

European Window Film Association (EWFA)
Draft Supplement to Regulation No. 43

Annexes, amend to read

Annex 17 - Film applied to glazing on the inside

Annex 18 - Measurement of the heights of segment and position of the points of impact

Annex 19 - Procedures for determining test areas on windscreens of M₁ category vehicles in relation to the "V" points

Annex 20 - Procedure for determining the "H" point and the actual torso angle for seating positions in motor vehicles

Annex 21 - Checks on conformity of production

Insert new paragraph 2.5.3, to read:

2.5.3 "Film" means a plastic material which is fixed to the carrier glass

Insert new paragraph 2.5.8, to read:

2.5.8 XI in the case of film

Insert new paragraph 7.13, to read:

7.13 As regards film, the requirements contained in annex 17.

Insert new paragraph 8.1.4.5, to read:

8.1.4.5 Luminous reflection test

The purpose of this test is to determine whether the luminous reflectance of films exceeds a specified value.

Paragraph 8.2.1.1, amend to read:

8.2.1.1 Safety glass panes shall be subjected to the tests listed in the following table.

Tests	Windscreen							Glass panes other than windscreen			
	Toughened glass		Ordinary laminated glass		Treated laminated glass		Glass-plastics	Toughened glass	Laminated glass	Glass-plastics	Films
	I	I-P	II	II-P	III	III-P	IV				
Fragmentation:	A4/2	A4/2	-	-	A8/4	A8/4	-	A5/2	-	-	A17/4
Mechanical strength											
- 227g ball	-	-	A6/4.3	A6/4.3	A6/4.3	A6/4.3	A6/4.3	A5/3.1	A7/4	A7/4	-
- 2260 g ball	-	-	A6/4.2	A6/4.2	A6/4.2	A6/4.2	A6/4.2	-	-	-	-
Head form test 1/	A4/3	A4/3	A6/3	A6/3	A6/3	A6/3	A10/3	-	A7/3	A11/3	A17/3
Abrasion											
Outer face	-	-	A6/5.1	A6/5.1	A6/5.1	A6/5.1	A6/5.1	-	A6/5.1	A6/5.1	-
Inner face	-	A9/2	-	A9/2	-	A9/2	A9/2	A9/2 <u>2/</u>	A9/2 <u>2/</u>	A9/2	A9/2
High temperature	-	-	A3/5	A3/5	A3/5	A3/5	A3/5	-	A3/5	A3/5	A3/5
Radiation	-	A3/6	A3/6	A3/6	A3/6	A3/6	A3/6	-	A3/6	A3/6	A3/6
Humidity	-	A3/7	A3/7	A3/7	A3/7	A3/7	A3/7	A3/7 <u>2/</u>	A3/7	A3/7	A3/7
Light transmission	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	-
Optional distortion	A3/9.2	A3/9.2	A3/9.2	A3/9.2	A3/9.2	A3/9.2	A3/9.2	A3/9.2 <u>3/</u>	-	-	-

Secondary image	A3/9.3	A3/9.3	A3/9.3	A3/9.3	A3/9.3	A3/9.3	A3/9.3	A3/9.3	A3/9.3 ^{3/}	-	-	-
Identification of colours	A3/9.4	A3/9.4	A3/9.4	A3/9.4	A3/9.4	A3/9.4	A3/9.4	A3/9.4	-	-	-	-
Luminous reflection	-	-	-	-	-	-	-	-	-	-	-	A3/9.5
Resistance to temperature changes	-	A3/8	-	A3/8	-	A3/8	A3/8	A3/8 ^{2/}	A3/8 ^{2/}	A3/8	A3/8	A3/8
Fire resistance	-	A3/10	-	A3/10	-	A3/10	A3/10	A3/10 ^{2/}		A3/10	A3/10	A3/10
Resistance to chemicals	-	A3/11	-	A3/11	-	A3/11	A3/11	A3/11 ^{2/}	A3/11 ^{2/}	A3/11	A3/11	A3/11

^{1/} Furthermore this test shall be carried out on double-glazed unites pursuant to annex 12 paragraph 3 (A12/3).

^{2/} If coated on the inner side with plastics material,

^{3/} This test shall only be carried out on uniformly-toughened glass-panes to be used as windscreens of slow-moving vehicles which, by construction, cannot exceed 40 km/h.

Note: A reference such as A4/3 in the table indicates the annex (4) and paragraph (3) of that annex, where the relevant test is described and the acceptance requirements are specified.

Insert new Annex 1 - Appendix 10, to read:

Annex 1 -Appendix 10

Film applied to glazing on the inside (Principal and secondary characteristics in accordance with annex 17)

Approval No.

Extension No.

Principal characteristics

Chemical designation of the material.....
Classification of the material by the manufacturer ...
Process of manufacture.....
Number of layers.....
Nominal thickness.....
Colouring of film
Nature of glue or adhesive.....

Secondary characteristics

Nature of surface coating

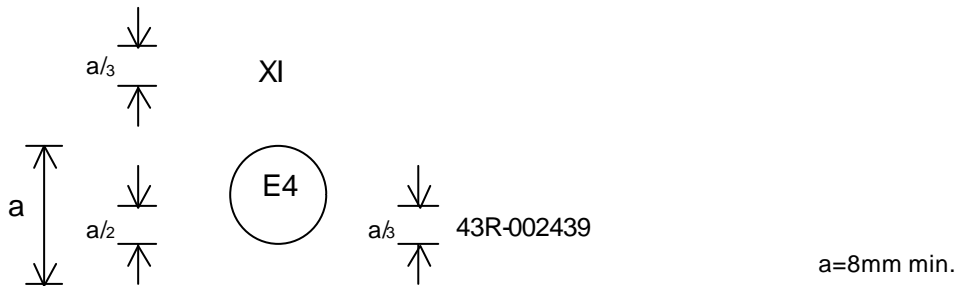
Remarks

Annex 1 - Appendix 10 (former), renumber as "Annex 1 - Appendix 11"

Annex 2

In addition, add at the end of this annex a new example of approval mark, to read:

Film applied to glazing on the inside at positions which are not essential for driver's vision



The above approval mark affixed to a film applied to a glazing pane on the inside at positions that are not essential for driver's vision shows that the component concerned has been approved in the Netherlands (E4) pursuant to Regulation No. 43 under No. 002439. The approval number indicates that the approval was granted in accordance with the requirements of Regulation No. 43.

Annex 3

Insert new paragraph 9.5 to read:

9.5 **Luminous reflection test**

9.5.1 Apparatus

9.5.1.1 Primary instrument: a highly accurate, integrating-sphere, laboratory photometer or spectrophotometer capable of determining the standard illuminant A reflectance of small working standards.

The primary instrument shall have one of the following geometries:

- a) diffuse/regular (symbol d/O): the specimen is illuminated diffusely by an integrating sphere and the angle between the normal to the specimen and the axis of the viewing beam does not exceed 10°;
- b) regular/diffuse (symbol 8/d): the specimen is illuminated by a beam whose axis is at an angle of 8° from the normal to the specimen and the reflected flux is collected by means of an integrating sphere.

The integrating sphere of the primary instrument should have a minimum diameter of about 100 mm and the total area of the ports shall not exceed 10 % of the sphere area. It shall be coated internally with spectrally nearly nonselective, high reflecting material (preferably above 95 % reflectance).

9.5.1.2 Secondary instrument: a less accurate, generally portable, instrument that is capable of determining the standard illuminant A reflectance of safety glazing materials by applying the formula given in 9.5.3.5 to its measured values.

9.5.1.3 Light trap: a device that reduces to 1 %, or less, the reflection from the transmitted source beam to the measured reflectance. The light trap should also block the spurious transmitted light from the opposite side of the specimen.

9.5.2. Test conditions

- 9.5.2.1 The test conditions of temperature, pressure, and humidity shall not affect the reflectance measurements.
- 9.5.2.2 Stray light shall not affect the measurement of specimen reflectance and all measurements should be made with a light trap.
- 9.5.2.3 A primary photometer shall have a light source accurately corresponding to CIE standard illuminant A and a detector precisely adapted to $V(\lambda)$ to generate the standard illuminant A reflectance directly.
- 9.5.2.4 A primary spectrophotometer shall have facilities to calculate standard illuminant A reflectance from the measured spectral reflectance values $\rho(\lambda)$ using the relative spectral radiant power distribution $S_A(\lambda)$ of standard illuminant A and the CIE photopic spectral luminous efficiency function $V(\lambda)$.
- 9.5.2.5 Primary standards are required to calibrate primary instruments. These are usually highly diffuse reflecting flat tiles with known reflectance values.
- 9.5.2.6 The total error of measurement of the primary instrument shall be within 1 % of the guaranteed primary standard value.
- 9.5.2.7 Secondary standards are required to calibrate secondary instrument. These standards shall be similar to the safety glazing materials to be measured, the reflectance values having been determined from calibrated primary instruments.
- 9.5.2.8 Secondary standards and test specimens shall be safety glazing materials which are essentially non-scattering to light, possessing haze of less than 2 %, are moderately curved by having a radius of curvature equal to or greater than 750 mm, and have a uniform thickness not exceeding 10 mm. They shall be clean, dry, and unbroken in the area of measurement.
- 9.5.2.9 In order to determine the adequacy of the secondary instrument, the ratio of the measured secondary instrument specimen value to the measured secondary instrument standard value shall not differ by more than ± 5 % of the ratio which would be obtained from measurements on the primary instrument. See 9.5.3.5.

This requirement shall be confirmed by measurements on specimens and standards before tests with the secondary instrument are performed.

- 9.5.2.10 Secondary instrument data shall not be suspect, due to one or more glazing attributes such as thickness, diffuse reflectance, or curvature, that are outside the limits prescribed in 9.5.2.8.

Laboratory remeasurements in accordance with CIE standards shall be made on any test specimen, or its equivalent, when its secondary instrument reflectance values are questionable. See 9.5.3.3, 9.5.2.4 and 9.5.3.5.

9.5.3 Procedure

9.5.3.1 Calibration of primary instrument

Stabilize the light source, detector and electrical circuits. Place a light trap at the reflectance specimen port and adjust its reflectance to zero. Place a primary standard at the specimen port and set the instrument to the determined reflectance value.

9.5.3.2 Measurement by primary instrument

Place a secondary standard, noting its film side and curvature orientation, at the specimen port. Measure the reflectance according to the recommendations of the instrument manufacturer.

9.5.3.3 Calibration of secondary instrument

Stabilize the light source, detector and electrical circuits. Place a light trap at the reflectance specimen port and adjust its reflectance to zero. Orient the secondary standard as noted in clause 9.5.3.2 at the specimen reflectance position and place the light trap behind the secondary standard. If possible, adjust the secondary instrument value to the reflectance value determined from the primary instrument.

9.5.3.4 Measurement by secondary instrument

Measure the test specimen in the secondary instrument with the specimen and light trap oriented in the same manner as the secondary standard during calibration. Measure the reflectance according to the instructions given by the instrument manufacturer. Obtain at least three separate measurements, spanning the flattest area of the test specimen.

NOTE 11 Accurate measurements of reflection become difficult as curvature, thickness, or light scattering increases.

9.5.3.5 Calculation of corrected values of standard illuminant A reflectance

If the secondary instrument was not adjusted as described in 9.5.3.3. calculate corrected standard illuminant A reflectance values from secondary instrument data by using the formula:

$$P_{cor} = \frac{P_{STD1} \times P_2}{P_{STD2}}$$

\tilde{n}_{cor} is the corrected value of reflectance, expressed as a percentage, obtained from the secondary instrument using the standard illuminant A;

\tilde{n}_{STD1} is the measured value of reflectance, expressed as a percentage, obtained from the primary instrument using the standard illuminant A;

\tilde{n}_2 is the measured specimen reflectance, obtained from the secondary instrument using standard illuminant A, C or D65.

\tilde{N}_{STD1} is the measured standard reflectance, obtained from the secondary instrument using standard illuminant A, C or D65;

NOTE 12 No calculation is made when calibration adjustments as prescribed in 9.5.3.3 render secondary instrument readings equivalent to corrected values.

9.5.4 Interpretation of results

The luminous reflection measured according to paragraph 9.5.3 in the case of side-windows or back lights shall not be more than 25 per cent and in the case of sunroofs shall not be more than 50 per cent.

Annex 17

Film applied to glazing on the inside (at positions which are not essential for driver's vision)

1. DEFINITION OF TYPE

Film applied to glazing shall be deemed to belong to different types if they differ in at least one of the following principal or secondary characteristics.

1.1 The principle characteristics are as follows:

1.1.1 The trade name or mark

1.1.2 The chemical designation of the material

1.1.3 The classification of the material by the manufacturer

1.1.4 The process of manufacture

1.1.5 The number of layers

1.1.6 The nominal thickness 'e' of the film, a manufacturing tolerance of $\pm 20\%$ above or below the nominal value being allowed

1.1.7 The colouring of the film

1.1.8 The nature of the glue or adhesive

1.2 The secondary characteristics are as follows:

1.2.1 The nature of the surface coating

2. GENERAL

2.1 In the case of films the tests shall be conducted on flat test pieces. For some tests the test pieces consist of a carrier glass of 4 mm and the film, for other tests only the film is enough. By laying the film on the glass the manufacturer's instructions have to be considered. The film shall not be fixed by a frame or rubber gaskets.

2.2 The test pieces must be freed from protecting markings and have to be cleaned carefully before the test.

They must be stored for 48 hours at a temperature of $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and a relative humidity of $50\% \pm 5\%$

3. HEADFORM TEST

3.1 Indices of difficulty of the secondary characteristics

No secondary characteristic is involved.

3.2 Number of test pieces

Six flat test pieces of carrier glass measuring (1170 mm x 570 mm) , \pm_{25}^0 mm are covered with film up to the frame of the support and shall be subjected to testing.

3.3. Test method

3.3.1 The method used shall be that described in annex 3, paragraph 3.

3.3.2 The height of drop shall be $1.50\text{ m} \pm \overset{0}{5}\text{ mm}$.

3.4 Interpretation of results

3.4.1 This test shall be deemed to have given a satisfactory result if the following conditions are fulfilled:

3.4.1.1 The test piece breaks

3.4.1.2 No large areas of film together with glass fragments shall fall from the test piece

3.4.2 A set of test pieces submitted for approval shall be considered satisfactory from the point of view of the headform test if one of the following two conditions is met.

3.4.2.1 All the tests give satisfactory results, or

3.4.2.2 one test having given an unsatisfactory result, a further series of tests carried out on a new set of test pieces gives satisfactory results.

4. FRAGMENTATION TEST

4.1 Indices of difficulty of the secondary characteristics

No secondary characteristic is involved.

4.2 Number of test pieces

Two flat test pieces of uniformly toughened glass panes with approval number and measuring 1100 mm x 500 mm shall be subjected to testing. One of the glass panes is covered with the film, the other one is without.

4.3 Test method

4.3.1 The test method used shall be that described in annex 3, paragraph 1.

4.4 Points of impact

For both flat glass panes the points of impact shall be in the geometric centre of the glass. The test shall be carried out on the outside surface of the glass pane.

4.5 Interpretation of results

A test shall be deemed to have given a satisfactory result if fragmentation is as described in annex 5. paragraph 2.6.

5. TEST OF RESISTANCE TO THE ENVIRONMENT

5.1 Test of resistance to abrasion-on the inner face

The requirements of annex 9, paragraph 2, shall apply.

5.2 Test of resistance to high temperature

The requirements of annex 3, paragraph 5, shall apply.

5.3 Resistance to radiation test

The requirements of annex 3, paragraph 6, shall apply.

5.4 Resistance to humidity test

The requirements of annex 3, paragraph 7, shall apply.

5.5 Test of resistance to temperature changes

The requirements of annex 3, paragraph 8, shall apply.

6. OPTICAL QUALITIES

6.1 Luminous reflection test

The requirements of annex 3, paragraph 9.5, shall apply.

7. FIRE-RESISTANCE TEST

7.1 Indices of difficulty and test method

The requirements of annex 3, paragraph 10, shall apply.

7.2 Interpretation of results

The fire-resistance test shall be considered to have given a satisfactory result if the burning rate is less than 110 mm/min.

7.2.1 For the purpose of approval a set of samples will be considered satisfactory if one of the following conditions is met.

7.2.1.1 All samples give a satisfactory result.

7.2.1.2 One sample having given an unsatisfactory result a second set of samples gives satisfactory results.

8. TEST OF RESISTANCE TO CHEMICALS

8.1 Indices of difficulty and test method

The requirements of annex 3, paragraph 11, shall apply.

8.2 Interpretation of results

A set of samples shall be considered acceptable if one of the following conditions are met.

8.2.1 All samples give satisfactory results.

8.2.2 One sample having given an unsatisfactory result, a second set of samples gives satisfactory results.

Annex 21

Insert new paragraph 2.11, to read:

2.11 Film applied to glazing on the inside

2.11.1 Test of resistance to abrasion in accordance with the requirements of annex 9, paragraph 2.1

2.11.2 Fire-resistance test in accordance with the requirements of annex 3, paragraph 10

2.11.3 Luminous reflection test in accordance with the requirements of annex 2, paragraph 9.5

NB: The above test only applies if the film has a reflective coating.

Insert new Paragraph 3.12, to read:

3.12 Luminous reflection test

3.12.1 Tests

Only films with a reflective coating shall be submitted to this test. There shall be at least one check at the beginning of every production run if there is a change in the characteristics of the film affecting the results of the test

3.12.1 Results

All results shall be recorded.