

Appendix 4: Terrestrial Spectral Irradiance

Absorbance, reflectance, and transmittance of terrestrial solar energy are important factors in solar thermal system performance, photovoltaic system performance, materials studies, biomass studies, and solar simulation activities. These optical properties are normally functions of wavelength, which requires that the spectral distribution of the solar flux be known before the solar weighted property can be calculated. To compare the performance of competitive products, a reference standard solar spectral irradiance distribution is desirable. [Table A4.1](#), given in this appendix, is constructed from data contained in ISO 9845-1:1992, Reference Solar Spectral Irradiance at the Ground at Different Receiving Conditions, Part 1, Direct Normal and Hemispherical Solar Irradiance for Air Mass 1.5 (see [Figure A4.1](#)).

Table A4.1 Direct Normal Solar Irradiance at Air Mass 1.5

λ (μm)	E ($\text{W}/\text{m}^2 \mu\text{m}$)	λ (μm)	E ($\text{W}/\text{m}^2 \mu\text{m}$)	λ (μm)	E ($\text{W}/\text{m}^2 \mu\text{m}$)
0.3050	3.4	0.7100	1002.4	1.3500	30.1
0.3100	15.8	0.7180	816.9	1.3950	1.4
0.3150	41.1	0.7240	842.8	1.4425	51.6
0.3200	71.2	0.7400	971.0	1.4625	97.0
0.3250	100.2	0.7525	956.3	1.4770	97.3
0.3300	152.4	0.7575	942.2	1.4970	167.1
0.3350	155.6	0.7625	524.8	1.5200	239.3
0.3400	179.4	0.7675	830.7	1.5390	248.8
0.3450	186.7	0.7800	908.9	1.5580	249.3
0.3500	212.0	0.8000	873.4	1.5780	222.3
0.3600	240.5	0.8160	712.0	1.5920	227.3
0.3700	324.0	0.8230	660.2	1.6100	210.5
0.3800	362.4	0.8315	765.5	1.6300	224.7
0.3900	381.7	0.8400	799.8	1.6460	215.9
0.4000	556.0	0.8600	815.2	1.6780	202.8
0.4100	656.3	0.8800	778.3	1.7400	158.2
0.4200	690.8	0.9050	630.4	1.8000	28.6
0.4300	641.9	0.9150	565.2	1.8600	1.8
0.4400	798.5	0.9250	586.4	1.9200	1.1
0.4500	956.6	0.9300	348.1	1.9600	19.7
0.4600	990.0	0.9370	224.2	1.9850	84.9
0.4700	998.0	0.9480	271.4	2.0050	25.0
0.4800	1046.1	0.9650	451.2	2.0350	92.5
0.4900	1005.1	0.9500	549.7	2.0650	56.3
0.5000	1026.7	0.9935	630.1	2.1000	82.7
0.5100	1066.7	1.0400	582.9	2.1480	76.5
0.5200	1011.5	1.0700	539.7	2.1980	66.4
0.5300	1084.9	1.1000	366.2	2.2700	65.0
0.5400	1082.4	1.1200	98.1	2.3600	57.6
0.5500	1102.2	1.1300	169.5	2.4500	19.8
0.5700	1087.4	1.1370	118.7	2.4940	17.0
0.5900	1024.3	1.1610	301.9	2.5370	3.0
0.6100	1088.8	1.1800	406.8	2.9410	4.0
0.6300	1062.1	1.2000	375.2	2.9730	7.0
0.6500	1061.7	1.2350	423.6	3.0050	6.0
0.6700	1046.2	1.2900	365.7	3.0560	3.0
0.6900	859.2	1.3200	223.4	3.1320	5.0

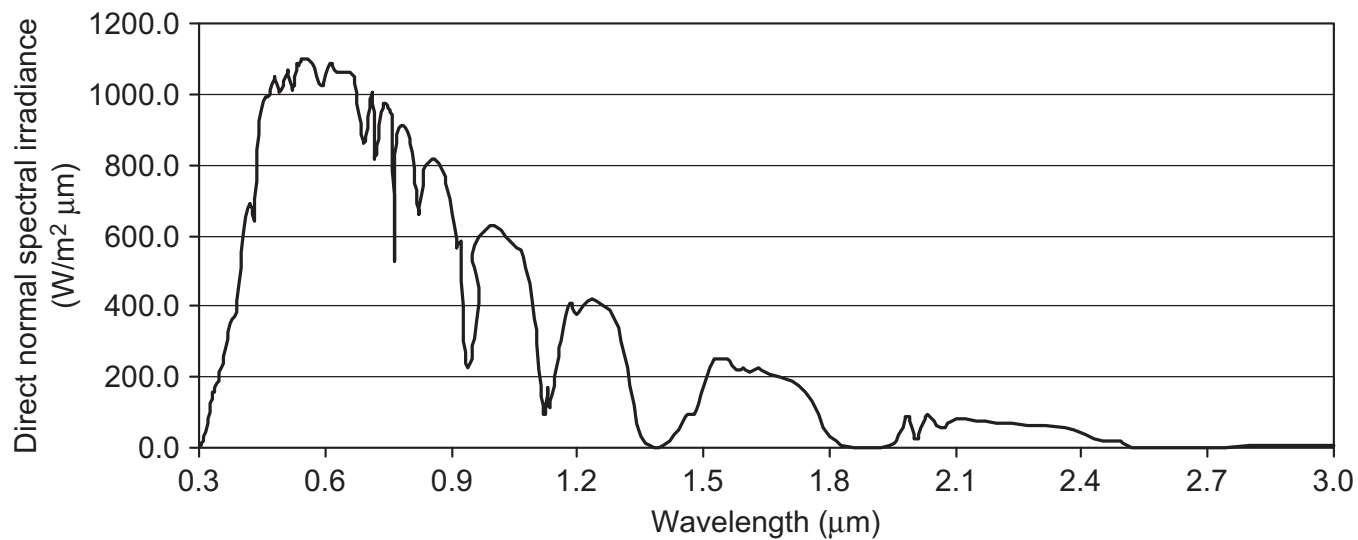


FIGURE A4.1

Direct normal solar irradiance at air mass 1.5.