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BUREAU OF INDIAN STANDARDS

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भारतीय मानक मसौदा

पिटवाँ एल्यूमीनियम और एल्यूमीनियम मिश्रधातु बार्स, छड़ें, सेक्शन एक्सट्रूडेड नलियाँ, खोखले सेक्शन और प्रोफाइल के लिए विशिष्टि (सामान्य इंजीनियरिंग उद्देश्यों के लिए)

(आईएस 733 का चौथा पुनरीक्षण)

Draft Indian Standard

SPECIFICATION FOR WROUGHT ALUMINIUM AND ALUMINIUM ALLOY BARS, RODS, SECTIONS, EXTRUDED TUBES, HOLLOW SECTIONS AND PROFILES

(FOR GENERAL ENGINEERING PURPOSES)

[*Fourth Revision of IS* 733]

ICS 77.150.10

Ores and Feed Stock for Aluminium Industry, its Metals/ Alloys and Products Sectional Committee, MTD 07	Last date of comments **17 September 2025**

FOREWORD

(Formal clauses of the foreword will be added later.)

This standard was first published in 1956 and subsequently revised in 1967, 1975, and 1983. This fourth revision incorporates the experience gained with the use of this specification and brings the standard in line with the latest developments in this field.

In this new version of the standard, the international alloy designations, many of which are widely used in the country, have been added in accordance with the teal sheets issued by the Aluminium Association. The Indian standard designations which were there in the standard have been retained but they have been given new designations in line with the international system of nomenclature considering the nearest equivalent alloy. A Table giving the old and new designations of these alloys have also been included in the Annex A. Some alloys have also been added based on specific customer / industry requirements for those alloys.

IS 1285:2023 covers extruded round tubes and hollow sections for general engineering purposes while IS 733:1983 covers bars, rods and solid sections for general engineering purposes. For all

the specific information related to alloy composition and mechanical properties, IS 1285:2023 gives reference of IS 733:1983. Furthermore, the manufacturing process, process flow, testing, in-process controls, etc. for both hollow and non-hollow extruded sections are similar. Therefore, it is felt that there is no need to have separate standards for hollow and non-hollow extruded sections. In view of the above, this standard has been prepared by including the requirements for hollow and non-hollow extruded sections. Hence, IS 1285 shall stand withdrawn subsequently. IS 733:2025 is intended to cover all types of extruded profiles of wrought aluminium and aluminium alloys. The mechanical properties of rods, bars, hollow tubes and profiles have been incorporated wherever available.

Aluminium extrusion is a very versatile process, through which, a wide variety of shapes and sizes can be manufactured through suitable die designs. Hence this standard does not want to impose any restrictions on the dimensions and shapes that can be manufactured. Any dimension and shape can be manufactured, as agreed between the manufacturer and the purchaser. Where the tolerances are not covered in the standard, it can be agreed between the manufacturer and purchaser. This will give the manufacturer and purchaser the freedom to innovate and produce new shapes and designs, while still complying with the chemical and mechanical properties specified in this standard.

For the purpose of whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft Indian Standard

SPECIFICATION FOR WROUGHT ALUMINIUM AND ALUMINIUM ALLOY BARS, RODS, SECTIONS, EXTRUDED TUBES, HOLLOW SECTIONS AND PROFILES

(FOR GENERAL ENGINEERING PURPOSES)

(Fourth Revision)

1 SCOPE

This standard covers requirements for wrought aluminium and aluminium alloy bars, rods and sections (regular solid sections and irregular solid sections), extruded structural and seamless tubes (round and other than round), hollow sections and profiles for general engineering purposes.

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards:

IS No.	*Title*
IS 504 (Part 1 to 12) : 2002	Chemical analysis of aluminium and its alloys: Parts 1 to 12 (*second revision*)
IS 1608 (Part 1) : 2022/ ISO 6892-1 : 2019	Metallic material ─ Tensile testing: Part 1 Method of test at room temperature (*fifth revision*)
IS 2673 : 2002	Dimensions for wrought aluminium and aluminium alloys extruded round tube ─ Specification (*second revision*)
IS 3965 : 1981	Dimensions for wrought aluminium and aluminium alloys, bar, rod and section (*first revision*)
IS 5047 (Part 1) : 1986	Glossary of terms relating to aluminium and aluminium alloys: Part 1 Unwrought and wrought metals (*second revision*)
IS 5047 (Part 2) : 1979	Glossary of terms relating to aluminium and aluminium alloys: Part 2 Plant and operations, thermal treatment, control and testing, finishing
IS 5047 (Part 3) : 1979	Glossary of terms relating to aluminium and aluminium alloys: Part 3 Geometrical properties and tolerance, structural and surface defects

IS 5052 : 2025	Aluminium and its alloys ─ Temper designations (*second revision*)
IS 6477 : 1983	Dimensions for wrought aluminium and aluminium alloys extruded hollow sections (*first revision*)
IS 10259 : 1982	General Conditions for delivery and inspection of aluminium and aluminium alloy products

3 TERMINOLOGY

3.1 For the purpose of this standard, the definitions given in IS 5047 (Part 1), IS 5047 (Part 2) and IS 5047 (Part 3) shall apply. Some of the important definitions are reproduced below for ready reference.

3.1.1 *Bars* — Any solid section other than round (for example square, rectangular, or polygonal), that is long in relation to cross section and whose width or greatest distance between parallel faces is greater than 6 mm.

3.1.2 *Rod* — A round solid section which is long in relation to cross section having a diameter greater than 6 mm.

3.1.3 *Regular Solid Section* — A solid rolled, drawn or extruded section other than round, square, polygonal or rectangular, which can be conveniently divided into approximate rectangles with measurable dimensions, for example, angles, channels, tees, etc.

3.1.4 *Irregular Solid Section* — A solid rolled, drawn or extruded section, the profile of which cannot be divided readily into approximate rectangles or measurable dimensions.

3.1.5 *Hollow Section* — An extruded shape other than tube, the cross section of which completely encloses a void or voids.

3.1.6 *Extruded Round Tube* — A hollow extrusion of uniform wall thickness and circular cross section not subjected to cold drawing.

3.1.7 *Extruded tube (other than round)* — A hollow wrought product that is long in relation to its cross section, which is having a cross section in the form of ellipse, squares, rectangles, equilateral triangles or regular polygons, with sharp or rounded corners and that has uniform wall thickness except as affected by corner radii.

3.1.8 *Extruded structural tube* — An extruded round tube brought to final dimensions by extruding through a bridge type die, port hole die or by similar method at the option of the producer.

3.1.9 *Extruded seamless tube* — An extruded round tube brought to final dimensions by extrusion of hollow billet or by an extrusion process to be free of longitudinal seam welds.

3.1.10 *Profile* – For the purpose of referring the mechanical properties listed in Table 9 of this standard, any extruded shape or size which is not covered under the definitions of **3.1.1**, **3.1.2, 3.16, 3.1.7, 3.1.8** and **3.1.9** as given above, is considered as a profile.

3.1.8 *Heat- Treatment Batch* — A quantity of material of one alloy, of the same dimensions and produced in the same way, solution-treated and subsequently precipitation-treated in one furnace load. More than one heat treatment batch may comprise a furnace load.

3.1.9 *Heat (Cast)*

a) The product of one furnace melt, or of one crucible melt;

b) The product of a number of either crucible melts or furnace melts mixed prior to casting; and

c) The amount of metal tapped from the furnace without any further addition of metal having been made when a continuous melting process is used.

3.1.10 *Lot (Batch)* — A quantity of material of the same specification and size produced and/or processed at the same time.

4 SUPPLY OF MATERIAL

General requirements for the supply of aluminium and aluminium alloy products shall conform to IS 10259.

5 FREEDOM FROM DEFECTS

5.1. The material shall be sound and generally free from harmful defects.

5.2. Slight discoloration due to heat treatment, minor polishing marks and spiral marks due to roll straightening shall not be a cause for rejection.

5.3. For aluminium copper and aluminium-zinc-magnesium-copper alloys, which are susceptible to peripheral grains coarsening, the permissible limit of 'coarse grain' envelope may be as agreed to between the manufacturer and the purchaser.

6 CHEMICAL COMPOSITION

6.1 The chemical composition of the products shall comply with the requirements specified in Tables 1 to 8.

6.2 The chemical analysis of the material shall be carried out either in accordance with IS 504 (Part 1 to 12) or by or any other established instrumental/chemical method. In case of any dispute, the method specified in IS 504 (Part 1 to 12) shall be used as the referee method.

7 MECHANICAL PROPERTIES

7.1 Tensile test shall be carried out as per method specified in IS 1608 (Part 1). The mechanical properties of the products shall comply with the requirements specified in Table 9. The mechanical properties of grades mentioned in Tables 1 to 8 but not mentioned in Table 9 may be as per the agreement between the purchaser and the manufacturer. The mechanical properties of tempers not mentioned in Table 9 may be as per the agreement between the purchaser and the manufacturer.

NOTE — For the 'as fabricated (F)' condition, the mechanical properties mentioned in Table 9 are typical values and are intended for guidance purposes only.

8 SUPPLY CONDITION

8.1 The material shall be supplied in the condition as specified by the purchaser. While specifying the condition, the temper designations as laid down in IS 5052 shall be followed.

8.2 Material shall be supplied in as manufactured condition (mill finished) or any suitable surface treatment (such as anodized, powder coating, etc.) as agreed between the purchaser and the manufacturer.

9 DIMENSIONS AND TOLERANCES

9.1 Unless and otherwise specified by the purchaser, the dimensions and dimensional tolerances of extruded bars, rods, and solid sections shall conform to IS 3965. For shapes and dimensions not covered in IS 3965, the dimensions and dimensional tolerances shall be as per the agreement between the purchaser and the manufacturer.

9.2 Unless and otherwise specified by the purchaser, the dimensions and dimensional tolerances of extruded round tubes shall conform to IS 2673. For shapes and dimensions not covered in IS 2673, the dimensions and dimensional tolerances shall be as per the agreement between the purchaser and the manufacturer.

9.3 Unless and otherwise specified by the purchaser, the dimensions and dimensional tolerances of extruded hollow sections and extruded tubes (other than round) shall conform to IS 6477. For shapes and dimensions not covered in IS 6477, the dimensions and dimensional tolerances shall be as per the agreement between the purchaser and the manufacturer.

9.4 The dimensions and dimensional tolerances of irregular solid sections and profiles shall be as per the agreement between the purchaser and the manufacturer.

10 SELECTION OF TEST SAMPLES

10.1 Chemical Testing — Minimum one sample shall be selected for every ‘heat’ of the products. Sample can be selected from any section extruded from that heat.

10.2 Mechanical Testing — Minimum one sample shall be selected for every 2 000 kg and thereof for the products of the same dimensions, condition produced in the same way.

10.2.1 The test samples, after heat treatment, shall not be mechanically worked (except by straightening and machining to the shape of the test piece) before they are tested.

11 RETESTS

11.1 Should any one of the test pieces first selected fail to pass the mechanical test two further samples from the same 'lot' shall be selected for testing, and the lot shall be considered passing only if both the samples pass.

11.2 If the lot fails in mechanical testing, the manufacturer may carry out re heat treatment of the lot and again retest. Two samples from this lot needs to test again, lot shall be considered passing only if both the samples pass or else lot shall be rejected.

11.2.1 For heat-treatable alloys the supplier shall have the right, if he so desires, to reheat-treat the material before the two further samples are selected.

11.2.2 Should the test pieces from both these additional samples pass, the lot represented by the test samples shall be deemed to comply with the requirements of mechanical properties. Should a test piece from either of these additional samples fail, the lot represented by the test samples shall be deemed not to comply with this standard.

12 MARKING

12.1 The material shall be suitably marked for identification. with the name of the manufacturer, alloy designation , condition of the material , size (drawing number or profile identification number or section number), surface condition (mill finish or any other surface coating to be mentioned). If required by the purchaser, the supplier shall furnish a certificate that the material supplied complies with the requirements of this specification.

12.2 BIS Certification Marking

The products(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provision of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product may be marked with the Standard Mark.

Table 1 Aluminium Alloys —1000 Series — Al

(Composition limits are in percent maximum unless shown otherwise)

(*Clauses* 6.1)

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium
														Each	Total [b]	min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
i)	1050	0.25	0.40	0.05	0.05	0.05	-	-	0.05	0.03	-	-	V: 0.05 max	0.03	-	99.50 [c]
ii)	1050A	0.25	0.40	0.05	0.05	0.05	-	-	0.07	0.05	-	-	-	0.03	-	99.50 [c]
iii)	1050B	0.30	0.40	0.05	0.05	-	-	-	-	-	-	-	-	-		99.50 [c]
iv)	1060	0.25	0.35	0.05	0.03	0.03	-	-	0.05	0.03	-	0.05	-	0.03	-	99.60 [c]
v)	1060A	0.25	0.35	0.05	0.03	-	-	-	-	-	-	-	-	-	-	99.60 [c]
vi)	1070	0.20	0.25	0.04	0.03	0.03	-	-	0.04	0.03	-	-	V: 0.05 max	0.03	-	99.70 [c]
vii)	1070A	0.20	0.25	0.03	0.03	0.03	-	-	0.07	0.03	-	-	-	0.03	-	99.70 [c]
viii)	1080A	0.15	0.15	0.03	0.02	0.02	-	-	0.06	0.02	0.03	-		0.02	-	99.80 [c]
ix)	1085	0.10	0.12	0.03	0.02	0.02	-	-	0.03	0.02	0.03	0.05	-	0.01	-	99.85 [c]
x)	1090	0.07	0.07	0.02	0.01	0.01	-	-	0.03	0.01	0.03	0.05	-	0.01	-	99.90 [c]
xi)	1098	0.01	0.006	0.003	-	-	-	-	0.015	0.003	-	-	-	0.003	-	99.98 [d]
xii)	1100	0.95 Si + Fe		0.05 to 0.20	0.05	-	-	-	0.10	-	-	-		0.05	0.15	99.00 [c]
xiii)	1110	0.30	0.80	0.04	0.01	0.25	-	-	–	–	–	–	B: 0.02 max; V + Ti:0.03 max	0.03	0.15	99.10 [c]
xiv)	1198	0.01	0.006	0.006	0.006	-	-	-	0.01	0.006	0.006	-	-	0.003	-	99.98 [d]
xv)	1199	0.006	0.006	0.006	0.002	0.006	-	-	0.006	0.002	0.005	0.005	-	0.002	-	99.99 [d]
xvi)	1200	1.00 Si + Fe		0.05	0.05	-	-	-	0.10	0.05	-	-	-	0.05	0.15	99.00 [c]

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium
														Each	Total [b]	min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xvii)	1200A	1.00 Si + Fe		0.10	0.30	0.30	0.10	-	-	0.10	-	-	-	0.05	0.15	99.00 [c]
xviii)	1200B	0.50	0.60	0.10	0.10	-	-	-	-	-	-	-	-	-	-	99.00 [c]
xix)	1235	0.65 Si + Fe		0.05	0.05	0.05	-	-	-	0.10	0.06	-	0.05	0.03	-	99.35 [c]
xx)	1350	0.10	0.40	0.05	0.01	-	0.01	-	0.05	-	0.03	-	B:0.05 max; V + Ti:0.02 max	0.03	0.10	99.50 [c]
xxi)	1350A	0.25	0.40	0.02	-	0.05	-	-	0.05	-	-	-	Cr + Mn + Ti + V:0.03 max	0.03	-	99.50 [c]
xxii)	1370	0.10	0.25	0.02	0.01	0.02	0.01	-	0.04	-	0.03	-	B:0.02 max; V + Ti:0.02 max	0.02	0.10	99.70 [c]
xxiii)	1450	0.25	0.40	0.05	0.05	0.05	-	-	0.07	0.10 to 0.20	-	-	-	0.03	-	99.50 [c]

NOTES

1. a 'Others' includes the listed elements for which no specific limits are mentioned and also unlisted metallic elements. Identification of unlisted elements shall be as per the mutual agreement between the manufacturer and the purchaser. 'Others' does not include modifying or refining elements such as Na, Sr, Sb and P

2. b The sum of those 'Others' metallic elements 0.010 percent or more each, expressed to the second decimal place before determining the sum.

3. c The aluminium content for unalloyed aluminium not made by a refining process is the difference between 100.00 percent and the sum of all other metallic elements present in amounts of 0.010 percent or more each, expressed to the second decimal place before determining the sum.

4. d Very High purity Aluminium (99.98, 99.99 percent aluminium): The aluminium content for unalloyed aluminium made by a refining process is the difference between 100.00 percent and the sum of all other metallic elements present in amounts of 0.0010 percent or more each, expressed to the third decimal before determining the sum, which is rounded to the second decimal place before subtracting.

Table 2 Aluminium Alloys — 2 000 Series — Al Cu

(Composition limits are in percent maximum unless shown otherwise)

(*Clauses* 6.1)

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium min.
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
i)	2001	0.20	0.20	5.20 to 6.00	0.15 to 0.50	0.20 to 0.45	0.10	0.05	0.10	0.20	-	-	Zr :0.05 max; Pb: 0.003 max	0.05	0.15	Remainder
ii)	2007	0.80	0.80	3.30 to 4.60	0.50 to 1.00	0.40 to 1.80	0.10	0.20	0.80	0.20	-	-	Bi: 0.20 max; Pb :0.80 to 1.50 ; Sn :0.20 max	0.10	0.30	Remainder
iii)	2011	0.40	0.70	5.00 to 6.00	-	-	-	-	0.30	-	-	-	Bi :0.20 to 0.60 ; Pb: 0.20 to 0.60	0.05	0.15	Remainder
iv)	2011A	0.40	0.50	4.50 to 6.00	-	-	-	-	0.30	-	-	-	Bi :0.20 to 0.60 ; Pb: 0.20 to 0.60	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium min.
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
v)	2014	0.50 to 1.20	0.70	3.90 to 5.00	0.40 to 1.20	0.20 to 0.80	0.10	-	0.25	0.15	-	-	[c]	0.05	0.15	Remainder
vi)	2014A	0.50 to 0.90	0.50	3.90 to 5.00	0.40 to 1.20	0.20 to 0.80	0.10	0.10	0.25	0.15	-	-	Zr+Ti:0.20 max	0.05	0.15	Remainder
vii)	2014B	0.50 to 1.20	0.70	3.80 to 5.00	0.30 to 1.20	0.2 to 0.80	0.30	-	0.20	0.30	-	-	-	-	-	Remainder
viii)	2017	0.20 to 0.80	0.70	3.50 to 4.50	0.40 to 1.00	0.40 to 0.80	-	-	0.25	0.15	-	-	[c]	0.05	0.15	Remainder
ix)	2017A	0.20 to 0.80	0.70	3.50 to 4.50	0.40 to 1.00	0.40 to 1.00	-	-	0.25	-	-	-	Zr+Ti:0.25 max	0.05	0.15	Remainder
x)	2024	0.50	0.50	3.80 to 4.90	0.30 to 0.90	1.20 to 1.80	-	-	0.25	0.15	-	-	-	0.05	0.15	Remainder
xi)	2024B	0.20 to 0.70	0.70	3.50 to 4.70	0.40 to 1.20	0.40 to 1.20	-	-	0.20	0.30	-	-	-	-	-	Remainder
xii)	2030	0.80	0.70	3.30 to 4.50	0.20 to 1.00	0.50 to 1.30	0.10	-	0.50	0.20	-	-	Bi :0.20 max; Pb: 0.80 to 1.50	0.10	0.30	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium min.
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xiii)	2031	0.50 to 1.30	0.60 to 1.20	1.80 to 2.80	0.50	0.60 to 1.20	-	0.60 to 1.40	0.20	0.20	-	-	-	0.05	0.15	Remainder
xiv)	2033	0.10 to 1.20	0.70	2.20 to 2.70	0.40 to 1.00	0.20 to 0.60	0.15	0.15	0.50	0.10	-	-	-	0.05	0.15	Remainder
xv)	2091	0.20	0.30	1.80 to 2.50	0.10	1.10 to 1.90	0.10	-	0.25	0.10	-	-	Zr: 0.04 to 0.16; Li: 1.70 to 2.30	0.05	0.15	Remainder
xvi)	2117	0.80	0.70	2.20 to 3.00	0.20	0.20 to 0.50	0.10	-	0.25	-	-	-	-	0.05	0.15	Remainder
xvii)	2124	0.20	0.30	3.80 to 4.90	0.30 to 0.90	1.20 to 1.80	0.10	-	0.25	0.15	-	-	[c]	0.05	0.15	Remainder
xviii	2214	0.50 to 1.20	0.30	3.90 to 5.00	0.40 to 1.20	0.20 to 0.80	0.10	-	0.25	0.15	-	-	[c]	0.05	0.15	Remainder
xix)	2219	0.20	0.30	5.80 to 6.80	0.20 to 0.40	0.020	-	-	0.10	0.02 to 0.10	-	0.05 to 0.15	Zr:0.10 to 0.25	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium min.
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xx)	2319	0.20	0.30	5.80 to 6.80	0.20 to 0.40	0.020	-	-	0.10	0.10 to 0.20	-	0.05 to 0.15	Zr :0.10 to 0.25	0.05	0.15	Remainder
xxi)	2618	0.10-0.25	0.90 to 1.30	1.90 to 2.70	-	1.30 to 1.80	0.90 to 1.20	-	0.10	0.04 to 0.10	-	-	-	0.05	0.15	Remainder
xxii)	2618A	0.15-0.25	0.90 to 1.40	1.80 to 2.70	0.25	1.20 to 1.80	0.80 to 1.40	-	0.15	0.20	-	-	Zr+Ti: 0.25 max	0.05	0.15	Remainder

NOTES

1. a Others' includes the listed elements for which no specific limits are mentioned and also unlisted metallic elements. Identification of unlisted elements shall be as per the mutual agreement between the manufacturer and the purchaser. Others' does not include modifying or refining elements such as Na, Sr, Sb and P.
2. b The sum of those "Others" metallic elements 0.010 percent or more each, expressed to the second decimal place before determining the sum.
3. c Zr + Ti limit of 0.20 maximum may be used if mutually agreed by supplier or manufacturer and purchaser.
4. The Aluminium content is the difference between 100.00 percent and the sum of all other metallic elements present in amounts of 0.010 percent or more each, expressed to the second decimal place before determining the sum.

Table 3 Aluminium Alloys — 3 000 Series — Al Mn

(Composition limits are in percent maximum unless shown otherwise)

(Clauses 6.1*)*

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium
														Each	Total [b]	min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
i)	3002	0.08	0.10	0.15	0.05 to 0.25	0.05 to 0.20	-	-	0.05	0.03	-	0.05	-	0.03	0.10	Remainder
ii)	3003	0.60	0.70	0.05 to 0.20	1.00 to 1.50	-	-	-	0.10	-	-	-	-	0.05	0.15	Remainder
iii)	3003A	0.60	0.70	0.10	0.80 to 1.50	0.10	-	-	0.20	0.20	-	-	-	0.05	0.15	Remainder
iv)	3004	0.30	0.70	0.25	1.00 to 1.50	0.80 to 1.30	-	-	0.25	-	-	-	-	0.05	0.15	Remainder
v)	3005	0.60	0.70	0.30	1.00 to 1.50	0.20 to 0.60	0.10	-	0.25	0.10	-	-	-	0.05	0.15	Remainder
vi)	3005A	0.70	0.80	0.30	1.00 to 1.50	0.20 to 0.60	0.10	-	0.40	0.10	-	-	-	0.05	0.15	Remainder
vii)	3017	0.25	0.25 to 0.45	0.25 to 0.40	0.8 to 1.2	0.10	0.15	-	0.10	0.05	-	-	-	0.05	0.15	Remainder
viii)	3102	0.40	0.70	0.10	0.05 to 0.40	-	-	-	0.30	0.10	-	-	-	0.05	0.15	Remainder
ix)	3103	0.50	0.70	0.10	0.90 to 1.50	0.30	0.10	-	0.20	-	-	-	Zr+Ti : 0.10 max	0.05	0.15	Remainder
x)	3103A	0.50	0.70	0.10	0.70 to 1.40	0.30	0.10	-	0.20	0.10	-	-	Zr+Ti: 0.10 max	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium
														Each	Total [b]	min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xi)	3103C	0.40 to 0.60	0.30	0.40 to 0.55	1.00 to 1.50	0.05	0.05	-	0.10	0.05	-	-	-	0.05	0.15	Remainder
xii)	3104	0.60	0.80	0.05 to 0.25	0.80 to 1.40	0.80 to 1.30	-	-	0.25	0.10	0.05	0.05	-	0.05	0.15	Remainder
xiii)	3105	0.60	0.70	0.30	0.30 to 0.80	0.20 to 0.80	0.20	-	0.40	0.10	-	-	-	0.05	0.15	Remainder
xiv)	3105A	0.60	0.70	0.30	0.30 to 0.80	0.20 to 0.80	0.20	-	0.25	0.10	-	-	-	0.05	0.15	Remainder
xv)	3105B	0.70	0.90	0.30	0.30 to 0.90	0.20 to 0.80	0.20	-	0.50	0.10	-	-	Pb: 0.10 max	0.05	0.15	Remainder
xvi)	3207	0.30	0.45	0.10	0.40 to 0.8	0.10	-	-	0.10	-	-	-	-	0.05	0.10	Remainder
xvii)	3207A	0.35	0.60	0.25	0.30 to 0.8	0.40	0.20	-	0.25	-	-	-	-	0.05	0.15	Remainder

NOTES

1. a 'Others' includes the listed elements for which no specific limits are mentioned and also unlisted metallic elements. Identification of unlisted elements shall be as per the mutual agreement between the manufacturer and the purchaser. 'Others' does not include modifying or refining elements such as Na, Sr, Sb and P.
2. b The sum of those 'Others' metallic elements 0.010 percent or more each, expressed to the second decimal place before determining the sum.
3. The Aluminium content is the difference between 100.00 percent and the sum of all other metallic elements present in amounts of 0.010 percent or more each, expressed to the second decimal place before determining the sum.

Table 4 Aluminium Alloys — 4 000 Series — Al Si

Composition limits are in percent maximum unless shown otherwise)

(Clauses 6.1*)*

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium min.
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
i)	4004	9.00 to 10.5	0.80	0.25	0.10	1.00 to 2.00	-	-	0.20	-	-	-	-	0.05	0.15	Remainder
ii)	4006	0.80 to 1.20	0.50 to 0.80	0.10	0.05	0.01	0.20	-	0.05	-	-	-	-	0.05	0.15	Remainder
iii)	4007	1.00 to 1.70	0.40 to 1.00	0.20	0.80 to 1.50	0.20	0.05 to 0.25	0.15 to 0.70	0.10	0.10	-	-	Co: 0.05 max	0.05	0.15	Remainder
iv)	4015	1.40 to 2.20	0.70	0.20	0.60 to 1.20	0.10 to 0.50	-	-	0.20	-	-	-	-	0.05	0.15	Remainder
v)	4016	1.40 to 2.20	0.70	0.20	0.60 to 1.20	0.10	-	-	0.50 to 1.30	-	-	-	-	0.05	0.15	Remainder
vi)	4017	0.60 to 1.60	0.70	0.10 to 0.50	0.60 to 1.20	0.10 to 0.50	-	-	0.20	-	-	-	-	0.05	0.15	Remainder
vii)	4018	6.50 to 7.50	0.20	0.05	0.10	0.50 to 0.80	-	-	0.10	0.20	-	-	-	0.05	0.15	Remainder
viii)	4032	11.0 to 13.5	1.00	0.50 to 1.30	-	0.80 to 1.30	0.10	0.50 to 1.30	0.25	-	-	-	-	0.05	0.15	Remainder
ix)	4043A	4.50 to 6.00	0.60	0.30	0.15	0.20	-	-	0.10	0.15	-	-	-	0.05	0.15	Remainder
x)	4043B	4.50 to 6.00	0.60	0.10	0.50	0.20	-	-	0.20	-	-	-	-	-	-	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium min.
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xi)	4045	9.00 to 11.0	0.80	0.30	0.05	0.05	-	-	0.10	0.20	-	-	-	0.05	0.15	Remainder
xii)	4046	9.00 to 11.0	0.50	0.03	0.40	0.20 to 0.50	-	-	0.10	0.15	-	-	-	0.05	0.15	Remainder
xiii)	4047A	11.0 to 13.0	0.60	0.30	0.15	0.10	-	-	0.20	0.15	-	-	-	0.05	0.15	Remainder
xiv)	4047B	10.0 to 13.0	0.60	0.10	0.50	0.20	-	-	0.20	-	-	-	-	-	-	Remainder
xv)	4104	9.00 to 10.5	0.80	0.25	0.10	1.00 to 2.00	-	-	0.20	-	-	-	Bi: 0.02 to 0.20	0.05	0.15	Remainder
xvi)	4115	1.80 to 2.20	0.70	0.10-0.50	0.60 to 1.20	0.10 to 0.50	-	-	0.20	-	-	-	-	0.05	0.15	Remainder
xvii)	4343	6.80 to 8.20	0.80	0.25	0.10	-	-	-	0.20	-	-	-	-	0.05	0.15	Remainder

NOTES

1. a 'Others' includes the listed elements for which no specific limits are mentioned and also unlisted metallic elements. Identification of unlisted elements shall be as per the mutual agreement between the manufacturer and the purchaser. 'Others' does not include modifying or refining elements such as Na, Sr, Sb and P.
2. b The sum of those 'Others' metallic elements 0.010 percent or more each, expressed to the second decimal place before determining the sum.
3. The Aluminium content is the difference between 100.00 percent and the sum of all other metallic elements present in amounts of 0.010 percent or more each, expressed to the second decimal place before determining the sum.

Table 5 Aluminium Alloys — 5 000 Series — Al Mg

(Composition limits are in percent maximum unless shown otherwise)

(Clauses 6.1*)*

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
i)	5005	0.30	0.70	0.20	0.20	0.50 to 1.10	0.10	-	0.25	-	-	-	-	0.05	0.15	Remainder
ii)	5005A	0.30	0.45	0.05	0.15	0.70 to 1.10	0.10	-	0.20	-	-	-	-	0.05	0.15	Remainder
iii)	5006	0.40	0.80	0.10	0.40 to 0.80	0.80 to 1.30	0.10	-	0.25	0.10	-	-	-	0.05	0.15	Remainder
iv)	5010	0.40	0.70	0.25	0.10 to 0.30	0.20 to 0.60	0.15	-	0.30	0.10	-	-	-	0.05	0.15	Remainder
v)	5018	0.25	0.40	0.05	0.20 to 0.60	2.60 to 3.60	0.30	-	0.20	0.15	-	-	Mn+Cr[c]: 0.20 to 0.60	0.05	0.15	Remainder
vi)	5019	0.40	0.50	0.10	0.10 to 0.60	4.50 to 5.60	0.20	-	0.20	0.20	-	-	Mn+Cr: 0.10 to 0.60	0.05	0.15	Remainder
vii)	5026	0.55 to 1.40	0.20to 1.00	0.10 to 0.80	0.60 to 1.80	3.90 to 4.90	0.30	-	1.00	0.20	-	-	Zr: 0.30 max	0.05	0.15	Remainder
viii)	5040	0.30	0.70	0.25	0.90	1.00	0.10	-	0.25	-	-	-	-	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
					to 1.40	to 1.50	to 0.30									
ix)	5042	0.20	0.35	0.15	0.20 to 0.50	3.00 to 4.00	0.10	-	0.25	0.10	-	-	-	0.05	0.15	Remainder
x)	5049	0.40	0.50	0.10	0.50 to 1.10	1.60 to 2.50	0.30	-	0.20	0.10	-	-	-	0.05	0.15	Remainder
xi)	5050	0.40	0.70	0.20	0.10	1.10 to 1.80	0.10	-	0.25	-	-	-	-	0.05	0.15	Remainder
xii)	5050A	0.40	0.70	0.20	0.30	1.10 to 1.80	0.10	-	0.25	-	-	-	-	0.05	0.15	Remainder
xiii)	5051A	0.30	0.45	0.05	0.25	1.40 to 2.10	0.30	-	0.20	0.10	-	-	-	0.05	0.15	Remainder
xiv)	5052	0.25	0.40	0.10	0.10	2.20 to 2.80	0.15 to 0.35	-	0.10	-	-	-	-	0.05	0.15	Remainder
xv)	5052A	0.60	0.50	0.10	0.50	1.20 to 2.60	0.25	-	0.20	0.20	-		Cr+Mn: 0.50	-	-	Remainder
xvi)	5056	0.30	0.40	0.10	0.05 to 0.20	4.50 to 5.60	0.05 to 0.20	-	0.10	-	-	-	-	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xvii)	5058	0.40	0.50	0.10	0.20	4.50 to 5.60	0.10	-	0.20	0.20	-	-	Pb :1.20 to 1.80	0.05	0.15	Remainder
xviii)	5059	0.45	0.50	0.25	0.60 to 1.20	5.00 to 6.00	0.25	-	0.40 to 0.90	0.20	-	-	Zr :0.05 to 0.25	0.05	0.15	Remainder
xix)	5070	0.25	0.40	0.25	0.40 to 0.80	3.50 to 4.50	0.30	-	0.40 to 0.80	0.15	-	-	-	0.05	0.15	Remainder
xx)	5082	0.20	0.35	0.15	0.15	4.00 to 5.00	0.15	-	0.25	0.10	-	-	- -	0.05	0.15	Remainder
xxi)	5083	0.40	0.40	0.10	0.40 to 1.00	4.00 to 4.90	0.05 to 0.25	-	0.25	0.15	-	-	-	0.05	0.15	Remainder
xxii)	5083A	0.40	0.70	0.10	0.50 to 1.00	4.00 to 4.90	0.25	-	0.20	0.20	-	-	Zr [c] :0.10 to 0.20	-	-	Remainder
xxiii)	5087	0.25	0.40	0.05	0.70 to 1.10	4.50 to 5.20	0.05 to 0.25	-	0.25	0.15	-	-	Mn+Cr [c] :0.20-0.60	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xxiv)	5088	0.20	0.10 to 0.35	0.25	0.20 to 0.50	4.70 to 5.50	0.15	-	0.20 to 0.40	-	-	-	Mn+Cr: 0.20 to 0.60 -	0.05	0.15	Remainder
xxv)	5110	0.08	0.08	-	0.03	0.30 to 0.60	-	-	0.05	0.02	-	-	Mn+Cr :0.10 to 0.50	0.02	-	Remainder
xxvi)	5119	0.25	0.40	0.05	0.20 to 0.60	4.5 to 5.60	0.30	-	0.20	0.15	-	-	-	0.05	0.15	Remainder
xxvii)	5119A	0.25	0.40	0.05	0.20 to 0.60	4.50 to 5.60	0.30	-	0.20	0.15	-	-	-	0.05	0.15	Remainder
xxviii)	5149	0.25	0.40	0.05	0.50 to 1.10	1.60 to 2.50	0.30	-	0.20	0.15	-	-	-	0.05	0.15	Remainder
xxix)	5154A	0.50	0.50	0.10	0.50	3.10 to 3.90	0.25	-	0.20	0.20	-	-	-	0.05	0.15	Remainder
xxx)	5154B	0.35	0.45	0.05	0.15-0.45	3.20 to 3.80	0.10	0.01	0.15	0.15	-	-	-	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xxxi)	5182	0.20	0.35	0.15	0.20 to 0.50	4.00 to 5.00	0.10	-	0.25	0.10	-	-	-	0.05	0.15	Remainder
xxxii)	5183	0.40	0.40	0.10	0.50 to 1.00	4.30 to 5.20	0.05 to 0.25	-	0.25	0.15	-	-	c	0.05	0.15	Remainder
xxxiii)	5183A	0.40	0.40	0.10	0.50 to 1.00	4.30 to 5.20	0.05 to 0.25	-	0.25	0.15	-	-	d	0.05	0.15	Remainder
xxxiv)	5186	0.40	0.45	0.25	0.20 to 0.50	3.80 to 4.80	0.15	-	0.40	0.15	-	-	Zr :0.05 max	0.05	0.15	Remainder
xxxv)	5187	0.25	0.40	0.05	0.70 to 1.10	4.50 to 5.20	0.05 to 0.25	-	0.25	0.15	-	-	Zr [d]: 0.10 to 0.20	0.05	0.15	Remainder
xxxvi)	5210	0.06	0.04	-	0.03	0.35 to 0.60	-	-	0.04	0.01	-	-	-	0.01	-	Remainder
xxxvii)	5249	0.25	0.40	0.05	0.50 to 1.10	1.60 to 2.50	0.30	-	0.20	0.15	-	-	Zr [c]: 0.10 to 0.20	0.05	0.15	Remainder
xxxviii)	5251	0.40	0.50	0.15	0.10 to 0.50	1.70 to 2.40	0.15	-	0.15	0.15	-	-	-	0.05	0.15	Remainder
xxxix)	5252	0.08	0.10	0.10	0.10	2.20 to 2.80	-	-	0.05	-	-	0.05	-	0.03	0.10	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xl)	5283A	0.30	0.30	0.03	0.50 to 1.00	4.50 to 5.10	0.05	0.03	0.10	0.03	-	-	Zr :0.05 max; Pb: 0.003	0.05	0.15	Remainder
xli)	5305	0.08	0.08	-	0.03	0.70 to 1.10		-	0.05	0.02	-	-	-	0.02	-	Remainder
xlii)	5310	0.01	0.008	-	-	0.35 to 0.6	-	-	0.01	0.008	-	-	Fe+Ti :0.008	0.003	-	Remainder
xliii)	5352	-	-	0.10	0.10	2.20 to 2.80	0.10	-	0.10	0.10	-	-	Si+Fe: 0.45	-	-	Remainder
xliv)	5354	0.25	0.40	0.05	0.50 to 1.00	2.40 to 3.00	0.05 to 0.20	-	0.25	0.15	-	-	Zr :0.10 to 0.20	0.05	0.15	Remainder
xlv)	5356	0.25	0.40	0.10	0.05 to 0.20	4.50 to 5.50	0.05 to 0.20	-	0.10	0.06 to 0.20	-	-	c	0.05	0.15	Remainder
xlvi)	5356A	0.25	0.40	0.10	0.05 to 0.20	4.5 to 5.5	0.05 to 0.20	-	0.10	0.06 to 0.20	-	-	d	0.05	0.15	Remainder
xlvii)	5383	0.25	0.25	0.20	0.70 to 1.00	4.00 to 5.20	0.25	-	0.40	0.15	-	-	Zr :0.20 max	0.05	0.15	Remainder
xlviii)	5449	0.40	0.70	0.30	0.60 to 1.10	1.60 to 2.60	0.30	-	0.30	0.10	-	-	-	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xlix)	5449A	0.60	1.20	0.30	0.60 to 1.10	1.60 to 2.60	0.30	0.10	0.30	0.10	-	-	Sn: 0.10 max	0.05	0.15	Remainder
l)	5454	0.25	0.40	0.10	0.50 to 1.00	2.40 to 3.00	0.05-0.20	-	0.25	0.20	-	-	-	0.025	0.15	Remainder
li)	5456	0.25	0.40	0.10	0.50 to 1.00	4.70 to 5.50	0.05 to 0.20	-	0.25	0.20	-	-	-	0.05	0.15	Remainder
lii)	5456A	0.25	0.40	0.05	0.70 to 1.10	4.50 to 5.20	0.05 to 0.25	-	0.25	0.15	-	-	c	0.05	0.15	Remainder
liii)	5456B	0.25	0.40	0.05	0.70 to 1.10	4.50 to 5.20	0.05 to 0.25	-	0.25	0.15	-	-		0.05	0.15	Remainder
liv)	5505	0.06	0.04	-	0.03	0.80 to 1.10		-	0.04	0.01	-	-	-	0.01	-	Remainder
lv)	5554	0.25	0.40	0.10	0.50 to 1.00	2.40 to 3.00	0.05 to 0.20	-	0.25	0.05 to 0.20	-	-	c	0.05	0.15	Remainder
lvi)	5556A	0.25	0.40	0.10	0.60 to 1.00	5.00 to 5.50	0.05 to 0.20	-	0.20	0.05 to 0.20	-	-	c	0.05	0.15	Remainder
lvii)	5556B	0.25	0.40	0.10	0.60 to 1.00	5.00 to 5.50	0.05 to 0.20	-	0.20	0.05 to 0.20	-	-	d	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
lviii)	5605	0.01	0.008	-	-	0.80 to 1.10	-	-	0.01	0.008	-	-	Fe+Ti: 0.008	0.003	-	Remainder
lix)	5654	0.45 Si+Fe		0.05	0.01	3.10 to 3.90	0.15 to 0.35	-	0.20	0.05 to 0.15	-	-	c	0.05	-	-
lx)	5654A	0.45 Si+Fe		0.05	0.01	3.10 to 3.90	0.15 to 0.35	-	0.20	0.05 to 0.15	-	-	d	0.05	-	-
lxi)	5657	0.08	0.10	0.10	0.03	0.60 to 1.00	-	-	0.05	-	0.03	0.05	-	0.02	0.05	Remainder
lxii)	5754	0.40	0.40	0.10	0.50	2.60 to 3.60	0.30	-	0.20	0.15	-	-	Mn+Cr [c] :0.10 to 0.6 0	0.05	0.15	Remainder
lxiii)	5754 A	0.60	0.50	0.10	0.50	2.80 to 4.00	0.25	-	-	0.20	0.20	-	Mn+Cr: 0.50	-	-	Remainder

NOTES

1. a 'Others' includes the listed elements for which no specific limits are mentioned and also unlisted metallic elements. Identification of unlisted elements shall be as per the mutual agreement between the manufacturer and the purchaser. 'Others' does not include modifying or refining elements such as Na, Sr, Sb and P.
2. b The sum of those 'Others' metallic elements 0.010 percent or more each, expressed to the second decimal place before determining the sum.
3. The Aluminium content is the difference between 100.00 percent and the sum of all other metallic elements present in amounts of 0.010 percent or more each, expressed to the second decimal place before determining the sum.
4. c 0.0003 max Be for welding electrode, welding rod and filler wire.
5. d 0.0005 max Be for welding electrode, welding rod and filler wire.

Table 6 Aluminium Alloys — 6 000 Series — Al-Mg-Si

(Composition limits are in percent maximum unless shown otherwise)

(clauses 6.1*)*

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
i)	6003	0.35 to 1.00	0.60	0.10	0.80	0.80 to 1.50	0.35	-	0.20	0.10	-	-	-	0.05	0.15	Remainder
ii)	6005	0.60 to 0.90	0.35	0.10	0.10	0.40 to 0.60	0.10	-	0.10	0.10	-	-	-	0.05	0.15	Remainder
iii)	6005A	0.50 to 0.90	0.35	0.30	0.50	0.40 to 0.70	0.30	-	0.20	0.10	-	-	Mn+Cr :0.12 to 0.50	0.05	0.15	Remainder
iv)	6005B	0.45 to 0.80	0.30	0.10	0.10	0.40 to 0.80	0.10	-	0.10	0.10	-	-	-	0.05	0.15	Remainder
v)	6005C	0.40 to 0.90	0.35	0.35	0.50	0.40 to 0.80	0.30	-	0.25	0.10	-	-	Mn + Cr : 0.50 max.	0.05	0.15	Remainder
vi)	6005D	0.50 to 0.90	0.70	0.10	0.10	0.40 to 0.60	0.10	-	0.10	0.10	-	-	-	0.05	0.15	Remainder
vii)	6008	0.50 to 0.90	0.35	0.30	0.30	0.40 to 0.70	0.30	-	0.20	0.10	-	0.05 to 0.20	-	0.05	0.15	Remainder
viii)	6011	0.60 to 1.20	1. 00	0.40 to 0.90	0.80	0.60 to 1.20	0.30	0.20	1.50	0.20	-	-	-	0.05	0.15	Remainder
ix)	6012	0.60 to 1.40	0.50	0.10	0.40 to 1.00	0.60 to 1.20	0.30	-	0.30	0.20	-	-	Bi :0.70 max; Pb: 0.40 to 2.00	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
x)	6012A	0.60 to 1.40	0.50	0.40	0.20 to 1.00	0.60 to 1.20	0.30	-	0.30	0.20	-	-	Bi :0.70 max; Sn: 0.40 to 2.00	0.05	0.15	Remainder
xi)	6013	0.60 to 1.00	0.50	0.60 to1.10	0.20 to 0.80	0.80 to 1.20	0.10	-	0.25	0.10	-	-	-	0.05	0.15	Rem.
xii)	6014	0.30 to 0.60	0.35	0.25	0.05 to 0.20	0.40 to 0.80	0.20	-	0.10	0.10	-	0.05 to 0.20	-	0.05	0.15	Remainder
xiii)	6015	0.20 to 0.40	0.10 to 0.30	0.10 to 0.25	0.10	0.80 to 1.10	0.10	-	0.10	0.10	-	-	-	0.05	0.15	Remainder
xiv)	6016	1.00 to 1.50	0.50	0.20	0.20	0.25 to 0.60	0.10	-	0.20	0.15	-	-	-	0.05	0.15	Remainder
xv)	6018	0.50 to 1.20	0.70	0.15 to 0.40	0.30 to 0.80	0.60 to 1.20	0.10	-	0.30	0.20	-	-	Bi: 0.40 to 0.7; Pb: 0.40 to 1.2	0.05	0.15	Remainder
xvi)	6023	0.60 to 1.40	0.50	0.20 to 0.50	0.20 to 0.60	0.40 to 0.90	-	-	-	-	-	-	Bi :0.30 to 0.80, Sn 0.60 to 1.20	0.05	0.15	Remainder
xvii)	6025	0.80 to 1.50	0.70	0.20 to 0.70	0.60 to 1.40	2.10 to 3.00	0.20	-	0.50	0.20	-	-	-	0.05	0.15	Remainder
xviii	6026	0.60 to 1.40	0.70	0.20 to 0.50	0.20 to 1.00	0.60 to 1.20	0.30	-	0.30	0.20	-	-	Bi: 0.50 to 1.5 max. Pb 0.40 max.; Sn: 0.05 max.	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xix)	6056	0.70 to 1.30	0.50	0.50 to 1.10	0.40 to 1.00	0.60 to 1.20	0.25	-	0.10 to 0.70	-	-	-	Zr + Ti: 0.20 max.	0.05	0.15	Remainder
xx)	6060	0.30 to 0.60	0.10 to 0.30	0.10	0.10	0.35 to 0.60	0.05	-	0.15	0.10	-	-	-	0.05	0.15	Remainder
xxi)	6061	0.40 to 0.80	0.70	0.15 to 0.40	0.15	0.80 to 1.20	0.04 to 0.35	-	0.25	0.15	-	-	-	0.05	0.15	Remainder
xxii)	6061A	0.40 to 0.80	0.70	0.15 to 0.40	0.15	0.80 to 1.20	0.04 to 0.35	-	0.25	0.15	-	-	Pb: 0.003 max.	0.05	0.15	Remainder
xxiii	6061B	0.40-0.80	0.70	0.15 to 0.40	0.20	0.70 to 1.20	0.15 to 0.35		0.20	0.20	-	-	-	0.05	0.15	Remainder
xxiv	6063	0.20 to 0.60	0.35	0.10	0.10	0.45 to 0.90	0.10	-	0.10	0.10	-	-	-	0.05	0.15	Remainder
xxv)	6063A	0.30 to 0.60	0.15-0.35	0.10	0.15	0.60 to 0.90	0.05	-	0.15	0.10	-	-	-	0.05	0.15	Remainder
xxvi	6063B	0.30 to 0.70	0.60	0.10	0.30	0.40 to 0.90	0.10		0.20	0.20	-	-	-	-	-	Remainder
xxvi	6064	0.40 to 0.80	0.70	0.15 to 0.40	0.15	0.80 to 1.20	0.05 to 0.14	-	0.25	0.15	-	-	-	0.05	0.15	Remainder
xxvi	6064A	0.40 to 0.80	0.70	0.15 to 0.40	0.15	0.80 to 1.20	0.04 to 0.14	-	0.25	0.15	-	-	-	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xxix	6065	0.40 to 0.80	0.70	0.15 to 0.40	0.15	0.80 to 1.20	0.15	-	0.25	0.10	-	-	Bi: 0.50 to 1.5; Pb 0.05 max; Zr: 0.15 max.	0.05	0.15	Remainder
xxx)	6081	0.70 to 1.10	0.50	0.10	0.10 to 0.45	0.60 to 1.00	0.10	-	0.20	0.15	-	-	-	0.05	0.15	Remainder
xxxi	6082	0.70 to 1.30	0.50	0.10	0.40 to 1.00	0.60 to 1.20	0.25	-	0.20	0.10	-	-	-	0.05	0.15	Remainder
xxxi	6082A	0.70 to 1.30	0.50	0.10	0.40 to 1.00	0.60 to 1.20	0.25	-	0.20	0.10	-	-	Pb: 0.003 max.	0.05	0.15	Remainder
xxxi	6082B	0.60 to 1.30	0.60	0.10	0.40 to 1.00	0.40 to 1.20	0.25	-	0.10	0.20	-	-	-	-	-	Remainder
xxxi	6101	0.30 to 0.70	0.50	0.10	0.03	0.35 to 0.80	0.03	-	0.10	-	-	-	B: 0.06 max.	0.03	0.10	Remainder
xxxv	6101A	0.30 to 0.70	0.40	0.05	-	0.40 to 0.90	-	-	-	-	-	-	-	0.03	0.10	Remainder
xxxv	6101B	0.30 to 0.60	0.10 to 0.30	0.05	0.05	0.35 to 0.60	-	-	0.10	-	-	-	-	0.03	0.10	Remainder
xxxv	6106	0.30 to 0.60	0.35	0.25	0.05 to 0.20	0.40 to 0.80	0.20	-	0.10	-	-	-	-	0.05	0.10	Remainder
xxxv	6110A	0.70 to 1.10	0.50	0.30 to 0.80	0.30 to 0.90	0.70 to 1.10	0.05 to 0.25	-	0.20	-	-	-	Ti+Zr: 0.20 max	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xxxi	6181	0.80 to 1.20	0.45	0.10	0.15	0.60 to 1.00	0.10	-	0.20	0.10	-	-	-	0.05	0.15	Remainder
xl)	6182	0.90 to 1.30	0.50	0.10	0.50 to 1.00	0.7 to 1.20	0.25	-	0.20	0.10	-	-	Zr: 0.05 to 0.20	0.05	0.15	Remainder
xli)	6201	0.50 to 0.90	0.50	0.10	0.03	0.60 to 0.90	0.03	-	0.10	-	-	-	B: 0.06 max.	0.03	0.10	Remainder
xlii)	6261	0.40 to 0.70	0.40	0.15 to 0.40	0.20 to 0.35	0.70 to 1.00	0.10	-	0.20	0.10	-	-	-	0.05	0.15	Remainder
xliii	6261A	0.40 to 0.80	0.70	0.15 to 0.40	0.20 to 0.80	0.70 to 1.20	0.15 to 0.35		0.20	0.20	-	-	-	-	-	Remainder
xliv)	6262	0.40 to 0.80	0.70	0.15 to 0.40	0.15	0.80 to 1.20	0.04 to 0.14	-	0.25	0.15	-	-	Bi: 0.40 to 0.70; Pb: 0.40 to 0.70.	0.05	0.15	Remainder
xlv)	6262A	0.40 to 0.80	0.70	0.15 to 0.40	0.15	0.80 to1.20	0.04 to 0.14	-	0.25	0.10	-	-	Bi :0.40 to 0.90 Sn: 0.40 to 1.00	0.05	0.15	Remainder
xlvi)	6351	0.70 to 1.30	0.50	0.10	0.40 to 0.80	0.40 to 0.80	-	-	0.20	0.20	-	-	-	0.05	0.15	Remainder
xlvii	6351A	0.70 to 1.30	0. 05	0.10	0.40 to 0.80	0.40 to 0.80	-	-	0.20	0.20	-	-	Pb: 0.003 max.	0.05	0.15	Remainder
xlvii	6360	0.35 to 0.80	0.10 to 0.30	0.15	0.02 to 0.15	0.25 to 0.45	0.05	-	0.10	0.10	-	-	-	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xlix)	6401	0.35 to 0.70	0.04	0.05 to 0.20	0.03	0.35 to 0.70	-	-	0.04	0.01	-	-	-	0.01	-	Remainder
l)	6463	0.20 to 0.6	0.15	0.20	0.05	0.45 to 0.90	-	-	0.05	-	-	-	-	0.05	0.15	Remainder
li)	6951	0.20 to 0.50	0.80	0.15 to 0.40	0.10	0.40 to 0.80	-	-	0.20	-	-	-	-	0.05	0.15	Remainder
lii)	6020	0.40 to 0.90	0.50	0.30 to 0.90	0.35	0.6 to 1.20	0.15	-	0.20	0.15	-	-	Pb: 0.05 max.. Sn:0.9-1.5	0.05	0.15	Remainder
liii)	6041	0.50 to 0.90	0.15 to 0.70	0.15 to 0.60	0.05 to 0.20	0.8 to 1.20	0.05 to 0.15	-	0.25	0.15	-	-	Bi: 0.30 to 0.90. Sn:0.35 to 1.20	0.05	0.15	Remainder
liv)	6042	0.50 to 1.20	0.70	0.20 to 0.60	0.40	0.70 to 1.20	0.04 to 0.35	-	0.25	0.15	-	-	Bi:0.20 to 0.80. Pb:0.15 to 0.40	0.05	0.15	Remainder
lv)	6066	0.90 to 1.80	0.50	0.70 to 1.20	0.60 to 1.10	0.80 to 1.40	0.40	-	0.25	0.20	-	-	-	0.05	0.15	Remainder
lvi)	6066A	0.70 to 1.30	0.80	0.50 to 1.00	1.00	0.50 to 1.30	-	-	-	-	-	-	-	-	-	Remainder
lvii)	6070	1.00 to 1.70	0.50	0.15 to 0.40	0.40 to 1.00	0.50 to 1.20	0.10	-	0.25	0.15	-	-	-	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
lviii)	6105	0.60 to 1.00	0.35	0.10	0.15	0.45 to 0.80	0.10	-	0.10	0.10	-	-	-	0.05	0.15	Remainder
lix)	6162	0.40 to 0.80	0.50	0.20	0.10	0.70 to 1.10	0.10	-	0.25	0.10	-	-	-	0.05	0.15	Remainder
lx)	6560	0.30 to 0.70	0.10 to 0.30	0.05 to 0.20	0.20	0.20 to 0.60	0.05	-	0.15	0.10	-	-	-	0.05	0.15	Remainder

NOTES

1. a Others' includes the listed elements for which no specific limits are mentioned and also unlisted metallic elements. Identification of unlisted elements shall be as per the mutual agreement between the manufacturer and the purchaser. Others' does not include modifying or refining elements such as Na, Sr, Sb and P.
2. b The sum of those "Others" metallic elements 0.010 percent or more each. Expressed to the second decimal place before determining the sum.
3. The Aluminium content is the difference between 100.00 percent and the sum of all other metallic elements present in amounts of 0.010 percent or more each, expressed to the second decimal place before determining the sum.

Table 7 Aluminium Alloys — 7 000 Series — Al Zn

(Composition limits are in percent maximum unless shown otherwise)

(Clauses 6.1*)*

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
i)	7003	0.30	0.35	0.20	0.30	0.50 to 1.00	0.20	-	5.00 to 6.50	0.20	-	-	Zr:0.05 to 0.25	0.05	0.15	Remainder
ii)	7005	0.35	0.40	0.10	0.20 to 0.70	1.00 to1.80	0.06 to 0.20	-	4.00 to 5.00	0.01 to 0.06	-	-	Zr:0.08 to 0.20	0.05	0.15	Remainder
iii)	7005A (74530 IS733:1983)	0.40	0.70	0.20	0.20 to 0.70	1.00 to 1.50	0.20		4.00 to 5.00	0.20	-	-	-	-	-	Remainder
iv)	7009	0.20	0.20	0.60 to 1.30	0.10	2.10 to 2.90	0.10 to 0.25	-	5.50 to 6.50	0.20	-	-	Ag: 0.25 to 0.40	0.05	0.15	Remainder
v)	7010	0.12	0.15	1.50 to 2.00	0.10	2.10 to 2.60	0.05	0.05	5.70 to 6.70	0.06	-	-	Zr: 0.10 to 0.16	0.05	0.15	Remainder
vi)	7012	0.15	0.25	0.80 to 1.20	0.08 to 0.15	1.80 to 2.20	0.04	-	5.80 to 6.50	0.02 to 0.08	-	-	Zr : 0.10 to 0.18	0.05	0.15	Remainder
vii)	7015	0.20	0.30	0.06 to 0.15	0.10	1.30 to 2.10	0.15	-	4.60 to 5.20	0.10	-	-	Zr :0.10 to 0.20	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
viii)	7016	0.10	0.12	0.45 to 1.00	0.03	0.80 to 1.40	-	-	4.00 to 5.00	0.03	-	0.05	-	0.03	0.10	Remainder
ix)	7019	0.35	0.45	0.20	0.15 to 0.50	1.50 to 2.50	0.20	0.10	3.5 0 to 4.50	0.15	-	-	Zr :0.10 to 0.25	0.05	0.15	Remainder
x)	7020	0.35	0.40	0.20	0.05-0.50	1.00 to 1.40	0.10 to 0.35	-	4.00 to 5.00	-	-	-	Zr: 0.08 to 0.20; Zr + Ti: 0.08-0.25.	0.05	0.15	Remainder
xi)	7021	0.25	0.40	0.25	0.10	1.20 to 1.80	0.05	-	5.00 to 6.00	0.10	-	-	Zr:0.08 to 0.18	0.05	0.15	Remainder
xii)	7022	0.50	0.50	0.50 to 1.00	0.10 to 0.40	2.60 to 3.70	0.10 to 0.30	-	4.30 to 5.20	-	-	-	Ti+Zr :0.20	0.05	0.15	Remainder
xiii)	7026	0.08	0.12	0.60 to 0.90	0.05 to 0.20	1.50 to 1.90	-	-	4.60 to 5.20	0.05	-	-	Zr :0.09 to 0.14	0.03	0.10	Remainder
xiv)	7029	0.10	0.12	0.50 to 0.90	0.03	1.30 to 2.00	-	-	4.20 to 5.20	0.05	-	0.05	-	0.03	0.10	Remainder
xv)	7030	0.20	0.30	0.20 to 0.40	0.05	1.00 to 1.50	0.04	-	4.80 to 5.90	0.03	0.03	-	Zr :0.03	0.05	0.15	Remainder
xvi)	7039	0.30	0.40	0.10	0.10 to 0.40	2.30 to 3.30	0.15 to 0.25	-	3.40 to 4.50	0.10	-	-	-	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xvii)	7049A	0.40	0.50	1.20 to 1.90	0.50	2.10 to 3.10	0.05 to 0.25	-	7.20 to 8.40	-	-	-	Zr+Ti :0.25	0.05	0.15	Remainder
xviii)	7050	0.12	0.15	2.00 to 2.60	0.10	1.90 to 2.60	0.04	-	5.70 to 6.70	0.06	-	-	Zr:0.08 to 0.15	0.05	0.15	Remainder
xix)	7060	0.15	0.20	1.80 to 2.60	0.20	1.30 to 2.10	0.15 to 0.25	-	6.10 to 7.50	0.05	-	-	Zr : 0.05 max; Pb: 0.003 max.	0.05	0.15	Remainder
xx)	7072	Si+Fe: 0.70		0.10	0.10	0.10	-	-	0.80 to 1.30	-	-	-	-	0.05	0.15	Remainder
xxi)	7075	0.40	0.50	1.20 to 2.00	0.30	2.10 to 2.90	0.18 to 0.28	-	5.10 to 6.10	0.20	-	-	f	0.05	0.15	Remainder
xxii)	7075A	0.50	0.70	1.20 to 2.00	0.30	2.10 to 2.90	0.20 to 0.28		5.10 to 6.10	0.20						Remainder
xxiii)	7108	0.10	0.10	0.05	0.05	0.70 to 1.40	-	-	4.50 to 5.50	0.05	-	-	Zr :0.12 to 0.25	0.05	0.15	Remainder
xxiv)	7108A	0.20	0.30	0.05	0.05	0. 07 to 1.50	0.04	-	4.80 to 5.80	0.03	0.03	-	Zr :0.15 to 0.25	0.05	0.15	Remainder
xxv)	7116	0.15	0.30	0.50-1.10	0.05	0.80-1.40	-	-	4.20-5.20	0.05	0.03	0.05	-	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xxvi)	7129	0.15	0.30	0.50 to 0.90	0.10	1.3 to 2.0	0.10	-	4.20 to 5.20	0.05	0.03	0.05	-	0.05	0.15	Remainder
xxvii)	7149	0.15	0.20	1.20 to 1.90	0.20	2.00 to 2.90	0.10 to 0.22	-	7.20 to 8.20	0.10	-	-	-	0.05	0.15	Remainder
xxviii)	7150	0.12	0.15	1.90 to 2.50	0.10	2.00 to 2.70	0.04	-	5.90 to 6.90	0.06	-	-	Zr: 0.08 to 0.15	0.05	0.15	Remainder
xxix)	7175	0.15	0.20	1.20 to 2.00	0.10	2.10 to 2.90	0.18 to 0.28	-	5.10 to 6.10	0.10	-	-	-	0.05	0.15	Remainder
xxx)	7178	0.40	0.50	1.60 to 2.40	0.30	2.40 to 3.10	0.18 to 0.28	-	6.30 to 7.30	0.20	-	-	-	0.05	0.15	Remainder
xxxi)	7204	0.30	0.35	0.20	0.20 to 0.70	1.00 to 2.00	0.30	-	4.00 to 5.00	0.20	-		V 0.10 max. Zr 0.25 max.	0.05	0.15	Remainder
xxxii)	7475	0.10	0.12	1.20 to 1.90	0.06	1.90 to 2.60	0.18 to 0.25	-	5.20 to 6.20	0.06	-	-		0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Al
														Each	Total [b]	

NOTES

1. a Others' includes the listed elements for which no specific limits are mentioned and also unlisted metallic elements. Identification of unlisted elements shall be as per the mutual agreement between the manufacturer and the purchaser. Others' does not include modifying or refining elements such as Na, Sr, Sb and P.
2. b The sum of those 'Others' metallic elements 0.010 percent or more each. expressed to the second decimal place before determining the sum.
3. f Zr + Ti limit of 0.25 maximum may be used for extruded and forged products if mutually agreed by supplier or manufacturer and purchaser.
4. The Aluminium content is the difference between 100.00 percent and the sum of all other metallic elements present in amounts of 0.010 percent or more each, expressed to the second decimal place before determining the sum.

Table 8 Aluminium Alloys — 8 000 Series — Miscellaneous

(Composition limits are in percent maximum unless shown otherwise)

(Clauses 6.1*)*

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
i)	8006	0.40	1.20 to 2.00	0.30	0.30 to 1.00	0.10	-	-	0.10	-	-	-	-	0.05	0.15	Remainder
ii)	8008	0.60	0.90 to 1.60	0.20	0.50 to 1.00	-	-	-	0.10	0.10	-	-	-	0.05	0.15	Remainder
iii)	8011A	0.40 to 0.80	0.50 to 1.00	0.10	0.10	0.10	0.10	-	0.10	0.05	-	-	-	0.05	0.15	Remainder
iv)	8014	0.30	1.20 to 1.60	0.20	0.20 to 0.60	0.10	-	-	0.10	0.10	-	-	-	0.05	0.15	Remainder
v)	8015	0.30	0.80 to 1.40	0.10	0.10 to 0.40	0.10	-	-	0.10	-	-	-	-	0.05	0.15	Remainder
vi)	8016	0.20	0.70 to 1.10	0.10	0.10 to 0.30	0.10	-	-	0.10	-	-	-	-	0.05	0.15	Remainder
vii)	8018	0.50 to 0.90	0.60 to 1.00	0.30 to 0.60	0.30	-	-	-	-	0.006 to 0.06	-	-	-	0.05	0.15	Remainder

Sl No.	Alloy designation	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others [a]		Aluminium
														Each	Total [b]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
viii)	8021B	0.40	1.10 to 1.70	0.05	0.03	0.01	0.03	-	0.05	0.05	-	-	-	0.03	0.10	Remainder
ix)	8030	0.10	0.30 to 0.80	0.15 to 0.30	–	0.05	–	–	0.05	–	–	–	B:0.001 to 0.04	0.03	0.10	Remainder
x)	8079	0.05 to 0.30	0.70 to 1.30	0.05	-	-	-	-	0.10	-	-	-	-	0.05	0.15	Remainder
xi)	8090	0.20	0.30	1.00 to 1.60	0.10	0.60 to 1.30	0.10	-	0.25	0.10	-	-	Zr :0.04 to 0.16; Li.: 2.2 to 2.7.	0.05	0.15	Remainder
xii)	8111	0.30- to 1.10	0.40 to 1.00	0.10	0.10	0.05	0.05	-	0.10	0.08	-	-	-	0.05	0.15	Remainder
xiii)	8112	1. 00	1. 00	0.40	0.60	0.70	0.20	-	10	0.20	-	-	-	0.05	0.15	Remainder
xiv)	8176	0.03 to 0.15	0.40 to 1.00	–	–	–	–	–	0.10	–	0.03	–	–	0.05	0.15	Remainder
xv)	8211	0.40 to 0.80	0.50 to 1.00	0.10	0.05 to 0.20	0.10	0.15	-	0.10	0.05	-	-	-	0.06	0.15	Remainder

NOTES

1. a Others' includes the listed elements for which no specific limits are mentioned and also unlisted metallic elements. Identification of unlisted elements shall be as per the mutual agreement between the manufacturer and the purchaser. Others' does not include modifying or refining elements such as Na, Sr, Sb and P.
2. b The sum of those "Others" metallic elements 0.010 percent or more each. expressed to the second decimal place before determining the sum.
3. The Aluminium content is the difference between 100.00 percent and the sum of all other metallic elements present in amounts of 0.010 percent or more each, expressed to the second decimal place before determining the sum.

Table 9 Mechanical Properties

(*Clause* 7.1)

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		$R_{p0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	*A* % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1)	1050A	Extruded rod/bar	F [c], H112	all	all	-	60	-	20	-	25	23
2)			O, H111	all	all	-	60	95	20	-	25	23
3)		Extruded tube	F [c], H112	-	-	all	60	-	20	-	25	23
4)			O, H111	-	-	all	60	95	20	-	25	23
5)		Extruded profile	F [c], H112	-	-	all	60	-	20	-	25	23
6)	1050B	All	F	-	-	all	65	-	18	-	-	23
7)			O	-	-	all	-	100	-	-	-	25
8)	1060A	All	F	-	-	all	65	-	17	-	-	23
9)			O	-	-	all	-	95	-	-	-	25
10)	1070A	Extruded rod/bar	F [c], H112	all	all	-	60	-	23	-	25	23
11)		Extruded tube Not specified										
12)		Extruded profile Not specified										
13)	1200 / 1200A	Extruded rod/bar	F [c], H112	all	all	-	75	-	25	-	20	18
14)		Extruded tube	F [c], H112	-	-	all	75	-	25	-	20	18
15)		Extruded profile	F [c], H112	-	-	all	75	-	25	-	20	18
16)	**1200 B**	All	F	-	-	all	65	-	20	-	-	18
17)			O	-	-	all	-	110	-	-	-	25
18)	1350 /1350A	Extruded rod/bar	F [c], H112	all	all	-	60	-	-	-	25	23
19)		Extruded tube	F [c], H112	-	-	all	60	-	-	-	25	23
20)		Extruded profile	F [c], H112	-	-	all	60	-	-	-	25	23
21)	**NOTES** 1. For 1350F /1350A F electrical conductivity shall be 61 percent IACS ,min.											
22)	2007	Extruded rod/bar	T4, T4510, T4511	≤ 80		-	370	-	250	-	8	6
23)				80 < *D/S* ≤ 200		-	340	-	220	-	8	-
24)				200 < *D/S* ≤ 250		-	330	-	210	-	7	-
25)		Extruded tube	T4, T4510, T4511	-	-	≤ 25	370	-	250	-	8	6
26)		Extruded profile	T4, T4510, T4511	-	-	≤ 30	370	-	250	-	8	6
27)	2011/ 2011A	Extruded rod/bar	T4 [c]	≤ 200	≤ 60	-	275	-	125	-	14	12
28)			T6 [c]	≤ 75	≤ 60	-	310	-	230	-	8	6
29)				75 < *D* ≤ 200	-	-	295	-	195	-	6	-

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		$Rp_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	*A* % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
30)		Extruded tube	T6 [c]	-	-	≤ 25	310	-	230	-	6	4
31)			O, H111	≤ 200		-	-	250	-	135	12	10
32)			T4, T4510, T4511	≤ 25	≤ 25	-	370	-	230	-	13	11
33)				25 < *D* ≤ 75	25 < *S* ≤ 75	-	410	-	270	-	12	-
34)				75 < *D* ≤ 150	75 < *S* ≤ 150	-	390	-	250	-	10	-
35)		Extruded rod/bar		150 < *D* ≤ 200	150 < *S* ≤ 200	-	350	-	230	-	8	-
36)			T6, T6510, T6511	≤ 25	≤ 25	415	-	370	-	-	6	5
37)				25 < *D* ≤ 75	25 < *S* ≤ 75	460	-	415	-	-	7	-
38)				75 < *D* ≤ 150	75 < *S* ≤ 150	465	-	420	-	-	7	-
39)				150 < *D* ≤ 200	150 < *S* ≤ 200	430	-	350	-	-	6	-
40)	2014 / 2014A			200 < *D* ≤ 250	200 < *S* ≤ 250	420	-	320	-	-	5	-
41)		Extruded tube	O, H111	-	-	≤ 20	-	250	-	135	12	10
42)			T4, T4510, T4511	-	-	≤ 20	370	-	230	-	11	10
43)			T6, T6510, T6511	-	-	≤ 10	415	-	370	-	7	5
44)				-	-	10 < *t* ≤ 40	450	-	400	-	6	4
45)		Extruded profile [d]	O, H111	-	-	all	-	250	-	135	12	10
46)												
47)												
48)			T4, T4510, T4511	-		≤ 25	370	-	230	-	11	10
49)				-	-	25 < *t* ≤ 75	410	-	270	-	10	-
50)			T6, T6510, T6511	-	-	< 25	415	-	370	-	7	5
51)				-	-	25 < *t* ≤ 75	460	-	415	-	7	-
52)	2014B	All	F	-	-	all	150	-	90	-	-	12
53)			O	-	-	all	-	240	-	175	-	12
54)			T4	-	-	< 200	375	-	225	-	-	8
55)			T6	-	-	<200	430	-	375	-	-	6
56)	2017 / 2017A	Extruded rod/bar	O, H111	≤ 200	≤ 200	-	-	250	-	135	12	10
57)				≤ 25	≤ 25	-	380	-	260	-	12	10

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		$Rp_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	S [b]	t	min.	max.	min.	max.	A % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
58)			T4,T4510, T4511	$25 < D \leq 75$	$25 < S \leq 75$	-	400	-	270	-	10	-
59)				$75 < D \leq 150$	$75 < S \leq 150$	-	390	-	260	-	9	-
60)				$150 < D \leq 200$	$150 < S \leq 200$	-	370	-	240	-	8	-
61)				$200 < D \leq 250$	$200 < S \leq 250$	-	360	-	220	-	7	-
62)		Extruded tube	O, H111	-	-	≤ 20	-	250	-	135	12	10
63)			T6, T6510, T4511	-	-	≤ 10	380	-	260	-	12	10
64)				-	-	$10 < t \leq 75$	400	-	270	-	10	8
65)		Extruded profile	O, T4, T4510, T4511	-	-	≤ 30	380	-	260	-	10	8
66)	2219	All	O	-	-	all	-	225	-	125	12	10
67)			T31, T3510, T3511	-	-	$D \leq 12.5$	290	-	180	-	14	12
68)				-	-	$12.5 < D \leq 80$	310	-	185	-	-	12
69)			T62	-	-	$D \leq 25$	370	-	250	-	6	5
70)				-	-	*Over 25*	370	-	250	-	-	5
71)	2618 / 2618A	Extruded rod/bar	T6, T6511	$D \leq 10$	$S \leq 10$	-	410	-	330	-	6	4
72)			T6, T6511	$10 < D \leq 100$	$10 < S \leq 100$	-	420	-	360	-	7	5
73)		Extruded tube	T6, T6511	-	-	≤ 10	410	-	330	-	6	4
74)			T6, T6511	-	-	$10 < t \leq 100$	420	-	360	-	7	5
75)		Extruded profile [d]	T6, T6511	-	-	≤ 10	410	-	330	-	6	4
76)			T6, T6511	-	-	$10 < t \leq 100$	420	-	360	-	7	5
77)	2024	Extruded rod/bar	O, H111	≤ 200	≤ 200	-	-	250	-	150	12	10
78)			T3, T3510, T3511	≤ 50	≤ 50	-	450	-	310	-	8	6
79)				$50 < D \leq 100$	$50 < S \leq 100$	-	440	-	300	-	8	-
80)				$100 < D \leq 200$	$100 < S \leq 200$	-	420	-	280	-	8	-
81)				$200 < D \leq 250$	$200 < S \leq 250$	-	400	-	270	-	8	-
82)			T8, T8510, T8511	≤ 150	≤ 150	-	455	-	380	-	5	4
83)		Extruded tube	O, H111	-	-	≤ 30	-	250	-	150	12	10
84)			T3, T3510, T3511	-	-	≤ 30	420	-	290	-	8	6

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		*R*p$_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	S [b]	t	min.	max.	min.	max.	A % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
85)			T8, T8510, T8511	-	-	≤ 30	455	-	380	-	5	4
86)		Extruded profile [d]	O, H111	-	-	all	-	250	-	150	12	10
87)			T3, T3510, T3511	-	-	≤ 15	395	-	290	-	8	6
88)				-	-	15 < t ≤ 50	420	-	290	-	8	-
89)			T8, T8510, T8511	-	-	≤ 50	455	-	380	-	5	4
90)	2024B	All	F	-	-	**all (dimensions)**	150	-	90	-	-	12
91)			O	-	-	**all (dimensions)**	-	240	-	175	-	12
92)			T4	-	-	<200	375	-	220	-	-	8
93)		Extruded rod/bar	T4, T4510, T4511 [c]	≤ 80	≤ 80	-	370	-	250	-	8	6
94)				80 < D ≤ 200	80 < S ≤ 200	-	340	-	220	-	8	-
95)	2030			200 < D ≤ 250	200 < S ≤ 250	-	330	-	210	-	7	-
96)		Extruded tub	T4, T4510, T4511	-	-	≤ 25	370	-	250	-	8	6
97)		Extruded profile[d]	T4, T4510, T4511	-	-	≤ 30	370	-	250	-	8	6
98)		Extruded rod/bar	F [c], H112	all	all	-	80	-	30	-	25	23
99)	3102	Extruded tube	F [c], H112	-	-	all	80	-	30	-	25	23
100)		Extruded profile	F [c], H112	-	-	all	80	-	30	-	25	23
101)		**Extruded rod/bar**	F [c], H112	all	all	-	95	-	35	-	25	20
102)			O, H111	all	all	-	95	135	35	-	25	20
103)		Extruded tube	F [c], H112	-	-	all	95	-	35	-	25	20
104)			O, H111	-	-	all	95	135	35	-	25	20
105)	3003	Extruded profile	F [c], H112	-	-	all	95	-	35	-	25	20
106)	3003A	All	F	-	-	**all**	95	-	-	-	-	16
107)			O	-	-	**all-**	-	130	-	-	-	20
108)	3004	All	O	-	-	**all**	160	200	60	-	-	-
109)		Extruded rod/bar	F [c], H112	all	all	-	95	-	35	-	25	20
110)			O, H111	all	all	-	95	135	35	-	25	20
111)	3103	Extruded tube	F [c], H112	-	-	all	95	-	35	-	25	20
112)			O, H111	-	-	all	95	135	35	-	25	20
113)		Extruded profile	F [c], H112	-		all	95	-	35	-	25	20
114)	4043A	All	F	-	-	all	90	-	-	-	-	18
115)	4043B		O	-	-	all	-	130	-	-	-	18
116)	4047B	All	F	-	-	all	100	-	-	-	-	10

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		*R*p$_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	*A* % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
117)			O	-	-	all	-	150	-	-	-	12
118)	5005 / 5005A	Extruded rod/bar	F [c], H112	all	100	-	100	-	40	-	18	16
119)			O, H111	≤ 80	≤ 60	-	100	150	40	-	18	16
120)		Extruded tube	F [c], H112	-	-	all	100	-	40	-	18	16
121)			O, H111	-	-	≤ 20	100	150	40	-	20	18
122)		Extruded profile	F [c], H112	-	-	all	100	-	40	-	18	16
123)			O, H111	-	-	≤ 20	100	150	40	-	20	18
124)	5019	Extruded rod/bar	F [c], H112	≤ 200	≤ 200	-	250	-	110	-	14	12
125)			O, H111	≤ 200	≤ 200	-	250	320	110	-	15	13
126)		Extruded tube	F [c], H112	-	-	≤ 30	250	-	110	-	14	12
127)			O, H111	-	-	≤ 30	250	320	110	-	15	13
128)		Extruded profile	F [c], H112	-	-	≤ 30	250	-	110	-	14	12
129)	5049	Extruded rod/bar	F [c], H112	all	all	-	180	-	80	-	15	13
130)		Extruded tube	F [c], H112	-	-	all	180	-	80	-	15	13
131)		Extruded profile	F [c], H112	-	-	all	180	-	80	-	15	13
132)	5051A	Extruded rod/bar	F [c], H112	all	all	-	150	-	50	-	16	14
133)			O, H111	all	all	-	150	200	50	-	18	16
134)		Extruded tube	F [c], H112	-	-	all	150	-	60	-	16	14
135)			O, H111	-	-	all	150	200	60	-	18	16
136)		Extruded profile	F [c], H112	-	-	all	150	-	60	-	16	14
137)	5052A	All	F	-	-	**all**	160	-	70	-	-	14
138)			O	-	-	**all**	-	240	-	-	-	18
139)	5083A	All	F	-	-	**all**	265	-	130	-	-	11
140)			O	-	-	**all**	-	350	125	-	-	13
141)	**NOTES** **1** [a] *D* = Diameter for round bar. **2** [b] *S* = Width across flats for square and hexagonal bar, thickness for rectangular bar. **3** [c] F Temper: property values are for information only.											
142)	5251	Extruded rod/bar	F [c], H112	all	all	-	160	-	60	-	16	14
143)			O, H111	all	all	-	160	220	60	-	17	15
144)		Extruded tube	F [c], H112	-	-	all	160	-	60	-	16	14
145)			O, H111	-	-	all	160	220	60	-	17	15
146)		Extruded profile	F [c], H112	-	-	all	160	-	60	-	16	14
147)	5052	Extruded rod/bar	F[c], H112	all	all	-	170	-	70	-	15	13
148)			O, H111	all	all	-	170	230	70	-	17	15
149)		Extruded tube	F[c], H112	-	-	all	170	-	70	-	15	13
150)			O, H111	-	-	all	170	230	70	-	17	15
151)		Extruded profile	F[c], H112	-	-	all	170	-	70	-	15	13
152)	5154A	Extruded rod/bar	F [c], H112	≤ 200	≤ 200	-	200	-	85	-	16	14
153)			O, H111	≤ 200	≤ 200	-	200	275	85	-	18	16
154)		Extruded tube	F [c], H112	-	-	≤ 25	200	-	85	-	16	14
155)			O, H111	-	-	≤ 25	200	275	85	-	18	16

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		$Rp_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	*A* % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
156)		Extruded profile	F [c], H112	-	-	≤ 25	200	-	85	-	16	14
157)	5454	Extruded rod/bar	F [c], H112	≤ 200	≤ 200	-	200	-	85	-	16	14
158)			O, H111	≤ 200	≤ 200	-	200	275	85	-	18	16
159)		Extruded tube	F [c], H112	-	-	≤ 25	200	-	85	-	16	14
160)			O, H111	-	-	≤ 25	200	275	85	-	18	16
161)		Extruded profile	F [c], H112	-	-	≤ 25	200	-	85	-	16	14
162)	5456	All	O	-	-	≤ 120	285	365	130		14	12
163)	5754	Extruded rod/bar	F [c], H112	≤ 150	≤ 150	-	180	-	80	-	14	12
164)				150 < *D* ≤ 250	150 < *S* ≤ 250	-	180	-	70	-	13	-
165)			O, H111	≤ 150	≤ 150	-	180	250	80	-	17	15
166)		Extruded tube	F [c], H112	-	-	≤ 25	180	-	80	-	14	12
167)			O, H111	-	-	≤ 25	180	250	80	-	17	15
168)		Extruded profile	F [c], H112	-	-	≤ 25	180	-	80	-	14	12
169)	5754A	All	F	-	-	**all**	200	-	100	-	-	14
170)			O	-	-	all	-	260	-	-	-	16
171)	5083	Extruded rod/bar	F [c]	≤ 200	≤ 200	-	270	-	110	-	12	10
172)				200 < *D* ≤ 250	200 < *S* ≤ 250	-	260	-	100	-	12	-
173)			O, H111	≤ 200	≤ 200	-	270	-	110	-	12	10
174)			H112	≤ 200	≤ 200	-	270	-	125	-	12	10
175)		Extruded tube	F [c]	-	-	all	270	-	110	-	12	10
176)			O, H111	-	-	all	270	-	110	-	12	10
177)			H112	-	-	all	270	-	125	-	12	10
178)		Extruded profile	F [c]	-	-	all	270	-	110	-	12	10
179)			H112	-	-	all	270	-	125	-	12	10
180)	5086	Extruded rod/bar	F [c], H112	≤ 250	≤ 250	-	240	-	95	-	12	10
181)			O, H111	≤ 200	≤ 200	-	240	320	95	-	18	15
182)		Extruded tube	F [c], H112	-	-	all	240	-	95	-	12	10
183)			O, H111	-	-	all	240	320	95	-	18	15
184)		Extruded profile	F [c], H112	-		all	240	-	95	-	12	10
185)	6005/ 6005A	Extruded rod/bar	T1	-	-	-	170	-	105	-	14	16
186)			T5	<3.2	*<3.2*	-	260	-	215	-	-	8

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		$Rp_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	*A* % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
187)				3.2 < D <25	*3.2< S<25*	-	260	-	215	-	9	10
188)			T6	≤ 25	≤ 25	-	270	-	225	-	10	8
189)				25 < *D* ≤ 50	25 < *S* ≤ 50	-	270	-	225	-	8	-
190)				50 < *D* ≤ 100	50 < *S* ≤ 100	-	260	-	215	-	8	-
191)		Extruded tube	T1	-	-	-	170		105		14	16
192)			T5	-	-	*<3.2*	260	-	215	-	7	-
193)				-	-	*3.2<S< 25*	260	-	215	-	9	8
194)			T6	-	-	≤ 5	270	-	225	-	8	6
195)			T6	-	-	5 < *t* ≤ 10	260	-	215	-	8	6
196)		All	T61	-	-	*<6..3*	260	-	240	-	8	-
197)				-	-	*6.3<S< 25*	260	-	240		10	9
198)		Extruded profile	T1	-	-	-	170	-	105	-	14	16
199)			T5	-	-	*<3.2*	260	-	240	-		8
200)				-	-	*3.2<S< 25*	260		240		9	10
201)			Open profile T4	-	-	≤ 25	180	-	90	-	15	13
202)			Open profile T6	-	-	≤ 5	270	-	225	-	8	6
203)				-	-	5 < *t* ≤ 10	260	-	215	-	8	6
204)		Extruded profile		-	-	10 < *t* ≤ 25	250	-	200	-	8	6
205)			Hollow profile T4	-	-	≤ 10	180	-	90	-	15	13
206)			Hollow profile T6	-	-	≤ 5	255	-	215	-	8	6
207)				-	-	5 < *t* ≤ 15	250	-	200	-	8	6
208)	6005C	All	T5	-	-	*t* ≤ 6	245	-	205	-	-	8
209)				-	-	6 < *t* ≤ 12	225	-	175	-	-	8
210)			T6	-	-	*t* ≤ 6	265	-	235	-	-	8
211)	6005D	All	T6	-	-	**All**	255	-	200	-	-	7
212)	6101A	Extruded tube	T6	-	-	≤ 25	200	-	170	-	10	8
213)		Extruded profile	T6	-	-	≤ 50	200	-	170	-	10	8
214)	6101B	Extruded rod/bar	T6	-	≤ 15	-	215	-	160	-	8	6
215)			T7	-	≤ 15	-	170	-	120	-	12	10
216)		Extruded tube	T6	-	-	≤ 15	215	-	160	-	8	6
217)			T7	-	-	≤ 15	170	-	120	-	12	10
218)		Extruded profile	T6	-	-	≤ 15	215	-	160	-	8	6
219)			T7	-	-	≤ 15	170	-	120	-	12	10
220)	1. For 6101BT6 , electrical conductivity shall be 51.72 percent IACS min. 2. For 6101BT7, electrical conductivity shall be 55 percent IACS min.											
221)	6106	Extruded profile	*T6* [a]	-	-	*≤ 10*	250	-	200	-	8	6

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		$Rp_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	*A* % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
222)		Extruded rod/bar Not specified										
223)		Extruded tube Not specified										
224)	6008	Extruded tube	T4	-	-	≤ 10	180	-	90		15	13
225)				-	-	≤ 5	270	-	225	-	8	6
226)			T6 [a]	-	-	5 < *t* ≤ 10	260	-	215	-	8	6
227)		Extruded profile [d]	Open profile T4 [a]	-	-	≤ 10	180	-	90	-	15	13
228)			Open profile T6 [a]	-	-	≤ 5	270	-	225	-	8	6
229)				-	-	5 < *t* ≤ 10	260	-	215	-	8	6
230)			Hollow profile T4 [a]	-	-	≤ 10	180	-	90	-	15	13
231)			Hollow profile	-	-	≤ 5	255	-	215	-	8	6
232)			T6 [a]	-	-	5 < *t* ≤ 10	250	-	200	-	8	6
233)		Extruded rod/bar Not specified										
234)		Extruded tube										
235)	6110A	Extruded rod/bar	T5	≤ 120	≤ 120	-	380	-	360	-	10	8
236)			T6	≤ 120	≤ 150	-	410	-	380	-	10	8
237)		Extruded tube	T4	-	-	≤ 25	320		220	-	16	14
238)			T6	-	-	≤ 25	380	-	360	-	10	8
239)		Extruded profile	T4	-	-	≤ 25	320		220	-	16	14
240)			T6	-	-	≤ 25	380	-	360	-	10	8
241)	6012/ 6012A	Extruded rod/bar	T6, T6510, T6511	≤ 150	≤ 150	-	310	-	260	-	8	6
242)				150 < *D* ≤ 200	150 < *S* ≤ 200	-	260	-	200	-	8	-
243)		Extruded tube	T6, T6510, T6511	-	-	≤ 30	310	-	260	-	8	6
244)		Extruded profile	T6, T6510, T6511	-	-	≤ 30	310	-	260	-	8	6
245)	6013	Extrusion, Rod, and Seamless Tube	T6, T6511	5 < *D* ≤ 12.5		-	340		315		8	
246)				12.5 < *D* ≤ 20		-	340		315			7
247)				20 < *D* ≤ 50		-	740		310			7
248)	6014	Extruded tube	T4 [a]	-	-	≤ 10	140	-	70	-	15	13
249)			T6 [a]	-	-	≤ 5	250	-	200	-	8	6
250)				-	-	5 < *t* ≤ 10	225	-	180	-	8	6
251)		Extruded profile [d]	Open profile T4 [a]	-	-	≤ 10	140	-	70	-	15	13
252)			Open profile T6 [a]	-	-	≤ 5	250	-	200	-	10	8
253)				-	-	5 < *t* ≤ 10	225	-	180	-	8	6
254)			Hollow profile T4 [a]	-	-	≤ 10	140	-	70	-	15	13
255)				-	-	≤ 5	250	-	200	-	8	6

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		$Rp_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	*A* % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
			Hollow profile T6 [a]									
256)				-	-	$5 < t \leq 10$	225	-	180	-	8	6
257)		Extruded rod/bar										
258)	Not specified											
259)	6018	Extruded rod/bar	T6, T6510, T6511	≤ 150	≤ 150	-	310	-	260	-	8	6
260)				150 < *D* ≤ 200	150 < *S* ≤ 200	-	260	-	200	-	8	-
261)		Extruded tube	T6, T6510, T6511	-	-	≤ 30	310	-	260	-	8	6
262)	6018	Extruded profile	T6, T6510, T6511	-	-	≤ 30	310	-	260	-	8	6
263)	6020	Extruded rod and bar	T6511	80 < *D* ≤ 160		-	260		240			9
264)	6023	Extruded tube Not specified										
265)		Extruded profile Not specified										
266)	6026	Extruded rod/bar	T6, T6510, T6511	≤ 140	≤ 140	-	370	-	300		8	6
267)				140 < D ≤ 200	140 < S ≤ 200	-	340	-	250	-	8	6
268)				200 < D ≤ 250	200 < S ≤ 250	-	300	-	200	-	8	6
269)		Extruded tube	T6, T6510, T6511	-	-	≤ 30	340	-	260	-	8	6
270)		Extruded profile	T6, T6510, T6511	-	-	≤ 40	340	-	260	-	8	6
271)	6041	All	T6, T6511	-	-	10 < D ≤ 50	310	-	275	-	10	9
272)	6042	All	T5, T5511	-	-	10 < D ≤ 12.5	260	-	240	-	10	
273)				-	-	12.5 < D ≤ 50	260	-	240	-		9
274)	6351/ 6351A	All	T1	-	-	D ≤ 12.5	180	-	90	-	15	13
275)			T11		-	D ≤ 20	180	-	110	-	16	14
276)			T5	-	-	D ≤ 12.5	260	-	240	-	8	
277)				-	-	12.5 < D ≤ 25	260	-	240	-	10	9
278)			T51	-	-	3.2 < D ≤ 25	250	-	230	-	10	7
279)			T54	-	-	D ≤ 12.5	205	-	140	-	10	9
280)		Extruded rod/bar	O, H111	**≤ 200**	**≤ 200**	-	-	160	-	110	14	12

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		*R*p$_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	***A* % min.**	***A*$_{50\ mm}$ % min.**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
281)			T4	**≤ 200**	**≤ 200**	-	205	-	110	-	14	12
282)			T6	**≤ 20**	**≤ 20**	-	295	-	250	-	8	6
283)				**20 < *D* ≤ 75**	**20 < *S* ≤ 75**	-	300	-	255	-	8	-
284)				75 < *D* ≤ 150	75 < *D* ≤ 150	-	310	-	260	-	8	-
285)				150 < *D* ≤ 200	150 < *D* ≤ 200	-	280	-	240	-	6	-
286)				200 < *D* ≤ 250	200 < *D* ≤ 250	-	270	-	200	-	6	-
287)		Extruded tube	O, H111	-	-	≤ 25	-	160	-	110	14	12
288)			T4	-	-	≤ 25	205	-	110	-	14	12
289)			T6	-	-	≤ 5	290	-	250	-	8	6
290)				-	-	5 < *t* ≤ 25	300	-	255	-	10	8
291)	6351 / 6351A	Extruded profile	O, H111	-	-	all	-	160	-	110	14	12
292)			T4	-	-	≤ 25	205	-	110	-	14	12
293)			Open profile T5	-	-	≤ 5	270	-	230	-	8	6
294)			Open profile	-	-	≤ 5	290	-	250	-	8	6
295)			T6	-	-	5 < *t* ≤ 25	300	-	255	-	10	8
296)			Hollow profile T5	-	-	≤ 5	270	-	230	-	8	6
297)			Hollow profile	-	-	≤ 5	290	-	250	-	8	6
298)			T6	-	-	5 < *t* ≤ 25	300	-	255	-	10	8
299)	6056	Extruded rod/bar	T4, T451, T4511	≤ 80	≤ 80	-	350	-	245	-	15	14
300)			T6, T651, T6511	≤ 80	≤ 80	-	380	-	360	-	10	8
301)			T78, T7851, T78511	≤ 80	≤ 80	-	360	-	335	-	10	8
302)		Extruded profile	T4, T4510, T4511	-	-	≤ 10	350	-	245	-	15	14
303)			T6, T6510, T6511	-	-	≤ 10	380	-	360	-	10	8
304)			T78, T78510, T78511	-	-	≤ 10	360	-	335	-	10	8
305)	6060	Extruded rod/bar	T4 [c]	≤ 150	≤ 150	-	120	-	60	-	16	14
306)			T5	≤ 150	≤ 150	-	160	-	120	-	8	6
307)			T6 [c]	≤ 150	≤ 150	-	190	-	150	-	8	6
308)			T64 [c d]	≤ 50	≤ 50	-	180	-	120	-	12	10

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		*R*p$_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	*A* % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
309)			T66 [c]	≤ 150	≤ 150	-	215	-	160	-	8	6
310)		Extruded tube	T4	-	-	≤ 15	120	-	60	-	16	14
311)			T5	-	-	≤ 15	160	-	120	-	8	6
312)			T6	-	-	≤ 15	190	-	150	-	8	6
313)			T64	-	-	≤ 15	180	-	120	-	12	10
314)			T66	-	-	≤ 15	215	-	160	-	8	6
315)		Extruded profile [d]	T4	-	-	≤ 25	120	-	60	-	16	14
316)			T5	-	-	≤ 5	160	-	120	-	8	6
317)				-	-	5 < *t* ≤ 25	140	-	100	-	8	6
318)			T6	-	-	≤ 5	190	-	150	-	8	6
319)				-	-	5 < *t* ≤ 25	170	-	140	-	8	6
320)			T64	-	-	≤ 15	180	-	120	-	12	10
321)			T66	-	-	≤ 5	215	-	160	-	8	6
322)				-	-	5 < *t* ≤ 25	195	-	150	-	8	6
323)	6360	Extruded rod/bar	T4	≤ 150	≤ 150	-	110	-	50	-	16	14
324)			T5	≤ 150	≤ 150	-	150	-	110	-	8	6
325)			T6	≤ 150	≤ 150	-	185	-	140	-	8	6
326)			T66	≤ 150	≤ 150	-	195	-	150	-	8	6
327)		Extruded tube	T4	-	-	≤ 15	110	-	50	-	16	14
328)	6360	Extruded Tube	T5	-	-	≤ 15	150	-	120	-	8	6
329)			T6	-	-	≤ 15	185	-	140	-	8	6
330)			T66	-	-	≤ 15	195	-	150	-	8	6
331)		Extruded profile [d]	T4	-	-	≤ 25	110	-	50	-	16	14
332)			T5	-	-	≤ 25	150	-	110	-	8	6
333)			T6	-	-	≤ 25	185	-	140	-	8	6
334)			T66	-	-	≤ 25	195	-	150	-	8	6
335)	6061/ 6061A	Extruded rod/bar	O, H111	≤ 200	≤ 200	-	-	150	-	110	16	14
336)			T4, T4511	≤ 200	≤ 200	-	180	-	110	-	15	13
337)			T6, T6511	≤ 200	≤ 200	-	260	-	240	-	8	6
338)		Extruded tube	O, H111	-	-	≤ 25	-	150	-	110	16	14
339)			T4, T4511	-	-	≤ 25	180	-	110	-	15	13
340)			T6, T6511	-	-	≤ 5	260	-	240	-	8	6
341)				-	-	5 < *t* ≤ 25	260	-	240	-	10	8
342)		Extruded profile [d]	T4 , T4511	-	-	≤ 25	180	-	110	-	15	13
343)			T6, T6511	-	-	≤ 5	260	-	240	-	9	7
344)				-	-	5 < *t* ≤ 25	260	-	240	-	10	8
345)	6061B	All	F	-	-	**all**	110	-	-	-	-	12
346)			T4	-	-	-	185	-	115	-	-	14
347)			T6	-	-	-	290	-	235	-	-	7
348)	6261	Extruded rod/bar	O, H111	≤ 100	≤ 100	-	-	170	-	120	14	12
349)			T4	≤ 100	≤ 100	-	180	-	100	-	14	12

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		*R*p$_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	***A* % min.**	***A*$_{50\ mm}$ % min.**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
350)			T6	≤ 20	≤ 20	-	290	-	245	-	8	7
351)				20 < *D* ≤ 100	20 < *S* ≤ 100	-	290	-	245	-	8	-
352)		Extruded tube	O, H111			≤ 10	-	170	-	120	14	12
353)			T4	-	-	≤ 10	180	-	100	-	14	12
354)			T5	-	-	≤ 5	270	-	230	-	8	7
355)				-	-	5 < *t* ≤ 10	260	-	220	-	9	8
356)			T6	-	-	≤ 5	290	-	245	-	8	7
357)				-	-	5 < *t* ≤ 10	290	-	245	-	9	8
358)		Extruded profile [c]	O, H111	**-**	**-**	**all**	**-**	**170**	**-**	**120**	**14**	**12**
359)			T4	**-**	**-**	**≤ 25**	**180**	**-**	**100**	**-**	**14**	**12**
360)			Open profile T5	-	-	≤ 5	**270**	-	230	-	8	7
361)				-	-	5 < *t* ≤ 25	260	-	220	-	9	8
362)				-	-	> 25	250	-	210	-	9	-
363)			Open profile T6	-	-	≤ 5	290	-	245	-	8	7
364)				-	-	5 < *t* ≤ 25	280	-	235	-	8	7
365)			Hollow profile T5	-	-	≤ 5	270	-	230	-	8	7
366)				-	-	5 < *t* ≤ 10	260	-	220	-	9	8
367)			Hollow profile T6	-	-	≤ 5	290	-	245	-	8	7
368)				-	-	5 < *t* ≤ 10	270	-	230	-	9	8
369)	6261A	All	F	-	-	<200	110	-	50	-	-	12
370)			O	-	-	<200	-	150	-	115	-	16
371)			T4	-	-	<200	170	-	100	-	-	12
372)			T6		-	<200	245	-	200	-	-	6
373)	6262	Extruded rod/bar	T6	200	200	-	260	-	240	-	10	8
374)		Extruded tube	T6	-	-	≤ 25	260	-	240	-	10	8
375)		Extruded profile [d]	T6	-	-	≤ 25	260	-	240	-	10	8
376)	6262A	Extruded rod/bar	T6	≤ 220	≤ 155	-	260	-	240	-	10	8
377)		Extruded tube	Not specified									
378)		Extruded profile	T6	-	-	≤ 25	260	-	240	-	10	8
379)	6063	Extruded rod/bar	O, H111	≤ 200	≤ 200	-	-	130	-	-	18	16
380)			T4	≤ 150	≤ 150	-	130	-	65	-	14	12
381)				150 < *D* ≤ 200	150 < *S* ≤ 200	-	120	-	65	-	12	-
382)			T5	≤ 200	≤ 200	-	150	-	110	-	8	6

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		*R*p$_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	S [b]	t	min.	max.	min.	max.	A % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
383)			T6	≤ 150	≤ 150	-	205	-	170	-	10	8
384)				150 < D ≤ 200	150 < S ≤ 200	-	195	-	160	-	10	-
385)			T66	≤ 200	≤ 200	-	245	-	200	-	10	8
386)	6063	Extruded tube	O, H111	-	-	≤ 25	-	130	-	-	18	16
387)			T4	-	-	≤ 10	130	-	65	-	14	12
388)				-	-	10 < t ≤ 25	120	-	65	-	12	10
389)			T5	-	-	< 25	150	-	110	-	8	6
390)			T6	-	-	≤ 25	205	-	170	-	10	8
391)			T66	-	-	≤ 25	245	-	200	-	10	8
392)		Extruded profile [d]	T4	-	-	≤ 25	130	-	65	-	14	12
393)			T5	-	-	≤ 10	150	-	110	-	8	6
394)				-	-	10 < t ≤ 25	145	-	105	-	7	5
395)			T6	-	-	≤ 10	205	-	170	-	8	6
396)				-	-	10 < t ≤ 25	195	-	160	-	8	6
397)			T64 [c]	-	-	≤ 15	180	-	120	-	12	10
398)			T66	-	-	≤ 10	245	-	200	-	8	6
399)				-	-	10 < t ≤ 25	225	-	180	-	8	6
400)	6063B	All	F	-	-	**all**	110	-	-	-	-	13
401)			O	-	-	**all**	-	130	-	-	-	18
402)			T4	-	-	**all (dimensions)**	125	-	80	-	-	13
403)			T5	-	-	**all (dimensions)**	150	-	110	-	-	7
404)			T6	-	-	<150	185	-	150	-	-	7
405)				-	-	150 < t ≤ 200	150		130			7
406)	6066	All	O	-	-	all		200		125	16	14
407)			T4, T4510, T4511	-	-	all	275		170		14	12
408)			T42	-	-	all	275 8		165		14	12
409)			T6, T6510, T6511	-	-	all	345		310		8	7
410)			T62	-	-	all	345		290		8	7
411)	6066A	All	F	-	-	all	120	-	-	-	-	10
412)			O	-	-	(Dimensions)	-	215	-	125	-	15
413)			T4	-	-	all	260	-	155	-	-	13
414)			T6	-	-	(Dimensions)	330	-	265	-	-	7
415)	6063 A	Extruded rod/bar	O, H111	≤ 200	≤ 200	-	-	150	-	-	16	14

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		$Rp_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	S [b]	t	min.	max.	min.	max.	A % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
416)			T4	≤ 150	≤ 150	-	150	-	90	-	12	10
417)				150 < D ≤ 200	150 < S ≤ 200	-	140	-	90	-	10	-
418)			T5	≤ 200	≤ 200	-	200	-	160	-	7	5
419)			T6	≤ 150	≤ 150	-	230	-	190	-	7	5
420)				150 < D ≤ 200	150 < S ≤ 200	-	220	-	160	-	7	-
421)		Extruded tube	O, H111	-	-	≤ 25	-	150	-	-	16	14
422)			T4	-	-	≤ 10	150	-	90	-	12	10
423)				-	-	10 < t ≤ 25	140	-	90	-	10	8
424)			T5	-	-	≤ 25	200	-	160	-	7	5
425)			T6	-	-	≤ 25	230	-	190	-	7	5
426)		Extruded profile [d]	T4	**-**	**-**	**≤ 25**	**150**	**-**	**90**	**-**	**12**	**10**
427)			T5	-	-	≤ 10	200	-	160	-	7	5
428)				-	-	10 < t ≤ 25	190	-	150	-	6	4
429)			T6	-	-	≤ 10	230	-	190	-	7	5
430)				-	-	10 < t ≤ 25	220	-	180	-	5	4
431)	6463	Extruded rod/bar	T4	≤ 150	≤ 150	-	125	-	75	-	14	12
432)			T5	≤ 150	≤ 150	-	150	-	110	-	8	6
433)			T6	≤ 150	≤ 150	-	195	-	160	-	10	8
434)		Extruded tube	T6	-	-	≤ 25	195	-	160	-	10	8
435)		Extruded profile[d]	T4	-	-	≤ 50	125	-	75	-	14	12
436)			T5	-	-	≤ 50	150	-	110	-	8	6
437)			T6	-	-	≤ 50	195	-	160	-	10	8
438)	6560	All	T5	-	-	2.5≤ 3.2	150		110		8	
439)			T6	-	-	2.5≤ 3.2	205		170		10	9
440)	6064	All	T6, T6511	-	-	5 < D ≤ 80	290		260		10	9
441)	6064A	Extruded rod/bar	T6, T6510, T6511 [c]	≤ 140	≤ 140	-	310	-	260	-	8	6
442)				140 < D ≤ 250	140 < S ≤ 250	-	260	-	240	-	8	6
443)		Extruded tube	T6, T6510, T6511 [c]			≤ 30	310	-	260	-	8	6
444)	6064A	Extruded profile [d]	T6, T6510, T6511 [c]	-		≤ 40	310	-	260	-	8	6

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		$Rp_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	S [b]	t	min.	max.	min.	max.	A % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
445)	6065	Extruded rod/bar	T6	≤ 220	≤ 155	-	260	-	240	-	10	8
446)		Extruded tube Not specified										
447)		Extruded profile	**T6**	-	-	**≤ 25**	**260**	**-**	**240**	**-**	**10**	**8**
448)	6081	Extruded rod/bar	T6	≤ 250	≤ 250	-	275	-	240	-	8	6
449)		Extruded tube	T6	-	-	≤ 25	275	-	240	-	8	6
450)		Extruded profile	Open profile T6	-	-	≤ 25	275	-	240	-	8	6
451)			Hollow profile T6	-	-	≤ 15	275	-	240	-	8	6
452)	6082	Extruded rod/bar	O, H111	≤ 200	≤ 200	-	-	160	-	110	14	12
453)			T4	≤ 200	≤ 200	-	205	-	110	-	14	12
454)			T6 , T6510, T6511	≤ 20	≤ 20		295	-	250	-	8	6
455)				20 < D ≤ 150	20 < S ≤ 150		310	-	260	-	8	-
456)				150 < D ≤ 200	150 < S ≤ 200		280	-	240	-	6	-
457)				200 < D ≤ 250	200 < S ≤ 250		270	-	200	-	6	-
458)		Extruded tube	O, H111	-	-	≤ 25	-	160	-	110	14	12
459)			T4	-	-	≤ 25	205	-	110	-	14	12
460)			T6 , T6510, T6511	-	-	≤ 5	290	-	250	-	8	6
461)				-	-	5 < t ≤ 25	310	-	260	-	10	8
462)		Extruded profile	O, H111	-	-	all	-	160	-	110	14	12
463)			T4		-	≤ 25	205	-	110	-	14	12
464)			Open profile T5	-	-	≤ 5	270	-	230	-	8	6
465)			Open profile T6 , T6510, T6511	-	-	≤ 5						
466)				--		5 < t ≤ 25	310	-	260	-	10	8
467)			Hollow profile T5	-	-	≤ 5	270	-	230	-	8	6
468)			Hollow profile T6, T6510, T6511	-	-	≤ 5	290	-	250	-	8	6
469)				-	-	5 < t ≤ 15	310	-	260	-	10	8
470)	6082B	All	F	-	-	<200	110	-	80	-	-	12
471)			O	-	-	<200	-	150	-	-	-	16
472)			T4	-	-	<200	170	-	100	-	-	12
473)			T6	-	-	<200	280	-	240	-	-	6
474)	6105	All	T1	-	-	<12.5	170		105		16	14
475)			T5	-	-	<12.5	260		240		8	7
476)			T6	-	-	<12.5	260	-	240	-	8	7

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		$Rp_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	S [b]	t	min.	max.	min.	max.	A % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
477)	6162	ALl	T5, T5510, T5511	-	-	<25	255	-	235	-	7	6
478)			T6, T6510, T6511	-	-	<6.3	260	-	240	-	8	-
479)				-	-	6.3 < D ≤12.5	260	-	240	-	10	9
480)	6182	Extruded rod/bar	T4	≤ 220	≤ 155	-	205	-	110	-	12	10
481)			T6 [c]	9 < D ≤ 100	9 < S ≤ 100		360	-	330	-	9	7
482)				100 < D ≤ 150	100 < S ≤ 150	-	330	-	300	-	8	6
483)				150 < D ≤ 220	150 < S ≤ 220	-	280	-	240	-	6	4
484)	7003	Extruded rod/bar	T5	all	all	-	310	-	260	-	10	8
485)			T6	≤ 50	≤ 50	-	350	-	290	-	10	8
486)				50 < D ≤ 150	50 < S ≤ 150	-	340	,	280	-	10	8
487)		Extruded tube	T5	-	-	all	310	-	260	-	10	8
488)			T6	-	-	10	350	-	290	-	10	8
489)				-	-	10 < t ≤ 25	340	-	280	-	10	8
490)		Extruded profile	T5	-	-	all	310	-	260	-	10	8
491)			T6	-	-	≤ 10	350	-	290	-	10	8
492)				-	-	10 < t ≤ 25	340	-	280	-	10	8
493)	7005	Extruded rod/bar	T6	≤ 50	≤ 50	-	350	-	290	-	10	8
494)				50 < D ≤	50 < S ≤	-	340	-	270	-	10	-
495)				200	200	-	-	-	-	-	-	-
496)		Extruded tube	T6	-		≤ 15	350	-	290	-	10	8
497)		Extruded profile	T6	-	-	≤ 40	350	-	290	-	10	8
498)	7005A	All	T4	-	-	<150	255	-	220	-	-	9
499)			T6	-	-	<150	285	-	245	-	-	7
500)	7108	Extruded rod/bar	T6	≤ 100	≤ 100	-	310	-	260		10	8
501)		Extruded tube	T6	-	-	≤ 20	310	-	260	-	10	8
502)		Extruded profile	T6	-	-	≤ 30	310	-	260	-	10	8
503)	7108A	Extruded rod/bar	T6	≤ 200	≤ 200	-	310	-	260	-	12	10
504)			T66	≤ 50	≤ 50	-	350	-	290	-	10	8
505)				50 < D ≤ 200	50 < S ≤ 200	-	340	-	275	-	10	-
506)		Extruded tube	T6	-	-	≤ 20	310	-	260	-	12	10
507)			T66	-	-	≤ 20	350	-	290	-	10	8
508)		Extruded profile	T6	-	-	≤ 40	310	-	260	-	12	10
509)			T66	-	-	≤ 40	350	-	290	-	10	8

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		*R*p$_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	*A* % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
510)	**702**0	Extruded rod/bar	T6	≤ 50	≤ 50	-	350	-	290	-	10	8
511)				50 < *D* ≤ 200	50 < *S* ≤ 200	-	340	-	275	-	10	-
512)		Extruded tube	T6	-	-	≤ 15	350	-	290	-	10	8
513)		Extruded profile	T6	-	-	≤ 40	350	-	290	-	10	8
514)	7021	Extruded rod/bar	T6	≤ 40	≤ 40	-	410	-	350	-	10	8
515)		Extruded tube	T6	-	-	≤ 10	410	-	350	-	10	8
516)		Extruded profile	T6	-	-	≤ 20	410	-	350	-	10	8
517)	7022	Extruded rod/bar	T6, T6510, T6511	≤ 80	≤ 80	-	490	-	420	-	7	5
518)				80 < *D* ≤ 200	80 < *S* ≤ 200	-	470	-	400	-	7	-
519)		Extruded tube	T6, T6510, T6511	-	-	≤ 30	490	-	420	-	7	5
520)		Extruded profile	T6, T6510, T6511	-	-	≤ 30	490	-	420	-	7	5
521)	7049A	Extruded rod/bar	T6, T6510, T6511	≤ 100	≤ 100	-	610	-	530	-	5	4
522)				100 < *D* ≤ 125	100 < *S* ≤ 125	-	560	-	500	-	5	-
523)				125 < *D* ≤ 150	125 < *S* ≤ 150	-	520	-	430	-	5	-
524)				150 < *D* ≤ 180	150 < *S* ≤ 180	-	450	-	400	-	3	-
525)		Extruded tube	T6, T6510, T6511	-	-	≤ 30	610	-	530	-	5	4
526)		Extruded profile	T6, T6510, T6511	-	-	≤ 30	610	-	530	-	5	4
527)	7075	Extruded rod/bar	O, H111	≤ 200	≤ 200	-	-	275	-	165	10	8
528)			T6, T6510, T6511	≤ 25	≤ 25	-	540	-	480	-	7	5
529)				25 < *D* ≤ 100	25 < *S* ≤ 100	-	560	-	500	-	7	-
530)				100 < *D* ≤ 150	100 < *S* ≤ 150	-	550	-	440	-	5	-
531)				150 < *D* ≤ 200	150 < *S* ≤ 200	-	440	-	400	-	5	-
532)			T73, T73510, T73511	≤ 25	≤ 25	-	485	-	420	-	7	5
533)				25 < *D* ≤ 75	25 < *S* ≤ 75	-	475	-	405	-	7	-
534)				75 < *D* ≤ 100	75 < *S* ≤ 100	-	470	-	390	-	6	-
535)				100 < *D* ≤ 150	100 < *S* ≤ 150	-	440	-	360	-	6	-
536)		Extruded tube	O, H111	-	-	≤ 10	-	275	-	165	10	-
537)				-	-	≤ 5	540	-	485	-	8	6

Sl No.	Alloy Designation	Type of profile	Temper	Dimensions mm			*R*m MPa		*R*p$_{0.2}$ MPa		*Elongation , Percent*	
				D [a]	*S* [b]	*t*	min.	max.	min.	max.	*A* % min.	$A_{50\ mm}$ % min.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
538)			T6, T6510, T6511	-	-	$5 < t \leq 10$	540	-	485	-	7	5
539)				-	-	$10 < t \leq 50$	560	-	505	-	6	4
540)			T73, T73510, T73511	-	-	≤ 5	470	-	400	-	7	5
541)				-	-	$5 < t \leq 25$	485	-	420	-	8	6
542)				-	-	$25 < t \leq 50$	475	-	405	-	8	-
543)		Extruded profile [c]	T6, T6510, T6511	-	-	≤ 25	530	-	460	-	6	4
544)				-	-	$25 < t \leq 60$	540	-	470	-	6	-
545)			T73, T73510, T73511	-	-	≤ 25	485	-	420	-	7	5
546)		All	T76, T76510, T76511	-	-	≤ 1.25	500	-	435	-	7	-
547)				-	-	$1.25 < t \leq 6.30$	510	-	440	-	7	-
548)				-	-	$6.30 < t \leq 50$	515		450	-		6
549)				-	-	$50 < t \leq 75$	510	-	440	-	-	6
550)				-	-	$75 < t \leq 100$	510	-	435	-	-	6
551)	7075A	All	O	-	-	<150	-	290	-	-	-	10
552)			T6	-	-	<150	500	-	430	-	-	6
553)	7116	All	T5	-	-	$3.20 < t \leq 12.5$	330		290		8	7
555)	7129	All	T5, T6	-	-	<12.5	380		340		9	8

NOTES

1 [a] *D* = Diameter for round bar.

2 [b] *S* = Width across flats for square and hexagonal bar, thickness for rectangular bar.

3. TD = Wall thickness of extruded tubes or extruded profile.

4 [c] F Temper: property values are for information only.

5[d] If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile cross section. This is applicable for all profiles and grades whether marked with the superscript [d] or not.

6 For the purpose of referring the mechanical properties listed in above table, any extruded shape or size which is not a rod, bar or tube, is considered as a profile.

7 For the purpose of referring the mechanical properties listed in above table, any extruded round tube, extruded tube (other than round), extruded structural tube and extruded seamless tube are considered as extruded tube.

8 The A value for elongation is the % elongation measured over a gauge length of $5.65\sqrt{So}$ (where So is the initial cross-sectional area of the test-piece), and expressed in percent.

9 For certain products the supplier may choose (if not otherwise specified in the order documents) to use the elongation based on A_{50mm}. Consequently, values for the A_{50mm} are included in the above table.

ANNEX-A

Table 10: Comparison of old and new nomenclature of alloys/grades

Sl No.	Nomenclature of grade mentioned in IS 733 : 1983 and IS 1285 : 2002 (withdrawn version)	Nomenclature in this standard
1)	19000	1200B
2)	19500	1050B
3)	19600	1060A
4)	24345	2014B
5)	24534	2024B
6)	43000	4043B
7)	46000	4047B
8)	52000	5052A
9)	53000	5754A
10)	54300	5083A
11)	63400	6063B
12)	64423	6066A
13)	64430	6082B
14)	65032	6261A
15)	74530	7005A
16)	76528	7075A
17)	31000	3003A
18)	62400	6005D
19)	65028	6061B