

# INTERNATIONAL STANDARD

**ISO**  
**3468**

Second edition  
1989-12-15

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## **Passenger cars — Windscreen defrosting systems — Test method**

*Voitures particulières — Dispositif de dégivrage du pare-brise —  
Méthode d'essai*



Reference number  
ISO 3468:1989(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 3468 was prepared by Technical Committee ISO/TC 22, *Road vehicles*.

This second edition cancels and replaces the first edition (ISO 3468:1976), of which it constitutes a technical revision and expansion.

Annexes A and B of this International Standard are for information only.

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## Introduction

This International Standard is one of a series of four dealing similarly with the testing of defrosting (ISO 3468), washing (ISO 3469), demisting (ISO 3470) and wiping (ISO 9619) for the windscreen of passenger cars. (See annex B.)

The testing of demisting, defrosting, and washing and wiping systems and equipment for the rear-windows of passenger cars is dealt with in ISO 5897, ISO 5898 and ISO 6255 respectively.

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# Passenger cars — Windscreen defrosting systems — Test method

## 1 Scope

This International Standard specifies the test method for passenger car (term 3.1.1 in ISO 3833:1977) windscreen defrosting systems when these are fitted.

It is not necessary for the tests to be repeated on types of power-driven vehicles which do not differ from one another in respect of the following essential features which affect defrosting performance:

- a) shape, size and surface characteristics of the windscreen;
- b) characteristics of each system designated by the vehicle manufacturer as contributing to windscreen defrosting.

This International Standard does not specify reference areas or levels of performance.

**NOTE 1** It may be possible to carry out tests of a similar nature on front windscreens and rear windows simultaneously.

The test condition of  $-18^{\circ}\text{C} \pm 3^{\circ}\text{C}$  specified in this International Standard will meet the majority of cold climatic requirements. However there may be instances where lower temperatures are encountered, and such conditions may be dealt with in a future document.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of ap-

plying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1176:—<sup>1)</sup>, *Road vehicles — Masses — Vocabulary and codes.*

ISO 3833:1977, *Road vehicles — Types — Terms and definitions.*

## 3 Definitions

For the purposes of this International Standard, the following definitions apply.

**3.1 defrosted area:** Area of the outer glazed surface of the windscreen having a dry surface or covered with melted or partially melted (wet) frost. It excludes any area of the windscreen covered with dry frost.

**3.2 defrosting:** Elimination of frost and/or ice covering the outer glazed surface of the windscreen by the operation of the windscreen defrosting and/or windscreen wiping and washing systems.

**3.3 windscreen defrosting system:** Device, or combination of devices, intended by the vehicle manufacturer to eliminate frost or ice from the glazed surfaces of the windscreen and thus restore visibility, together with the necessary accessories and controls.

**3.4 windscreen wiping system:** Device for wiping the windscreen outer glazed surface, together with the necessary accessories and controls.

**3.5 windscreen washing system:** Device for storing washer solution and applying it to the windscreen outer glazed surface together with the necessary controls.

1) To be published. (Revision of ISO 1176:1974.)

**3.6 road load:** Power output as indicated by the vehicle manufacturer required to move the vehicle on a flat road at a specified speed through still air at 20 °C with a standard barometric pressure of 1 013 mbar, the vehicle being at its complete vehicle kerb mass as specified in ISO 1176 plus 150 kg to represent the driver and passenger on the front seats. Road load takes account of transmission friction, rolling friction and air resistance.

## 4 Test method

### 4.1 Performance requirements

When tested in accordance with the following procedure, and at the temperature specified, the defrosting system shall be capable of defrosting specified percentages of specified areas after stated time intervals from the start of the test.

### 4.2 Test equipment

**4.2.1 Cold chamber** large enough to contain the complete vehicle and capable of ensuring that temperatures of either  $-8\text{ °C} \pm 2\text{ °C}$  or  $-18\text{ °C} \pm 3\text{ °C}$  can be maintained throughout the test.

**4.2.2 Spray gun** capable of applying liquid to the outer glazed surface of the windscreen and having the following characteristics:

Nozzle diameter:	1,7 mm
Operating pressure:	$350\text{ kPa} \pm 20\text{ kPa}^{2)}$
Nominal flow rate:	395 ml/min
Projection cone diameter at 200 mm from nozzle:	300 mm

### 4.3 Test preparation

**4.3.1** Carry out all necessary vehicle preparation, e.g. cleaning, and marking if required, of the windscreen and installation of necessary instrumentation to ensure a satisfactory test and to record the test conditions, prior to the temperature stabilization in 4.3.4.

**4.3.2** Thoroughly degrease the outer and inner glazed surfaces using an appropriate degreasing agent. When dry, apply a 3 % to 10 % solution of ammonia in water, allow to dry, and finally wipe with a dry cotton cloth or paper towel that contains no additives.

**4.3.3** Ensure that the chamber (4.2.1) is at or below the specified test temperature before the start of the stabilizing period.

**4.3.4** Place the vehicle in the chamber (4.2.1). Maintain the temperature in the chamber throughout the soak and test periods at either

- a)  $-18\text{ °C} \pm 3\text{ °C}$ , full temperature range; or
- b)  $-8\text{ °C} \pm 2\text{ °C}$ , restricted temperature range.

**4.3.5** Keep the vehicle, with the engine stopped, at the specified test temperature for a period of 10 h. This period may be shortened if instruments are available to check that the engine coolant, lubricant and vehicle internal air have stabilized at the specified test temperature.

### 4.4 Test conditions

**4.4.1** Measure the chamber temperature at the same height as the middle of the windscreen at a location such that the temperature is not significantly affected by heat from the vehicle under test or by cold air entering the chamber.

**4.4.2** Measure the horizontal component of the air velocity cooling the chamber immediately prior to the test at a point located on the longitudinal centreline of the vehicle 300 mm ahead of the base of the windscreen at a level half-way between the windscreen top and bottom. The velocity of this component shall be as low as possible and in any case less than 8 km/h.

### 4.5 Test procedure

**4.5.1** Set the vehicle defrosting system controls for maximum defrost as recommended by the vehicle manufacturer.

**4.5.2** After the temperature stabilization in 4.3.4, create an even coating of frost of 0,044 g/cm<sup>2</sup> over the entire outer glazing surface of the windscreen by means of the spray gun (4.2.2).

**4.5.3** The engine bonnet (hood), doors, windows and vents, except the air intakes and outlets of the defrosting and ventilating system, shall be closed, except that one or two windows may be open a total distance of 25 mm depending on the mode of operation as indicated by the vehicle manufacturer.

**4.5.4** After the frost coating has been formed, an additional period of between 30 min and 40 min shall elapse before the start of the recorded test period.

2) 1 kPa = 10<sup>-2</sup> bar

**4.5.5** After the period specified in 4.5.4 has elapsed, one or two observers may enter the vehicle; start the engine. An external power source may be used to start it but shall then be disconnected. The test period commences when the engine has been started and is running under its own power. Bring the defrosting system into operation as prescribed by the vehicle manufacturer with the vehicle in the condition specified by the manufacturer for satisfactory operation at low temperature.

**4.5.6** The conditions specified in 4.5.6.1 to 4.5.6.5 shall apply throughout the test period.

**4.5.6.1** During the first 5 min of the test period, the engine speed or speeds may be those indicated by the vehicle manufacturer for warming-up after starting in cold weather.

**4.5.6.2** During the final 35 min of the test period (or the entire test period if the 5 min warming-up procedure is not followed) either

- a) the engine speed shall be as indicated by the vehicle manufacturer, but in no case exceeding 50 % of the speed at which it develops maximum power; or,

- b) if the vehicle manufacturer so desires, on a chassis dynamometer the engine speed and load shall not exceed the speed and equivalent road load at 40 km/h in the gear and with the tyre inflation pressures recommended by the vehicle manufacturer for the road load.

**4.5.6.3** The windscreen wipers may be used during the test in accordance with the instructions of the vehicle manufacturer if they can commence operation without manual assistance.

**4.5.6.4** If the vehicle battery is used, it shall be fully charged; an external power source may supplement or replace the battery to meet the requirements of 4.5.6.5.

**4.5.6.5** The voltage measured between the earth and the point in the common live line that can be identified and contacted nearest to the windscreen defrosting system shall be the system's rated voltage (if it differs from the vehicle's rated voltage) or  $1,15 \times$  the rated voltage specified for the vehicle  $\pm 5 \%$ .

**4.5.7** At the start of the test, and thereafter at stated intervals, record the defrosting pattern. (A method of recording is given in annex A but an equivalent method may be used.)

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**Annex A**  
(informative)

**Recommended method of recording cleared area**

**A.1 Test preparation**

The area to be assessed should be accurately located and clearly marked on the inside of the windscreen.

On completion of every test, a tracing should be taken of the defrosted pattern. The tracing should be marked to identify the driver's side.

Other methods are permitted providing they give a comparable result; for example see ISO 5898.

**A.2 Recording cleared area**

On the inside of the windscreen, the observer(s) should outline the defrosted area at 5 min intervals from the start of the test period using, for example, a wax pencil for this purpose.

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**Annex B**  
(informative)

**Bibliography**

- [1] ISO 3469:1989, *Passenger cars — Windscreen washer systems — Test methods.*
- [2] ISO 3470:1989, *Passenger cars — Windscreen demisting systems — Test method.*
- [3] ISO 5897:1987, *Road vehicles — Rear-window demisting system for passenger cars — Test method.*
- [4] ISO 5898:1987, *Road vehicles — Rear-window defrosting system for passenger cars — Test method.*
- [5] ISO 6255:1987, *Road vehicles — Rear-window washing and wiping systems for passenger cars — Test methods.*
- [6] ISO 9619:—<sup>3)</sup>, *Passenger cars — Windscreen-wiping systems — Test method.*

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3) To be published.