

ISO 18526-2:2020-02 (E)

Eye and face protection - Test methods - Part 2: Physical optical properties

Contents		Page
Foreword		vii
Introduction		viii
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Preparatory information	1
5	General test requirements	2
6	Test methods for measuring transmittance -- General	2
6.1	Uncertainty of measurement	2
6.2	Reporting compliance	3
6.3	Applicability	3
6.4	Position and direction of measurement	3
6.5	Wavelength intervals	3
6.6	Test report	3
7	Luminous transmittance	3
7.1	Calculations of luminous transmittance from spectral values	3
7.2	Test report	3
7.3	Broadband method of measurement of luminous transmittance	4
7.3.1	Apparatus	4
7.3.2	Calibration	4
7.3.3	Procedure	4
7.3.4	Test reports for luminous transmittance values	4
7.4	Measurement of uniformity of luminous transmittance	4
7.4.1	Unmounted filter covering one eye	4
7.4.2	Filter covering both eyes	6
7.5	Transmittance matching at right and left reference points	9
7.5.1	Test method	9
7.5.2	Calculations	10
7.5.3	Test report	10
8	Ultraviolet transmittance	10
8.1	General	10
8.2	Spectral transmittance and mean spectral transmittance	10
8.3	Solar UV transmittance	10
8.4	Solar UV-A transmittance	10
8.5	Solar UV-B transmittance	10
8.6	Mean UV-A transmittance	10
8.7	Mean UV-B transmittance	11
8.8	Mean 380 nm to 400 nm transmittance	11
8.9	Test report	11
9	Blue-light transmittance	11
9.1	Solar blue-light transmittance	11
9.1.1	Calculation of solar blue-light transmittance from spectral values	11

9.1.2	Broadband method of measurement of solar blue-light transmittance	11
9.2	Blue-light transmittance from artificial sources	11
9.2.1	Calculation of blue-light transmittance from artificial sources from spectral values	11
9.2.2	Broadband method of measurement of blue-light transmittance from artificial sources ...	12
9.2.3	Test report	12
10	IR transmittance	12
10.1	Near IR transmittance	12
10.1.1	Calculation	12
10.2	IR-A transmittance	12
10.2.1	Calculation	12
10.3	IR-B transmittance	12
10.3.1	Calculation	12
10.4	Solar IR transmittance	12
10.4.1	Calculation	12
10.5	Test report	12
11	Relative visual attenuation coefficient for traffic signal light detection, Q_{signal}	13
11.1	Calculation	13
11.2	Test report	13
12	Spectral reflectance	13
12.1	Uncertainty of measurement	13
12.2	Position and direction of measurement	13
12.2.1	Specular spectral reflectance	13
12.2.2	Total spectral reflectance (specular included)	13
12.2.3	Total spectral reflectance (specular excluded)	14
12.2.4	0°/45° and 45°/0° geometry	14
12.3	Wavelength intervals	14
12.4	Test report	14
13	Luminous reflectance	14
13.1	Calculations	14
13.2	Test report	14
13.3	Luminous reflectance of mesh	14
14	Scattered light	15
14.1	Wide angle scatter	15
14.1.1	Principle	15
14.1.2	Apparatus	15
14.1.3	Test sample	16
14.1.4	Test procedure	16
14.1.5	Calculation	16
14.1.6	Test report	17
14.2	Narrow angle scatter	17
14.2.1	Principle	17
14.2.2	Test methods	18
14.2.3	Test report	23
15	Polarization	23
15.1	Plane of transmission	23
15.1.1	Apparatus	23
15.1.2	Test procedure	23
15.1.3	Test report	24
15.2	Polarizing efficiency	24
15.2.1	Principle	24
15.2.2	Test procedure for the spectrophotometric method	25
15.2.3	Test report	25
15.2.4	Test procedure for the broadband method	25
15.2.5	Test report	26

16	Photochromic lenses	26
16.1	Light source(s) to approximate the spectral distribution of solar radiation for air mass 2 for testing	26
16.1.1	Radiation source using one lamp	26
16.1.2	Radiation source using two lamps	27
16.2	Conditioning for luminous transmittance in the faded state	27
16.3	Measurement	28
16.3.1	Principle	28
16.3.2	Faded state	28
16.3.3	Darkened states	28
17	Automaticweldingfilters	29
17.1	General	29
17.2	Luminous transmittance in the light state	29
17.2.1	Measurement	29
17.2.2	Test report	30
17.3	Luminous transmittance in the dark state	30
17.3.1	Measurement	30
17.3.2	Test report	30
17.4	Shade number of welding filters with automatic shade number setting	30
17.4.1	Principle	30
17.4.2	Apparatus	31
17.4.3	Test procedure	31
17.4.4	Test report	31
17.5	Luminous transmittance variation over time	31
17.5.1	Principle	31
17.5.2	Apparatus	32
17.5.3	Test procedure	32
17.5.4	Test report	32
17.6	Blue-light transmittance for artificial sources	32
17.6.1	Measurement	32
17.6.2	Test report	32
17.7	Uniformity of luminous transmittance for flat filters	32
17.7.1	Filter covering both eyes	32
17.8	Angular dependence of luminous transmittance for flat filters	33
17.8.1	Principle	33
17.8.2	Apparatus	33
17.8.3	Test procedure	34
17.8.4	Test report	37
17.9	Angular dependence and uniformity of luminous transmittance for curved filters	37
17.9.1	Principle	37
17.9.2	Apparatus	37
17.9.3	Procedure	38
17.9.4	Test report	39
17.10	Transmittance matching at right and left reference points	39
17.10.1	Procedure	39
17.10.2	Test report	39
17.11	Switching time	39
17.11.1	Principle	39
17.11.2	Apparatus	39
17.11.3	Procedure	39
17.11.4	Uncertainty of measurement	40
17.11.5	Test report	40
17.12	Holding time	40
17.12.1	Principle	40
17.12.2	Apparatus	40
17.12.3	Procedure	40
17.12.4	Uncertainty of measurement	40
17.12.5	Test report	40
17.13	Manual control of dark state	40
17.13.1	Procedure	40
17.13.2	Test report	41

17.14	Optical sensitivity of welding detection	41
17.14.1	Principle	41
17.14.2	Apparatus	41
17.14.3	Measuring equipment	42
17.14.4	Trigger light source (L)	43
17.14.5	Calibration procedure for the trigger light source (L)	44
17.14.6	Higher intensity light source (I)	44
17.14.7	Lower intensity light source (F)	45
17.14.8	Test procedure	46
17.14.9	Test report	46
Annex A (normative) Application of uncertainty of measurement		47
Annex B (informative) Sources of uncertainty in spectrophotometry and their estimation and control		50
Annex C (informative) Definitions in summation form		58
Annex D (normative) Spectral functions for the calculation of transmittance and reflectance values		63
Annex E (informative) Generic description of automatic welding filters and guidance on illumination during testing		73
Bibliography		77