Appendix 5

Relative Spectral Power Distributions of Illuminants

A5.1 INTRODUCTION

Relative spectral power distributions are given as follows: in Section A5.2 for CIE Standard Illuminants A, and D65, and for CIE Illuminants B, C, D50, D55, D75, ID50, and ID65; in Section A5.3 for representative fluorescent lamps; in Section A5.4 for Planckian radiators; and in Section A5.5 for gas-discharge lamps. In Section A5.6, the method is given for deriving the relative spectral power distributions for CIE D Illuminants of different correlated colour temperatures.

A5.2 CIE ILLUMINANTS

Relative spectral power distributions of illuminants

Wavelength	A	B	C	D50	D55	D65	D75	ID50	ID65
300	0.93			0.02	0.02	0.03	0.04	0.00	0.00
305	1.13			1.03	1.05	1.66	2.59	0.00	0.00
310	1.36			2.05	2.07	3.29	5.13	0.00	0.00
315	1.62			4.91	6.65	11.77	17.47	0.00	0.00
320	1.93	0.02	0.0	7.78	11.22	20.2	29.8	0.03	0.01
325	2.27	0.26	0.20	11.26	15.94	28.64	42.37	0.33	0.13
330	2.66	0.50	0.40	14.75	20.65	37.05	54.93	1.60	0.64
335	3.10	1.45	1.55	16.35	22.27	38.50	56.09	4.17	1.77
340	3.59	2.40	2.70	17.95	23.88	39.95	57.26	8.76	3.94
345	4.14	4.00	4.85	19.48	25.85	42.43	60.00	15.61	7.16

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(*Continued*)

Wavelength	A	B	C	D50	D55	D65	D75	ID50	ID65
350	4.74	5.60	7.00	21.01	27.82	44.91	62.74	24.24	11.34
355	5.41	7.60	9.95	22.48	29.22	45.78	62.86	31.93	15.68
360	6.14	9.60	12.90	23.94	30.62	46.64	62.98	37.94	19.48
365	6.95	12.40	17.20	25.45	32.46	49.36	66.65	43.65	22.50
370	7.82	15.20	21.40	26.96	34.31	52.09	70.31	47.99	24.84
375	8.77	18.8	27.5	25.72	33.45	51.03	68.51	47.23	23.81
380	9.80	22.40	33.00	24.50	32.58	49.98	66.65	22.55	46.01
385	10.90	26.85	39.92	27.20	35.34	52.31	68.28	25.56	49.19
390	12.09	31.30	47.40	29.80	38.09	54.65	69.91	28.77	52.63
395	13.35	36.18	55.17	39.60	49.52	68.70	85.89	38.67	67.11
400	14.71	41.30	63.30	49.30	60.95	82.75	101.87	48.53	81.45
405	16.15	46.62	71.81	52.90	64.75	87.12	106.85	52.21	85.97
410	17.68	52.10	80.60	56.50	68.55	91.49	111.83	55.72	90.20
415	19.29	57.70	89.53	58.30	70.07	92.46	112.28	57.33	90.96
420	20.99	63.20	98.10	60.00	71.58	93.43	112.74	58.95	91.75
425	22.79	68.37	105.80	58.90	69.75	90.06	107.89	57.84	88.40
430	24.67	73.10	112.40	57.80	67.91	86.68	103.04	56.75	85.08
435	26.64	77.31	117.75	66.30	76.76	95.77	112.09	65.08	93.98
440	28.70	80.80	121.50	74.80	85.61	104.86	121.15	73.45	102.94
445	30.85	83.44	123.45	81.00	91.80	110.94	127.05	79.73	109.14
450	33.09	85.40	124.00	87.20	97.99	117.01	132.96	86.12	115.49
455	35.41	86.88	123.60	88.90	99.23	117.41	132.63	88.09	116.30
460	37.81	88.30	123.10	90.60	100.46	117.81	132.31	90.05	117.08
465	40.30	90.08	123.30	91.00	100.19	116.34	129.80	90.64	115.89
470	42.87	92.00	123.80	91.40	99.91	114.86	127.28	91.18	114.62
475	45.52	93.75	124.09	93.30	101.33	115.39	127.02	93.17	115.30
480	48.24	95.20	123.90	95.20	102.74	115.92	126.76	95.14	115.97
485	51.04	96.23	122.92	93.60	100.41	112.37	122.26	93.69	112.55
490	53.91	96.50	120.70	92.00	98.08	108.81	117.75	92.23	109.12
495	56.85	95.71	116.90	93.90	99.38	109.08	117.16	94.19	109.48
500	59.86	94.20	112.10	95.70	100.68	109.35	116.57	96.13	109.82
505	62.93	92.37	106.98	96.20	100.69	108.58	115.12	96.65	109.12
510	66.06	90.70	102.30	96.60	100.70	107.80	113.68	97.16	108.41
515	69.25	89.95	98.81	96.90	100.34	106.30	111.16	97.44	106.93
520	72.50	89.50	96.90	97.10	99.99	104.79	108.65	97.71	105.42
525	75.79	90.43	96.78	99.60	102.10	106.24	109.54	100.18	106.84
530	79.13	92.20	98.00	102.10	104.21	107.69	110.44	102.63	108.25
535	82.52	94.46	99.94	101.50	103.16	106.05	108.36	101.90	106.54
540	85.95	96.90	102.10	100.80	102.10	104.41	106.28	101.16	104.83
545	89.41	99.16	103.95	101.60	102.53	104.23	105.59	101.87	104.57

(*Continued*)

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Wavelength	A	B	C	D50	D55	D65	D75	ID50	ID65
550	92.91	101.00	105.20	102.30	102.97	104.05	104.90	102.56	104.29
555	96.44	102.20	105.67	101.20	101.48	102.02	102.45	101.29	102.16
560	100.00	102.80	105.30	100.00	100.00	100.00	100.00	100.00	100.00
565	103.58	102.92	104.11	98.90	98.61	98.17	97.81	98.73	98.03
570	107.18	102.60	102.30	97.70	97.22	96.33	95.62	97.41	96.01
575	110.80	101.90	100.15	98.30	97.48	96.06	94.92	97.75	95.50
580	114.44	101.00	97.80	98.90	97.75	95.79	94.22	98.07	94.97
585	118.08	100.07	95.43	96.20	94.59	92.24	90.61	95.12	91.19
590	121.73	99.20	93.20	93.50	91.43	88.69	87.00	92.18	87.44
595	125.39	98.44	91.22	95.60	92.93	89.35	87.12	93.98	87.84
600	129.04	98.00	89.70	97.70	94.42	90.01	87.24	95.80	88.27
605	132.70	98.08	88.83	98.50	94.78	89.80	86.69	96.35	87.86
610	136.35	98.50	88.40	99.30	95.14	89.60	86.15	96.85	87.41
615	139.99	99.06	88.19	99.20	94.68	88.65	84.87	96.37	86.16
620	143.62	99.70	88.10	99.00	94.22	87.70	83.59	95.88	84.90
625	147.24	100.36	88.06	97.40	92.33	85.49	81.18	93.97	82.50
630	150.84	101.00	88.00	95.70	90.45	83.29	78.76	92.09	80.13
635	154.42	101.56	87.86	97.30	91.39	83.49	78.60	93.28	80.05
640	157.98	102.20	87.80	98.80	92.33	83.70	78.44	94.45	79.97
645	161.52	103.05	87.99	97.30	90.59	81.86	76.63	92.64	77.97
650	165.03	103.90	88.20	95.70	88.85	80.03	74.82	90.82	75.97
655	168.51	104.59	88.20	97.00	89.59	80.12	74.58	91.74	75.83
660	171.96	105.00	87.90	98.20	90.32	80.21	74.34	92.65	75.69
665	175.38	105.08	87.22	100.60	92.13	81.25	74.89	94.65	76.44
670	178.77	104.90	86.30	103.00	93.95	82.28	75.44	96.58	77.15
675	182.12	104.55	85.30	101.10	91.95	80.28	73.52	94.35	74.94
680	185.43	103.90	84.00	99.10	89.96	78.28	71.60	92.14	72.77
685	188.70	102.84	82.21	93.30	84.82	74.00	67.73	86.42	68.58
690	191.93	101.60	80.20	87.40	79.68	69.72	63.87	80.74	64.42
695	195.12	100.38	78.24	89.50	81.26	70.67	64.48	82.37	65.04
700	198.26	99.10	76.30	91.60	82.84	71.61	65.10	83.94	65.62
705	201.36	97.70	74.36	92.30	83.84	72.98	66.59	84.18	66.60
710	204.41	96.20	72.40	92.90	84.84	74.35	68.09	84.42	67.57
715	207.41	94.60	70.40	84.90	77.54	67.98	62.27	76.80	61.51
720	210.36	92.90	68.30	76.80	70.24	61.60	56.46	69.24	55.50
725	213.27	91.10	66.30	81.70	74.77	65.74	60.36	73.31	59.00
730	216.12	89.40	64.40	86.60	79.30	69.89	64.26	77.32	62.46
735	218.92	88.00	62.80	89.60	82.15	72.49	66.71	79.68	64.50
740	221.67	86.90	61.50	92.60	84.99	75.09	69.17	81.97	66.48
745	224.36	85.90	60.20	85.40	78.44	69.34	63.91	75.30	61.13

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Wavelength	A	B	C	D50	D55	D65	D75	ID50	ID65
750	227.00	85.20	59.20	78.20	71.88	63.59	58.64	68.69	55.83
755	229.59	84.80	58.50	68.00	62.34	55.01	50.64	59.42	48.09
760	232.12	84.70	58.10	57.70	52.79	46.42	42.63	50.23	40.41
765	234.59	84.90	58.00	70.30	64.36	56.61	52.00	60.97	49.09
770	237.01	85.40	58.20	82.90	75.93	66.81	61.37	71.62	57.70
775	239.37	86.10	58.50	80.60	73.87	65.09	59.85	69.34	56.00
780	241.68	87.00	59.10	78.30	71.82	63.38	58.34	67.06	54.30
785	243.92		78.91	72.38	63.84	58.73			
790	246.12		79.55	72.94	64.30	59.14			
795	248.25		76.48	70.14	61.88	56.94			
800	250.33		73.40	67.35	59.45	54.73			
805	252.35		68.66	63.04	55.71	51.32			
810	254.31		63.92	58.73	51.96	47.92			
815	256.22		67.35	61.86	54.70	50.42			
820	258.07		70.78	64.99	57.44	52.92			
825	259.86		72.61	66.65	58.88	54.23			
830	261.60		74.44	68.31	60.31	55.54			

Tristimulus values, chromaticity co-ordinates and correlated colour temperatures (based on 5 nm intervals from 380 nm to 780 nm)

	X	Y	Z	x	y	u'	v'
A	109.85	100.00	35.58	0.4476	0.4074	0.2560	0.5243
B	99.09	100.00	85.31	0.3484	0.3516	0.2137	0.4852
C	98.07	100.00	118.23	0.3101	0.3162	0.2009	0.4609
D50	96.41	100.00	82.50	0.3457	0.3585	0.2091	0.4881
D55	95.68	100.00	92.14	0.3324	0.3474	0.2044	0.4807
D65	95.04	100.00	108.88	0.3127	0.3290	0.1978	0.4683
D75	94.97	100.00	122.57	0.2991	0.3149	0.1935	0.4586
ID50	95.28	100.00	82.33	0.3432	0.3602	0.2069	0.4885
ID65	93.95	100.00	108.46	0.3107	0.3307	0.1958	0.4689
	X_{10}	Y_{10}	Z_{10}	x_{10}	y_{10}	u'_{10}	v'_{10}
A	111.14	100.00	35.20	0.4512	0.4059	0.2590	0.5242
B	99.19	100.00	84.35	0.3498	0.3527	0.2142	0.4859
C	97.29	100.00	116.15	0.3104	0.3190	0.2000	0.4626
D50	96.71	100.00	81.41	0.3477	0.3596	0.2101	0.4889
D55	95.80	100.00	90.93	0.3341	0.3488	0.2051	0.4816
D65	94.81	100.00	107.33	0.3138	0.3310	0.1979	0.4695
D75	94.42	100.00	120.60	0.2997	0.3174	0.1931	0.4601
ID50	95.68	100.00	81.16	0.3456	0.3612	0.2081	0.4894
ID65	93.81	100.00	106.80	0.3121	0.3327	0.1960	0.4702

The correlated colour temperatures are as follows:

A	$T_c = 2848(1.4388/1.4380) = 2856$ K approximately
B	$T_c = 4874$ K
C	$T_c = 6774$ K
D50	$T_c = 5000(1.4388/1.4380) = 5003$ K approximately
D55	$T_c = 5500(1.4388/1.4380) = 5503$ K approximately.
D65	$T_c = 6500(1.4388/1.4380) = 6504$ K approximately
D75	$T_c = 7500(1.4388/1.4380) = 7504$ K approximately
ID50	$T_c = 5096$ K
ID65	$T_c = 6600$ K

A5.3 REPRESENTATIVE FLUORESCENT LAMPS

Spectral power distributions are given in this section for 27 types of fluorescent lamps. These distributions do not constitute CIE Standard Illuminants, but they have been compiled by the CIE for use as representative distributions for practical purposes. The first 12, FL1 to FL12, are in three different groups, normal, broad-band, and three-band. The distributions F2, F7, and F11, which are asterisked, are intended for use in preference to the others when the choice within each group is not critical. The subsequent 15, FL3.1 to FL3.15, are in five different groups: standard halophosphate, deluxe, three-band, multi-band, and D65 simulator.

Each of the distributions in the normal group consists of two semi-broad band emissions of antimony and manganese activations in calcium halo-phosphate phosphor. Those in the broad-band group are more or less enhanced in colour rendering properties as compared with those in the normal group, usually using multiple phosphors; this results in the distributions being flatter and having a wider range in the visible spectrum. The distributions in the three-band group consist mostly of three narrow-band emissions in red, green, and blue wavelength regions; in most cases the narrow band emissions are caused by ternary compositions of rare-earth phosphors.

Below 380 nm and above 780 nm, these spectral power distributions should be taken as zero.

Spectral power distributions of representative fluorescent lamps: FL1 to FL12.

Wavelength	FL1	*FL2	FL3	FL4	FL5	FL6	*FL7	FL8	FL9	FL10	*FL11	FL12
380	1.87	1.18	0.82	0.57	1.87	1.05	2.56	1.21	0.90	1.11	0.91	0.96
385	2.36	1.48	1.02	0.70	2.35	1.31	3.18	1.50	1.12	0.80	0.63	0.64
390	2.94	1.84	1.26	0.87	2.92	1.63	3.84	1.81	1.36	0.62	0.46	0.45
395	3.47	2.15	1.44	0.98	3.45	1.90	4.53	2.13	1.60	0.57	0.37	0.33
400	5.17	3.44	2.57	2.01	5.10	3.11	6.15	3.17	2.59	1.48	1.29	1.19
405	19.49	15.69	14.36	13.75	18.91	14.80	19.37	13.08	12.80	12.16	12.68	12.48
410	6.13	3.85	2.70	1.95	6.00	3.43	7.37	3.83	3.05	2.12	1.59	1.12
415	6.24	3.74	2.45	1.59	6.11	3.30	7.05	3.45	2.56	2.70	1.79	0.94
420	7.01	4.19	2.73	1.76	6.85	3.68	7.71	3.86	2.86	3.74	2.46	1.08

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(*Continued*)

Wavelength	FL1	*FL2	FL3	FL4	FL5	FL6	*FL7	FL8	FL9	FL10	*FL11	FL12
425	7.79	4.62	3.00	1.93	7.58	4.07	8.41	4.42	3.30	5.14	3.33	1.37
430	8.56	5.06	3.28	2.10	8.31	4.45	9.15	5.09	3.82	6.75	4.49	1.78
435	43.67	34.98	31.85	30.28	40.76	32.61	44.14	34.10	32.62	34.39	33.94	29.05
440	16.94	11.81	9.47	8.03	16.06	10.74	17.52	12.42	10.77	14.86	12.13	7.90
445	10.72	6.27	4.02	2.55	10.32	5.48	11.35	7.68	5.84	10.40	6.95	2.65
450	11.35	6.63	4.25	2.70	10.91	5.78	12.00	8.60	6.57	10.76	7.19	2.71
455	11.89	6.93	4.44	2.82	11.40	6.03	12.58	9.46	7.25	10.67	7.12	2.65
460	12.37	7.19	4.59	2.91	11.83	6.25	13.08	10.24	7.86	10.11	6.72	2.49
465	12.75	7.40	4.72	2.99	12.17	6.41	13.45	10.84	8.35	9.27	6.13	2.33
470	13.00	7.54	4.80	3.04	12.40	6.52	13.71	11.33	8.75	8.29	5.46	2.10
475	13.15	7.62	4.86	3.08	12.54	6.58	13.88	11.71	9.06	7.29	4.79	1.91
480	13.23	7.65	4.87	3.09	12.58	6.59	13.95	11.98	9.31	7.91	5.66	3.01
485	13.17	7.62	4.85	3.09	12.52	6.56	13.93	12.17	9.48	16.64	14.29	10.83
490	13.13	7.62	4.88	3.14	12.47	6.56	13.82	12.28	9.61	16.73	14.96	11.88
495	12.85	7.45	4.77	3.06	12.20	6.42	13.64	12.32	9.68	10.44	8.97	6.88
500	12.52	7.28	4.67	3.00	11.89	6.28	13.43	12.35	9.74	5.94	4.72	3.43
505	12.20	7.15	4.62	2.98	11.61	6.20	13.25	12.44	9.88	3.34	2.33	1.49
510	11.83	7.05	4.62	3.01	11.33	6.19	13.08	12.55	10.04	2.35	1.47	0.92
515	11.50	7.04	4.73	3.14	11.10	6.30	12.93	12.68	10.26	1.88	1.10	0.71
520	11.22	7.16	4.99	3.41	10.96	6.60	12.78	12.77	10.48	1.59	0.89	0.60
525	11.05	7.47	5.48	3.90	10.97	7.12	12.60	12.72	10.63	1.47	0.83	0.63
530	11.03	8.04	6.25	4.69	11.16	7.94	12.44	12.60	10.78	1.80	1.18	1.10
535	11.18	8.88	7.34	5.81	11.54	9.07	12.33	12.43	10.96	5.71	4.90	4.56
540	11.53	10.01	8.78	7.32	12.12	10.49	12.26	12.22	11.18	40.98	39.59	34.40
545	27.74	24.88	23.82	22.59	27.78	25.22	29.52	28.96	27.71	73.69	72.84	65.40
550	17.05	16.64	16.14	15.11	17.73	17.46	17.05	16.51	16.29	33.61	32.61	29.48
555	13.55	14.59	14.59	13.88	14.47	15.63	12.44	11.79	12.28	8.24	7.52	7.16
560	14.33	16.16	16.63	16.33	15.20	17.22	12.58	11.76	12.74	3.38	2.83	3.08
565	15.01	17.56	18.49	18.68	15.77	18.53	12.72	11.77	13.21	2.47	1.96	2.47
570	15.52	18.62	19.95	20.64	16.10	19.43	12.83	11.84	13.65	2.14	1.67	2.27
575	18.29	21.47	23.11	24.28	18.54	21.97	15.46	14.61	16.57	4.86	4.43	5.09
580	19.55	22.79	24.69	26.26	19.50	23.01	16.75	16.11	18.14	11.45	11.28	11.96
585	15.48	19.29	21.41	23.28	15.39	19.41	12.83	12.34	14.55	14.79	14.76	15.32
590	14.91	18.66	20.85	22.94	14.64	18.56	12.67	12.53	14.65	12.16	12.73	14.27
595	14.15	17.73	19.93	22.14	13.72	17.42	12.45	12.72	14.66	8.97	9.74	11.86

(*Continued*)

(*Continued*)

Wavelength	FL1	*FL2	FL3	FL4	FL5	FL6	*FL7	FL8	FL9	FL10	*FL11	FL12
600	13.22	16.54	18.67	20.91	12.69	16.09	12.19	12.92	14.61	6.52	7.33	9.28
605	12.19	15.21	17.22	19.43	11.57	14.64	11.89	13.12	14.50	8.31	9.72	12.31
610	11.12	13.80	15.65	17.74	10.45	13.15	11.60	13.34	14.39	44.12	55.27	68.53
615	10.03	12.36	14.04	16.00	9.35	11.68	11.35	13.61	14.40	34.55	42.58	53.02
620	8.95	10.95	12.45	14.42	8.29	10.25	11.12	13.87	14.47	12.09	13.18	14.67
625	7.96	9.65	10.95	12.56	7.32	8.95	10.95	14.07	14.62	12.15	13.16	14.38
630	7.02	8.40	9.51	10.93	6.41	7.74	10.76	14.20	14.72	10.52	12.26	14.71
635	6.20	7.32	8.27	9.52	5.63	6.69	10.42	14.16	14.55	4.43	5.11	6.46
640	5.42	6.31	7.11	8.18	4.90	5.71	10.11	14.13	14.40	1.95	2.07	2.57
645	4.73	5.43	6.09	7.01	4.26	4.87	10.04	14.34	14.58	2.19	2.34	2.75
650	4.15	4.68	5.22	6.00	3.72	4.16	10.02	14.50	14.88	3.19	3.58	4.18
655	3.64	4.02	4.45	5.11	3.25	3.55	10.11	14.46	15.51	2.77	3.01	3.44
660	3.20	3.45	3.80	4.36	2.83	3.02	9.87	14.00	15.47	2.29	2.48	2.81
665	2.81	2.96	3.23	3.69	2.49	2.57	8.65	12.58	13.20	2.00	2.14	2.42
670	2.47	2.55	2.75	3.13	2.19	2.20	7.27	10.99	10.57	1.52	1.54	1.64
675	2.18	2.19	2.33	2.64	1.93	1.87	6.44	9.98	9.18	1.35	1.33	1.36
680	1.93	1.89	1.99	2.24	1.71	1.60	5.83	9.22	8.25	1.47	1.46	1.49
685	1.72	1.64	1.70	1.91	1.52	1.37	5.41	8.62	7.57	1.79	1.94	2.14
690	1.67	1.53	1.55	1.70	1.48	1.29	5.04	8.07	7.03	1.74	2.00	2.34
695	1.43	1.27	1.27	1.39	1.26	1.05	4.57	7.39	6.35	1.02	1.20	1.42
700	1.29	1.10	1.09	1.18	1.13	0.91	4.12	6.71	5.72	1.14	1.35	1.61
705	1.19	0.99	0.96	1.03	1.05	0.81	3.77	6.16	5.25	3.32	4.10	5.04
710	1.08	0.88	0.83	0.88	0.96	0.71	3.46	5.63	4.80	4.49	5.58	6.98
715	0.96	0.76	0.71	0.74	0.85	0.61	3.08	5.03	4.29	2.05	2.51	3.19
720	0.88	0.68	0.62	0.64	0.78	0.54	2.73	4.46	3.80	0.49	0.57	0.71
725	0.81	0.61	0.54	0.54	0.72	0.48	2.47	4.02	3.43	0.24	0.27	0.30
730	0.77	0.56	0.49	0.49	0.68	0.44	2.25	3.66	3.12	0.21	0.23	0.26
735	0.75	0.54	0.46	0.46	0.67	0.43	2.06	3.36	2.86	0.21	0.21	0.23
740	0.73	0.51	0.43	0.42	0.65	0.40	1.90	3.09	2.64	0.24	0.24	0.28
745	0.68	0.47	0.39	0.37	0.61	0.37	1.75	2.85	2.43	0.24	0.24	0.28
750	0.69	0.47	0.39	0.37	0.62	0.38	1.62	2.65	2.26	0.21	0.20	0.21
755	0.64	0.43	0.35	0.33	0.59	0.35	1.54	2.51	2.14	0.17	0.24	0.17
760	0.68	0.46	0.38	0.35	0.62	0.39	1.45	2.37	2.02	0.21	0.32	0.21
765	0.69	0.47	0.39	0.36	0.64	0.41	1.32	2.15	1.83	0.22	0.26	0.19
770	0.61	0.40	0.33	0.31	0.55	0.33	1.17	1.89	1.61	0.17	0.16	0.15
775	0.52	0.33	0.28	0.26	0.47	0.26	0.99	1.61	1.38	0.12	0.12	0.10
780	0.43	0.27	0.21	0.19	0.40	0.21	0.81	1.32	1.12	0.09	0.09	0.05

Tristimulus values, chromaticity co-ordinates and correlated colour temperatures (based on 5 nm intervals from 380 nm to 780 nm)

Group	Lamp	X	Y	Z	x	y	u'	v'	K	R_a
Normal	FL1	92.87	100.00	103.78	0.3131	0.3371	0.1951	0.4726	6430	76
	FL2	99.19	100.00	67.39	0.3721	0.3751	0.2202	0.4996	4230	64
	FL3	103.80	100.00	49.93	0.4091	0.3941	0.2368	0.5132	3450	57
	FL4	109.20	100.00	38.88	0.4402	0.4031	0.2531	0.5215	2940	51
	FL5	90.90	100.00	98.82	0.3138	0.3452	0.1927	0.4769	6350	72
	FL6	97.34	100.00	60.26	0.3779	0.3882	0.2190	0.5062	4150	59
Broadband	FL7	95.04	100.00	108.75	0.3129	0.3292	0.1979	0.4684	6500	90
	FL8	96.43	100.00	82.42	0.3458	0.3586	0.2092	0.4882	5000	95
	FL9	100.38	100.00	67.94	0.3741	0.3727	0.2225	0.4988	4150	90
Three-band	FL10	96.38	100.00	82.35	0.3458	0.3588	0.2091	0.4882	5000	81
	FL11	100.96	100.00	64.35	0.3805	0.3769	0.2251	0.5017	4000	83
	FL12	108.12	100.00	39.27	0.4370	0.4042	0.2506	0.5215	3000	83

Group	Lamp	X_{10}	Y_{10}	Z_{10}	x_{10}	y_{10}	u'_{10}	v'_{10}
Normal	FL1	94.82	100.00	103.26	0.3181	0.3355	0.1991	0.4725
	FL2	103.28	100.00	69.03	0.3793	0.3672	0.2282	0.4971
	FL3	109.01	100.00	52.00	0.4176	0.3831	0.2470	0.5099
	FL4	115.01	100.00	41.00	0.4492	0.3906	0.2647	0.5178
	FL5	93.39	100.00	98.70	0.3197	0.3424	0.1977	0.4763
	FL6	102.18	100.00	62.11	0.3866	0.3784	0.2285	0.5032
Broadband	FL7	95.79	100.00	107.69	0.3156	0.3295	0.1997	0.4690
	FL8	97.12	100.00	81.19	0.3490	0.3593	0.2110	0.4889
	FL9	102.13	100.00	67.87	0.3783	0.3704	0.2262	0.4984
Three-band	FL10	98.96	100.00	83.29	0.3506	0.3543	0.2141	0.4868
	FL11	103.86	100.00	65.61	0.3854	0.3711	0.2307	0.4998
	FL12	111.48	100.00	40.37	0.4427	0.3971	0.2574	0.5195

Spectral power distributions of representative fluorescent lamps: FL3.1 to FL3.6.

Wavelength	FL3.1	FL3.2	FL3.3	FL3.4	FL3.5	FL3.6
380	2.39	5.80	8.94	3.46	4.72	5.53
385	2.93	6.99	11.21	3.86	5.82	6.63
390	3.82	8.70	14.08	4.41	7.18	8.07
395	4.23	9.89	16.48	4.51	8.39	9.45

(*Continued*)

(*Continued*)

Wavelength	FL3.1	FL3.2	FL3.3	FL3.4	FL3.5	FL3.6
400	4.97	11.59	19.63	4.86	9.96	11.28
405	86.30	94.53	116.33	71.22	58.86	61.47
410	11.65	20.80	32.07	8.72	15.78	17.80
415	7.09	16.52	29.72	5.36	15.10	17.47
420	7.84	18.30	33.39	5.61	17.30	20.12
425	8.59	20.33	36.94	5.91	19.66	23.05
430	9.44	22.00	40.33	6.42	22.43	26.37
435	196.54	231.90	262.66	192.77	176.00	186.01
440	10.94	25.81	46.87	7.77	28.67	33.94
445	11.38	27.63	49.79	8.37	31.92	37.98
450	11.89	29.10	52.46	9.22	35.38	42.12
455	12.37	30.61	54.81	10.18	38.73	46.38
460	12.81	31.92	56.81	11.18	41.98	50.30
465	13.15	33.11	58.44	12.28	44.92	53.95
470	13.39	33.83	59.52	13.38	47.49	56.94
475	13.56	34.70	60.12	14.54	49.58	59.48
480	13.59	35.02	60.24	15.74	51.21	61.36
485	13.56	35.22	59.88	17.09	52.36	62.68
490	14.07	35.81	59.88	19.60	53.99	64.34
495	13.39	35.14	58.60	21.05	53.78	63.90
500	13.29	35.14	57.85	23.96	54.04	63.85
505	13.25	34.90	56.29	27.77	53.88	63.24
510	13.53	34.70	54.81	32.68	53.62	62.46
515	14.24	35.02	53.42	38.29	53.25	61.41
520	15.74	36.13	52.70	43.76	53.09	60.47
525	18.26	37.92	52.50	47.72	52.88	59.48
530	22.28	40.62	53.30	50.27	52.99	58.65
535	27.97	44.70	54.89	51.78	53.15	57.93
540	35.70	49.63	57.61	52.68	53.67	57.49
545	148.98	154.16	182.75	167.36	167.93	175.17
550	56.55	62.21	65.27	55.29	55.61	57.27
555	68.68	68.92	69.41	56.94	56.82	57.49
560	79.99	75.83	73.28	59.30	58.39	57.99
565	91.47	81.95	76.56	62.15	60.22	58.76
570	101.32	86.95	78.67	65.26	62.21	59.64
575	123.16	103.54	95.74	84.26	81.45	78.77
580	129.53	109.94	97.22	89.22	84.96	81.26
585	115.05	91.95	76.79	75.79	68.71	63.18
590	113.48	89.85	73.36	79.19	70.70	64.29
595	110.08	87.15	69.33	82.80	73.01	65.78

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(*Continued*)

Wavelength	FL3.1	FL3.2	FL3.3	FL3.4	FL3.5	FL3.6
600	104.28	83.26	64.23	85.76	74.69	66.77
605	97.98	78.93	58.92	88.62	76.26	67.77
610	89.60	73.93	53.38	91.12	77.68	68.60
615	80.74	68.84	47.91	93.43	78.67	69.10
620	71.92	63.44	42.61	96.89	80.14	70.15
625	63.50	58.84	37.74	101.45	81.71	71.69
630	55.46	53.84	33.11	103.65	82.08	71.97
635	47.97	49.43	29.04	100.30	79.98	69.81
640	41.39	45.54	25.29	97.89	78.15	68.05
645	35.50	41.53	22.10	96.59	76.52	66.66
650	30.32	38.31	19.31	106.21	79.20	69.70
655	25.79	34.62	16.84	109.97	79.51	70.37
660	21.84	31.80	14.68	117.49	81.08	72.47
665	18.53	29.02	12.89	96.04	70.76	62.30
670	15.67	26.72	11.37	80.15	62.58	54.45
675	13.22	24.22	9.97	70.42	56.87	49.20
680	11.14	22.19	8.82	65.01	52.83	45.60
685	9.40	20.41	7.86	60.15	49.11	42.40
690	8.65	19.10	7.78	56.04	46.28	40.02
695	6.75	16.79	6.30	50.92	42.24	36.48
700	5.69	15.13	5.67	46.26	38.58	33.28
705	4.87	13.82	5.15	42.60	35.59	30.84
710	4.29	12.63	4.91	38.85	32.76	28.30
715	3.54	11.39	4.31	35.09	29.61	25.65
720	3.03	10.32	3.99	31.73	26.89	23.33
725	2.62	9.21	3.67	28.77	24.53	21.23
730	2.28	8.89	3.43	25.76	22.17	19.29
735	1.94	7.50	3.19	23.16	20.02	17.41
740	1.70	6.71	2.95	21.30	18.45	16.31
745	1.50	6.11	2.75	18.55	16.09	14.21
750	1.36	5.40	2.63	17.74	15.62	14.04
755	1.16	4.80	2.43	14.74	13.10	11.55
760	4.91	8.70	7.14	12.93	11.69	10.39
765	0.95	4.01	2.19	13.63	12.42	11.28
770	1.50	4.09	2.71	10.43	9.43	8.51
775	0.89	3.30	2.00	9.67	8.96	8.24
780	0.68	2.82	1.80	8.07	7.39	7.02

Tristimulus values, chromaticity co-ordinates and correlated colour temperatures (based on 5 nm intervals from 380 nm to 780 nm)

		X	Y	Z	x	y	u'	v'	K	R_a
Halophosphate	FL3.1	109.27	100.00	38.69	0.4407	0.4033	0.2533	0.5216	2932	51
	FL3.2	101.99	100.00	65.85	0.3808	0.3734	0.2267	0.5001	3965	70
	FL3.3	91.69	100.00	99.13	0.3153	0.3439	0.1941	0.4764	6280	72
DeLuxe	FL3.4	109.54	100.00	37.78	0.4429	0.4043	0.2543	0.5224	2904	87
	FL3.5	102.11	100.00	70.25	0.3749	0.3672	0.2253	0.4964	4086	95
	FL3.6	96.89	100.00	80.89	0.3488	0.3600	0.2107	0.4892	4894	96
		X_{10}	Y_{10}	Z_{10}	x_{10}	y_{10}	u'_{10}	v'_{10}		
Halophosphate	FL3.1	115.27	100.00	40.99	0.4498	0.3902	0.2653	0.5178		
	FL3.2	105.79	100.00	67.62	0.3869	0.3658	0.2340	0.4976		
	FL3.3	94.32	100.00	99.36	0.3212	0.3405	0.1994	0.4756		
DeLuxe	FL3.4	112.85	100.00	38.99	0.4481	0.3971	0.2610	0.5203		
	FL3.5	103.05	100.00	69.71	0.3778	0.3666	0.2275	0.4966		
	FL3.6	97.47	100.00	79.46	0.3520	0.3611	0.2124	0.4902		

Spectral power distributions of representative fluorescent lamps: FL3.7 to FL3.15.

Wavelength	FL3.7	FL3.8	FL3.9	FL3.10	FL3.11	FL3.12	FL3.13	FL3.14	FL3.15
380	3.79	4.18	3.77	0.25	3.85	1.62	2.23	2.87	300.00
385	2.56	2.93	2.64	0.00	2.91	2.06	2.92	3.69	286.00
390	1.91	2.29	2.06	0.00	2.56	2.71	3.91	4.87	268.00
395	1.42	1.98	1.87	0.00	2.59	3.11	4.55	5.82	244.00
400	1.51	2.44	2.55	0.69	3.63	3.67	5.46	7.17	304.00
405	73.64	70.70	71.68	21.24	74.54	74.60	77.40	72.21	581.00
410	7.37	10.19	12.05	2.18	14.69	8.88	11.25	13.69	225.00
415	4.69	9.79	13.57	1.86	17.22	4.77	7.69	11.12	155.00
420	5.33	13.21	19.60	3.10	24.99	4.72	8.29	12.43	152.00
425	6.75	17.79	27.33	5.00	34.40	4.72	8.98	13.90	170.00
430	8.51	22.98	35.39	7.03	44.57	4.94	10.01	15.82	295.00
435	181.81	191.43	211.82	45.08	228.08	150.29	204.45	200.99	1417.00
440	11.71	31.76	49.02	16.78	61.53	6.08	13.75	21.72	607.00
445	11.96	33.35	51.83	12.28	65.31	7.13	16.88	26.33	343.00
450	12.18	33.87	52.50	13.31	66.35	9.10	21.73	32.85	386.00
455	11.90	32.89	50.73	13.66	64.37	11.76	27.96	40.80	430.00
460	11.16	30.60	46.93	13.69	59.81	14.96	34.92	49.23	469.00
465	11.22	28.28	42.42	13.13	54.24	18.54	41.96	57.39	502.00
470	9.83	24.81	37.16	12.28	47.42	22.48	48.62	65.26	531.00

(*Continued*)

(*Continued*)

Wavelength	FL3.7	FL3.8	FL3.9	FL3.10	FL3.11	FL3.12	FL3.13	FL3.14	FL3.15
475	8.94	21.60	31.84	11.42	41.10	26.76	54.33	71.99	552.00
480	12.08	23.40	31.94	11.66	40.04	31.66	59.49	78.25	567.00
485	52.56	68.99	77.74	22.04	85.54	40.93	67.91	88.85	572.00
490	55.42	70.85	79.45	26.17	86.55	45.83	70.01	91.67	575.00
495	31.69	42.29	47.93	18.57	53.47	46.00	66.40	86.81	561.00
500	16.03	22.67	26.24	11.36	30.91	45.26	62.07	80.42	548.00
505	6.72	11.08	13.15	6.83	17.41	43.16	56.95	73.82	527.00
510	4.59	7.66	8.80	5.58	12.56	41.63	52.70	69.12	507.00
515	3.67	6.07	6.70	4.88	10.10	39.75	48.54	63.69	482.00
520	3.02	5.07	5.38	4.31	8.48	37.83	44.80	58.44	461.00
525	3.21	4.88	4.93	3.76	7.74	36.16	41.75	53.57	438.00
530	4.90	6.26	6.06	3.61	8.58	35.25	39.77	49.66	418.00
535	19.05	20.29	19.76	5.62	21.39	37.04	40.50	48.44	404.00
540	177.64	204.67	215.94	38.59	220.12	59.86	59.27	72.56	429.00
545	347.34	390.25	412.13	100.00	417.35	183.53	184.09	200.42	1016.00
550	116.80	135.69	142.39	36.54	146.13	59.03	59.06	65.00	581.00
555	31.87	34.57	34.74	10.57	36.67	47.93	49.95	47.49	370.00
560	16.37	15.71	14.76	2.98	16.51	48.67	50.90	44.14	368.00
565	14.92	12.60	10.99	2.05	12.56	52.69	54.51	44.71	371.00
570	14.12	11.05	9.25	1.84	10.81	57.24	58.33	46.01	377.00
575	29.50	25.05	23.50	6.09	25.31	77.75	77.49	63.52	490.00
580	61.40	54.98	53.05	17.27	53.31	87.81	85.78	71.73	525.00
585	85.05	82.84	81.90	21.77	80.75	80.55	76.20	63.52	402.00
590	64.86	58.22	54.92	18.72	53.56	84.83	78.73	64.13	404.00
595	65.01	53.06	47.80	10.15	44.02	86.84	78.95	63.74	412.00
600	53.17	41.44	36.65	7.26	33.05	91.44	81.48	66.82	418.00
605	34.22	25.26	21.82	5.17	20.26	96.51	84.57	70.65	425.00
610	427.27	329.89	285.69	56.66	233.61	105.25	87.75	79.29	428.00
615	201.10	161.29	139.94	49.39	118.20	106.74	89.56	80.77	432.00
620	58.63	54.19	53.37	18.57	51.66	108.53	91.36	83.59	433.00
625	72.01	66.30	64.30	14.21	61.27	106.92	89.00	82.59	431.00
630	88.19	71.43	64.04	14.01	55.15	101.54	83.67	77.60	427.00
635	20.07	15.74	13.79	5.99	12.95	95.20	78.26	72.47	420.00
640	13.10	10.22	9.06	2.68	8.93	89.34	73.19	68.34	410.00
645	12.92	10.68	9.83	3.14	9.77	82.95	67.61	63.82	399.00
650	24.54	20.32	18.60	6.25	17.12	75.78	61.42	58.57	385.00
655	15.94	14.13	13.38	5.78	13.01	68.65	55.49	53.18	370.00
660	13.56	11.72	10.99	6.75	10.45	61.70	49.78	47.97	352.00
665	13.38	11.75	10.77	5.16	10.33	55.23	44.46	43.14	336.00
670	8.42	7.87	7.57	3.03	7.70	48.58	39.13	38.19	317.00

(*Continued*)

(*Continued*)

Wavelength	FL3.7	FL3.8	FL3.9	FL3.10	FL3.11	FL3.12	FL3.13	FL3.14	FL3.15
675	6.57	6.38	6.19	1.57	6.34	42.90	34.45	33.85	298.00
680	7.18	7.23	7.09	1.72	7.35	37.74	30.28	29.94	277.00
685	9.90	8.94	8.54	1.54	8.22	32.93	26.37	26.24	260.00
690	11.47	9.79	8.77	1.71	7.93	29.65	23.88	23.90	242.00
695	8.88	7.26	6.41	1.10	5.70	25.19	20.10	20.33	223.00
700	3.05	2.59	2.26	0.28	2.23	21.69	17.40	17.42	202.00
705	22.04	17.03	15.02	3.65	12.43	19.28	15.29	15.64	187.00
710	42.79	33.69	29.39	7.54	24.24	17.36	13.62	14.34	167.00
715	14.40	12.02	10.22	2.34	8.74	14.74	11.68	12.21	152.00
720	1.88	1.68	1.42	0.05	1.39	12.86	10.31	10.65	136.00
725	1.60	1.50	1.23	0.04	1.23	11.28	9.11	9.43	125.00
730	1.42	1.31	1.10	0.04	1.10	9.97	8.03	8.34	113.00
735	1.05	1.01	0.84	0.03	0.84	8.88	7.13	7.52	103.00
740	1.23	1.16	0.97	0.03	0.94	7.78	6.31	6.73	93.00
745	1.76	1.59	1.35	0.02	1.23	7.04	5.67	6.08	84.00
750	0.74	0.79	0.65	0.02	0.68	6.30	5.11	5.52	75.00
755	0.52	0.67	0.13	0.01	0.52	5.55	4.55	5.00	66.00
760	4.10	4.82	4.22	0.01	4.60	10.15	9.06	9.47	58.00
765	0.46	0.61	0.10	0.00	0.45	4.50	3.74	4.08	51.00
770	0.99	1.25	0.68	0.00	1.04	4.81	4.04	4.43	46.00
775	0.43	0.79	0.16	0.00	0.45	3.72	3.14	3.39	41.00
780	0.00	0.58	0.00	0.00	0.00	3.28	2.75	3.17	37.00

Tristimulus values, chromaticity co-ordinates and correlated colour temperatures (based on 5 nm intervals from 380 nm to 780 nm)

		X	Y	Z	x	y	u'	v'	K	R_a
3-Band	FL3.7	108.38	100.00	38.82	0.4384	0.4045	0.2513	0.5218	2979	82
	FL3.8	99.69	100.00	61.29	0.3820	0.3832	0.2236	0.5046	4006	79
	FL3.9	97.43	100.00	81.05	0.3499	0.3591	0.2117	0.4890	4853	79
	FL3.10	97.07	100.00	83.87	0.3455	0.3560	0.2100	0.4868	5000	88
	FL3.11	94.51	100.00	96.72	0.3245	0.3434	0.2006	0.4775	5854	78
Multi-band	FL3.12	108.43	100.00	39.30	0.4377	0.4037	0.2512	0.5213	2984	93
	FL3.13	102.85	100.00	65.65	0.3831	0.3724	0.2286	0.5001	3896	96
	FL3.14	95.51	100.00	81.55	0.3447	0.3609	0.2076	0.4891	5045	95
D65 Simulator	FL3.15	95.11	100.00	109.07	0.3127	0.3288	0.1979	0.4682	6509	98

(*Continued*)

		X_{10}	Y_{10}	Z_{10}	x_{10}	y_{10}	u'_{10}	v'_{10}
3-Band	FL3.7	111.98	100.00	40.05	0.4443	0.3968	0.2586	0.5196
	FL3.8	103.00	100.00	62.75	0.3876	0.3763	0.2300	0.5024
	FL3.9	100.35	100.00	82.58	0.3547	0.3534	0.2172	0.4870
	FL3.10	98.41	100.00	83.29	0.3493	0.3550	0.2130	0.4869
	FL3.11	97.17	100.00	97.94	0.3293	0.3389	0.2055	0.4759
Multi-band	FL3.12	110.23	100.00	39.01	0.4422	0.4012	0.2553	0.5211
	FL3.13	103.20	100.00	63.98	0.3863	0.3743	0.2300	0.5014
	FL3.14	94.67	100.00	77.96	0.3473	0.3668	0.2071	0.4922
D65 Simulator	FL3.15	94.37	100.00	105.59	0.3146	0.3334	0.1975	0.4709

A5.4 PLANCKIAN RADIATORS

Relative spectral power distributions ($c_2 = 1.4388 \times 10^{-2}$ m K).

Wavelength	1000 K	2000 K	2500 K	3000 K	4000 K	5000 K	6000 K	7000 K	8000 K	10000 K
380	0.00	1.58	5.34	12.03	33.11	60.62	90.33	119.59	147.00	194.46
385	0.01	1.90	6.09	13.27	35.07	62.65	91.86	120.22	146.51	191.56
390	0.01	2.26	6.92	14.60	37.07	64.65	93.30	120.73	145.92	188.63
395	0.01	2.68	7.83	16.00	39.09	66.60	94.64	121.14	145.23	185.68
400	0.02	3.15	8.82	17.49	41.13	68.51	95.90	121.44	144.46	182.71
405	0.03	3.70	9.90	19.06	43.19	70.37	97.06	121.65	143.60	179.74
410	0.04	4.32	11.07	20.71	45.27	72.18	98.14	121.77	142.66	176.76
415	0.06	5.03	12.34	22.44	47.36	73.93	99.13	121.79	141.66	173.78
420	0.08	5.82	13.71	24.26	49.46	75.63	100.04	121.73	140.59	170.81
425	0.11	6.71	15.18	26.15	51.56	77.28	100.87	121.59	139.46	167.85
430	0.16	7.71	16.76	28.12	53.66	78.87	101.62	121.38	138.27	164.90
435	0.22	8.82	18.45	30.17	55.76	80.40	102.28	121.09	137.04	161.97
440	0.30	10.05	20.25	32.30	57.85	81.87	102.88	120.73	135.76	159.07
445	0.41	11.41	22.17	34.50	59.93	83.28	103.39	120.31	134.44	156.19
450	0.56	12.91	24.20	36.78	62.00	84.63	103.84	119.83	133.08	153.33
455	0.75	14.57	26.36	39.13	64.06	85.92	104.21	119.29	131.70	150.51
460	1.00	16.38	28.63	41.54	66.10	87.15	104.52	118.69	130.28	147.72
465	1.33	18.36	31.03	44.03	68.12	88.33	104.76	118.05	128.84	144.96
470	1.75	20.52	33.56	46.58	70.11	89.44	104.94	117.36	127.37	142.23
475	2.29	22.86	36.20	49.18	72.08	90.49	105.06	116.63	125.89	139.55
480	2.99	25.40	38.98	51.85	74.02	91.48	105.12	115.85	124.39	136.90
485	3.86	28.15	41.88	54.58	75.93	92.41	105.13	115.04	122.88	134.29
490	4.97	31.11	44.91	57.35	77.81	93.29	105.08	114.19	121.35	131.71
495	6.35	34.30	48.06	60.18	79.65	94.11	104.98	113.31	119.82	129.18

(*Continued*)

(*Continued*)

Wavelength	1000 K	2000 K	2500 K	3000 K	4000 K	5000 K	6000 K	7000 K	8000 K	10000 K
500	8.07	37.72	51.34	63.05	81.46	94.87	104.83	112.40	118.28	126.69
505	10.21	41.39	54.75	65.97	83.24	95.57	104.64	111.47	116.74	124.24
510	12.86	45.30	58.28	68.93	84.97	96.22	104.40	110.51	115.20	121.83
515	16.10	49.48	61.93	71.92	86.67	96.82	104.11	109.53	113.66	119.46
520	20.07	53.92	65.70	74.95	88.32	97.37	103.79	108.52	112.11	117.13
525	24.90	58.64	69.60	78.01	89.93	97.86	103.43	107.50	110.58	114.85
530	30.76	63.64	73.61	81.10	91.51	98.31	103.04	106.47	109.04	112.60
535	37.82	68.94	77.73	84.21	93.03	98.71	102.60	105.41	107.51	110.40
540	46.31	74.53	81.97	87.34	94.52	99.05	102.14	104.35	105.99	108.24
545	56.47	80.43	86.32	90.48	95.95	99.36	101.65	103.28	104.48	106.12
550	68.59	86.63	90.78	93.65	97.35	99.61	101.12	102.19	102.98	104.04
555	82.98	93.16	95.34	96.82	98.70	99.83	100.58	101.10	101.48	102.00
560	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
565	120.07	107.17	104.76	103.19	101.26	100.13	99.40	98.90	98.53	98.04
570	143.66	114.67	109.62	106.37	102.47	100.22	98.78	97.79	97.07	96.12
575	171.27	122.50	114.56	109.56	103.63	100.27	98.14	96.68	95.63	94.24
580	203.50	130.67	119.60	112.74	104.75	100.29	97.48	95.57	94.20	92.39
585	241.00	139.18	124.71	115.92	105.83	100.27	96.80	94.45	92.78	90.58
590	284.48	148.04	129.91	119.08	106.86	100.21	96.10	93.34	91.38	88.81
595	334.75	157.23	135.18	122.24	107.84	100.12	95.39	92.23	89.99	87.08
600	392.71	166.77	140.52	125.37	108.78	100.00	94.66	91.12	88.62	85.38
605	459.32	176.66	145.94	128.50	109.67	99.85	93.92	90.01	87.27	83.72
610	535.68	186.90	151.41	131.60	110.52	99.67	93.17	88.91	85.93	82.09
615	622.96	197.48	156.94	134.68	111.32	99.46	92.41	87.81	84.61	80.49
620	722.46	208.40	162.53	137.73	112.09	99.22	91.64	86.72	83.30	78.93
625	835.60	219.67	168.17	140.76	112.80	98.96	90.86	85.63	82.01	77.40
630	963.93	231.28	173.86	143.76	113.48	98.67	90.07	84.55	80.74	75.91
635	1109.1	243.24	179.58	146.73	114.12	98.36	89.28	83.47	79.49	74.44
640	1273.0	255.53	185.35	149.67	114.71	98.02	88.48	82.40	78.25	73.01
645	1457.5	268.15	191.15	152.57	115.27	97.66	87.67	81.34	77.03	71.61
650	1664.8	281.11	196.98	155.44	115.78	97.28	86.86	80.29	75.83	70.23
655	1897.2	294.39	202.83	158.27	116.26	96.88	86.05	79.25	74.64	68.89
660	2157.1	308.00	208.71	161.06	116.69	96.47	85.23	78.21	73.47	67.57
665	2447.2	321.93	214.60	163.81	117.09	96.03	84.41	77.18	72.32	66.29
670	2770.3	336.16	220.50	166.52	117.46	95.58	83.59	76.17	71.19	65.03
675	3129.4	350.71	226.42	169.19	117.78	95.11	82.76	75.16	70.07	63.79
680	3527.8	365.56	232.33	171.81	118.08	94.63	81.94	74.16	68.97	62.59
685	3968.9	380.70	238.25	174.39	118.33	94.13	81.12	73.17	67.89	61.41
690	4456.3	396.14	244.17	176.92	118.56	93.62	80.29	72.19	66.82	60.25
695	4994.0	411.86	250.08	179.41	118.75	93.09	79.47	71.22	65.77	59.12

(*Continued*)

(*Continued*)

Wavelength	1000 K	2000 K	2500 K	3000 K	4000 K	5000 K	6000 K	7000 K	8000 K	10000 K
700	5586.0	427.85	255.98	181.85	118.91	92.56	78.65	70.26	64.74	58.01
705	6236.7	444.11	261.87	184.24	119.04	92.01	77.83	69.32	63.72	56.93
710	6950.7	460.63	267.74	186.58	119.13	91.45	77.02	68.38	62.72	55.87
715	7732.8	477.41	273.59	188.87	119.20	90.88	76.20	67.45	61.73	54.83
720	8588.0	494.43	279.42	191.11	119.24	90.30	75.39	66.54	60.76	53.81
725	9521.8	511.69	285.22	193.30	119.25	89.72	74.58	65.63	59.81	52.82
730	10539.7	529.17	290.99	195.44	119.23	89.12	73.78	64.74	58.87	51.85
735	11647.5	546.88	296.72	197.53	119.19	88.52	72.98	63.85	57.95	50.90
740	12851.5	564.80	302.43	199.57	119.12	87.91	72.18	62.98	57.04	49.96
745	14158.1	582.92	308.09	201.55	119.03	87.30	71.39	62.12	56.15	49.05
750	15573.8	601.23	313.71	203.48	118.91	86.68	70.61	61.27	55.27	48.16
755	17105.7	619.73	319.28	205.36	118.77	86.05	69.82	60.43	54.41	47.28
760	18761.1	638.41	324.81	207.19	118.60	85.42	69.05	59.60	53.56	46.43
765	20547.4	657.25	330.30	208.97	118.42	84.78	68.28	58.78	52.73	45.59
770	22472.4	676.25	335.72	210.69	118.21	84.15	67.51	57.97	51.90	44.77
775	24544.3	695.39	341.10	212.36	117.98	83.50	66.75	57.17	51.10	43.97
780	26771.4	714.68	346.42	213.98	117.73	82.86	66.00	56.39	50.30	43.18

Tristimulus values and chromaticity co-ordinates (based on 5 nm intervals from 380 to 780 nm)

	X	Y	Z	x	y	u'	v'
1000 K	189.56	100.00	0.81	0.6528	0.3444	0.4481	0.5319
2000 K	127.44	100.00	14.52	0.5267	0.4133	0.3051	0.5386
2500 K	115.31	100.00	26.43	0.4770	0.4137	0.2722	0.5311
3000 K	108.13	100.00	39.34	0.4369	0.4041	0.2506	0.5214
4000 K	100.98	100.00	64.44	0.3805	0.3768	0.2251	0.5016
5000 K	98.15	100.00	86.24	0.3451	0.3516	0.2114	0.4847
6000 K	97.08	100.00	104.31	0.3221	0.3318	0.2033	0.4712
7000 K	96.79	100.00	119.11	0.3064	0.3166	0.1981	0.4606
8000 K	96.85	100.00	131.22	0.2952	0.3048	0.1946	0.4521
10000 K	97.33	100.00	149.47	0.2807	0.2884	0.1903	0.4399
	X_{10}	Y_{10}	Z_{10}	x_{10}	y_{10}	u'_{10}	v'_{10}
1000 K	184.59	100.00	0.63	0.6472	0.3506	0.4378	0.5337
2000 K	128.56	100.00	14.00	0.5300	0.4123	0.3078	0.5387
2500 K	116.66	100.00	25.97	0.4808	0.4122	0.2754	0.5311
3000 K	109.38	100.00	38.99	0.4404	0.4026	0.2534	0.5213
4000 K	101.80	100.00	64.20	0.3827	0.3759	0.2269	0.5016
5000 K	98.54	100.00	85.91	0.3464	0.3516	0.2123	0.4848
6000 K	97.11	100.00	103.76	0.3228	0.3324	0.2035	0.4716
7000 K	96.52	100.00	118.27	0.3066	0.3177	0.1978	0.4612
8000 K	96.33	100.00	130.08	0.2951	0.3064	0.1940	0.4530
10000 K	96.43	100.00	147.74	0.2802	0.2905	0.1891	0.4412

A5.5 GAS DISCHARGE LAMPS

Relative spectral power distributions

Below 380 nm and above 780 nm, these spectral power distributions should be taken as zero.

	Low pressure sodium lamp SOX	Standard high pressure sodium lamp HP1	Colour Enhanced High Pressure Sodium Lamp HP2	High pressure mercury lamp type MB	High pressure mercury lamp type MBF	High pressure mercury lamp type MBTF	High pressure mercury lamp type HMI	Xenon
380	0.1	1.90	2.64	5.14	4.53	4.73	116.39	93.03
385	0.0	2.20	2.77	4.28	3.91	4.01	114.92	94.59
390	0.0	2.50	3.42	7.49	6.68	6.40	115.62	96.33
395	0.1	2.70	3.68	5.26	4.81	4.85	107.07	100.56
400	0.0	3.10	4.33	7.71	7.73	6.77	108.19	102.81
405	0.2	4.30	5.50	121.05	107.15	102.94	123.74	100.40
410	0.0	3.80	5.94	61.57	54.92	54.53	125.42	100.84
415	0.0	4.20	7.20	5.73	6.08	5.97	123.88	101.45
420	0.0	4.80	9.02	3.67	4.33	4.19	125.56	102.57
425	0.1	5.19	10.27	4.29	4.97	4.82	116.39	101.94
430	0.1	5.89	12.48	6.26	7.15	6.75	89.57	101.29
435	0.0	7.39	16.82	168.75	146.23	144.91	122.69	101.54
440	0.0	7.89	16.04	140.57	123.51	131.86	120.03	103.74
445	0.0	5.69	15.26	5.84	6.82	7.00	71.29	103.67
450	0.0	12.89	22.58	3.86	4.66	4.96	65.93	110.30
455	0.0	6.69	20.07	3.22	3.79	4.28	73.25	112.78
460	0.0	4.30	15.13	2.84	3.46	4.08	80.53	116.52
465	0.1	20.78	25.27	2.72	3.27	4.05	72.48	129.56
470	0.1	12.99	28.04	2.74	3.49	4.34	66.65	141.07
475	0.0	6.69	15.99	3.00	3.70	4.68	67.82	126.45
480	0.0	1.40	10.40	2.77	3.58	4.68	66.60	115.94
485	0.1	1.50	11.10	3.10	3.94	5.20	59.40	118.42
490	0.0	3.20	13.44	5.24	6.04	7.27	60.43	111.75
495	0.3	18.18	22.62	6.11	6.39	8.03	62.92	113.67
500	0.7	56.24	49.71	2.88	3.73	5.59	64.03	105.17
505	0.0	2.90	17.21	2.58	3.49	5.55	68.89	103.88
510	0.0	2.10	17.12	2.39	3.57	5.73	57.96	102.90
515	0.2	13.39	27.26	2.58	3.75	6.16	57.28	102.71

(*Continued*)

(*Continued*)

	Low pressure sodium lamp SOX	Standard high pressure sodium lamp HP1	Colour Enhanced High Pressure Sodium Lamp HP2	High pressure mercury lamp type MB	High pressure mercury lamp type MBF	High pressure mercury lamp type MBTF	High pressure mercury lamp type HMI	Xenon
520	0.1	2.10	20.02	2.28	3.67	6.24	54.24	102.29
525	0.0	2.00	21.54	2.43	3.88	6.70	50.74	101.90
530	0.1	2.20	23.36	2.53	4.38	7.29	52.25	101.54
535	0.1	2.30	25.66	3.67	6.74	9.43	53.26	101.47
540	0.1	2.60	29.69	4.29	9.93	12.21	56.32	101.12
545	0.1	5.10	43.12	195.18	198.10	195.59	114.85	101.43
550	0.1	11.39	98.3	181.63	171.97	178.84	119.19	100.98
555	0.2	15.48	125.6	6.93	10.57	14.46	59.24	100.75
560	0.2	20.78	134.57	3.74	7.55	11.60	56.91	100.44
565	2.1	55.64	149.7	3.50	6.61	11.26	62.96	100.28
570	8.1	254.03	166.12	3.79	6.76	11.92	65.18	100.19
575	1.3	56.14	98.77	100.00	100.00	100.00	100.00	100.00
580	1.4	111.78	30.47	292.87	273.65	265.84	158.96	99.86
585	131.8	297.98	1.17	39.62	42.59	47.39	81.58	100.47
590	1000.0	142.55	0.39	4.23	15.05	19.07	82.42	100.33
595	150.6	334.84	1.65	3.38	27.64	28.62	72.41	99.04
600	2.0	189.40	21.41	2.74	13.65	18.67	74.44	97.17
605	1.5	117.78	76.11	2.97	10.75	16.68	62.19	96.65
610	1.3	79.92	126.16	2.78	24.34	26.49	61.75	96.84
615	3.5	108.09	161.96	3.10	83.81	69.19	61.00	98.50
620	1.9	46.85	160.06	2.65	149.80	119.79	60.76	100.21
625	0.6	38.16	158.19	3.51	58.07	53.70	62.91	99.91
630	0.6	32.47	153.69	2.67	17.99	23.74	55.78	97.80
635	0.8	28.37	147.40	2.91	10.51	18.90	50.61	96.84
640	1.8	25.37	140.60	2.66	8.09	18.23	52.97	98.92
645	0.6	22.98	134.92	2.76	7.86	18.56	49.83	99.18
650	0.7	20.38	127.59	2.66	10.98	21.14	46.82	101.99
655	0.4	19.78	124.65	2.78	10.76	21.58	47.96	98.78
660	0.3	17.78	118.02	2.68	7.25	19.31	56.13	97.14
665	0.2	16.78	113.94	2.81	6.29	18.98	53.38	98.43
670	0.5	19.18	118.1	2.96	6.06	19.18	67.89	100.30
675	0.2	17.98	115.16	3.18	5.91	19.68	73.25	101.29
680	0.0	13.69	102.85	2.75	5.18	19.43	47.32	101.97
685	0.0	9.99	90.54	2.95	5.48	20.20	50.08	109.55

(*Continued*)

(*Continued*)

	Low pressure sodium lamp SOX	Standard high pressure sodium lamp HP1	Colour Enhanced High Pressure Sodium Lamp HP2	High pressure mercury lamp type MB	High pressure mercury lamp type MBF	High pressure mercury lamp type MBTF	High pressure mercury lamp type HMI	Xenon
690	0.1	8.19	83.34	6.51	9.83	24.27	44.96	110.88
695	0.5	7.59	79.44	5.19	18.35	30.79	56.34	102.08
700	0.2	6.99	76.97	2.82	46.48	51.26	69.68	94.49
705	0.6	6.79	74.85	3.17	35.63	43.56	36.16	93.05
710	0.1	6.49	73.12	4.29	15.82	29.82	28.41	98.10
715	0.0	6.39	71.51	3.22	5.92	23.00	27.15	106.20
720	0.1	6.09	70.13	2.76	4.61	22.22	28.21	98.24
725	0.2	5.99	69.04	2.97	4.48	22.86	34.95	95.69
730	0.0	5.79	67.48	2.74	4.11	22.84	34.94	101.73
735	0.0	5.79	66.70	2.97	4.23	23.63	27.68	108.38
740	0.2	5.79	66.31	2.71	3.92	23.41	24.19	102.62
745	0.0	5.79	65.14	2.97	4.08	24.35	22.61	100.28
750	0.4	6.39	65.70	2.63	3.84	24.30	21.79	97.33
755	0.2	5.99	64.79	3.00	4.13	26.32	30.47	97.45
760	0.1	5.59	64.10	2.67	3.67	25.18	33.75	101.71
765	23.6	31.97	83.04	3.10	3.99	26.40	36.16	137.21
770	55.8	27.87	86.25	2.99	3.79	26.22	32.39	105.22
775	11.1	5.89	63.93	3.86	4.61	27.96	26.55	84.41
780	0.0	6.69	64.92	2.64	3.41	27.08	24.38	80.55

Tristimulus values, chromaticity co-ordinates and correlated colour temperatures (based on 5 nm intervals from 380 nm to 780 nm)

	X	Y	Z	x	y	u'	v'	K	R_a
LP Sodium	135.24	100.00	0.24	0.5743	0.4246	0.3307	0.5501	1725	
HP1	128.45	100.00	12.54	0.5330	0.4150	0.3084	0.5402	1959	8
HP2	114.90	100.00	25.58	0.4778	0.4158	0.2717	0.5320	2506	83
MB	86.97	100.00	75.95	0.3308	0.3803	0.1917	0.4959	5563	15
MBF	104.94	100.00	57.00	0.4006	0.3818	0.2364	0.5068	3531	48
MBTF	103.16	100.00	56.98	0.3965	0.3844	0.2326	0.5073	3649	49
HMI	103.75	100.00	116.80	0.3237	0.3120	0.2124	0.4606	5983	88
Xenon	99.78	100.00	110.21	0.3219	0.3226	0.2068	0.4662	6043	94

	X_{10}	Y_{10}	Z_{10}	x_{10}	y_{10}	u'_{10}	v'_{10}
LP Sodium	143.44	100.00	0.09	0.5890	0.4106	0.3491	0.5475
HP1	134.06	100.00	12.68	0.5433	0.4053	0.3207	0.5382
HP2	117.49	100.00	25.93	0.4826	0.4108	0.2772	0.5309
MB	96.95	100.00	84.63	0.3443	0.3551	0.2095	0.4863
MBF	112.44	100.00	63.12	0.4080	0.3629	0.2496	0.4995
MBTF	110.44	100.00	62.78	0.4042	0.3660	0.2456	0.5003
HMI	105.45	100.00	120.71	0.3233	0.3066	0.2144	0.4574
Xenon	98.97	100.00	108.74	0.3216	0.3250	0.2056	0.4675

A5.6 METHOD OF CALCULATING D ILLUMINANT DISTRIBUTIONS

For daylight illuminants, CIE Standard Illuminant D65 should be used whenever possible; if D65 is not appropriate, then either ID65, D50, ID50, D55, or D75, should be used if possible. If none of these daylight illuminants is appropriate, then one of the other CIE D illuminants, defined below, should be used.

Chromaticity

The chromaticity co-ordinates must be such that:

$$y_D = -3.000x_D^2 + 2.870x_D - 0.275$$

with x_D being within the range of 0.250 to 0.380. The correlated colour temperature T_c (calculated with c_2 of Planck's Law being equal to 1.4388×10^{-2} mK) of daylight D is related to x_D by the following formulae based on normals to the Planckian locus on a chromaticity diagram in which v is plotted against u (not v' against u'):

a. for correlated colour temperatures from 4000 K to 7000 K:

$$x_D = -4.6070(10^9/T_c^3) + 2.9678(10^6/T_c^2) + 0.09911(10^3/T_c) + 0.244063$$

b. for correlated colour temperatures from 7000 K to 25000 K

$$x_D = -2.0064(10^9/T_c^3) + 1.9018(10^6/T_c^2) + 0.24748(10^3/T_c) + 0.237040$$

The relative spectral power distributions, $S(\lambda)$, of the D illuminants are given by:

$$S(\lambda) = S_0(\lambda) + M_1 S_1(\lambda) + M_2 S_2(\lambda)$$

where $S_0(\lambda)$, $S_1(\lambda)$, $S_2(\lambda)$ are functions of wavelength, λ, as given in the table below, and M_1, M_2 are factors whose values are related to the chromaticity co-ordinates x_D, y_D as follows:

$$M_1 = (-1.3515 - 1.7703x_D + 5.9114y_D)/(0.0241 + 0.2562x_D - 0.7341y_D)$$

$$M_2 = (0.0300 - 31.4424x_D + 30.0717y_D)/(0.0241 + 0.2562x_D - 0.7341y_D)$$

Values of x_D, y_D, M_1, and M_2 for correlated colour temperatures in the range 4000 K to 25000 K are given below.

Wavelength	S_0	S_1	S_2	Wavelength	S_0	S_1	S_2
300	0.04	0.02	0.00	575	95.55	−2.55	0.35
305	3.02	2.26	1.00	580	95.10	−3.50	0.50
310	6.00	4.50	2.00	585	92.10	−3.50	1.30
315	17.80	13.45	3.00	590	89.10	−3.50	2.10
320	29.60	22.40	4.00	595	89.80	−4.65	2.65
325	42.45	32.20	6.25	600	90.50	−5.80	3.20
330	55.30	42.00	8.50	605	90.40	−6.50	3.65
335	56.30	41.30	8.15	610	90.30	−7.20	4.10
340	57.30	40.60	7.80	615	89.35	−7.90	4.40
345	59.55	41.10	7.25	620	88.40	−8.60	4.70
350	61.80	41.60	6.70	625	86.20	−9.05	4.90
355	61.65	39.80	6.00	630	84.00	−9.50	5.10
360	61.50	38.00	5.30	635	84.55	−10.20	5.90
365	65.15	40.20	5.70	640	85.10	−10.90	6.70
370	68.80	42.40	6.10	645	83.50	−10.80	7.00
375	66.10	40.45	4.55	650	81.90	−10.70	7.30
380	63.40	38.50	3.00	655	82.25	−11.35	7.95
385	64.60	36.75	2.10	660	82.60	−12.00	8.60
390	65.80	35.00	1.20	665	83.75	−13.00	9.20
395	80.30	39.20	0.05	670	84.90	−14.00	9.80
400	94.80	43.40	−1.10	675	83.10	−13.80	10.00
405	99.80	44.85	−0.80	680	81.30	−13.60	10.20
410	104.80	46.30	−0.50	685	76.60	−12.80	9.25
415	105.35	45.10	−0.60	690	71.90	−12.00	8.30
420	105.90	43.90	−0.70	695	73.10	−12.65	8.95
425	101.35	40.50	−0.95	700	74.30	−13.30	9.60
430	96.80	37.10	−1.20	705	75.35	−13.10	9.05
435	105.35	36.90	−1.90	710	76.40	−12.90	8.50
440	113.90	36.70	−2.60	715	69.85	−11.75	7.75
445	119.75	36.30	−2.75	720	63.30	−10.60	7.00
450	125.60	35.90	−2.90	725	67.50	−11.10	7.30
455	125.55	34.25	−2.85	730	71.70	−11.60	7.60
460	125.50	32.60	−2.80	735	74.35	−11.90	7.80
465	123.40	30.25	−2.70	740	77.00	−12.20	8.00
470	121.30	27.90	−2.60	745	71.10	−11.20	7.35

(*Continued*)

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Wavelength	S_0	S_1	S_2	Wavelength	S_0	S_1	S_2
475	121.30	26.10	−2.60	750	65.20	−10.20	6.70
480	121.30	24.30	−2.60	755	56.45	−9.00	5.95
485	117.40	22.20	−2.20	760	47.70	−7.80	5.20
490	113.50	20.10	−1.80	765	58.15	−9.50	6.30
495	113.30	18.15	−1.65	770	68.60	−11.20	7.40
500	113.10	16.20	−1.50	775	66.80	−10.80	7.10
505	111.95	14.70	−1.40	780	65.00	−10.40	6.80
510	110.80	13.20	−1.30	785	65.50	−10.50	6.90
515	108.65	10.90	−1.25	790	66.00	−10.60	7.00
520	106.50	8.60	−1.20	795	63.50	−10.15	6.70
525	107.65	7.35	−1.10	800	61.00	−9.70	6.40
530	108.80	6.10	−1.00	805	57.15	−9.00	5.95
535	107.05	5.15	−0.75	810	53.30	−8.30	5.50
540	105.30	4.20	−0.50	815	56.10	−8.80	5.80
545	104.85	3.05	−0.40	820	58.90	−9.30	6.10
550	104.40	1.90	−0.30	825	60.40	−9.55	6.30
555	102.20	0.95	−0.15	830	61.90	−9.80	6.50
560	100.00	0.00	0.00				
565	98.00	−0.80	0.10				
570	96.00	−1.60	0.20				

Chromaticity co-ordinates x_D, y_D and factors M_1, M_2 used in the calculation of the relative spectral power distributions of CIE D Illuminants. The corresponding chromaticity co-ordinates u'_D, v'_D are also given.

T_c	x_D	y_D	u'_D	v'_D	M_1	M_2
4000	0.3823	0.3838	0.2236	0.5049	−1.505	2.827
4100	0.3779	0.3812	0.2217	0.5031	−1.464	2.460
4200	0.3737	0.3786	0.2200	0.5014	−1.422	2.127
4300	0.3697	0.3760	0.2183	0.4997	−1.378	1.825
4400	0.3658	0.3734	0.2168	0.4979	−1.333	1.550
4500	0.3621	0.3709	0.2153	0.4962	−1.286	1.302
4600	0.3585	0.3684	0.2139	0.4946	−1.238	1.076
4700	0.3551	0.3659	0.2126	0.4929	−1.190	0.871
4800	0.3519	0.3634	0.2114	0.4913	−1.140	0.686
4900	0.3487	0.3610	0.2102	0.4897	−1.090	0.518

(*Continued*)

(*Continued*)

T_c	x_D	y_D	u'_D	v'_D	M_1	M_2
5000	0.3457	0.3587	0.2091	0.4882	−1.040	0.367
5100	0.3429	0.3564	0.2081	0.4866	−0.989	0.230
5200	0.3401	0.3541	0.2071	0.4851	−0.939	0.106
5300	0.3375	0.3619	0.2062	0.4837	−0.888	−0.005
5400	0.3349	0.3497	0.2053	0.4822	−0.837	−0.105
5500	0.3325	0.3476	0.2044	0.4808	−0.786	−0.195
5600	0.3302	0.3455	0.2036	0.4795	−0.736	−0.276
5700	0.3279	0.3435	0.2028	0.4781	−0.685	−0.348
5800	0.3258	0.3416	0.2021	0.4768	−0.635	−0.412
5900	0.3237	0.3397	0.2014	0.4755	−0.586	−0.469
6000	0.3217	0.3378	0.2007	0.4743	−0.536	−0.519
6100	0.3198	0.3360	0.2001	0.4730	−0.487	−0.563
6200	0.3179	0.3342	0.1995	0.4719	−0.439	−0.602
6300	0.3161	0.3325	0.1989	0.4707	−0.391	−0.635
6400	0.3144	0.3308	0.1983	0.4695	−0.343	−0.664
6500	0.3128	0.3292	0.1978	0.4684	−0.296	−0.688
6600	0.3112	0.3276	0.1973	0.4673	−0.250	−0.709
6700	0.3097	0.3260	0.1968	0.4663	−0.204	−0.726
6800	0.3082	0.3245	0.1963	0.4652	−0.159	−0.739
6900	0.3067	0.3231	0.1959	0.4642	−0.114	−0.749
7000	0.3054	0.3216	0.1955	0.4632	−0.070	−0.757
7100	0.3040	0.3202	0.1950	0.4623	−0.026	−0.762
7200	0.3027	0.3189	0.1946	0.4613	0.017	−0.765
7300	0.3015	0.3176	0.1943	0.4604	0.060	−0.765
7400	0.3003	0.3163	0.1939	0.4595	0.102	−0.763
7500	0.2991	0.3150	0.1935	0.4586	0.144	−0.760
7600	0.2980	0.3138	0.1932	0.4578	0.184	−0.755
7700	0.2969	0.3126	0.1928	0.4569	0.225	−0.748
7800	0.2958	0.3115	0.1925	0.4561	0.264	−0.740
7900	0.2948	0.3103	0.1922	0.4553	0.303	−0.730
8000	0.2938	0.3092	0.1919	0.4545	0.342	−0.720
8100	0.2928	0.3081	0.1916	0.4537	0.380	−0.708
8200	0.2919	0.3071	0.1913	0.4530	0.417	−0.695
8300	0.2910	0.3061	0.1911	0.4523	0.454	−0.682
8400	0.2901	0.3051	0.1908	0.4515	0.490	−0.667
8500	0.2892	0.3041	0.1906	0.4508	0.526	−0.652
9000	0.2853	0.2996	0.1894	0.4475	0.697	−0.566
9500	0.2818	0.2956	0.1884	0.4446	0.856	−0.471
10000	0.2788	0.2920	0.1876	0.4419	1.003	−0.369
10500	0.2761	0.2887	0.1868	0.4395	1.139	−0.265

(*Continued*)

(*Continued*)

T_c	x_D	y_D	u'_D	v'_D	M_1	M_2
11000	0.2737	0.2858	0.1861	0.4373	1.266	−0.160
12000	0.2697	0.2808	0.1850	0.4335	1.495	0.045
13000	0.2664	0.2767	0.1841	0.4303	1.693	0.239
14000	0.2637	0.2732	0.1834	0.4275	1.868	0.419
15000	0.2614	0.2702	0.1828	0.4252	2.021	0.586
17000	0.2578	0.2655	0.1818	0.4214	2.278	0.878
20000	0.2539	0.2603	0.1809	0.4172	2.571	1.231
25000	0.2499	0.2548	0.1798	0.4126	2.907	1.655
5003	0.3457	0.3585	0.2092	0.4881	−1.039	0.363
5503	0.3324	0.3474	0.2044	0.4807	−0.785	−0.198
6504	0.3127	0.3290	0.1978	0.4683	−0.295	−0.689
7504	0.2990	0.3149	0.1935	0.4585	0.145	−0.760