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Commission Regulation (EU) No 672/2010 of 27 July 2010 concerning type-approval requirements for windscreen defrosting and demisting systems of certain motor vehicles and implementing Regulation (EC) No 661/2009 of the European Parliament and of the Council concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor

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ANNEX II

Requirements for windscreen defrosting and demisting systems

1. SPECIFIC REQUIREMENTS

1.1. Windscreen defrosting

1.1.1. Every vehicle shall be equipped with a system for removing frost and ice from the exterior glazed surface of the windscreen. The windscreen defrosting system shall be effective enough to ensure adequate visibility through the windscreen in cold weather.

1.1.2. The efficiency of the system shall be verified by determining the defrosted area of the windscreen periodically after starting, the vehicle having been kept in a cold chamber for a certain amount of time.

1.1.3. The requirements of paragraphs 1.1.1 and 1.1.2 shall be checked using the method set out in paragraph 2.1 of this Annex.

1.1.4. The following requirements shall be satisfied:

1.1.4.1. 20 minutes after the start of the test period, vision area A, as determined in accordance with Appendix 3 to Annex II, shall be 80 % defrosted;

1.1.4.2. 25 minutes after the start of the test period, the defrosted area of the windscreen on the passenger side shall be comparable to that specified in paragraph 1.1.4.1 for the driver's side;

1.1.4.3. 40 minutes after the start of the test period, vision area B, as determined in accordance with Appendix 3 to Annex II, shall be 95 % defrosted.

1.2. Windscreen demisting

1.2.1. Every vehicle shall be equipped with a system for removing mist from the interior glazed surface of the windscreen.

1.2.2. The demisting system shall be effective enough to restore visibility through the windscreen in case it is fogged up with mist. Its efficiency shall be verified by the procedure described in paragraph 2.2 of this Annex.

1.2.3. The following requirements shall be satisfied:

1.2.3.1. Vision area A, as determined in accordance with Appendix 3 to Annex II, shall be 90 % demisted in 10 minutes;

1.2.3.2. Vision area B, as determined in accordance with Appendix 3 to Annex II, shall be 80 % demisted in 10 minutes.

2. TEST PROCEDURE

2.1. Windscreen defrosting

2.1.1. The test shall be carried out at a temperature of -8 ± 2 °C or -18 ± 3 °C, as selected by the manufacturer.

2.1.2. The test shall be carried out in a cold chamber large enough to contain the complete vehicle and equipped to maintain one of the temperatures mentioned in paragraph 2.1.1 in the chamber throughout the test and to circulate cold air. The cold chamber shall be

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maintained at or below the specified test temperature for not less than 24 hours before the start of the period during which the vehicle is exposed to cold.

- 2.1.3. Before the test, the inner and outer surfaces of the windscreen shall be thoroughly degreased by means of methylated spirit or an equivalent degreasing agent. After drying, a solution of ammonia of not less than 3 % and not more than 10 % shall be applied. The surface shall be allowed to dry again and then be wiped with a dry cotton cloth.
- 2.1.4. The vehicle shall be switched off and shall be kept at the test temperature for not less than 10 hours prior to commencement of the test.
 - 2.1.4.1. If it is possible to check whether the vehicle's engine coolant and lubricant are stabilized at the test temperature, this period may be shortened.
- 2.1.5. Following the exposure period prescribed in paragraph 2.1.4, an even layer of ice of 0,044 g/cm² shall be applied over the entire outside surface of the windscreen by means of a water spray gun working at 3,5 ± 0,2 bar operating pressure.
 - 2.1.5.1. The spray nozzle, adjusted to full fan pattern and maximum flow, shall be held perpendicular to and at a distance of between 200 and 250 mm from the glazed surface, and so directed as to form an even layer of ice right across the windscreen from one side to the other.
 - 2.1.5.1.1. A spray gun having a nozzle of 1,7 mm diameter and a liquid flow rate of 0,395 l/min, and capable of producing a fan pattern of 300 mm diameter on the glazed surface at a distance 200 mm from that surface, may be used to satisfy the requirements of paragraph 2.1.5. Any other device by which the requirements can be satisfied shall also be permitted.
- 2.1.6. After the ice has been formed on the windscreen, the vehicle shall be kept in the cold chamber for an additional period of not less than 30 minutes and not more than 40 minutes.
- 2.1.7. After the period prescribed in paragraph 2.1.6 has elapsed, one or two observers shall enter the vehicle, subsequently the vehicle master operation control may be switched to the on position and any engine can be started, if necessary by some external means. The test period shall commence as soon as the vehicle master control switch has been activated.
 - 2.1.7.1. If the vehicle is fitted with an engine, the engine speeds may be adjusted according to manufacturer's specification recommended for warming up when starting in cold weather, during the first five minutes of the test period.
 - 2.1.7.2. During the final 35 minutes of the test period (or during the entire test period if the five-minute warming-up procedure is not followed):
 - 2.1.7.2.1. The engine, if fitted, shall run at a speed not exceeding 50 % of the speed corresponding to its maximum power output. However, if this is proven not to be practicable due to specific engine control strategies, for instance in the case of electric hybrid vehicles, a realistic worst case scenario shall be determined. The scenario shall take into account the engine speeds, periodical absence or complete absence of a running engine during normal driving conditions at an ambient temperature of – 8 °C or – 18 °C, whichever has been selected by the manufacturer as the designated test temperature. If the system can meet the defrosting requirements without a running engine, the engine does not have to run at all.

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- 2.1.7.3. All batteries shall be fully charged at the start of the test.
- 2.1.7.4. During the test, the voltage at the terminals of the defrosting device may be not more than 20 % above the nominal rating of the system.
- 2.1.7.5. The temperature in the test chamber shall be measured at the level of the centre of the windscreen, at a point not significantly affected by heat from the vehicle under test.
- 2.1.7.6. The horizontal component of the speed of the air cooling the chamber, measured immediately prior to the test, in the median plane of the vehicle at a point 300 mm forward of the base of the windscreen and at a level half-way between the base and the top of the windscreen, shall be as low as possible and in any event less than 8 km/h.
- 2.1.7.7. If fitted, the engine bonnet, roof, all doors, windows and vents, except the intakes and outlets of the heating and ventilating system, shall be closed; one or two windows may be opened for a total vertical distance of 25 mm if the vehicle manufacturer so requests.
- 2.1.7.8. The vehicle's defrosting system controls shall be set as recommended by the vehicle manufacturer for the test temperature.
- 2.1.7.9. The windscreen wipers may be used during the test, but this shall be done without any manual assistance apart from the operation of any controls in the interior of the vehicle.
- 2.1.8. The observer(s) shall outline the defrosted area on the inside surface of the windscreen, at five-minute intervals from the start of the test period.
- 2.1.9. On completion of the test, the pattern of the defrosted area outlined on the inner face of the windscreen as required by paragraph 2.1.8 shall be noted and marked to identify windscreen vision areas A and B.
- 2.2. Windscreen demisting
 - 2.2.1. Before the test, the inside surface of the windscreen shall be thoroughly degreased by means of methylated spirit, or an equivalent degreasing agent. After drying, a solution of ammonia of not less than 3 % and not more than 10 % shall be applied. The surface shall be allowed to dry again and then be wiped with a dry cotton cloth.
 - 2.2.2. The test shall be carried out in an environmental chamber large enough to take the complete vehicle and capable of producing and maintaining a test temperature of -3 ± 1 °C throughout the test period.
 - 2.2.2.1. The temperature in the test chamber shall be measured at the level of the centre of the windscreen, at a point not significantly affected by heat from the vehicle under test.
 - 2.2.2.2. The horizontal component of the speed of the air cooling the chamber, measured immediately prior to the test, in the median plane of the vehicle at a point 300 mm forward of the base of the windscreen and at a level half-way between the base and the top of the windscreen, shall be as low as possible and in any event less than 8 km/h.
 - 2.2.2.3. If fitted, the engine bonnet, roof, all doors, windows and vents, except the intakes and outlets of the heating and ventilation system, shall be closed; one or two windows may be opened from the beginning of the demisting test for a total vertical distance of 25 mm if the vehicle manufacturer so requests.
 - 2.2.3. The mist shall be produced by means of the steam generator described in Appendix 4 of Annex II. The generator shall contain enough water to generate at least 70 ± 5 g/

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h of steam for each seating position designated by the manufacturer, in an ambient temperature of $-3\text{ }^{\circ}\text{C}$.

- 2.2.4. The inside surface of the windscreen shall be cleaned as prescribed in paragraph 2.2.1 after the vehicle is placed in the environmental chamber. The ambient air temperature shall be lowered and stabilized at $-3 \pm 1\text{ }^{\circ}\text{C}$. The vehicle shall be switched off and shall be kept at the test temperature for not less than 10 hours prior to commencement of the test. If it is possible to check whether the vehicle's engine coolant and lubricant are stabilized at the test temperature, this period may be shortened.
- 2.2.5. The steam generator shall be placed with its outlets in the median longitudinal plane of the vehicle at a height of $580 \pm 80\text{ mm}$ above the R-point or seating reference point of the driver's seat. It shall normally be placed immediately behind the front seat backrests, with the seats in the manufacturer's declared design positions and the seat-backs set in accordance with design torso angles. Where the design of the vehicle precludes this, the generator shall be placed in front of the backrests, in the nearest convenient position to that mentioned above.
- 2.2.6. After the generator has been operating for five minutes inside the vehicle, one or two observers shall quickly enter the vehicle, opening any access doors for a total duration not exceeding 8 seconds, and be seated on the front seating position(s), the output of the generator being then reduced by $70 \pm 5\text{ g/h}$ for each observer.
- 2.2.7. One minute after the observer(s) have entered the vehicle, the vehicle master operation control may be switched to the on position and any engine can be started, if necessary by some external means. The test period shall commence as soon as the vehicle master control switch has been activated.
 - 2.2.7.1. If the vehicle is fitted with an engine, it shall run at a speed not exceeding 50 % of the speed corresponding to its maximum power output. However, if this is proven not to be practicable due to specific engine control strategies, for instance in the case of electric hybrid vehicles, a realistic worst case scenario shall be determined. The scenario shall take into account the engine speeds, periodical absence or complete absence of a running engine during normal driving conditions at an ambient temperature of $-1\text{ }^{\circ}\text{C}$. If the system can meet the demisting requirements without a running engine, the engine does not have to run at all.
 - 2.2.7.2. The vehicle's demisting system controls shall be set as recommended by the vehicle manufacturer for the test temperature.
 - 2.2.7.3. All batteries shall be fully charged at the start of the test.
 - 2.2.7.4. The voltage at the terminals of the demisting device may be not more than 20 % above the nominal rating of the system.
- 2.2.8. At the end of the test, the demist pattern shall be recorded, noted and marked to identify windscreen vision areas A and B.

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Appendix 1

Procedure for verification of the R-point or seating reference point

The R-point or seating reference point is established in accordance with the provisions laid down in Annex 3 of UN-ECE Regulation 17⁽¹⁾.

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Appendix 2

Procedure for determining primary reference marks in the three-dimensional reference system

The dimensional relationships between primary reference marks on drawings and their position on the actual vehicle are established in accordance with the provisions laid down in Annex 4 of UN-ECE Regulation 125⁽²⁾.

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Appendix 3

Procedure for determining vision areas on windcreens of vehicles

The vision areas A and B are established in accordance with the provisions laid down in Annex 18 of UN-ECE Regulation 43.

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Appendix 4

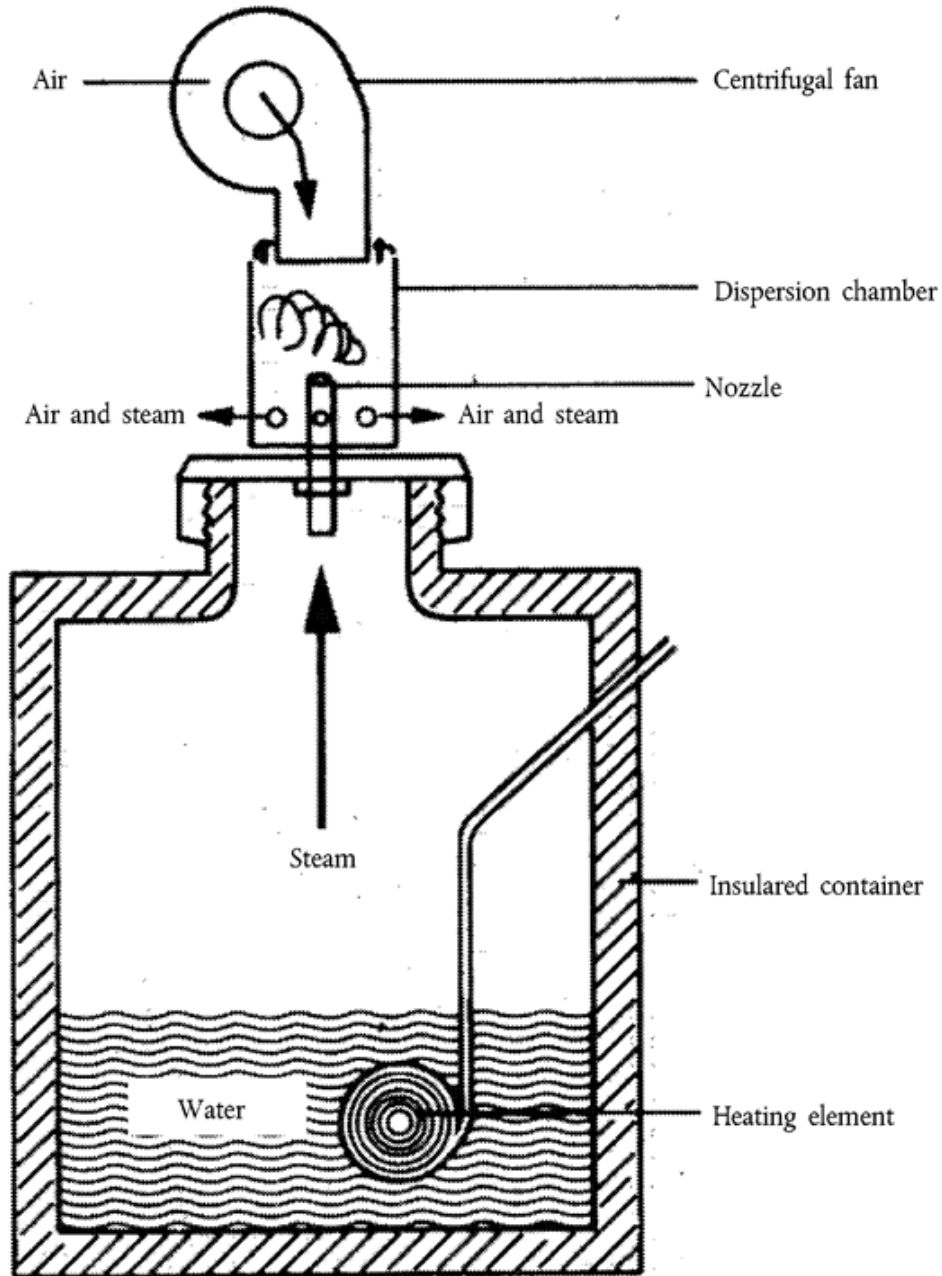
Requirements for the steam generator

1. CHARACTERISTICS
 - 1.1. The steam generator used for the test shall have the following general characteristics:
 - 1.1.1. The water container shall have a capacity of at least 2,25 litres.
 - 1.1.2. The heat loss at boiling point shall not exceed 75 W in an ambient temperature of -3 ± 1 °C.
 - 1.1.3. The fan shall have a capacity of 0,07 to 0,10 m³/min at 0,5 mbar static pressure.
 - 1.1.4. Six steam outlet holes shall be positioned at the top of the generator, around the perimeter spaced at equal distances (see Figure 1):
 - 1.1.5. The generator shall be calibrated at -3 ± 1 °C to give reading for each 70 ± 5 g/h output up to a maximum of n times this figure, where n is the maximum number of seating positions designated by the manufacturer.

Figure 1

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Diagram of steam generator



1.2. The specified parts shall have the following dimensional and material characteristics:

1.2.1. Nozzle

1.2.1.1. Dimensions:

1.2.1.1.1. Length 100 mm.

1.2.1.1.2. Inside diameter 15 mm.

1.2.1.2. Material:

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1.2.1.2.1.Brass.

1.2.2. Dispersion chamber

1.2.2.1. Dimensions:

1.2.2.1.1.Pipe outside diameter 75 mm.

1.2.2.1.2.Wall thickness 0,38 mm.

1.2.2.1.3.Length 115 mm.

1.2.2.1.4.Six evenly spaced holes of 6,3 mm in diameter, 25 mm above the bottom of the dispersion chamber.

1.2.2.2. Material:

1.2.2.2.1.Brass.

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- (1) [OJ L 373, 27.12.2006, p. 1.](#)
- (2) Hasn't been published yet. Will be published by August 2010.

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Changes and effects yet to be applied to the whole legislation item and associated provisions

- Signature words omitted by [S.I. 2022/1273 reg. 57\(5\)](#)
- Annex 1 Pt. 2 s. 2 notes words substituted by [S.I. 2022/1273 reg. 57\(6\)\(d\)\(ii\)](#)