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## Road vehicles — Rear-window demisting system for passenger cars — Test method

*Véhicules routiers — Dispositif de désembuage de la lunette arrière des voitures particulières  
— Méthode d'essai*

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Reference number  
ISO 5897:1987 (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.

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 5897 was prepared by Technical Committee ISO/TC 22, *Road vehicles*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

# Road vehicles — Rear-window demisting system for passenger cars — Test method

## 0 Introduction

This International Standard is one of a series of three covering demisting, defrosting, and washing and wiping systems for the rear-window of passenger cars:

ISO 5897, *Road vehicles — Rear-window demisting system for passenger cars — Test method.*

ISO 5898, *Road vehicles — Rear-window defrosting system for passenger cars — Test method.*

ISO 6255, *Road vehicles — Rear-window washing and wiping systems for passenger cars — Test methods.*

Tests on defrosting, washer and demisting systems for the windscreen of passenger cars are covered respectively in the following International Standards:

ISO 3468, *Road vehicles — Windscreen defrosting systems for passenger cars — Test method.*

ISO 3469, *Road vehicles — Windscreen washer systems for passenger cars — Test methods.*

ISO 3470, *Road vehicles — Windscreen demisting equipment for passenger cars — Test method.*

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

It should be noted that it may be possible to carry out tests of a similar nature on windscreen and rear-window simultaneously.

The tests shall be conducted at a temperature of  $-3 \pm 1$  °C since this is the practical minimum temperature at which mist as defined in 3.1 can normally occur.

## 1 Scope and field of application

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

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 demisting 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 demisting of the rear window;
- c) number of seats as designated by the vehicle manufacturer.

## 2 References

ISO 1176, *Road vehicles — Weights — Vocabulary.*

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

ISO 6549, *Road vehicles — Procedure for H-point determination.*

## 3 Definitions

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

**3.1 mist** : Film of condensate on interior of glazed surface.

**3.2 demisting** : Elimination of mist from the rear-window by the operation of the rear-window demisting system.

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

**3.4 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 kerb weight as specified in ISO 1176 plus 150 kg, i.e. representing the driver and passenger on the front seats. Road load takes account of transmission friction, rolling friction and air resistance.

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

### 4.1 Test requirements

When tested in accordance with the following procedure, the demisting system shall be capable of demisting 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 demisted 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 a temperature of  $-3 \pm 1 \text{ }^\circ\text{C}$  and relative humidity of 50 % to 80 % can be maintained during the pre-test period.

NOTE — If the test result is not influenced significantly, a higher relative humidity value is acceptable.

**4.2.2 Steam generator**, having the following characteristics (see the figure):

- a) a water capacity of at least 2,25 l;
- b) the heat loss at boiling point not exceeding 75 W at a temperature of  $-3 \pm 1 \text{ }^\circ\text{C}$ ;
- c) fan operating at a capacity of 0,07 to 0,10 m<sup>3</sup>/min at 50 Pa static pressure;
- d) device to regulate the steam output by controlling the input wattage to the heating element.

Dimensions and materials of the generator parts shall meet the requirements given in the table.

Table — Dimensions and materials of the steam generator

Component	Dimensions	Material
Nozzle	a) Length 100 mm b) Inside diameter 15 mm	Brass
Dispersion chamber	a) Inside length 115 mm b) Inside diameter 75 mm c) Six evenly spaced holes of 6,3 mm diameter, 25 mm above the bottom of the dispersion chamber interior	Brass tube of 0,38 mm wall thickness
Heating element	Capacity 700 to 800 W	

The generator shall be calibrated at  $-3 \pm 1 \text{ }^\circ\text{C}$  to give readings for each  $70 \pm 5 \text{ g/h}$  output up to a maximum of  $n$  times this figure, where  $n$  is the number of seats designated by the vehicle manufacturer.

The generator with water is calibrated by weighing before and after 1 h of operation at the set temperature. A minimum of four points covering the range of seats shall be obtained. The heat input to achieve the above shall be made by using a regulating device as indicated in 4.2.2d). The calibration shall be presented in the form of a graph or table of steam output against input wattage.

### 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 demisting test conditions, shall be carried out prior to the temperature stabilization referred to in 4.3.5.

**4.3.2** Thoroughly degrease the outer and inner glazed surfaces using methylated spirit or an appropriate degreasing agent. When dry, apply a 3 % to 10 % (V/V) solution of ammonia in water, 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 at  $-3 \pm 1 \text{ }^\circ\text{C}$ , and relative humidity at 50 % to 80 % throughout the preparation and stabilization periods.

**4.3.5** Maintain the vehicle, with the engine stopped, at the specified test temperature for a stabilizing 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 velocity of this component shall be as low as possible and in any case less than 8 km/h.

**4.4.3** The engine bonnet (hood), doors, windows and vents, except the air intakes and outlets of the heating and ventilating system, shall be closed during the misting period.

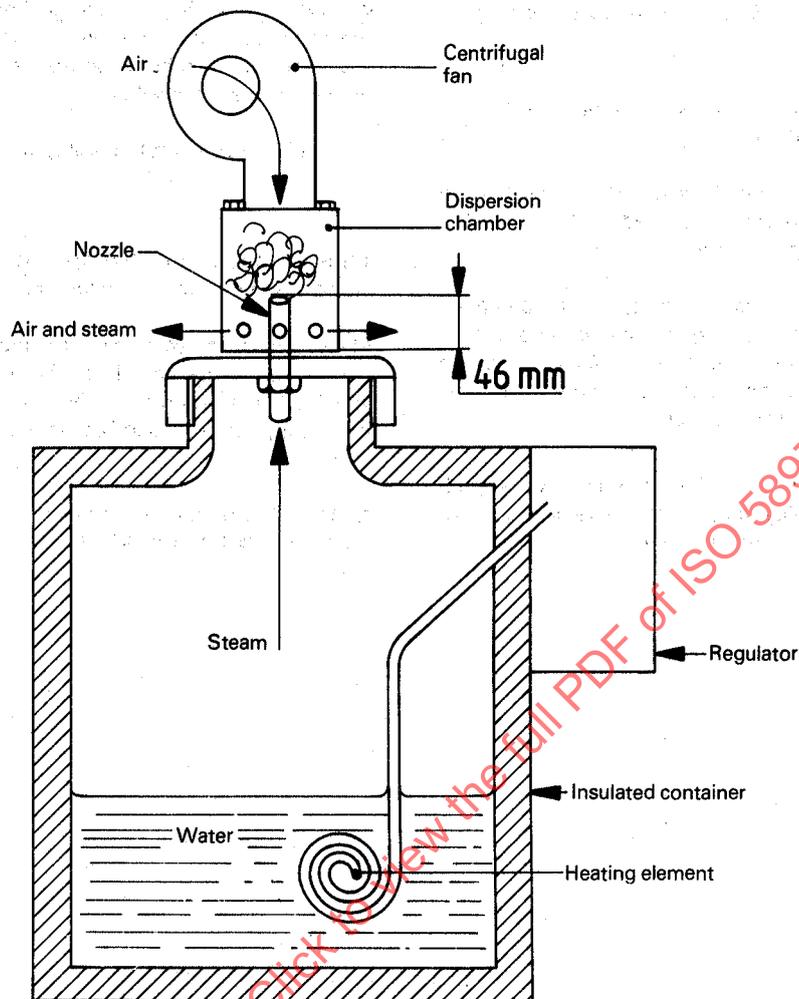


Figure — Schematic drawing of a typical steam generator

4.4.4 The mist shall be produced by means of the steam generator described in 4.2.2 or by any other means giving an equivalent result.

4.4.5 Fill the container of the steam generator with water. Start the steam generator outside the vehicle, bringing up to boiling as soon as possible. The steam generator, containing at least 1,7 l of water, shall be stabilized to generate  $70 \pm 5$  g/h of steam for each seat designated by the vehicle manufacturer.

4.4.6 The steam generator shall be located with its outlets in the median plane of the vehicle at a height of  $580 \pm 80$  mm above the R point of the driver's seat as defined in ISO 6549. It shall normally be placed immediately behind the front seatback, with the seatback, if adjustable, set at the angle specified by the vehicle manufacturer. Where the design of the vehicle precludes this location, the generator may be placed in the nearest convenient position to that described above.

#### 4.5 Test method

4.5.1 Install the generator in the vehicle, set and maintain the reduced power level appropriate to cause the beginning of boiling. Increase the power setting as indicated in 4.4.5 and allow to steam for 5 min after which time one or two observers shall enter the vehicle; the output of the generator shall be reduced by  $70 \pm 5$  g/h for each observer.

4.5.2 Set the vehicle demister controls as recommended by the vehicle manufacturer.

4.5.3 One minute after the observer(s) has (have) entered the vehicle, start the engine as indicated by the vehicle manufacturer. The test period shall commence when the engine has been started and is running under its own power.

At the discretion of the vehicle manufacturer, 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 during the demisting period.

**4.5.4** The conditions set in 4.5.4.1 to 4.5.4.3 shall apply throughout the test period.

**4.5.4.1** During the test period, taking account of the individual vehicle characteristics, run the engine:

a) either at the engine speed indicated by the vehicle manufacturer, but at no period exceeding 50 % of the speed at which it develops 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.

**4.5.4.2** 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 4.5.4.3.

**4.5.4.3** The voltage measured between earth (ground) and the point in the common live line that can be identified and with which contact can be made that is nearest to the rear-window demisting system shall be

$$(1,15 \times \text{system rated voltage}) \pm 5 \%$$

**4.5.5** At the end of the test the demisted area shall be recorded (see 4.1) by the following method.

Place a piece of heavy, clear tracing paper on the outer glazed surface and trace on it both the rear-window outline and the specified area. Then trace the demisted 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.

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