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**Petroleum and natural gas industries —  
Design and operating limits of drill  
strings with aluminium alloy components**

*Industries du pétrole et du gaz naturel — Conception et limites de  
fonctionnement des garnitures de forage en alliage d'aluminium*

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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 20312 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

## Introduction

The function of this International Standard is to define operating limits of aluminium drill pipes and recommend design criteria for the drill stem containing such aluminium drill pipes. This International Standard contains formulas and figures to aid in the design and selection of equipment to meet a specific drilling condition.

In this International Standard, data are expressed in the International System of units (SI).

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 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 provisions of various nature. 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.



# Petroleum and natural gas industries — Design and operating limits of drill strings with aluminium alloy components

## 1 Scope

This International Standard applies to design and operating limits for drill strings containing aluminium alloy pipes manufactured in accordance with ISO 15546.

## 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 9712, *Non-destructive testing — Qualification and certification of personnel*

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

ASNT Recommended Practice No. SNT-TC-1A, *Personnel Qualification and Certification in Non-destructive Testing*

## 3 Terms, definitions, symbols and abbreviated terms

### 3.1 Terms and definitions

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

#### 3.1.1

##### **aluminium alloy pipe body**

aluminium alloy pipe formed by extrusion, including upsets and protector thickening

#### 3.1.2

##### **aluminium alloy drill pipe**

aluminium alloy pipe body with threaded steel tool joints

#### 3.1.3

##### **box**

tool joint part that has internal tool-joint thread

#### 3.1.4

##### **buckling**

unstable lateral deflection of a drill stem component under compressive effective axial force

#### 3.1.5

##### **corrosion**

adverse chemical alteration or destruction of a metal by air, moisture or chemicals