
**Steel flat products for pressure
purposes — Technical delivery
conditions —**

**Part 6:
Weldable fine grain steels, quenched
and tempered**

*Produits plats en acier pour service sous pression — Conditions
techniques de livraison —*

Partie 6: Aciers soudables à grains fins, trempés et revenus

ISO 9328-6:2018

<https://standards.iteh.ai/catalog/standards/iso/f7147024-2325-43dc-a9ae-4f743fd166c4/iso-9328-6-2018>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 9328-6:2018

<https://standards.iteh.ai/catalog/standards/iso/f7147024-2325-43dc-a9ae-4f743fd166c4/iso-9328-6-2018>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Classification and designation	1
4.1 Classification.....	1
4.2 Designation.....	2
5 Information to be supplied by the purchaser	2
5.1 Mandatory information.....	2
5.2 Options.....	2
5.3 Example for ordering.....	2
6 Requirements	3
6.1 Steelmaking process.....	3
6.2 Delivery condition.....	3
6.3 Chemical composition.....	3
6.4 Mechanical properties.....	3
6.5 Surface condition.....	3
6.6 Internal soundness.....	3
6.7 Weldability.....	3
6.8 Dimensions and tolerances.....	5
6.9 Calculation of mass.....	5
7 Inspection	5
7.1 Types of inspection and inspection documents.....	5
7.2 Tests to be carried out.....	5
7.3 Retests, sorting and reprocessing.....	5
8 Sampling	5
9 Test methods	5
10 Marking	5
Annex A (normative) Chemical composition and mechanical properties of products delivered in accordance with European design codes	6
Annex B (normative) Chemical composition and mechanical properties of products delivered in accordance with ASME-type design codes	10
Annex C (informative) Steel designations in accordance with this document and designation of comparable steel grades in national or regional standards	12
Bibliography	13

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 10, *Steel for pressure purposes*.

This third edition cancels and replaces the second edition (ISO 9328-6:2011), which has been technically revised. The following changes have been made:

- the term “product thickness” has been replaced with “nominal thickness”;
- the example of ordering has been revised;
- the technical data in [Annex A](#) have been aligned with EN 10028-6;
- in [Table B.1](#), the specifications of “P” and “S” have been changed.
- the content of the document has been generally updated.

A list of all the parts in the ISO 9328 series can be found on the ISO website.

Steel flat products for pressure purposes — Technical delivery conditions —

Part 6: Weldable fine grain steels, quenched and tempered

1 Scope

This document specifies the requirements for flat products for pressure equipment made of quenched and tempered weldable fine grain steels as specified in [Tables A.1](#) and [B.1](#). The requirements and definitions of ISO 9328-1 also apply to this document.

NOTE 1 Fine grain steels are understood to be steels with a ferritic grain size of 6 or finer when tested in accordance with ISO 643.

NOTE 2 This document offers the possibility of specifying products in accordance with European design codes and ASME-type design codes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 4948-1, *Steels — Classification — Part 1: Classification of steels into unalloyed and alloy steels based on chemical composition*

ISO 4948-2, *Steels — Classification — Part 2: Classification of unalloyed and alloy steels according to main quality classes and main property or application characteristics*

ISO 9328-1:2018, *Steel flat products for pressure purposes — Technical delivery conditions — Part 1: General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9328-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

4 Classification and designation

4.1 Classification

In accordance with ISO 4948-1 and ISO 4948-2, all steel grades covered by this document are alloyed special steels.

4.2 Designation

Shall be in accordance with ISO 9328-1.

This document covers the steel grades specified in [Annexes A](#) and [B](#) in four series:

- a) basic series (P...Q; PT...Q);
- b) series with elevated temperature properties (P...QH, PT...QH);
- c) series with low temperature properties down to $-40\text{ }^{\circ}\text{C}$ (P...QL1);
- d) series with low temperature properties down to $-60\text{ }^{\circ}\text{C}$ (P...QL2, PT...QL2).

NOTE 1 The steel grades in [Annex A](#) are classified in accordance with their yield strength; the steel grades in [Annex B](#) are classified in accordance with their tensile strength.

NOTE 2 Information on the designation of comparable steel grades in national or regional standards is given in [Annex C](#).

5 Information to be supplied by the purchaser

5.1 Mandatory information

Shall be in accordance with ISO 9328-1.

Additionally, for steel grades in accordance with [Annex B](#), the test direction for the impact test shall be agreed upon (see [Clause 9](#) and [Table B.3](#), footnote a).

5.2 Options

A number of options are specified in this document. These are listed below under a) to j). Additionally, the relevant options of ISO 9328-1 apply. If the purchaser does not indicate a wish to implement any of these options at the time of enquiry and order, the products shall be supplied in accordance with the basic specification (see ISO 9328-1):

- a) carbon-equivalent value (see [6.3.3](#));
- b) tensile properties at elevated temperatures for steel grades PT...QH (see [6.4](#));
- c) specification of an impact energy of 40 J (see the Note to [6.4](#) and [Table A.3](#));
- d) lower copper content and maximum tin content (see [Table A.1](#), footnote c);
- e) mechanical properties for thicknesses $> 150\text{ mm}$ (see [Table A.2](#), footnote b);
- f) applicability of elevated temperature values for QL grades (see [Table A.4](#), footnote b);
- g) increased maximum carbon content for the grade PT520Q (see [Table B.1](#), footnote c);
- h) increased maximum carbon content for the grade PT550QL2 (see [Table B.1](#), footnote d);
- i) other test requirements for the impact test (see [Table B.3](#), footnote b);
- j) tests on simulated heat-treated samples (see [6.7.2](#)).

5.3 Example for ordering

An order of 10 plates with nominal dimensions thickness = 50 mm, width = 2 000 mm, length = 10 000 mm, made of a steel grade with the name P355QL2 as specified in this document, with inspection certificate 3.1 as specified in ISO 10474, is designated as follows: