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**Aluminium and aluminium alloy sheets,
strips and plates**

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Aluminium Association (JAA)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act. This edition replaces the previous edition (**JIS H 4000** : 2017), which has been technically revised.

However, **JIS H 4000** : 2017 may be applied in the **JIS** mark certification based on the relevant provisions of Article 30, paragraph (1), etc. of the Industrial Standardization Act until 19 April 2023.

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Aluminium and aluminium alloy sheets, strips and plates

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 209** : 2007 (Edition 1), **ISO 6361-1** : 2011 (Edition 2), **ISO 6361-2** : 2014 (Edition 4), **ISO 6361-3** : 2014 (Edition 3), **ISO 6361-4** : 2014 (Edition 3) and **ISO 6361-5** : 2011 (Edition 1) with some modification of the technical contents to reflect the market reality of Japan.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies requirements for rolled aluminium and aluminium alloy sheets, strips, plates, clad plates and disks (hereafter referred to as sheets, strips, plates, clad plates and disks).

NOTE The International Standards corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 209 : 2007 *Aluminium and aluminium alloys — Chemical composition*

ISO 6361-1 : 2011 *Wrought aluminium and aluminium alloys — Sheets, strips and plates — Part 1 : Technical conditions for inspection and delivery*

ISO 6361-2 : 2014 *Wrought aluminium and aluminium alloys — Sheets, strips and plates — Part 2 : Mechanical properties*

ISO 6361-3 : 2014 *Wrought aluminium and aluminium alloys — Sheets, strips and plates — Part 3 : Strips: Tolerances on shape and dimensions*

ISO 6361-4 : 2014 *Wrought aluminium and aluminium alloys — Sheets, strips and plates — Part 4 : Sheets and plates : Tolerances on shape and dimensions*

ISO 6361-5 : 2011 *Wrought aluminium and aluminium alloys — Sheets, strips and plates — Part 5 : Chemical composition* (Overall evaluation: MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

Part or all of the provisions of the following standards, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (in-

cluding amendments) indicated below shall be applied.

JIS H 0001 *Aluminium, magnesium and their alloys — Temper designation*

NOTE Normative reference in the corresponding International Standard : ISO 2107 *Aluminium and aluminium alloys — Wrought products — Temper designations*

JIS H 0321 *General rules for inspection of non-ferrous metal materials*

JIS H 0505 *Measuring methods for electrical resistivity and conductivity of non-ferrous materials*

JIS H 1305 *Method for optical emission spectrochemical analysis of aluminium and aluminium alloys*

JIS H 1306 *Methods for atomic absorption spectrometric analysis of aluminium and aluminium alloys*

JIS H 1307 *Methods for inductively coupled plasma emission spectrometric analysis of aluminium and aluminium alloys*

JIS H 1351 *General rules for chemical analysis of aluminium and aluminium alloy*

JIS H 1352 *Methods for determination of silicon in aluminium and aluminium alloys*

JIS H 1353 *Methods for determination of iron in aluminium and aluminium alloys*

JIS H 1354 *Methods for determination of copper in aluminium and aluminium alloys*

JIS H 1355 *Methods for determination of manganese in aluminium and aluminium alloys*

JIS H 1356 *Method for determination of zinc in aluminium and aluminium alloys*

JIS H 1357 *Methods for determination of magnesium in aluminium and aluminium alloys*

JIS H 1358 *Methods for determination of chromium in aluminium and aluminium alloys*

JIS H 1359 *Methods for determination of titanium in aluminium and aluminium alloys*

JIS H 1360 *Methods for determination of nickel in aluminium and aluminium alloys*

JIS H 1361 *Methods for determination of tin in aluminium and aluminium alloys*

JIS H 1362 *Method for determination of vanadium in aluminium and aluminium alloys*

JIS H 1363 *Methods for determination of zirconium in aluminium alloys*

JIS H 1364 *Methods for determination of bismuth in aluminium and aluminium alloys*

JIS H 1365	<i>Methods for determination of boron in aluminium and aluminium alloys</i>
JIS H 1366	<i>Methods for determination of lead in aluminium and aluminium alloys</i>
JIS H 1367	<i>Methods for determination of beryllium in aluminium and aluminium alloys</i>
JIS H 1368	<i>Method for determination of gallium in aluminium and aluminium alloys</i>
JIS Z 2241	<i>Metallic materials — Tensile testing — Method of test at room temperature</i>
JIS Z 2248	<i>Metallic materials — Bend test</i>
JIS Z 8401	<i>Rounding of numbers</i>
ASTM G34	<i>Standard Test Method for Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys (EXCO Test)</i>
ASTM G47	<i>Standard Test Method for Determining Susceptibility to Stress-Corrosion Cracking of 2XXX and 7XXX Aluminum Alloy Products</i>
ASTM G66	<i>Standard Test Method for Visual Assessment of Exfoliation Corrosion Susceptibility of 5XXX Series Aluminum Alloys (ASSET Test)</i>

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1

sheet

generally, rolled product that is rectangular cross-section with thickness 0.20 mm or over up to and including 6 mm

Note 1 to entry Sheets are supplied in straight length with sheared or sawed edges.

3.2

strip

generally, rolled product that is rectangular cross-section with thickness 0.20 mm or over up to and including 6 mm

Note 1 to entry Strips are supplied in coils with trimmed edges. Strip is sometimes called coil.

Note 2 to entry Sheet and strip products in the thickness range 0.15 mm to 0.20 mm are usually defined as foils (see JIS H 4160), but may in some cases be supplied as sheets or strips.

3.3

plate

generally, rolled product that is rectangular in cross-section and with thickness over 6 mm

Note 1 to entry Plates are supplied in straight length with sheared or sawed edges.

3.4

clad plate

plate composed of a core material (base plate) and a skin material (plate of different alloy from base plate), manufactured by bonding the skin material over the whole surface of the core material usually by pressure-welding

3.5

disk

generally, circular sheet manufactured by cutting a sheet or a strip by pressing or shearing

4 Alloy numbers, classes and symbols

The alloy numbers, classes and symbols shall be as given in Table 1. The product symbol shall consist of the symbol shown in the table, followed by the symbol of temper grade.

Table 1 Alloy numbers, classes and symbols

Alloy number	Class	Symbol	Characteristics and examples of application (informative)
1085	—	A1085P	Pure aluminium having low strength but excellent formability, weldability and corrosion resistance. Used for reflection plates, lighting fixtures, ornaments, tanks for chemical industry, conductive materials and others.
1080	—	A1080P	
1070	—	A1070P	
1060	—	A1060P ^{a)}	Pure aluminium for conductor having high electrical conductivity. Used for bus bars and others.
1050	—	A1050P	Same as 1085 and 1080, etc.
1050A	—	A1050AP	Alloy having a slightly higher strength than that of 1050.
1100	—	A1100P	Having a relatively low strength but excellent formability, weldability and corrosion resistance. Used for general vessels, architectural materials, electrical appliances, various containers, printing boards and others.
1100A	—	A1100AP	Slightly higher in strength than and superior in formability to 1100. Used for domestic wares.
1200	—	A1200P	Same as 1100.
1230A	—	A1230AP	Excellent in ductility and corrosion resistance. Used for aluminium foils and others.
2014	—	A2014P	A high strength heat-treated alloy. In the case of clad plate, 6003 is clad on the surface to improve corrosion resistance. Used for aircraft materials, various construction materials and others.
	—	A2014PC ^{b)}	

Table 1 (continued)

Alloy number	Class	Symbol	Characteristics and examples of application (informative)
2014A	—	A2014AP	A heat-treated alloy having a slightly lower strength than that of 2014.
2017	—	A2017P	Heat-treated alloy with high strength and good machinability. Used for aircraft materials, various construction materials and others.
2017A	—	A2017AP	Alloy higher in strength than 2017.
2219	—	A2219P	Having high strength and excellent heat resistance and weldability. Used for aerospace instruments and others.
2024	—	A2024P	Higher in strength than 2017 and excellent in machinability. Clad plate has an improved corrosion resistance by cladding 1230 on the surface. Used for aircraft materials, various construction materials and others.
	—	A2024PC ^{b)}	
2124	—	A2124P	Used for aircraft materials and others.
3003	—	A3003P	Slightly higher in strength than 1100 and excellent in formability, weldability and corrosion resistance. Used for general vessels, architectural materials, ship materials, fin stocks, various containers and others.
3103	—	A3103P	
3203	—	A3203P	
3004	—	A3004P	Higher in strength than 3003, excellent in formability and good in corrosion resistance.
3004A	—	A3004AP	
3104	—	A3104P	Used for beverage cans, roof plates, material for door panels, coloured aluminium, lamp sockets and others.
3204	—	A3204P	
3005	—	A3005P	Higher in strength than 3003, and excellent in corrosion resistance. Used for architectural material, coloured aluminium and others.
3105	—	A3105P	Slightly higher in strength than 3003, excellent in formability and corrosion resistance. Used for architectural material, coloured aluminium, caps and others.
5005	—	A5005P	Equivalent in strength to 3003, excellent in corrosion resistance, weldability and machinability. Used for exterior and interior materials of buildings, interior materials of vehicles and others.
5110A	—	A5110AP	Equivalent in strength to 3003. A high brightness can be obtained by bright processing such as chemical or electrolytic polishing followed by anodic oxidation processing. Excellent in formability and corrosion resistance. Used for ornaments, kitchen utensils, name plates and others.
5021	—	A5021P	Equivalent in strength to 5052, excellent in corrosion resistance and formability. Used for beverage can material and others.
5042	—	A5042P	Alloy having a strength intermediate between those of 5052 and 5182. Excellent in corrosion resistance and formability. Used for beverage can material and others.
5050	—	A5050P	Used for architectural materials, refrigerating machines, electronics devices and others.
5052	—	A5052P	Representative alloy having a medium strength. Excellent in corrosion resistance, formability and weldability. Used for ship materials, vehicle materials, architectural materials, beverage cans and others.

Table 1 (continued)

Alloy number	Class	Symbol	Characteristics and examples of application (informative)
5154	—	A5154P	Alloy having a strength intermediate between those of 5052 and 5083. Excellent in corrosion resistance, formability and weldability. Used for ship materials, vehicle materials, pressure vessels and others.
5254	—	A5254P	An alloy of 5154, but with restrained decomposition of hydrogen peroxide achieved by limiting the content of impurities, the other characteristics being the same as those of 5154. Used for hydrogen peroxide vessels and others.
5454	—	A5454P	Higher in strength than 5052, excellent in corrosion resistance, formability and weldability. Used for automobile wheels and others.
5754	—	A5754P	Alloy having a strength intermediate between those of 5052 and 5454.
5456	—	A5456P	Used for welding structural materials with higher strength, pressure vessels, ship materials and others.
5082	—	A5082P	Approximately equivalent in strength to 5083, and excellent in corrosion resistance and formability. Used for beverage cans, and others.
5182	—	A5182P	
5083	Ordinary class	A5083P	Alloy having the highest strength among non-heat-treated alloys. Excellent in corrosion resistance and weldability. Used for ship and vehicle materials, low-temperature tanks, pressure vessels and others.
	Special class	A5083PS ^{c)}	Used for liquefied natural gas storage tanks.
5086	—	A5086P	Welding structural alloy with higher strength than that of 5154 and excellent corrosion resistance. Used for ship materials, pressure vessels, magnetic disks and others.
6101	—	A6101P ^{a)}	High strength alloy for conductors having high electrical conductivity. Used for bus bars and others.
6061	—	A6061P	Excellent in corrosion resistance. Mainly used for structural materials for bolt or rivet jointing. Used for ship and vehicle materials, ground constructions and others.
6082	—	A6082P	Approximately equivalent in strength to 6061, excellent in corrosion resistance. Used for skis and others.
7204		A7204P	Welding structural alloy having high strength and good corrosion resistance. Used for vehicles, ground constructions and others.
7010	—	A7010P	Alloy approximately equivalent in strength to 7075.
7050	—	A7050P	Used for aircrafts, other construction materials and others.
7075		A7075P	Alloy having the highest strength among aluminium alloys. Clad plate has an improved corrosion resistance by cladding 7072 on the surface. Used for aircraft materials, skis and others.
		A7075PC ^{b)}	
7475	—	A7475P	Approximately equivalent in strength to 7075, excellent in toughness. Used for superplastic materials, aircraft materials and others.

Table 1 (concluded)

Alloy number	Class	Symbol	Characteristics and examples of application (informative)
7178	—	A7178P	Alloy higher in strength than 7075. Used for materials for bats, skis and others.
8011A	—	A8011AP	For foil materials and others.
8021	—	A8021P	Higher in strength than 1230A, excellent in ductility and corrosion resistance. Used for aluminium foils, decoration, telecommunication, packaging and others.
8079	—	A8079P	
Note ^{a)}	The utilization of A1060P and A6101P shall be limited to conductors.		
Note ^{b)}	The utilization of A2014PC, A2024PC and A7075PC shall be limited to clad plates. The alloy numbers 1230, 6003 and 7072, specified as skin material for the above clad plates, shall only be used as skin materials for clad plates.		
Note ^{c)}	The utilization of A5083PS shall be limited to a side wall plate, annular plate and knuckle plate of storage tank for liquefied natural gas.		

5 Quality

5.1 Appearance

The sheets, strips, plates, clad plates and disks shall be fine and uniform in surface finish, and be free from defects such as blisters and flaws detrimental to their use. The surface defects shall be removed to obtain a smooth finish.

5.2 Chemical composition

The chemical composition of sheets, strips, plates, clad plates (core material and skin material) and disks, when tested in accordance with 7.1, shall satisfy the requirements given in Table 2.

Table 2 Chemical composition

Unit: %

Alloy number	Clad material	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ga, V, Ni, B, Zr, etc.	Ti	Others ^{a)}		Al
											Each	Total	
1085	—	0.10 max.	0.12 max.	0.03 max.	0.02 max.	0.02 max.	—	0.03 max.	Ga 0.03 max., V 0.05 max.	0.02 max.	0.01 max.	—	99.85 min.
1080	—	0.15 max.	0.15 max.	0.03 max.	0.02 max.	0.02 max.	—	0.03 max.	Ga 0.03 max., V 0.05 max.	0.03 max.	0.02 max.	—	99.80 min.
1070	—	0.20 max.	0.25 max.	0.04 max.	0.03 max.	0.03 max.	—	0.04 max.	V 0.05 max.	0.03 max.	0.03 max.	—	99.70 min.
1060	—	0.25 max.	0.35 max.	0.05 max.	0.03 max.	0.03 max.	—	0.05 max.	V 0.05 max.	0.03 max.	0.03 max.	—	99.60 min.
1050	—	0.25 max.	0.40 max.	0.05 max.	0.05 max.	0.05 max.	—	0.05 max.	V 0.05 max.	0.03 max.	0.03 max.	—	99.50 min.
1050A	—	0.25 max.	0.40 max.	0.05 max.	0.05 max.	0.05 max.	—	0.07 max.	—	0.05 max.	0.03 max.	—	99.50 min.
1100	—	Si + Fe 0.95 max.		0.05 to 0.20	0.05 max.	—	—	0.10 max.	—	—	0.05 max.	0.15 max.	99.00 min.
1100A	—	Si + Fe 1.00 max.		0.05 to 0.20	0.05 max.	0.10 max.	—	0.10 max.	—	0.10 max.	0.05 max.	0.15 max.	99.00 min.
1200	—	Si + Fe 1.00 max.		0.05 max.	0.05 max.	—	—	0.10 max.	—	0.05 max.	0.05 max.	0.15 max.	99.00 min.
1230A	—	Si + Fe 0.70 max.		0.10 max.	0.05 max.	0.05 max.	—	0.05 max.	—	—	0.03 max.	—	99.30 min.
2014	—	0.50 to 1.2	0.7 max.	3.9 to 5.0	0.40 to 1.2	0.20 to 0.8	0.10 max.	0.25 max.	—	0.15 max.	0.05 max.	0.15 max.	Remainder
2014 Clad plate	Core material	0.50 to 1.2	0.7 max.	3.9 to 5.0	0.40 to 1.2	0.20 to 0.8	0.10 max.	0.25 max.	—	0.15 max.	0.05 max.	0.15 max.	Remainder
	Skin material (6003)	0.35 to 1.0	0.6 max.	0.10 max.	0.8 max.	0.8 to 1.5	0.35 max.	0.20 max.	—	0.10 max.	0.05 max.	0.15 max.	Remainder
2014A	—	0.50 to 0.9	0.50 max.	3.9 to 5.0	0.40 to 1.2	0.20 to 0.8	0.10 max.	0.25 max.	Ni 0.10 max., Zr + Ti 0.20 max.	0.15 max.	0.05 max.	0.15 max.	Remainder
2017	—	0.20 to 0.8	0.7 max.	3.5 to 4.5	0.40 to 1.0	0.40 to 0.8	0.10 max.	0.25 max.	—	0.15 max.	0.05 max.	0.15 max.	Remainder
2017A	—	0.20 to 0.8	0.7 max.	3.5 to 4.5	0.40 to 1.0	0.40 to 1.0	0.10 max.	0.25 max.	Zr + Ti 0.25 max.	—	0.05 max.	0.15 max.	Remainder
2219	—	0.20 max.	0.30 max.	5.8 to 6.8	0.20 to 0.40	0.02 max.	—	0.10 max.	V 0.05 to 0.15, Zr 0.10 to 0.25	0.02 to 0.10	0.05 max.	0.15 max.	Remainder
2024	—	0.50 max.	0.50 max.	3.8 to 4.9	0.30 to 0.9	1.2 to 1.8	0.10 max.	0.25 max.	—	0.15 max.	0.05 max.	0.15 max.	Remainder
2024 Clad plate	Core material	0.50 max.	0.50 max.	3.8 to 4.9	0.30 to 0.9	1.2 to 1.8	0.10 max.	0.25 max.	—	0.15 max.	0.05 max.	0.15 max.	Remainder
	Skin material (1230)	Si + Fe 0.70 max.		0.10 max.	0.05 max.	0.05 max.	—	0.10 max.	V 0.05 max.	0.03 max.	0.03 max.	—	99.30 min.
2124	—	0.20 max.	0.30 max.	3.8 to 4.9	0.30 to 0.9	1.2 to 1.8	0.10 max.	0.25 max.	—	0.15 max.	0.05 max.	0.15 max.	Remainder
3003	—	0.6 max.	0.7 max.	0.05 to 0.20	1.0 to 1.5	—	—	0.10 max.	—	—	0.05 max.	0.15 max.	Remainder
3103	—	0.50 max.	0.7 max.	0.10 max.	0.9 to 1.5	0.30 max.	0.10 max.	0.20 max.	Zr + Ti 0.10 max.	—	0.05 max.	0.15 max.	Remainder
3203	—	0.6 max.	0.7 max.	0.05 max.	1.0 to 1.5	—	—	0.10 max.	—	—	0.05 max.	0.15 max.	Remainder
3004	—	0.30 max.	0.7 max.	0.25 max.	1.0 to 1.5	0.8 to 1.3	—	0.25 max.	—	—	0.05 max.	0.15 max.	Remainder

Table 2 (continued)

Unit: %

Alloy number	Clad material	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ga, V, Ni, B, Zr, etc.	Ti	Others ^{a)}		Al
											Each	Total	
3004A	—	0.40 max.	0.7 max.	0.25 max.	0.8 to 1.5	0.8 to 1.5	0.10 max.	0.25 max.	Pb 0.03 max.	0.05 max.	0.05 max.	0.15 max.	Remainder
3104	—	0.6 max.	0.8 max.	0.05 to 0.25	0.8 to 1.4	0.8 to 1.3	—	0.25 max.	Ga 0.05 max., V 0.05 max.	0.10 max.	0.05 max.	0.15 max.	Remainder
3204	—	0.30 max.	0.7 max.	0.10 to 0.25	0.8 to 1.5	0.8 to 1.5	—	0.25 max.	—	—	0.05 max.	0.15 max.	Remainder
3005	—	0.6 max.	0.7 max.	0.30 max.	1.0 to 1.5	0.20 to 0.6	0.10 max.	0.25 max.	—	0.10 max.	0.05 max.	0.15 max.	Remainder
3105	—	0.6 max.	0.7 max.	0.30 max.	0.30 to 0.8	0.20 to 0.8	0.20 max.	0.40 max.	—	0.10 max.	0.05 max.	0.15 max.	Remainder
5005	—	0.30 max.	0.7 max.	0.20 max.	0.20 max.	0.50 to 1.1	0.10 max.	0.25 max.	—	—	0.05 max.	0.15 max.	Remainder
5110A	—	0.15 max.	0.25 max.	0.20 max.	0.20 max.	0.20 to 0.6	—	0.03 max.	—	—	0.05 max.	0.10 max.	Remainder
5021	—	0.40 max.	0.50 max.	0.15 max.	0.10 to 0.50	2.2 to 2.8	0.15 max.	0.15 max.	—	—	0.05 max.	0.15 max.	Remainder
5042	—	0.20 max.	0.35 max.	0.15 max.	0.20 to 0.50	3.0 to 4.0	0.10 max.	0.25 max.	—	0.10 max.	0.05 max.	0.15 max.	Remainder
5050	—	0.40 max.	0.7 max.	0.20 max.	0.10 max.	1.1 to 1.8	0.10 max.	0.25 max.	—	—	0.05 max.	0.15 max.	Remainder
5052	—	0.25 max.	0.40 max.	0.10 max.	0.10 max.	2.2 to 2.8	0.15 to 0.35	0.10 max.	—	—	0.05 max.	0.15 max.	Remainder
5154	—	0.25 max.	0.40 max.	0.10 max.	0.10 max.	3.1 to 3.9	0.15 to 0.35	0.20 max.	—	0.20 max.	0.05 max.	0.15 max.	Remainder
5254	—	Si + Fe 0.45 max.		0.05 max.	0.01 max.	3.1 to 3.9	0.15 to 0.35	0.20 max.	—	0.05 max.	0.05 max.	0.15 max.	Remainder
5454	—	0.25 max.	0.40 max.	0.10 max.	0.50 to 1.0	2.4 to 3.0	0.05 to 0.20	0.25 max.	—	0.20 max.	0.05 max.	0.15 max.	Remainder
5754	—	0.40 max.	0.40 max.	0.10 max.	0.50 max.	2.6 to 3.6	0.30 max.	0.20 max.	Mn + Cr 0.10 to 0.6	0.15 max.	0.05 max.	0.15 max.	Remainder
5456	—	0.25 max.	0.40 max.	0.10 max.	0.50 to 1.0	4.7 to 5.5	0.05 to 0.20	0.25 max.	—	0.20 max.	0.05 max.	0.15 max.	Remainder
5082	—	0.20 max.	0.35 max.	0.15 max.	0.15 max.	4.0 to 5.0	0.15 max.	0.25 max.	—	0.10 max.	0.05 max.	0.15 max.	Remainder
5182	—	0.20 max.	0.35 max.	0.15 max.	0.20 to 0.50	4.0 to 5.0	0.10 max.	0.25 max.	—	0.10 max.	0.05 max.	0.15 max.	Remainder
5083	—	0.40 max.	0.40 max.	0.10 max.	0.40 to 1.0	4.0 to 4.9	0.05 to 0.25	0.25 max.	—	0.15 max.	0.05 max.	0.15 max.	Remainder
5086	—	0.40 max.	0.50 max.	0.10 max.	0.20 to 0.7	3.5 to 4.5	0.05 to 0.25	0.25 max.	—	0.15 max.	0.05 max.	0.15 max.	Remainder
6101	—	0.30 to 0.7	0.50 max.	0.10 max.	0.03 max.	0.35 to 0.8	0.03 max.	0.10 max.	B 0.06 max.	—	0.03 max.	0.10 max.	Remainder
6061	—	0.40 to 0.8	0.7 max.	0.15 to 0.40	0.15 max.	0.8 to 1.2	0.04 to 0.35	0.25 max.	—	0.15 max.	0.05 max.	0.15 max.	Remainder
6082	—	0.7 to 1.3	0.50 max.	0.10 max.	0.40 to 1.0	0.6 to 1.2	0.25 max.	0.20 max.	—	0.10 max.	0.05 max.	0.15 max.	Remainder
7204	—	0.30 max.	0.35 max.	0.20 max.	0.20 to 0.7	1.0 to 2.0	0.30 max.	4.0 to 5.0	V 0.10 max., Zr 0.25 max.	0.20 max.	0.05 max.	0.15 max.	Remainder
7010	—	0.12 max.	0.15 max.	1.5 to 2.0	0.10 max.	2.1 to 2.6	0.05 max.	5.7 to 6.7	Ni 0.05 max., Zr 0.10 to 0.16	0.06 max.	0.05 max.	0.15 max.	Remainder

Table 2 (concluded)

Unit: %

Alloy number	Clad material	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ga, V, Ni, B, Zr, etc.	Ti	Others ^{a)}		Al
											Each	Total	
7050	—	0.12 max.	0.15 max.	2.0 to 2.6	0.10 max.	1.9 to 2.6	0.04 max.	5.7 to 6.7	Zr 0.08 to 0.15	0.06 max.	0.05 max.	0.15 max.	Remainder
7075	—	0.40 max.	0.50 max.	1.2 to 2.0	0.30 max.	2.1 to 2.9	0.18 to 0.28	5.1 to 6.1	—	0.20 max.	0.05 max.	0.15 max.	Remainder
7075	Core material	0.40 max.	0.50 max.	1.2 to 2.0	0.30 max.	2.1 to 2.9	0.18 to 0.28	5.1 to 6.1	—	0.20 max.	0.05 max.	0.15 max.	Remainder
7075	Skin material (7072)	Si + Fe 0.7 max.		0.10 max.	0.10 max.	0.10 max.	—	0.8 to 1.3	—	—	0.05 max.	0.15 max.	Remainder
7475	—	0.10 max.	0.12 max.	1.2 to 1.9	0.06 max.	1.9 to 2.6	0.18 to 0.25	5.2 to 6.2	—	0.06 max.	0.05 max.	0.15 max.	Remainder
7178	—	0.40 max.	0.50 max.	1.6 to 2.4	0.30 max.	2.4 to 3.1	0.18 to 0.28	6.3 to 7.3	—	0.20 max.	0.05 max.	0.15 max.	Remainder
8011A	—	0.40 to 0.8	0.50 to 1.0	0.10 max.	0.10 max.	0.10 max.	0.10 max.	0.10 max.	—	0.05 max.	0.05 max.	0.15 max.	Remainder
8021	—	0.15 max.	1.2 to 1.7	0.05 max.	—	—	—	—	—	—	0.05 max.	0.15 max.	Remainder
8079	—	0.05 to 0.30	0.7 to 1.3	0.05 max.	—	—	—	0.10 max.	—	—	0.05 max.	0.15 max.	Remainder
Note ^{a)} Elements in “Others” column are analysed at the discretion of the manufacturer when, in the routine analysis, there is an indication that such elements will exceed the specified value. “Each” column is applicable to listed elements for which no specific limit is shown, as well as unlisted metallic elements. “Total” is the sum of values of all the “each” elements.													

5.3 Mechanical properties

5.3.1 Mechanical properties of sheets, strips, plates and disks

The mechanical properties (tensile strength, proof stress, elongation and bending) of the sheets, strips, plates and disks, when tested in accordance with 7.2 and 7.3, shall satisfy the requirements given in Table 3. Mechanical properties for the products exceeding the range of thickness specified in Table 3 shall be agreed upon between the purchaser and the supplier.

The application of proof stress and bending is as follows.

- a) **Proof stress** Proof stress for alloys A1085P, A1080P, A1070P, A1060P, A1050P, A1100P, A1200P, A1100AP, A1230AP, A3003P, A3103P, A3203P, A3004P, A3004AP, A3104P, A3204P, A3005P, A3105P, A5005P, A5052P and A6101P shall be applied only when requested by the purchaser.
- b) **Bending** The bend test shall be carried out only when requested by the purchaser.

When a bend test is carried out, cracks shall not be generated on the outside of the bend of the sheet, strip, plate, or disk.

Table 3 Mechanical properties of sheets, strips, plates and disks

Symbol	Tem- per grade a)	Tensile test					Bend test ^{c)}	
		Thickness mm	Tensile strength N/mm ²	Proof stress N/mm ²	Elongation ^{b)} %		Thickness mm	Inside ra- dius
					A _{50mm}	A		
A1085P A1080P A1070P	H112	4.0 or over up to and incl. 6.5	75 min.	35 min.	13 min.	—	—	—
		Over 6.5 up to and incl. 13.0	70 min.	35 min.	15 min.			
		Over 13.0 up to and incl. 25.0	60 min.	25 min.	20 min.			
		Over 25.0 up to and incl. 50.0	55 min.	20 min.	25 min.			
		Over 50.0 up to and incl. 75.0	55 min.	15 min.	25 min.			
	O	0.2 or over up to and incl. 0.3	55 min. 95 max.	—	15 min.	—	0.2 or over up to and incl. 6.0	Flat on itself
		Over 0.3 up to and incl. 0.5		—	20 min.			
		Over 0.5 up to and incl. 0.8		—	25 min.			
		Over 0.8 up to and incl. 1.3		15 min.	30 min.			
		Over 1.3 up to and incl. 13.0		15 min.	35 min.			
		Over 13.0 up to and incl. 50.0		15 min.	30 min.			

Table 3 (continued)

Symbol	Tem- per grade a)	Tensile test					Bend test ^{c)}	
		Thickness mm	Tensile strength N/mm ²	Proof stress N/mm ²	Elongation ^{b)} %		Thickness mm	Inside ra- dius
					A_{50mm}	A		
A1085P A1080P A1070P	H12 H22 ^{d)}	0.2 or over up to and incl. 0.3	70 min. 110 max.	—	2 min.	—	0.2 or over up to and incl. 6.0	Flat on itself
		Over 0.3 up to and incl. 0.5		—	3 min.			
		Over 0.5 up to and incl. 0.8		—	4 min.			
		Over 0.8 up to and incl. 1.3		55 min.	6 min.			
		Over 1.3 up to and incl. 2.9		55 min.	8 min.			
		Over 2.9 up to and incl. 12.0		55 min.	9 min.			
	H14 H24 ^{d)}	0.2 or over up to and incl. 0.3	85 min. 120 max.	—	1 min.	—	0.2 or over up to and incl. 0.8 Over 0.8 up to and incl. 6.0	Thickness × 0.5 Thickness × 1
		Over 0.3 up to and incl. 0.5		—	2 min.			
		Over 0.5 up to and incl. 0.8		—	3 min.			
		Over 0.8 up to and incl. 1.3		65 min.	4 min.			
		Over 1.3 up to and incl. 2.9		65 min.	5 min.			
		Over 2.9 up to and incl. 12.0		65 min.	6 min.			
	H16 H26 ^{d)}	0.2 or over up to and incl. 0.5	100 min. 135 max.	—	1 min.	—	0.2 or over up to and incl. 0.8 Over 0.8 up to and incl. 4.0	Thickness × 1 Thickness × 1.5
		Over 0.5 up to and incl. 0.8		—	2 min.			
		Over 0.8 up to and incl. 1.3		75 min.	3 min.			
		Over 1.3 up to and incl. 4.0		75 min.	4 min.			
	H18	0.2 or over up to and incl. 0.5	120 min.	—	1 min.	—	—	—
		Over 0.5 up to and incl. 0.8			2 min.			
		Over 0.8 up to and incl. 1.3			3 min.			
		Over 1.3 up to and incl. 3.0			4 min.			

Table 3 (continued)

Symbol	Tem- per grade a)	Tensile test					Bend test c)	
		Thickness mm	Tensile strength N/mm ²	Proof stress N/mm ²	Elongation ^{b)} %		Thickness mm	Inside ra- dius
					A _{50mm}	A		
A1060P	H112	4.0 or over up to and incl. 6.5	75 min.	35 min.	10 min.	—	6.0 or over up to and incl. 16.0	Thickness × 1
		Over 6.5 up to and incl. 13.0	70 min.	35 min.	10 min.			
		Over 13.0 up to and incl. 25.0	60 min.	25 min.	16 min.			
		Over 25.0 up to and incl. 50.0	55 min.	20 min.	22 min.			
	H14 H24	0.8 or over up to and incl. 1.3	85 min.	65 min.	4 min.	—	0.8 or over up to and incl. 12.0	Thickness × 1
		Over 1.3 up to and incl. 2.9			5 min.			
		Over 2.9 up to and incl. 12.0			6 min.			
A1050P	H112	4.0 or over up to and incl. 6.5	85 min.	45 min.	10 min.	—	—	—
		Over 6.5 up to and incl. 13.0	80 min.	45 min.	10 min.			
		Over 13.0 up to and incl. 25.0	70 min.	35 min.	16 min.			
		Over 25.0 up to and incl. 50.0	65 min.	30 min.	22 min.			
		Over 50.0 up to and incl. 75.0	65 min.	20 min.	22 min.			
	O	0.2 or over up to and incl. 0.5	60 min. 100 max.	—	15 min.	—	0.2 or over up to and incl. 6.0	Flat on itself
		Over 0.5 up to and incl. 0.8		—	20 min.			
		Over 0.8 up to and incl. 1.3		20 min.	25 min.			
		Over 1.3 up to and incl. 6.5		20 min.	30 min.			
		Over 6.5 up to and incl. 50.0		20 min.	28 min.			
	H12 H22 ^{d)}	0.2 or over up to and incl. 0.3	80 min. 120 max.	—	2 min.	—	0.2 or over up to and incl. 0.8 Over 0.8 up to and incl. 6.0	Flat on itself Thickness × 0.5
		Over 0.3 up to and incl. 0.5		—	3 min.			
		Over 0.5 up to and incl. 0.8		—	4 min.			
		Over 0.8 up to and incl. 1.3		65 min.	6 min.			
		Over 1.3 up to and incl. 2.9		65 min.	8 min.			
		Over 2.9 up to and incl. 12.0		65 min.	9 min.			

Table 3 (continued)

Symbol	Tem- per grade a)	Tensile test					Bend test ^{c)}	
		Thickness mm	Tensile strength N/mm ²	Proof stress N/mm ²	Elongation ^{b)} %		Thickness mm	Inside ra- dius
					<i>A</i> _{50mm}	<i>A</i>		
A1050P	H14 H24 ^{d)}	0.2 or over up to and incl. 0.3	95 min. 125 max.	—	1 min.	—	0.2 or over up to and incl. 0.8 Over 0.8 up to and incl. 6.0	Thickness × 0.5 Thickness × 1
		Over 0.3 up to and incl. 0.5		—	2 min.			
		Over 0.5 up to and incl. 0.8		—	3 min.			
		Over 0.8 up to and incl. 1.3		75 min.	4 min.			
		Over 1.3 up to and incl. 2.9		75 min.	5 min.			
		Over 2.9 up to and incl. 12.0		75 min.	6 min.			
	H16 H26 ^{d)}	0.2 or over up to and incl. 0.5	120 min. 145 max.	—	1 min.	—	0.2 or over up to and incl. 4.0	Thickness × 2
		Over 0.5 up to and incl. 0.8		—	2 min.			
		Over 0.8 up to and incl. 1.3		85 min.	3 min.			
		Over 1.3 up to and incl. 4.0		85 min.	4 min.			
	H18	0.2 or over up to and incl. 0.5	125 min.	—	1 min.	—	—	—
		Over 0.5 up to and incl. 0.8			2 min.			
		Over 0.8 up to and incl. 1.3			3 min.			
		Over 1.3 up to and incl. 3.0			4 min.			
A1050AP	O	0.2 or over up to and incl. 0.5	65 min. 95 max.	20 min.	20 min.	—	—	—
		Over 0.5 up to and incl. 1.5			22 min.	—		
		Over 1.5 up to and incl. 3.0			26 min.	—		
		Over 3.0 up to and incl. 6.0			29 min.	—		
		Over 6.0 up to and incl. 12.5			35 min.	—		
		Over 12.5 up to and incl. 25.0			32 min.	32 min.		

Table 3 (continued)

Symbol	Tem- per grade a)	Tensile test					Bend test ^{c)}	
		Thickness mm	Tensile strength N/mm ²	Proof stress N/mm ²	Elongation ^{b)} %		Thickness mm	Inside ra- dius
					A _{50mm}	A		
A1050AP	H14	0.2 or over up to and incl. 0.5	105 min. 145 max.	85 min.	2 min.	—	—	—
		Over 0.5 up to and incl. 1.5			3 min.			
		Over 1.5 up to and incl. 3.0			4 min.			
		Over 3.0 up to and incl. 6.0			5 min.			
	H24	0.2 or over up to and incl. 0.5	105 min. 145 max.	75 min.	3 min.	—	—	—
		Over 0.5 up to and incl. 1.5			4 min.			
		Over 1.5 up to and incl. 3.0			5 min.			
		Over 3.0 up to and incl. 6.0			8 min.			
	H18	0.2 or over up to and incl. 0.5	140 min.	120 min.	1 min.	—	—	—
		Over 0.5 up to and incl. 1.5			2 min.			
		Over 1.5 up to and incl. 3.0			2 min.			
A1100P A1100AP A1200P A1230AP	H112	4.0 or over up to and incl. 6.5	95 min.	50 min.	9 min.	—	—	—
		Over 6.5 up to and incl. 13.0	90 min.	50 min.	9 min.			
		Over 13.0 up to and incl. 50.0	85 min.	35 min.	14 min.			
		Over 50.0 up to and incl. 75.0	80 min.	25 min.	20 min.			
	O	0.2 or over up to and incl. 0.5	75 min. 105 max.	25 min.	17 min.	—	0.2 or over up to and incl. 6.0	Flat on itself
		Over 0.5 up to and incl. 0.8			22 min.	—		
		Over 0.8 up to and incl. 1.3			22 min.	—		
		Over 1.3 up to and incl. 6.5			30 min.	—		
		Over 6.5 up to and incl. 75.0			28 min.	25 min.		

Table 3 (continued)

Symbol	Tem- per grade a)	Tensile test					Bend test ^{c)}	
		Thickness mm	Tensile strength N/mm ²	Proof stress N/mm ²	Elongation ^{b)} %		Thickness mm	Inside ra- dius
					A _{50mm}	A		
A1100P A1100AP A1200P A1230AP	H12 H22 ^{d)}	0.2 or over up to and incl. 0.3	95 min. 125 max.	75 min.	2 min.	—	0.2 or over up to and incl. 6.0	Thickness × 0.5
		Over 0.3 up to and incl. 0.5			3 min.			
		Over 0.5 up to and incl. 0.8			4 min.			
		Over 0.8 up to and incl. 1.3			6 min.			
		Over 1.3 up to and incl. 2.9			8 min.			
		Over 2.9 up to and incl. 12.0			9 min.			
	H14 H24 ^{d)}	0.2 or over up to and incl. 0.3	120 min. 145 max.	95 min.	1 min.	—	0.2 or over up to and incl. 6.0	Thickness × 1
		Over 0.3 up to and incl. 0.5			2 min.			
		Over 0.5 up to and incl. 0.8			3 min.			
		Over 0.8 up to and incl. 1.3			4 min.			
		Over 1.3 up to and incl. 2.9			5 min.			
		Over 2.9 up to and incl. 12.0			6 min.			
	H16 H26 ^{d)}	0.2 or over up to and incl. 0.5	135 min. 165 max.	115 min.	1 min.	—	0.2 or over up to and incl. 4.0	Thickness × 2
		Over 0.5 up to and incl. 0.8			2 min.			
		Over 0.8 up to and incl. 1.3			3 min.			
		Over 1.3 up to and incl. 4.0			4 min.			
	H18	0.2 or over up to and incl. 0.5	150 min.	130 min.	1 min.	—	—	—
		Over 0.5 up to and incl. 0.8			2 min.			
		Over 0.8 up to and incl. 1.3			3 min.			
		Over 1.3 up to and incl. 3.0			4 min.			

Table 3 (continued)

Symbol	Tem- per grade a)	Tensile test					Bend test c)	
		Thickness mm	Tensile strength N/mm ²	Proof stress N/mm ²	Elongation b)		Thickness mm	Inside ra- dius
					A _{50mm}	A		
A2014P	O e)	0.4 or over up to and incl. 0.5	220 max.	140 max.	16 min.	—	0.4 or over up to and incl. 1.6	Thickness × 0.5
		Over 0.5 up to and incl. 13.0			16 min.	—	Over 1.6 up to and incl. 2.9	Thickness × 1
		Over 13.0 up to and incl. 25.0			10 min.	9 min.	Over 2.9 up to and incl. 6.0	Thickness × 1.5
	T3	0.4 or over up to and incl. 0.5	395 min.	245 min.	14 min.	—	0.4 or over up to and incl. 0.5	Thickness × 1.5
		Over 0.5 up to and incl. 6.0		245 min.	14 min.		Over 0.5 up to and incl. 1.6	Thickness × 2.5
		Over 6.0 up to and incl. 6.3		240 min.	14 min.		Over 1.6 up to and incl. 2.9	Thickness × 3
		Over 6.3 up to and incl. 12.0		235 min.	13 min.		Over 2.9 up to and incl. 6.0	Thickness × 3.5
	T4	0.4 or over up to and incl. 0.5	395 min.	240 min.	14 min.	—	0.4 or over up to and incl. 0.5	Thickness × 1.5
		Over 0.5 up to and incl. 6.0	395 min.	240 min.			Over 0.5 up to and incl. 1.6	Thickness × 2.5
		Over 6.0 up to and incl. 6.3	400 min.	250 min.			Over 1.6 up to and incl. 2.9	Thickness × 3
		Over 6.3 up to and incl. 12.0	400 min.	250 min.			Over 2.9 up to and incl. 6.0	Thickness × 3.5
	T451 ^d	6.0 or over up to and incl. 13.0	400 min.	250 min.	14 min.	—	—	—
		Over 13.0 up to and incl. 25.0	400 min.		14 min.	—		
		Over 25.0 up to and incl. 50.0	400 min.		12 min.	10 min.		
		Over 50.0 up to and incl. 80.0	395 min.		8 min.	7 min.		
	T42 ^{g)}	0.4 or over up to and incl. 0.5	400 min.	—	14 min.	—	—	—
		Over 0.5 up to and incl. 25.0		235 min.				
	T6	0.4 or over up to and incl. 0.5	440 min.	390 min.	6 min.	—	0.4 or over up to and incl. 0.5	Thickness × 3
		Over 0.5 up to and incl. 1.0	440 min.	390 min.	6 min.		Over 0.5 up to and incl. 1.6	Thickness × 3.5
		Over 1.0 up to and incl. 6.0	440 min.	390 min.	7 min.		Over 1.6 up to and incl. 2.9	Thickness × 4.5
		Over 6.0 up to and incl. 6.3	450 min.	395 min.	7 min.		Over 2.9 up to and incl. 6.0	Thickness × 5
		Over 6.3 up to and incl. 12.0	450 min.	395 min.	7 min.			

Table 3 (continued)

Symbol	Tem- per grade a)	Tensile test					Bend test ^{c)}	
		Thickness mm	Tensile strength N/mm ²	Proof stress N/mm ²	Elongation ^{b)} %		Thickness mm	Inside ra- dius
					A_{50mm}	A		
A2014P	T62 ^{g)}	0.4 or over up to and incl. 0.5	440 min.	—	6 min.	—	—	—
		Over 0.5 up to and incl. 1.0	440 min.	390 min.	6 min.	—	—	—
		Over 1.0 up to and incl. 6.5	460 min.	400 min.	7 min.	—	—	—
		Over 6.5 up to and incl. 13.0	460 min.	410 min.	7 min.	—	—	—
		Over 13.0 up to and incl. 25.0	460 min.	410 min.	6 min.	—	—	—
	T651	6.0 or over up to and incl. 13.0	460 min.	405 min.	7 min.	—	—	—
		Over 13.0 up to and incl. 25.0	460 min.	405 min.	7 min.	6 min.	—	—
		Over 25.0 up to and incl. 50.0	460 min.	405 min.	4 min.	5 min.	—	—
		Over 50.0 up to and incl. 60.0	450 min.	390 min.	2 min.	3 min.	—	—
		Over 60.0 up to and incl. 80.0	435 min.	380 min.	2 min.	1 min.	—	—
		Over 80.0 up to and incl. 100.0	405 min.	380 min.	—	1 min.	—	—
	O	0.35 or over up to and incl. 3.2	220 max.	140 max.	16 min.	13 min.	—	—
		Over 3.2 up to and incl. 6.0			16 min.	12 min.		
		Over 6.0 up to and incl. 12.0			16 min.	12 min.		
		Over 12.0 up to and incl. 12.5			16 min.	12 min.		
		Over 12.5 up to and incl. 25.0			12 min.	9 min.		
	T3 T4	0.35 or over up to and incl. 0.5	395 min.	240 min.	14 min.	—	—	—
		Over 0.5 up to and incl. 1.0		240 min.	14 min.	—		
		Over 1.0 up to and incl. 1.6		240 min.	14 min.	—		
		Over 1.6 up to and incl. 6.0		240 min.	14 min.	—		
		Over 6.0 up to and incl. 6.3		240 min.	14 min.	—		
		Over 6.3 up to and incl. 12.0		235 min.	13 min.	—		

Table 3 (continued)

Symbol	Tem- per grade a)	Tensile test					Bend test ^{c)}	
		Thickness mm	Tensile strength N/mm ²	Proof stress N/mm ²	Elongation ^{b)} %		Thickness mm	Inside ra- dius
					A_{50mm}	A		
A2014AP	T6	0.35 or over up to and incl. 0.5	440 min.	380 min.	6 min.	—	—	—
		Over 0.5 up to and incl. 1.0		380 min.	6 min.	—		
		Over 1.0 up to and incl. 1.6		380 min.	7 min.	—		
		Over 1.6 up to and incl. 6.0		390 min.	7 min.	—		
		Over 6.0 up to and incl. 6.3		390 min.	7 min.	—		
		Over 6.3 up to and incl. 12.0		390 min.	7 min.	—		
	T451 ^{d)}	6.0 or over up to and incl. 6.3	395 min.	240 min.	14 min.	—	—	—
		Over 6.3 up to and incl. 12.0	395 min.	240 min.	14 min.	—		
		Over 12.0 up to and incl. 12.5	400 min.	250 min.	14 min.	—		
		Over 12.5 up to and incl. 25.0	400 min.	250 min.	14 min.	12 min.		
		Over 25.0 up to and incl. 40.0	400 min.	250 min.	—	10 min.		
		Over 40.0 up to and incl. 50.0	400 min.	250 min.	—	8 min.		
		Over 50.0 up to and incl. 60.0	395 min.	250 min.	—	7 min.		
		Over 60.0 up to and incl. 80.0	390 min.	240 min.	—	7 min.		
	T651	6.0 or over up to and incl. 6.3	450 min.	395 min.	7 min.	—	—	—
		Over 6.3 up to and incl. 12.0	450 min.	395 min.	7 min.	—		
		Over 12.0 up to and incl. 12.5	450 min.	395 min.	7 min.	—		
		Over 12.5 up to and incl. 25.0	460 min.	405 min.	7 min.	6 min.		
		Over 25.0 up to and incl. 40.0	460 min.	405 min.	—	5 min.		
		Over 40.0 up to and incl. 50.0	450 min.	390 min.	—	3 min.		
		Over 50.0 up to and incl. 60.0	450 min.	390 min.	—	3 min.		
		Over 60.0 up to and incl. 80.0	435 min.	380 min.	—	1 min.		
		Over 80.0 up to and incl. 100.0	405 min.	350 min.	—	1 min.		

Table 3 (continued)

Symbol	Tem- per grade a)	Tensile test					Bend test ^{c)}	
		Thickness mm	Tensile strength N/mm ²	Proof stress N/mm ²	Elongation ^{b)} %		Thickness mm	Inside ra- dius
					A _{50mm}	A		
A2017P	O ^{e)}	0.4 or over up to and incl. 0.5	215 max.	—	12 min.	—	0.4 or over up to and incl. 1.6 Over 1.6 up to and incl. 2.9 Over 2.9 up to and incl. 6.0	Thickness × 0.5
		Over 0.5 up to and incl. 25.0		110 max.				Thickness × 1
								Thickness × 1.5
	T3	0.4 or over up to and incl. 0.5	375 min.	—	12 min.	—	0.4 or over up to and incl. 0.5 Over 0.5 up to and incl. 1.6 Over 1.6 up to and incl. 2.9 Over 2.9 up to and incl. 6.0	Thickness × 1.5
		Over 0.5 up to and incl. 1.6		215 min.	15 min.			Thickness × 2.5
		Over 1.6 up to and incl. 2.9		215 min.	17 min.			Thickness × 3
		Over 2.9 up to and incl. 6.0		215 min.	15 min.			Thickness × 3.5
	T351	6.0 or over up to and incl. 25.0	375 min.	215 min.	12 min.	—	—	—
		Over 25.0 up to and incl. 50.0	375 min.	215 min.	12 min.			
		Over 50.0 up to and incl. 80.0	355 min.	195 min.	11 min.			
		Over 80.0 up to and incl. 100.0	355 min.	195 min.	10 min.			
	T4	0.4 or over up to and incl. 0.5	355 min.	—	12 min.	—	0.4 or over up to and incl. 0.5 Over 0.5 up to and incl. 1.6 Over 1.6 up to and incl. 2.9 Over 2.9 up to and incl. 6.0	Thickness × 1.5
		Over 0.5 up to and incl. 1.6		195 min.	15 min.			Thickness × 2.5
		Over 1.6 up to and incl. 2.9		195 min.	17 min.			Thickness × 3
		Over 2.9 up to and incl. 6.0		195 min.	15 min.			Thickness × 3.5
	T451	6.0 or over up to and incl. 25.0	355 min.	195 min.	12 min.	—	—	—
		Over 25.0 up to and incl. 50.0			12 min.			
		Over 50.0 up to and incl. 80.0			11 min.			
		Over 80.0 up to and incl. 100.0			10 min.			