INTERNATIONAL STANDARD

**ISO 5898**

Second edition
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# Passenger cars — Rear-window defrosting system — Test method

*Voitures particulières — Dispositif de dégivrage de la lunette arrière — Méthode d'essai*



Reference number
ISO 5898:1997(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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 5898 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 17, *Visibility*.

This second edition cancels and replaces the first edition (ISO 5898:1987), of which it constitutes a technical revision.

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 three International Standards covering demisting (ISO 5897), defrosting (ISO 5898), and washing and wiping (ISO 6255) systems for the rear-window of passenger cars.

Tests on defrosting, washing, demisting and wiping systems for the windscreen of passenger cars are covered respectively in ISO 3468, ISO 3469, ISO 3470 and ISO 9619.

# Passenger cars — Rear-window defrosting system — Test method



## 1 Scope

This International Standard specifies a test method for passenger car (as defined in ISO 3833) rear-window defrosting systems, when these are fitted.

It does not specify reference areas or levels of performance, since at the time it was prepared there was insufficient data available.

NOTE — It may be possible to carry out tests of a similar nature on windscreen and rear-window simultaneously.

The test method is intended to apply to 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 rear-window;

b) characteristics of each system designated by the vehicle manufacturer as contributing to the defrosting of the rear-window.

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

ISO 1176:1990, *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 rear-window having a dry surface or covered with melted or partially-melted (wet) frost.

NOTE — This definition excludes any area of the rear-window covered with dry frost.

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

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

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

**3.5 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 mass of the vehicle being equal to the complete vehicle kerb mass, in accordance with ISO 1176 (ISO-M06) plus 150 kg, i.e. representing the driver and passenger on the front seats.

NOTE — Road load takes account of transmission friction, rolling friction and air resistance.

## 4 Verification of performance of rear-window defrosting system

### 4.1 Test requirements

When tested in accordance with this clause, the defrosting system shall be capable of defrosting specified percentages of specified areas within a stated time from the start of the test.

If the vehicle fails the test at the first attempt, a second attempt may be made on the same vehicle at the discretion of the vehicle manufacturer, and the arithmetical average of the defrosted areas obtained at the two attempts shall be taken as the result.

### 4.2 Test equipment

**4.2.1 Environmental chamber,** large enough to contain the complete vehicle and capable of ensuring that temperatures of either – 18 °C ± 3 °C or – 8 °C ± 2 °C can be maintained throughout the test.

**4.2.2 Spray-gun,** capable of applying liquid to the outer glazed surface of the rear-window and satisfying the requirements given in table 1.

**Table 1 — Spray-gun characteristics**

| Characteristic | Specifications |
|---|---|
| Nozzle diameter | 1,7 mm |
| Operating pressure | (350 ± 20) kPa[1)] |
| Nominal flow rate | 395 ml/min |
| Projection cone diameter at 200 mm from nozzle | 300 mm |

1) 1 kPa = $10^{-2}$ bar

### 4.3 Test preparation

**4.3.1** All necessary vehicle preparation, for example cleaning and marking, if required, of the rear-window and installation of instrumentation necessary to ensure a satisfactory test and to record the defrosting test conditions, shall be carried out prior to the temperature stabilization referred to in 4.3.4 a) and b).

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

**4.3.3** Check that the environmental 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 environmental chamber. Maintain the temperature in the chamber throughout the stabilization and test periods at either:

a) – 18 °C ± 3 °C, full temperature range; or;

b) – 8 °C ± 2 °C, restricted temperature range.

**4.3.5** Maintain the vehicle, with the engine stopped. at the specified test temperature for a period of not less than 10 h. This period may be shortened if instruments are available to check that the engine coolant, lubricant and vehicle internal air are stabilized at the specified test temperature.

## 4.4 Test conditions

**4.4.1** The environmental chamber temperature shall be measured at the height of 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** The horizontal component of the velocity of the air cooling the chamber shall be measured 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 top and bottom of the windscreen. The value of this component shall be as low as possible and in any case less than 8 km/h.

## 4.5 Test method

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

**4.5.2** After temperature stabilization (see 4.3.4), form an even coating of frost of 0,044 g/cm$^2$ over the entire outer glazed surface of the rear-window by means of the spray-gun (4.2.2).

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

**4.5.4** When the frosting-up of the rear-window has been carried out, allow an additional period of not less than 30 min and not more than 40 min to elapse before beginning the test.

**4.5.5** After the period specified in 4.5.4 has elapsed, and with one or two observers in the vehicle, start the engine. An external power source may be used to start the engine but shall then be disconnected. The test period commences when the engine has been started and is running under its own power.

**4.5.6** Start the defrosting system by the vehicle manufacturer provided in the conditions specified for satisfactory operation at low temperature.

**4.5.7** The conditions set in 4.5.7.1 to 4.5.7.5 shall apply throughout the test period.

**4.5.7.1** If necessary, warm up the engine during the first 5 min of the test period, at the speed indicated by the vehicle manufacturer for warming-up after starting in cold weather.

**4.5.7.2** During the final 35 min of the test period (or the entire test period if the 5 min warming-up procedure is not followed), run the engine:

a) either at the engine speed record indicated by the vehicle manufacturer, but in no case exceeding 50 % of the speed corresponding to maximum power;

b) or, if the vehicle manufacturer so desires, on a chassis dynamometer, where the engine speed and load do 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.

**4.5.7.3** The rear-window wipers, if fitted, may be used during the test in accordance with the instructions of the vehicle manufacturer, if they can commence operation without manual assistance.

**4.5.7.4** If the vehicle battery is used, it shall be fully charged; an external power source may supplement or replace the vehicle battery to meet the requirements of 4.5.7.5.

**4.5.7.5** The voltage at the terminals of the defrosting device shall be not more than 20 % above the nominal rating of the system.

**4.5.8** At the start of the test, and thereafter at stated intervals, record the defrosting pattern

a) in accordance with annex A (recommended method) or,

b) by placing a piece of heavy, clear tracing paper on the outer glazed surface and tracing on it both the rear-window outline and the specified area. Then trace the defrosted area and calculate the percentage of the specified area that was cleared during the test.

NOTE — It is recommended that the cleared area be outlined on the glazed surface before transferring it to the tracing paper.

# Annex A
(informative)

# Recommended method of recording area cleared

## A.1 Test preparation

The area to be assessed shall be accurately located and clearly marked on the inside of the rear-window.

## A.2 Camera position

Cameras may be placed either inside or outside the vehicle. If inside the vehicle, the camera shall be placed as close as possible to the position of the rear-view mirror viewing the rear-window direct. In either event the optical axis of the camera(s) shall be located at the intersection of the $Y$ and $Z$ planes[4] through the centre of the inside rear-view mirror. The photographic image shall cover at least the area of the rear-window to be assessed. The location of the camera(s) shall be such that the result of the test is not affected.

## A.3 Lighting

The rear-window shall be adequately illuminated, but such that the results of the test are not influenced (for example by radiated heat). Any additional lighting in the test chamber shall not affect the test.

## A.4 Frequency of photographing

Photographs shall be taken at specified time intervals.

## A.5 Size of picture

The value of the dimension of the major axis of the area to be assessed on the photograph shall be not less than 200 mm. However, when the results obtained are marginal, photographs may be enlarged sufficiently to enable areas to be determined more accurately.