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Petroleum and natural gas industries — Aluminium alloy drill pipe thread connection gauging

Industries du pétrole et du gaz naturel — Calibrage des raccords filetés des tiges de forage en alliage d'aluminium

ICS 75.180.10; 77.150.10

ISO/CEN PARALLEL PROCESSING

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This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

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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 27627 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

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Introduction

Users of this International Standard need to be aware that further or differing requirements could be needed for individual applications. This International Standard is not intended to inhibit a manufacturer from offering or the purchaser from accepting, alternative equipment or engineering solutions for the individual application – particularly applicable where there is innovative or developing technology. Where an alternative is offered, the manufacturer will need to identify any variations from this International Standard and provide details.

This International Standard includes requirements of various natures. These are identified by the use of certain verbal forms:

- “shall” is used to indicate that a provision is mandatory;
- “should” is used to indicate that a provision is not mandatory, but recommended as good practice;
- “may” is used to indicate that a provision is optional.

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Petroleum and natural gas industries — Aluminium alloy drill pipe thread connection gauging

1 Scope

This International Standard specifies the technical delivery condition, manufacturing process, material requirements, configuration and dimensions, and verification and inspection procedures for aluminium alloy drill pipes manufactured under ISO 15546.

In this International Standard the gauging procedure for taper buttress thread (right and left) and adjoining tapered stabilizing shoulders (bores) made of Aluminium alloy drill pipes and concerned steel tool joints is presented as well.

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 15546, *Petroleum and natural gas industries — Aluminium alloy drill pipe*

EN 10027-2, *Designation systems for steels — Part 2: Numerical system*

ASTM A370, *Standard test methods and definitions for mechanical testing of steel products*

3 Terms, definitions and symbols

3.1 Terms and definitions

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

3.1.1

complete set of gauges

set of screw and plain gauges of one standard size, associated among themselves under metrological characteristics

3.1.2

gauge plane

imaginary plane, perpendicular to the thread axis of rotary shouldered connections at which the pitch diameter at gauge point is measured

3.1.3

master gauge

gauge used for calibration of other gauges

3.1.4

pitch

axial distance between successive threads, which, in a single start thread, is equivalent to lead

3.1.5

plain plug gauge

gauge to control internal diameter over the basic plane of the internal taper thread or diameter in the design plane of plain tapered bore of the drill pipe tool joint ^[1]

3.1.6

plain ring gauge

gauge to control external diameter over the basic plane of the external taper thread or diameter in the design plane of plain tapered shoulder of drill pipe

3.1.7

reference plane

imaginary plane, perpendicular to the thread axis of rotary shouldered connections used for design and inspection of the thread

3.1.8

screw plug gauge

gauge to control normalized effective and external diameters of the internal taper thread with buttress profile

3.1.9

screw ring gauge

gauge to control normalized effective and internal diameters of the external taper thread with buttress profile

3.1.10

stabilizing shoulder

taper surface adjoining drill pipe taper thread and used for increase of fatigue resistance of connection with drill pipe tool joint [1]

3.1.11

working gauge

gauge used for gauging rotary shouldered connections

3.2 Symbols

The following symbols are used in this International Standard.

- d₁ diameter at the plug gauge plane
- d₂ external thread diameter at the plug gauge reference plane
- d₃ internal thread diameter at the plug gauge reference plane
- d₄ diameter of the major cone base of a plain plug gauge
- d₅ diameter of the minor cone base of a plain plug gauge
- d₆ diameter of the bore of a screw ring gauge
- d₇ internal thread diameter at the gauge plane of a ring gauge
- d₈ external thread diameter at the gauge plane of a ring gauge
- L₁ length of a plain plug gauge for thread gauging
- L₂ length of a plain plug gauge for the taper bore gauging

4 Technical specifications on gauges

4.1 Types of gauges

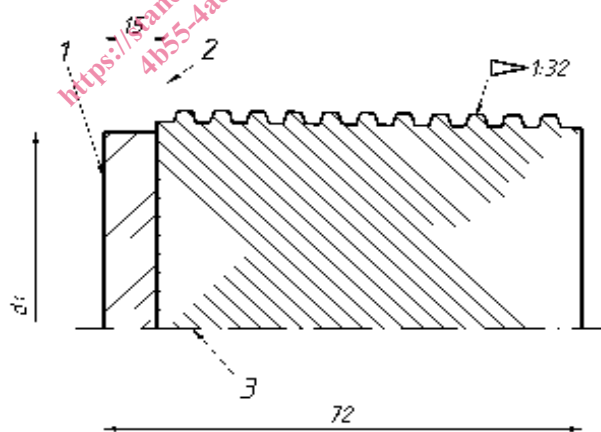
4.1.1 Gauges of the following types should be manufactured:

- R: working screw plug gauge;
- G: working plain plug gauge for thread gauging;
- G-S: working plain plug gauge for gauging of drill pipe tool joint bore;
- R-P: working screw ring-gauge with perfect profile;
- R-N: working screw ring-gauge with not perfect profile;
- K-G-R: master plain plug gauge for a screw ring-gauge R-P;
- G: working plain ring gauge for thread gauging;
- K-G-G: master plain plug gauge for a plain ring gauge G;
- G-S: working plain ring gauge for the pipe shoulder gauging;
- K-G-G-S: working plain plug gauge for the gauging of ring gauge G-S.

4.1.2 The scope of gauges is specified in the informative Annex A.

4.2 Thread profile, basic dimensions and tolerance

4.2.1 The basic dimensions of working and master gauges, thread profile and their limit deviation are specified on Figures 1-8 and in Tables 1-5.

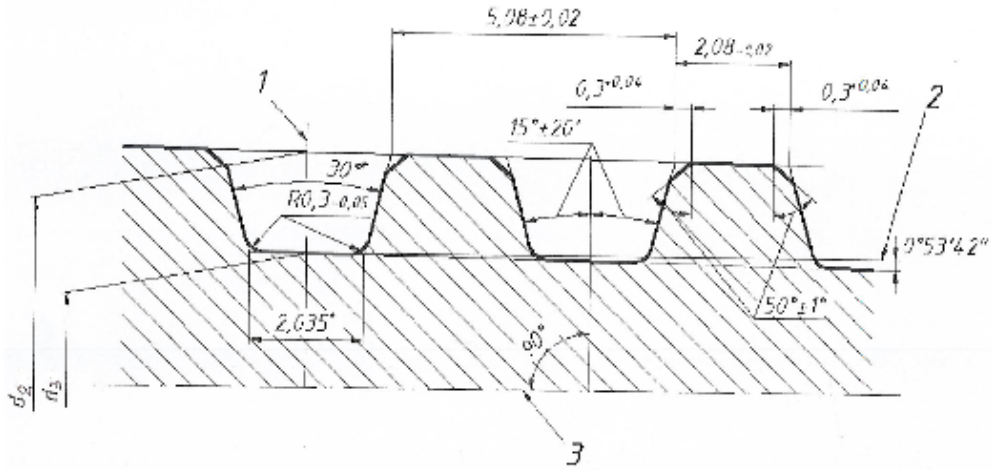


Key

- 1 gauge plane
- 2 reference plane
- 3 thread axis

NOTE For symbols, see 3.2.

Figure 1 — Plug gauge characteristics (R type)



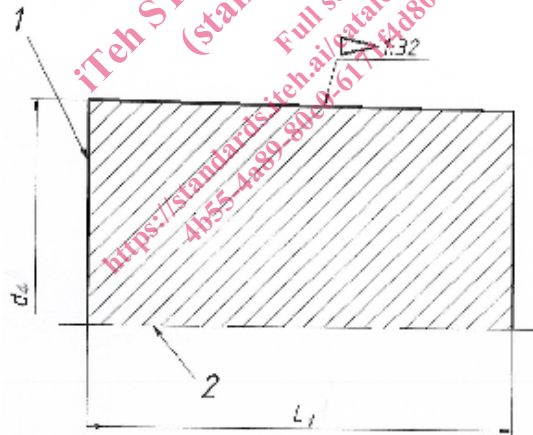
Key

- 1 reference plane
- 2 line parallel to the gauge thread axis
- 3 thread axis

NOTE 1 For symbols, see 3.2

NOTE 2 * numbers are reference dimensions

Figure 2 — Thread form for a plug gauge (R type)



Key

- 1 gauge plane
- 2 axis gauge

NOTE For symbols, see 3.2

Figure 3 — Gauges of G and G-S types