

TECHNICAL REPORT

CEN ISO/TR 20173

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

August 2018

ICS 25.160.20

Supersedes CEN ISO/TR 20173:2009

English Version

## Welding - Grouping systems for materials - American materials (ISO 20173:2018)

Soudage - Systèmes de groupement des matériaux - Matériaux américains (ISO 20173:2018)

Schweißen - Werkstoffgruppeneinteilung - Amerikanische Werkstoffe (ISO 20173:2018)

This Technical Report was approved by CEN on 25 July 2018. It has been drawn up by the Technical Committee CEN/TC 121.

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

Dit document mag slechts op een stand-alone PC worden geïnstalleerd. Gebruik op een netwerk is alleen toestaan als een aanvullende licentieovereenkomst voor netwerkgebruik met NEN is afgesloten. This document may only be used on a stand-alone PC. Use in a network is only permitted when a supplementary license agreement for us in a network with NEN has been concluded.

Preview



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2018 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. CEN ISO/TR 20173:2018 E

Dit document is een voorbeeld van NEN / This document is a preview by NEN

**Contents**

Page

European foreword..... 3

For  
Preview  
only

## European foreword

This document (CEN ISO/TR 20173:2018) has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" in collaboration with Technical Committee CEN/TC 121 "Welding and allied processes" the secretariat of which is held by DIN.

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

This document supersedes CEN ISO/TR 20173:2009.

## Endorsement notice

The text of ISO/TR 20173:2018 has been approved by CEN as CEN ISO/TR 20173:2018 without any modification.

Preview

Voorbeeld  
Preview

Preview

---

---

**Welding — Grouping systems for  
materials — American materials**

*Soudage — Systèmes de groupement des matériaux — Matériaux  
américains*



Copyright  
Preview



**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  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
Foreword.....	iv
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative references.....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>4 American grouping system for materials.....</b>	<b>1</b>
<b>Bibliography.....</b>	<b>106</b>

For more information  
visit [www.iso.org](http://www.iso.org)

## 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](http://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](http://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 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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 10, *Quality management in the field of welding*.

Any feedback, question or request for official interpretation related to any aspect of this document should be directed to the Secretariat of ISO/TC 44/SC 10 via your national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html). Official interpretations, where they exist, are available from this page: <https://committee.iso.org/sites/tc44/home/interpretation.html>.

This third edition cancels and replaces the second edition (ISO/TR 20173:2009), which has been technically revised. The main changes compared to the previous edition are as follows:

- [Table 1](#) and [Table 2](#) have been completely revised;
- the layout has been editorially revised.



# Welding — Grouping systems for materials — American materials

## 1 Scope

This document provides an American grouping system for materials for welding purposes, classified in accordance with the grouping system of ISO/TR 15608. A number of Canadian, Australian and New Zealand materials commonly used in North America are also included.

It can also apply for other purposes, such as heat treatment, forming, and non-destructive testing. Types of steels are listed in accordance with the grouping system of ISO/TR 15608:2017, Table 1.

This document covers grouping systems for the following standardized materials:

- steel;
- aluminium and its alloys;
- nickel and its alloys;
- copper and its alloys;
- titanium and its alloys;
- zirconium and its alloys;
- cast irons.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

No terms and definitions are listed in this document.

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

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

## 4 American grouping system for materials

[Tables 1](#) and [2](#) give American grouping systems for ferrous and non-ferrous materials, respectively.

Materials from the following organizations are listed:

- AAR (Association of American Railroads);
- ABS (American Bureau of Shipping);
- API (American Petroleum Institute);
- AS/NZS (Australia. New Zealand Standards);

- ASTM (ASTM International, formerly the American Society for Testing of Materials);
- ASME (American Society of Mechanical Engineers);
- CSA (Canadian Standards Association);
- MSS (Manufacturers Standardization Society);
- NACE (NACE International, formerly the National Association of Corrosion Engineers).

Copyright  
Preview

Table 1 — American grouping system for ferrous materials

Standard	Specification	No.	UNS	Type/Grade	ASME/AWS P/M-No.	Group No.	ISO/TR 15608:2017 Group	Nominal composition
AAR	AAR	TC-128		B	10C	1	11.1	C-Mn-Si
AAR	AAR	M-201		A	1	1	11.1	C-Mn-Si
AAR	AAR	M-201		B	1	2	11.1	C-Mn-Si
AAR	AAR	M-201		B+	1	3	11.1	C-Mn-Si
AAR	AAR	M-201		C	1	4	11.1	C-Mn-Si
ABS	ABS	ABS		CS	1	1	1.1	C-Mn-Si
ABS	ABS	ABS		DS	1	1	1.1	C-Mn-Si
ABS	ABS	ABS	K01801	F	1	1	1.1	C-Si
ABS	ABS	ABS	K02101	D	1	1	1.1	C-Si
ABS	ABS	ABS	K02102	B	1	1	1.1	C
ABS	ABS	ABS	K02300	A	1	1	1.1	C
ABS	ABS	ABS	K11846	AH32	1	1	1.2	C-Mn-Si
ABS	ABS	ABS	K11846	DH32	1	1	1.2	C-Mn-Si
ABS	ABS	ABS	K11846	EH32	1	1	1.2	C-Mn-Si
ABS	ABS	ABS	K11846	FH32	1	1	1.2	C-Mn-Si
ABS	ABS	ABS	K11852	AH36	1	2	1.2	C-Mn-Si
ABS	ABS	ABS	K11852	DH36	1	2	1.2	C-Mn-Si
ABS	ABS	ABS	K11852	EH36	1	2	1.2	C-Mn-Si
ABS	ABS	ABS	K11852	FH36	1	2	1.2	C-Mn-Si
ABS	ABS	ABS	K11857	AH40	1	2	1.3	C-Mn-Si
ABS	ABS	ABS	K11857	DH40	1	2	1.3	C-Mn-Si
ABS	ABS	ABS	K11857	EH40	1	2	1.3	C-Mn-Si
ABS	ABS	ABS	K11857	FH40	1	2	1.3	C-Mn-Si
API	API	2H		42	1	1	1.2	C-Mn
API	API	2H		50	1	2	1.2	C-Mn
API	API	2MT1		50	1	1	1.2	C-Mn
API	API	2W		50	1	1	1.2	C-Mn
API	API	2W		60	1	2	1.3	C-Mn
API	API	2Y		42	1	1	1.2	C-Mn

Table 1 (continued)

Standard	Specification	No.	UNS	Type/Grade	ASME/AWS P/M-No.	Group No.	ISO/TR 15608:2017 Group	Nominal composition
API	API	2Y		50	1	1	1.2	C-Mn
API	API	2Y		50T	1	2	1.2	C-Mn
API	API	2Y		60	1	2	1.3	C-Mn
API	API	5L		A	1	1	1.1	C-Mn
API	API	5L		A25	1	1	1.1	C-Mn
API	API	5L		A25, Cl. I	1	1	1.1	C-Mn
API	API	5L		A25, Cl. II	1	1	1.1	C-Mn
API	API	5L		A25P	1	1	1.1	C-Mn
API	API	5L		B	1	1	11.1	C-Mn
API	API	5L		BM	1	1	1.1	C-Mn
API	API	5L		BMM	1	1	1.1	C-Mn
API	API	5L		BMS	1	1	1.1	C-Mn
API	API	5L		BN	1	1	1.1	C-Mn
API	API	5L		BNO	1	1	1.1	C-Mn
API	API	5L		BNS	1	1	1.1	C-Mn
API	API	5L		BO	1	1	1.1	C-Mn
API	API	5L		BOO	1	1	1.1	C-Mn
API	API	5L		BOS	1	1	1.1	C-Mn
API	API	5L		BR	1	1	1.1	C-Mn
API	API	5L		X42	1	1	11.1	C-Mn
API	API	5L		X42M	1	1	1.2	C-Mn
API	API	5L		X42MO	1	1	1.2	C-Mn
API	API	5L		X42MS	1	1	1.2	C-Mn
API	API	5L		X42N	1	1	1.2	C-Mn
API	API	5L		X42NO	1	1	1.2	C-Mn
API	API	5L		X42NS	1	1	1.2	C-Mn
API	API	5L		X42Q	1	1	1.2	C-Mn
API	API	5L		X42QO	1	1	1.2	C-Mn
API	API	5L		X42QS	1	1	1.2	C-Mn

Table 1 (continued)

Standard	Specification	No.	UNS	Type/Grade	ASME/AWS P/M-No.	Group No.	ISO/TR 15608:2017 Group	Nominal composition
API	API	5L		X42R	1	1	1.2	C-Mn
API	API	5L		X46	1	1	1.1	C-Mn
API	API	5L		X46M	1	1	1.2	C-Mn
API	API	5L		X46MO	1	1	1.2	C-Mn
API	API	5L		X46MS	1	1	1.2	C-Mn
API	API	5L		X46N	1	1	1.2	C-Mn
API	API	5L		X46NO	1	1	1.2	C-Mn
API	API	5L		X46Q	1	1	1.2	C-Mn
API	API	5L		X46Q	1	1	1.2	C-Mn
API	API	5L		X52	1	1	1.1	C-Mn
API	API	5L		X52M	1	1	1.2	C-Mn
API	API	5L		X52MO	1	1	1.2	C-Mn
API	API	5L		X52MS	1	1	1.2	C-Mn
API	API	5L		X52N	1	1	1.2	C-Mn
API	API	5L		X52NO	1	1	1.2	C-Mn
API	API	5L		X52NS	1	1	1.2	C-Mn
API	API	5L		X52Q	1	1	1.2	C-Mn
API	API	5L		X52QO	1	1	1.2	C-Mn
API	API	5L		X52QS	1	1	1.2	C-Mn
API	API	5L		X56	1	2	1.1	C-Mn
API	API	5L		X56M	1	2	2.1	C-Mn
API	API	5L		X56MO	1	2	2.1	C-Mn
API	API	5L		X56MS	1	2	2.1	C-Mn
API	API	5L		X56N	1	2	1.3	C-Mn
API	API	5L		X56Q	1	2	3.1	C-Mn
API	API	5L		X56QO	1	2	3.1	C-Mn
API	API	5L		X56QS	1	2	3.1	C-Mn

Table 1 (continued)

Standard	Specification	No.	UNS	Type/Grade	ASME/AWS P/M-No.	Group No.	ISO/TR 15608:2017 Group	Nominal composition
API	API	5L		X60	1	2	11.1	C-Mn
API	API	5L		X60M	1	2	2.1	C-Mn
API	API	5L		X60MO	1	2	2.1	C-Mn
API	API	5L		X60MS	1	2	2.1	C-Mn
API	API	5L		X60N	1	2	1.3	C-Mn
API	API	5L		X60Q	1	2	3.1	C-Mn
API	API	5L		X60QO	1	2	3.1	C-Mn
API	API	5L		X60QS	1	2	3.1	C-Mn
API	API	5L		X65	1	2	11.1	C-Mn
API	API	5L		X65M	1	2	2.1	C-Mn
API	API	5L		X65N	1	2	2.1	C-Mn
API	API	5L		X65MS	1	2	2.1	C-Mn
API	API	5L		X65Q	1	2	3.1	C-Mn
API	API	5L		X65QO	1	2	3.1	C-Mn
API	API	5L		X65QS	1	2	3.1	C-Mn
API	API	5L		X70	1	3	11.1	C-Mn
API	API	5L		X70M	1	3	2.2	C-Mn
API	API	5L		X70MO	1	3	2.2	C-Mn
API	API	5L		X70MS	1	3	2.2	C-Mn
API	API	5L		X70Q	1	3	3.1	C-Mn
API	API	5L		X70QO	1	3	3.1	C-Mn
API	API	5L		X70QS	1	3	3.1	C-Mn
API	API	5L		X80M	1	4	2.2	C-Mn
API	API	5L		X80MO	1	4	2.2	C-Mn
API	API	5L		X80Q	1	4	3.1	C-Mn
API	API	5L		X80QO	1	4	3.1	C-Mn
API	API	5L		X46	1	1	11.1	C-Mn
AS/ASTM	AS	945		50	1	2	1.2	C-Mn-Si
AS/ASTM	AS	945		65	1	2	1.3	C-Mn-Si-Ti

Table 1 (continued)

Standard	Specification	No.	UNS	Type/Grade	ASME/AWS P/M-No.	Group No.	ISO/TR 15608:2017 Group	Nominal composition
AS	AS	1548		5-490	1	2	1.2	C
AS	AS	1548		7-430	1	1	1.2	C
AS	AS	1548		7-460	1	1	1.2	C
AS	AS	1548		7-490	1	2	1.2	C
AS	AS	1548		PT430	1	1	1.2	C
AS	AS	1548		PT430	1	1	1.1	C
AS	AS	1548		PT460	1	1	1.1	C
AS	AS	1548		PT460	1	1	1.2	C
AS	AS	1548		PT490	1	2	1.2	C
AS	AS	1548		PT490	1	2	1.2	C
AS	AS	1548		PT540T	1	2	1.3	C-Mn
AS/NZS	AS/NZS	1594		HA200	1	1	1.1	C
AS/NZS	AS/NZS	1594		HA250	1	1	1.1	C
AS/NZS	AS/NZS	1594		HA300	1	1	1.2	C-Mn
AS/NZS	AS/NZS	1594		HA300/1	1	1	1.2	C-Mn
AS/NZS	AS/NZS	1594		HA350	1	1	1.2	C-Mn
AS/NZS	AS/NZS	1594		HA400	1	1	2.1	C-Mn
AS/NZS	AS/NZS	1594		HU250	1	1	1.1	C
AS/NZS	AS/NZS	1594		HU300	1	1	1.2	C-Mn
AS/NZS	AS/NZS	1594		HU300/1	1	1	1.2	C-Mn
AS/NZS	AS/NZS	1594		HW350	1	1	1.4	C-Mn-Cr-Ni-Cu
AS/NZS	AS/NZS	1594		XF300	1	1	1.2	C-Mn
AS/NZS	AS/NZS	1594		XF400	1	1	2.1	C-Mn
AS/NZS	AS/NZS	1594		XF500	1	3	2.2	C-Mn
AS/NZS	AS/NZS	3597		500			3.1	C-Mn-1Cr.25Mo
AS/NZS	AS/NZS	3597		600			3.1	C-Mn-1Cr.25Mo
AS/NZS	AS/NZS	3597		700			3.1	C-Mn-1Cr.25Mo
AS/NZS	AS/NZS	3597		700PV		11B	3.1	C-Mn-1Cr.25Mo
AS/NZS	AS/NZS	3678		200		1	1.1	C-Mn



# ALTIJD DE ACTUELE NORM IN UW BEZIT HEBBEN?

Nooit meer zoeken in de systemen en uzelf de vraag stellen:  
'Is CEN ISO/TR 20173:2018 en de laatste versie?'

Via het digitale platform NEN Connect heeft u altijd toegang tot de meest actuele versie van deze norm. Vervallen versies blijven ook beschikbaar. **U en uw collega's** kunnen de norm via NEN Connect makkelijk raadplagen, online en offline.

Kies voor slimmer werken en bekijk onze mogelijkheden op [www.nenconnect.nl](http://www.nenconnect.nl).

## Heeft u vragen?

Onze Klantenservice is bereikbaar maandag tot en met vrijdag, van 8.30 tot 17.00 uur.

Telefoon: 015 2 690 391

E-mail: [klantenservice@nen.nl](mailto:klantenservice@nen.nl)

