

BS ISO 17447-2:2015



BSI Standards Publication

Road Vehicles — Glow-plugs with conical seating and their cylinder head housing

Part 2: Basic characteristics and dimensions
for ceramic-sheath-type glow-plugs

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National foreword

This British Standard is the UK implementation of ISO 17447-2:2015. Together with BS ISO 17747-1:2015 and BS ISO 17747-3:2015, it supersedes BS AU 262-1:1995, BS AU 262-2:1995 and BS ISO 7578:2008 which are withdrawn. Together with BS ISO 6550-3:2013, BS ISO 17747-1:2015 and BS ISO 17747-3:2015, it supersedes BS ISO 6550-3:2009 which is withdrawn. Together with BS ISO 6550-4:2014, BS ISO 17747-1:2015 and BS ISO 17747-3:2015, it supersedes BS ISO 6550-4:2009 which is withdrawn.

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**Road Vehicles — Glow-plugs with
conical seating and their cylinder
head housing —**

Part 2:
**Basic characteristics and dimensions
for ceramic-sheath-type glow-plugs**

*Véhicules routiers — Bougies de préchauffage à fourreau et à siège
conique et leur logement dans la culasse —*

*Partie 2: Caractéristiques de base et dimensions des bougies de
préchauffage à fourreau de type céramique*



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Foreword

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The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 32, *Electrical and electronic components and general system aspects*.

ISO 17447 consists of the following parts, under the general title *Road Vehicles — Glow-plugs with conical seating and their cylinder head housing*:

- *Part 1: Basic characteristics and dimensions for metal-sheath-type glow-plugs*
- *Part 2: Basic characteristics and dimensions for ceramic-sheath-type glow-plugs*
- *Part 3: Tests and requirements*

Introduction

The purpose of this International Standard is to provide a compact and concise specification on glow-plugs and their cylinder head housings, which is to replace the existing single standards on each type of glow-plugs.

It is intended to specify the main properties, the design requirements, and the dimensions of most of the existing types of glow-plugs and their cylinder head housings. It is to enable the user to work with one comprehensive document valid for most types of glow-plugs instead of a number of standards, each of them specified for one type only.

ISO 17447-1 covers basic characteristics and dimensions for metal-sheath-type glow-plugs. This part of ISO 17447 covers basic characteristics and dimensions for ceramic-sheath-type glow-plugs. Tests and requirements are defined in ISO 17447-3.

It is intended to withdraw the following standards on glow-plugs and their cylinder head housing as soon as this part of ISO 17447 is published:

ISO 6550-1, ISO 6550-2, ISO 6550-3, ISO 6550-4, ISO 7578.

Road Vehicles — Glow-plugs with conical seating and their cylinder head housing —

Part 2: Basic characteristics and dimensions for ceramic-sheath-type glow-plugs

1 Scope

This part of ISO 17447 specifies the main properties and dimensions of ceramic-sheath-type glow-plugs, including the terminals and the dimensions of their cylinder head housings, for use with diesel (compression ignition) engines.

2 Normative references

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

ISO 68-1, *ISO general purpose screw threads — Basic profile — Part 1: Metric screw threads*

ISO 261, *ISO general purpose metric screw threads — General plan*

ISO 965-1:2013, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data*

ISO 965-3, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads*

ISO 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

3 Terms and definitions

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

3.1

nominal voltage

voltage as marked on the housing of the glow-plug

Note 1 to entry: The nominal voltage of the glow-plug is generally not identical to the supply voltage of the vehicle's electrical system.

3.2

test voltage

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

4 Dimensions and tolerances

4.1 Threads-dimension limits and tolerances

The threads of glow-plugs and the corresponding tapped holes in cylinder heads shall be in accordance with ISO 68-1, ISO 261, ISO 965-1, and ISO 965-3.

The tolerance class 6g shall be used for glow-plug threads. For existing designs, tolerance class 6e is also permitted. New designs shall be to tolerance class 6g.

The thread in the corresponding tapped holes in the cylinder heads shall have tolerance class 6H.

The threads, dimension limits, and tolerances of glow-plugs and the corresponding tapped holes in the cylinder head are given in [Tables 1](#) and [2](#).

Table 1 — Dimension limits

Dimensions in millimetres

Thread size	Tolerance class	Dimension	Major diameter		Pitch diameter		Minor diameter	
			max	min	max	min	max	min
M10 × 1,25	6g	Plug thread (on finished plug)	9,972	9,760	9,160	9,042	8,439	8,251 ^a
	6H	Tapped hole in the cylinder head	Not specified	10,000	9,348	9,188	8,912	8,647
M10 × 1	6g	Plug thread (on finished plug)	9,974	9,794	9,324	9,212	8,747	8,563 ^b
	6H	Tapped hole in the cylinder head	Not specified	10,000	9,500	9,350	9,153	8,917
M8 × 1	6g	Plug thread (on finished plug)	7,974	7,794	7,324	7,212	6,747	6,596 ^b
	6H	Tapped hole in the cylinder head	Not specified	8,000	7,500	7,350	7,153	6,917

^a With a root radius ≥0,125 mm (0,1 P).
^b With a root radius ≥0,1 mm (0,1 P).

Table 2 — Minor diameters and fundamental deviations for glow-plug threads

Dimensions in millimetres

Thread size	Minor diameter ^a $d_{3\max}$	Fundamental deviation ^b es
M10 × 1,25 – 6g	$d_{3\max} = (8,647 - 0,028 - 0,180) = 8,439$	0,028
M10 × 1 – 6g	$d_{3\max} = (8,917 - 0,026 - 0,144) = 8,747$	0,026
M8 × 1 – 6g	$d_{3\max} = (6,917 - 0,026 - 0,144) = 6,747$	0,026

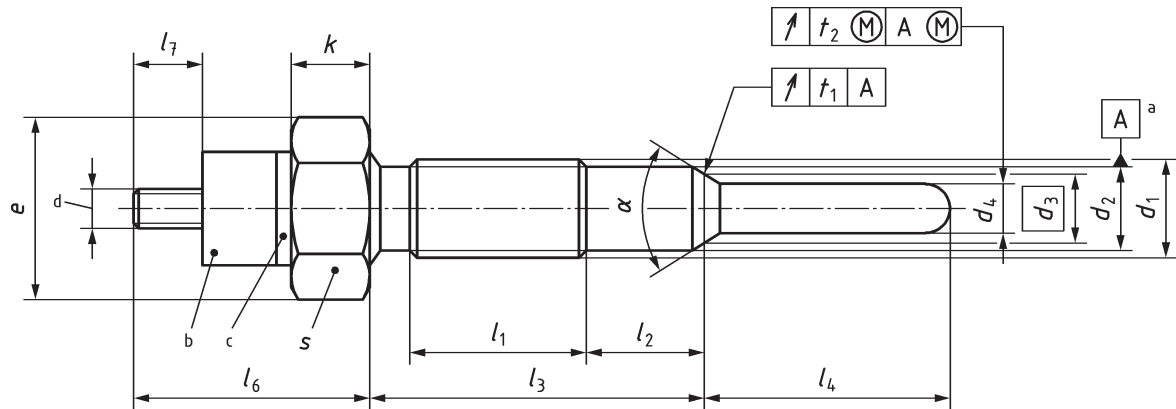
^a The maximum value of the minor diameter, $d_{3\max}$, is calculated according to ISO 965-1:2013, Clause 11 with a truncation of H/6, in accordance with the following formula:
$$d_{3\max} = D_1 - es - 2(H/4 - H/6)$$

^b The fundamental deviation, es , between the pitch diameters of the thread and of the tapped hole is intended to prevent the possibility of seizure, as a result of combustion deposits on the bare threads, when removing the glow-plugs. This clearance is also intended to enable glow-plugs with threads in accordance with this part of ISO 17447 to be fitted in existing tapped holes.

4.2 Glow-plugs

4.2.1 General

Ceramic-sheath-type glow-plug dimensions and tolerances shall be as given in [Figure 1](#) and [Table 3](#). Ceramic-type glow-plugs should comply with this part of ISO 17447. However, it is allowed that products designed before the publication of this part of ISO 17447 do not comply with this part of ISO 17447.



Key

- a Major diameter, in accordance with ISO 1101.
- b Cylinder or hexagonal nut (only for threaded terminal).
- c Insulator.
- d M4 or pin terminal (for details, see [4.2.3](#)).

Figure 1 — Glow-plug

NOTE See [Table 3](#) for dimensions.

4.2.2 Heating elements

[Figures 2](#) and [3](#) show additional heating elements.

NOTE For other dimensions, see [Figure 1](#).

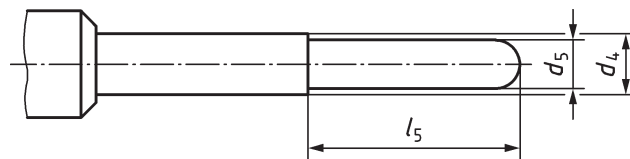


Figure 2 — Heating element: type H1

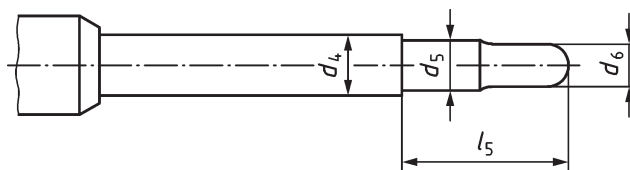
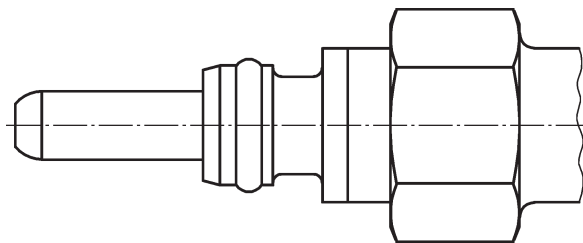


Figure 3 — Heating element: type H2

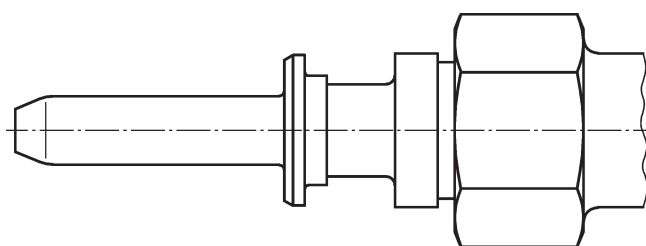
4.2.3 Electrical connection

Figures 4 and 5 show the pin terminals P1 and P2.



NOTE For details, see Annex A.

Figure 4 — Pin terminal: type P1



NOTE For details, see Annex A.

Figure 5 — Pin terminal: type P2

4.2.4 Dimensions for M10 and M8 glow-plugs

Table 3 — M10 and M8

Type	Electrical connection			Thread		Hexagon			Body					Heating element						
	Type	l_6	l_7	d_1	l_1	s	e	k	α $\pm 2^\circ$	d_2	d_3 ref	t_1	l_2	l_3	d_4	d_5	d_6	l_4 $\pm 0,5$	l_5 $\pm 0,5$	t_2
M10 types	Thread M4, Type P1, P2	a	a	M10 × 1,25 – 6g	a	12,0 h13	≥13,3	a	63° or 93° or 123°	≤8,4	a	a	a	a	≤5,3	≤3,5	-	25 to 30	10 to 14	0,6
						10,0 h13	11													
				12,0 h13		≥13,3														
				10,0 h13		11														
M8 types				M8 × 1–6g		10,0 h13	11		93° or 123°	≤6,8				≤4,5	≤3,4	≤3		9 to 14		
						8,0 h13	8,6													

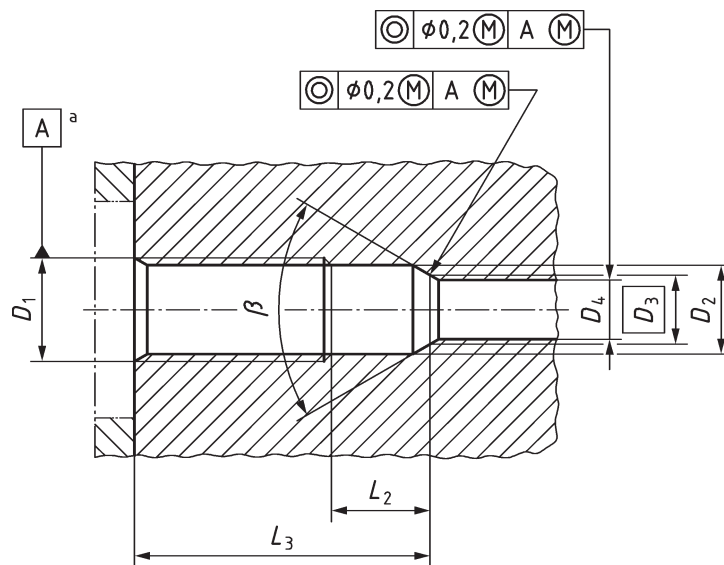
^a Value shall be agreed between glow-plug manufacturers and engine manufacturers.

4.3 Cylinder head housing dimensions

4.3.1 General

The dimensions and tolerances of the cylinder head housing for ceramic-sheath-type glow-plugs shall be as given in Figure 6 and Table 4.

Dimensions in millimetres



Key

^a Pitch diameter, see [Table 1](#).

NOTE See [Table 4](#) for dimensions.

Figure 6 — Cylinder head housing

4.3.2 Housing dimensions

Table 4 — Housing dimensions for M10 and M8

Dimensions in millimetres

Glow-plug type	D_1 6H	β $\pm 1^\circ$	D_2	D_3 ref	D_4	L_2	L_3
M10 type	M10 × 1,25	$\alpha - 3^\circ$	$\geq 8,7$	a	a	$\leq (l_2 - 2)$	$\leq (l_3 - 4)$
	M10 × 1						$\leq (l_3 - 3)$
M8 type	M8 × 1		$\geq 6,95$				$\leq (l_3 - 5)$

^a Value shall be agreed between glow-plug manufacturers and engine manufacturers.

NOTE α , l_2 , and l_3 are dimensions of the glow-plug. See [Figure 1](#), [Table 3](#), and [Table 4](#).

5 Installation tightening torque

The installation tightening torque values shall be as given in [Table 5](#). The values apply to unused sheath-type glow-plugs without lubricant on the threads. If threads are lubricated, the torque value shall be reduced by approximately one-third to avoid overstressing.

Table 5 — Tightening torques

Glow-plug thread size	Electrical connection (terminal)	Installation tightening torque	
		Nm	
		Glow-plug thread ^b	M4 terminal thread
M10	M4 thread	10 to 20	0,8 to 1,5 ^a
	Pin		n.a.
M8	M4 thread	9 to 12	0,8 to 1,5 ^a
	Pin		n.a.

n.a. = not applicable

^a Differing specifications apply to the admissible tightening torque depending on the nut used.

^b Torque values for cast iron and aluminium cylinder heads as applicable.

NOTE 1 Engine manufacturers may specify a different torque for the first installation.

NOTE 2 For M8 glow-plugs, values apply to unused nickel or zinc plated sheath-type glow-plugs without lubricant on the threads.

If glow-plugs are plated with a different material and/or the threads are lubricated, the applicable torque values shall be agreed between the glow-plug manufacturer and the engine manufacturer.

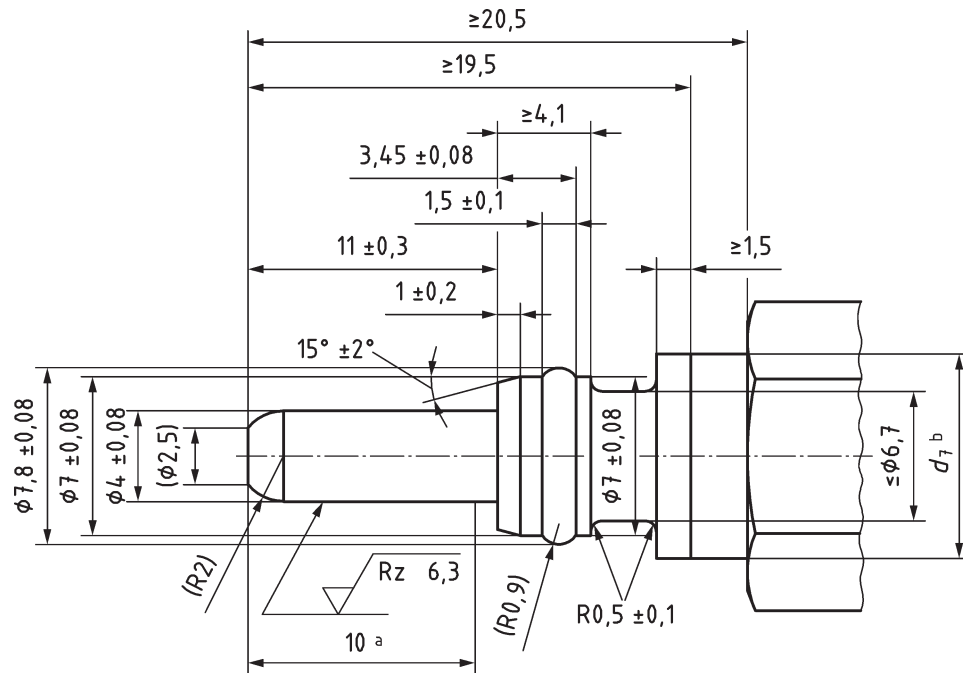
When the installation deformation by cylinder head housing material and by glow-plug plating is big, consultation should be held between glow-plug manufacturers and engine manufacturers.

Annex A (normative)

Pin terminal dimensions

The dimensions of pin terminals P1 and P2 shall be as shown in [Figures A.1](#) and [A.2](#).

Dimensions in millimetres

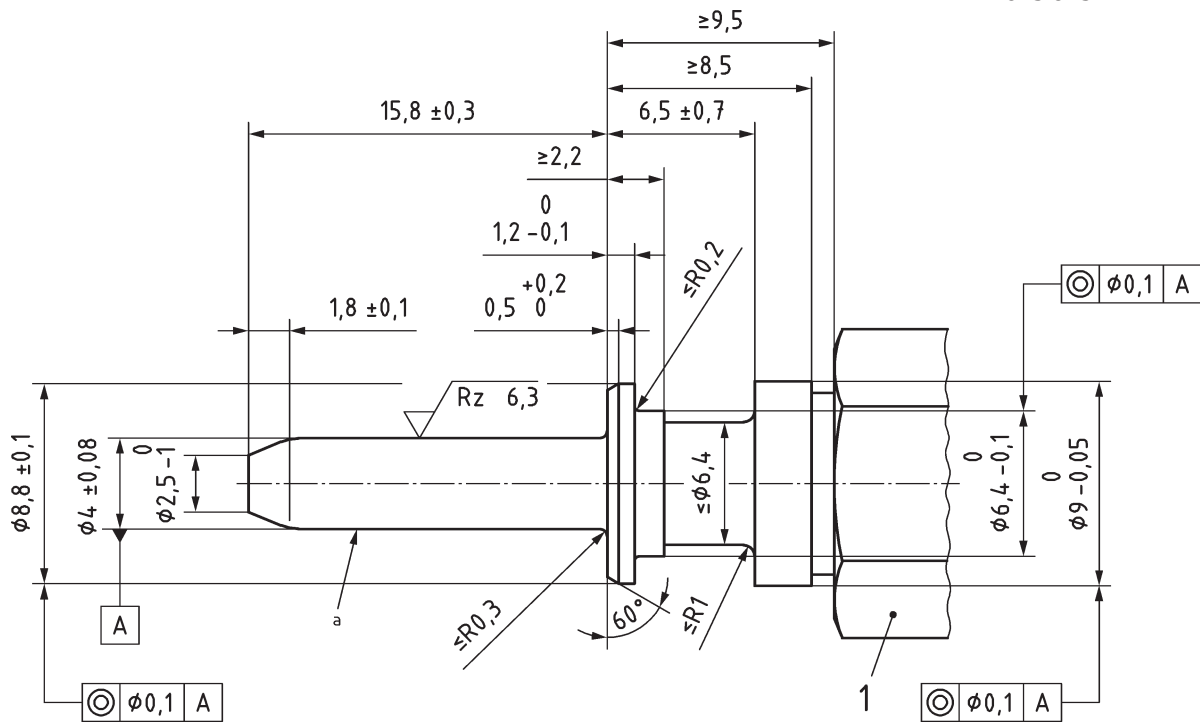


Key

- a Effective dimension for diameter $4 + 0,08 / - 0,08$ and $Rz\ 6,3$.
- b $d_7 \leq 9$ for M10; $d_7 \leq 7,8$ for M8.

Figure A.1 — Dimensions of pin terminal P1 for M8 and M10 glow-plugs

Dimensions in millimetres



Key

- 1 hexagon 10,0 h13
- a The surface in this area is free of undercut.

Figure A.2 — Dimensions of pin terminal P2 for M10 glow-plugs

Bibliography

- [1] ISO 2768-2, *General tolerances — Part 2: Geometrical tolerances for features without individual tolerance indications*
- [2] ISO 8092-1, *Road vehicles — Connections for on-board electrical wiring harnesses — Part 1: Tabs for single-pole connections — Dimensions and specific requirements*
- [3] ISO 8092-4, *Road vehicles — Connections for on-board electrical wiring harnesses — Part 4: Pins for single- and multi-pole connections — Dimensions and specific requirements*

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