
Structural steels —

Part 5:

**Technical delivery conditions for
structural steels with improved
atmospheric corrosion resistance**

Aciers de construction —

*Partie 5: Conditions techniques de livraison pour aciers de
construction à résistance améliorée à la corrosion atmosphérique*

This document is a preview generated by ELS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2023

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
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword.....	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Classification and designation	2
4.1 Classification.....	2
4.2 Designation (grades and qualities).....	2
5 Information to be supplied by purchaser	3
5.1 Mandatory information.....	3
5.2 Options.....	3
6 Requirements	3
6.1 Steelmaking process.....	3
6.2 Delivery condition.....	3
6.3 Chemical composition.....	3
6.3.1 Heat analysis.....	3
6.3.2 Product analysis.....	3
6.3.3 Carbon equivalent value.....	4
6.4 Mechanical properties.....	4
6.4.1 Tensile properties.....	4
6.4.2 Charpy V-notch impact properties.....	4
6.5 Surface conditions.....	4
6.6 Internal soundness.....	4
6.7 Dimensions, tolerances on dimensions and shape and mass.....	4
7 Inspection	4
8 Sampling — Frequency of testing	4
8.1 Verification.....	4
8.2 Test units.....	5
8.2.1 Test units for grades S235, S295, S355, S420, S460, S500, S550.....	5
8.2.2 Test units for grades SG245, SG345, SG365, SG400, SG460, SG500, SG700.....	5
9 Test methods	5
10 Marking	5
11 Information about technological properties	5
11.1 Weldability.....	5
11.2 Use of steel with improved corrosion resistance.....	5
Annex A (normative) Steel grades S235, S295, S355, S420, S460, S500, S550: Chemical composition and mechanical properties	6
Annex B (normative) Steel grades SG245, SG345, SG365, SG400, SG460, SG500, SG700: Chemical composition and mechanical properties	14
Annex C (informative) Notes on weldability	20
Annex D (informative) Additional information for the use of steel with improved atmospheric corrosion resistance	21
Bibliography	22

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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

For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 3, *Steels for structural purposes*.

This second edition cancels and replaces the first edition (ISO 630-5:2014), which has been technically revised.

The main changes are as follows:

- grades S295W, S355WSE, S420W, S460W, S500W, S550W and pertaining requirements have been added;
- applicable thickness ranges have been added in the scope;
- terms and definitions concerning heat treatments have been deleted because defined in ISO 630-1;
- quality E (impact testing at -40 °C) has been added;
- list of options has been integrated in ISO 630-1;
- test units have been updated;
- Bibliography has been updated;
- the content of the document has been updated to harmonize with the other parts of the ISO 630 series.

A list of all parts in the ISO 630 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Structural steels —

Part 5:

Technical delivery conditions for structural steels with improved atmospheric corrosion resistance

1 Scope

This document specifies qualities for flat and long products of hot-rolled structural steels with improved atmospheric corrosion resistance in the as-rolled, normalized/normalized rolled, thermomechanical control processed and quenched and tempered delivery conditions. It is applicable to steel plates rolled on a reversing mill, wide flats, hot-rolled sections and bars, which are intended for use in welded or bolted structures.

This document covers 14 grades and 5 qualities. Grades S235, S295, S355, S420, S460, S500 and S550 are covered in [Annex A](#). Grades SG245, SG345, SG365, SG400, SG460, SG500, and SG700 are covered in [Annex B](#). Not all grades are available in all qualities, and some qualities have Charpy V-notch requirements.

The steels specified in this document are applicable to hot-rolled plates, wide flats, sections and bars with a maximum nominal thickness of 150 mm for grades S235W, S295W, S355W, S420W, S460W, S500W and S550W, with a maximum nominal thickness of 200 mm for grades SG245, SG345, SG365, SG400, SG460, SG500, and SG700.

The steels specified in this document are applicable to hot-rolled plates with a maximum nominal thickness of 20 mm for grades S295WP and S355WP.

The steels specified in this document are applicable to hot-rolled wide flats, sections and bars with a maximum nominal thickness of 40 mm for grades S295WP and S355WP.

The steels specified in this document are applicable to hot-rolled plates with a maximum nominal thickness of 80 mm for grade S355WSE.

This document does not include the following structural steels, some of which are covered by other International Standards.

- sheet and strip, e.g. ISO 4995 or ISO 4996;
- tubular products, e.g. ISO 12633-1, ISO 12633-2.

NOTE In this document, the term of "thickness" is considered as "nominal thickness", unless otherwise stated.

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 630-1, *Structural steels — Part 1: General technical delivery conditions for hot-rolled products*

ISO 643, *Steels — Micrographic determination of the apparent grain size*

ISO 4948-1, *Steels — Classification — Part 1: Classification of steels into unalloyed and alloy steels based on chemical composition*

ISO 10474, *Steel and steel products — Inspection documents*

ASTM G101, *Standard Guide for Estimating the Atmospheric Corrosion Resistance of Low-Alloy Steels*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 630-1 and the following apply.

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

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

3.1

fine-grain steel

steel with fine grain structure with an equivalent index of ferritic grain size ≥ 6 determined in accordance with specific requirements

Note 1 to entry: The requirements shall be in accordance with ISO 643.

Note 2 to entry: See [6.1](#).

3.2

steel with improved atmospheric corrosion resistance

steel in which a certain number of alloying elements, such as P, Cu, Cr, Ni, etc., have intentionally been added in order to increase its resistance to atmospheric corrosion, by forming an auto-protective oxide layer on the base metal

Note 1 to entry: These steels are commonly known as “weathering steels”.

Note 2 to entry: For additional information for the use of steel with improved atmospheric corrosion resistance, see [Annex D](#).

4 Classification and designation

4.1 Classification

The steel grades specified in this document shall be classified as unalloyed or alloy steels in accordance with ISO 4948-1.

4.2 Designation (grades and qualities)

Steel grades and qualities differ in their specified mechanical properties and impact energy requirements.

Grades S295 and SG345 are subdivided into classes W and WP, which differ primarily in their phosphorus contents; grade S355 is subdivided into classes W, WP and WSE, which differ primarily in phosphorus content and alloying element requirements for Sn, Cr, Mo and Cu; grades SG245, SG365, and SG460 are subdivided into classes W1 and W2, which differ primarily in alloying element requirements for Si, Cr, Cu and Ni (see [Table B.1](#)). Class W denotes weathering steel; class WP denotes weathering steel with higher levels of phosphorus; class WSE denotes weathering steel with an improved resistance to saline environments.

- Quality A: no impact testing
- Quality B: impact testing at +20 °C