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Date
Jan 27, 2005

Reference
MTeF501292

Spectral measurements on TV-monitors

(1 appendix)

Identification

Object	TV-monitor SMPTE Sony BVM-14E5U Serial No. 2100054
	TV-monitor EBU Sony BVM-14F5E Serial No. 2001951
	Philips PM5639 display unit with colour sensor, No. KU059999
Object state	Upon arrival the object had no visual damages.
Arrival date	Jan 26, 2005
Measurement location	Borås
Measurement date	Jan 26, 2005

Measurement methods and procedures

Relative spectral radiance was measured every 5 nm in the wavelength range 380 nm - 775 nm using a Zeiss MM12 double prisms monochromator having a photomultiplier detector. Each monitor was positioned in front of the entrance of the monochromator at about 40 cm distance giving a measurement spot of about 2 x 3 cm size. The monitor was adjusted so the spot came in the center position of a pre-marked circular area on the screen.

The monochromator/detector was calibrated in relative spectral radiance using a spectral irradiance standard of 1000 W tungsten halogen lamp type F.E.L. (No. F143) irradiating a pressed barium sulphate tablet.

The luminance was measured using a luminance meter LMT type 1009.

Measurement conditions

Measurement conditions	23 ±1 °C
	The monitors was connected to 230 V AC ±0.5 V

Results

Relative spectral radiance in the 380 nm - 775 nm wavelength range.
See diagrams 1-8.



Test object	Luminance	CIE 1931 chromaticity coordinates for 2° standard observer		
		cd·m ⁻²	x	y
BVM-14E5U white	80,7		0,3130	0,3294
BVM-14E5U red			0,6246	0,3407
BVM-14E5U green			0,3125	0,5916
BVM-14E5U blue			0,1536	0,0733
BVM-14F5E white	81,0		0,3117	0,3287
BVM-14F5E red			0,6436	0,3304
BVM-14F5E green			0,2909	0,6016
BVM-14F5E blue			0,1505	0,0581

Test object	Luminance	Luminance and chromaticity coordinates with Philips PM5639 with colour sensor		
		cd·m ⁻²	x	y
BVM-14E5U white	78,6		0,3154	0,3297
BVM-14E5U red			0,6267	0,3394
BVM-14E5U green			0,3101	0,5905
BVM-14E5U blue			0,1533	0,0724
BVM-14F5E white	80,1		0,3131	0,3295
BVM-14F5E red			0,6458	0,3296
BVM-14F5E green			0,2873	0,6029
BVM-14F5E blue			0,1503	0,0571

Measurement uncertainty

Estimated total uncertainty is ± 0.002 for the white and green colours, ± 0.005 for the blue and red colours and $\pm 2\%$ of the measured luminance at the time of the measurement. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %. The standard uncertainty of measurement has been determined in accordance with EAL Publication EA-4/02 (formerly EAL-R2).

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Traceability

The spectral irradiance of the F.E.L. lamp is traceable to NIST, USA by substitution to a group of F.E.L. lamps that are calibrated by NIST.

The luminance measurements are traceable to the Bureau Internationale de Poids et Mesures (BIPM), Sèvres through a primary group of luminous intensity standards calibrated by the BIPM every second year. The luminance meter is calibrated using a luminance source, having a characterized luminance distribution. The mean luminance of the source is calibrated, at a given distance, against a illuminance standard having a very accurate $V(\lambda)$ -correction. The illuminance standard is calibrated, at a given distance, against a working luminous intensity standard, which is calibrated against the primary group.

**SP Swedish National Testing and Research Institute
Measurement Technology, MTe**

A handwritten signature in black ink, appearing to read 'Gösta Werner'.

Gösta Werner
Technical Manager

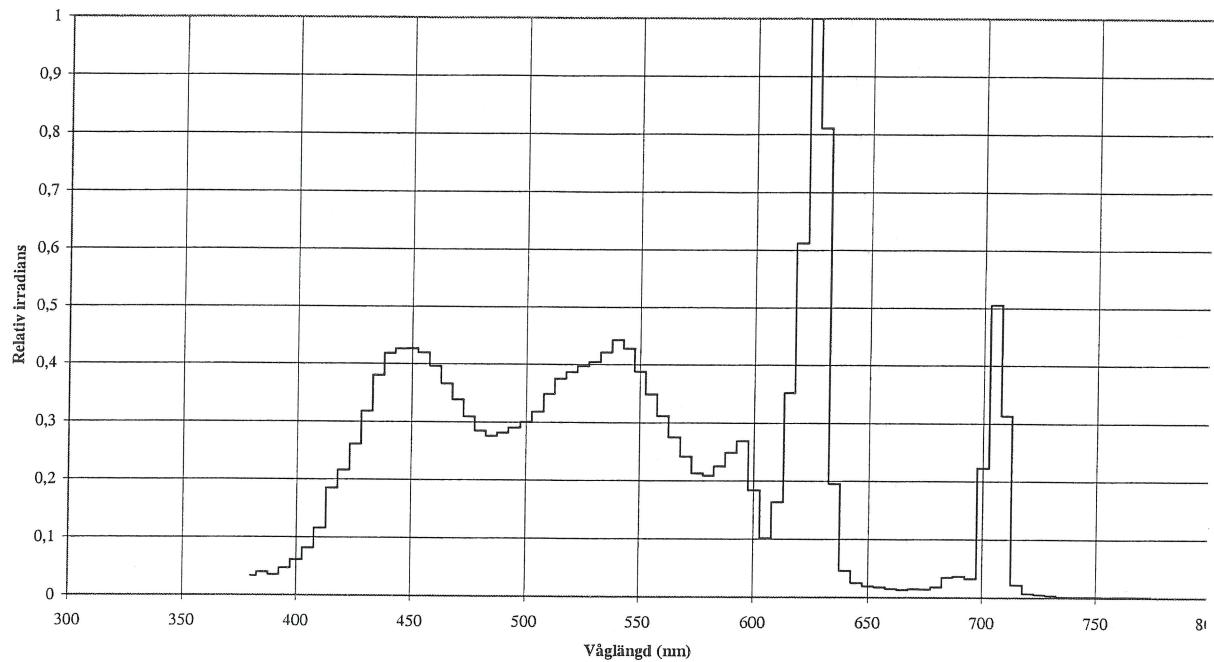
A handwritten signature in black ink, appearing to read 'Lars-Åke Norsten'.

Lars-Åke Norsten
Technical Officer

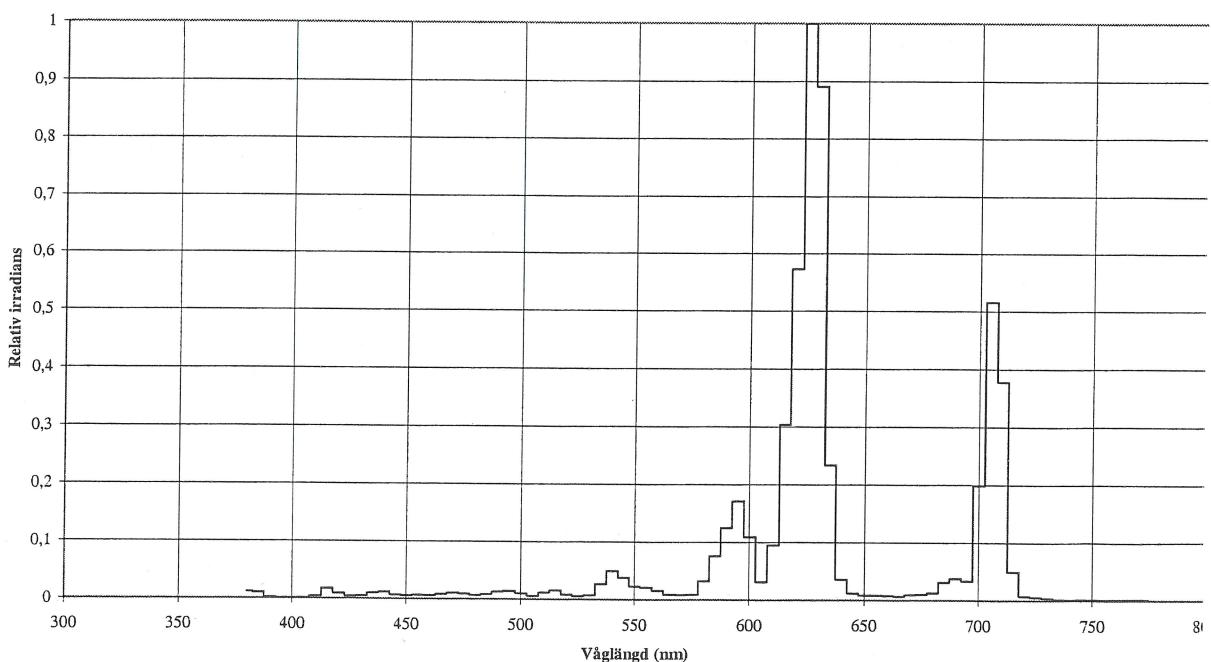
Appendix



TV-monitor Sony BVM-14E5U nr 2100054 / vit

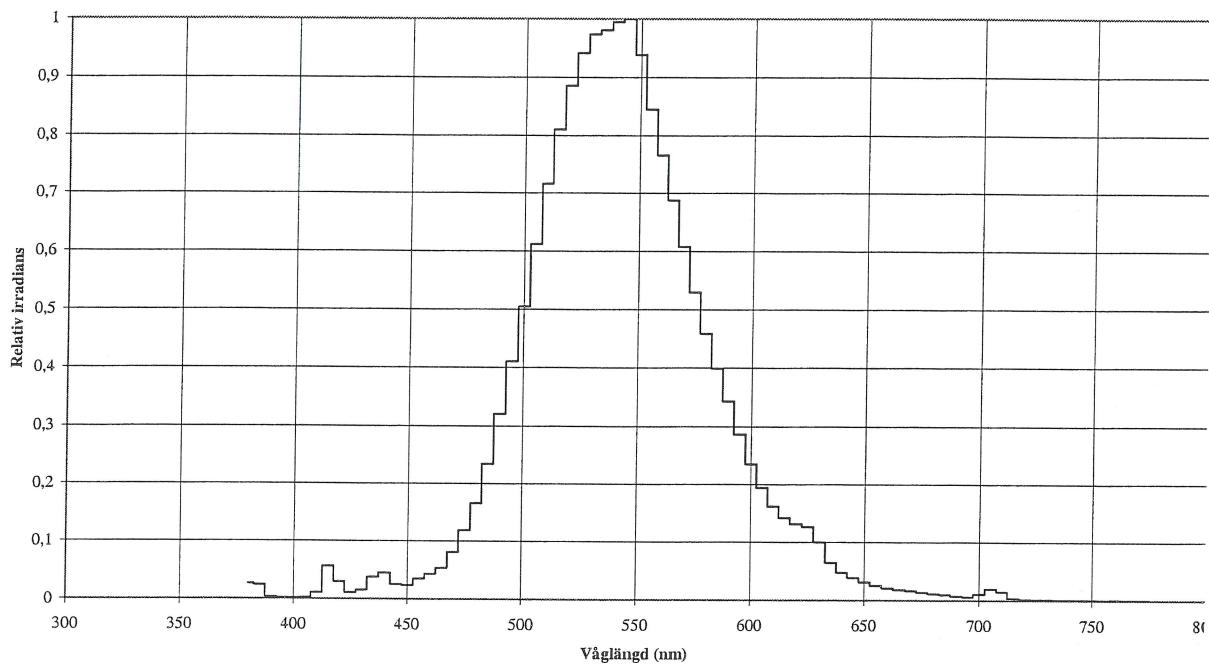


TV-monitor Sony BVM-14E5U nr 2100054 / röd

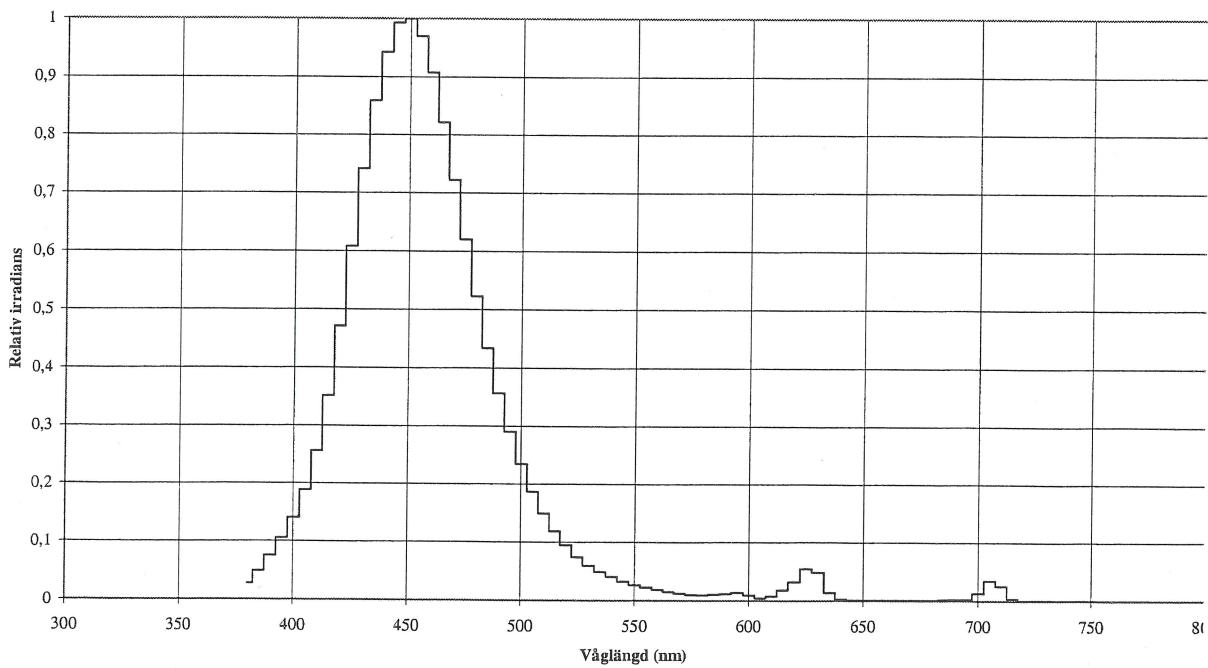




TV-monitor Sony BVM-14E5U nr 2100054 / grön

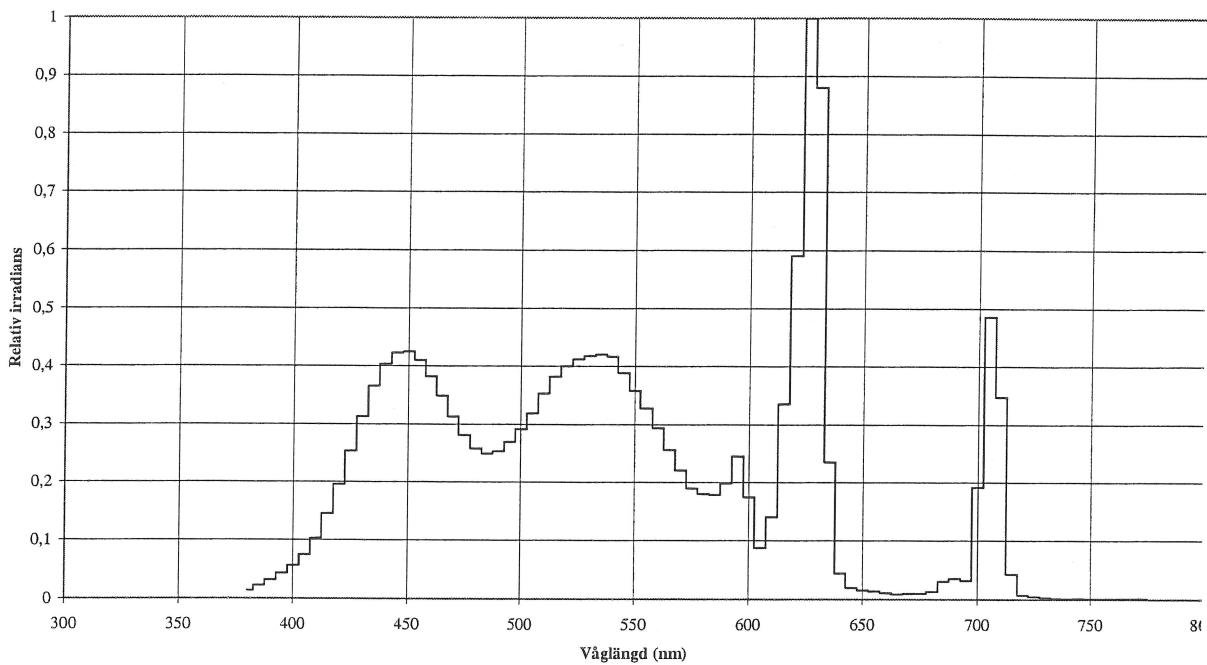


TV-monitor Sony BVM-14E5U nr 2100054 / blå

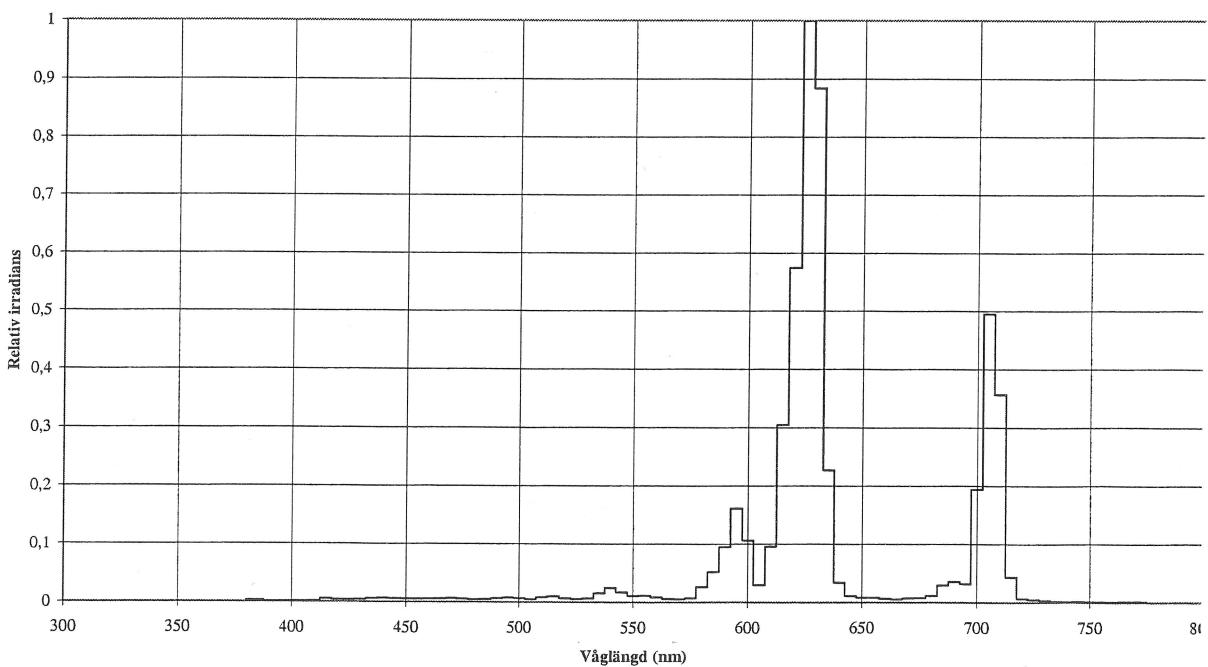




TV-monitor Sony BVM-14F5E nr 2001951 / vit

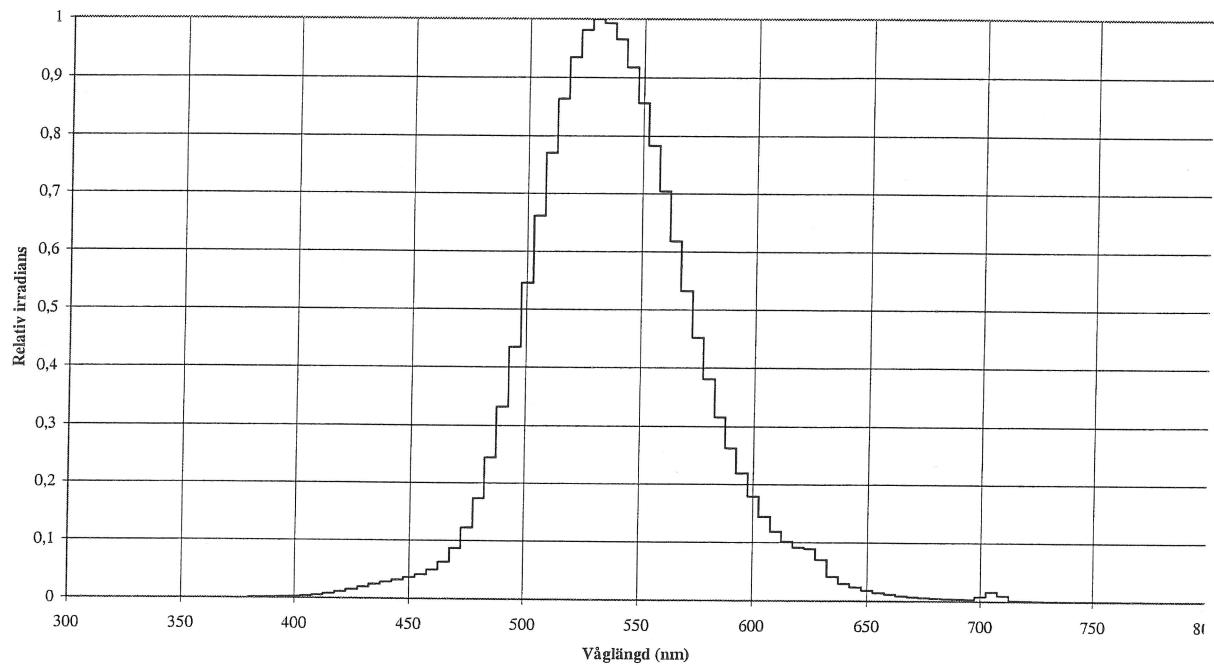


TV-monitor Sony BVM-14F5E nr 2001951 / röd





TV-monitor Sony BVM-14F5E nr 2001951 / grön



TV-monitor Sony BVM-14F5E nr 2001951 / blå

