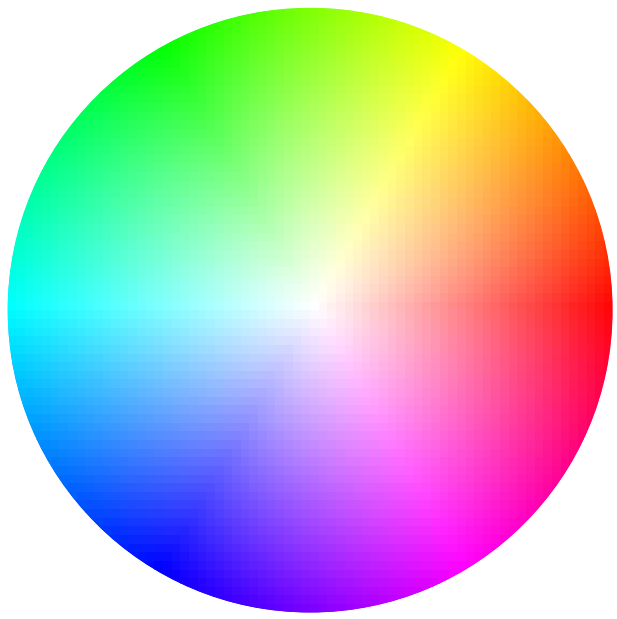
Gernot Hoffmann

Graphics for Color Science



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1. Introduction

This catalog contains a selection of accurate graphics for color science. Each of them has been directly programmed by PostScript as scaleable vector graphic. Shaded areas consist of small squares.

The graphics can be used by various methods in desktop publishing programs like CorelDraw, PageMaker or InDesign:

1. Download the respective file *.txt
   Rename as *.eps
   Place EPS in final document
   Scale
   The DTP program should create a *preview* (eventually low resolution)
   This is the best method

2. Place a page of this PDF in final document
   Scale and crop
   The DTP program should create a *preview* (eventually low resolution)
   This is not perfect because the PDF uses a lower number of squares in shaded areas than the EPS

3. Copy and paste a part of this PDF
   Result is a raster image with screen quality
   This is generally not recommended,
   with the exception of Web applications (HTML)

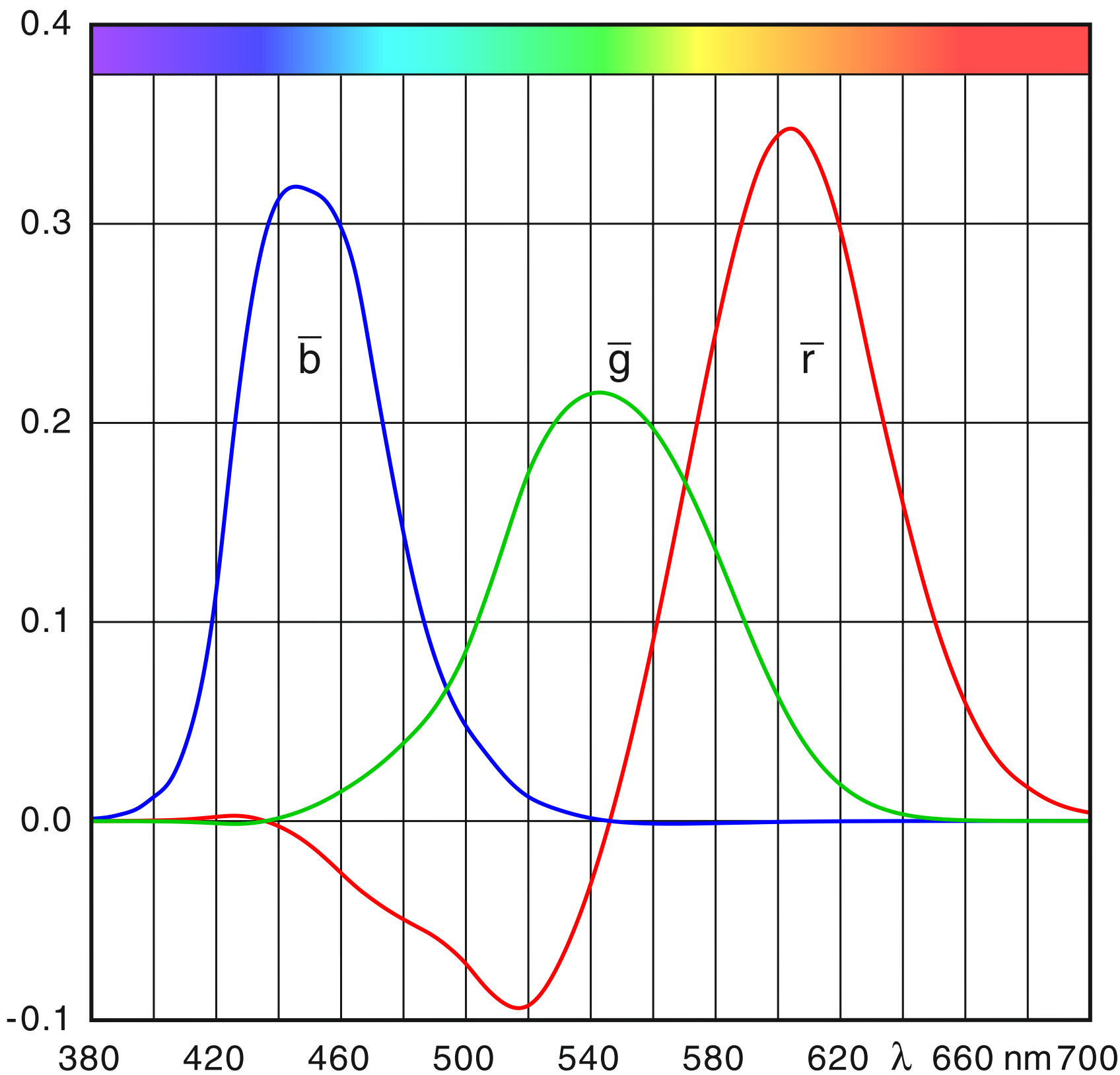
Methods 1 and 2 work in a PostScript workflow. The graphics will be printed by a PS printer with ultimate quality. They will be exported to PDF accurately. Non-PostScript printers (PCL) will show only the low resolution *preview*.

EPS files can be modified by a text editor. E.g. change line widths and colors.

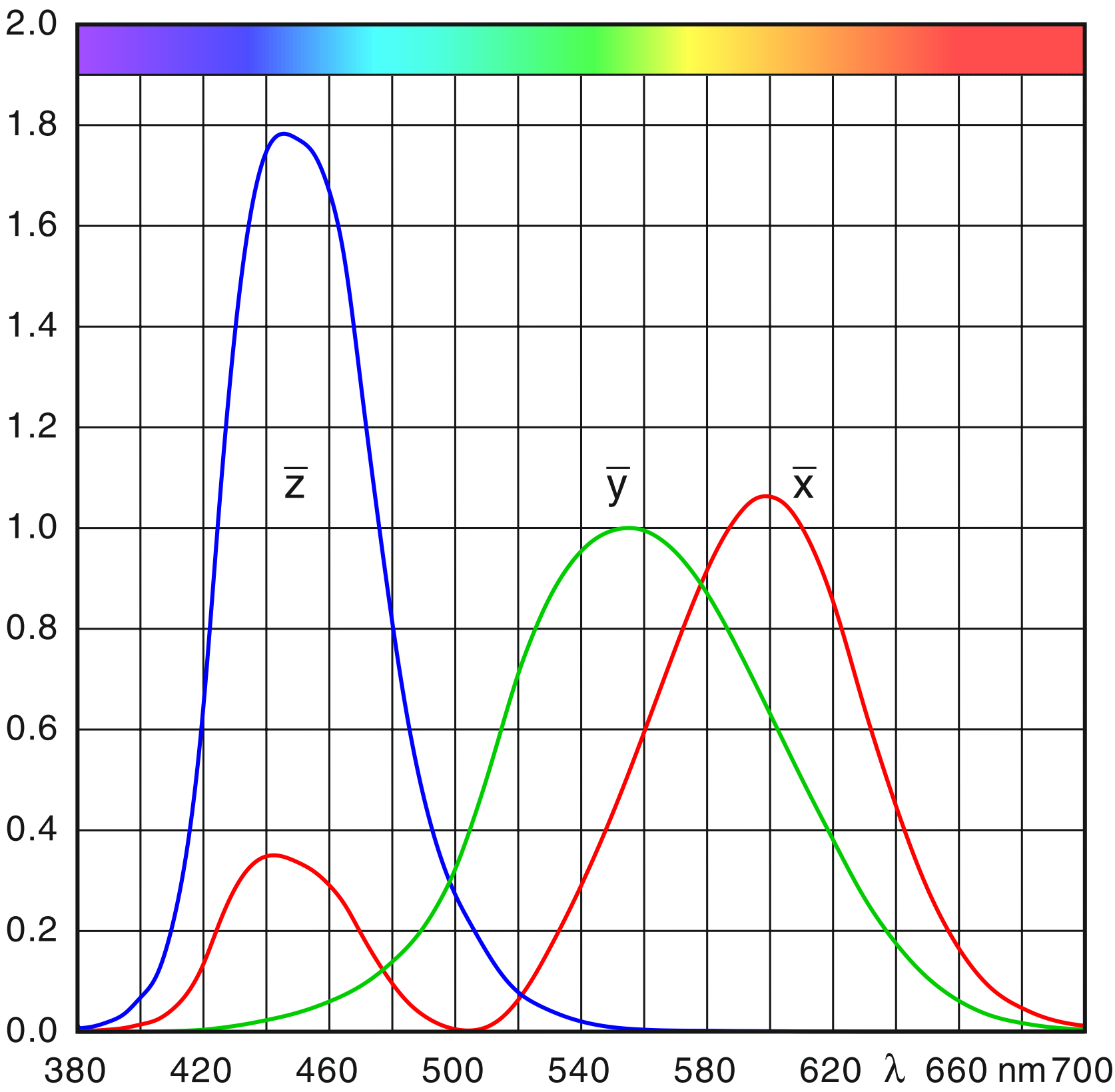
Many other graphics and tutorials with references are available.
Please refer to the Website / Chapter Documents or [3].

The use of the graphics files is free. The author should be mentioned.

2. Color-matching Functions RGB



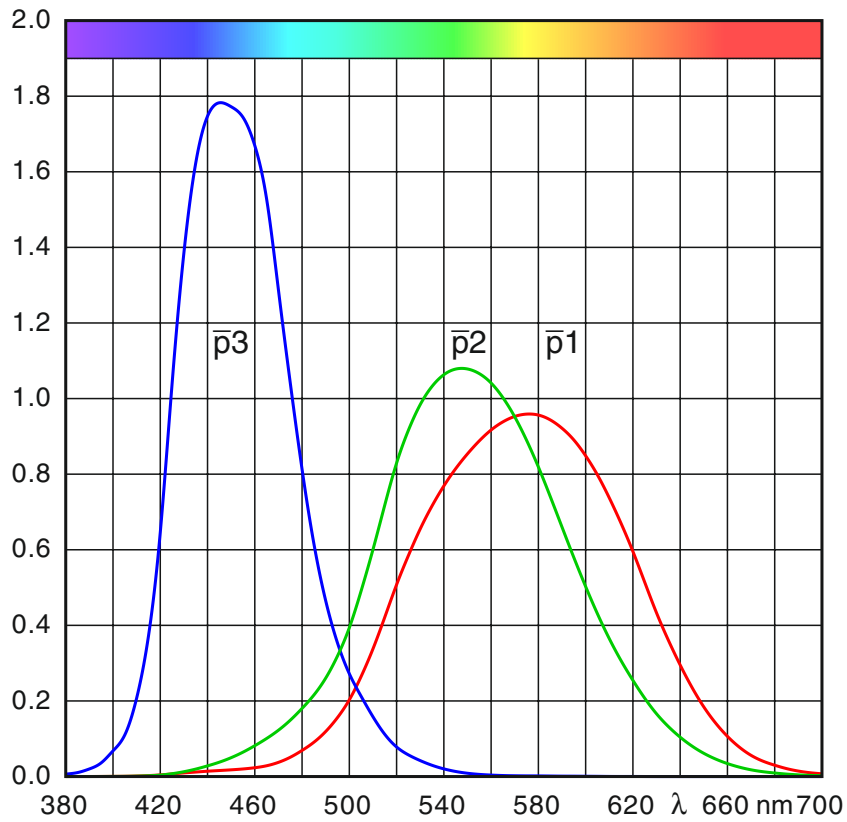
3. Color-matching Functions XYZ

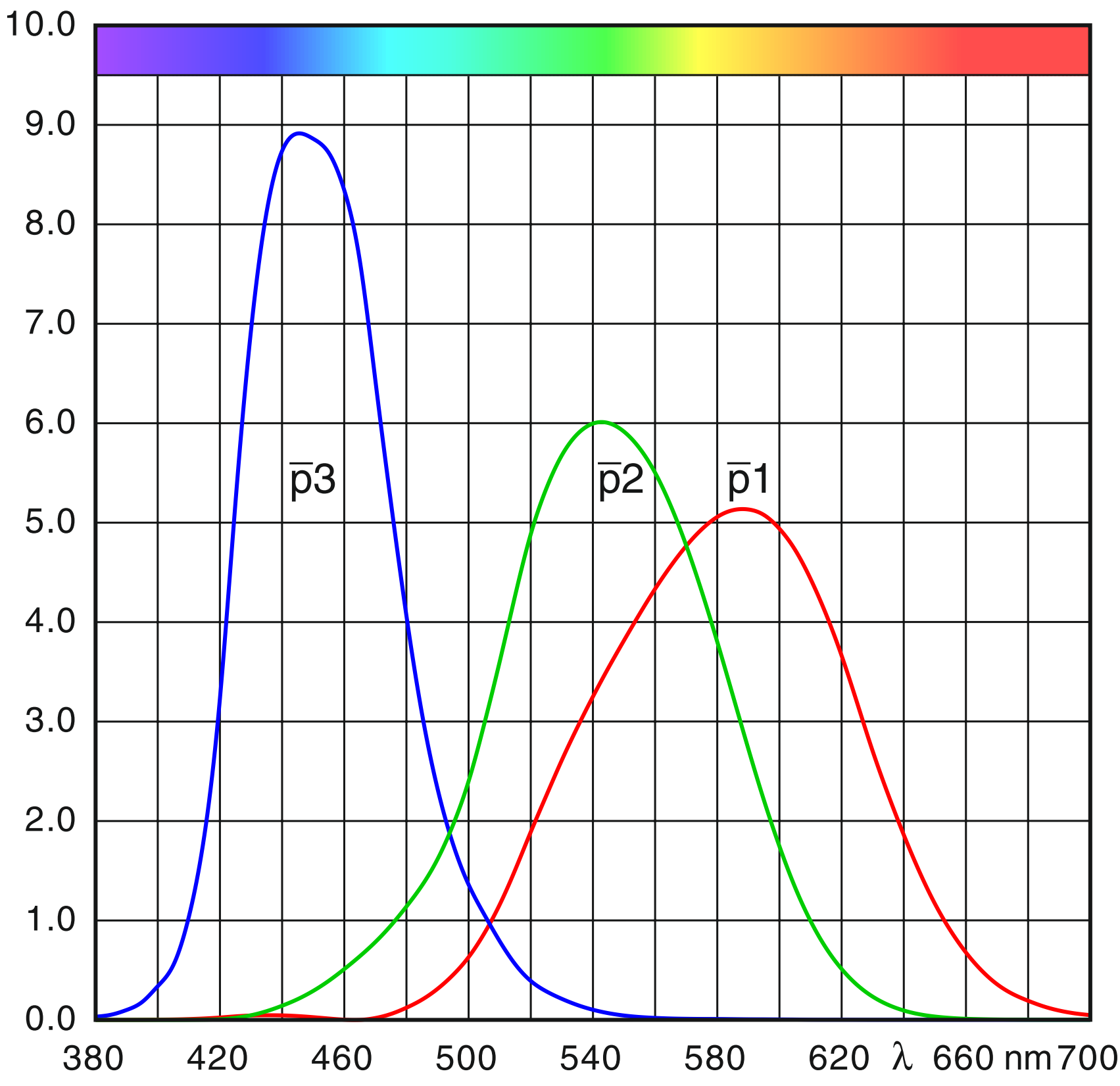


4. Cone Response

Right [1]

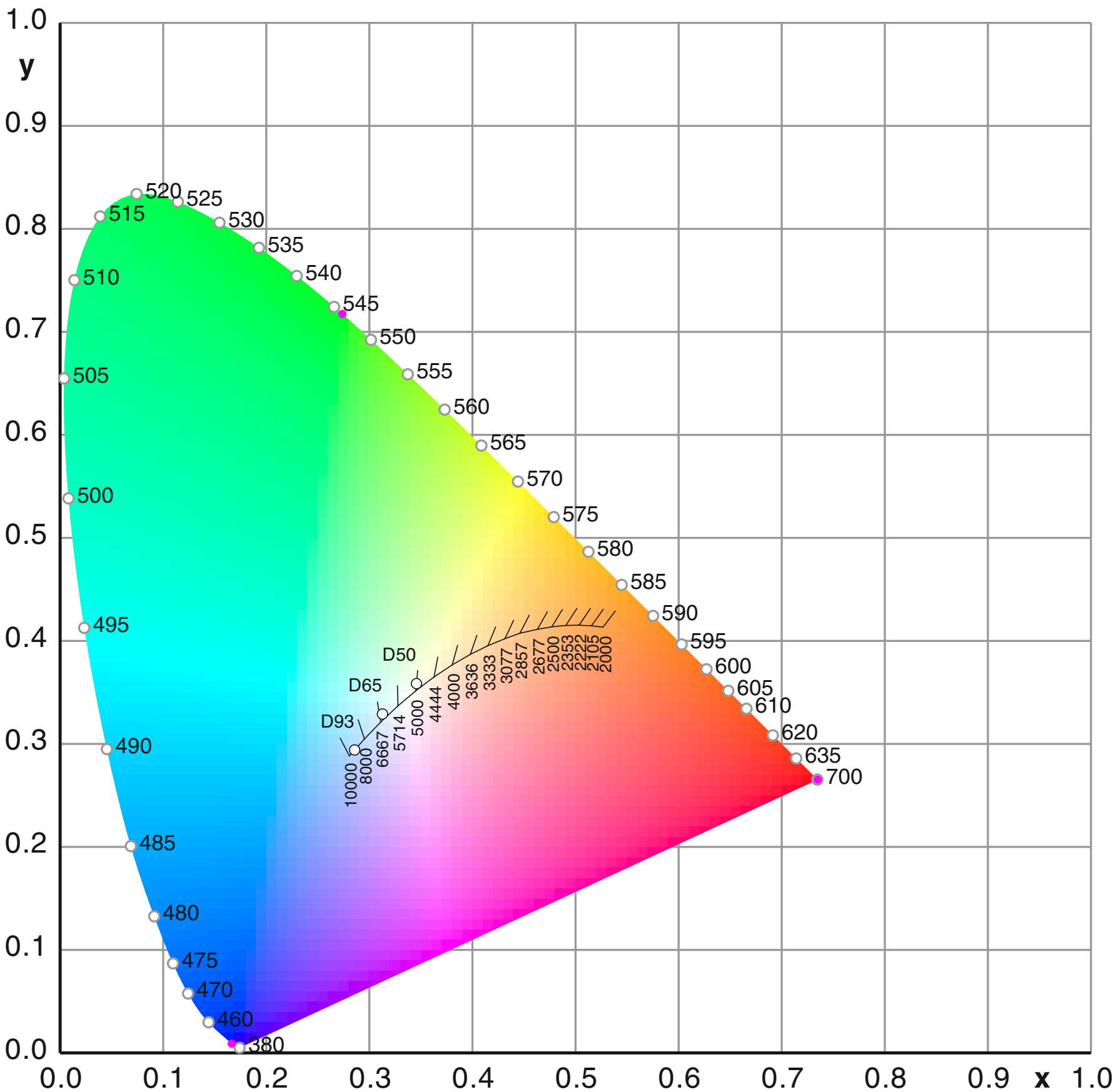
Bottom [2]





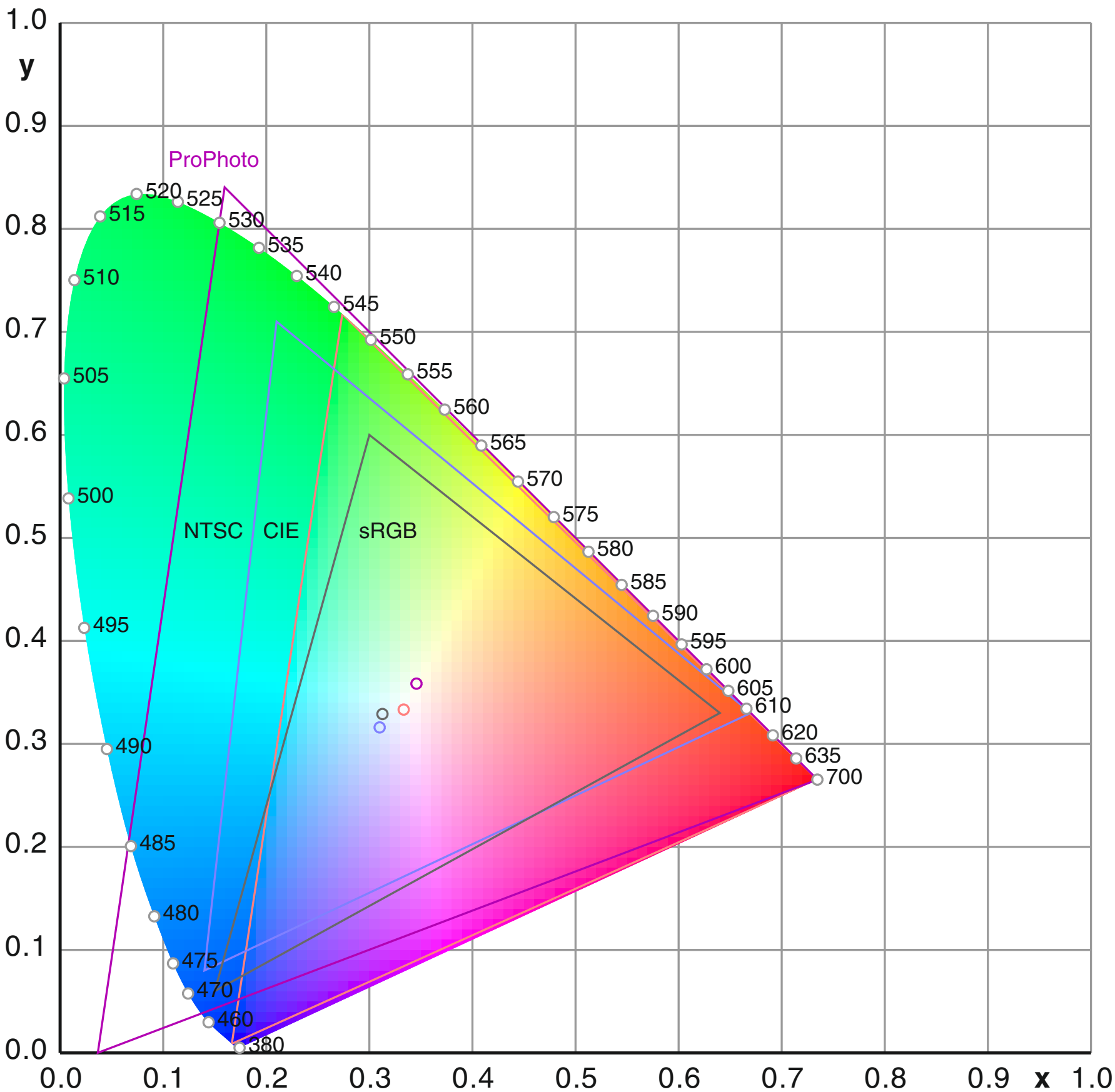
5. Chromaticity Diagram with Color Temperatures

This PDF shows visible small boxes. The downloadable source file will create fill patterns with hardly visible boxes.



6a. Chromaticity Diagram with Gamut Triangles

This PDF shows visible small boxes. The downloadable source file will create fill patterns with hardly visible boxes.

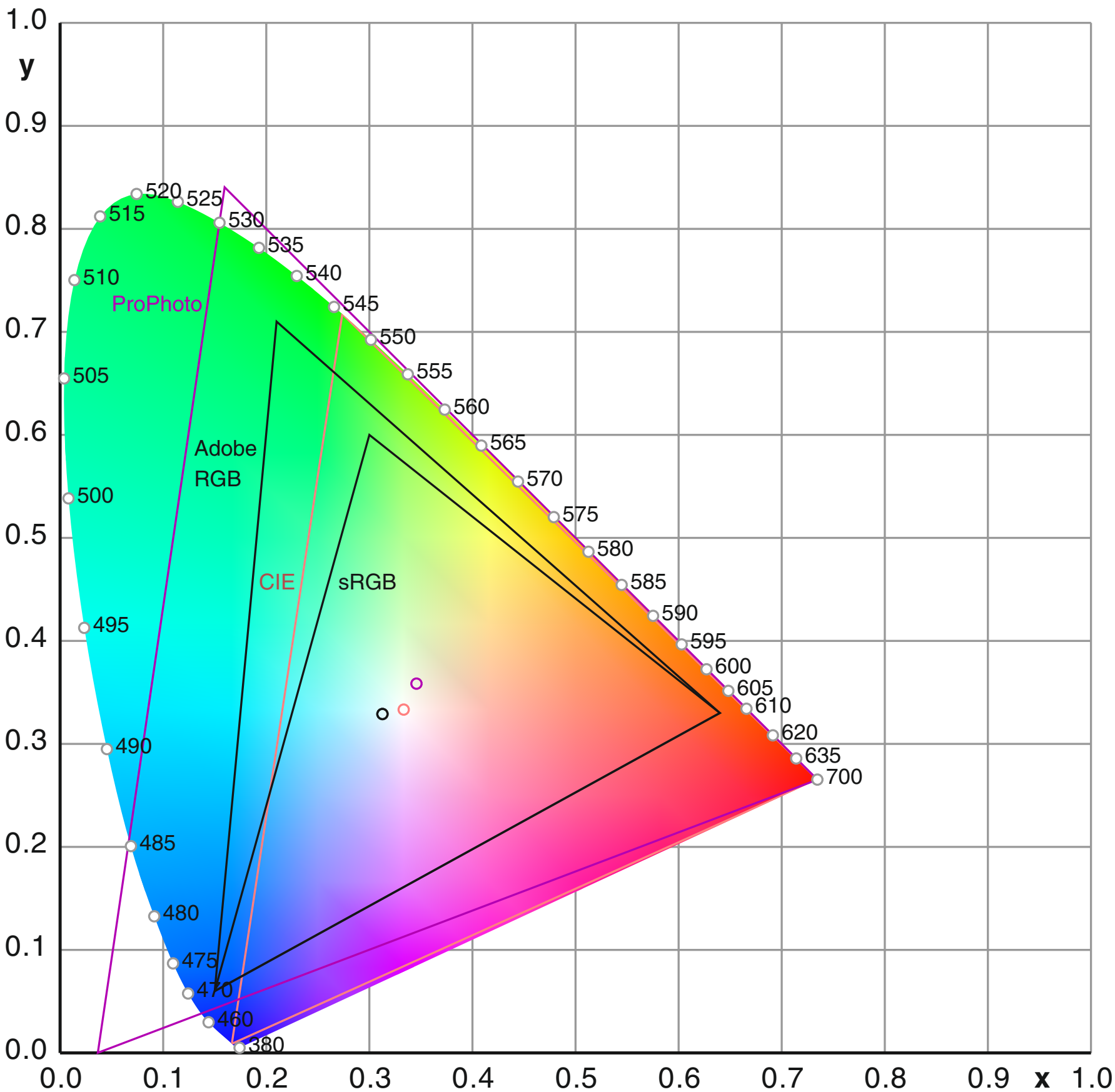


6b. Chromaticity Diagram / Smooth Shading

This PDF does not use visible small boxes. The colors are interpolated by smooth shading.

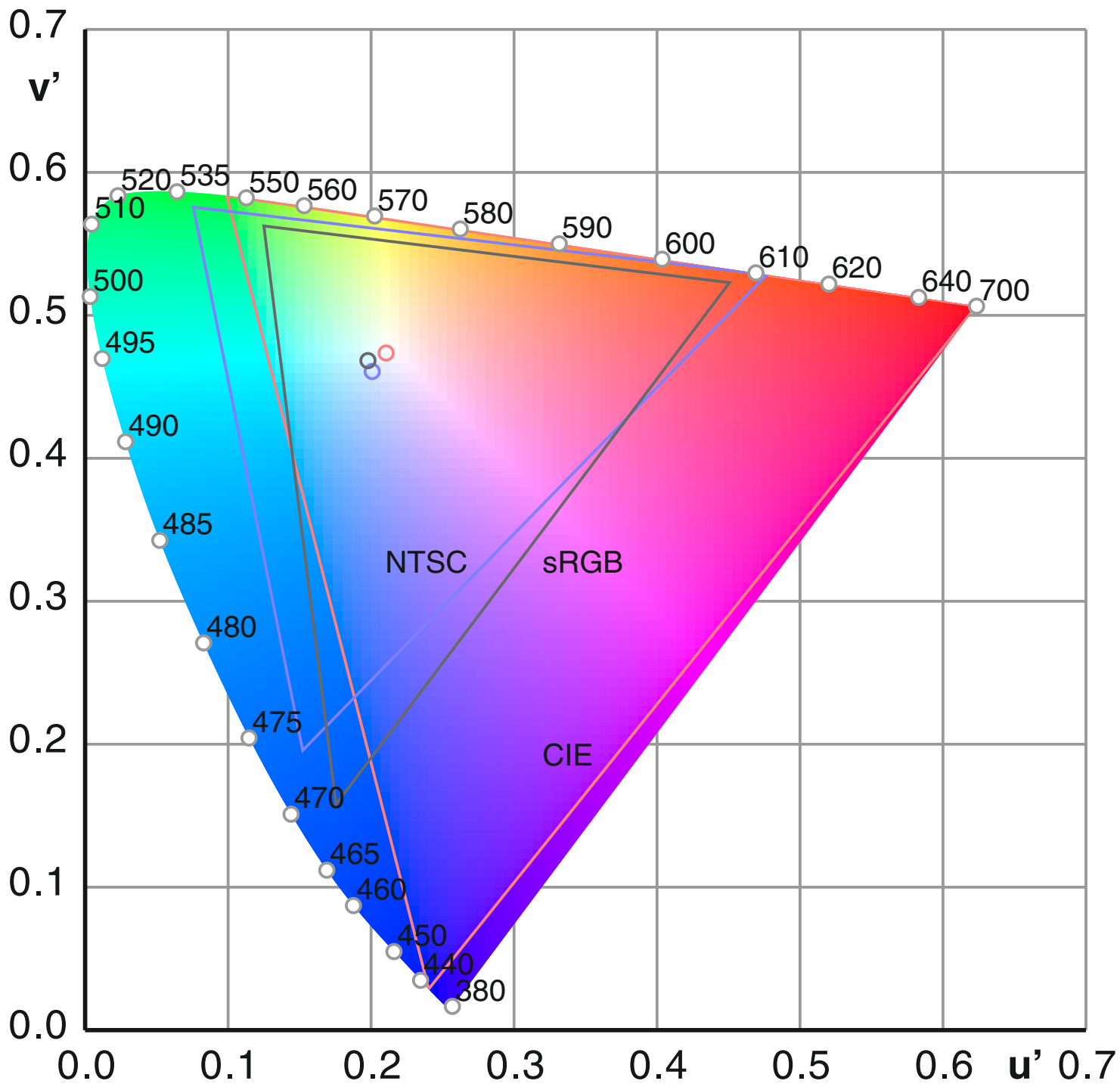
Gamut triangles and color temperature curves can be switched on and off in the source code.

See [22].

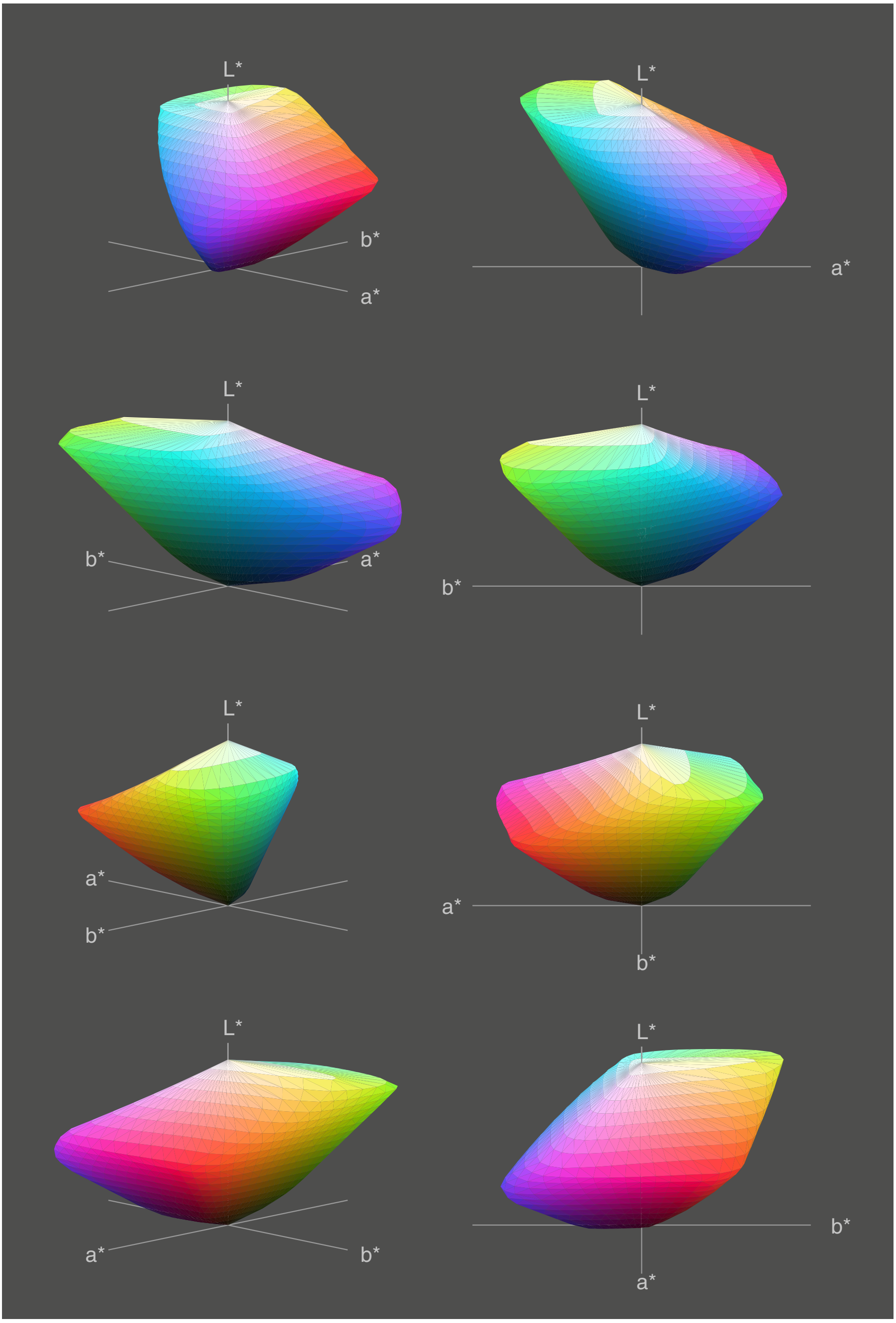


7. Chromaticity Diagram Lu'v'

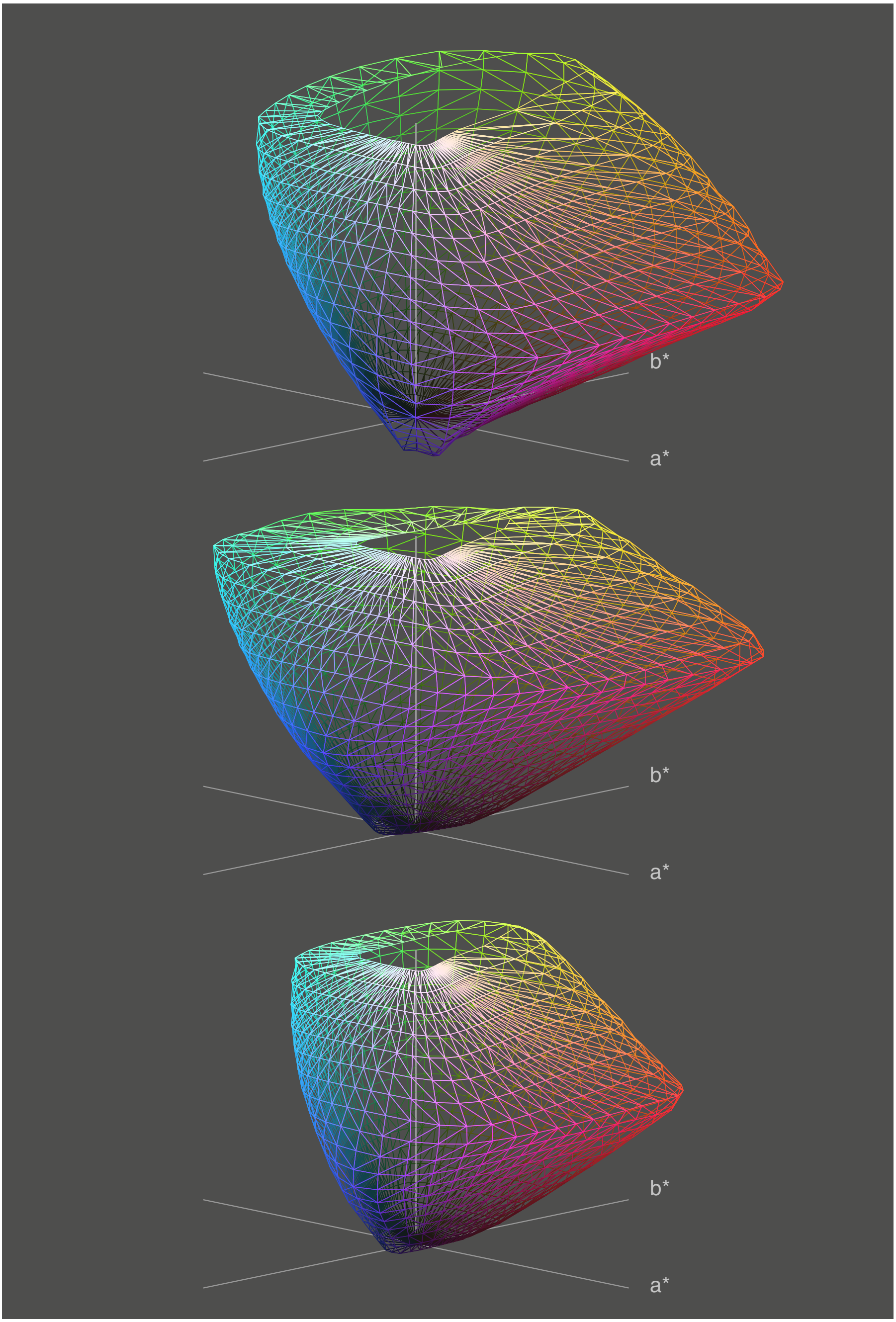
This PDF shows visible small boxes. The downloadable source file will create fill patterns without visible boxes.



8. CIELab Gamut Volume for sRGB

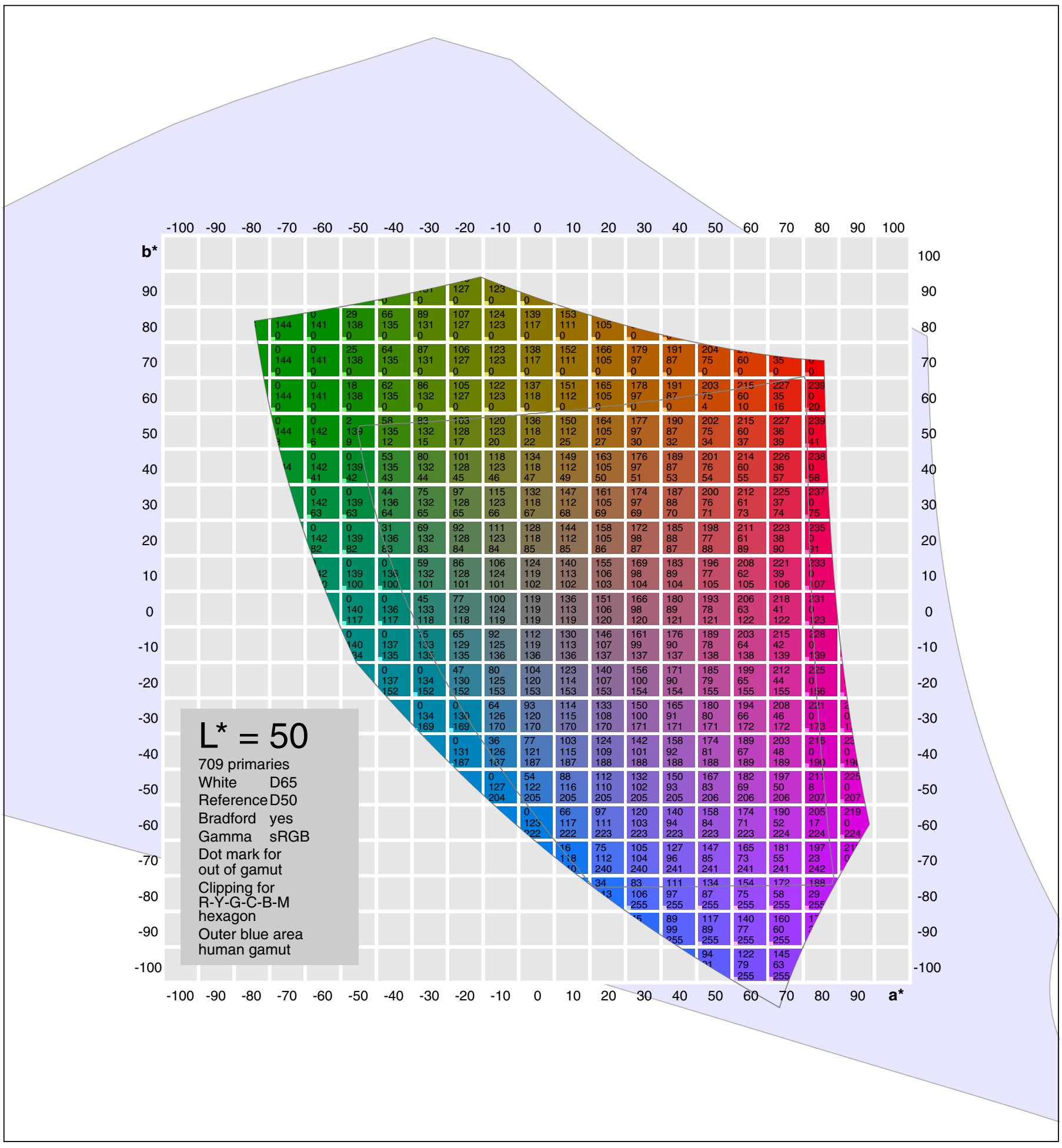


9. CIELab Wireframes for CIE-RGB / NTSC / sRGB



10. CIELab and sRGB Numbers

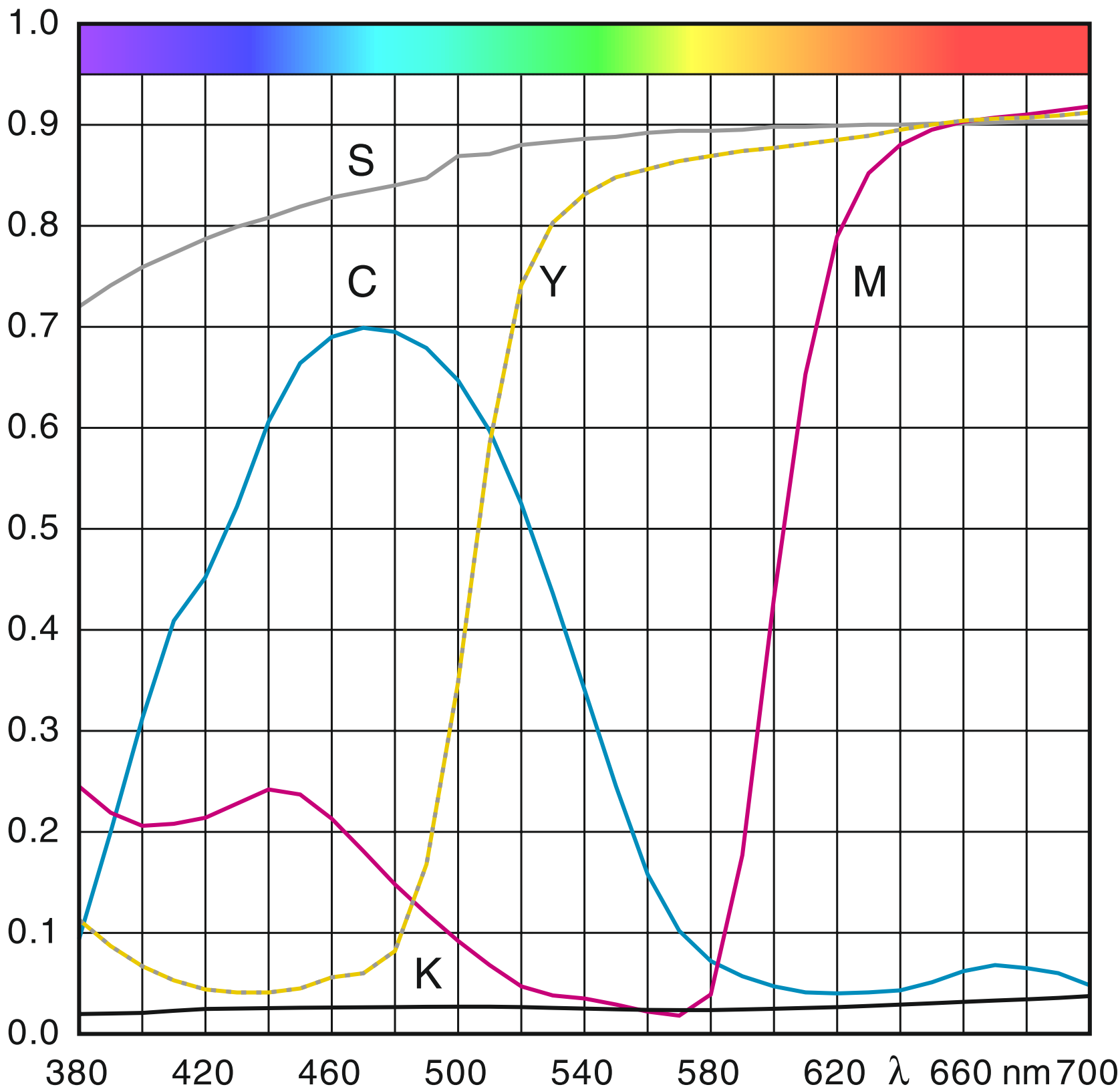
The diagram shows a CIELab chart with sRGB values. Out-of-gamut colors are marked by a dot.



11. Ink Spectra ISO 2846-1 (Reflectance,0°/45° Geometry)

Reflectance factor

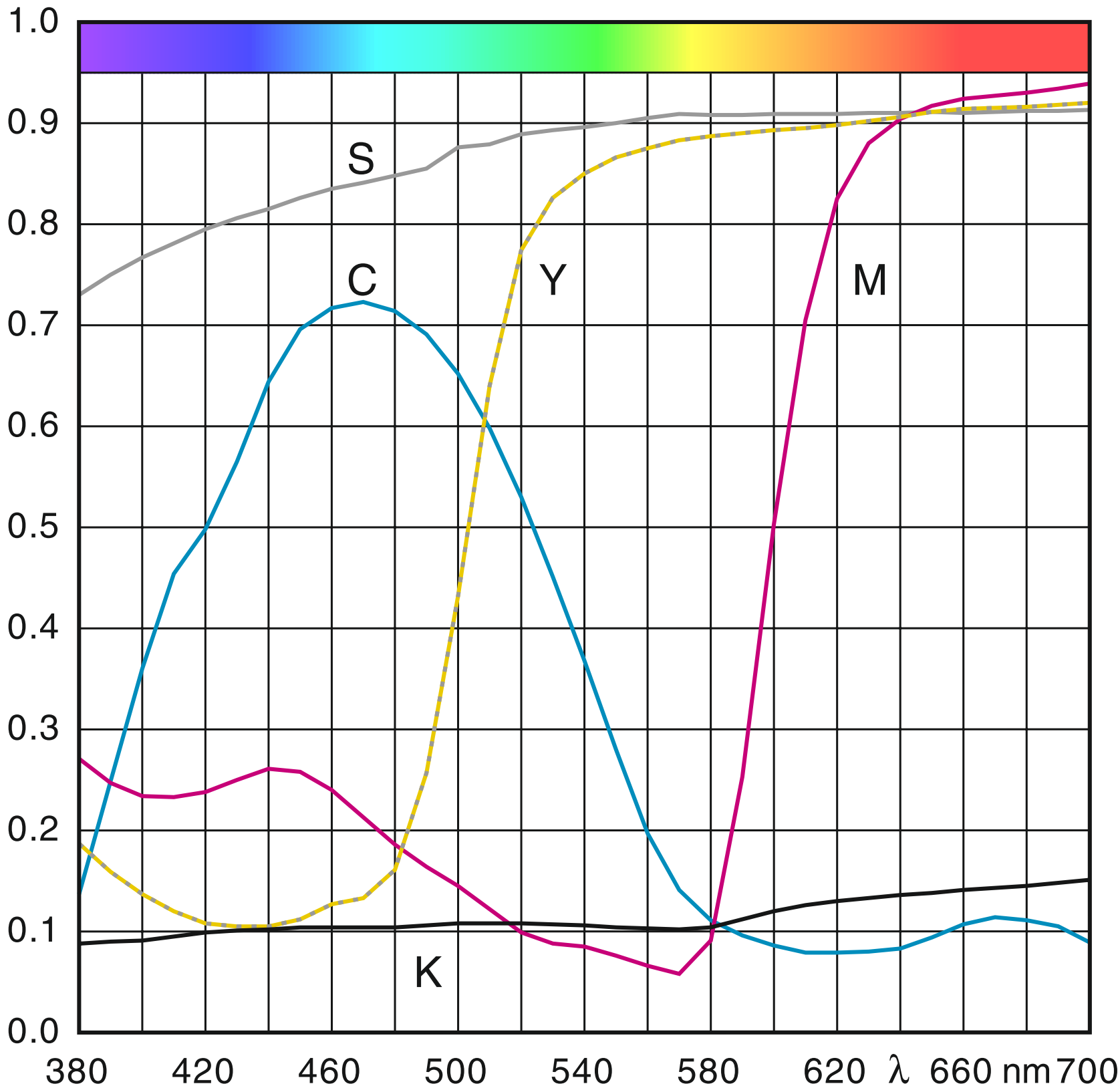
S is the substrate.



12. Ink Spectra ISO 2846-1 (Reflectance, 8°/Diffuse Geom.)

Reflectance factor

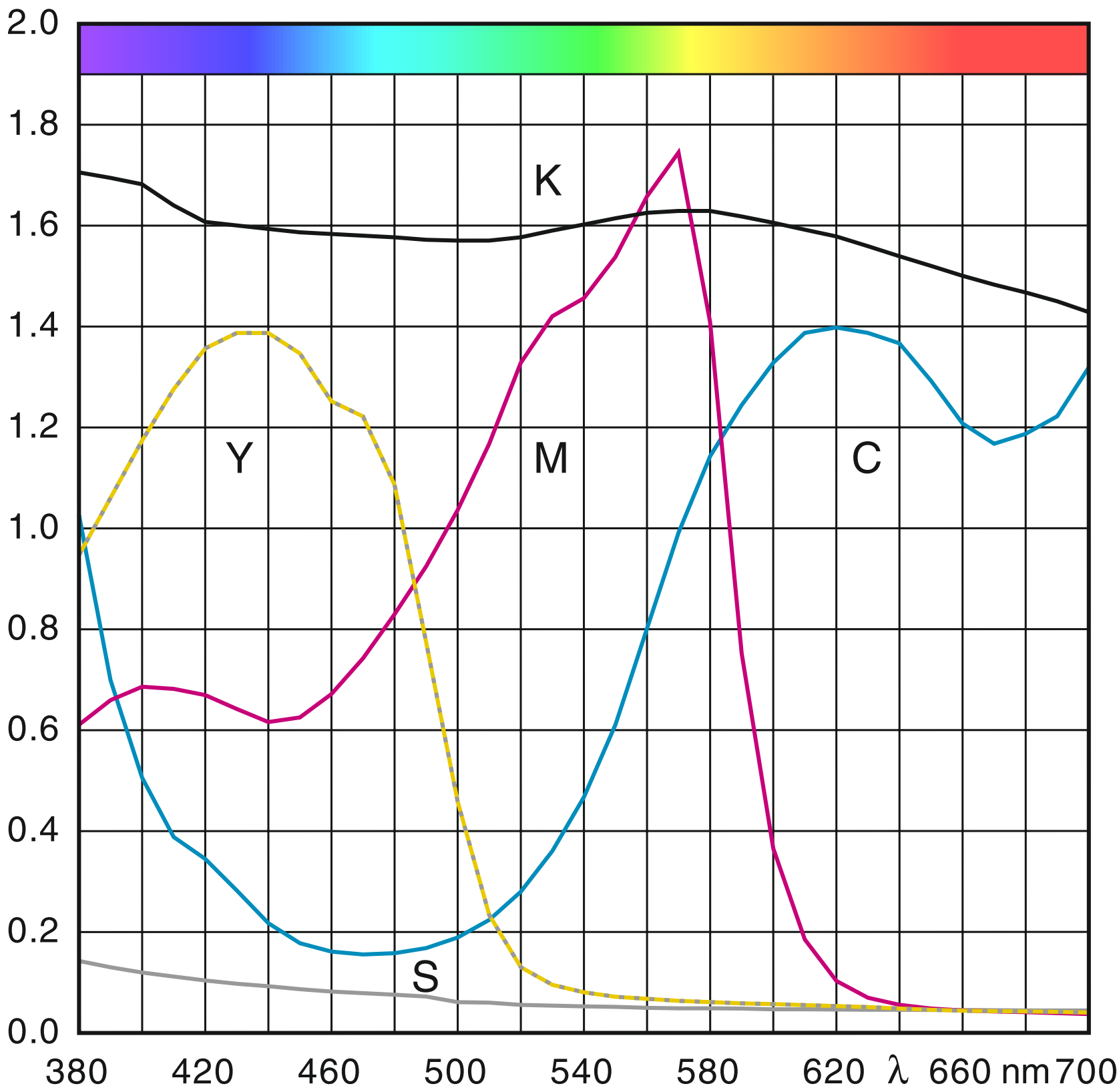
S is the substrate.



13. Ink Spectra ISO 2846-1 (Density, 0°/45° Geometry)

Density

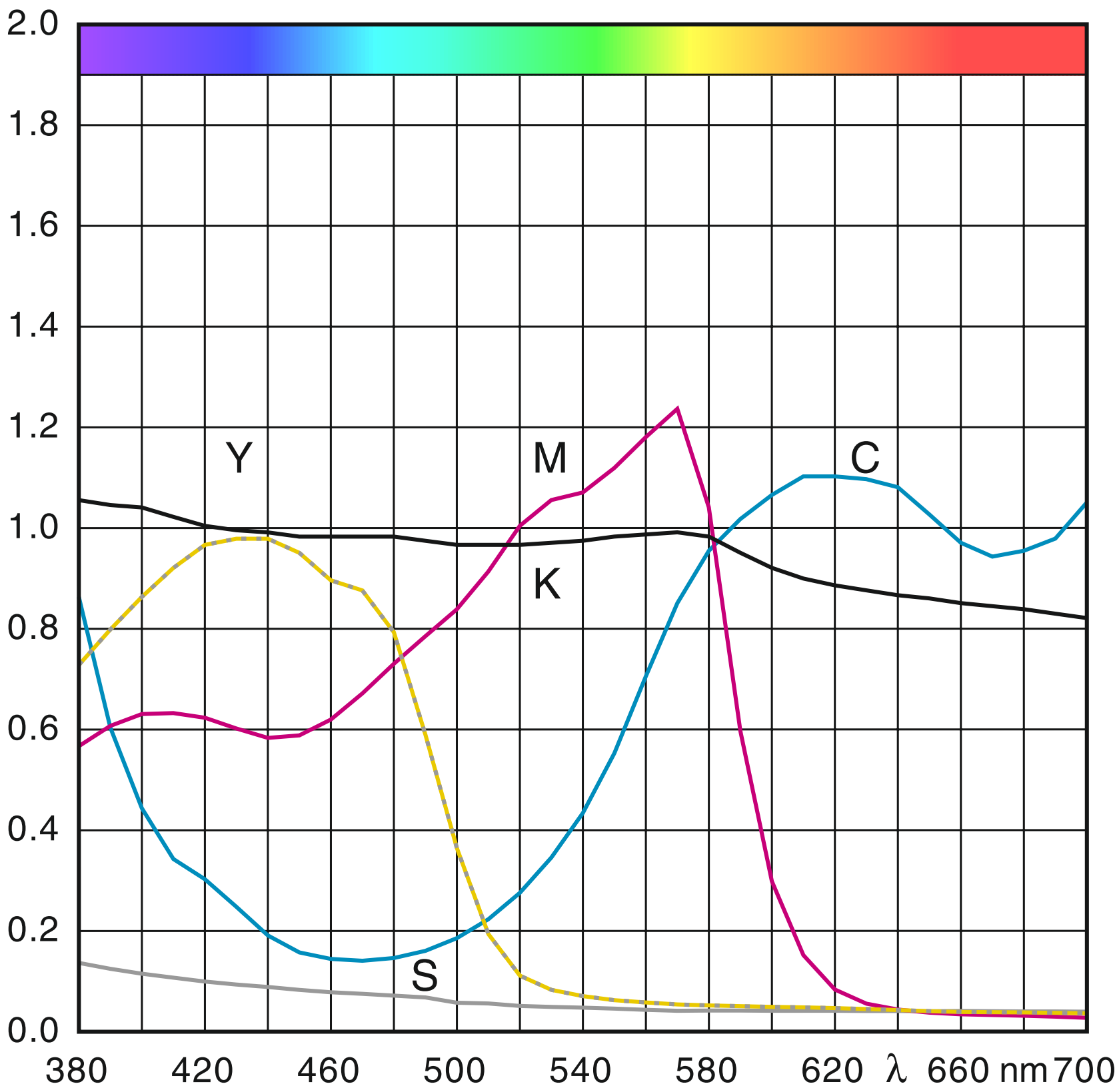
S is the substrate.



14. Ink Spectra ISO 2846-1 (Density, 8°/Diffuse Geom.)

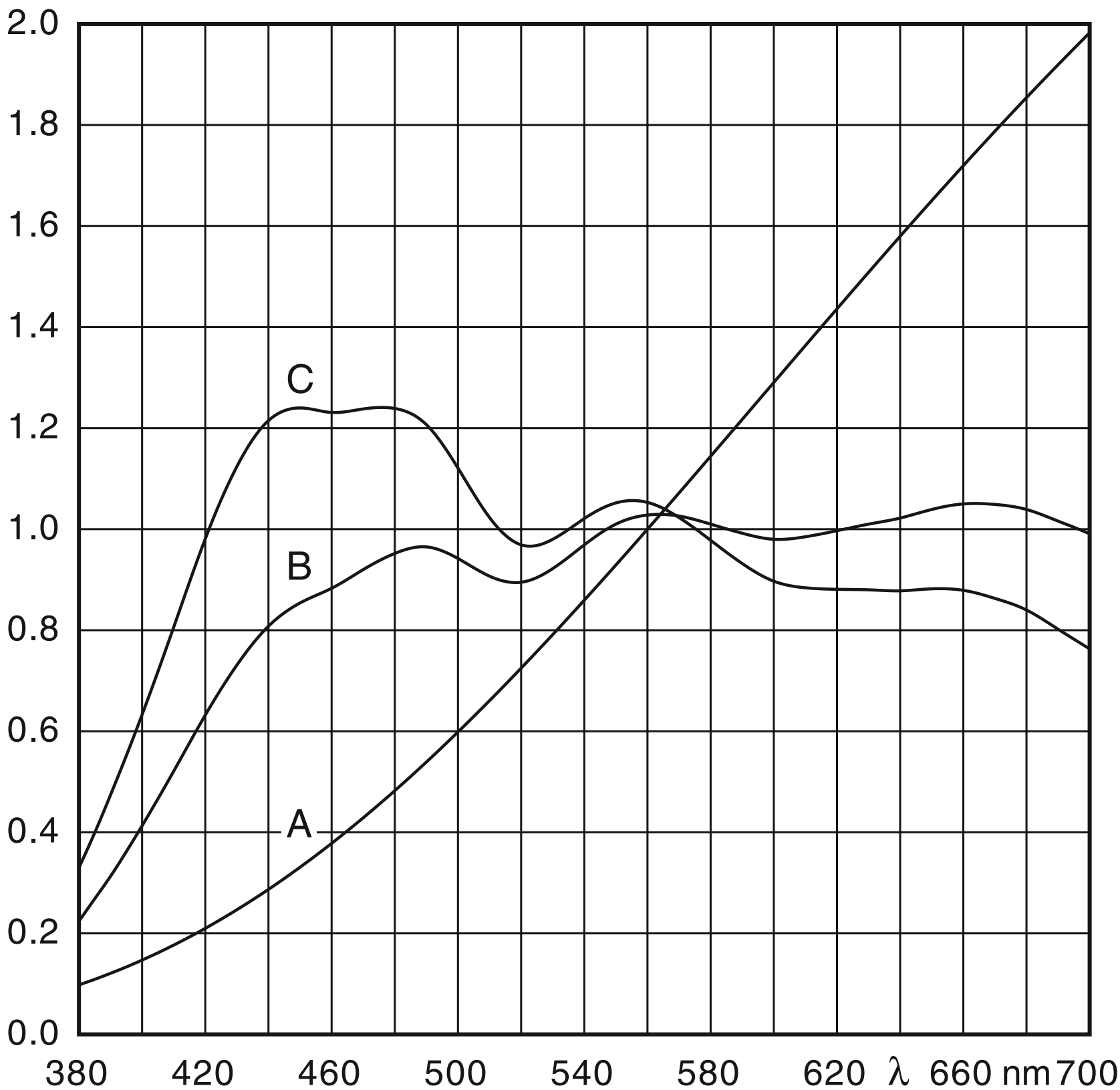
Density

S is the substrate.



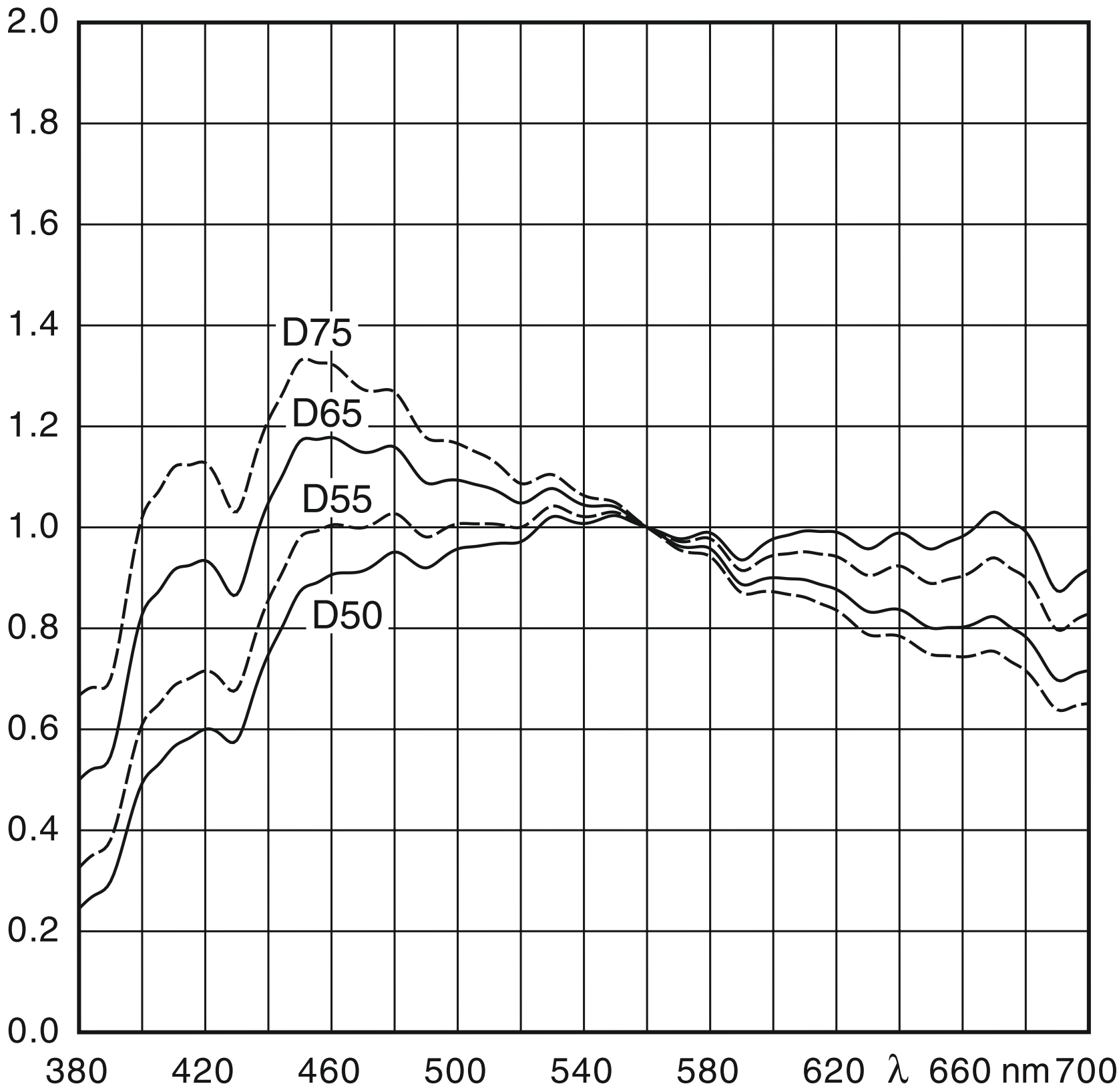
15. Daylight ABC

Relative Intensity



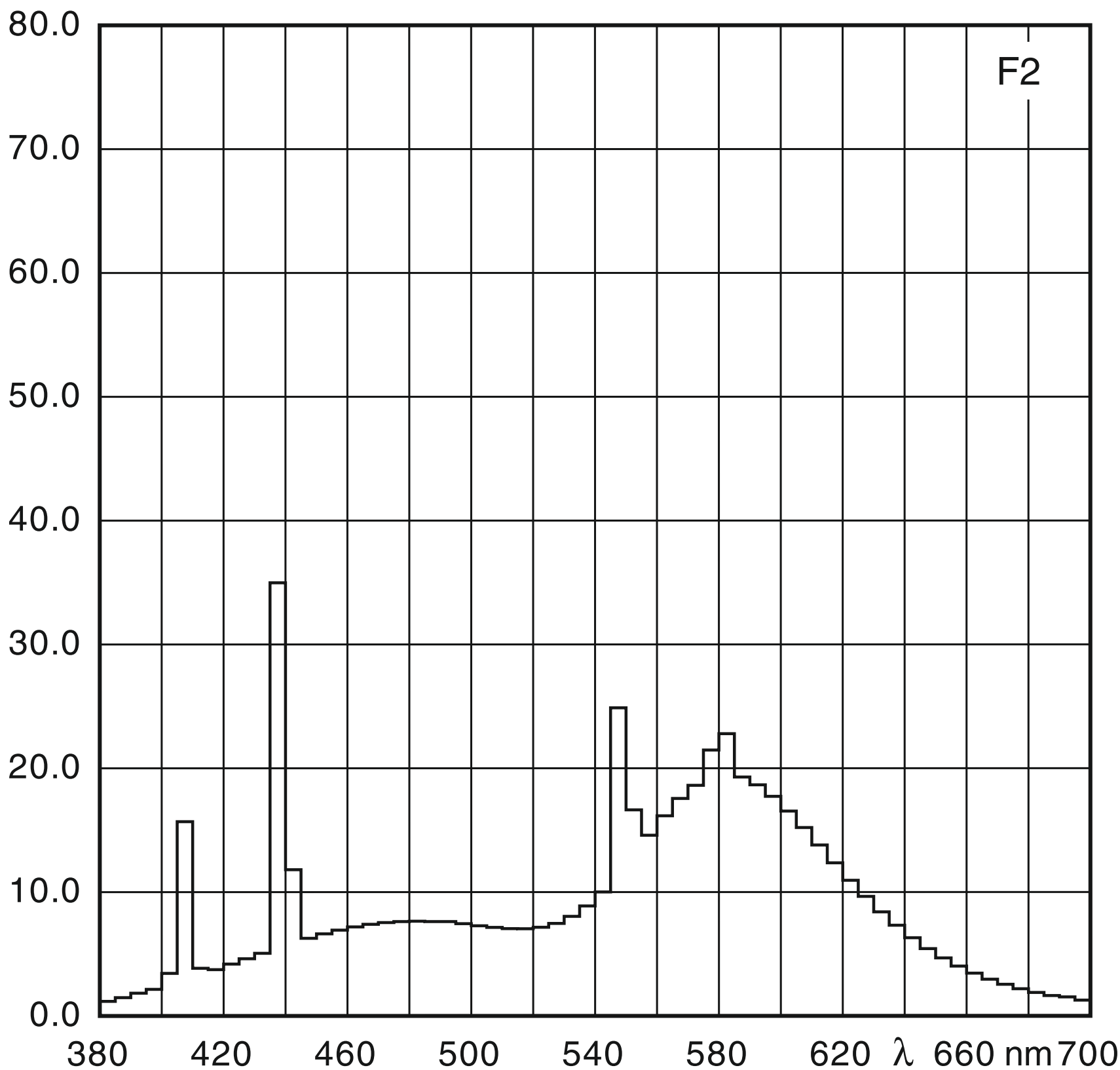
16. Daylight Dxx

Relative Intensity



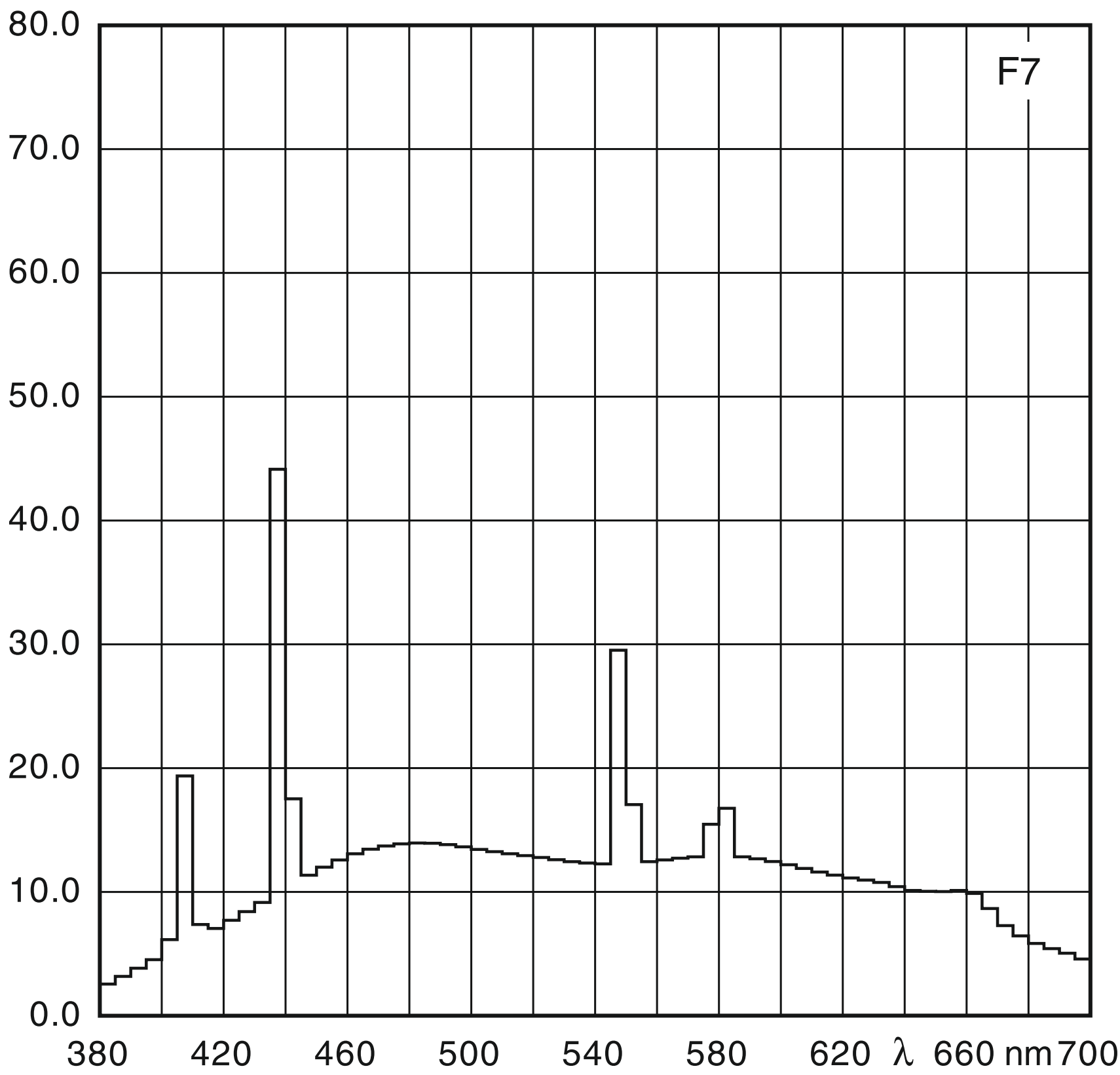
17.1 Fluorescent F2

Relative Intensity
Normal type



17.2 Fluorescent F7

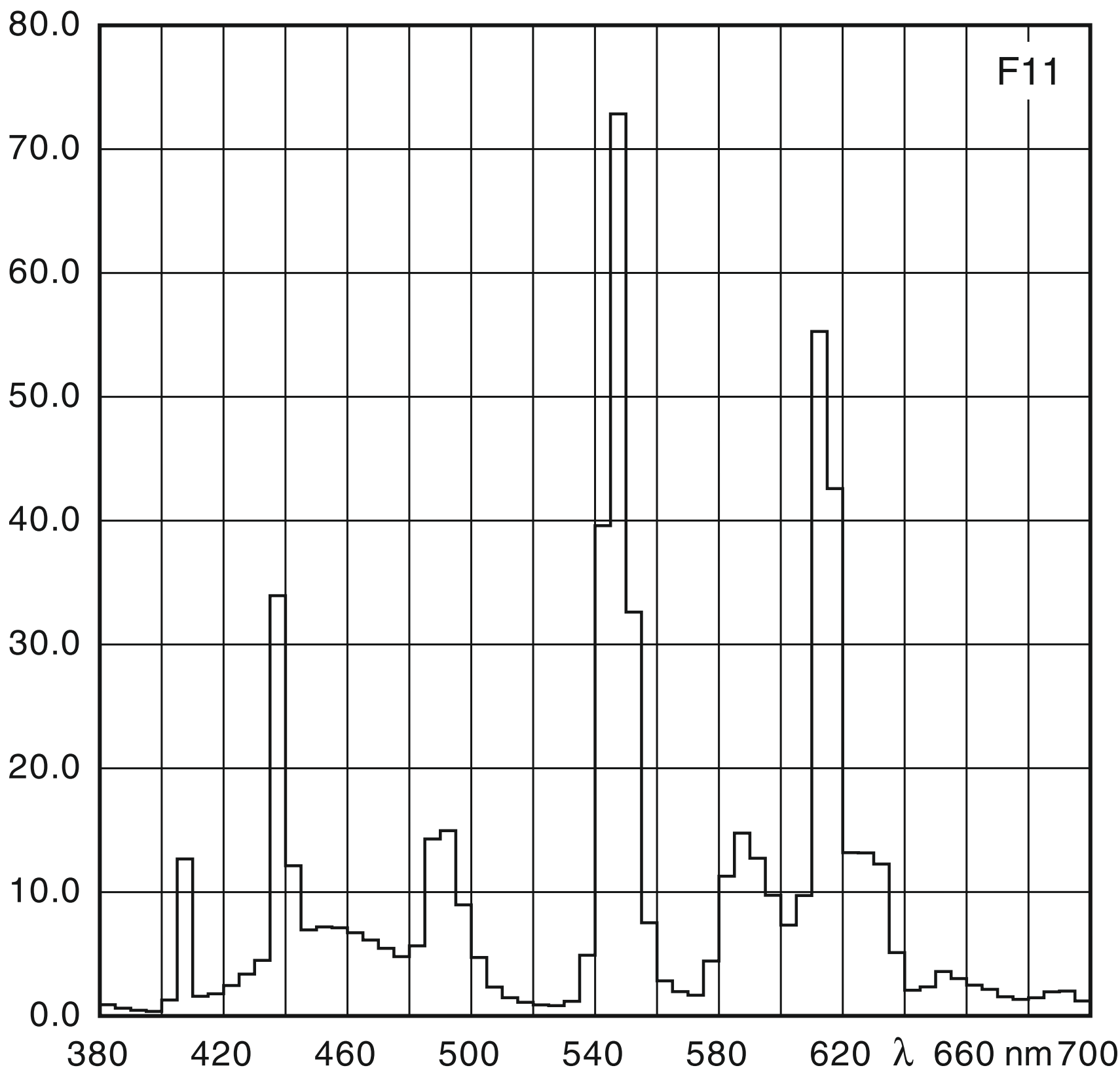
Relative Intensity
Broad-band type



17.3 Fluorescent F11

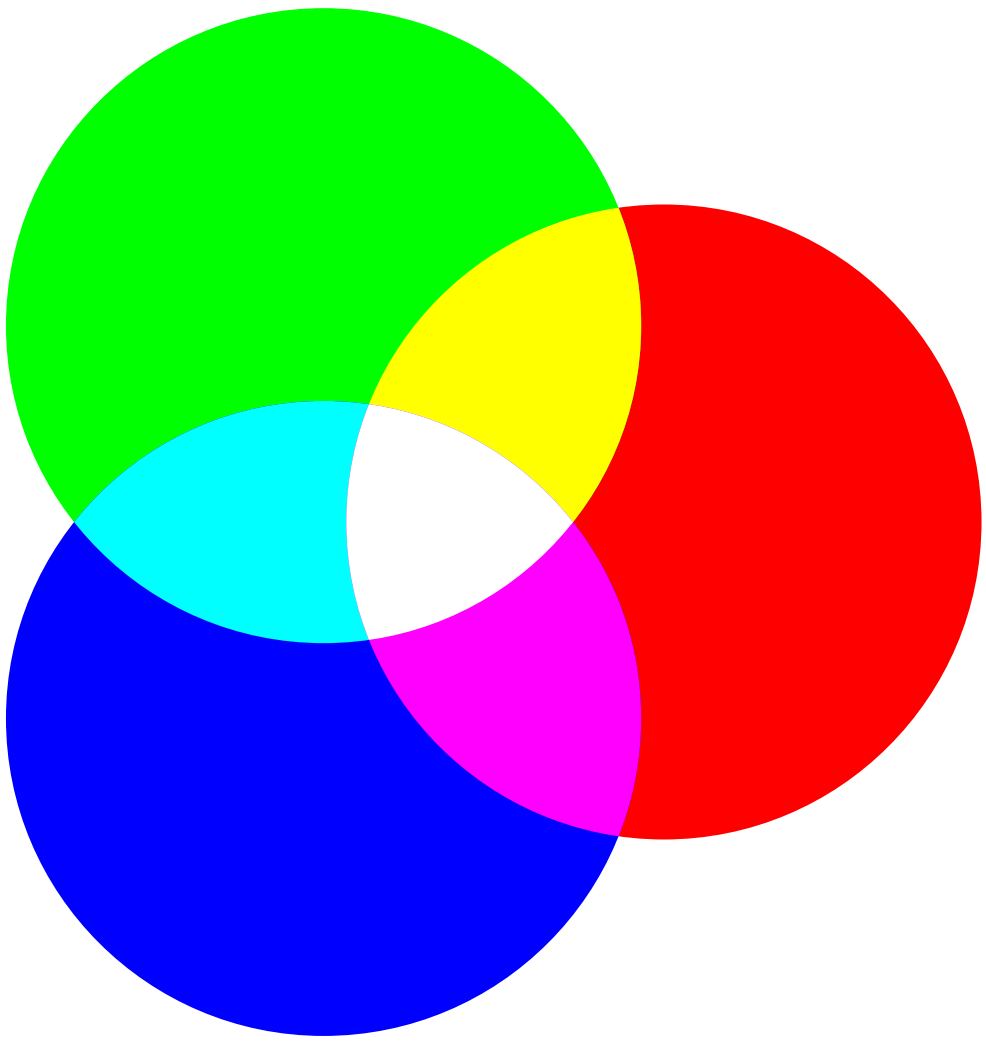
Relative Intensity

Three-band type



18.1 Additive versus Subtractive

Standard textbook illustration - RGB is additive [20]



Standard textbook illustration - CMY is subtractive [21]

19.1 Files

1. Color Wheel
   http://docs-hoffmann.de/colorwheel.txt

2. Color-Matching Function RGB
   http://docs-hoffmann.de/matchrgb.txt

3. Color-Matching Function XYZ
   http://docs-hoffmann.de/matchxyz.txt

4. Cone Response
   http://docs-hoffmann.de/coneresp.txt

5. Chromaticity Diagram with Color Temperatures
   http://docs-hoffmann.de/ciesuper.txt

6. Chromaticity Diagram with Gamut Triangles
   http://docs-hoffmann.de/ciegamut.txt

7. Chromaticity Diagram Lu'v'
   http://docs-hoffmann.de/cieuv.txt

8. CIELab Gamut Volume for sRGB
   http://docs-hoffmann.de/labbody.txt

9. CIELab Wireframe for CIE-RGB / NTSC / RGB
   http://docs-hoffmann.de/labwire.txt

10. CIELab and sRGB Numbers
    http://docs-hoffmann.de/cielab709-50num.txt

11. Reflectance Ink Spectra ISO 2846-1 / 45°
    http://docs-hoffmann.de/spectrum45.txt

12. Reflectance Ink Spectra ISO 2846-1 / 08°
    http://docs-hoffmann.de/spectrum08.txt

13. Density Ink Spectra ISO 2846-1 / 45°
    http://docs-hoffmann.de/density45.txt

14. Density Ink Spectra ISO 2846-1 / 08°
    http://docs-hoffmann.de/density08.txt

15. Daylight ABC
    http://docs-hoffmann.de/daylightabc.txt

16. Daylight Dxx
    http://docs-hoffmann.de/daylightdxx.txt

17. Fluorescent F2
    http://docs-hoffmann.de/fluorescf02.txt

18. Fluorescent F7
    http://docs-hoffmann.de/fluorescf07.txt

19. Fluorescent F11
    http://docs-hoffmann.de/fluorescf11.txt

19.2 Files

20. Three overlapping circles (RGB)
    http://docs-hoffmann.de/rgb-circle.txt

21. Three overlapping circles (CMY)
    http://docs-hoffmann.de/cmy-circle.txt

    New April 2015

22. Chromaticity diagram with smooth shading.
    Choice of gamut triangles and color temperature curve
    http://docs-hoffmann.de/ciegamut-smooth.txt

    Save as *.txt and rename as *.eps

20. References

[1] R.W.G.Hunt
Measuring Colour
Fountain Press England 1998

[2] G.Wyszecki + W.S.Stiles
Color Science
John Wiley & Sons, Inc
New York ... Toronto 1982 / 2000

[3] Gernot Hoffmann / Many Dokuments
http://docs-hoffmann.de/howww41a.html

This doc:

http://docs-hoffmann.de/ciegraph17052004.pdf

Gernot Hoffmann
May 17 / 2005 – April 04 / 2015
Website
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