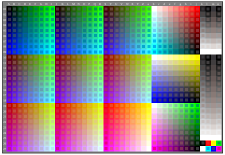
http://farbe.li.tu-berlin.de/EE04/EE04L0N1.TXT /.PS; only vector graphic VG; start output
see separate images of this page: http://farbe.li.tu-berlin.de/EE04/EE04.HTM

PostScript-Colour Parameters and 1-Minus-Relation (1MR) 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<=*c,m,y*<=1 and *k*=0 many colours including greys are defined.
15
16 For 0<=*c,m,y*<=1 and *k*=0 the minimum of *{c, m, y}* can be changeds 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 *cmy0* is *r*=1−*c*, *g*=1−*m*, *b*=1−*y*.

Lines 03 to 14: parameters of *setgray*, *setrgbcolor*, and *setcmykcolor*.
Lines 16 to 19: 1-Minus-Relation between *{c,m,y,0}*, *{c,m,y,k}*, and *{r,g,b}*.

EE040−1N



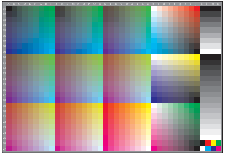
EE040-2N

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

```
01 %!PS-Adobe-3.0 EPSF-3.0, 1MR-0003 for change to cmyk setcmykcolor
02 /1MR-0003 {%BEG procedure 1MR-0003 to cmyk setcmykcolor
03 /Mind {/Min Mc def %procedure to define Minimum of Mc, Mm, My
04    Mc Mm 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 cmy0 to cmyk setcmykcolor
16         /Mk exch def /My exch def /Mm exch def /Mc 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 %END procedure cmy0 to cmyk setcmykcolor
20 %%Trailer %END procedure (1MR-0003) to cmyk setcmykcolor
```

Assumption: only *cmyk setcmykcolor* or *cmy0 setcmykcolor* is in file

EE041−1N



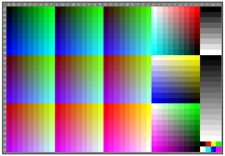
EE041-2N

Frame File PostScript Code for 1-Minus-Relation (1MR) to *setrgbcolor*
and line 05 to 07 for change of setgray to setrgbcolor
and line 09 to 13 for change of setcmykcolor to setrgbcolor

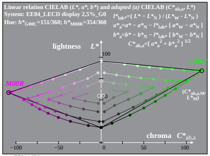
```
01 %!PS-Adobe-3.0 EPSF-3.0, 1MR for change to setrgbcolor
02 /1MR-0000 {%BEG procedure 1MR-0000
03 %1MR-Transform of setgray and setcmykcolor to FFM_setrgbcolor
04
05 /setgray {%BEG procedure setgray to setrgbcolor
06           dup dup FFM_setrgbcolor
07          } def %END procedure setgray to setrgbcolor
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 {1 FFM_c sub 1 FFM_m sub 1 FFM_y sub FFM_setrgbcolor}
12            {1 FFM_k sub dup dup FFM_setrgbcolor} ifelse
13               } def %END procedure setcmykcolor to setrgbcolor
14
15 } def %END procedure 1MR-0000
16 %%Trailer %END 1-Minus-Relation (1MR) to setrgbcolor
```

Remarks:
The FF_PS code includes: /FFM_setrgbcolor {setrgbcolor} bind def
Then setgray and setcmykcolor is changed to standard setrgbcolor

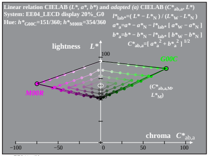
EE040−3N



EE040-4N



EE041−3N



EE041−4N

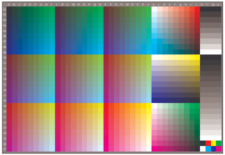
Frame File PostScript-code for 1-Minus-Relation (1MR) to *cmy0 setcmykcolor*

```
01 %!PS-Adobe-3.0 EPSF-3.0, 1MR-0002 for change to cmy0 setcmykcolor
02 /1MR-0002 {%BEG procedure 1MR-0002 to cmy0 setcmykcolor
03 %BEG setgray, setrgbcolor, cmyk setcmykcolor to cmy0 setcymkcolor
04 /setgray {%BEG procedure setgray to cmy0 setcmykcolor
05           /Mw exch def  1 Mw 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                /Mk exch def /My exch def /Mm exch def /Mc exch def
13                Mk 0 ne {Mc Mk add Mm Mk add My Mk add 0}
14                        {Mc Mm My 0} ifelse FFM_setcmykcolor
15               } def %END %END procedure cmyk to cmy0 setcmykcolor
16 %%Trailer %END procedure (1MR-0002) to cmy0 setcmykcolor
```

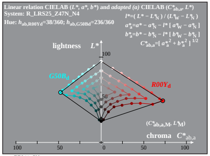
Remarks:
line 04 to 10: change of setgray, setrgbcolor to cmy0 setcmykcolor
line 11 to 15: change of cmyk setcmykcolor to cmy0 setcmykcolor

The FF_PS-code includes: /FFM_setcmykcolor {setcmykcolor} bind def

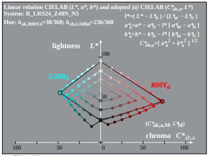
EE040−5N



EE040-6N



EE041−5N



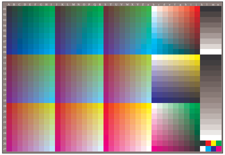
EE041−6N

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

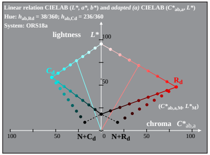
```
01 %!PS-Adobe-3.0 EPSF-3.0, 1MR-0002 for change to cmy0 setcmykcolor
02 /1MR-0002 {%BEG procedure 1MR-0002 to cmy0 setcmykcolor
03 %BEG setgray, setrgbcolor, cmyk setcmykcolor to cmy0 setcymkcolor
04 /setgray {%BEG procedure setgray to cmy0 setcmykcolor
05           /Mw exch def  1 Mw sub dup dup 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                /Mk exch def /My exch def /Mm exch def /Mc exch def
13                Mk 0 ne {Mc Mk add Mm Mk add My Mk add 0}
14                        {Mc Mm My 0} ifelse FFM_setcmykcolor
15               } def %END %END procedure cmyk to cmy0 setcmykcolor
16 %%Trailer %END procedure (1MR-0002) to cmy0 setcmykcolor
```

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

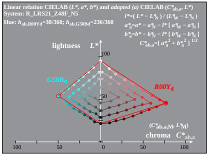
EE040−7N



EE040-8N



EE041−7N



EE041−8N

TUB-test chart EE04; Frame File PS code (FF_PS) input: *w/rgb/cmyk −> w/rgb/cmyk*
Output and steering of test chart AE49 of ISO 9241-306 output: *all[2],rgb[4],cmy0[6,8],cmyk[10]*

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/EE04L0N1.TXT /.PS
application for evaluation and measurement of display or print output
TUB material: code=rha4ta