
INTERNATIONAL STANDARD



3917

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Road vehicles — Safety glasses — Test methods for resistance to radiation, high temperature, humidity and fire

Véhicules routiers — Vitres de sécurité — Méthodes d'essai de résistance au rayonnement, à haute température, à l'humidité et à la combustion

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3917 was drawn up by Technical Committee ISO/TC 22, *Road vehicles*, and was circulated to the Member Bodies in June 1975.

It has been approved by the Member Bodies of the following countries:

Austria	Germany	Poland
Belgium	Hungary	Portugal
Brazil	Iran	Romania
Bulgaria	Ireland	Sweden
Canada	Italy	Switzerland
Chile	Mexico	Turkey
Czechoslovakia	Netherlands	U.S.A.*
Finland	New Zealand	Yugoslavia

* The U.S.A. approved only clauses 1 to 7 of the International Standard, and abstained from voting on clause 8.

The Member Bodies of the following countries expressed disapproval of the document on technical grounds:

Australia
France
Spain

Road vehicles — Safety glasses — Test methods for resistance to radiation, high temperature, humidity and fire

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies test methods relating to the safety requirements for all safety glasses in a road vehicle, whatever the type of glass or the material of which they are composed.

2 REFERENCES

ISO 3536/1, *Road vehicles — Safety glasses — Vocabulary — Part 1*.

ISO 3538, *Road vehicles — Safety glasses — Test methods for optical properties*.

ISO 3795, *Road vehicles — Determination of burning behaviour of interior materials for motor vehicles*. ISO 3917:1976

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3 TEST CONDITIONS

Unless otherwise specified, the tests shall be carried out under the following conditions :

Temperature : 20 ± 5 °C

Pressure : 860 to 1 060 mbar

Relative humidity : 60 ± 20 %

4 APPLICATION OF TESTS

For certain types of safety glass, it is not necessary to carry out all the tests specified in this International Standard when the results, according to the purpose of testing, can be predicted with certainty from knowledge of the properties of the safety glass concerned.

5 RADIATION TEST

5.1 Purpose of test

The purpose of this test is to determine whether exposure to radiation over an extended period of time produces any appreciable decrease in regular luminous transmittance or any pronounced discoloration of the safety glass.

5.2 Apparatus

5.2.1 Radiation source consisting of a medium-pressure mercury vapour arc lamp with a tubular quartz bulb of ozone-free type; the bulb axis shall be vertical. The nominal dimensions of the lamp shall be 360 mm in length by 9,5 mm in diameter. The arc length shall be 300 ± 14 mm. The lamp shall be operated at 750 ± 50 W.

Any other source of radiation which produces the same effect as the lamp specified above may be used. To check that the effects of another source are the same, a comparison shall be made by measuring the amount of energy emitted within a wavelength range of 300 to 450 nm, all other wavelengths being removed by the use of suitable filters. The alternative source shall then be used with these filters.

In the case of safety glass for which there is no satisfactory correlation between this test and the conditions of use it will be necessary to review the test conditions.

5.2.2 Power supply transformer and capacitor capable of supplying to the lamp (5.2.1) a starting peak voltage of 1 100 V minimum and an operating voltage of 500 ± 50 V.

5.2.3 Device for mounting and rotating the test specimens at 1 to 5 rev/min about the centrally located radiation source in order to ensure even exposure.

5.3 Test specimen

The size of the test specimens shall be 76 mm × 300 mm.

5.4 Procedure

Check the regular light transmittance, determined according to ISO 3538, of three test specimens before exposure. Protect a portion of each test specimen from the radiation, and then position the test specimen in the test apparatus 230 mm from, and with its 300 mm dimension parallel to, the lamp axis. Maintain the temperature of the test specimens at 45 ± 5 °C throughout the test. That face of each test specimen which would represent the glazed exterior part of the motor vehicle shall face the lamp. For the type of lamp specified in 5.2.1, the exposure time shall be 100 h.

After exposure, measure the light transmittance again on each test specimen in the exposed area.

5.5 Expression of results

The results of the light transmission measurement of the exposed test specimen shall be compared with the values obtained for unexposed test specimens of the same material. The deviation shall be expressed as a percentage.

Changes in colour shall be evaluated :

- either by examining the test specimens placed upon a white background and comparing the exposed area with the area which was protected from the radiation;
- or by measuring the trichromatic co-ordinates of the test specimen before and after ageing and by calculating the difference between two colours according to the IC1¹⁾ prescriptions.

6 HIGH TEMPERATURE TEST

6.1 Purpose of test

The purpose of this test is to determine whether the safety glass will withstand exposure to high temperatures over an extended period of time without its appearance becoming substantially altered.

6.2 Procedure

Heat one or more test specimens of at least 300 mm × 300 mm to 100 °C. Maintain this temperature for a period of 2 h, then allow the test specimen(s) to cool to room temperature.

If the safety glass has both external surfaces of inorganic material, the test may be carried out by immersing the test specimen vertically in boiling water for the specified period of time, care being taken to avoid undue thermal shock.

If specimens are cut from windscreens, one edge of the test specimen shall be part of an edge of the windscreen.

6.3 Expression of results

The resistance of the safety glass to high temperatures shall be evaluated with reference to bubbles or other defects produced in the test specimen by the above test.

Any defects within 15 mm of an uncut edge, 25 mm from a cut edge or within 10 mm of any cracks which may develop shall be disregarded.

Any test specimen in which cracks develop to an extent which might confuse the results shall be discarded and another test specimen shall be tested in its place.

7 HUMIDITY TEST

7.1 Purpose of test

The purpose of this test is to determine whether the safety glass will successfully withstand the effects of humidity in the atmosphere over an extended period of time.

7.2 Procedure

Keep one or more test specimens of at least 300 mm × 300 mm vertically for 2 weeks in a closed container in which the temperature is maintained at 50 ± 2 °C and the relative humidity at 95 ± 4 %.

NOTE — These test conditions exclude any condensation on test specimens.

In the event that several test specimens are tested at the same time, adequate spacing shall be provided between the test specimens.

Precautions shall be taken to prevent condensate from the walls and ceiling of the test chamber from falling on the test specimens.

If the test specimens are cut from windscreens, one edge of the test specimen shall be part of an edge of the windscreen.

7.3 Expression of results

The resistance to humidity shall be evaluated visually by reference to change in the appearance of the safety glass after testing, i.e. :

- separation of materials;
- loss of transparency according to ISO 3538.

The changes shall be assessed over the whole test specimen, except within 10 mm of the uncut edges or within 15 mm of the cut edges.

8 BURNING BEHAVIOUR TEST

8.1 Purpose of test

The purpose of this test is to determine the behaviour of the safety glass under the action of a small flame.

The method used shall be that specified in ISO 3795.

8.2 Expression of results

The burning behaviour of the safety glass shall be evaluated by reference to the burning rate.

1) International Commission on Illumination.