                  | 1.00                     | 0.00                      | 0.26 | 0.26 | 0.86 | 0.8  | 0.00 | 0.26 | 0.86 | 0.8  | 0.00 |
| 015                                                                                                                                                                                                                | 41.0     | 0.483    | 0.291    | 1.656    | -0.308   | 0.717                  | 28.9     | 5.2      | 29.4                   | 10.2                  | 70.1     | 75.5       | 16.2       | 77.3       | 12.1                  | 1.00                     | 0.00                      | 0.24 | 0.24 | 0.87 | 0.8  | 0.00 | 0.24 | 0.87 | 0.8  | 0.00 |
| 016                                                                                                                                                                                                                | 41.0     | 0.486    | 0.294    | 1.651    | -0.297   | 0.713                  | 28.7     | 5.6      | 29.3                   | 11.1                  | 70.2     | 75.1       | 17.7       | 77.2       | 13.2                  | 1.00                     | 0.00                      | 0.22 | 0.22 | 0.88 | 0.8  | 0.00 | 0.22 | 0.88 | 0.8  | 0.00 |
| 017                                                                                                                                                                                                                | 41.0     | 0.489    | 0.297    | 1.646    | -0.286   | 0.711                  | 28.5     | 6.1      | 29.2                   | 12.0                  | 70.2     | 74.6       | 19.2       | 77.1       | 14.4                  | 1.00                     | 0.00                      | 0.19 | 0.19 | 0.89 | 0.8  | 0.00 | 0.19 | 0.89 | 0.8  | 0.00 |
| 018                                                                                                                                                                                                                | 41.0     | 0.492    | 0.3      | 1.641    | -0.276   | 0.709                  | 28.3     | 6.5      | 29.1                   | 12.9                  | 70.2     | 74.2       | 20.8       | 77.1       | 15.7                  | 1.00                     | 0.00                      | 0.17 | 0.17 | 0.91 | 0.8  | 0.00 | 0.17 | 0.91 | 0.8  | 0.00 |
| 019                                                                                                                                                                                                                | 41.0     | 0.495    | 0.302    | 1.636    | -0.266   | 0.706                  | 28.1     | 6.9      | 29.0                   | 13.8                  | 70.2     | 73.7       | 22.4       | 77.1       | 16.9                  | 1.00                     | 0.00                      | 0.15 | 0.15 | 0.92 | 0.8  | 0.00 | 0.15 | 0.92 | 0.8  | 0.00 |
| 020                                                                                                                                                                                                                | 41.1     | 0.498    | 0.305    | 1.631    | -0.256   | 0.704                  | 27.9     | 7.3      | 28.9                   | 14.7                  | 70.2     | 73.3       | 24.1       | 77.1       | 18.1                  | 1.00                     | 0.00                      | 0.12 | 0.12 | 0.93 | 0.8  | 0.00 | 0.12 | 0.93 | 0.8  | 0.00 |
| 021                                                                                                                                                                                                                | 41.1     | 0.501    | 0.308    | 1.626    | -0.246   | 0.701                  | 27.7     | 7.7      | 28.8                   | 15.6                  | 70.2     | 72.8       | 25.7       | 77.3       | 19.4                  | 1.00                     | 0.00                      | 0.1  | 0.1  | 0.94 | 0.8  | 0.00 | 0.1  | 0.94 | 0.8  | 0.00 |
| 022                                                                                                                                                                                                                | 41.1     | 0.504    | 0.311    | 1.621    | -0.236   | 0.699                  | 27.5     | 8.1      | 28.7                   | 16.5                  | 70.2     | 72.4       | 27.4       | 77.4       | 20.7                  | 1.00                     | 0.00                      | 0.08 | 0.08 | 0.95 | 0.8  | 0.00 | 0.08 | 0.95 | 0.8  | 0.00 |
| 023                                                                                                                                                                                                                | 41.1     | 0.507    | 0.314    | 1.616    | -0.226   | 0.697                  | 27.4     | 8.6      | 28.7                   | 17.4                  | 70.2     | 72.0       | 29.1       | 77.6       | 22.0                  | 1.00                     | 0.00                      | 0.06 | 0.06 | 0.96 | 0.8  | 0.00 | 0.06 | 0.96 | 0.8  | 0.00 |
| 024                                                                                                                                                                                                                | 41.1     | 0.51     | 0.317    | 1.611    | -0.216   | 0.696                  | 27.2     | 9.0      | 28.6                   | 18.3                  | 70.3     | 71.5       | 30.8       | 77.7       | 23.3                  | 1.00                     | 0.00                      | 0.03 | 0.03 | 0.98 | 0.8  | 0.00 | 0.03 | 0.98 | 0.8  | 0.00 |
| 025                                                                                                                                                                                                                | 41.1     | 0.514    | 0.319    | 1.606    | -0.207   | 0.694                  | 27.0     | 9.3      | 28.6                   | 19.1                  | 70.3     | 71.1       | 32.5       | 78.2       | 24.6                  | 1.00                     | 0.00                      | 0.01 | 0.01 | 0.99 | 0.8  | 0.00 | 0.01 | 0.99 | 0.8  | 0.00 |
| 026                                                                                                                                                                                                                | 41.2     | 0.517    | 0.322    | 1.601    | -0.198   | 0.693                  | 26.8     | 9.7      | 28.5                   | 20.0                  | 70.3     | 70.7       | 34.3       | 78.6       | 25.9                  | 1.00                     | 0.00                      | 0.00 | 0.00 | 0.00 | 0.8  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 027                                                                                                                                                                                                                | 41.2     | 0.52     | 0.326    | 1.597    | -0.187   | 0.692                  | 26.6     | 10.2     | 28.5                   | 20.9                  | 70.3     | 70.3       | 36.4       | 79.2       | 27.4                  | 1.00                     | 0.02                      | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| 028                                                                                                                                                                                                                | 41.2     | 0.525    | 0.329    | 1.593    | -0.176   | 0.692                  | 26.5     | 10.6     | 28.5                   | 21.9                  | 70.3     | 69.9       | 38.7       | 79.9       | 28.9                  | 1.00                     | 0.03                      | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 |
| 029                                                                                                                                                                                                                | 41.2     | 0.528    | 0.332    | 1.588    | -0.165   | 0.693                  | 26.3     | 11.1     | 28.6                   | 22.8                  | 70.3     | 69.5       | 40.9       | 80.7       | 30.4                  | 1.00                     | 0.05                      | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 |
| 030                                                                                                                                                                                                                | 41.3     | 0.532    | 0.336    | 1.584    | -0.155   | 0.693                  | 26.2     | 11.5     | 28.6                   | 23.8                  | 70.3     | 69.1       | 43.2       | 81.5       | 31.9                  | 1.00                     | 0.06                      | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 |
| 031                                                                                                                                                                                                                | 41.3     | 0.536    | 0.339    | 1.58     | -0.145   | 0.693                  | 26.0     | 11.9     | 28.6                   | 24.6                  | 70.4     | 68.8       | 45.5       | 82.5       | 33.4                  | 1.00                     | 0.08                      | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 |
| 032                                                                                                                                                                                                                | 41.3     | 0.54     | 0.342    | 1.576    | -0.136   | 0.694                  | 25.8     | 12.3     | 28.7                   | 25.5                  | 70.4     | 68.4       | 47.8       | 83.5       | 34.9                  | 1.00                     | 0.09                      | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 |
| 033                                                                                                                                                                                                                | 41.3     | 0.544    | 0.345    | 1.572    | -0.127   | 0.694                  | 25.7     | 12.7     | 28.7                   | 26.3                  | 70.4     | 68.1       | 50.1       | 84.5       | 36.3                  | 1.00                     | 0.11                      | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 |
| 034                                                                                                                                                                                                                | 41.3     | 0.547    | 0.348    | 1.569    | -0.118   | 0.695                  | 25.6     | 13.1     | 28.7                   | 27.1                  | 70.4     | 67.7       | 52.4       | 85.6       | 37.7                  | 1.00                     | 0.12                      | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 |
| 035                                                                                                                                                                                                                | 41.4     | 0.55     | 0.351    | 1.565    | -0.11    | 0.695                  | 25.4     | 13.4     | 28.8                   | 27.8                  | 70.4     | 67.4       | 54.7       | 86.8       | 39.0                  | 1.00                     | 0.13                      | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 |
| 036                                                                                                                                                                                                                | 41.4     | 0.554    | 0.354    | 1.561    | -0.102   | 0.696                  | 25.3     | 13.8     | 28.8                   | 28.5                  | 70.4     | 67.1       | 57.0       | 88.1       | 40.3                  | 1.00                     | 0.15                      | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 |
| 037                                                                                                                                                                                                                | 41.4     | 0.557    | 0.357    | 1.558    | -0.094   | 0.696                  | 25.1     | 14.1     | 28.8                   | 29.2                  | 70.4     | 66.7       | 59.4       | 89.3       | 41.6                  | 1.00                     | 0.16                      | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 |
| 038                                                                                                                                                                                                                | 41.4     | 0.56     | 0.36     | 1.554    | -0.087   | 0.697                  | 25.0     | 14.4     | 28.9                   | 29.9                  | 70.5     | 66.4       | 61.7       | 90.7       | 42.9                  | 1.00                     | 0.18                      | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 |
| 039                                                                                                                                                                                                                | 41.5     | 0.563    | 0.363    | 1.55     | -0.08    | 0.697                  | 24.9     | 14.7     | 28.9                   | 30.5                  | 70.5     | 66.1       | 64.0       | 92.0       | 44.0                  | 1.00                     | 0.19                      | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 |
| 040                                                                                                                                                                                                                | 41.5     | 0.565    | 0.365    | 1.547    | -0.074   | 0.697                  | 24.7     | 14.9     | 28.9                   | 31.1                  | 70.5     | 65.8       | 66.3       | 93.4       | 45.2                  | 1.00                     | 0.21                      | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 |
| 041                                                                                                                                                                                                                | 41.5     | 0.568    | 0.368    | 1.544    | -0.068   | 0.698                  | 24.6     | 15.2     | 29.0                   | 31.7                  | 70.5     | 65.5       | 68.7       | 94.9       | 46.3                  | 1.00                     | 0.22                      | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 |
| 042                                                                                                                                                                                                                | 41.5     | 0.571    | 0.37     | 1.54     | -0.062   | 0.698                  | 24.5     | 15.4     | 29.0                   | 32.2                  | 70.5     | 65.2       | 71.0       | 96.4       | 47.4                  | 1.00                     | 0.24                      | 0.00 | 0.00 | 0.00 | 0.24 | 0.00 | 0.00 | 0.00 | 0.24 | 0.00 |
| 043                                                                                                                                                                                                                | 41.5     | 0.573    | 0.372    | 1.537    | -0.057   | 0.698                  | 24.4     | 15.7     | 29.0                   | 32.7                  | 70.5     | 64.9       | 73.2       | 97.9       | 48.4                  | 1.00                     | 0.25                      | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 |
| 044                                                                                                                                                                                                                | 41.6     | 0.575    | 0.375    | 1.534    | -0.0     |                        |          |          |                        |                       |          |            |            |            |                       |                          |                           |      |      |      |      |      |      |      |      |      |

| rgb* <sub>cab</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                      |      |       |       |       |        |       |       |      |      |       |      |       |                 |       |       |      |      |      |                 |      |      |      |    |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|-------|-------|--------|-------|-------|------|------|-------|------|-------|-----------------|-------|-------|------|------|------|-----------------|------|------|------|----|------|
| Yxy, rgb* <sub>AB</sub> , ABC <sub>AB</sub> , LabC* <sub>ahb</sub> data for relative spacing of elementary hue h <sub>ab</sub> of CIELAB for CIE 2 degree observer |      |       |       |       |        |       |       |      |      |       |      |       |                 |       |       |      |      |      |                 |      |      |      |    |      |
| Elementary hue circle with 4 intended elementary hue angles: h <sub>ab</sub> = 25.6, 92.4, 162.1, 271.5 of CIELAB, and 90 intended hue angles:                     |      |       |       |       |        |       |       |      |      |       |      |       |                 |       |       |      |      |      |                 |      |      |      |    |      |
| 0.901, ..., 179, CIELAB data of CIE test colours 9 (R): 40.0 58.9 28.3, 10 (Y): 81.3 -3.0 71.8, 11 (G): 52.2 -42.3 13.6, 12 (B): 30.5 1.2 -46.3                    |      |       |       |       |        |       |       |      |      |       |      |       |                 |       |       |      |      |      |                 |      |      |      |    |      |
| no.                                                                                                                                                                | ab   | Y     | x     | y     | a      | b     | c     | ab   | A    | B     | C    | ab    | h <sub>AB</sub> | L*    | a*    | b*   | C*   | ab   | h <sub>AB</sub> | rgb* | ab   | Code | ab |      |
| 990                                                                                                                                                                | 80.7 | 0.483 | 0.509 | 0.938 | -0.005 | 0.43  | -0.1  | 34.7 | 34.7 | 90.3  | 92.0 | -0.3  | 143.4           | 143.4 | 90.1  | 1.00 | 0.96 | 0.00 | 0.00            | 0.96 | 0.00 | 0.96 | Y  | 956  |
| 991                                                                                                                                                                | 81.9 | 0.479 | 0.512 | 0.935 | -0.005 | 0.43  | -1.2  | 35.2 | 35.2 | 92.0  | 92.5 | -2.5  | 143.0           | 143.0 | 91.0  | 1.00 | 0.97 | 0.00 | 0.00            | 0.97 | 0.00 | 0.97 | Y  | 957  |
| 992                                                                                                                                                                | 83.5 | 0.474 | 0.516 | 0.919 | -0.006 | 0.43  | -2.6  | 35.8 | 35.9 | 94.1  | 93.2 | -5.2  | 142.2           | 142.3 | 92.1  | 1.00 | 0.99 | 0.00 | 0.00            | 0.99 | 0.00 | 0.99 | Y  | 959  |
| 993                                                                                                                                                                | 84.8 | 0.47  | 0.519 | 0.906 | -0.007 | 0.43  | -3.7  | 36.3 | 36.5 | 95.8  | 93.8 | -7.4  | 140.8           | 141.0 | 93.0  | 0.99 | 1.00 | 0.00 | 0.00            | 1.00 | 0.00 | 1.00 | Y  | 960  |
| 994                                                                                                                                                                | 86.0 | 0.466 | 0.522 | 0.893 | -0.008 | 0.43  | -4.8  | 36.7 | 37.0 | 97.5  | 94.3 | -9.6  | 138.9           | 139.2 | 93.9  | 0.97 | 1.00 | 0.00 | 0.00            | 0.97 | 0.00 | 0.97 | Y  | 962  |
| 995                                                                                                                                                                | 87.3 | 0.462 | 0.524 | 0.881 | -0.009 | 0.431 | -6.0  | 37.1 | 37.6 | 99.2  | 94.8 | -11.9 | 136.8           | 137.3 | 94.9  | 0.96 | 1.00 | 0.00 | 0.00            | 0.96 | 0.00 | 0.96 | Y  | 963  |
| 996                                                                                                                                                                | 88.6 | 0.457 | 0.526 | 0.868 | -0.011 | 0.432 | -7.2  | 37.5 | 38.2 | 100.9 | 95.9 | -14.1 | 134.5           | 135.3 | 96.0  | 0.94 | 1.00 | 0.00 | 0.00            | 0.94 | 0.00 | 0.94 | Y  | 965  |
| 997                                                                                                                                                                | 89.8 | 0.453 | 0.528 | 0.857 | -0.013 | 0.432 | -8.3  | 37.9 | 38.8 | 102.6 | 95.9 | -16.3 | 132.3           | 133.3 | 97.0  | 0.93 | 1.00 | 0.00 | 0.00            | 0.93 | 0.00 | 0.93 | Y  | 966  |
| 998                                                                                                                                                                | 91.1 | 0.448 | 0.530 | 0.845 | -0.015 | 0.432 | -9.5  | 38.2 | 39.4 | 104.0 | 96.4 | -18.5 | 130.0           | 131.0 | 98.1  | 0.91 | 1.00 | 0.00 | 0.00            | 0.91 | 0.00 | 0.91 | Y  | 968  |
| 999                                                                                                                                                                | 92.0 | 0.444 | 0.53  | 0.836 | -0.018 | 0.432 | -10.4 | 38.8 | 39.7 | 105.2 | 96.8 | -20.2 | 126.4           | 128.0 | 99.0  | 0.9  | 1.00 | 0.00 | 0.00            | 0.9  | 0.00 | 0.9  | Y  | 969  |
| 100                                                                                                                                                                | 93.8 | 0.445 | 0.526 | 0.846 | -0.021 | 0.426 | -9.8  | 38.8 | 40.0 | 104.1 | 97.5 | -18.6 | 123.6           | 125.0 | 98.5  | 0.89 | 1.00 | 0.00 | 0.00            | 0.89 | 0.00 | 0.89 | Y  | 970  |
| 101                                                                                                                                                                | 93.8 | 0.435 | 0.529 | 0.822 | -0.026 | 0.429 | -12.0 | 38.4 | 40.2 | 107.3 | 97.5 | -23.0 | 119.1           | 121.3 | 100.9 | 0.87 | 1.00 | 0.00 | 0.00            | 0.87 | 0.00 | 0.87 | Y  | 972  |
| 102                                                                                                                                                                | 93.4 | 0.432 | 0.532 | 0.813 | -0.026 | 0.431 | -12.8 | 38.2 | 40.2 | 108.5 | 97.3 | -24.7 | 118.5           | 121.0 | 101.8 | 0.86 | 1.00 | 0.00 | 0.00            | 1.00 | 0.00 | 1.00 | Y  | 973  |
| 103                                                                                                                                                                | 92.9 | 0.429 | 0.534 | 0.804 | -0.027 | 0.434 | -13.6 | 37.9 | 40.3 | 109.7 | 97.2 | -26.4 | 117.9           | 120.8 | 102.6 | 0.84 | 1.00 | 0.00 | 0.00            | 0.84 | 0.00 | 0.84 | Y  | 975  |
| 104                                                                                                                                                                | 92.5 | 0.426 | 0.536 | 0.794 | -0.027 | 0.436 | -14.4 | 37.9 | 40.4 | 110.8 | 97.0 | -28.2 | 117.3           | 120.6 | 103.5 | 0.83 | 1.00 | 0.00 | 0.00            | 0.83 | 0.00 | 0.83 | Y  | 976  |
| 105                                                                                                                                                                | 92.0 | 0.423 | 0.539 | 0.785 | -0.027 | 0.44  | -15.2 | 37.5 | 40.5 | 112.0 | 96.8 | -30.0 | 116.7           | 120.5 | 104.4 | 0.81 | 1.00 | 0.00 | 0.00            | 0.81 | 0.00 | 0.81 | Y  | 978  |
| 106                                                                                                                                                                | 91.5 | 0.421 | 0.541 | 0.775 | -0.028 | 0.443 | -16.0 | 37.2 | 40.6 | 113.2 | 96.4 | -31.8 | 115.0           | 120.5 | 105.3 | 0.79 | 1.00 | 0.00 | 0.00            | 0.79 | 0.00 | 0.79 | Y  | 979  |
| 107                                                                                                                                                                | 91.0 | 0.416 | 0.544 | 0.765 | -0.028 | 0.447 | -16.8 | 37.0 | 40.7 | 114.4 | 96.4 | -33.8 | 115.4           | 120.3 | 106.3 | 0.78 | 1.00 | 0.00 | 0.00            | 0.78 | 0.00 | 0.78 | Y  | 980  |
| 108                                                                                                                                                                | 90.5 | 0.412 | 0.547 | 0.754 | -0.029 | 0.451 | -17.7 | 36.8 | 40.8 | 115.7 | 96.2 | -35.7 | 114.8           | 120.2 | 107.3 | 0.77 | 1.00 | 0.00 | 0.00            | 0.77 | 0.00 | 0.77 | Y  | 982  |
| 109                                                                                                                                                                | 90.0 | 0.409 | 0.549 | 0.744 | -0.029 | 0.455 | -18.5 | 36.5 | 40.9 | 116.9 | 96.0 | -37.7 | 114.2           | 120.2 | 108.3 | 0.76 | 1.00 | 0.00 | 0.00            | 0.76 | 0.00 | 0.76 | Y  | 983  |
| 110                                                                                                                                                                | 89.5 | 0.405 | 0.552 | 0.733 | -0.03  | 0.459 | -19.4 | 36.2 | 41.1 | 118.1 | 95.8 | -39.8 | 113.5           | 120.3 | 109.3 | 0.74 | 1.00 | 0.00 | 0.00            | 0.74 | 0.00 | 0.74 | Y  | 985  |
| 111                                                                                                                                                                | 88.9 | 0.401 | 0.555 | 0.722 | -0.03  | 0.464 | -20.2 | 36.0 | 41.3 | 119.3 | 95.5 | -41.9 | 112.8           | 120.3 | 110.3 | 0.73 | 1.00 | 0.00 | 0.00            | 0.73 | 0.00 | 0.73 | Y  | 986  |
| 112                                                                                                                                                                | 88.4 | 0.397 | 0.558 | 0.712 | -0.031 | 0.469 | -21.0 | 35.7 | 41.5 | 120.5 | 95.3 | -44.0 | 112.1           | 120.5 | 111.4 | 0.71 | 1.00 | 0.00 | 0.00            | 0.71 | 0.00 | 0.71 | Y  | 988  |
| 113                                                                                                                                                                | 87.8 | 0.393 | 0.561 | 0.701 | -0.031 | 0.474 | -21.9 | 35.4 | 41.6 | 121.6 | 95.1 | -46.1 | 111.0           | 120.5 | 112.4 | 0.7  | 1.00 | 0.00 | 0.00            | 0.7  | 0.00 | 0.7  | Y  | 989  |
| 114                                                                                                                                                                | 87.2 | 0.389 | 0.564 | 0.69  | -0.032 | 0.479 | -22.7 | 35.2 | 41.8 | 122.8 | 95.0 | -48.3 | 110.0           | 120.8 | 113.5 | 0.69 | 1.00 | 0.00 | 0.00            | 0.69 | 0.00 | 0.69 | Y  | 990  |
| 115                                                                                                                                                                | 86.7 | 0.385 | 0.567 | 0.679 | -0.032 | 0.485 | -23.5 | 34.9 | 42.1 | 123.9 | 94.6 | -50.5 | 110.1           | 121.1 | 114.6 | 0.67 | 1.00 | 0.00 | 0.00            | 0.67 | 0.00 | 0.67 | Y  | 992  |
| 116                                                                                                                                                                | 86.1 | 0.381 | 0.57  | 0.668 | -0.033 | 0.491 | -24.3 | 34.6 | 42.3 | 125.0 | 94.3 | -52.7 | 109.3           | 121.4 | 115.7 | 0.66 | 1.00 | 0.00 | 0.00            | 0.66 | 0.00 | 0.66 | Y  | 993  |
| 117                                                                                                                                                                | 85.5 | 0.377 | 0.573 | 0.657 | -0.034 | 0.497 | -25.0 | 34.3 | 42.5 | 126.1 | 94.1 | -54.9 | 108.6           | 121.7 | 116.8 | 0.64 | 1.00 | 0.00 | 0.00            | 0.64 | 0.00 | 0.64 | Y  | 995  |
| 118                                                                                                                                                                | 84.9 | 0.372 | 0.577 | 0.646 | -0.034 | 0.503 | -25.8 | 34.0 | 42.7 | 127.1 | 93.8 | -57.1 | 107.9           | 122.1 | 117.8 | 0.63 | 1.00 | 0.00 | 0.00            | 0.63 | 0.00 | 0.63 | Y  | 996  |
| 119                                                                                                                                                                | 84.3 | 0.368 | 0.58  | 0.635 | -0.035 | 0.509 | -26.5 | 33.7 | 42.9 | 128.2 | 93.6 | -59.3 | 107.2           | 122.5 | 118.9 | 0.61 | 1.00 | 0.00 | 0.00            | 0.61 | 0.00 | 0.61 | Y  | 998  |
| 120                                                                                                                                                                | 83.8 | 0.364 | 0.583 | 0.624 | -0.035 | 0.515 | -27.3 | 33.4 | 43.2 | 129.2 | 93.3 | -61.5 | 106.5           | 123.0 | 120.0 | 0.6  | 1.00 | 0.00 | 0.00            | 0.6  | 0.00 | 0.6  | Y  | 999  |
| 121                                                                                                                                                                | 83.2 | 0.359 | 0.586 | 0.613 | -0.036 | 0.522 | -28.0 | 33.2 | 43.4 | 130.3 | 93.1 | -63.8 | 105.7           | 123.5 | 121.0 | 0.59 | 1.00 | 0.00 | 0.00            | 0.59 | 0.00 | 0.59 | Y  | 1000 |
| 122                                                                                                                                                                | 82.6 | 0.355 | 0.589 | 0.603 | -0.037 | 0.528 | -28.7 | 32.9 | 43.6 | 131.4 | 92.9 | -66.0 | 104.9           | 124.0 | 121.9 | 0.57 | 1.00 | 0.00 | 0.00            | 0.57 | 0.00 | 0.57 | Y  | 1001 |
| 123                                                                                                                                                                | 82.0 | 0.351 | 0.592 | 0.592 | -0.037 | 0.535 | -29.3 | 32.6 | 43.9 | 131.9 | 92.8 | -68.2 | 104.3           | 124.6 | 123.1 | 0.56 | 1.00 | 0.00 | 0.00            | 0.56 | 0.00 | 0.56 | Y  | 1002 |
| 124                                                                                                                                                                | 81.4 | 0.346 | 0.595 | 0.582 | -0.038 | 0.541 | -30.0 | 32.3 | 44.1 | 132.8 | 92.3 | -70.3 | 103.5           | 125.2 | 124.1 | 0.54 | 1.00 | 0.00 | 0.00            | 0.54 | 0.00 | 0.54 | Y  | 1003 |
| 125                                                                                                                                                                | 80.8 | 0.342 | 0.598 | 0.572 | -0.039 | 0.548 | -30.6 | 32.0 | 44.3 | 133.6 | 92.0 | -72.5 | 102.8           | 125.8 | 125.0 | 0.53 | 1.00 | 0.00 | 0.00            | 0.53 | 0.00 | 0.53 | Y  | 1004 |
| 126                                                                                                                                                                | 80.3 | 0.338 | 0.601 | 0.561 | -0.039 | 0.554 | -31.2 | 31.7 | 44.5 | 134.4 | 91.8 | -74.6 | 102.1           | 126.5 | 126.1 | 0.51 | 1.00 | 0.00 | 0.00            | 0.51 | 0.00 | 0.51 | Y  | 1005 |
| 127                                                                                                                                                                | 79.7 | 0.333 | 0.604 | 0.552 | -0.04  | 0.561 | -31.7 | 31.5 | 44.7 | 135.2 | 91.5 | -76.7 | 101.3           | 127.1 | 127.1 | 0.5  | 1.00 | 0.00 | 0.00            | 0.5  | 0.00 | 0.5  | Y  | 1006 |
| 128                                                                                                                                                                | 79.2 | 0.329 | 0.607 | 0.542 | -0.041 | 0.567 | -32.3 | 31.2 | 44.9 | 135.9 | 91.3 | -78.8 | 100.6           | 127.8 | 128.0 | 0.48 | 1.00 | 0.00 | 0.00            | 0.48 | 0.00 | 0.48 | Y  | 1007 |
| 129                                                                                                                                                                | 78.6 | 0.325 | 0.61  | 0.532 | -0.042 | 0.574 | -32.8 | 30.9 | 45.1 | 136.7 | 91.0 | -81.0 | 99.8            | 128.6 | 128.0 | 0.47 | 1.00 | 0.00 | 0.00            | 0.47 | 0.00 | 0.47 | Y  | 1008 |
| 130                                                                                                                                                                | 78.1 | 0.321 | 0.614 | 0.519 | -0.043 | 0.583 | -33.5 | 30.6 | 45.3 | 137.5 | 90.8 | -83.9 | 98.5            | 129.4 | 130.4 | 0.46 | 1.00 | 0.00 | 0.00            | 0.46 | 0.00 | 0.46 | Y  | 1009 |
| 131                                                                                                                                                                | 76.9 | 0.312 | 0.617 | 0.506 | -0.045 | 0.591 | -34.1 | 30.0 | 45.4 | 138.6 | 90.2 | -86.7 | 97.2            | 130.2 | 137.7 | 0.44 | 1.00 | 0.00 | 0.00            | 0.44 | 0.00 | 0.44 | Y  | 1010 |
| 132                                                                                                                                                                | 76.1 | 0.307 | 0.62  | 0.494 | -0.046 | 0.599 | -34.6 | 29.6 | 45.6 | 139.5 | 89.9 | -89.2 | 95.9            | 131.0 | 132.9 | 0.43 | 1.00 | 0.00 | 0.00            | 0.43 | 0.00 | 0.43 | Y  | 1011 |
| 133                                                                                                                                                                | 75.3 | 0.301 | 0.623 | 0.483 | -0.048 | 0.606 | -35.1 | 29.2 | 45.7 | 140.2 | 89.5 | -91.6 | 94.7            | 131.8 | 134.0 | 0.41 | 1.00 | 0.00 | 0.00            | 0.41 | 0.00 | 0.41 | Y  | 1012 |
| 134                                                                                                                                                                | 74.6 | 0.296 | 0.625 | 0.473 | -0.049 | 0.613 | -35.5 | 28.8 | 45.7 | 141.0 | 89.2 | -93.9 | 93.4            | 132.5 | 135.1 | 0.4  | 1.00 | 0.00 | 0.00            | 0.4  | 0.00 | 0.4  | Y  | 1013 |
| 135                                                                                                                                                                | 73.9 | 0.291 | 0.627 | 0.464 | -0.051 | 0.619 | -35.9 | 28.4 | 45.8 | 141.8 | 88.9 | -96.0 | 92.2            | 133.1 | 136.1 | 0.38 | 1.00 | 0.00 | 0.00            | 0.38 | 0.00 | 0.38 | Y  | 1014 |
| 136                                                                                                                                                                | 73.3 | 0.286 | 0.629 | 0.455 | -0.052 | 0.625 | -36.2 | 28.0 | 45.8 | 142.2 | 88.5 | -98.0 | 91.0            | 133.7 | 137.1 | 0.37 | 1.00 | 0.00 | 0.00            | 0.37 | 0.00 | 0.37 | Y  | 1015 |
| 137                                                                                                                                                                | 72.6 | 0.282 | 0.631 | 0.447 | -0.054 | 0     |       |      |      |       |      |       |                 |       |       |      |      |      |                 |      |      |      |    |      |

| rgb <sub>cab</sub> and CIE data of a elementary hci color according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                     |      |       |       |       |        |       |       |       |      |       |     |        |                 |       |    |    |                 |                 |                    |      |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|-------|-------|--------|-------|-------|-------|------|-------|-----|--------|-----------------|-------|----|----|-----------------|-----------------|--------------------|------|------|
| Xyy, cab <sub>AB</sub> , ABC <sub>AB</sub> , LabC <sub>ab</sub> h <sub>ab</sub> data for relative spacing of elementary hue h <sub>ab</sub> of CIELAB for CIE 2 degree observer |      |       |       |       |        |       |       |       |      |       |     |        |                 |       |    |    |                 |                 |                    |      |      |
| Elementary hue circle with 4 different elementary hue angles: h <sub>ab</sub> = 25.6, 92.4, 162.1, 271.5 of CIELAB, and 90 indexed hue angles:                                  |      |       |       |       |        |       |       |       |      |       |     |        |                 |       |    |    |                 |                 |                    |      |      |
| 180, 181, ..., 269, CIELAB data of CIE test colours 9 (R): 40.0 58.9 28.3, 10 (Y): 81.3 -3.0 71.8, 11 (G): 52.2 -42.3 13.6, 12 (B): 30.5 1.2 -46.3                              |      |       |       |       |        |       |       |       |      |       |     |        |                 |       |    |    |                 |                 |                    |      |      |
| no.                                                                                                                                                                             | ab   | Y     | x     | y     | a      | b     | c     | ab    | A    | B     | C   | ab     | h <sub>ab</sub> | L*    | a* | b* | C <sub>ab</sub> | h <sub>ab</sub> | rgb <sub>cab</sub> | Code |      |
| 180                                                                                                                                                                             | 59.2 | 0.168 | 0.394 | 0.416 | -0.423 | 0.534 | -31.6 | 0.7   | 31.6 | 178.6 | 0.1 | -100.9 | 0.5             | 100.9 |    |    | 179.0           | 0.00            | 1.00               | 0.32 | G168 |
| 181                                                                                                                                                                             | 59.1 | 0.168 | 0.397 | 0.422 | -0.436 | 0.528 | -31.2 | 0.8   | 31.2 | 180.0 | 0.1 | -99.4  | 0.0             | 99.4  |    |    | 180.0           | 0.00            | 1.00               | 0.34 | G178 |
| 182                                                                                                                                                                             | 59.1 | 0.167 | 0.391 | 0.427 | -0.449 | 0.522 | -30.9 | -0.8  | 30.9 | 181.5 | 0.1 | -98.0  | -1.7            | 98.0  |    |    | 181.0           | 0.00            | 1.00               | 0.36 | G188 |
| 183                                                                                                                                                                             | 59.1 | 0.167 | 0.386 | 0.433 | -0.462 | 0.517 | -30.5 | -1.6  | 30.5 | 183.0 | 0.1 | -96.5  | -3.4            | 96.6  |    |    | 182.0           | 0.00            | 1.00               | 0.38 | G198 |
| 184                                                                                                                                                                             | 59.0 | 0.167 | 0.38  | 0.439 | -0.476 | 0.512 | -30.1 | -2.4  | 30.2 | 184.5 | 0.1 | -95.0  | -5.0            | 95.2  |    |    | 183.0           | 0.00            | 1.00               | 0.39 | G198 |
| 185                                                                                                                                                                             | 59.0 | 0.166 | 0.374 | 0.445 | -0.489 | 0.507 | -29.8 | -3.2  | 29.9 | 186.1 | 0.1 | -93.6  | -6.7            | 93.8  |    |    | 184.0           | 0.00            | 1.00               | 0.41 | G208 |
| 186                                                                                                                                                                             | 59.0 | 0.166 | 0.368 | 0.451 | -0.503 | 0.503 | -29.4 | -4.0  | 29.7 | 187.7 | 0.1 | -92.1  | -8.3            | 92.5  |    |    | 185.1           | 0.00            | 1.00               | 0.43 | G218 |
| 187                                                                                                                                                                             | 58.9 | 0.166 | 0.363 | 0.457 | -0.517 | 0.495 | -29.0 | -4.8  | 29.4 | 189.3 | 0.1 | -90.6  | -9.9            | 91.2  |    |    | 186.2           | 0.00            | 1.00               | 0.45 | G228 |
| 188                                                                                                                                                                             | 58.9 | 0.166 | 0.358 | 0.463 | -0.531 | 0.486 | -28.7 | -5.6  | 29.2 | 191.0 | 0.1 | -89.2  | -11.1           | 89.9  |    |    | 187.3           | 0.00            | 1.00               | 0.47 | G238 |
| 189                                                                                                                                                                             | 58.9 | 0.165 | 0.352 | 0.469 | -0.545 | 0.493 | -28.3 | -6.4  | 29.0 | 192.8 | 0.1 | -87.7  | -13.0           | 88.7  |    |    | 188.4           | 0.00            | 1.00               | 0.49 | G248 |
| 190                                                                                                                                                                             | 58.9 | 0.165 | 0.347 | 0.475 | -0.559 | 0.49  | -27.9 | -7.3  | 28.8 | 194.6 | 0.1 | -86.3  | -14.5           | 87.5  |    |    | 189.5           | 0.00            | 1.00               | 0.5  | G258 |
| 191                                                                                                                                                                             | 58.8 | 0.165 | 0.343 | 0.481 | -0.573 | 0.488 | -27.5 | -8.1  | 28.7 | 196.3 | 0.1 | -84.9  | -16.0           | 86.4  |    |    | 190.7           | 0.00            | 1.00               | 0.52 | G268 |
| 192                                                                                                                                                                             | 58.8 | 0.165 | 0.338 | 0.487 | -0.587 | 0.487 | -27.2 | -8.9  | 28.6 | 198.1 | 0.1 | -83.5  | -17.5           | 85.3  |    |    | 191.8           | 0.00            | 1.00               | 0.54 | G278 |
| 193                                                                                                                                                                             | 58.8 | 0.164 | 0.333 | 0.493 | -0.6   | 0.485 | -26.8 | -9.7  | 28.5 | 199.8 | 0.1 | -82.2  | -18.9           | 84.3  |    |    | 192.9           | 0.00            | 1.00               | 0.56 | G288 |
| 194                                                                                                                                                                             | 58.7 | 0.164 | 0.328 | 0.5   | -0.616 | 0.485 | -26.4 | -10.6 | 28.4 | 201.8 | 0.1 | -80.6  | -20.5           | 83.2  |    |    | 194.2           | 0.00            | 1.00               | 0.58 | G298 |
| 195                                                                                                                                                                             | 58.6 | 0.164 | 0.323 | 0.507 | -0.631 | 0.484 | -26.0 | -11.5 | 28.4 | 203.8 | 0.1 | -79.0  | -22.1           | 82.0  |    |    | 195.6           | 0.00            | 1.00               | 0.6  | G308 |
| 196                                                                                                                                                                             | 58.6 | 0.164 | 0.318 | 0.513 | -0.646 | 0.483 | -25.6 | -12.3 | 28.4 | 205.8 | 0.1 | -77.5  | -23.5           | 81.0  |    |    | 196.8           | 0.00            | 1.00               | 0.61 | G308 |
| 197                                                                                                                                                                             | 58.5 | 0.163 | 0.315 | 0.52  | -0.66  | 0.485 | -25.2 | -13.1 | 28.4 | 207.6 | 0.1 | -76.1  | -24.9           | 80.1  |    |    | 198.1           | 0.00            | 1.00               | 0.63 | G318 |
| 198                                                                                                                                                                             | 58.5 | 0.163 | 0.311 | 0.525 | -0.673 | 0.486 | -24.8 | -13.9 | 28.4 | 209.2 | 0.1 | -74.8  | -26.1           | 79.2  |    |    | 199.2           | 0.00            | 1.00               | 0.65 | G328 |
| 199                                                                                                                                                                             | 58.4 | 0.163 | 0.308 | 0.531 | -0.685 | 0.488 | -24.4 | -14.6 | 28.5 | 210.8 | 0.1 | -73.6  | -27.3           | 78.5  |    |    | 200.3           | 0.00            | 1.00               | 0.67 | G338 |
| 200                                                                                                                                                                             | 58.3 | 0.163 | 0.304 | 0.536 | -0.697 | 0.489 | -24.1 | -15.2 | 28.5 | 212.3 | 0.1 | -72.4  | -28.3           | 77.8  |    |    | 201.3           | 0.00            | 1.00               | 0.69 | G348 |
| 201                                                                                                                                                                             | 58.3 | 0.163 | 0.302 | 0.541 | -0.707 | 0.491 | -23.8 | -15.8 | 28.6 | 213.6 | 0.1 | -71.4  | -29.3           | 77.1  |    |    | 202.3           | 0.00            | 1.00               | 0.71 | G358 |
| 202                                                                                                                                                                             | 58.3 | 0.163 | 0.299 | 0.546 | -0.716 | 0.492 | -23.5 | -16.3 | 28.7 | 214.8 | 0.1 | -70.4  | -30.1           | 76.6  |    |    | 203.1           | 0.00            | 1.00               | 0.72 | G368 |
| 203                                                                                                                                                                             | 58.2 | 0.163 | 0.297 | 0.551 | -0.725 | 0.493 | -23.2 | -16.8 | 28.7 | 216.0 | 0.1 | -69.5  | -30.9           | 76.1  |    |    | 204.0           | 0.00            | 1.00               | 0.74 | G378 |
| 204                                                                                                                                                                             | 58.2 | 0.163 | 0.295 | 0.554 | -0.732 | 0.495 | -23.0 | -17.2 | 28.8 | 216.8 | 0.1 | -68.7  | -31.6           | 75.6  |    |    | 204.6           | 0.00            | 1.00               | 0.76 | G388 |
| 205                                                                                                                                                                             | 58.2 | 0.163 | 0.293 | 0.557 | -0.738 | 0.496 | -22.8 | -17.6 | 28.9 | 217.6 | 0.1 | -68.0  | -32.1           | 75.2  |    |    | 205.3           | 0.00            | 1.00               | 0.78 | G398 |
| 206                                                                                                                                                                             | 58.6 | 0.164 | 0.292 | 0.563 | -0.741 | 0.493 | -22.6 | -17.9 | 28.9 | 218.3 | 0.1 | -66.9  | -32.5           | 74.3  |    |    | 205.9           | 0.00            | 1.00               | 0.8  | G408 |
| 207                                                                                                                                                                             | 57.5 | 0.162 | 0.289 | 0.562 | -0.756 | 0.503 | -22.3 | -18.4 | 28.9 | 219.6 | 0.1 | -66.6  | -33.6           | 74.6  |    |    | 206.7           | 0.00            | 1.00               | 0.82 | G418 |
| 208                                                                                                                                                                             | 56.2 | 0.16  | 0.286 | 0.561 | -0.773 | 0.515 | -22.1 | -19.0 | 28.9 | 221.0 | 0.1 | -66.3  | -34.8           | 74.9  |    |    | 207.7           | 0.00            | 1.00               | 0.83 | G418 |
| 209                                                                                                                                                                             | 54.9 | 0.158 | 0.282 | 0.56  | -0.792 | 0.528 | -21.4 | -19.6 | 29.0 | 222.5 | 0.1 | -66.0  | -36.2           | 75.3  |    |    | 208.7           | 0.00            | 1.00               | 0.85 | G428 |
| 210                                                                                                                                                                             | 53.5 | 0.155 | 0.278 | 0.559 | -0.813 | 0.543 | -20.9 | -20.2 | 29.0 | 224.0 | 0.1 | -65.6  | -37.6           | 75.6  |    |    | 209.7           | 0.00            | 1.00               | 0.87 | G438 |
| 211                                                                                                                                                                             | 52.0 | 0.153 | 0.274 | 0.558 | -0.835 | 0.55  | -20.4 | -20.8 | 29.1 | 225.6 | 0.1 | -65.2  | -39.0           | 76.0  |    |    | 210.8           | 0.00            | 1.00               | 0.89 | G448 |
| 212                                                                                                                                                                             | 50.7 | 0.15  | 0.269 | 0.557 | -0.858 | 0.569 | -19.9 | -21.4 | 29.2 | 227.1 | 0.1 | -64.8  | -40.4           | 76.4  |    |    | 211.9           | 0.00            | 1.00               | 0.91 | G458 |
| 213                                                                                                                                                                             | 49.3 | 0.148 | 0.265 | 0.557 | -0.881 | 0.594 | -19.4 | -22.0 | 29.3 | 228.5 | 0.1 | -64.4  | -41.8           | 76.8  |    |    | 213.0           | 0.00            | 1.00               | 0.92 | G468 |
| 214                                                                                                                                                                             | 48.2 | 0.146 | 0.262 | 0.558 | -0.902 | 0.609 | -18.9 | -22.5 | 29.4 | 229.9 | 0.1 | -63.7  | -43.0           | 76.9  |    |    | 214.0           | 0.00            | 1.00               | 0.94 | G478 |
| 215                                                                                                                                                                             | 47.2 | 0.144 | 0.258 | 0.559 | -0.921 | 0.623 | -18.4 | -22.9 | 29.4 | 231.2 | 0.1 | -63.0  | -44.2           | 76.9  |    |    | 215.0           | 0.00            | 1.00               | 0.96 | G488 |
| 216                                                                                                                                                                             | 46.2 | 0.143 | 0.255 | 0.561 | -0.94  | 0.637 | -17.9 | -23.3 | 29.4 | 232.3 | 0.1 | -62.1  | -45.2           | 76.9  |    |    | 216.0           | 0.00            | 1.00               | 0.98 | G498 |
| 217                                                                                                                                                                             | 45.4 | 0.142 | 0.252 | 0.564 | -0.958 | 0.65  | -17.5 | -23.7 | 29.5 | 233.5 | 0.1 | -61.3  | -46.2           | 76.7  |    |    | 216.9           | 0.00            | 0.99               | 1.00 | G508 |
| 218                                                                                                                                                                             | 44.5 | 0.141 | 0.249 | 0.566 | -0.976 | 0.662 | -17.0 | -24.0 | 29.5 | 234.6 | 0.1 | -60.4  | -47.1           | 76.6  |    |    | 217.9           | 0.00            | 0.97               | 1.00 | G518 |
| 219                                                                                                                                                                             | 43.7 | 0.14  | 0.246 | 0.569 | -0.993 | 0.675 | -16.6 | -24.4 | 29.5 | 235.6 | 0.1 | -59.5  | -48.0           | 76.5  |    |    | 218.8           | 0.00            | 0.96               | 1.00 | G528 |
| 220                                                                                                                                                                             | 42.9 | 0.139 | 0.243 | 0.572 | -1.012 | 0.689 | -16.2 | -24.7 | 29.6 | 236.7 | 0.1 | -58.6  | -48.9           | 76.4  |    |    | 219.8           | 0.00            | 0.94               | 1.00 | G538 |
| 221                                                                                                                                                                             | 42.1 | 0.138 | 0.24  | 0.575 | -1.031 | 0.703 | -15.8 | -25.1 | 29.6 | 237.6 | 0.1 | -57.7  | -49.9           | 76.3  |    |    | 220.8           | 0.00            | 0.92               | 1.00 | G538 |
| 222                                                                                                                                                                             | 41.3 | 0.137 | 0.237 | 0.578 | -1.05  | 0.718 | -15.3 | -25.4 | 29.7 | 238.8 | 0.1 | -56.7  | -50.8           | 76.2  |    |    | 221.8           | 0.00            | 0.9                | 1.00 | G548 |
| 223                                                                                                                                                                             | 40.6 | 0.136 | 0.234 | 0.582 | -1.07  | 0.734 | -14.9 | -25.8 | 29.8 | 239.9 | 0.1 | -55.7  | -51.7           | 76.0  |    |    | 222.9           | 0.00            | 0.88               | 1.00 | G558 |
| 224                                                                                                                                                                             | 39.8 | 0.135 | 0.231 | 0.586 | -1.091 | 0.75  | -14.4 | -26.1 | 29.8 | 240.9 | 0.1 | -54.6  | -52.7           | 75.9  |    |    | 223.9           | 0.00            | 0.86               | 1.00 | G568 |
| 225                                                                                                                                                                             | 39.3 | 0.135 | 0.229 | 0.589 | -1.105 | 0.761 | -14.2 | -26.3 | 29.9 | 241.6 | 0.1 | -53.9  | -53.3           | 75.8  |    |    | 224.6           | 0.00            | 0.85               | 1.00 | G578 |
| 226                                                                                                                                                                             | 38.7 | 0.134 | 0.227 | 0.591 | -1.12  | 0.773 | -13.9 | -26.5 | 30.0 | 242.3 | 0.1 | -53.2  | -54.0           | 75.8  |    |    | 225.4           | 0.00            | 0.83               | 1.00 | G588 |
| 227                                                                                                                                                                             | 38.0 | 0.134 | 0.225 | 0.59  | -1.136 | 0.786 | -13.5 | -26.8 | 30.0 | 243.3 | 0.1 | -52.4  | -54.7           | 75.7  |    |    | 226.2           | 0.00            | 0.81               | 1.00 | G598 |
| 228                                                                                                                                                                             | 37.6 | 0.133 | 0.222 | 0.599 | -1.154 | 0.8   | -13.2 | -27.0 | 30.1 | 243.9 | 0.1 | -51.4  | -55.4           | 75.6  |    |    | 227.1           | 0.00            | 0.79               | 1.00 | G608 |
| 229                                                                                                                                                                             | 37.0 | 0.133 | 0.22  | 0.603 | -1.174 | 0.816 | -12.8 | -27.3 | 30.2 | 244.8 | 0.1 | -50.3  | -56.2           | 75.5  |    |    | 228.0           | 0.00            | 0.77               | 1.00 | G618 |
| 230                                                                                                                                                                             | 36.3 | 0.132 | 0.217 | 0.609 | -1.197 | 0.834 | -12.3 | -27.6 | 30.2 | 245.6 | 0.1 | -49.0  | -57.1           | 75.3  |    |    | 229.3           | 0.00            | 0.75               | 1.00 | G628 |
| 231                                                                                                                                                                             | 35.5 | 0.131 | 0.213 | 0.616 | -1.222 | 0.855 | -11.8 | -27.9 | 30.3 | 247.0 | 0.1 | -47.5  | -58.1           | 75.1  |    |    | 230.7           | 0.00            | 0.74               | 1.00 | G628 |
| 232                                                                                                                                                                             | 34.9 | 0.131 | 0.211 | 0.622 | -1.244 | 0.873 | -11.4 | -28.2 | 30.4 | 247.9 | 0.1 | -46.3  | -59.0           | 75.0  |    |    | 231.8           | 0.00            | 0.72               | 1.00 | G638 |
| 233                                                                                                                                                                             | 34.4 | 0.131 | 0.209 | 0.626 | -1.259 | 0.885 | -11.1 | -28.4 | 30.5 | 248.5 | 0.1 | -45.4  | -59.5           | 74.9  |    |    | 232.6           | 0.00            | 0.7                | 1.00 | G648 |
| 234                                                                                                                                                                             | 33.6 | 0.13  | 0.207 | 0.631 | -1.275 | 0.898 | -10.8 | -28.6 | 30.6 | 249.1 | 0.1 | -44.5  | -60.1           | 74    |    |    |                 |                 |                    |      |      |

| rgb* <sub>ab</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                     |      |       |       |       |         |       |      |       |      |       |                 |                 |        |       |       |                  |                 |      |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|-------|-------|---------|-------|------|-------|------|-------|-----------------|-----------------|--------|-------|-------|------------------|-----------------|------|--------------------|
| Yxy, cab <sub>AB</sub> , ABC <sub>AB</sub> , LabC* <sub>ab</sub> h <sub>ab</sub> data for relative spacing of elementary hue h <sub>ab</sub> of CIELAB for CIE 2 degree observer |      |       |       |       |         |       |      |       |      |       |                 |                 |        |       |       |                  |                 |      |                    |
| Elementary hue circle with 4 intended elementary hue angles: h <sub>ab</sub> = 25.6, 92.4, 162.1, 271.5 of CIELAB, and 90 intended hue angles:                                   |      |       |       |       |         |       |      |       |      |       |                 |                 |        |       |       |                  |                 |      |                    |
| 270, 271, ..., 360, CIELAB data of CIE test colours 9 (R): 40.0 58.9 28.3, 10 (Y): 81.3 -3.0 71.8, 11 (G): 52.2 -42.3 13.6, 12 (B): 30.5 1.2 -46.3                               |      |       |       |       |         |       |      |       |      |       |                 |                 |        |       |       |                  |                 |      |                    |
| no.                                                                                                                                                                              | ab   | Y     | x     | y     | a       | b     | c    | ab    | A    | B     | C <sub>ab</sub> | h <sub>ab</sub> | L*     | a*    | b*    | C* <sub>ab</sub> | h <sub>ab</sub> | rgb* | Code <sub>ab</sub> |
| 276                                                                                                                                                                              | 19.2 | 0.127 | 0.132 | 0.961 | -2.238  | 1.893 | 0.2  | -34.7 | 34.7 | 270.3 | 51.0            | 1.1             | -83.8  | 83.8  | 270.7 | 0.00             | 0.02            | 1.00 | G98B               |
| 271                                                                                                                                                                              | 18.9 | 0.127 | 0.133 | 0.974 | -2.272  | 1.837 | 0.4  | -34.8 | 34.8 | 270.7 | 50.6            | 2.4             | -84.4  | 84.4  | 271.6 | 0.00             | 0.0             | 1.00 | G98B               |
| 272                                                                                                                                                                              | 18.6 | 0.127 | 0.128 | 0.987 | -2.307  | 1.817 | 0.6  | -34.9 | 34.9 | 271.1 | 50.3            | 3.7             | -84.4  | 85.0  | 272.4 | 0.0              | 0.00            | 1.00 | B00R               |
| 273                                                                                                                                                                              | 18.4 | 0.127 | 0.127 | 1.0   | -2.341  | 1.906 | 0.9  | -35.0 | 35.1 | 271.5 | 49.9            | 4.9             | -85.5  | 85.6  | 273.3 | 0.02             | 0.00            | 1.00 | B01R               |
| 274                                                                                                                                                                              | 18.1 | 0.127 | 0.125 | 1.014 | -2.375  | 1.94  | 1.1  | -35.1 | 35.2 | 271.8 | 49.6            | 6.1             | -86.6  | 86.2  | 274.1 | 0.04             | 0.00            | 1.00 | B02R               |
| 275                                                                                                                                                                              | 17.8 | 0.127 | 0.123 | 1.03  | -2.419  | 1.985 | 1.4  | -35.3 | 35.3 | 272.3 | 49.2            | 7.7             | -86.7  | 87.1  | 275.0 | 0.06             | 0.00            | 1.00 | B03R               |
| 276                                                                                                                                                                              | 17.4 | 0.127 | 0.121 | 1.05  | -2.471  | 2.038 | 1.7  | -35.4 | 35.5 | 272.8 | 48.7            | 9.5             | -87.5  | 88.0  | 276.1 | 0.07             | 0.00            | 1.00 | B05R               |
| 277                                                                                                                                                                              | 17.0 | 0.127 | 0.119 | 1.07  | -2.521  | 2.093 | 2.0  | -35.6 | 35.6 | 273.3 | 48.3            | 11.1            | -88.2  | 88.9  | 277.2 | 0.09             | 0.00            | 1.00 | B08R               |
| 278                                                                                                                                                                              | 16.7 | 0.127 | 0.117 | 1.089 | -2.57   | 2.139 | 2.3  | -35.7 | 35.8 | 273.7 | 47.9            | 12.8            | -89.8  | 89.8  | 278.2 | 0.11             | 0.00            | 1.00 | B10R               |
| 279                                                                                                                                                                              | 16.4 | 0.128 | 0.115 | 1.088 | -2.618  | 2.188 | 2.6  | -35.8 | 35.9 | 274.1 | 47.5            | 14.4            | -89.6  | 90.7  | 279.1 | 0.13             | 0.00            | 1.00 | B06R               |
| 280                                                                                                                                                                              | 16.1 | 0.128 | 0.113 | 1.128 | -2.667  | 2.238 | 2.8  | -35.9 | 36.1 | 274.4 | 47.1            | 16.0            | -90.3  | 91.7  | 280.0 | 0.14             | 0.00            | 1.00 | B07R               |
| 281                                                                                                                                                                              | 15.8 | 0.128 | 0.111 | 1.149 | -2.717  | 2.29  | 3.1  | -36.1 | 36.2 | 274.9 | 46.7            | 17.6            | -90.9  | 92.6  | 280.9 | 0.16             | 0.00            | 1.00 | B08R               |
| 282                                                                                                                                                                              | 15.5 | 0.128 | 0.109 | 1.171 | -2.769  | 2.344 | 3.4  | -36.2 | 36.3 | 275.4 | 46.3            | 19.3            | -91.6  | 93.6  | 281.9 | 0.18             | 0.00            | 1.00 | B09R               |
| 283                                                                                                                                                                              | 15.1 | 0.129 | 0.107 | 1.195 | -2.826  | 2.403 | 3.7  | -36.3 | 36.5 | 275.8 | 45.8            | 21.2            | -92.3  | 94.7  | 282.9 | 0.2              | 0.00            | 1.00 | B10R               |
| 284                                                                                                                                                                              | 14.8 | 0.129 | 0.105 | 1.222 | -2.888  | 2.468 | 4.0  | -36.4 | 36.6 | 276.3 | 45.4            | 23.1            | -93.0  | 95.9  | 283.9 | 0.21             | 0.00            | 1.00 | B18R               |
| 285                                                                                                                                                                              | 14.4 | 0.129 | 0.103 | 1.252 | -2.96   | 2.542 | 4.3  | -36.5 | 36.8 | 276.8 | 44.9            | 25.3            | -93.9  | 97.2  | 285.0 | 0.23             | 0.00            | 1.00 | B11R               |
| 286                                                                                                                                                                              | 14.0 | 0.13  | 0.101 | 1.286 | -3.038  | 2.624 | 4.7  | -36.6 | 37.0 | 277.3 | 44.5            | 27.6            | -94.8  | 98.7  | 286.2 | 0.25             | 0.00            | 1.00 | B12R               |
| 287                                                                                                                                                                              | 13.7 | 0.13  | 0.098 | 1.322 | -3.121  | 2.712 | 5.0  | -36.8 | 37.1 | 277.8 | 43.8            | 29.9            | -95.7  | 100.2 | 287.3 | 0.27             | 0.00            | 1.00 | B13R               |
| 288                                                                                                                                                                              | 13.3 | 0.13  | 0.096 | 1.36  | -3.21   | 2.804 | 5.4  | -36.9 | 37.3 | 278.3 | 43.2            | 32.4            | -96.6  | 101.9 | 288.5 | 0.28             | 0.00            | 1.00 | B14R               |
| 289                                                                                                                                                                              | 12.9 | 0.131 | 0.093 | 1.4   | -3.303  | 2.902 | 5.8  | -37.0 | 37.5 | 278.9 | 42.6            | 34.8            | -97.5  | 103.6 | 289.6 | 0.3              | 0.00            | 1.00 | B15R               |
| 290                                                                                                                                                                              | 12.5 | 0.131 | 0.091 | 1.442 | -3.401  | 3.005 | 6.1  | -37.2 | 37.7 | 279.4 | 42.0            | 37.3            | -98.5  | 105.3 | 290.7 | 0.32             | 0.00            | 1.00 | B16R               |
| 291                                                                                                                                                                              | 12.1 | 0.132 | 0.088 | 1.486 | -3.503  | 3.114 | 6.5  | -37.3 | 37.8 | 279.9 | 41.4            | 39.8            | -99.4  | 107.1 | 291.8 | 0.34             | 0.00            | 1.00 | B17R               |
| 292                                                                                                                                                                              | 11.7 | 0.132 | 0.086 | 1.532 | -3.609  | 3.226 | 6.8  | -37.4 | 38.0 | 280.3 | 40.8            | 42.3            | -100.4 | 108.9 | 292.8 | 0.35             | 0.00            | 1.00 | B18R               |
| 293                                                                                                                                                                              | 11.4 | 0.133 | 0.084 | 1.58  | -3.719  | 3.344 | 7.2  | -37.5 | 38.2 | 280.8 | 40.3            | 44.8            | -101.3 | 110.8 | 293.8 | 0.37             | 0.00            | 1.00 | B19R               |
| 294                                                                                                                                                                              | 11.0 | 0.133 | 0.081 | 1.629 | -3.833  | 3.465 | 7.5  | -37.6 | 38.3 | 281.3 | 39.7            | 47.2            | -102.2 | 112.6 | 294.8 | 0.39             | 0.00            | 1.00 | B19R               |
| 295                                                                                                                                                                              | 10.7 | 0.133 | 0.079 | 1.68  | -3.95   | 3.589 | 7.8  | -37.7 | 38.5 | 281.7 | 39.1            | 49.7            | -103.1 | 114.5 | 295.7 | 0.41             | 0.00            | 1.00 | B20R               |
| 296                                                                                                                                                                              | 10.4 | 0.134 | 0.077 | 1.732 | -4.069  | 3.716 | 8.1  | -37.8 | 38.7 | 282.1 | 38.5            | 52.1            | -104.0 | 116.4 | 296.6 | 0.42             | 0.00            | 1.00 | B21R               |
| 297                                                                                                                                                                              | 10.1 | 0.134 | 0.075 | 1.785 | -4.19   | 3.846 | 8.4  | -37.9 | 38.8 | 282.5 | 38.0            | 54.4            | -104.9 | 118.2 | 297.4 | 0.44             | 0.00            | 1.00 | B22R               |
| 298                                                                                                                                                                              | 9.8  | 0.135 | 0.073 | 1.839 | -4.312  | 3.977 | 8.7  | -38.0 | 39.0 | 282.9 | 37.4            | 56.7            | -105.8 | 120.0 | 298.2 | 0.46             | 0.00            | 1.00 | B23R               |
| 299                                                                                                                                                                              | 9.4  | 0.135 | 0.071 | 1.906 | -4.465  | 4.141 | 9.0  | -38.1 | 39.1 | 283.3 | 36.8            | 59.4            | -106.8 | 122.2 | 299.1 | 0.48             | 0.00            | 1.00 | B24R               |
| 300                                                                                                                                                                              | 8.9  | 0.136 | 0.067 | 2.013 | -4.707  | 4.401 | 9.5  | -38.2 | 39.3 | 283.8 | 35.8            | 63.6            | -108.3 | 125.6 | 300.4 | 0.49             | 0.00            | 1.00 | B24R               |
| 301                                                                                                                                                                              | 8.5  | 0.136 | 0.064 | 2.111 | -4.925  | 4.637 | 9.9  | -38.3 | 39.5 | 284.5 | 35.0            | 67.1            | -109.5 | 128.4 | 301.4 | 0.51             | 0.00            | 1.00 | B25R               |
| 302                                                                                                                                                                              | 8.1  | 0.137 | 0.062 | 2.202 | -5.123  | 4.852 | 10.2 | -38.3 | 39.6 | 284.9 | 34.3            | 70.1            | -110.6 | 131.0 | 302.3 | 0.53             | 0.00            | 1.00 | B26R               |
| 303                                                                                                                                                                              | 7.8  | 0.138 | 0.06  | 2.287 | -5.31   | 5.055 | 10.5 | -38.3 | 39.8 | 285.3 | 33.7            | 72.9            | -111.5 | 133.2 | 303.1 | 0.55             | 0.00            | 1.00 | B27R               |
| 304                                                                                                                                                                              | 7.2  | 0.136 | 0.056 | 2.409 | -5.715  | 5.477 | 10.6 | -38.5 | 39.9 | 285.4 | 32.4            | 75.9            | -113.5 | 136.5 | 303.7 | 0.56             | 0.00            | 1.00 | B28R               |
| 305                                                                                                                                                                              | 6.4  | 0.131 | 0.05  | 2.589 | -6.422  | 6.297 | 10.5 | -38.7 | 40.1 | 285.3 | 30.5            | 79.6            | -116.5 | 141.1 | 304.3 | 0.58             | 0.00            | 1.00 | B29R               |
| 306                                                                                                                                                                              | 6.0  | 0.131 | 0.047 | 2.758 | -6.887  | 6.7   | 10.8 | -38.7 | 40.2 | 285.6 | 29.4            | 83.4            | -118.2 | 144.7 | 305.2 | 0.6              | 0.00            | 1.00 | B30R               |
| 307                                                                                                                                                                              | 6.0  | 0.138 | 0.048 | 2.878 | -6.779  | 6.629 | 11.7 | -38.5 | 40.2 | 286.9 | 29.5            | 87.7            | -117.6 | 146.7 | 306.7 | 0.62             | 0.00            | 1.00 | B31R               |
| 308                                                                                                                                                                              | 6.5  | 0.146 | 0.05  | 2.886 | -6.338  | 6.212 | 12.5 | -38.2 | 40.2 | 288.1 | 30.5            | 90.0            | -115.7 | 146.6 | 307.8 | 0.63             | 0.00            | 1.00 | B31R               |
| 309                                                                                                                                                                              | 6.8  | 0.153 | 0.053 | 2.876 | -6.951  | 5.844 | 13.2 | -38.0 | 40.2 | 289.2 | 31.5            | 91.3            | -114.0 | 146.1 | 308.7 | 0.65             | 0.00            | 1.00 | B32R               |
| 310                                                                                                                                                                              | 7.3  | 0.16  | 0.056 | 2.855 | -7.572  | 5.479 | 14.0 | -37.7 | 40.3 | 290.3 | 32.6            | 92.7            | -112.2 | 145.6 | 309.7 | 0.67             | 0.00            | 1.00 | B33R               |
| 311                                                                                                                                                                              | 7.8  | 0.168 | 0.059 | 2.836 | -8.207  | 5.083 | 14.8 | -37.5 | 40.3 | 291.5 | 33.7            | 94.1            | -110.2 | 145.0 | 310.5 | 0.69             | 0.00            | 1.00 | B34R               |
| 312                                                                                                                                                                              | 8.4  | 0.176 | 0.062 | 2.815 | -8.857  | 4.799 | 15.7 | -37.2 | 40.4 | 292.8 | 34.8            | 95.6            | -108.2 | 144.3 | 311.4 | 0.7              | 0.00            | 1.00 | B35R               |
| 313                                                                                                                                                                              | 9.0  | 0.184 | 0.066 | 2.794 | -9.527  | 4.487 | 16.6 | -36.9 | 40.5 | 294.2 | 36.0            | 97.0            | -106.0 | 143.7 | 312.4 | 0.72             | 0.00            | 1.00 | B36R               |
| 314                                                                                                                                                                              | 9.6  | 0.193 | 0.069 | 2.771 | -10.215 | 4.196 | 17.6 | -36.6 | 40.6 | 295.7 | 37.2            | 98.4            | -103.8 | 143.1 | 313.4 | 0.74             | 0.00            | 1.00 | B37R               |
| 315                                                                                                                                                                              | 10.3 | 0.202 | 0.073 | 2.748 | -10.925 | 3.925 | 18.6 | -36.2 | 40.7 | 297.2 | 38.5            | 99.8            | -101.8 | 142.4 | 314.4 | 0.76             | 0.00            | 1.00 | B38R               |
| 316                                                                                                                                                                              | 11.1 | 0.211 | 0.077 | 2.724 | -11.654 | 3.675 | 19.7 | -35.8 | 40.9 | 298.8 | 39.8            | 101.1           | -99.3  | 141.8 | 315.5 | 0.77             | 0.00            | 1.00 | B38R               |
| 317                                                                                                                                                                              | 11.9 | 0.221 | 0.081 | 2.7   | -12.405 | 3.446 | 20.9 | -35.4 | 41.2 | 300.5 | 41.1            | 102.5           | -97.0  | 141.1 | 316.5 | 0.78             | 0.00            | 1.00 | B39R               |
| 318                                                                                                                                                                              | 12.8 | 0.226 | 0.086 | 2.676 | -13.174 | 3.237 | 22.1 | -35.0 | 41.4 | 302.2 | 42.4            | 103.8           | -94.4  | 140.5 | 317.6 | 0.81             | 0.00            | 1.00 | B40R               |
| 319                                                                                                                                                                              | 13.7 | 0.239 | 0.09  | 2.652 | -13.963 | 3.047 | 23.3 | -34.6 | 41.7 | 303.9 | 43.8            | 105.1           | -92.2  | 139.9 | 318.7 | 0.83             | 0.00            | 1.00 | B41R               |
| 320                                                                                                                                                                              | 14.6 | 0.249 | 0.094 | 2.628 | -14.769 | 2.874 | 24.5 | -34.1 | 42.1 | 305.7 | 45.1            | 106.4           | -89.8  | 139.3 | 319.8 | 0.84             | 0.00            | 1.00 | B42R               |
| 321                                                                                                                                                                              | 15.6 | 0.258 | 0.099 | 2.605 | -15.592 | 2.718 | 25.8 | -33.7 | 42.4 | 307.5 | 46.4            | 107.6           | -87.5  | 138.7 | 320.8 | 0.86             | 0.00            | 1.00 | B43R               |
| 322                                                                                                                                                                              | 16.6 | 0.267 | 0.103 | 2.582 | -16.431 | 2.578 | 27.1 | -33.2 | 42.9 | 309.2 | 47.8            | 108.7           | -85.1  | 138.1 | 321.9 | 0.88             | 0.00            | 1.00 | B44R               |
| 323                                                                                                                                                                              | 17.6 | 0.276 | 0.107 | 2.56  | -17.284 | 2.451 | 28.4 | -32.7 | 43.3 | 311.0 | 49.1            | 109.8           | -82.8  | 137.5 | 322.9 | 0.9              | 0.00            | 1.00 | B45R               |
| 324                                                                                                                                                                              | 18.7 | 0.284 | 0.112 | 2.538 | -18.151 | 2.337 | 29.8 | -32.2 | 43.8 | 312.7 | 50.4            | 110.9           | -80.4  | 137.0 | 324.0 | 0.91             | 0.00            | 1.00 | B45R               |
| 325                                                                                                                                                                              | 19.8 | 0.292 | 0.116 | 2.516 | -18.993 | 2.235 | 31.1 | -31.6 | 44.4 | 314.4 | 51.6            | 111.8           | -78.2  | 136.5 | 325.0 | 0.93             | 0.0             |      |                    |

| Ostwald optimal colours (o) of maximum (m) C <sub>AB</sub> for D65, Y <sub>w,10</sub> =100, Y <sub>m</sub> =520_770, CIELAB data          |                                 |                   |                   |                   |                  |        |         |                 |                                 |                                 |      |  |   | % |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------|-------------------|-------------------|------------------|--------|---------|-----------------|---------------------------------|---------------------------------|------|--|---|---|
| i <sub>1</sub> , λ <sub>1</sub>                                                                                                           | i <sub>2</sub> , λ <sub>2</sub> | L* <sub>100</sub> | a* <sub>100</sub> | b* <sub>100</sub> | C* <sub>ab</sub> | a'     | b'      | h <sub>ab</sub> | i <sub>d</sub> , λ <sub>d</sub> | i <sub>c</sub> , λ <sub>c</sub> | Code |  | % |   |
| 0 405                                                                                                                                     | 31 556                          | 79.94             | −66.31            | −34.08            | 74.56            | 0.1807 | −0.1034 | 207.2           | 15 476                          | 37 585                          | Cm   |  | % |   |
| 6 435                                                                                                                                     | 31 557                          | 80.42             | −82.6             | −17.8             | 84.5             | 0.1724 | −0.0949 | 192.1           | 16 480                          | 44 621                          |      |  | % |   |
| 10 450                                                                                                                                    | 31 559                          | 80.48             | −108.29           | 14.97             | 109.32           | 0.1591 | −0.078  | 172.1           | 18 491                          | −1 491c                         |      |  | % |   |
| 11 460                                                                                                                                    | 32 562                          | 81.44             | −111.37           | 27.39             | 114.69           | 0.1581 | −0.0717 | 166.1           | 19 498                          | −1 498c                         |      |  | % |   |
| 12 465                                                                                                                                    | 33 565                          | 82.34             | −112.77           | 40.26             | 119.75           | 0.1579 | −0.0653 | 160.3           | 21 506                          | −1 506c                         |      |  | % |   |
| 14 470                                                                                                                                    | 34 570                          | 83.48             | −109.79           | 65.41             | 127.8            | 0.1601 | −0.053  | 149.2           | 24 522                          | −1 522c                         |      |  | % |   |
| 15 475                                                                                                                                    | 35 579                          | 86.33             | −94.64            | 81.3              | 124.77           | 0.169  | −0.0462 | 139.3           | 26 533                          | −1 533c                         | Gm   |  | % |   |
| 16 480                                                                                                                                    | 41 606                          | 92.55             | −53.33            | 102.14            | 115.22           | 0.1907 | −0.0389 | 117.5           | 30 550                          | −1 550c                         |      |  | % |   |
| 16 485                                                                                                                                    | −1 484c                         | 96.94             | −20.21            | 109.71            | 111.55           | 0.2063 | −0.0374 | 100.4           | 32 560                          | 10 454                          |      |  | % |   |
| 18 490                                                                                                                                    | −1 490c                         | 95.61             | −14.83            | 124.45            | 125.34           | 0.2086 | −0.0302 | 96.7            | 32 562                          | 11 459                          | max  |  | % |   |
| 19 495                                                                                                                                    | −1 495c                         | 94.76             | −11.22            | 130.34            | 130.82           | 0.2101 | −0.0271 | 94.9            | 32 563                          | 12 461                          |      |  | % |   |
| 19 500                                                                                                                                    | −1 499c                         | 94.76             | −11.22            | 130.34            | 130.82           | 0.2101 | −0.0271 | 94.9            | 32 563                          | 12 461                          |      |  | % |   |
| 22 510                                                                                                                                    | −1 510c                         | 91.28             | 2.92              | 142.55            | 142.58           | 0.2166 | −0.0195 | 88.8            | 33 567                          | 13 466                          |      |  | % |   |
| 23 520                                                                                                                                    | −1 519c                         | 89.77             | 8.54              | 144.07            | 144.32           | 0.2192 | −0.0174 | 86.6            | 33 568                          | 13 468                          | Ym   |  | % |   |
| 26 530                                                                                                                                    | −1 530c                         | 84.06             | 27.32             | 142.33            | 144.93           | 0.2288 | −0.0115 | 79.1            | 34 573                          | 14 472                          |      |  | % |   |
| 27 540                                                                                                                                    | −1 539c                         | 81.79             | 33.86             | 139.63            | 143.68           | 0.2325 | −0.0095 | 76.3            | 35 576                          | 14 473                          |      |  | % |   |
| 28 545                                                                                                                                    | −1 544c                         | 79.35             | 40.37             | 136.19            | 142.05           | 0.2363 | −0.0075 | 73.4            | 35 578                          | 14 474                          |      |  | % |   |
| 29 550                                                                                                                                    | −1 549c                         | 76.75             | 46.79             | 132.12            | 140.16           | 0.2404 | −0.0054 | 70.4            | 36 580                          | 15 475                          |      |  | % |   |
| 31 555                                                                                                                                    | −1 555c                         | 71.13             | 58.79             | 122.64            | 136.0            | 0.2489 | 0.0     | 64.3            | 37 586                          | 15 476                          |      |  | % |   |
| 32 560                                                                                                                                    | 10 451                          | 69.5              | 84.42             | −15.9             | 85.9             | 0.2645 | −0.095  | 349.3           | −1 492c                         | 18 492                          |      |  | % |   |
| 380                                                                                                                                       | 770                             | 100.0             | 0.0               | 0.0               | 0.0              | 0.2152 | −0.0857 | 0.0             |                                 |                                 |      |  | % |   |
| Ostwald optimal colours (o) of maximum (m) C <sub>AB</sub> for D65, Y <sub>w,10</sub> =100, Y <sub>m</sub> =770_520, CIELAB complementary |                                 |                   |                   |                   |                  |        |         |                 |                                 |                                 |      |  |   | % |
| i <sub>1</sub> , λ <sub>1</sub>                                                                                                           | i <sub>2</sub> , λ <sub>2</sub> | L* <sub>100</sub> | a* <sub>100</sub> | b* <sub>100</sub> | C* <sub>ab</sub> | a'     | b'      | h <sub>ab</sub> | i <sub>d</sub> , λ <sub>d</sub> | i <sub>c</sub> , λ <sub>c</sub> | Code |  | % |   |
| 31 556                                                                                                                                    | 0 405                           | 71.84             | 57.81             | 111.35            | 125.47           | 0.2481 | −0.0221 | 62.5            | 37 585                          | 15 476                          | Rm   |  | % |   |
| 31 557                                                                                                                                    | 6 435                           | 71.27             | 68.77             | 29.56             | 74.85            | 0.2546 | −0.0689 | 23.2            | 44 621                          | 16 480                          |      |  | % |   |
| 31 559                                                                                                                                    | 10 450                          | 71.19             | 81.9              | −15.15            | 83.29            | 0.2621 | −0.0944 | 349.5           | −1 491c                         | 18 491                          |      |  | % |   |
| 32 562                                                                                                                                    | 11 460                          | 69.98             | 86.63             | −25.22            | 90.23            | 0.2655 | −0.1003 | 343.7           | −1 498c                         | 19 498                          |      |  | % |   |
| 33 565                                                                                                                                    | 12 465                          | 68.81             | 90.56             | −33.85            | 96.68            | 0.2685 | −0.1056 | 339.5           | −1 506c                         | 21 506                          |      |  | % |   |
| 34 570                                                                                                                                    | 14 470                          | 67.22             | 93.6              | −46.01            | 104.3            | 0.2714 | −0.1132 | 333.8           | −1 522c                         | 24 522                          |      |  | % |   |
| 35 579                                                                                                                                    | 15 475                          | 62.81             | 97.27             | −56.68            | 112.58           | 0.2768 | −0.1215 | 329.7           | −1 533c                         | 26 533                          | Mm   |  | % |   |
| 41 606                                                                                                                                    | 16 480                          | 49.57             | 94.8              | −81.7             | 125.15           | 0.2874 | −0.1477 | 319.2           | −1 550c                         | 30 550                          |      |  | % |   |
| −1 484c                                                                                                                                   | 16 485                          | 33.36             | 73.3              | −109.63           | 131.88           | 0.2894 | −0.1962 | 303.7           | 10 454                          | 32 560                          |      |  | % |   |
| −1 490c                                                                                                                                   | 18 490                          | 39.48             | 47.93             | −101.69           | 112.42           | 0.2584 | −0.1769 | 295.2           | 11 459                          | 32 562                          | min  |  | % |   |
| −1 495c                                                                                                                                   | 19 495                          | 42.69             | 34.2              | −96.93            | 102.79           | 0.2443 | −0.1679 | 289.4           | 12 461                          | 32 563                          |      |  | % |   |
| −1 499c                                                                                                                                   | 19 500                          | 42.69             | 34.2              | −96.93            | 102.79           | 0.2443 | −0.1679 | 289.4           | 12 461                          | 32 563                          |      |  | % |   |
| −1 510c                                                                                                                                   | 22 510                          | 52.84             | −7.33             | −80.67            | 81.0             | 0.2099 | −0.144  | 264.8           | 13 466                          | 33 567                          |      |  | % |   |
| −1 519c                                                                                                                                   | 23 520                          | 56.28             | −19.89            | −74.95            | 77.55            | 0.2014 | −0.1373 | 255.1           | 13 468                          | 33 568                          | Bm   |  | % |   |
| −1 530c                                                                                                                                   | 26 530                          | 66.39             | −49.47            | −57.84            | 76.11            | 0.1852 | −0.1206 | 229.4           | 14 472                          | 34 573                          |      |  | % |   |
| −1 539c                                                                                                                                   | 27 540                          | 69.54             | −55.96            | −52.46            | 76.71            | 0.1825 | −0.1162 | 223.1           | 14 473                          | 35 576                          |      |  | % |   |
| −1 544c                                                                                                                                   | 28 545                          | 72.53             | −60.74            | −47.32            | 77.0             | 0.1809 | −0.1123 | 217.9           | 14 474                          | 35 578                          |      |  | % |   |
| −1 549c                                                                                                                                   | 29 550                          | 75.38             | −63.87            | −42.44            | 76.68            | 0.1803 | −0.1088 | 213.6           | 15 475                          | 36 580                          |      |  | % |   |
| −1 555c                                                                                                                                   | 31 555                          | 80.53             | −65.58            | −33.56            | 73.67            | 0.1813 | −0.103  | 207.1           | 15 476                          | 37 586                          |      |  | % |   |
| 10 451                                                                                                                                    | 32 560                          | 81.82             | −103.91           | 14.76             | 104.95           | 0.1621 | −0.0782 | 171.9           | 18 492                          | −1 492c                         |      |  | % |   |
| 380                                                                                                                                       | 770                             | 100.0             | 0.0               | 0.0               | 0.0              | 0.2152 | −0.0857 | 0.0             |                                 |                                 |      |  | % |   |
| 1-001000-L0                                                                                                                               |                                 |                   |                   |                   |                  |        |         |                 |                                 | VE470-7X                        |      |  |   |   |

| rgb <sub>cab</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                        |                 |                 |                 |                 |                      |                 |                 |                      |                     |                |      |      |                      |                     |                      |                       |      |      |      |      |      |      |      |      |      |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|---------------------|----------------|------|------|----------------------|---------------------|----------------------|-----------------------|------|------|------|------|------|------|------|------|------|------|
| Yxy, abc <sub>AB</sub> , ABC <sub>AB</sub> , LabC <sub>ab</sub> at h <sub>AB</sub> data for relative spacing of elementary hue h <sub>AB</sub> of CIELAB for CIE 10 degree observer |                 |                 |                 |                 |                      |                 |                 |                      |                     |                |      |      |                      |                     |                      |                       |      |      |      |      |      |      |      |      |      |      |
| Elementary hue circle with 4 intended elementary hues 9 angles: h <sub>ab</sub> = 25.9, 87.3, 158.8, 252.1 of CIELAB, and 90 intended hue angles:                                   |                 |                 |                 |                 |                      |                 |                 |                      |                     |                |      |      |                      |                     |                      |                       |      |      |      |      |      |      |      |      |      |      |
| 000, 001, ..., 099, CIELAB data of CIE test colours 9 (R): 39.2 54.5 26.4, 10 (Y): 79.5 3.2 71.0, 11 (G): 52.3 -39.6 15.3, 12 (B): 33.6 -12.8 -39.9                                 |                 |                 |                 |                 |                      |                 |                 |                      |                     |                |      |      |                      |                     |                      |                       |      |      |      |      |      |      |      |      |      |      |
| no. <sub>AB</sub>                                                                                                                                                                   | x <sub>10</sub> | y <sub>10</sub> | a <sub>10</sub> | b <sub>10</sub> | C <sub>AB</sub> 10.9 | A <sub>10</sub> | B <sub>10</sub> | C <sub>AB</sub> 10.8 | hA <sub>AB</sub> 10 | L <sub>Y</sub> | a*   | b*   | C <sub>AB</sub> 10.7 | hA <sub>AB</sub> 10 | rgb <sub>AB</sub> 10 | Code <sub>AB</sub> 10 |      |      |      |      |      |      |      |      |      |      |
| 000                                                                                                                                                                                 | 40.0            | 0.447           | 0.257           | 1.737           | -0.458               | 0.789           | 31.5            | -1.1                 | 31.6                | 357.8          | 69.4 | 82.4 | -3.2                 | 82.4                | 357.7                | 1.00                  | 0.00 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B75R |
| 001                                                                                                                                                                                 | 40.0            | 0.45            | 0.259           | 1.734           | -0.445               | 0.786           | 31.4            | -0.6                 | 31.4                | 358.8          | 69.4 | 82.2 | -1.8                 | 82.2                | 358.7                | 1.00                  | 0.00 | 0.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B76R |
| 002                                                                                                                                                                                 | 40.0            | 0.454           | 0.262           | 1.731           | -0.432               | 0.783           | 31.3            | -0.1                 | 31.3                | 359.7          | 69.5 | 81.9 | -0.3                 | 81.9                | 359.7                | 1.00                  | 0.00 | 0.44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B77R |
| 003                                                                                                                                                                                 | 40.0            | 0.457           | 0.264           | 1.728           | -0.419               | 0.78            | 31.2            | 0.3                  | 31.2                | 0.7            | 69.5 | 81.7 | 1.1                  | 81.7                | 0.7                  | 1.00                  | 0.00 | 0.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B78R |
| 004                                                                                                                                                                                 | 40.0            | 0.461           | 0.267           | 1.725           | -0.406               | 0.778           | 31.1            | 0.9                  | 31.1                | 1.6            | 69.5 | 81.4 | 2.6                  | 81.4                | 1.8                  | 1.00                  | 0.00 | 0.4  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B79R |
| 005                                                                                                                                                                                 | 40.0            | 0.464           | 0.269           | 1.722           | -0.393               | 0.775           | 31.0            | 1.4                  | 31.0                | 2.6            | 69.5 | 81.1 | 4.2                  | 81.3                | 2.9                  | 1.00                  | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B80R |
| 006                                                                                                                                                                                 | 40.0            | 0.468           | 0.272           | 1.719           | -0.38                | 0.773           | 30.9            | 1.9                  | 30.9                | 3.6            | 69.5 | 80.9 | 5.7                  | 81.1                | 4.0                  | 1.00                  | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B81R |
| 007                                                                                                                                                                                 | 40.0            | 0.472           | 0.275           | 1.716           | -0.367               | 0.77            | 30.7            | 2.4                  | 30.8                | 4.5            | 69.5 | 80.6 | 7.4                  | 80.9                | 5.2                  | 1.00                  | 0.00 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B82R |
| 008                                                                                                                                                                                 | 40.0            | 0.475           | 0.277           | 1.713           | -0.354               | 0.768           | 30.6            | 2.9                  | 30.8                | 5.5            | 69.5 | 80.3 | 9.2                  | 80.8                | 6.4                  | 1.00                  | 0.00 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B83R |
| 009                                                                                                                                                                                 | 40.1            | 0.479           | 0.28            | 1.709           | -0.342               | 0.766           | 30.5            | 3.5                  | 30.7                | 6.5            | 69.5 | 80.0 | 10.7                 | 80.7                | 7.6                  | 1.00                  | 0.00 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B84R |
| 010                                                                                                                                                                                 | 40.1            | 0.483           | 0.283           | 1.706           | -0.329               | 0.764           | 30.4            | 4.0                  | 30.6                | 7.5            | 69.5 | 79.7 | 12.4                 | 80.7                | 8.8                  | 1.00                  | 0.00 | 0.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B85R |
| 011                                                                                                                                                                                 | 40.1            | 0.487           | 0.286           | 1.702           | -0.316               | 0.762           | 30.2            | 4.5                  | 30.6                | 8.4            | 69.5 | 79.4 | 14.2                 | 80.7                | 10.1                 | 1.00                  | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B86R |
| 012                                                                                                                                                                                 | 40.1            | 0.491           | 0.289           | 1.699           | -0.304               | 0.761           | 30.1            | 5.0                  | 30.5                | 9.4            | 69.5 | 79.1 | 15.9                 | 80.7                | 11.4                 | 1.00                  | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B87R |
| 013                                                                                                                                                                                 | 40.1            | 0.494           | 0.291           | 1.695           | -0.292               | 0.759           | 30.0            | 5.5                  | 30.5                | 10.4           | 69.5 | 78.8 | 17.7                 | 80.8                | 12.7                 | 1.00                  | 0.00 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B88R |
| 014                                                                                                                                                                                 | 40.1            | 0.498           | 0.294           | 1.691           | -0.279               | 0.758           | 29.8            | 6.0                  | 30.4                | 11.3           | 69.5 | 78.5 | 19.6                 | 80.9                | 14.0                 | 1.00                  | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B88R |
| 015                                                                                                                                                                                 | 40.2            | 0.502           | 0.297           | 1.687           | -0.268               | 0.757           | 29.7            | 6.4                  | 30.4                | 12.2           | 69.6 | 78.2 | 21.4                 | 81.1                | 15.3                 | 1.00                  | 0.00 | 0.2  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B89R |
| 016                                                                                                                                                                                 | 40.2            | 0.506           | 0.299           | 1.683           | -0.256               | 0.755           | 29.5            | 6.9                  | 30.4                | 13.2           | 69.6 | 77.8 | 23.3                 | 81.3                | 16.6                 | 1.00                  | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B90R |
| 017                                                                                                                                                                                 | 40.2            | 0.51            | 0.303           | 1.68            | -0.244               | 0.754           | 29.4            | 7.4                  | 30.3                | 14.1           | 69.6 | 77.5 | 25.2                 | 81.5                | 18.0                 | 1.00                  | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B91R |
| 018                                                                                                                                                                                 | 40.2            | 0.514           | 0.306           | 1.676           | -0.233               | 0.753           | 29.3            | 7.8                  | 30.3                | 15.0           | 69.6 | 77.2 | 27.1                 | 81.8                | 19.3                 | 1.00                  | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B92R |
| 019                                                                                                                                                                                 | 40.2            | 0.517           | 0.309           | 1.672           | -0.222               | 0.752           | 29.1            | 8.3                  | 30.3                | 15.9           | 69.6 | 76.8 | 29.0                 | 82.1                | 20.6                 | 1.00                  | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B93R |
| 020                                                                                                                                                                                 | 40.3            | 0.521           | 0.312           | 1.667           | -0.211               | 0.752           | 29.0            | 8.7                  | 30.3                | 16.8           | 69.6 | 76.5 | 30.9                 | 82.5                | 22.0                 | 1.00                  | 0.00 | 0.1  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B94R |
| 021                                                                                                                                                                                 | 40.3            | 0.525           | 0.315           | 1.663           | -0.201               | 0.751           | 28.8            | 9.1                  | 30.2                | 17.6           | 69.7 | 76.1 | 32.9                 | 82.9                | 23.4                 | 1.00                  | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B95R |
| 022                                                                                                                                                                                 | 40.3            | 0.528           | 0.318           | 1.659           | -0.191               | 0.75            | 28.7            | 9.6                  | 30.2                | 18.5           | 69.7 | 75.8 | 34.9                 | 83.4                | 24.7                 | 1.00                  | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B96R |
| 023                                                                                                                                                                                 | 40.3            | 0.532           | 0.321           | 1.655           | -0.181               | 0.749           | 28.6            | 10.0                 | 30.2                | 19.3           | 69.7 | 75.5 | 36.9                 | 84.0                | 26.0                 | 1.00                  | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B97R |
| 024                                                                                                                                                                                 | 40.4            | 0.536           | 0.324           | 1.651           | -0.171               | 0.748           | 28.4            | 10.4                 | 30.2                | 20.1           | 69.7 | 75.0 | 38.9                 | 84.5                | 27.4                 | 1.00                  | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B98R |
| 025                                                                                                                                                                                 | 40.4            | 0.539           | 0.327           | 1.646           | -0.162               | 0.748           | 28.2            | 10.8                 | 30.2                | 20.9           | 69.7 | 74.7 | 41.0                 | 85.2                | 28.7                 | 1.00                  | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | B99R |
| 026                                                                                                                                                                                 | 40.4            | 0.542           | 0.33            | 1.642           | -0.152               | 0.747           | 28.1            | 11.1                 | 30.2                | 21.7           | 69.8 | 74.3 | 43.0                 | 85.9                | 30.0                 | 1.00                  | 0.00 | 0.0  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R00Y |
| 027                                                                                                                                                                                 | 40.5            | 0.546           | 0.333           | 1.638           | -0.144               | 0.746           | 27.9            | 11.5                 | 30.2                | 22.4           | 69.8 | 73.9 | 45.1                 | 86.6                | 31.3                 | 1.00                  | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R01Y |
| 028                                                                                                                                                                                 | 40.5            | 0.549           | 0.336           | 1.633           | -0.135               | 0.745           | 27.7            | 11.9                 | 30.2                | 23.1           | 69.8 | 73.5 | 47.1                 | 87.4                | 32.6                 | 1.00                  | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R03Y |
| 029                                                                                                                                                                                 | 40.5            | 0.552           | 0.339           | 1.629           | -0.127               | 0.745           | 27.6            | 12.2                 | 30.2                | 23.8           | 69.8 | 73.2 | 49.2                 | 88.2                | 33.9                 | 1.00                  | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R05Y |
| 030                                                                                                                                                                                 | 40.5            | 0.555           | 0.342           | 1.624           | -0.119               | 0.744           | 27.4            | 12.5                 | 30.2                | 24.5           | 69.8 | 72.8 | 51.3                 | 89.1                | 35.1                 | 1.00                  | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R06Y |
| 031                                                                                                                                                                                 | 40.6            | 0.558           | 0.344           | 1.62            | -0.112               | 0.743           | 27.3            | 12.8                 | 30.2                | 25.2           | 69.9 | 72.4 | 53.4                 | 90.0                | 36.4                 | 1.00                  | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R08Y |
| 032                                                                                                                                                                                 | 40.6            | 0.561           | 0.347           | 1.615           | -0.104               | 0.742           | 27.1            | 13.1                 | 30.1                | 25.9           | 69.9 | 72.0 | 55.5                 | 90.9                | 37.6                 | 1.00                  | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R09Y |
| 033                                                                                                                                                                                 | 40.7            | 0.564           | 0.35            | 1.611           | -0.097               | 0.741           | 26.9            | 13.4                 | 30.1                | 26.5           | 69.9 | 71.6 | 57.6                 | 91.9                | 38.8                 | 1.00                  | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R11Y |
| 034                                                                                                                                                                                 | 40.7            | 0.566           | 0.352           | 1.606           | -0.091               | 0.74            | 26.8            | 13.7                 | 30.1                | 27.1           | 69.9 | 71.2 | 59.8                 | 93.0                | 40.0                 | 1.00                  | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R13Y |
| 035                                                                                                                                                                                 | 40.7            | 0.569           | 0.355           | 1.602           | -0.084               | 0.739           | 26.6            | 14.0                 | 30.1                | 27.7           | 70.0 | 70.8 | 61.9                 | 94.1                | 41.1                 | 1.00                  | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R14Y |
| 036                                                                                                                                                                                 | 40.8            | 0.571           | 0.357           | 1.597           | -0.078               | 0.738           | 26.5            | 14.3                 | 30.1                | 28.3           | 70.0 | 70.4 | 64.0                 | 95.2                | 42.2                 | 1.00                  | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R16Y |
| 037                                                                                                                                                                                 | 40.8            | 0.573           | 0.36            | 1.592           | -0.072               | 0.736           | 26.3            | 14.5                 | 30.0                | 28.9           | 70.0 | 70.0 | 66.2                 | 96.3                | 43.3                 | 1.00                  | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R18Y |
| 038                                                                                                                                                                                 | 40.9            | 0.576           | 0.362           | 1.588           | -0.067               | 0.735           | 26.1            | 14.8                 | 30.0                | 29.4           | 70.1 | 69.6 | 68.3                 | 97.5                | 44.4                 | 1.00                  | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R19Y |
| 039                                                                                                                                                                                 | 40.9            | 0.578           | 0.365           | 1.583           | -0.062               | 0.733           | 26.0            | 15.0                 | 30.0                | 30.0           | 70.1 | 69.2 | 70.5                 | 98.5                | 45.5                 | 1.00                  | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R21Y |
| 040                                                                                                                                                                                 | 40.9            | 0.58            | 0.367           | 1.578           | -0.057               | 0.732           | 25.8            | 15.2                 | 30.0                | 30.6           | 70.1 | 68.8 | 72.6                 | 100.0               | 46.6                 | 1.00                  | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R22Y |
| 041                                                                                                                                                                                 | 41.0            | 0.581           | 0.369           | 1.574           | -0.052               | 0.73            | 25.6            | 15.4                 | 29.9                | 31.0           | 70.1 | 68.4 | 74.8                 | 101.3               | 47.5                 | 1.00                  | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R24Y |
| 042                                                                                                                                                                                 | 41.0            | 0.583           | 0.371           | 1.569           | -0.048               | 0.728           | 25.5            | 15.6                 | 29.9                | 31.5           | 70.2 | 67.9 | 76.9                 | 102.6               | 48.5                 | 1.00                  | 0.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R26Y |
| 043                                                                                                                                                                                 | 41.1            | 0.584           | 0.373           | 1.564           | -0.044               | 0.727           | 25.3            | 15.8                 | 29.9                | 31.9           | 70.2 | 67.5 | 79.0                 | 104.0               | 49.4                 | 1.00                  | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | R27Y |
| 044                                                                                                                                                                                 | 41.1            | 0.586           | 0.375           | 1.56            | -0.04                |                 |                 |                      |                     |                |      |      |                      |                     |                      |                       |      |      |      |      |      |      |      |      |      |      |



| rgb <sub>tab</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                                       |                 |                 |                 |                 |                     |                 |                 |                    |                    |                 |                 |                 |                   |                   |                     |                       |      |      |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|---------------------|-----------------|-----------------|--------------------|--------------------|-----------------|-----------------|-----------------|-------------------|-------------------|---------------------|-----------------------|------|------|------|
| Yxy <sub>tab</sub> , abc <sub>AB</sub> , ABC <sub>AB</sub> , LabC <sub>ab</sub> , h <sub>ab</sub> data for relative spacing of elementary hue h <sub>ab</sub> of CIELAB for CIE 10 degree observer |                 |                 |                 |                 |                     |                 |                 |                    |                    |                 |                 |                 |                   |                   |                     |                       |      |      |      |
| Elementary hue circle with 4 intended elementary hue angles: h <sub>ab</sub> = 25.9, 87.3, 158.8, 252.1 of CIELAB, and 39.6 intended hue angles:                                                   |                 |                 |                 |                 |                     |                 |                 |                    |                    |                 |                 |                 |                   |                   |                     |                       |      |      |      |
| 180, 181, ..., 269, CIELAB data of CIE test colours 9 (R): 39.2 54.5 26.4, 10 (Y): 79.5 3.2 71.0, 11 (G): 52.3 -39.6 15.3, 12 (B): 33.6 -12.8 -39.9                                                |                 |                 |                 |                 |                     |                 |                 |                    |                    |                 |                 |                 |                   |                   |                     |                       |      |      |      |
| no. <sub>ab</sub>                                                                                                                                                                                  | x <sub>69</sub> | y <sub>10</sub> | a <sub>10</sub> | b <sub>10</sub> | ca <sub>AB,10</sub> | A <sub>10</sub> | B <sub>10</sub> | Ca <sub>B,10</sub> | h <sub>AB,10</sub> | L <sub>10</sub> | a <sub>10</sub> | b <sub>10</sub> | C <sub>a,10</sub> | h <sub>a,10</sub> | rgb <sub>a,10</sub> | Code <sub>ab,10</sub> |      |      |      |
| 180                                                                                                                                                                                                | 41.9            | 0.557           | 0.353           | 1.577           | -0.1                | 0.71            | 26.4            | 13.8               | 29.8               | 27.5            | 70.8            | 69.2            | 57.5              | 90.0              | 39.7                | 0.00                  | 1.00 | 0.45 | G22B |
| 181                                                                                                                                                                                                | 41.9            | 0.557           | 0.352           | 1.579           | -0.101              | 0.71            | 26.4            | 13.7               | 29.8               | 27.4            | 70.8            | 69.3            | 57.0              | 89.8              | 39.4                | 0.00                  | 1.00 | 0.47 | G23B |
| 182                                                                                                                                                                                                | 41.9            | 0.556           | 0.352           | 1.58            | -0.103              | 0.711           | 26.5            | 13.6               | 29.8               | 27.2            | 70.8            | 69.4            | 56.5              | 89.5              | 39.1                | 0.00                  | 1.00 | 0.49 | G24B |
| 183                                                                                                                                                                                                | 41.9            | 0.555           | 0.351           | 1.581           | -0.105              | 0.711           | 26.5            | 13.5               | 29.8               | 27.0            | 70.8            | 69.5            | 55.9              | 89.3              | 38.8                | 0.00                  | 1.00 | 0.51 | G25B |
| 184                                                                                                                                                                                                | 41.9            | 0.555           | 0.35            | 1.582           | -0.107              | 0.711           | 26.6            | 13.5               | 29.8               | 26.9            | 70.8            | 69.6            | 55.4              | 89.0              | 38.5                | 0.00                  | 1.00 | 0.53 | G26B |
| 185                                                                                                                                                                                                | 41.9            | 0.554           | 0.35            | 1.583           | -0.108              | 0.712           | 26.6            | 13.4               | 29.8               | 26.7            | 70.8            | 69.8            | 54.9              | 88.8              | 38.2                | 0.00                  | 1.00 | 0.56 | G28B |
| 186                                                                                                                                                                                                | 41.8            | 0.553           | 0.349           | 1.588           | -0.11               | 0.712           | 26.6            | 13.3               | 29.8               | 26.5            | 70.7            | 69.9            | 54.4              | 88.6              | 37.9                | 0.00                  | 1.00 | 0.58 | G29B |
| 187                                                                                                                                                                                                | 41.8            | 0.553           | 0.348           | 1.586           | -0.112              | 0.712           | 26.7            | 13.2               | 29.8               | 26.4            | 70.7            | 70.0            | 53.9              | 88.3              | 37.6                | 0.00                  | 1.00 | 0.6  | G30B |
| 188                                                                                                                                                                                                | 41.8            | 0.552           | 0.348           | 1.587           | -0.114              | 0.713           | 26.7            | 13.1               | 29.8               | 26.2            | 70.7            | 70.1            | 53.4              | 88.1              | 37.2                | 0.00                  | 1.00 | 0.62 | G31B |
| 189                                                                                                                                                                                                | 41.8            | 0.547           | 0.347           | 1.588           | -0.115              | 0.713           | 26.8            | 13.0               | 29.8               | 26.0            | 70.7            | 70.2            | 52.8              | 87.9              | 36.9                | 0.00                  | 1.00 | 0.64 | G32B |
| 190                                                                                                                                                                                                | 41.8            | 0.551           | 0.346           | 1.59            | -0.117              | 0.713           | 26.8            | 13.0               | 29.8               | 25.8            | 70.7            | 70.3            | 52.3              | 87.7              | 36.6                | 0.00                  | 1.00 | 0.66 | G33B |
| 191                                                                                                                                                                                                | 41.8            | 0.55            | 0.345           | 1.591           | -0.119              | 0.713           | 26.9            | 12.9               | 29.8               | 25.7            | 70.7            | 70.4            | 51.8              | 87.4              | 36.3                | 0.00                  | 1.00 | 0.68 | G34B |
| 192                                                                                                                                                                                                | 41.8            | 0.549           | 0.345           | 1.592           | -0.121              | 0.714           | 26.9            | 12.8               | 29.8               | 25.5            | 70.7            | 70.5            | 51.3              | 87.2              | 36.0                | 0.00                  | 1.00 | 0.71 | G35B |
| 193                                                                                                                                                                                                | 41.7            | 0.549           | 0.344           | 1.593           | -0.123              | 0.714           | 26.9            | 12.7               | 29.8               | 25.3            | 70.7            | 70.6            | 50.8              | 87.0              | 35.7                | 0.00                  | 1.00 | 0.73 | G36B |
| 194                                                                                                                                                                                                | 41.7            | 0.548           | 0.343           | 1.595           | -0.125              | 0.714           | 27.0            | 12.7               | 29.8               | 25.1            | 70.7            | 70.7            | 50.3              | 86.8              | 35.4                | 0.00                  | 1.00 | 0.75 | G37B |
| 195                                                                                                                                                                                                | 41.7            | 0.547           | 0.343           | 1.596           | -0.127              | 0.715           | 27.0            | 12.6               | 29.8               | 24.9            | 70.7            | 70.8            | 49.8              | 86.6              | 35.0                | 0.00                  | 1.00 | 0.77 | G38B |
| 196                                                                                                                                                                                                | 41.7            | 0.546           | 0.342           | 1.597           | -0.129              | 0.715           | 27.1            | 12.5               | 29.8               | 24.8            | 70.7            | 70.9            | 49.2              | 86.4              | 34.7                | 0.00                  | 1.00 | 0.79 | G39B |
| 197                                                                                                                                                                                                | 41.7            | 0.546           | 0.341           | 1.598           | -0.131              | 0.715           | 27.1            | 12.4               | 29.8               | 24.6            | 70.6            | 71.0            | 48.7              | 86.2              | 34.4                | 0.00                  | 1.00 | 0.81 | G40B |
| 198                                                                                                                                                                                                | 41.7            | 0.545           | 0.34            | 1.599           | -0.133              | 0.715           | 27.2            | 12.3               | 29.8               | 24.4            | 70.6            | 71.1            | 48.2              | 86.0              | 34.1                | 0.00                  | 1.00 | 0.83 | G41B |
| 199                                                                                                                                                                                                | 41.7            | 0.544           | 0.34            | 1.601           | -0.135              | 0.716           | 27.2            | 12.2               | 29.8               | 24.2            | 70.6            | 71.2            | 47.7              | 85.8              | 33.8                | 0.00                  | 1.00 | 0.86 | G43B |
| 200                                                                                                                                                                                                | 41.7            | 0.543           | 0.339           | 1.602           | -0.137              | 0.716           | 27.2            | 12.1               | 29.8               | 24.0            | 70.6            | 71.4            | 47.2              | 85.6              | 33.4                | 0.00                  | 1.00 | 0.88 | G44B |
| 201                                                                                                                                                                                                | 41.6            | 0.543           | 0.338           | 1.603           | -0.139              | 0.716           | 27.3            | 12.0               | 29.8               | 23.8            | 70.6            | 71.5            | 46.7              | 85.4              | 33.1                | 0.00                  | 1.00 | 0.9  | G45B |
| 202                                                                                                                                                                                                | 41.6            | 0.542           | 0.337           | 1.604           | -0.141              | 0.717           | 27.3            | 11.9               | 29.8               | 23.6            | 70.6            | 71.6            | 46.2              | 85.2              | 32.8                | 0.00                  | 1.00 | 0.92 | G46B |
| 203                                                                                                                                                                                                | 41.6            | 0.541           | 0.337           | 1.606           | -0.143              | 0.717           | 27.4            | 11.9               | 29.8               | 23.4            | 70.6            | 71.7            | 45.6              | 85.0              | 32.4                | 0.00                  | 1.00 | 0.94 | G47B |
| 204                                                                                                                                                                                                | 41.6            | 0.54            | 0.336           | 1.607           | -0.145              | 0.717           | 27.4            | 11.8               | 29.8               | 23.2            | 70.6            | 71.8            | 45.1              | 84.8              | 32.1                | 0.00                  | 1.00 | 0.96 | G48B |
| 205                                                                                                                                                                                                | 41.6            | 0.54            | 0.335           | 1.608           | -0.147              | 0.717           | 27.4            | 11.7               | 29.8               | 23.0            | 70.6            | 71.9            | 44.6              | 84.6              | 31.8                | 0.00                  | 1.00 | 0.98 | G49B |
| 206                                                                                                                                                                                                | 41.6            | 0.539           | 0.335           | 1.609           | -0.15               | 0.718           | 27.5            | 11.6               | 29.8               | 22.8            | 70.6            | 72.0            | 44.1              | 84.4              | 31.5                | 0.00                  | 0.98 | 1.00 | G50B |
| 207                                                                                                                                                                                                | 41.6            | 0.538           | 0.334           | 1.61            | -0.152              | 0.718           | 27.5            | 11.5               | 29.8               | 22.6            | 70.6            | 72.1            | 43.6              | 84.3              | 31.1                | 0.00                  | 0.96 | 1.00 | G51B |
| 208                                                                                                                                                                                                | 41.5            | 0.537           | 0.333           | 1.612           | -0.154              | 0.718           | 27.6            | 11.4               | 29.8               | 22.4            | 70.5            | 72.2            | 43.1              | 84.1              | 30.8                | 0.00                  | 0.94 | 1.00 | G52B |
| 209                                                                                                                                                                                                | 41.5            | 0.536           | 0.332           | 1.613           | -0.156              | 0.719           | 27.6            | 11.3               | 29.9               | 22.2            | 70.5            | 72.3            | 42.6              | 83.9              | 30.4                | 0.00                  | 0.92 | 1.00 | G53B |
| 210                                                                                                                                                                                                | 41.5            | 0.536           | 0.332           | 1.614           | -0.158              | 0.719           | 27.7            | 11.2               | 29.9               | 22.0            | 70.5            | 72.4            | 42.1              | 83.8              | 30.1                | 0.00                  | 0.9  | 1.00 | G54B |
| 211                                                                                                                                                                                                | 41.5            | 0.535           | 0.331           | 1.615           | -0.161              | 0.719           | 27.7            | 11.1               | 29.9               | 21.8            | 70.5            | 72.5            | 41.5              | 83.6              | 29.8                | 0.00                  | 0.88 | 1.00 | G55B |
| 212                                                                                                                                                                                                | 41.5            | 0.534           | 0.33            | 1.617           | -0.163              | 0.719           | 27.7            | 11.0               | 29.9               | 21.6            | 70.5            | 72.6            | 41.0              | 83.4              | 29.4                | 0.00                  | 0.86 | 1.00 | G56B |
| 213                                                                                                                                                                                                | 41.5            | 0.533           | 0.329           | 1.618           | -0.165              | 0.72            | 27.8            | 10.9               | 29.9               | 21.4            | 70.5            | 72.7            | 40.5              | 83.3              | 29.1                | 0.00                  | 0.83 | 1.00 | G58B |
| 214                                                                                                                                                                                                | 41.5            | 0.532           | 0.328           | 1.619           | -0.168              | 0.72            | 27.8            | 10.8               | 29.9               | 21.2            | 70.5            | 72.8            | 40.0              | 83.1              | 28.7                | 0.00                  | 0.81 | 1.00 | G59B |
| 215                                                                                                                                                                                                | 41.5            | 0.531           | 0.328           | 1.62            | -0.17               | 0.72            | 27.9            | 10.7               | 29.9               | 21.0            | 70.5            | 72.9            | 39.5              | 83.0              | 28.4                | 0.00                  | 0.79 | 1.00 | G60B |
| 216                                                                                                                                                                                                | 41.4            | 0.531           | 0.327           | 1.622           | -0.172              | 0.721           | 27.9            | 10.6               | 29.9               | 20.8            | 70.5            | 73.0            | 39.0              | 82.8              | 28.1                | 0.00                  | 0.77 | 1.00 | G61B |
| 217                                                                                                                                                                                                | 41.4            | 0.53            | 0.326           | 1.623           | -0.175              | 0.721           | 28.0            | 10.5               | 29.9               | 20.6            | 70.5            | 73.2            | 38.5              | 82.7              | 27.7                | 0.00                  | 0.75 | 1.00 | G62B |
| 218                                                                                                                                                                                                | 41.4            | 0.529           | 0.325           | 1.624           | -0.177              | 0.721           | 28.0            | 10.4               | 29.9               | 20.4            | 70.5            | 73.3            | 38.0              | 82.5              | 27.4                | 0.00                  | 0.73 | 1.00 | G63B |
| 219                                                                                                                                                                                                | 41.4            | 0.528           | 0.325           | 1.625           | -0.179              | 0.722           | 28.0            | 10.3               | 29.9               | 20.2            | 70.4            | 73.4            | 37.5              | 82.4              | 27.0                | 0.00                  | 0.71 | 1.00 | G64B |
| 220                                                                                                                                                                                                | 41.4            | 0.527           | 0.324           | 1.626           | -0.181              | 0.722           | 28.1            | 10.2               | 29.9               | 20.0            | 70.4            | 73.5            | 37.0              | 82.2              | 26.7                | 0.00                  | 0.69 | 1.00 | G65B |
| 221                                                                                                                                                                                                | 41.4            | 0.526           | 0.323           | 1.628           | -0.184              | 0.722           | 28.1            | 10.1               | 29.9               | 19.7            | 70.4            | 73.6            | 36.5              | 82.1              | 26.3                | 0.00                  | 0.66 | 1.00 | G66B |
| 222                                                                                                                                                                                                | 41.4            | 0.525           | 0.322           | 1.629           | -0.187              | 0.723           | 28.2            | 10.0               | 29.9               | 19.5            | 70.4            | 73.7            | 36.0              | 82.0              | 26.0                | 0.00                  | 0.64 | 1.00 | G67B |
| 223                                                                                                                                                                                                | 41.4            | 0.525           | 0.322           | 1.63            | -0.189              | 0.723           | 28.2            | 9.9                | 29.9               | 19.3            | 70.4            | 73.8            | 35.4              | 81.9              | 25.6                | 0.00                  | 0.62 | 1.00 | G68B |
| 224                                                                                                                                                                                                | 41.3            | 0.524           | 0.321           | 1.631           | -0.192              | 0.723           | 28.2            | 9.8                | 29.9               | 19.1            | 70.4            | 73.9            | 34.9              | 81.7              | 25.3                | 0.00                  | 0.6  | 1.00 | G69B |
| 225                                                                                                                                                                                                | 41.3            | 0.523           | 0.32            | 1.633           | -0.194              | 0.724           | 28.3            | 9.6                | 29.9               | 18.8            | 70.4            | 74.0            | 34.4              | 81.6              | 24.9                | 0.00                  | 0.58 | 1.00 | G70B |
| 226                                                                                                                                                                                                | 41.3            | 0.522           | 0.319           | 1.634           | -0.197              | 0.724           | 28.3            | 9.5                | 29.9               | 18.6            | 70.4            | 74.1            | 33.9              | 81.5              | 24.6                | 0.00                  | 0.56 | 1.00 | G71B |
| 227                                                                                                                                                                                                | 41.3            | 0.521           | 0.318           | 1.635           | -0.2                | 0.724           | 28.4            | 9.4                | 29.9               | 18.4            | 70.4            | 74.2            | 33.4              | 81.4              | 24.2                | 0.00                  | 0.53 | 1.00 | G73B |
| 228                                                                                                                                                                                                | 41.3            | 0.52            | 0.318           | 1.636           | -0.202              | 0.725           | 28.4            | 9.3                | 29.9               | 18.2            | 70.4            | 74.3            | 32.9              | 81.3              | 23.9                | 0.00                  | 0.51 | 1.00 | G74B |
| 229                                                                                                                                                                                                | 41.3            | 0.519           | 0.317           | 1.637           | -0.205              | 0.725           | 28.5            | 9.2                | 29.9               | 17.9            | 70.4            | 74.4            | 32.4              | 81.2              | 23.5                | 0.00                  | 0.49 | 1.00 | G75B |
| 230                                                                                                                                                                                                | 41.3            | 0.518           | 0.316           | 1.639           | -0.207              | 0.725           | 28.5            | 9.1                | 29.9               | 17.7            | 70.3            | 74.5            | 31.9              | 81.1              | 23.2                | 0.00                  | 0.47 | 1.00 | G76B |
| 231                                                                                                                                                                                                | 41.2            | 0.518           | 0.315           | 1.64            | -0.21               | 0.726           | 28.5            | 9.0                | 29.9               | 17.5            | 70.3            | 74.6            | 31.4              | 81.0              | 22.8                | 0.00                  | 0.45 | 1.00 | G77B |
| 232                                                                                                                                                                                                | 41.2            | 0.517           | 0.315           | 1.641           | -0.213              | 0.726           | 28.6            | 8.9                | 29.9               | 17.3            | 70.3            | 74.7            | 30.9              | 80.9              | 22.5                | 0.00                  | 0.43 | 1.00 | G78B |
| 233                                                                                                                                                                                                | 41.2            | 0.517           | 0.314           | 1.642           | -0.215              | 0.726           | 28.6            | 8.8                | 29.9               | 17.1            | 70.3            | 74.8            | 30.4              | 80.8              | 22.2                | 0.00                  | 0.41 | 1.00 | G79B |
| 234                                                                                                                                                                                                | 41.2            | 0.515           | 0.313           | 1.643           | -0.218              | 0.727           | 28.7            | 8.6                | 29.9               | 16.8            | 70.3            | 74.9            | 30.0              | 80.7              | 21.8                | 0.00                  | 0.38 | 1.00 | G80B |
| 235                                                                                                                                                                                                | 41.2            | 0.514           | 0.312           | 1.645           | -0.221              | 0.727           | 28.7            | 8.5                | 30.0               | 16.6            | 70.3            | 75.0            | 29.5              | 80.6              | 21.4                | 0.00                  | 0.36 | 1.00 | G81B |
| 236                                                                                                                                                                                                | 41.2            | 0.513           | 0.311           | 1.646           | -0.224              | 0.727           | 28.7            | 8.4                | 30.0               | 16.3            | 70.3            | 75.1            | 29.0              | 80.5              | 21.1                | 0.00                  | 0.34 | 1.00 | G82B |
| 237                                                                                                                                                                                                | 41.2            | 0.512           | 0.311           | 1.647           | -0.226              | 0.728           | 28.8            | 8.3                | 30.0               | 16.1            | 70.3            | 75.2            | 28.5              | 80.4              | 20.7                | 0.00                  | 0.32 | 1.00 | G83B |
| 238                                                                                                                                                                                                | 41.2            | 0.511           | 0.31            | 1.648           | -0.229              | 0.728           | 28.8            | 8.2                | 30.0               | 1               |                 |                 |                   |                   |                     |                       |      |      |      |

| rgb <sub>cab</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours for CIE illuminant D65                                                     |    |                 |                 |                 |                 |                      |                 |                 |                      |                    |                 |                              |                              |                                    |                    |                                   |                       |      |      |      |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------------|-----------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|--------------------|-----------------|------------------------------|------------------------------|------------------------------------|--------------------|-----------------------------------|-----------------------|------|------|------|------|
| Yxy, abc <sub>AB</sub> , ABC <sub>AB</sub> , LabC <sub>ab</sub> h <sub>ab</sub> data for relative spacing of elementary hue h <sub>ab</sub> of CIELAB for CIE 10 degree observer |    |                 |                 |                 |                 |                      |                 |                 |                      |                    |                 |                              |                              |                                    |                    |                                   |                       |      |      |      |      |
| Elementary hue circle with 4 intended elementary hues (angles): h <sub>ab</sub> = 25.9, 87.3, 158.8, 252.1 of CIELAB and 39.6 intended hue angles:                               |    |                 |                 |                 |                 |                      |                 |                 |                      |                    |                 |                              |                              |                                    |                    |                                   |                       |      |      |      |      |
| 270, 271, ..., 360, CIELAB data of CIE test colours 9 (R): 39.2 54.5 26.4, 10 (Y): 79.5 3.2 71.0, 11 (G): 52.3 39.6 15.3, 12 (B): 33.6 12.8 39.9                                 |    |                 |                 |                 |                 |                      |                 |                 |                      |                    |                 |                              |                              |                                    |                    |                                   |                       |      |      |      |      |
| no.                                                                                                                                                                              | ab | X <sub>10</sub> | Y <sub>10</sub> | q <sub>10</sub> | b <sub>10</sub> | C <sub>ab</sub> 10.9 | A <sub>10</sub> | B <sub>10</sub> | C <sub>ab</sub> 10.6 | hA <sub>10.6</sub> | L <sub>10</sub> | a <sup>*</sup> <sub>10</sub> | b <sup>*</sup> <sub>10</sub> | C <sup>*</sup> <sub>ab</sub> 10.10 | h <sub>ab</sub> 10 | rgb <sup>*</sup> <sub>ab</sub> 10 | Code <sub>ab</sub> 10 |      |      |      |      |
| 270                                                                                                                                                                              | ab | 0.8             | 0.481           | 0.285           | 1.686           | -0.326               | 0.745           | 30.1            | 4.1                  | 30.4               | 7.9             | 70.0                         | 78.4                         | 12.9                               | 79.5               | 9.3                               | 0.26                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 271                                                                                                                                                                              | ab | 0.8             | 0.48            | 0.284           | 1.687           | -0.329               | 0.745           | 30.1            | 4.0                  | 30.4               | 7.6             | 70.0                         | 78.5                         | 12.4                               | 79.5               | 9.0                               | 0.28                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 272                                                                                                                                                                              | ab | 0.7             | 0.479           | 0.283           | 1.688           | -0.333               | 0.746           | 30.2            | 3.9                  | 30.4               | 7.4             | 70.0                         | 78.6                         | 12.0                               | 79.5               | 8.6                               | 0.29                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 273                                                                                                                                                                              | ab | 0.7             | 0.478           | 0.283           | 1.689           | -0.336               | 0.747           | 30.2            | 3.7                  | 30.4               | 7.1             | 70.0                         | 78.7                         | 11.5                               | 79.5               | 8.3                               | 0.31                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 274                                                                                                                                                                              | ab | 0.7             | 0.477           | 0.282           | 1.69            | -0.339               | 0.747           | 30.2            | 3.6                  | 30.4               | 6.8             | 70.0                         | 78.8                         | 11.1                               | 79.6               | 8.0                               | 0.32                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 275                                                                                                                                                                              | ab | 0.7             | 0.476           | 0.281           | 1.691           | -0.342               | 0.748           | 30.3            | 3.5                  | 30.5               | 6.6             | 70.0                         | 78.9                         | 10.6                               | 79.6               | 7.7                               | 0.34                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 276                                                                                                                                                                              | ab | 0.7             | 0.475           | 0.281           | 1.692           | -0.346               | 0.749           | 30.3            | 3.3                  | 30.5               | 6.3             | 70.0                         | 79.0                         | 10.2                               | 79.6               | 7.3                               | 0.35                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 277                                                                                                                                                                              | ab | 0.7             | 0.474           | 0.281           | 1.693           | -0.349               | 0.75            | 30.3            | 3.2                  | 30.5               | 6.1             | 69.9                         | 79.1                         | 9.8                                | 79.7               | 7.0                               | 0.37                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 278                                                                                                                                                                              | ab | 0.7             | 0.473           | 0.279           | 1.695           | -0.352               | 0.751           | 30.4            | 3.1                  | 30.5               | 5.8             | 69.9                         | 79.1                         | 9.3                                | 79.7               | 6.7                               | 0.38                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 279                                                                                                                                                                              | ab | 0.7             | 0.472           | 0.278           | 1.696           | -0.356               | 0.751           | 30.4            | 2.9                  | 30.6               | 5.5             | 69.9                         | 79.2                         | 8.9                                | 79.7               | 6.4                               | 0.4                   | 0.00 | 1.00 | 0.00 | 0.00 |
| 280                                                                                                                                                                              | ab | 0.7             | 0.471           | 0.278           | 1.697           | -0.359               | 0.752           | 30.4            | 2.8                  | 30.6               | 5.3             | 69.9                         | 79.3                         | 8.5                                | 79.8               | 6.1                               | 0.41                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 281                                                                                                                                                                              | ab | 0.6             | 0.471           | 0.277           | 1.698           | -0.362               | 0.753           | 30.5            | 2.7                  | 30.6               | 5.0             | 69.9                         | 79.4                         | 8.0                                | 79.8               | 5.8                               | 0.43                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 282                                                                                                                                                                              | ab | 0.6             | 0.47            | 0.276           | 1.699           | -0.366               | 0.753           | 30.5            | 2.5                  | 30.6               | 4.8             | 69.9                         | 79.5                         | 7.6                                | 79.9               | 5.4                               | 0.44                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 283                                                                                                                                                                              | ab | 0.6             | 0.469           | 0.275           | 1.7             | -0.369               | 0.754           | 30.5            | 2.4                  | 30.6               | 4.5             | 69.9                         | 79.6                         | 7.2                                | 79.9               | 5.1                               | 0.46                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 284                                                                                                                                                                              | ab | 0.6             | 0.468           | 0.275           | 1.701           | -0.372               | 0.755           | 30.6            | 2.2                  | 30.7               | 4.2             | 69.9                         | 79.7                         | 6.7                                | 80.0               | 4.8                               | 0.47                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 285                                                                                                                                                                              | ab | 0.6             | 0.467           | 0.274           | 1.702           | -0.376               | 0.756           | 30.6            | 2.1                  | 30.7               | 4.0             | 69.9                         | 79.8                         | 6.3                                | 80.0               | 4.5                               | 0.49                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 286                                                                                                                                                                              | ab | 0.6             | 0.466           | 0.273           | 1.703           | -0.379               | 0.757           | 30.7            | 2.0                  | 30.7               | 3.7             | 69.9                         | 79.9                         | 5.9                                | 80.1               | 4.2                               | 0.5                   | 0.00 | 1.00 | 0.00 | 0.00 |
| 287                                                                                                                                                                              | ab | 0.6             | 0.465           | 0.273           | 1.704           | -0.382               | 0.758           | 30.7            | 1.8                  | 30.7               | 3.5             | 69.9                         | 79.9                         | 5.5                                | 80.1               | 3.9                               | 0.52                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 288                                                                                                                                                                              | ab | 0.6             | 0.464           | 0.272           | 1.705           | -0.386               | 0.758           | 30.7            | 1.7                  | 30.8               | 3.2             | 69.9                         | 80.0                         | 5.1                                | 80.2               | 3.6                               | 0.53                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 289                                                                                                                                                                              | ab | 0.6             | 0.463           | 0.271           | 1.706           | -0.389               | 0.759           | 30.8            | 1.6                  | 30.8               | 2.9             | 69.9                         | 80.1                         | 4.7                                | 80.2               | 3.3                               | 0.55                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 290                                                                                                                                                                              | ab | 0.5             | 0.462           | 0.27            | 1.707           | -0.393               | 0.76            | 30.8            | 1.4                  | 30.8               | 2.7             | 69.9                         | 80.2                         | 4.2                                | 80.3               | 3.0                               | 0.56                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 291                                                                                                                                                                              | ab | 0.5             | 0.461           | 0.27            | 1.708           | -0.396               | 0.761           | 30.8            | 1.3                  | 30.9               | 2.4             | 69.8                         | 80.3                         | 3.8                                | 80.4               | 2.7                               | 0.58                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 292                                                                                                                                                                              | ab | 0.5             | 0.46            | 0.269           | 1.709           | -0.399               | 0.762           | 30.9            | 1.1                  | 30.9               | 2.2             | 69.8                         | 80.4                         | 3.4                                | 80.4               | 2.4                               | 0.59                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 293                                                                                                                                                                              | ab | 0.5             | 0.458           | 0.268           | 1.71            | -0.403               | 0.763           | 30.9            | 1.0                  | 30.9               | 1.9             | 69.8                         | 80.4                         | 3.0                                | 80.5               | 2.1                               | 0.61                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 294                                                                                                                                                                              | ab | 0.5             | 0.459           | 0.268           | 1.712           | -0.406               | 0.764           | 30.9            | 0.9                  | 30.9               | 1.7             | 69.8                         | 80.5                         | 2.6                                | 80.6               | 1.8                               | 0.62                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 295                                                                                                                                                                              | ab | 0.5             | 0.458           | 0.267           | 1.713           | -0.41                | 0.765           | 31.0            | 0.7                  | 31.0               | 1.4             | 69.8                         | 80.6                         | 2.2                                | 80.6               | 1.5                               | 0.64                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 296                                                                                                                                                                              | ab | 0.5             | 0.457           | 0.266           | 1.714           | -0.413               | 0.766           | 31.0            | 0.6                  | 31.0               | 1.1             | 69.8                         | 80.7                         | 1.8                                | 80.7               | 1.3                               | 0.65                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 297                                                                                                                                                                              | ab | 0.5             | 0.456           | 0.266           | 1.715           | -0.416               | 0.767           | 31.0            | 0.5                  | 31.0               | 0.9             | 69.8                         | 80.8                         | 1.4                                | 80.8               | 1.0                               | 0.67                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 298                                                                                                                                                                              | ab | 0.5             | 0.455           | 0.265           | 1.716           | -0.42                | 0.768           | 31.1            | 0.3                  | 31.1               | 0.6             | 69.8                         | 80.9                         | 1.0                                | 80.9               | 0.7                               | 0.68                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 299                                                                                                                                                                              | ab | 0.5             | 0.454           | 0.264           | 1.717           | -0.423               | 0.769           | 31.1            | 0.2                  | 31.1               | 0.4             | 69.8                         | 80.9                         | 0.6                                | 80.9               | 0.4                               | 0.7                   | 0.00 | 1.00 | 0.00 | 0.00 |
| 300                                                                                                                                                                              | ab | 0.4             | 0.453           | 0.264           | 1.718           | -0.427               | 0.77            | 31.1            | 0.0                  | 31.1               | 0.1             | 69.8                         | 81.0                         | 0.2                                | 81.0               | 0.1                               | 0.71                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 301                                                                                                                                                                              | ab | 0.4             | 0.452           | 0.263           | 1.719           | -0.43                | 0.771           | 31.2            | 0.0                  | 31.2               | 0.0             | 69.9                         | 81.1                         | -0.1                               | 81.1               | 0.0                               | 0.73                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 302                                                                                                                                                                              | ab | 0.4             | 0.452           | 0.262           | 1.72            | -0.433               | 0.772           | 31.2            | -0.1                 | 31.2               | 0.0             | 69.9                         | 81.2                         | -0.5                               | 81.2               | 0.0                               | 0.75                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 303                                                                                                                                                                              | ab | 0.4             | 0.451           | 0.262           | 1.721           | -0.437               | 0.773           | 31.2            | -0.3                 | 31.2               | 0.0             | 69.9                         | 81.3                         | -0.8                               | 81.3               | 0.0                               | 0.78                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 304                                                                                                                                                                              | ab | 0.4             | 0.45            | 0.261           | 1.722           | -0.44                | 0.774           | 31.3            | -0.4                 | 31.3               | 0.0             | 69.9                         | 81.3                         | -1.2                               | 81.3               | 0.0                               | 0.77                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 305                                                                                                                                                                              | ab | 0.4             | 0.449           | 0.26            | 1.723           | -0.443               | 0.775           | 31.3            | -0.5                 | 31.3               | 0.0             | 69.9                         | 81.4                         | -1.6                               | 81.4               | 0.0                               | 0.79                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 306                                                                                                                                                                              | ab | 0.4             | 0.448           | 0.26            | 1.723           | -0.447               | 0.776           | 31.3            | -0.7                 | 31.3               | 0.0             | 69.9                         | 81.5                         | -2.0                               | 81.5               | 0.0                               | 0.8                   | 0.00 | 1.00 | 0.00 | 0.00 |
| 307                                                                                                                                                                              | ab | 0.4             | 0.447           | 0.259           | 1.724           | -0.45                | 0.777           | 31.4            | -0.8                 | 31.4               | 0.0             | 69.9                         | 81.6                         | -2.4                               | 81.6               | 0.0                               | 0.83                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 308                                                                                                                                                                              | ab | 0.4             | 0.446           | 0.258           | 1.725           | -0.454               | 0.778           | 31.4            | -1.0                 | 31.4               | 0.0             | 69.9                         | 81.6                         | -2.7                               | 81.7               | 0.0                               | 0.83                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 309                                                                                                                                                                              | ab | 0.4             | 0.446           | 0.258           | 1.726           | -0.457               | 0.779           | 31.4            | -1.1                 | 31.4               | 0.0             | 69.9                         | 81.7                         | -3.1                               | 81.8               | 0.0                               | 0.85                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 310                                                                                                                                                                              | ab | 0.3             | 0.445           | 0.257           | 1.727           | -0.46                | 0.78            | 31.4            | -1.2                 | 31.5               | 0.0             | 69.9                         | 81.8                         | -3.5                               | 81.9               | 0.0                               | 0.87                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 311                                                                                                                                                                              | ab | 0.3             | 0.444           | 0.257           | 1.728           | -0.464               | 0.781           | 31.5            | -1.4                 | 31.5               | 0.0             | 69.9                         | 81.9                         | -3.8                               | 82.0               | 0.0                               | 0.88                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 312                                                                                                                                                                              | ab | 0.3             | 0.443           | 0.256           | 1.729           | -0.467               | 0.782           | 31.5            | -1.5                 | 31.5               | 0.0             | 69.9                         | 82.0                         | -4.2                               | 82.1               | 0.0                               | 0.89                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 313                                                                                                                                                                              | ab | 0.3             | 0.442           | 0.255           | 1.73            | -0.47                | 0.783           | 31.5            | -1.6                 | 31.6               | 0.0             | 69.9                         | 82.1                         | -4.6                               | 82.2               | 0.0                               | 0.91                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 314                                                                                                                                                                              | ab | 0.3             | 0.442           | 0.255           | 1.731           | -0.474               | 0.784           | 31.6            | -1.8                 | 31.6               | 0.0             | 69.9                         | 82.2                         | -4.9                               | 82.3               | 0.0                               | 0.92                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 315                                                                                                                                                                              | ab | 0.3             | 0.441           | 0.254           | 1.732           | -0.477               | 0.785           | 31.6            | -1.9                 | 31.7               | 0.0             | 69.9                         | 82.2                         | -5.3                               | 82.3               | 0.0                               | 0.94                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 316                                                                                                                                                                              | ab | 0.3             | 0.44            | 0.254           | 1.733           | -0.48                | 0.787           | 31.6            | -2.0                 | 31.7               | 0.0             | 69.9                         | 82.2                         | -5.6                               | 82.4               | 0.0                               | 0.95                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 317                                                                                                                                                                              | ab | 0.3             | 0.439           | 0.253           | 1.734           | -0.484               | 0.788           | 31.7            | -2.2                 | 31.7               | 0.0             | 69.9                         | 82.3                         | -6.0                               | 82.5               | 0.0                               | 0.96                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 318                                                                                                                                                                              | ab | 0.3             | 0.438           | 0.252           | 1.735           | -0.487               | 0.789           | 31.7            | -2.3                 | 31.8               | 0.0             | 69.9                         | 82.3                         | -6.4                               | 82.5               | 0.0                               | 0.98                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 319                                                                                                                                                                              | ab | 0.3             | 0.438           | 0.252           | 1.736           | -0.49                | 0.79            | 31.7            | -2.4                 | 31.8               | 0.0             | 69.9                         | 82.5                         | -6.7                               | 82.7               | 0.0                               | 0.99                  | 0.00 | 1.00 | 0.00 | 0.00 |
| 320                                                                                                                                                                              | ab | 0.2             | 0.437           | 0.251           | 1.737           | -0.494               | 0.791           | 31.7            | -2.6                 | 31.8               | 0.0             | 69.9                         | 82.5                         | -7.0                               | 82.8               | 0.0                               | 1.0                   | 0.00 | 0.98 | 0.00 | 0.00 |
| 321                                                                                                                                                                              | ab | 0.2             | 0.436           | 0.251           | 1.737           | -0.497               | 0.792           | 31.8            | -2.7                 | 31.9               | 0.0             | 69.9                         | 82.6                         | -7.4                               | 82.9               | 0.0                               | 1.0                   | 0.00 | 0.97 | 0.00 | 0.00 |
| 322                                                                                                                                                                              | ab | 0.2             | 0.435           | 0.25            | 1.738           | -0.5                 | 0.793           | 31.8            | -2.8                 | 31.9               | 0.0             | 69.9                         | 82.7                         | -7.7                               | 83.0               | 0.0                               | 1.0                   | 0.00 | 0.95 | 0.00 | 0.00 |
| 323                                                                                                                                                                              | ab | 0.2             | 0.434           | 0.25            | 1.739           | -0.503               | 0.795           | 31.8            | -3.0                 | 32.0               | 0.0             | 69.9                         | 82.8                         | -8.0                               | 83.1               | 0.0                               | 1.0                   | 0.00 | 0.94 | 0.00 | 0.00 |
| 324                                                                                                                                                                              | ab | 0.2             | 0.434           | 0.249           | 1.74            | -0.507               | 0.796           | 31.9            | -3.1                 | 32.0               | 0.0             | 69.9                         | 82.8                         | -8.4                               | 83.2               | 0.0                               | 1.0                   | 0.00 | 0.92 | 0.00 | 0.00 |
| 325                                                                                                                                                                              | ab | 0.2             | 0.433           | 0.248           | 1.741           | -0.51                | 0.797           | 31.9            | -3.2                 |                    |                 |                              |                              |                                    |                    |                                   |                       |      |      |      |      |