

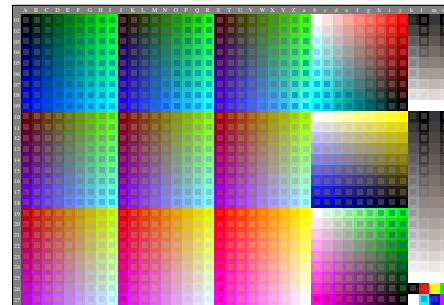
<http://farbe.li.tu-berlin.de/EE04/EE04LONP.PDF> /PS; only vector graphic VG; start output
see separate images of this page: <http://farbe.li.tu-berlin.de/EE04/EE04.HTM>

see similar files of the whole serie: <http://farbe.li.tu-berlin.de/EE.HTM>
technical information: <http://farbe.li.tu-berlin.de> or <http://color.li.tu-berlin.de>

TUB registration: 20230801-EE04/EE04LONP.PDF /PS
application for evaluation and measurement of display or print output
TUB material: code=rh4ta

PostScript-Colour Parameters and 1-Minus-Relation (IMR) of *rgb* and *cmYk*

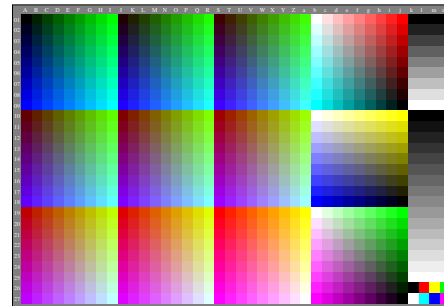
```
01 Colour parameters setgray, setrgbcolor, and setcmykcolor in PostScript.
02
03 k setgray with 0 <= k <= 1 defines colours in the space DeviceGray.
04 For k=0 the colour is black, for k=1 the colour is white.
05 For 0 <= k <= 1 a grey colour is defined between black and white.
06
07 r g b setrgbcolor with 0 <= r,g,b <= 1 defines colors in the space DeviceRGB.
08 For r=g=b=0 the colour is black, for r=g=b=1 the colour is white.
09 For 0 <= r,g,b <= 1 many colours including greys are defined.
10
11 c m y k setcmykcolor mit 0 <= cmyk <= 1 defines colours in the space DeviceCMYK.
12 If k=0 and c=m=y=1 the colour is black, for c=m=y=0 the colour is white.
13 If c=m=y=0 and k=1 the colour is black, for k=0 the colour is white.
14 For 0 <= cmyk <= 1 and k=0 many colours including greys are defined.
15
16 For 0 <= cmyk <= 1 and k=0 the minimum of {c, m, y} can be changed by k.
17 In this case the new parameters of setcmykcolor are {c-k, m-k, y-k, k}.
18 Lines 16 and 17 define the 1-Minus-Relation for the cmyk values.
19 The 1-Minus-Relation for values of rgb and cmYk is  $r=1-c$ ,  $g=1-m$ ,  $b=1-y$ .
20
21 Lines 03 to 14: parameters of setgray, setrgbcolor, and setcmykcolor.
22 Lines 16 to 19: 1-Minus-Relation between {c,m,y,0}, {c,m,y,k}, and {r,g,b}.
```



EE040-2N

Frame File PostScript Code for 1-Minus-Relation (IMR) to setrgbcolor and line 05 to 07 for change of setgray to setcmykcolor

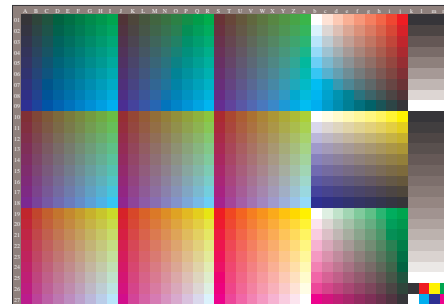
```
01 %!PS-Adobe-3.0 EPSF-3.0, IMR-0002 for change to setcmykcolor
02 /IMR-0002 {%BEG procedure IMR-0002 to cmyk setcmykcolor
03 %IMR-Transform of setgray and setcmykcolor to FFM_setrgbcolor
04
05 /setgray {%BEG procedure setgray to setcmykcolor
06 dup dup FFM_setcmykcolor
07 } def %END procedure setgray to setcmykcolor
08
09 /setcmykcolor {%BEG procedure setcmykcolor to setrgbcolor
10 /FFM_k exch def /FFM_y exch def /FFM_m exch def /FFM_c exch def
11 FFM_k 0 eq { FFM_c sub 1 FFM_m sub 1 FFM_y sub FFM_setrgbcolor }
12 { FFM_k sub dup dup FFM_setrgbcolor } ifelse
13 } def %END procedure setcmykcolor to setrgbcolor
14
15 } def %END procedure IMR-0002
16 %Trailer %END 1-Minus-Relation (IMR) to setcmykcolor
17
Remarks:
The FF_PS code includes: /FFM_setrgbcolor {setrgbcolor} bind def
Then setgray and setcmykcolor is changed to standard setrgbcolor
```



EE040-4N

Frame File PostScript-code for 1-Minus-Relation (IMR) to cmy0 setcmykcolor

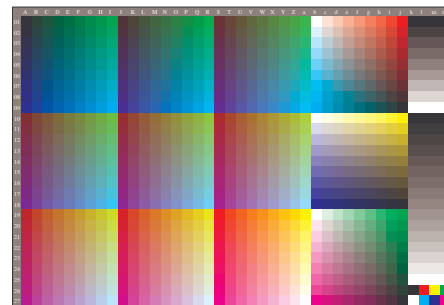
```
01 %!PS-Adobe-3.0 EPSF-3.0, IMR-0002 for change to cmy0 setcmykcolor
02 /IMR-0002 {%BEG procedure IMR-0002 to cmy0 setcmykcolor
03 %BEG setgray, setrgbcolor, cmyk setcmykcolor to cmy0 setcmykcolor
04 /setgray {%BEG procedure setgray to cmy0 setcmykcolor
05 /Mk exch def 1 Mv sub dup dup 0 FFM_setcmykcolor
06 } def %END procedure setgray to cmy0 setcmykcolor
07 /setrgbcolor {%BEG procedure setrgbcolor to cmy0 setcmykcolor
08 /Mb exch def /Mg exch def /Mr exch def
09 1 Mr sub 1 Mg sub 1 Mb sub 0 FFM_setcmykcolor
10 } def %END procedure setrgbcolor to cmy0 setcmykcolor
11 /setcmykcolor {%BEG procedure cmyk to cmy0 setcmykcolor
12 /Mc exch def /My exch def /Mm exch def /Mo exch def
13 Mk 0 ne {Mc Mk add Mm Mk add My Mk add Mo Mk add 0}
14 {Mc Mm My Mo} ifelse FFM_setcmykcolor
15 } def %END procedure cmyk to cmy0 setcmykcolor
16 %Trailer %END procedure (IMR-0002) to cmy0 setcmykcolor
17
Remarks:
line 04 to 10: change of setgray, setrgbcolor to cmy0 setcmykcolor
line 11 to 15: change of cmyk setcmykcolor to cmy0 setcmykcolor
The FF_PS-code includes: /FFM_setcmykcolor {setcmykcolor} bind def
```



EE040-6N

Frame File PostScript-code for 1-Minus-Relation (IMR) to cmy0 setcmykcolor

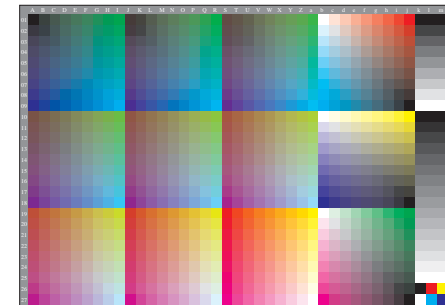
```
01 %!PS-Adobe-3.0 EPSF-3.0, IMR-0002 for change to cmy0 setcmykcolor
02 /IMR-0002 {%BEG procedure IMR-0002 to cmy0 setcmykcolor
03 %BEG setgray, setrgbcolor, cmyk setcmykcolor to cmy0 setcmykcolor
04 /setgray {%BEG procedure setgray to cmy0 setcmykcolor
05 /Mv exch def 1 Mv sub dup dup 0 FFM_setcmykcolor
06 } def %END procedure setgray to cmy0 setcmykcolor
07 /setrgbcolor {%BEG procedure setrgbcolor to cmy0 setcmykcolor
08 /Mb exch def /Mg exch def /Mr exch def
09 1 Mr sub 1 Mg sub 1 Mb sub 0 FFM_setcmykcolor
10 } def %END procedure setrgbcolor to cmy0 setcmykcolor
11 /setcmykcolor {%BEG procedure cmyk to cmy0 setcmykcolor
12 /Mc exch def /My exch def /Mm exch def /Mo exch def
13 Mk 0 ne {Mc Mk add Mm Mk add My Mk add Mo Mk add 0}
14 {Mc Mm My Mo} ifelse FFM_setcmykcolor
15 } def %END procedure cmyk to cmy0 setcmykcolor
16 %Trailer %END procedure (IMR-0002) to cmy0 setcmykcolor
17
Remarks:
line 04 to 10: change of setgray, setrgbcolor to cmy0 setcmykcolor
line 11 to 15: change of cmyk setcmykcolor to cmy0 setcmykcolor
The FF_PS-code includes: /FFM_setcmykcolor {setcmykcolor} bind def
```



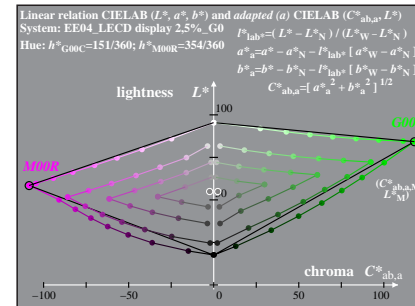
EE040-8N

Frame File PostScript-code for 1-Minus-Relation (IMR) to cmyk setcmykcolor

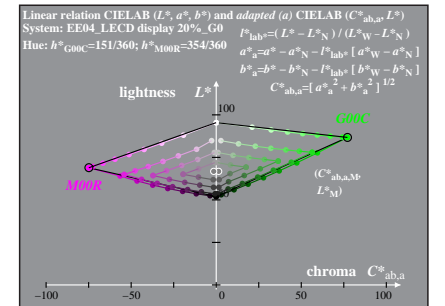
```
01 %!PS-Adobe-3.0 EPSF-3.0, IMR-0003 for change to cmyk setcmykcolor
02 /IMR-0003 {%BEG procedure IMR-0003 to cmyk setcmykcolor
03 /Mind {/Min Mc def %procedure to define Minimum of Mc, Mm, My
04 Mc Min le Mc My le and {Min Mc def} if
05 Mm My le Mm Mc le and {Min Mm def} if
06 My Mc le My Mm le and {Min My def} if} bind def
07 /setgray {%BEG procedure setgray to 000k setcmykcolor
08 /Mk exch def 0 0 0 1 Mk sub FFM_setcmykcolor
09 } def %END procedure setgray to 000k setcmykcolor
10 /setrgbcolor {%BEG procedure setrgbcolor to cmyk setcmykcolor
11 /Mb exch def /Mg exch def /Mr exch def
12 /Mc 1 Mr sub def /Mm 1 Mg sub def /My 1 Mb sub def Mind
13 Mc Min sub Mm Min sub My Min sub Min FFM_setcmykcolor
14 } def %END procedure setrgbcolor to cmyk setcmykcolor
15 /setcmykcolor {%BEG procedure cmyk to cmyk setcmykcolor
16 /Mc exch def /My exch def /Mm exch def /Mk exch def Mind
17 Mk 0 eq {Mc Min sub Mm Min sub My Min sub Min}
18 {Mc Mm My Mk} ifelse FFM_setcmykcolor
19 } def %END procedure cmyk to cmyk setcmykcolor
20 %Trailer %END procedure (IMR-0003) to cmyk setcmykcolor
21
Assumption: only cmyk setcmykcolor or cmy0 setcmykcolor is in file
```



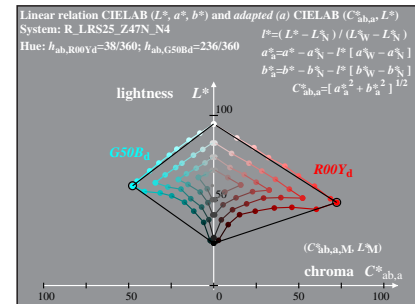
EE041-2N



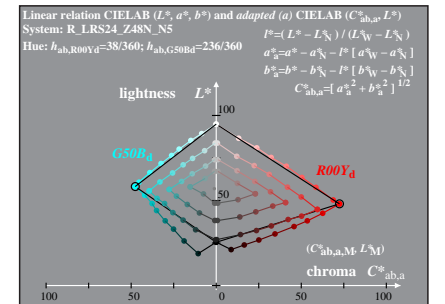
EE041-3N



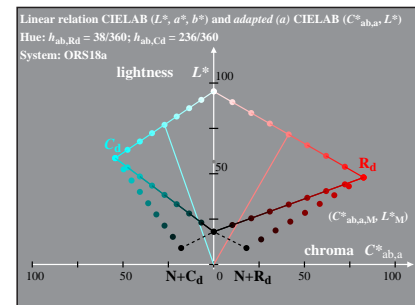
EE041-4N



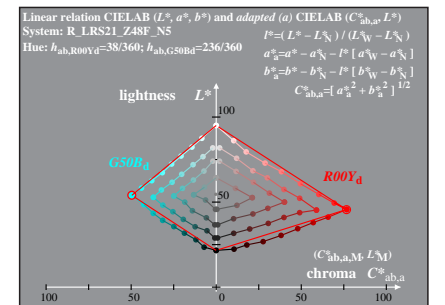
EE041-5N



EE041-6N



EE041-7N



EE041-8N

TUB-test chart EE04; Frame File PS code (FF_PS)
Output and steering of test chart AE49 of ISO 9241-306

input: *w/rgb/cmyk* → *w/rgb/cmyk*
output: *all[2],rgb[4],cmy0[6,8],cmyk[10]*