INTERNATIONAL STANDARD

ISO 7578

Fourth edition
2008-12-15

Road vehicles — Sheath-type glow-plugs — General requirements and test methods

Véhicules routiers — Bougies de préchauffage du type à fourreau — Exigences générales et méthodes d'essai

Reference number
ISO 7578:2008(E)

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Published in Switzerland

Foreword

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The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 7578 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 1, *Ignition equipment*.

This fourth edition cancels and replaces the third edition (ISO 7578:2001), which has been technically revised.

Road vehicles — Sheath-type glow-plugs — General requirements and test methods

1 Scope

This International Standard specifies general requirements and test methods for sheath-type glow-plugs. Detailed test condition(s) and/or requirement(s) are agreed between the glow-plug manufacturers and the engine manufacturer. It is applicable to those sheath-type glow-plugs conforming to ISO 6550-1, ISO 6550-2, ISO 6550-3 and ISO 6550-4, used in compression ignition (diesel) engines.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6550-1, *Road vehicles — Sheath-type glow-plugs with conical seating and their cylinder head housing — Part 1: M14 × 1,25 glow-plugs*

ISO 6550-2, *Road vehicles — Sheath-type glow-plugs with conical seating and their cylinder head housing — Part 2: M12 × 1,25 glow-plugs*

ISO 6550-3, *Road vehicles — Sheath-type glow-plugs with conical seating and their cylinder head housing — Part 3: M10 glow-plugs*

ISO 6550-4, *Road vehicles — Sheath-type glow-plugs with conical seating and their cylinder head housing — Part 4: M8 × 1 glow-plugs*

IEC 60068-2-6, *Environmental testing — Part 2-6: Tests — Test Fc: Vibration (sinusoidal)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
nominal voltage
voltage as marked on the housing of the glow-plug

NOTE The nominal voltage of the glow-plug is generally not identical to the supply voltage of the electrical system.

3.2
test voltage
voltage(s) applied to the glow-plug under test

4 Test methods and requirements

4.1 General

If not otherwise specified, all tests shall be carried out at room temperature (RT) (23 ± 5) °C.

4.2 Gas tightness

4.2.1 Test

Mount the sample on a test assembly with the tightening torque as specified in the relevant part of ISO 6550. Subject the sample to a pressure of 4 MPa [40 bar] [1)] above ambient air pressure on the sheath end for a duration of 15 s. Use air, nitrogen, carbon dioxide or any other detection gas.

4.2.2 Requirements

The measured total leakage shall not exceed 2 cm^3/min. If neither air nor nitrogen is used, the leakage rate shall be converted to that of air using the specific volume of the detection gas.

4.3 Thermal characteristic

4.3.1 Test sample preparation

Before the test, pre-heat the sample to oxidation at the nominal voltage of the glow-plug and then allow it to cool to RT. The time for oxidation shall be as agreed between the glow-plug manufacturer and the engine manufacturer, e.g. three times the duration of the glow cycle.

4.3.2 Test

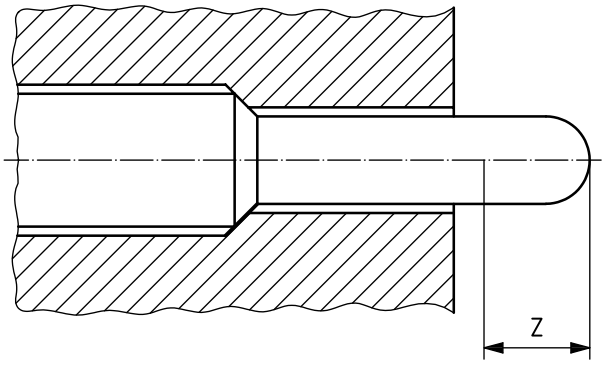
Carry out the test using a test installation in accordance with Figure 1 (see Table 1), equipped with a cooling device by which the temperature can be maintained below 30 °C, measured at the seating of the glow-plug housing.

If the thermal behaviour is measured in accordance with a specific application, this shall be by agreement between the glow-plug manufacturer and the engine manufacturer.

Carry out the test at the test voltage(s) of the glow-plug as specified in the description of the glow plug system.

Temperature measurements shall be made without direct contact.

1) 1 bar = 0,1 MPa = 10^5 Pa; 1 MPa = 1 N/mm^2.



Key

Z maximum measuring zone

Figure 1 — Test installation

4.3.3 Requirements

The hottest point of standard warm-up sheath-type glow-plugs shall be within the measuring zone, Z, as shown in Figure 1. Z shall have a maximum length of 8 mm.

The temperature/time characteristic of the glow-plug shall be agreed between the glow-plug manufacturer and the engine manufacturer.

4.4 Resistance at room temperature

4.4.1 Test

Use a suitable measuring device which does not distort the resistance (e.g. 4-pole measuring device).

4.4.2 Requirement

The measured resistance shall be as agreed between the glow-plug manufacturer and the engine manufacturer.

4.5 Current characteristic

4.5.1 Test

Use the test installation as specified in 4.3.2. Record the current characteristic by measuring the initial current, its gradient and the current at thermal equilibrium.

4.5.2 Requirement

The recorded characteristics shall be as agreed between the glow-plug manufacturer and the engine manufacturer.

4.6 Higher voltage

4.6.1 Test

Use the test installation as specified in 4.3.2. Apply a test voltage of 130 % of the nominal voltage of the glow-plug for the duration (15 ± 1) s.

4.6.2 Requirement

After the test, the glow-plug shall still meet the requirements of 4.3, 4.4 and 4.5.

4.7 Vibration (sinusoidal)

4.7.1 Test method

The glow-plug, mounted as provided for and tightened as specified, shall be subjected to a vibration test of type Fc in accordance with the test method in IEC 60068-2-6, using the parameters given in Table 1.

Table 1 — Values for vibration test

Frequency f Hz	**Amplitude** mm	**Acceleration**
$50 < f \leqslant 160$	0,3	—
$160 < f \leqslant 500$	—	30 g (294 m/s^2)
Sweep rate:	1 octave/min	
Vibration directions:	glow-plug axis and perpendicular	
Duration:	8 h in each direction	

4.7.2 Requirement

After the test specified in 4.7.1, the glow-plug shall show no visual damage and shall meet the requirements mutually agreed between the glow-plug manufacturer and the engine manufacturer.

4.8 Endurance

4.8.1 Test

The test conditions shall be agreed between the glow-plug manufacturer and the engine manufacturer. The agreed conditions shall include at least the following:

— number of cycles,

— voltage characteristic,

— installation (i.e. in accordance with 4.3.2 or in a simulated cylinder head),

— environmental condition (e.g. air speed and temperature),

— cooling, and

— cycle start temperature.

4.8.2 Requirement

The glow-plug manufacturer and the engine manufacturer shall agree on the performance.

5 Marking and labelling

The glow-plug shall be permanently marked with at least the following:

— the nominal voltage of the glow-plug, and

— the manufacturer's name, trademark or symbol.

ICS 43.060.50

Price based on 5 pages