



DRAFT INTERNATIONAL STANDARD ISO/DIS 28741

ISO/TC 22/SC 1

Secretariat: DIN

Voting begins on:
2007-09-25

Voting terminates on:
2008-02-25

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Road vehicles — Spark-plugs and their cylinder head housings — Basic characteristics and dimensions

Véhicules routiers — Bougies d'allumage et leurs logements dans la culasse — Caractéristiques élémentaires et dimensions

ICS 43.060.50

In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.

Conformément aux dispositions de la Résolution du Conseil 15/1993, ce document est distribué en version anglaise seulement.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/857a4c3e-4c09-49a1-8135-1625d0f1ddea/iso-28741-2009>

Copyright notice

This ISO document is a Draft International Standard and is copyright-protected by ISO. Except as permitted under the applicable laws of the user's country, neither this ISO draft nor any extract from it may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission being secured.

Requests for permission to reproduce should be addressed to either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Reproduction may be subject to royalty payments or a licensing agreement.

Violators may be prosecuted.

Contents

Page

Foreword	iv
Introduction.....	v
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions	1
4 Terminals.....	3
4.1 Solid post terminal dimensions	3
4.2 Threaded terminal dimensions	3
5 Dimensions, threads and related items	4
5.1 Spark-plug reach	4
5.2 Gasket.....	4
5.3 Threads, limiting dimensions, tolerances.....	4
6 Other dimensions of spark-plugs and their cylinder head housings	5
7 Installation tightening torque.....	6
8 Spark-plug dimensions.....	6
8.1 Spark-plugs with flat seating	6
8.2 Spark-plugs with conical seating	13
9 Cylinder head housings.....	15
9.1 Cylinder head housing for spark-plugs with flat seating	15
9.2 Cylinder head housing for spark-plugs with conical seating	16
Annex A (normative) Spark-plugs with half thread and their cylinder head housings	18
Annex B (informative) Optional terminals for compact spark-plugs.....	20
Annex C (informative) Optional combination cylinder head housing for spark-plugs with conical or flat seating	22

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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 28741 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 1, *Ignition Equipment*.

This Standard will cancel and replace the following Standards, which have been introduced into this summary standard:

ISO 1919, ISO 2344, ISO 2345, ISO 2346, ISO 2347, ISO 2704, ISO 2705, ISO 8470, ISO 14508, ISO 16246, ISO 19812 and ISO 22977.

Introduction

The purpose of this standard is to provide a compact and concise specification on spark-plugs and their cylinder head housings, which shall replace the large number of existing single standards on each type of spark-plug.

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

It is intended to withdraw the following standards on spark-plugs and their cylinder head housing as soon as this standard is published:

ISO 1919, ISO 2344, ISO 2345, ISO 2346, ISO 2347, ISO 2704, ISO 2705, ISO 8470, ISO 14508, ISO 16246, ISO 19812 and ISO 22977

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/857a4c3e-4c09-49a1-8135-1625d0f1ddea/iso-28741-2009>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Full standard:
<https://standards.iteh.ai/catalog/standards/sist/857a4c3e-4c09-49a1-8135-1625d0f1ddea/iso-28741-2009>

Road vehicles — Spark-plugs and their cylinder head housings — Basic characteristics and dimensions

1 Scope

This International Standard specifies the main properties and dimensions of spark-plugs, including the terminals and the dimensions of their cylinder head housings, for use with spark-ignition engines. Screened and waterproof spark-plugs (ISO 3412, ISO 3895 and ISO 3896) are not covered by this standard.

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 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: *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 threads*

ISO 4095: *Aerospace – Bi-hexagonal drives -- Wrenching configuration -- Metric series*

ISO 3412: *Road vehicles – Screened and waterproof spark-plugs and their connections – Types 1A and 1B*

ISO 3895: *Road vehicles – Screened and waterproof spark-plug and its connection – Type 2*

ISO 3896: *Road vehicles – Screened and waterproof spark-plug and its connection – Type 3*

ISO 6518-1: *Road vehicles -- Ignition systems -- Part 1: Vocabulary*

ISO 11565: *Road vehicles – Spark-plugs – Test methods and requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6518-1 and the following apply.

3.1

Installed height (dimension L)

distance from the contact point of the cylinder head to the top of the spark-plug terminal, including the compressed gasket thickness with the spark-plug installed at the specified installation torque

NOTE For conical seat the contact point is defined from the gage point of the seat.

3.2

Spark-plug thread size

nominal size of the spark-plug thread used to interface between the spark-plug and the cylinder head thread

NOTE These are standard metric threads, with the exception of the M14 x 1,25 thread.

3.3

Hexagon / bi-hexagon

feature of the spark-plug shell that is used to install the spark-plug into the cylinder head, interfacing with the installation socket while the spark-plug is installed into the cylinder head

NOTE A bi-hexagon is a 12 point installation feature, which requires that a 12 point socket wrench be used to install the spark-plug.

3.4

Conical seating

conical section of the spark-plug shell on some spark-plug types, that is used for the seal interface between the spark-plug and the cylinder head

NOTE There is typically no gasket used between the conical mating surfaces.

3.5

Flat seating

flat surface of some spark-plug types which is perpendicular to the spark-plug axis and is used for the seal interface between the spark-plug and the cylinder head

NOTE This seal typically uses a gasket between the flat seat of the spark-plug and the mating flat surface of the cylinder head.

3.6

Insulator diameter (dimension E)

nominal diameter of the insulator in a defined region of the insulator between the top of the shell and the terminal of the spark-plug which interfaces with a corresponding region of the high voltage boot of the ignition lead or ignition coil

NOTE The fit is the key to suppression of high voltage leakage around the spark-plug insulator (flashover).

3.7

High voltage terminals

part of the spark-plug, used as the contact point between the high voltage ignition source and the spark-plug

NOTE The connection between the high voltage ignition source and the spark-plug terminal can be made with a threaded fastener, a snap clip that interfaces with the solid terminal or by spring loaded mechanical contact.

3.8

Installation tightening torque

rotational force applied to the spark-plug hexagon to ensure proper seating and sealing of the spark-plug to the cylinder head

NOTE The value of the correct installation tightening torque can vary from conditions that affect the friction between the spark-plug threads and the cylinder head threads. These include cylinder head material, spark-plug shell plating, thread lubrication and contamination from combustion deposits. Care should be taken to insure that spark-plugs are not over-torqued during installation as this can damage spark-plug integrity and may result in engine damage. Spark-plugs with smaller thread sizes require lower installation tightening torque.

3.9

Spark-plug reach

distance from the spark-plug seating surface (flat seat) or from the gage diameter (conical seat) to the point on the shell designed to be aligned with the combustion chamber surface on the cylinder head with the spark-plug properly installed

NOTE The spark-plug reach and the cylinder head housing should be designed to match in order to ensure correct fit of the spark-plug into the combustion chamber.

3.10

Spark-plug projection

distance that the spark-plug projects past the spark-plug reach into the combustion chamber

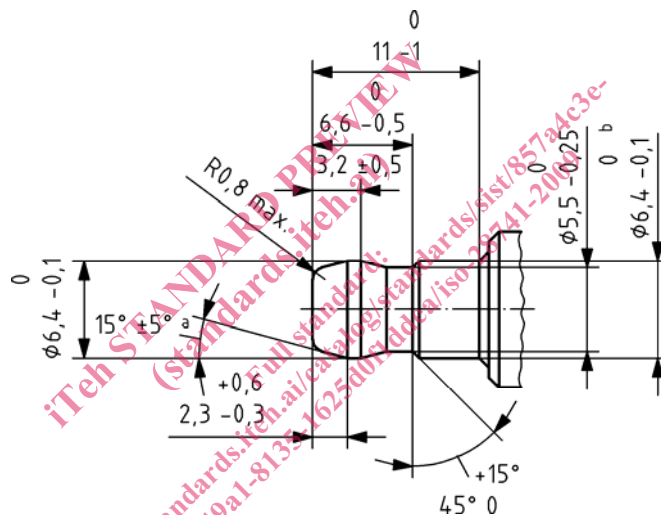
NOTE This dimension must be considered for possible interference with the engine piston at top dead centre.

4 Terminals

4.1 Solid post terminal dimensions

The dimensions of solid post terminals shall be according to Figure 1.

Dimensions in mm



Key:

- a for existing products, values between 7° and 30° are allowed
- b for M10 x 1 spark-plugs with bi-hex this diameter is 5,4 +0/-0,1 mm

Figure 1 — Solid post terminal

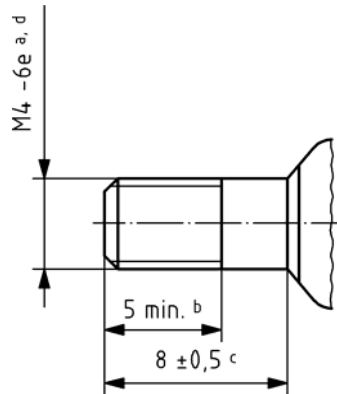
Nuts for use with threaded terminals shall have the same external dimensions as those of the solid post terminal, and shall have internal threads to 6H tolerance prior to assembly on the threaded terminals.

The measurement of the minimum diameter of 6,3 mm and 5,3 mm, respectively, shall be taken at any or all points around the post circumference. A ring gauge shall be used for measuring the maximum diameter of 6,4 mm and 5,4 mm, respectively.

4.2 Threaded terminal dimensions

The dimensions of threaded terminals shall be according to Figure 2.

Dimensions in mm



- Key:**
- a 0,7 mm pitch complying with ISO 68-1 and with ISO 261
 - b length of usable thread
 - c cylindrical part
 - d Depending on manufacturing process, class 7e is acceptable on finished product.

Figure 2 — Threaded terminal

5 Dimensions, threads and related items

5.1 Spark-plug reach

The spark-plug reach shall be in accordance with Table 5 or 7 (see also Figures 3 through 14).

The following basic types of spark-plug reach are defined:

- Short: **S**
- Medium: **M**
- Long: **L**
- Extended long: **EL**
- Extra long: **XL**
- Extended extra long: **EXL**

5.2 Gasket

When the spark-plugs with flat seating have been tightened with a torque as specified in Clause 7 and Table 3 on threads that are clean, smooth and dry, the gasket thickness shall be as specified in this table. Non-captive gaskets may be used in special cases.

5.3 Threads, limiting dimensions, tolerances

The threads of spark-plugs and the corresponding tapped holes in the cylinder heads shall conform to ISO 68-1, ISO 261, ISO 965-1 and ISO 965-3. Their limiting dimensions, minor diameters, basic profiles and initial clearances are specified in Table 1, and Table 2, respectively.