



**NSAI**  
Standards

Irish Standard  
I.S. EN ISO 20312:2011

# Petroleum and natural gas industries - Design and operating limits of drill strings with aluminium alloy components (ISO 20312:2011)

## I.S. EN ISO 20312:2011

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWIFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

*This document replaces:*

*This document is based on:*  
EN ISO 20312:2011

*Published:*  
31 October, 2011

This document was published  
under the authority of the NSAI  
and comes into effect on:  
31 October, 2011

**ICS number:**  
75.180.10

**NSAI**  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

**Sales:**  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

I.S. EN ISO 20312:2011

EUROPEAN STANDARD

**EN ISO 20312**

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2011

ICS 75.180.10

English Version

**Petroleum and natural gas industries - Design and operating  
limits of drill strings with aluminium alloy components (ISO  
20312:2011)**

Industries du pétrole et du gaz naturel - Conception et  
limites de fonctionnement des garnitures de forage en  
alliage d'aluminium (ISO 20312:2011)

Erdöl- und Erdgasindustrie - Auslegung und  
Einsatzgrenzen von Bohrsträngen aus Aluminium-  
Bohrgestängen (ISO 20312:2011)

This European Standard was approved by CEN on 14 October 2011.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: Avenue Marnix 17, B-1000 Brussels**

## **Contents**

Page

<b>Foreword.....</b>	<b>3</b>
----------------------	----------

## **Foreword**

This document (EN ISO 20312:2011) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" in collaboration with Technical Committee CEN/TC 12 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

### **Endorsement notice**

The text of ISO 20312:2011 has been approved by CEN as a EN ISO 20312:2011 without any modification.

*This page is intentionally left BLANK.*

I.S. EN ISO 20312:2011  
**INTERNATIONAL  
STANDARD**

**ISO  
20312**

First edition  
2011-10-15

---

---

**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*

---

---

Reference number  
ISO 20312:2011(E)



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from 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](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland



# Contents

Page

Foreword .....	iv
Introduction.....	v
1 Scope .....	1
2 Normative references .....	1
3 Terms, definitions, symbols and abbreviated terms .....	1
3.1 Terms and definitions .....	1
3.2 Symbols.....	3
3.3 Abbreviated terms .....	7
4 Properties of ADP and tool joints .....	8
4.1 General .....	8
4.2 New pipes and tool joints data.....	8
4.3 Buoyant weight.....	8
4.4 Mechanical properties.....	8
4.5 ADP with integral tool joint and heavy wall ADP .....	11
5 Considerations and limitations of drill string design using ADP .....	15
5.1 Application aspects of aluminium alloy drill pipe.....	15
5.2 General principles of aluminium drill string assembly design.....	16
5.3 Influence of temperature on choice of material for drill pipe .....	17
5.4 Resistance to hydroabrasive and corrosive damage .....	23
5.5 Buckling .....	24
6 Basic requirements for calculation of drill strings containing ADP .....	26
7 Drill pipe operation.....	27
7.1 Operations management .....	27
7.2 General drill pipe operating recommendations .....	27
7.3 Fatigue strength limitations .....	31
7.4 Combined load capacity limitation .....	32
8 Wear-based inspection, identification and classification of aluminium drill pipe .....	36
8.1 Inspection.....	36
8.2 Wear-based marking and identification of pipe and tool joints.....	38
8.3 Wear-based pipe classification.....	39
8.4 Wear-based tool joints classification .....	40
8.5 Pipe repairing and discarding.....	40
9 Transportation and storage of pipe.....	41
9.1 Transportation of pipe .....	41
9.2 Storage of pipe .....	41
Annex A (informative) Drill pipe design, range and technical properties of integral tool joint ADP and heavy wall ADP.....	42
Annex B (normative) Calculations .....	47
Annex C (informative) Conversion of SI units to USC units.....	58
Bibliography.....	59

## **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.

**I.S. EN ISO 20312:2011**

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- Looking for additional Standards? Visit Intertek Inform Infostore
  - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-