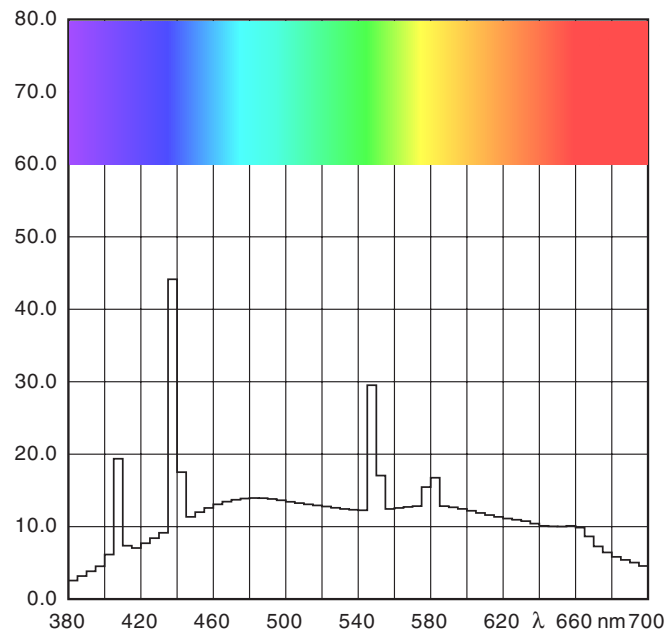


# Gernot Hoffmann

## Fluorescent Illuminants and Tubes



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# 1. Introduction

This doc shows data sets for fluorescent illuminants according to [1].

The calculations were done by SpectroCalc [4] and [9].

The reference list is the same as in [4].

It is intended to add informations about available fluorescent tubes.  
It seems that no manufacturer uses the scientific notation F1-F12.

All color coordinates are calculated for  $Y=1$  and  $L^*=100$ .  
The dE calculation is meaningless.

Chapter 2:

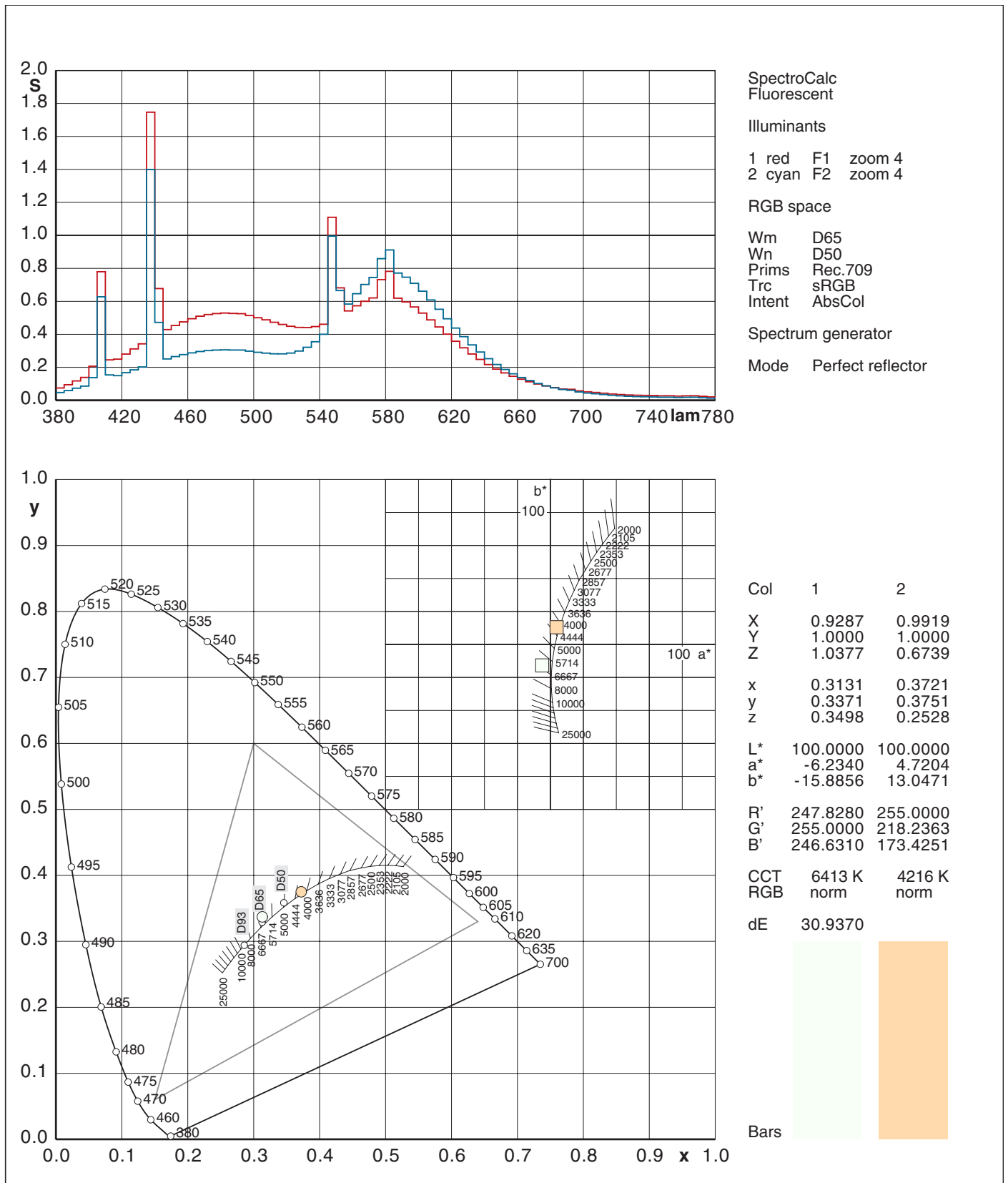
RGB values are calculated for sRGB. RGB values would be out of gamut if the actual white point is not near to the white point for sRGB (6500K). The rendering intent is Absolute Colorimetric (AbsCol). Therefore the RGB values are normalized by defining the largest value as 255. After the normalization the sRGB tone reproduction curve is applied (gamma encoding), which delivers RGB'. The normalization is indicated by 'norm' instead of a gamut warning.  
The simulated color patches would show a 6500K illuminant on a monitor which is near to sRGB neutrally gray. Warmer illuminants are looking quite yellow-ish and too dark. If the patch would be blown up to screen size with removed menu areas, then the appearance would be better because of adaptation.

Chapter 3:

Standard tubes have often a correlated color temperature of about 4100K. Here we use 4000K as 'Viewing Reference' color temperature, because 4100K is not available in the data base. Now we can compare warmer and cooler tubes, so far represented by illuminants. In a real environment, a 5000K tube, e.g. for inspecting prints, looks already rather cool, especially if 4000K tubes are available as standard office light.  
The RGB calculations are still done for Rec.709 primaries and the sRGB tone reproduction curve, but the working space white point is at 4000K. The rendering intent is AbsCol, as in chapter 2.

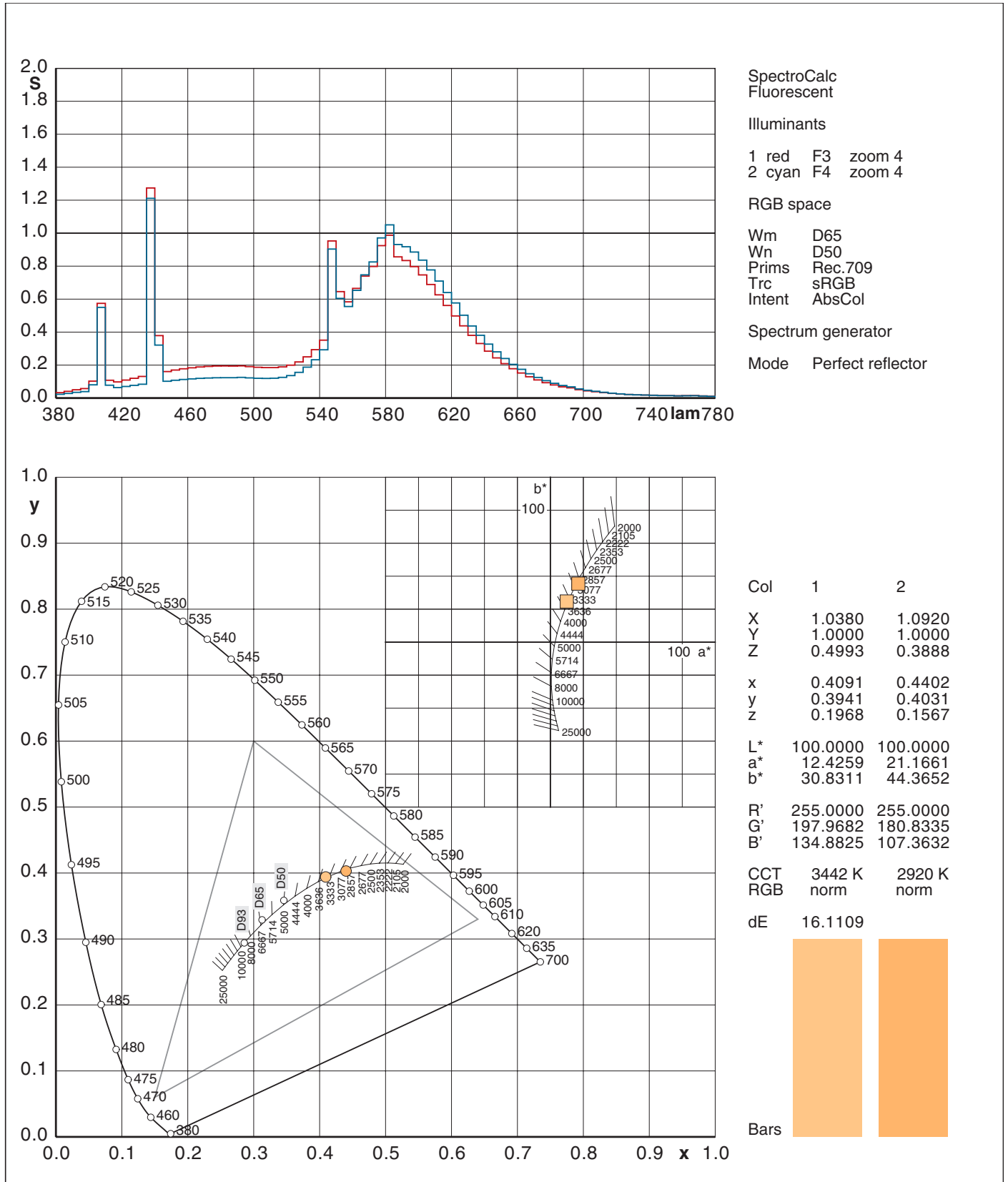
# 2.1 Fluorescent Illuminants F1+F2 / View 6500K

Manufacturers:



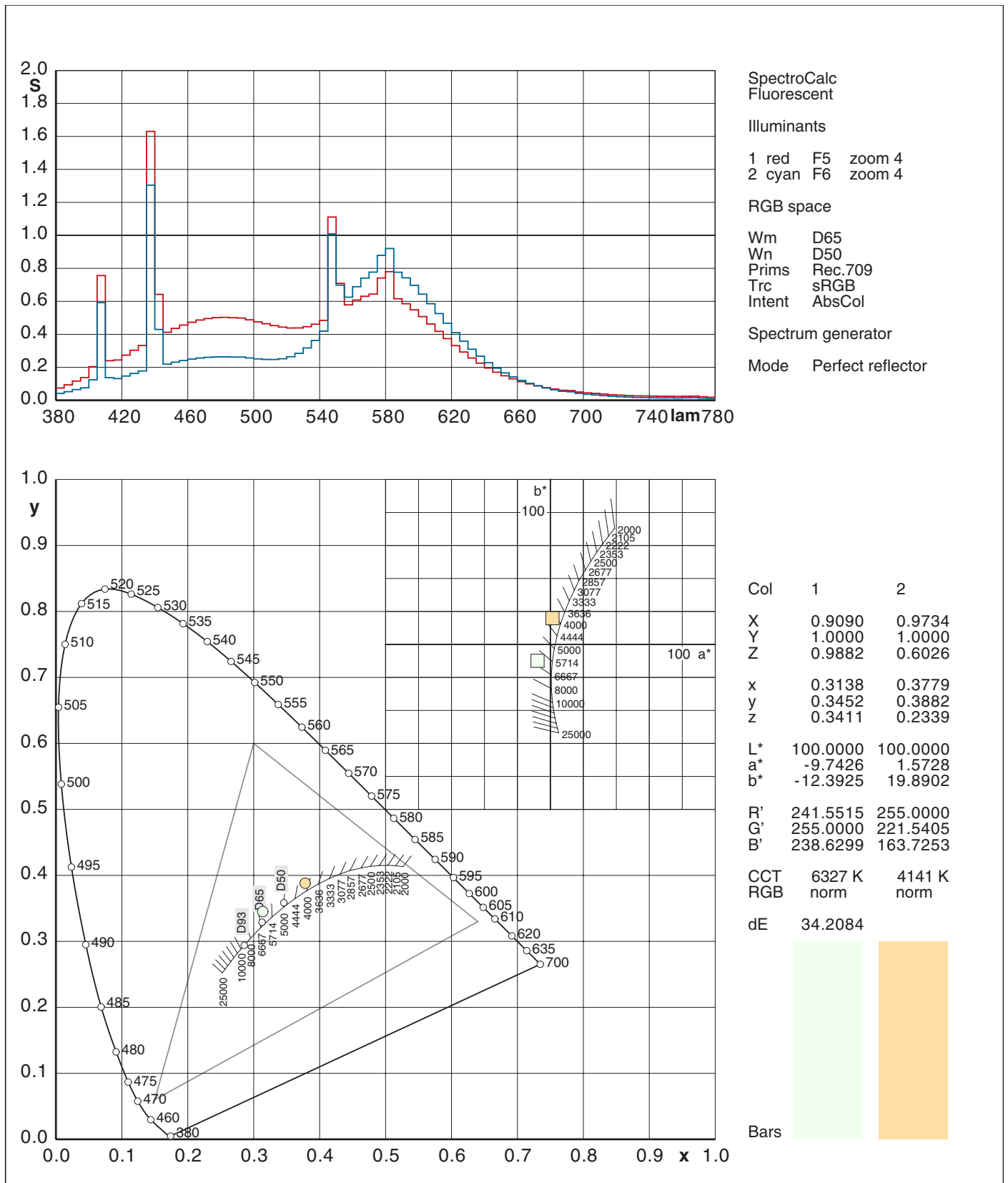
# 2.2 Fluorescent Illuminants F3+F4 / View 6500K

Manufacturers:



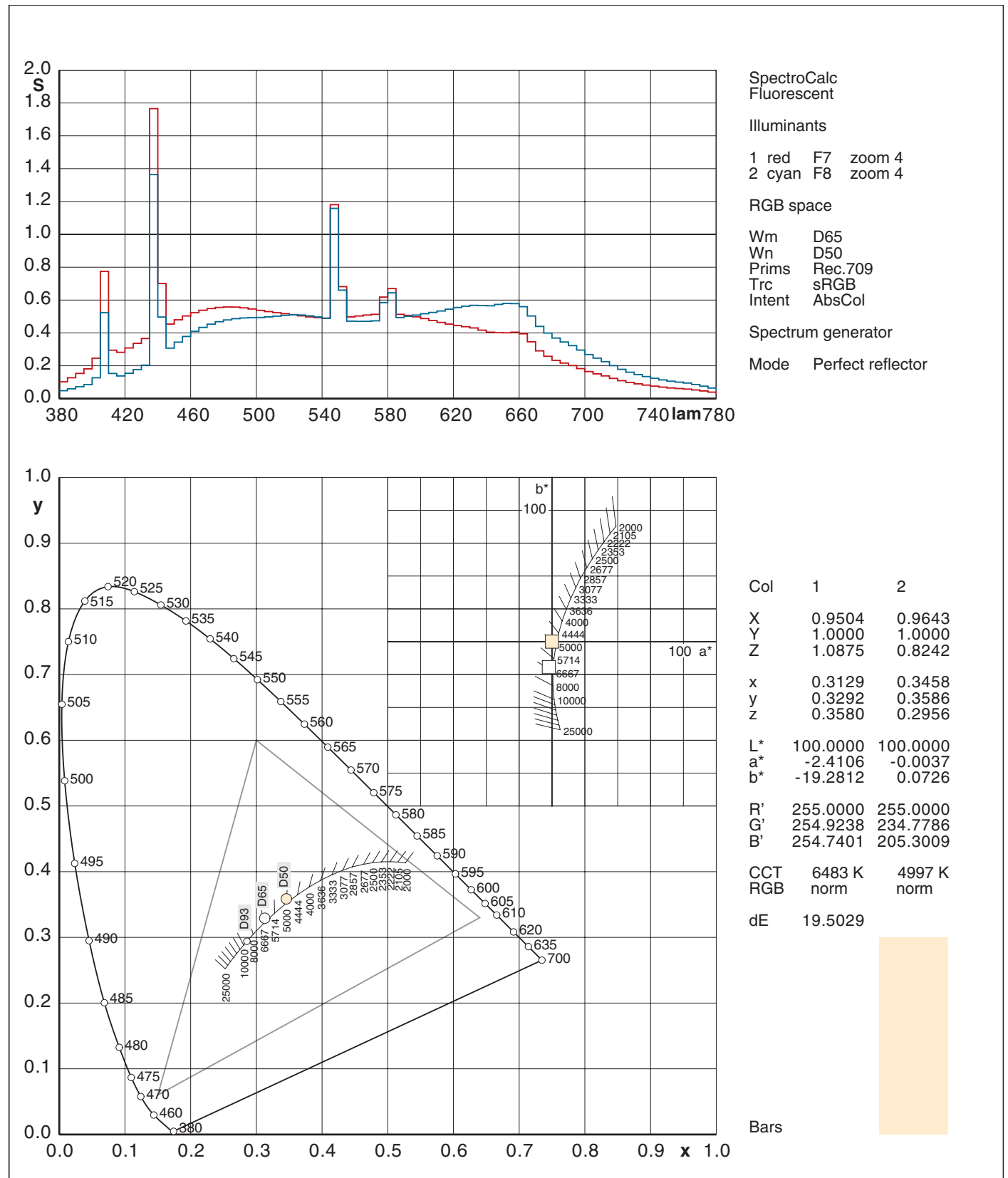
## 2.3 Fluorescent Illuminants F5+F6 / View 6500K

Manufacturers:



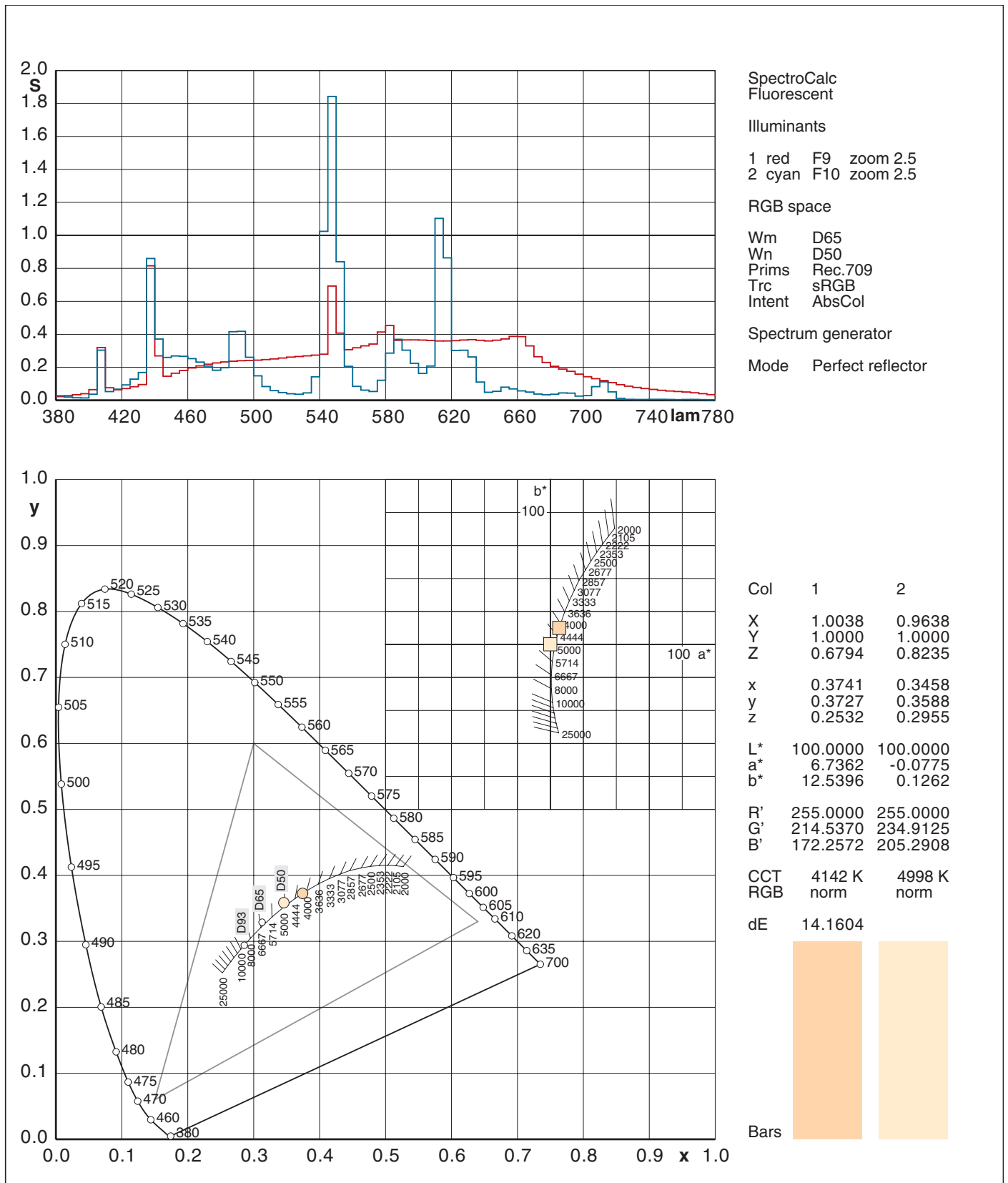
# 2.4 Fluorescent Illuminants F7+F8 / View 6500K

Manufacturers:



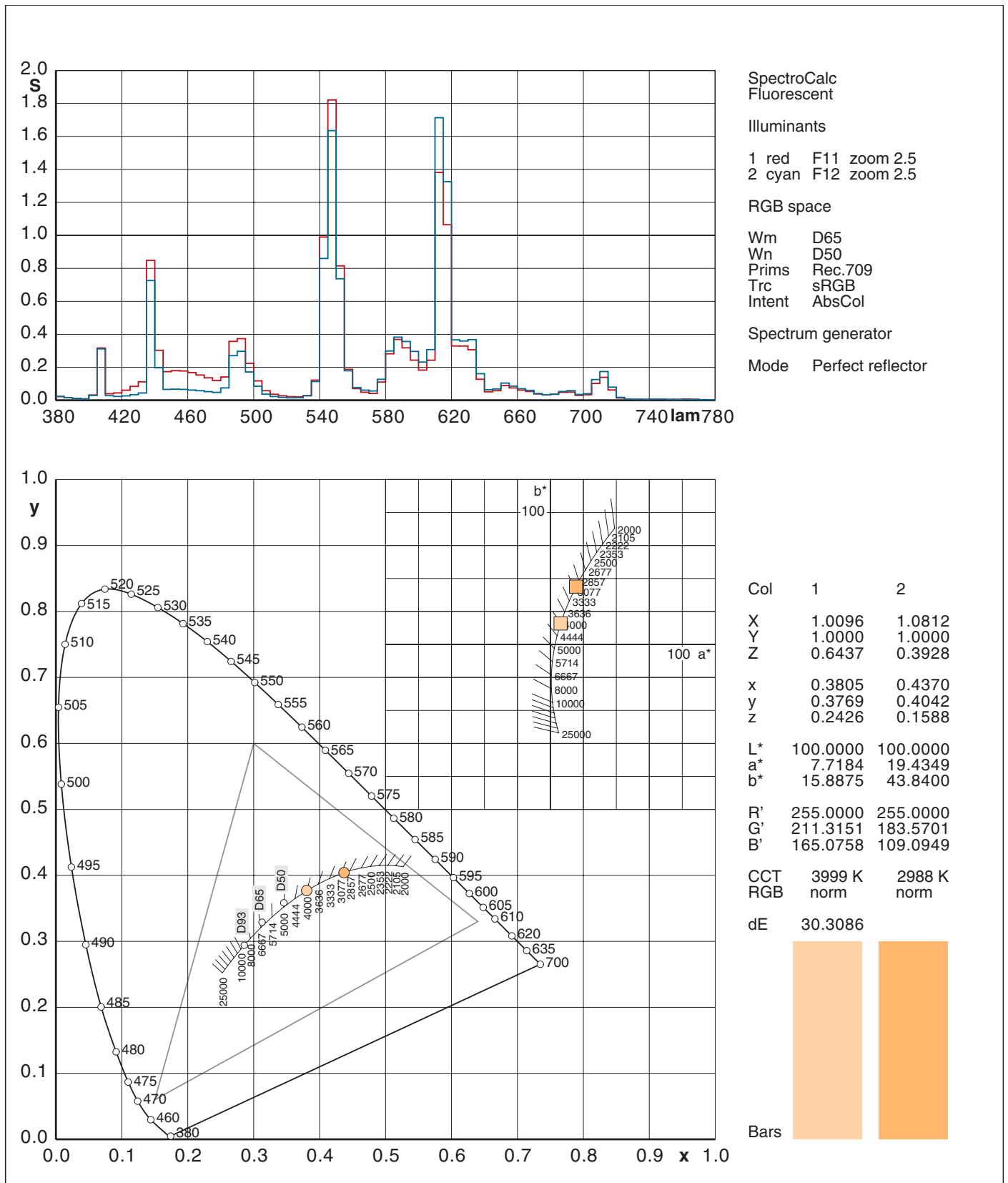
# 2.5 Fluorescent Illuminants F9+F10 / View 6500K

Manufacturers:



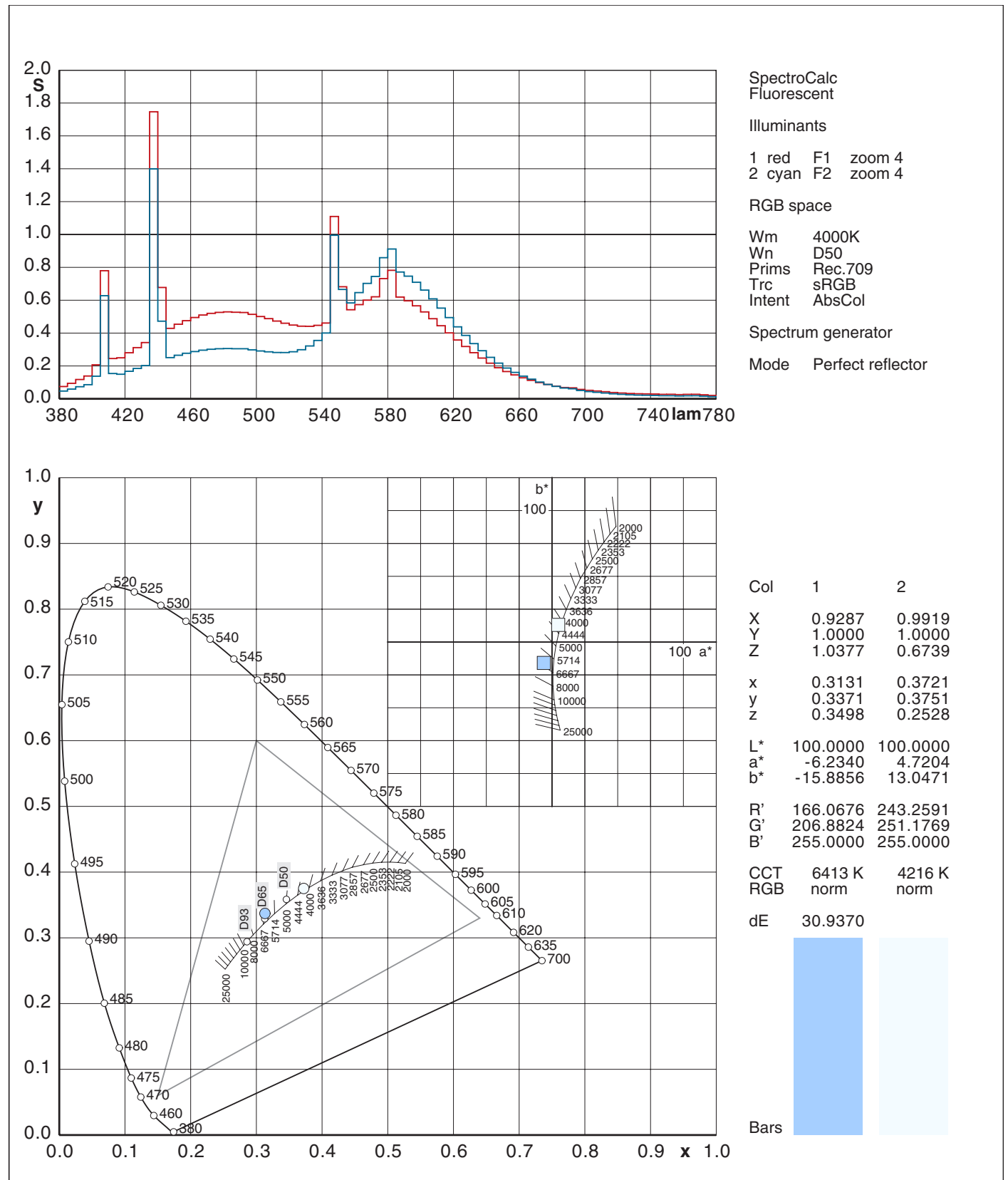
# 2.6 Fluorescent Illuminants F11+F12 / View 6500K

Manufacturers:



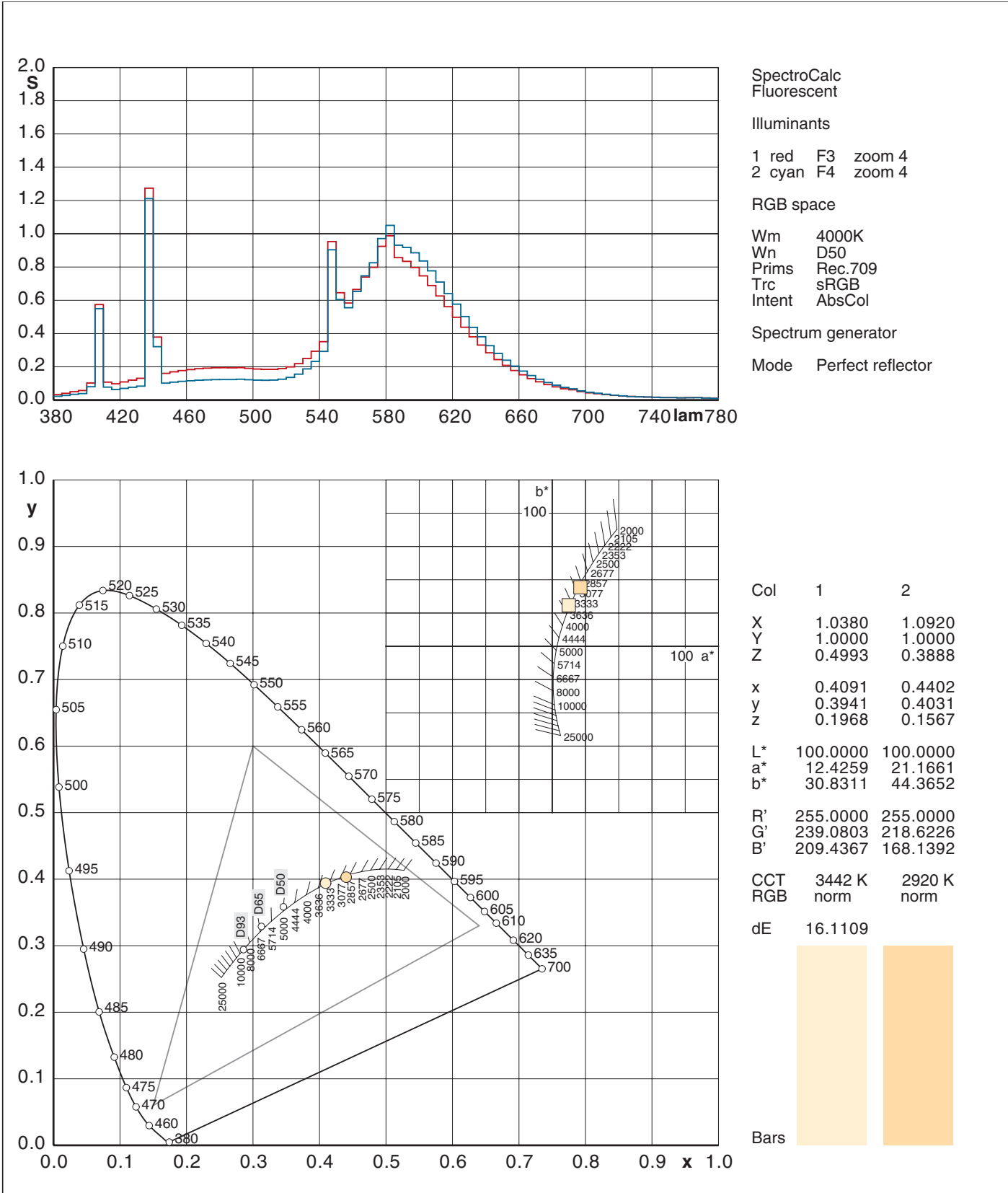
# 3.1 Fluorescent Illuminants F1+F2 / View 4000K

Manufacturers:



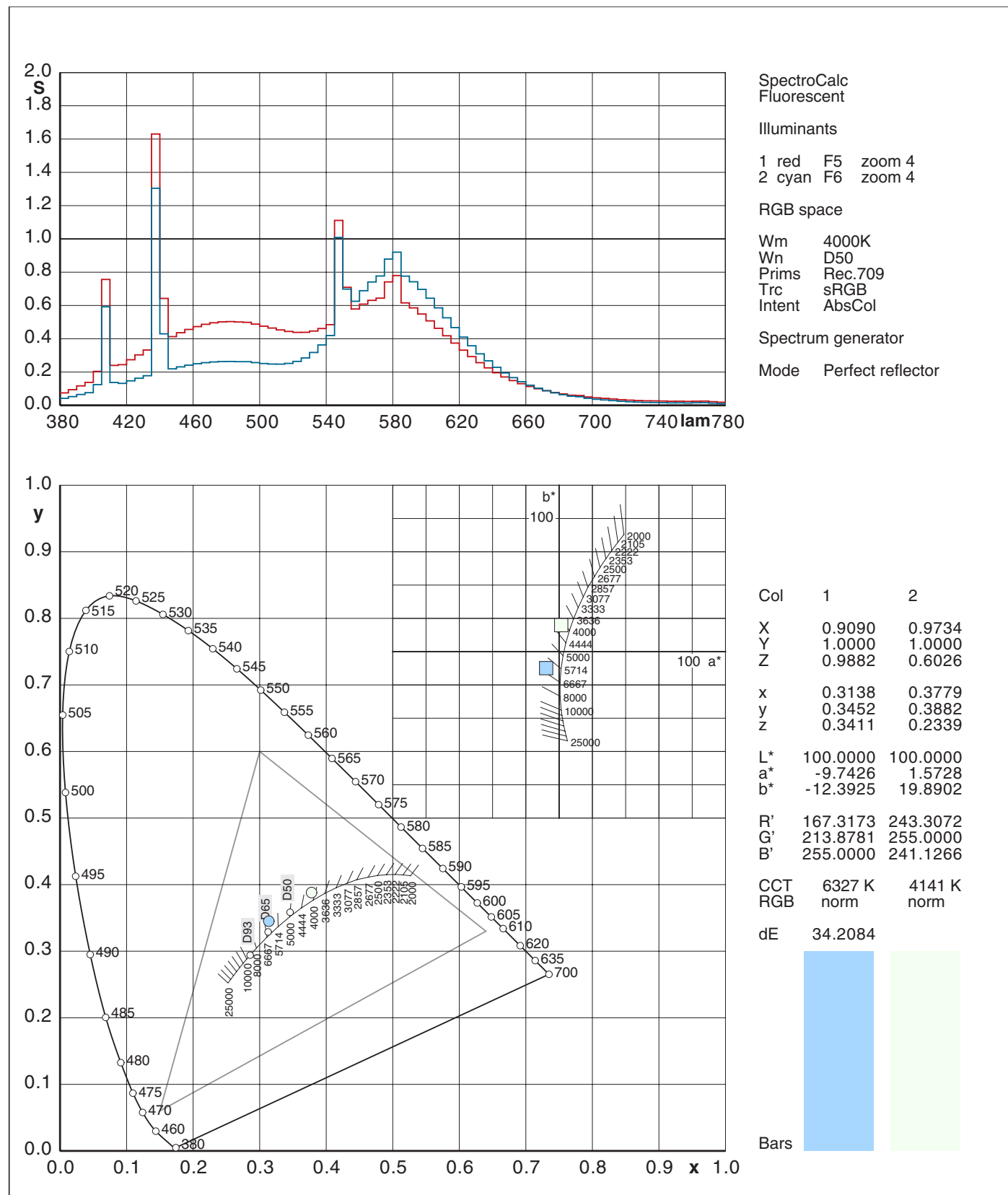
# 3.2 Fluorescent Illuminants F3+F4 / View 4000K

Manufacturers:



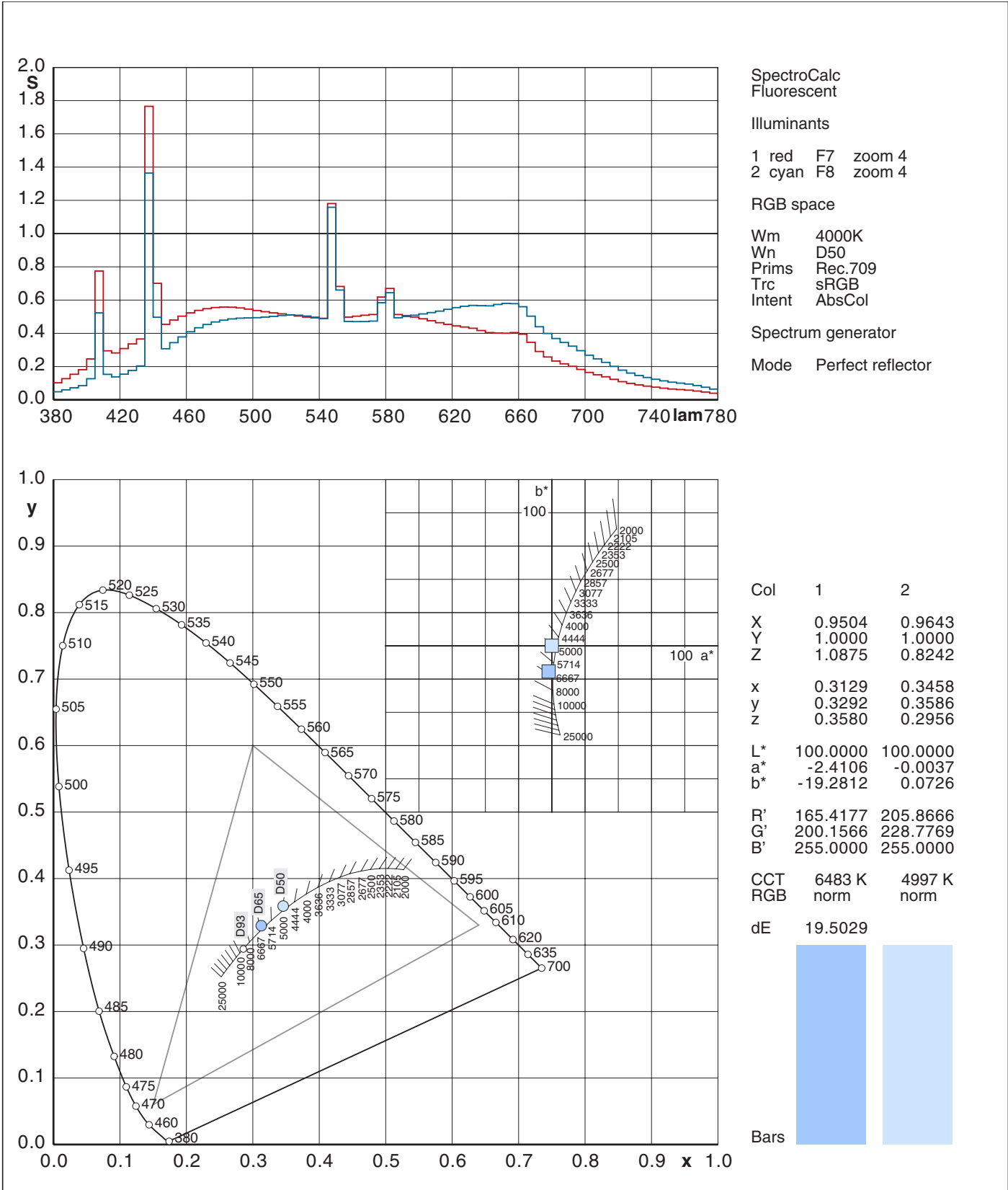
# 3.3 Fluorescent Illuminants F5+F6 / View 4000K

Manufacturers:



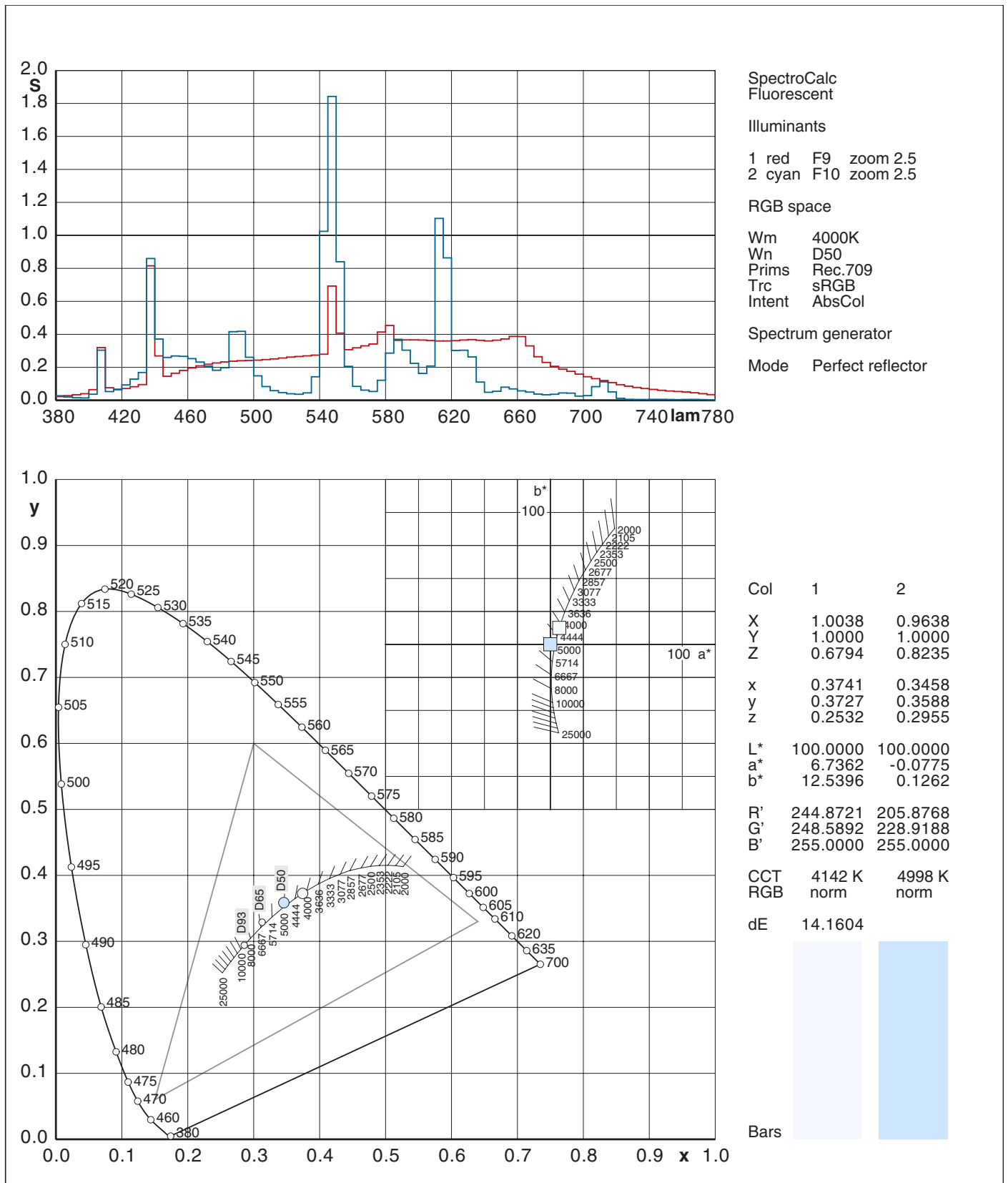
# 3.4 Fluorescent Illuminants F7+F8 / View 4000K

Manufacturers:



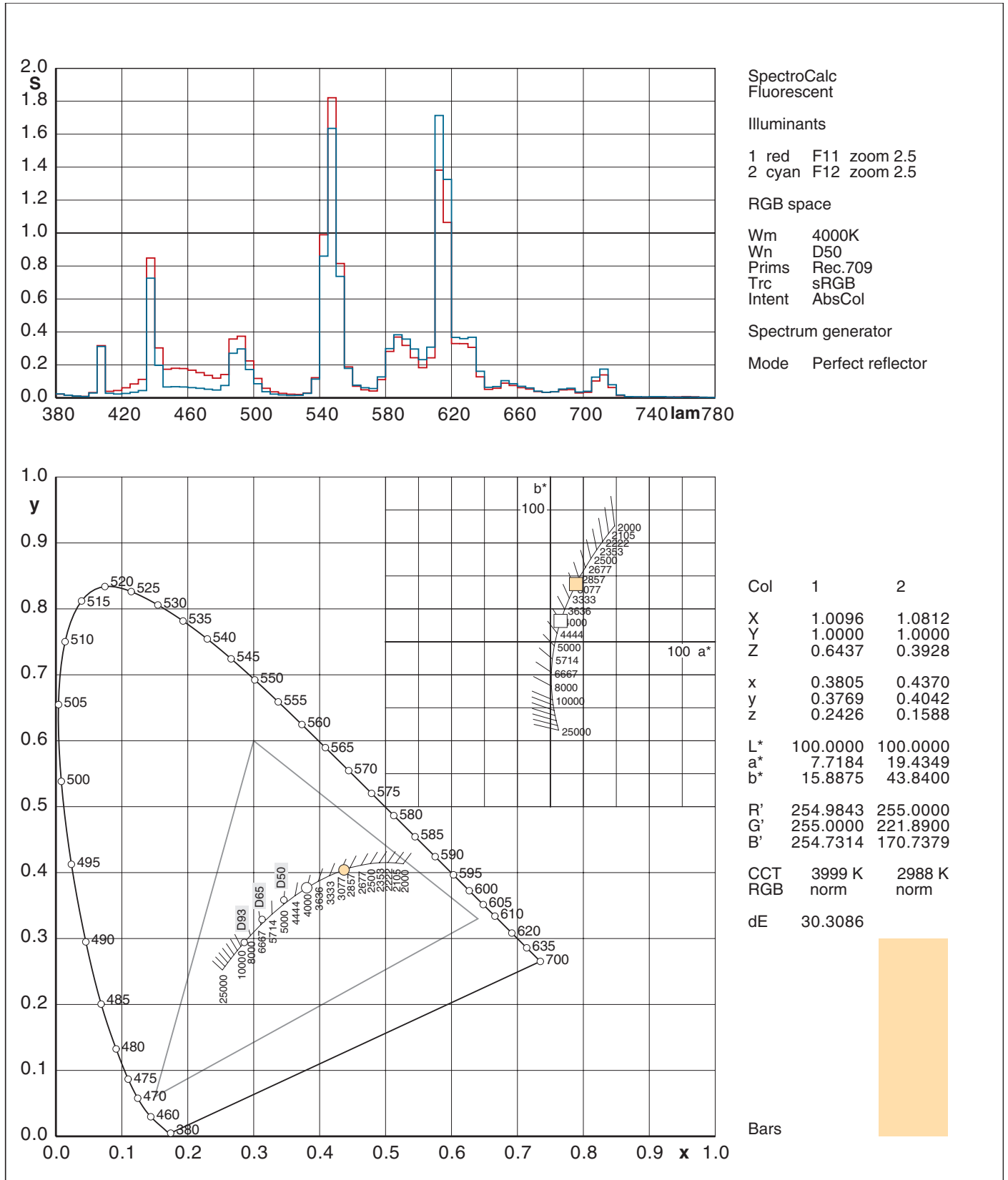
# 3.5 Fluorescent Illuminants F9+F10 / View 4000K

Manufacturers:



# 3.6 Fluorescent Illuminants F11+F12 / View 4000K

Manufacturers:



## 4. Commercial Designations

By courtesy of the author:

D. C. Rich

Light Sources and Illuminants: How to Standardize Retail Lighting

Textile Chemist and Colorist, vol 30, No. 1, pp 8-14, 1998.

Type	Commercial designation	Illuminant	Chromaticity		CCT K	CRI Ra
			x	y		
Standard	DAY	F1	0.3131	0.3371	6430	76
Standard	CWF	F2	0.3721	0.3751	4230	64
Standard	WHITE	F3	0.4091	0.3941	3450	57
Standard	WWF	F4	0.4402	0.4031	2940	51
Standard	DAY	F5	0.3138	0.3452	6350	72
Standard	LWF	F6	0.3779	0.3882	4152	59
Broad band	D65	F7	0.3129	0.3292	6500	90
Broad band	D50	F8	0.3458	0.3586	5000	95
Broad band	CWX	F9	0.3741	0.3727	4150	90
3 narrow bands	TL85	F10	0.3458	0.3588	5000	81
3 narrow bands	TL84	F11	0.3805	0.3769	4000	83
3 narrow bands	TL83	F12	0.4370	0.4042	3000	83

Abbreviations:

DAY	Daylight
CWF	Cool White Fluorescent
WHITE	
WWF	Warm White Fluorescent
LWF	
CWX	Cool White Delux
TL85	Philips 5000K
TL84	Philips 4000K
TL83	Philips 3000K

The nomenclature by Radium and Osram is at present not clear.  
G.H.

## 5. References

- [1] R.W.G.Hunt  
Measuring Colour  
Fountain Press, England, 1998
  - [2] International Color Consortium  
<http://www.color.org>
  - [3] Specification ICC.1:21001-12  
File Format for Color Profiles (Version 4.0.0)  
<http://www.color.org/newiccspec.pdf>
  - [4] G.Hoffmann  
Color Mathematics by PostScript  
<http://www.fho-emden.de/~hoffmann/colcalc03022006.pdf>
  - [5] G.Wyszecki + W.S.Stiles  
Color Science  
John Wiley & Sons, New York .., 1982/2000
  - [6] G.Hoffmann  
CIE (1931) Color Space  
<http://www.fho-emden.de/~hoffmann/ciexyz29082000.pdf>
  - [7] G.Hoffmann  
CIELab Color Space  
<http://www.fho-emden.de/~hoffmann/cielab03022003.pdf>
  - [8] G.Hoffmann  
ColorCalc PostScript Code  
<http://www.fho-emden.de/~hoffmann/colcalc03022006.txt>  
Rename as \*.eps
  - [9] G.Hoffmann  
SpectroCalc PostScript Code  
<http://www.fho-emden.de/~hoffmann/specalc03022006.txt>  
Rename as \*.eps
  - [10] G.Hoffmann  
Color Management by ICC profiles  
<http://www.fho-emden.de/~hoffmann/cmsicc08102003.pdf>
  - [11] <http://www.brucelindbloom.com>
- This doc  
<http://www.fho-emden.de/~hoffmann/fluorescent02062006.pdf>

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June 14 / 2006  
Website  
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