

INTERNATIONAL  
STANDARD

**ISO**  
**2345**

Fifth edition  
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**Road vehicles — M18 × 1,5 spark-plugs  
with conical seating and their cylinder head  
housing**

*Véhicules routiers — Bougies d'allumage M18 × 1,5 à siège conique et  
leur logement dans la culasse*



Reference number  
ISO 2345:1994(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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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.

International Standard ISO 2345 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 1, *Ignition equipment*.

This fifth edition cancels and replaces the fourth edition (ISO 2345:1987), of which it constitutes a technical revision.

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# Road vehicles — M18 × 1,5 spark-plugs with conical seating and their cylinder head housing

## 1 Scope

This International Standard specifies the main characteristics of M18 × 1,5 spark-plugs with conical seating and their cylinder head housing, for use with spark-ignition engines.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 68:1973, *ISO general purpose screw threads — Basic profile.*

ISO 261:1973, *ISO general purpose metric screw threads — General Plan.*

ISO 965-1:1980, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data.*

ISO 965-3:1980, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional threads.*

## 3 Requirements

### 3.1 Terminals

The spark-plug terminal may be either the solid post or the threaded type. A spark-plug with threaded ter-

minal on which a nut is applied shall respect the dimensions specified for spark-plugs with solid post terminal. See figure 1.

### 3.2 Dimensions and threads

See figures 1 and 2.

#### 3.2.1 Length dimensions

The length dimensions are measured from a gauging plane defined by diameter 19 mm on the seating.

Dimension 10,9 mm ± 0,3 mm may be increased for certain spark-plug types.

#### 3.2.2 Dimensions of spark-plug housing in cylinder head

The length dimensions Z and 9 mm max. in the cylinder head are measured from a gauging plane defined by diameter 19 mm on the seating.

The Z length of the spark-plug housing in the cylinder head shall be sufficient to ensure that the end of the spark-plug thread does not project into the combustion chamber at any point when the spark-plug is tightened to the maximum torque specified in 3.4.

#### 3.2.3 Threads

##### 3.2.3.1 Spark-plug and cylinder head

The threads of M18 × 1,5 spark-plugs and the corresponding tapped holes in the cylinder head shall conform to ISO 68, ISO 261, ISO 965-1 and ISO 965-3. Their limiting dimensions and their tolerance classes shall be as specified in 3.2.3.1.1 and 3.2.3.1.2 respectively.

### 3.2.3.1.1 Limiting dimensions

The limiting dimensions shall be as given in table 1.

**Table 1**  
Dimensions in millimetres

Dimension		Plug thread (on finished plug)	Tapped hole in cylinder head
Major diameter	max.	17,933	not specified
	min.	17,697	18
Pitch diameter	max.	16,959	17,216
	min.	16,819	17,026
Minor diameter	max.	16,092	16,676
	min.	15,845 <sup>1)</sup>	16,376
1) With a root radius $\geq 0,150$ mm (0,1P).			

### 3.2.3.1.2 Tolerance classes

The tolerance classes of thread M18  $\times$  1,5 of finished spark-plugs and of the corresponding tapped holes in the cylinder head shall be as follows:

- 6e for spark-plugs (see note 1);
- 6H for tapped holes in the cylinder head.

#### NOTES

1 In order that spark-plugs complying with this International Standard can be fitted in existing heads also in extreme cases, the value for the maximum truncation of the minor diameter of the spark-plug base has been slightly reduced with respect to the ISO value.

This maximum value of the minor diameter is calculated from a distance of  $H/6$  for the maximum truncation instead of the value given by the formula in ISO 965-1:1980, clause 11, according to the formula given below:

$$\begin{aligned} \text{Minor diameter, maximum} &= d_1 - es - 2(H/4 - H/6) \\ &= 16,376 - 0,067 - 0,217 \\ &= 16,376 - 0,284 = 16,092 \end{aligned}$$

The value for the basic profile remains the same as for the ISO thread ( $16,376 - 0,067 = 16,309$ ).

2 The initial clearance  $e = 0,067$  mm 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 spark-plugs.

This clearance is also intended to enable spark-plugs with threads in accordance with this International Standard to be fitted in existing tapped holes.

### 3.2.3.2 Threaded terminal

For spark-plugs with a threaded-type terminal, the thread tolerance class of the terminal [see figure 1 b)] is 6e.

NOTE 3 Depending on manufacturing processes, class 7e is acceptable on the finished product.

Nuts for use with threaded terminals shall have internal threads to 6H tolerance prior to assembly on the threaded post.

### 3.3 Other dimensions of spark-plug and housing in cylinder head

The other dimensions shall be as indicated in figures 1 and 2.

The contour of the insulator is optional; however, between the reference planes defined for spark-plugs with solid post terminal by the dimensions 29 mm and 33 mm, and for spark-plugs with threaded terminal by the dimensions 26 mm and 30 mm, its largest diameter shall be  $12,2 \text{ mm} \pm 0,3 \text{ mm}$ .

Details not specified are left to the manufacturer's choice.

### 3.4 Installation tightening torque

The installation torque values apply to new spark-plugs without lubricant on the threads. If threads are lubricated, the torque value shall be reduced by approximately one-third to avoid overstressing. The spark-plugs shall be tightened with a torque of 20 N·m to 30 N·m in cast iron cylinder heads.

NOTE 4 Engine manufacturers may specify a different torque for the first spark-plug installation.

Dimensions in millimetres

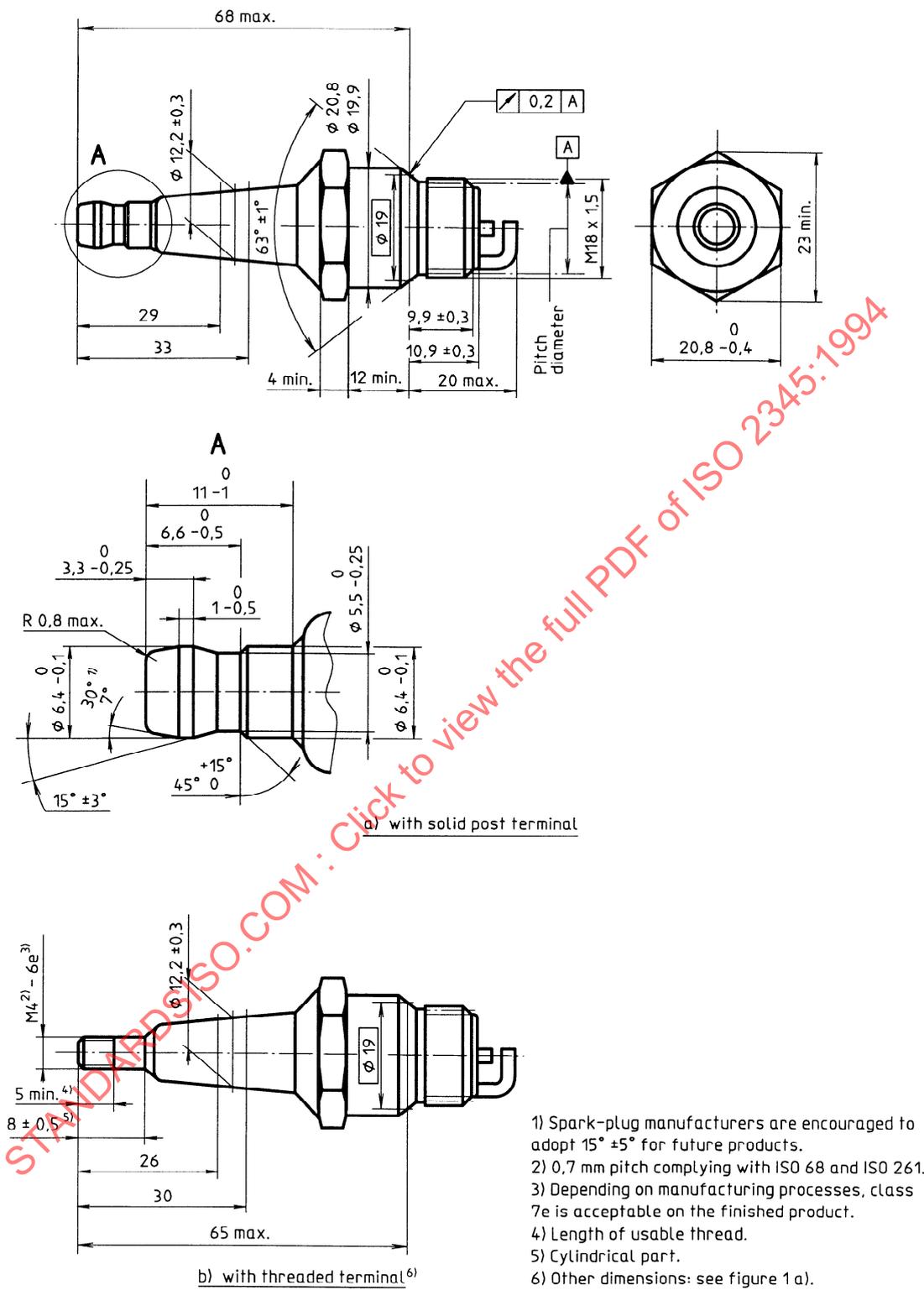


Figure 1 — M18 × 1,5 spark-plugs with conical seating

Dimensions in millimetres

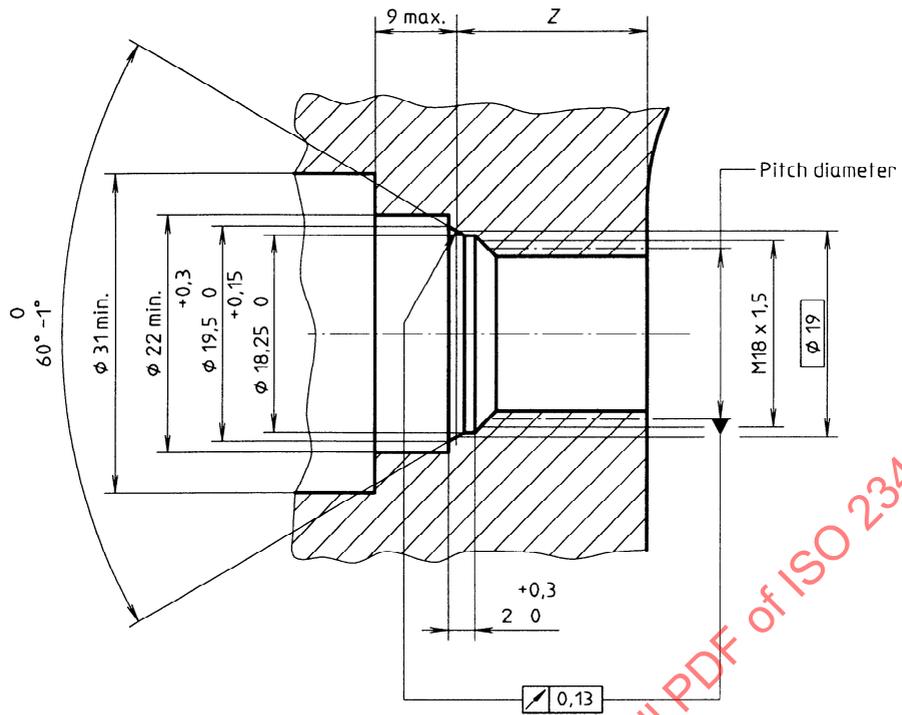


Figure 2 — Housing of spark-plug in cylinder head

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