CIE *Y* and lightness *L** for surface colours and for emissive display colours

	extrapolated surface-colour range											lighter samples
step	0	1	2	3	4	..	9	10			15	20
$L^*_w=100\,(Y/100)^{1/2}$	extrapolated surface-colour range											lighter samples
L^*_w	0	10	20	30	40	..	90	100			150	200
	extrapolated surface-colour range											lighter samples
Y	0	1	4	9	16	..	81	100			225	400
	black	real matte surface-colours						white				lighter samples
Y_2	3,6				18			90			225	400
	black	intended emissive colour display without reflection								white		lighter samples
Y_3	1,8				18					180	225	400
	black emissive colour display with 3,6% reflection									white		lighter samples
$Y_4=18\,(Y_3+3{,}6)/21{,}6$	4,5				18					153	190	336
$L^*_{CIE}=116\,(Y/100)^{1/3}-16$	extrapolated surface-colour range											lighter samples
L^*_{CIE}	0	8	14	22	23	35	46	49	57	92	95 100 125	135 168
$L^*_{TUB}=40\,\log(Y/18)/\log 5$	extrapolated surface-colour range											lighter samples
L^*_{TUB}	−71	−57	−40	−37	−17	−2	0	8	37	40	42 57	62 77
	extrapolated surface-colour range											lighter samples
$50+L^*_{TUB}$	−21	−7	10	12	32	47	50	58	87	90	92 107	112 127

eej20−3n

CIE *Y* and lightness *L** for surface colours and for emissive display colours

	extrapolated surface-colour range											lighter samples
step	0	1	2	3	4	..	9	10			15	20
$L^*_w=100\,(Y/100)^{1/2}$	extrapolated surface-colour range											lighter samples
L^*_w	0	10	20	30	40	..	90	100			150	190
	extrapolated surface-colour range											lighter samples
Y	0	1	4	9	16	..	81	100			225	360
	black	real matte surface-colours						white				lighter samples
Y_2	3,6				18			90			180	360
	black	intended emissive colour display without reflection								white		lighter samples
Y_3	1,8				18					180	180	360
	black emissive display colours with 3,6% reflection									white		lighter samples
$Y_4=18\,(Y_3+3{,}6)/21{,}6$	4,5				18					153	190	303
$L^*_{CIE}=116\,(Y/100)^{1/3}-16$	extrapolated surface-colour range											lighter samples
L^*_{CIE}	0	8	14	22	23	35	46	49	57	92	95 100 125	135 161
$L^*_{TUB}=40\,\log(Y/18)/\log 5$	extrapolated surface-colour range											lighter samples
L^*_{TUB}	−71	−57	−40	−37	−17	−2	0	8	37	40	42 57	62 74
	extrapolated surface-colour range											lighter samples
$50+L^*_{TUB}$	−21	−7	10	12	32	47	50	58	87	90	92 107	112 124

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CIE *Y* and lightness *L** for surface colours and for emissive display colours

	extrapolated surface-colour range											lighter samples
step	0	1	2	3	4	..	9	10			15	20
$L^*_w=100\,(Y/100)^{1/2}$	extrapolated surface-colour range											lighter samples
L^*_w	0	10	20	30	40	..	90	100			150	200
	extrapolated surface-colour range											lighter samples
Y	0	1	4	9	16	..	81	100			225	400
	black	real matte surface-colours						white				lighter samples
Y_2	3,6				18			90			225	400
	black	intended emissive colour display without reflection								white		lighter samples
Y_3	1,8				18					180	225	400
	black emissive colour display with 3,6% reflection									white		lighter samples
$Y_4=18\,(Y_3+3{,}6)/21{,}6$	4,5				18					153	190	336
$L^*_{CIE}=116\,(Y/100)^{1/3}-16$	extrapolated surface-colour range											lighter samples
L^*_{CIE}	0	8	14	22	23	35	46	49	57	92	95 100 125	135 168
$L^*_{TUB}=40\,\log(Y/18)/\log 5$	extrapolated surface-colour range											lighter samples
L^*_{TUB}	−71	−57	−40	−37	−17	−2	0	8	37	40	42 57	62 77
	extrapolated surface-colour range											lighter samples
$50+L^*_{TUB}$	−21	−7	10	12	32	47	50	58	87	90	92 107	112 127

eej20−7n

CIE *Y* and lightness *L** for surface colours and for emissive display colours

	extrapolated surface-colour range											lighter samples
step	0	1	2	3	4	..	9	10			15	20
$L^*_w=100\,(Y/100)^{1/2}$	extrapolated surface-colour range											lighter samples
L^*_w	0	10	20	30	40	..	90	100			150	190
	extrapolated surface-colour range											lighter samples
Y	0	1	4	9	16	..	81	100			225	360
	black	real matte surface-colours						white				lighter samples
Y_2	3,6				18			90			180	360
	black	intended emissive display colours without reflection								white		lighter samples
Y_3	1,8				18					180	180	360
	black emissive display colours with 3,6% reflection									white		lighter samples
$Y_4=18\,(Y_3+3{,}6)/21{,}6$	4,5				18					153	190	303
$L^*_{CIE}=116\,(Y/100)^{1/3}-16$	extrapolated surface-colour range											lighter samples
L^*_{CIE}	0	8	14	22	23	35	46	49	57	92	95 100 125	125 161
$L^*_{TUB}=40\,\log(Y/18)/\log 5$	extrapolated surface-colour range											lighter samples
L^*_{TUB}	−71	−57	−40	−37	−17	−2	0	8	37	40	42 57	57 74
	extrapolated surface-colour range											lighter samples
$50+L^*_{TUB}$	−21	−7	10	12	32	47	50	58	87	90	92 107	107 124

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TUB-test chart eej2; luminance range of HDR and SDR colours with different contrast ranges
Surface colours and emissive display colours and tristimulus value *Y*- and lightness *L**-.