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Welding — Grouping systems for materials — Japanese materials

Soudage — Systèmes de groupement des matériaux — Matériaux japonais

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Contents

Page

Foreword

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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).

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This document was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 10, *Quality management in the field of welding,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 121, *Welding,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO/TR 20174:2005), which has been technically revised.

The main change compared to the previous edition is the revision of Tables 1 to 3.

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 https://www.iso.org/members.html.

Official interpretations of ISO/TC 44 documents, where they exist, are available from this page: https://committee.iso.org/sites/tc44/home/interpretation.html.

Welding — Grouping systems for materials — Japanese materials

1 Scope

This document provides a Japanese grouping system for materials for welding purposes, classified in accordance with the grouping system of ISO/TR 15608.

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.

Types of aluminium and aluminium alloys are listed in accordance with the grouping system of ISO/TR 15608:2017, Table 2.

Types of titanium and titanium alloys are listed in accordance with the grouping system of ISO/TR 15608:2017, Table 5.

This document covers grouping systems for the following standardized materials:

— steels;

— aluminium and its alloys;

— titanium and its alloys.

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 Japanese grouping system for materials

4.1 Types of steels in accordance with the grouping system of ISO/TR 15608:2017, Table 1

See Table 1.

Table 1 — Japanese grouping system for steels

Group	Reference standard	Designation
1.1	JIS G 3101	SS330
		SS400
	JIS G 3103	SB410
		SB450
		SB480
		SB450M
		SB480M
	JIS G 3106	SM400A
		SM400B
		SM400C
	JIS G 3113	SAPH310
	JIS G 3116	SG255
	JIS G 3115	SPV235
	JIS G 3118	SGV410
		SGV450
		SGV480
	JIS G 3126	SLA235A
		SLA235B
	JIS G 3131	SPHC
		SPHD
		SPHE
		SPHF
	JIS G 3135	SPFC340
		SPFC370
		SPFC390
		SPFC440
		SPFC490Y
		SPFC540Y
		SPFC590Y
		SPFC340H
	JIS G 3136	SN400A
		SN400B
		SN400C
	JIS G 3444	STK290
		STK400
	JIS G 3452	SGP
	JIS G 3454	STPG370
		STPG410
	JIS G 3455	STS370
		STS410
		STS480

Table 1 *(continued)*

Group	Reference standard	Designation
1.1	JIS G 3456	STPT370
		STPT410
		STPT480
	JIS G 3457	STPY400
	JIS G 3458	STPA12
	JIS G 3460	STPL380
	JIS G 3461	STB340
		STB410
	JIS G 3462	STBA12
		STBA13
	JIS G 3464	STBL380
	JIS G 3467	STF410
		STFA12
	JIS G 3472	STAM290GA
		STAM290GB
		STAM340G
		STAM390G
	JIS G 3473	STC370
	JIS G 3475	STKN400W
		STKN400B
	JIS G 3201	SF340A
		SF390A
		SF440A
		SF490A
		SF540A
	JIS G 3202	SFVC1
		SFVC2A
		SFVC2B
	JIS G 3203	SFVAF1
	JIS G 3205	SFL1
		SFL2
1.2	JIS G 3101	SS490
	JIS G 3106	SM490A
		SM490B
		SM490C
		SM490YA
		SM490YB

Table 1 *(continued)*

Group	Reference standard	Designation
1.2	JIS G 3115	SPV315
		SPV355
	JIS G 3116	SG295
		SG325
	JIS G 3119	SBV1A
		SBV1B
	JIS G 3120	SQV1A
		SQV2A
	JIS G 3126	SLA325A
		SLA325B
	JIS G 3134	SPFH490
		SPFH540
		SPFH540Y
		SPFH590Y
	JIS G 3135	SPFC490
		SPFC540
		SPFC590
	JIS G 3136	SN490B
		SN490C
	JIS G 3444	STK500
		STK490
	JIS G 3461	STB510
	JIS G 3472	STAM440G
		STAM470G
		STAM500G
		STAM440H
	JIS G 3473	STC440
	JIS G 3475	STKN490B
	JIS G 3201	SF540B
		SF590A
		SF590B
	JIS G 3204	SFVQ1A
1.3	JIS G 3106	SM520BN
		SM520CN
	JIS G 3113	SAPH370
		SAPH400
		SAPH440
	JIS G 3115	SPV450N
		SPV490N
	JIS G 3124	SEV245N
		SEV295N
		SEV345N

Table 1 *(continued)*

Group	Reference standard	Designation
1.4	JIS G 3114	SMA400AW
		SMA400AP
		SMA400BW
		SMA400BP
		SMA400CW
		SMA400CP
		SMA490AW
		SMA490AP
		SMA490BW
		SMA490BP
		SMA490CW
		SMA490CP
2.1	JIS G 3106	SM490YATMC
		SM490YBTMC
		SM520BTMC
		SM520CTMC
		SM570TMC
	JS G 3114	SMA490AWTMC
		SMA490APTMC
		SMA490BWTMC
		SMA490BPTMC
		SMA490CWTMC
		SMA490CPTMC
		SMA570WTMC
		SMA570PTMC
	JIS G 3115	SPV410TMC
		SPV450TMC
	JIS G 3129	SH590P-TMC
		SH590S-TMC
	JIS G 3140	SBHS400
		SBHS400W
2.2	JIS G 3115	SPV490TMC
	JIS G 3140	SBHS500
		SBHS500W

Table 1 *(continued)*

Group	Reference standard	Designation
3.1	JIS G 3106	SM570Q
	JIS G 3114	SMA570WQ
		SMA570PQ
	JIS G 3115	SPV410Q
		SPV450Q
		SPV490Q
	JIS G 3120	SQV1B
		SQV2B
		SQV3A
		SQV3B
	JIS G 3128	SHY685
		SHY685N
		SHY685NS
		SHY685NS-F
	JIS G 3201	SF640B
	JIS G 3204	SFVQ1B
		SFVQ2B
		SFVQ3
3.2	JIS G 3140	SBHS700
		SBHS700W
4.2	JIS G 3458	STPA20
	JIS G 3462	STBA20
	JIS G 3203	SFVAF2
5.1	JIS G 3458	STPA22
		STPA23
	JIS G 3462	STBA22
		STBA23
	JIS G 3467	STFA22
		STFA23
	JIS G 4109	SCMV11
		SCMV12
		SCMV21
		SCMV22
		SCMV31
		SCMV32
	JIS G 3203	SFVAF12
		SFVAF11A
		SFVAF11B

Table 1 *(continued)*

Group	Reference standard	Designation
5.2	JIS G 3458	STPA24
	JIS G 3462	STBA24
	JIS G 3467	STFA24
	JIS G 4109	SCMV41
		SCMV42
		SCMV51
		SCMV52
	JIS G 4110	SCMQ4E
	JIS G 3203	SFVAF22A
		SFVAF22B
		SFVAF21A
		SFVAF21B
	JIS G 3206	SFVCMF22B
5.3	JIS G 3458	STPA25
	JIS G 3462	STBA25
	JIS G 3467	STFA25
	JIS G 4109	SCMV61
		SCMV62
	JIS G 3203	SFVAF5A
		SFVAF5B
		SFVAF5C
		SFVAF5D
5.4	JIS G 3458	STPA26
	JIS G 3462	STBA26
	JIS G 3467	STFA26
	JIS G 3203	SFVAF9
6.2	JIS G 4110	SCMQ4V
		SCMQ5V
	JIS G 3206	SFVCMF22V
		SFVCMF3V
7.1	JIS G 4304	SUS405
		SUS410L
		SUS429
		SUS430
		SUS430LX

Table 1 *(continued)*

Group	Reference standard	Designation
7.1	JIS G 4304	SUS430J1L
		SUS434
		SUS436L
		SUS436J1L
		SUS443J1
		SUS444
		SUS445J1
		SUS445J2
		SUS447J1
		SUSXM27
	JIS G 4305	SUS405
		SUS410L
		SUS429
		SUS430
		SUS430LX
		SUS430J1L
		SUS434
		SUS436L
		SUS436J1L
		SUS443J1
		SUS444
		SUS445J1
		SUS445J2
		SUS447J1
		SUSXM27
	JIS G 3446	SUS430TKA
		SUS430TKC
	JIS G 3463	SUS405TB
		SUS409TB
		SUS409LTB
		SUS430TB
		SUS430LXTB
		SUS430J1LTB
		SUS436LTB
		SUS444TB
		SUSXM8TB
		SUSXM27TB

Table 1 *(continued)*

Group	Reference standard	Designation
7.2	JIS G 4304	SUS403
		SUS410
		SUS410S
		SUS420J1
		SUS420J2
		SUS440A
	JIS G 4305	SUS403
		SUS410
		SUS410S
		SUS420J1
		SUS420J2
		SUS440A
	JIS G 3214	SUSF410-A
		SUSF410-B
		SUSF410-C
		SUSF410-D
		SUSF6B
		SUSF6NM
	JIS G 3446	SUS410TKA
		SUS420J1TKA
		SUS420J2TKA
		SUS410TKC
7.3	JIS G 4304	SUS630
		SUS631
	JIS G 4305	SUS630
		SUS631
	JIS G 3214	SUSF630
8.1	JIS G 4304	SUS301
		SUS301L
		SUS301J1
		SUS302B
		SUS303
		SUS304
		SUS304Cu
		SUS304L
		SUS304N1
		SUS304N2

Table 1 *(continued)*

Group	Reference standard	Designation
8.1	JIS G 4304	SUS304LN
		SUS304J1
		SUS304J2
		SUS305
		SUS315J1
		SUS315J2
		SUS316
		SUS316L
		SUS316N
		SUS316LN
		SUS316Ti
		SUS316J1
		SUS316J1L
		SUS317
		SUS317L
		SUS317LN
		SUS317J1
		SUS321
		SUS347
		SUSXM7
		SUSXM15J1
	JIS G 4305	SUS301
		SUS301L
		SUS301J1
		SUS302B
		SUS304
		SUS304Cu
		SUS304L
		SUS304N1
		SUS304N2
		SUS304LN
		SUS304J1
		SUS304J2
		SUS305
		SUS315J1
		SUS315J2
		SUS316

Table 1 *(continued)*

Group	Reference standard	Designation
8.1	JIS G 4305	SUS316L
		SUS316N
		SUS316LN
		SUS316Ti
		SUS316J1
		SUS316J1L
		SUS317
		SUS317L
		SUS317LN
		SUS317J1
		SUS321
		SUS347
		SUSXM7
		SUSXM15J1
	JIS G 3446	SUS304TKA
		SUS316TKA
		SUS321TKA
		SUS347TKA
		SUS304TKC
		SUS316TKC
	JIS G 3463	SUS304TB
		SUS304HTB
		SUS304LTB
		SUS316TB
		SUS316HTB
		SUS316LTB
		SUS316TiTB
		SUS317TB
		SUS317LTB
		SUS321TB
		SUS321HTB
		SUS347TB
		SUS347HTB
		SUSXM15J1TB

Table 1 *(continued)*

Group	Reference standard	Designation
8.1	JIS G 3467	SUS304TF
		SUS304HTF
		SUS316TF
		SUS316HTF
		SUS321TF
		SUS321HTF
		SUS347TF
		SUS347HTF
	JIS G 3468	SUS304TPY
		SUS304LTPY
		SUS316TPY
		SUS316LTPY
		SUS317TPY
		SUS317LTPY
		SUS321TPY
		SUS347TPY
	JIS G 3214	SUSF304
		SUSF304H
		SUSF304L
		SUSF304N
		SUSF304LN
		SUSF316
		SUSF316H
		SUSF316L
		SUSF316N
		SUSF316LN
		SUSF317
		SUSF317L
		SUSF321
		SUSF321H
		SUSF347
		SUSF347H

Table 1 *(continued)*

Group	Reference standard	Designation
8.2	JIS G 4304	SUS309S
		SUS310S
		SUS317J2
		SUS312L
		SUS836L
		SUS890L
	JIS G 4305	SUS309S
		SUS310S
		SUS317J2
		SUS312L
		SUS836L
		SUS890L
	JIS G 3463	SUS310TB
		SUS310STB
		SUS836LTB
		SUS890LTB
	JIS G 3467	SUS309TF
		SUS310TF
	JIS G 3214	SUSF310
8.3	JIS G 4303	SUS201
		SUS202
9.1	JIS G 3127	SL2NS55
9.2	JIS G 3127	SL3N255
		SL3NS75
		SL3N440
		SL5N590
		SL9N520
		SL9N590
	JIS G 3460	STPL450
		STPL690
	JIS G 3464	STBL450
		STBL690
	JIS G 3205	SFL3
10.1	JIS G 4304	SUS323L
		SUS329J1
		SUS329J3L
	JIS G 4305	SUS323L
		SUS329J1
		SUS329J3L
10.2	JIS G 4304	SUS329J4L
		SUS327L1
	JIS G 4305	SUS329J4L
		SUS327L1

Table 1 *(continued)*

Group	Reference standard	Designation
10.3	JIS G 4304	SUS821L1
	JIS G 4305	SUS821L1
11.1	JIS G 4051	S28C
		S30C
		S33C
		S35C
	JIS G 4052	SMn433H
	JIS G 4053	SMn433
11.2	JIS G 4051	S38C
		S40C
		S43C
		S45C
		S48C
		S50C
	JIS G 4052	SMn438H
		SMn443H
	JIS G 4053	SMn438
		SMn443
11.3	JIS G 4051	S53C
		S55C
		S58C

4.2 Types of aluminium and aluminium alloys in accordance with the grouping system of ISO/TR 15608:2017, Table 2

See Table 2.

Table 2 — Japanese grouping system for aluminium and aluminium alloys

Group	Reference standard	Number
21	JIS H 4000	1085
		1080
		1070
		1060
		1050
		1100
		1100A (1N00)
		1200
		1230A (1N30)
		1050A
	JIS H 4040	1070
		1060
		1050
		1100
		1200
		1050A
	JIS H 4080	1070
		1050
		1100
		1200
		1050A
	JIS H 4090	1070
		1050
		1100
		1200
	JIS H 4100	1070
		1060
		1050
		1100
		1200
	JIS H 4140	1100
		1200

[a] Although the range of chemical composition mainly belongs to the above group, there are some that belong to other groups or that do not belong to any group.

Table 2 *(continued)*

Group	Reference standard	Number
22.1	JIS H 4000	3003
		3203
		3004
		3103
		3104
		3005
		3105
	JIS H 4040	3003
		3103
	JIS H 4080	3102
		3003
		3103
		3203
		3021
	JIS H 4090	3003
		3203
	JIS H 4100	3102
		3003
		3103
		3203
		3021
22.2	JIS H 4000	5005
		5110A (5N01)
		5050[a]
	JIS H 4040	5050[a]
	JIS H 4080	5005
		5050[a]
22.3	JIS H 4000	5052
		5021
		5154[a]
		5254[a]
		5454
		5754[a]
		5042[a]

[a] Although the range of chemical composition mainly belongs to the above group, there are some that belong to other groups or that do not belong to any group.

Table 2 *(continued)*

Group	Reference standard	Number
22.3	JIS H 4040	5052
		5041 (5N02)[a]
		5154[a]
		5454
		5754[a]
	JIS H 4080	5052
		5154[a]
		5454
		5251
		5754[a]
	JIS H 4090	5052
		5154[a]
	JIS H 4100	5052
		5454
	JIS H 4140	5052
	JIS H 5202	AlMg3
22.4	JIS H 4000	5456
		5082
		5182
		5083
		5086
	JIS H 4040	5056
		5083
		5086
	JIS H 4080	5056
		5083
		5086
	JIS H 4090	5083
	JIS H 4100	5083
		5086
	JIS H 4140	5056
		5083
	JIS H 5202	AC7A
		AlMg5
		AlMg5(Si)

[a] Although the range of chemical composition mainly belongs to the above group, there are some that belong to other groups or that do not belong to any group.

Table 2 *(continued)*

Group	Reference standard	Number
23.1	JIS H 4000	6101
		6061
		6082
	JIS H 4040	6101
		6061
		6063
		6060
		6262
		6005A
		6005C (6N01)
		6082
		6181
	JIS H 4080	6101
		6061
		6063
		6060
		6005A
		6005C (6N01)
		6463
		6082
		6262
	JIS H 4100	6101
		6061
		6063
		6463
		6060
		6005A
		6005C (6N01)
		6082
	JIS H 4140	6151
		6061
	JIS H 5202	AlSi2MgTi

[a] Although the range of chemical composition mainly belongs to the above group, there are some that belong to other groups or that do not belong to any group.

Table 2 *(continued)*

Group	Reference standard	Number
23.2	JIS H 4000	7075
		7075 (clad plate)
		7204 (7N01)
		7178
		7475
		7010
		7050
	JIS H 4040	7003
		7204 (7N01)
		7075
		7020
		7050
		7049A
	JIS H 4080	7003
		7204 (7N01)
		7075
		7020
		7050
	JIS H 4100	7003
		7204 (7N01)
		7075
		7020
		7005
		7050
	JIS H 4140	7050
		7075
		7N01
	JIS H 5202	AlZn5Mg
24.1	JIS H 5202	AC3A
		AC8A
		AlSi11
		AlSi12(a)
		AlSi12(b)
		AlSi12(Cu)
		AlSi12CuMgNi[a]

[a] Although the range of chemical composition mainly belongs to the above group, there are some that belong to other groups or that do not belong to any group.

Table 2 *(continued)*

Group	Reference standard	Number
24.2	JIS H 5202	AC4A
		AC4C
		AC4CH
		AlSi7Mg
		AlSi7Mg0.3
		AlSi7Mg0.6
		AlSi9Mg
		AlSi10Mg
		AlSi10Mg(Cu)
25	JIS H 5202	AC2A[a]
		AC2B
		AC4B
		AC4D[a]
		AC8B[a]
		AC8C[a]
		AlSi5Cu1Mg[a]
		AlSi5Cu3[a]
		AlSi5Cu3Mg[a]
		AlSi5Cu3Mn[a]
		AlSi6Cu4
		AlSi7Cu2
		AlSi7Cu3Mg
		AlSi8Cu3
		AlSi9Cu1Mg[a]
26	JIS H 4000	2014
		2014 (clad plate)
		2014A
		2017
		2017A
		2219[a]
		2024
		2024 (clad plate)
		2124

[a] Although the range of chemical composition mainly belongs to the above group, there are some that belong to other groups or that do not belong to any group.

Table 2 *(continued)*

Group	Reference standard	Number
26	JIS H 4040	2011
		2014
		2014A
		2017
		2017A
		2117
		2219[a]
		2024
		2030
	JIS H 4080	2011
		2014
		2014A
		2017
		2017A
		2024
		2030
	JIS H 4100	2014
		2014A
		2017
		2017A
		2024
	JIS H 4140	2014
		2017
		2018
		2218
		2219[a]
		2025
		2618[a]
		2N01[a]
	JIS H 5202	AC1B
		AC5A
		AlCu4Ti
		AlCu4MgTi
		AlCu5MgAg

[a] Although the range of chemical composition mainly belongs to the above group, there are some that belong to other groups or that do not belong to any group.

4.3 Types of titanium and titanium alloys in accordance with the grouping system of ISO/TR 15608:2017, Table 5

See Table 3.