



Aluminium Alloy - EN Standards for Aluminium Extrusions

The old BS1474 - 1987 standard has been replaced by a number of EN standards of which the most important are:

- EN754 - Cold drawn rod, bar & tube
- EN755 - Hot extruded products
- EN12020 - Extruded precision profiles in alloys 6060 & 6063
- EN515 - Temper Designations
- EN573-1: Numerical alloy designation system
- EN573-2: Chemical symbol designation system
- EN573-3: Chemical Compositions
- EN573-4: Product forms in different alloys

For those familiar with the old BS1474 it is useful to highlight where the new EN standards differ:

- Chemical Compositions – No Change.
- Alloy Numbering System – No Change.
- Temper Designations for Heat Treatable Alloys – A new wider range of special tempers having up to four digits after the T have been introduced for non-standard applications (e.g. T6151).
- Temper Designations for Non Heat Treatable Alloys – No change to existing tempers but a more comprehensive definition of how tempers are achieved. Soft (O) temper is now classified H111 and an intermediate temper H112 is introduced. For alloy 5251 tempers are now shown as H32/H34/H36/H38 (equivalent to H22/H24, etc). H19/H22 & H24 are now shown separately.

Chemical Compositions

Please refer to the datasheet entitled Aluminium Specifications.

Mechanical Properties

Please refer to the datasheet entitled Aluminium Specifications.

Note that for the purposes of tolerances the alloys are split into two groups:

- Group I – 1000 series, 3000 series, 6000 series, 5005, 5051, 5251

- Group II – 2000 series, 7000 series, 5052, 5154, 5454, 5754, 5083, 5086

ALLOY GROUPS

Alloy Group I	
1050, 1070, 1200, 1350, 3102, 3003, 3103	
5005, 5005A, 5051A, 5251	
6101A, 6101B, 6005, 6005A, 6106, 6008, 6010A, 6012, 6014, 6018, 6023, 6351, 6060, 6360,	
6061, 6261, 6262, 6262A, 6063, 6063A, 6463, 6065, 6081, 6082, 6182	
Alloy Group II	
2007, 2011, 2011A, 2014, 2014A, 2017A, 2024, 2030	
5019, 5049, 5052, 5154A, 5454, 5754, 5083, 5086	
7003, 7005, 7108, 7108A, 7020, 7021, 7022, 7049A, 7075	

DIAMETER TOLERANCES - ROUND BAR

Diameter mm	Tolerances mm (+/-)	
	Group I	Group II
8 to 18	0.22	0.30
19 to 25	0.25	0.35
26 to 40	0.30	0.40
41 to 50	0.35	0.45
51 to 65	0.40	0.50
66 to 80	0.45	0.70
81 to 100	0.55	0.90
101 to 120	0.65	1.0
121 to 150	0.80	1.2
151 to 180	1.0	1.4
181 to 220	1.15	1.7
221 to 270	1.3	2.0
271 to 320	1.6	2.5



Aluminium Alloy - EN Standards for Aluminium Extrusions

DIMENSIONAL TOLERANCES - SQUARE BAR

Width Across Flats (mm)	Tolerances mm (+/-)	
	Group I	Group II
10 to 18	0.22	0.30
19 to 25	0.25	0.35
26 to 40	0.30	0.40
41 to 50	0.35	0.45
51 to 65	0.40	0.50
66 to 80	0.45	0.70
81 to 100	0.55	0.90
101 to 120	0.65	1.0
121 to 150	0.80	1.2
151 to 180	1.0	1.4
181 to 220	1.15	1.7

WIDTH TOLERANCE - RECTANGULAR BARS

Width Across Flats (mm)	Tolerances mm (+/-)	
	Group I	Group II
10 to 18	0.25	0.35
19 to 30	0.30	0.40
31 to 50	0.40	0.50
51 to 80	0.60	0.70
81 to 120	0.80	1.0
121 to 180	1.0	1.4
181 to 240	1.4	1.8
241 to 350	1.8	2.2
351 to 450	2.2	2.8
451 to 600	3.0	3.5

DIMENSIONAL TOLERANCES - HEXAGON BAR

Width Across Flats (mm)	Tolerances mm (+/-)	
	Group I	Group II
10 to 18	0.22	0.30
19 to 25	0.25	0.35
26 to 40	0.30	0.40
41 to 50	0.35	0.45
51 to 65	0.40	0.50
66 to 80	0.50	0.70
81 to 100	0.55	0.90
101 to 120	0.65	1.0
121 to 150	0.80	1.2
151 to 180	1.0	1.4
181 to 220	1.15	1.7

SQUARENESS TOLERANCES - RECTANGULAR BAR

Width Across Flats (mm)	Max Deviation from Square (mm)
2 to 10	0.1
11 to 100	0.01 x Width Across Flats
101 to 180	1.0
181 to 240	1.5

SQUARENESS TOLERANCES - SQUARE BARS

Width Across Flats (mm)	Max Deviation from Square (mm)
10 to 100	0.01 x Width across Flats
101 to 180	1.0
181 to 220	1.5



Aluminium Alloy - EN Standards for Aluminium Extrusions

MAX CORNER RADII - SQUARE BARS

Width Across Flats (mm)	Tolerances mm (+/-)	
	Group I	Group II
10 to 25	1.0	1.5
26 to 50	1.5	2.0
51 to 80	2.0	3.0
81 to 120	2.5	3.0
121 to 180	2.5	4.0
181 to 220	3.5	5.0

THICKNESS TOLERANCES FOR RECTANGULAR BAR - GROUP I

Width Across Flats (mm)	Tols +/-				
	2-6mm	6.1 - 10mm	10.1- 18mm	19- 30mm	31- 50mm
10 to 18	0.20	0.25	0.25	-	-
19 to 30	0.20	0.25	0.30	0.3	-
31 to 50	0.25	0.25	0.30	0.35	0.4
51 to 80	0.25	0.30	0.35	0.40	0.5
81 to 120	0.30	0.35	0.40	0.45	0.6
121 to 180	0.40	0.45	0.50	0.55	0.6
181 to 240	-	0.55	0.60	0.65	0.7
241 to 350	-	0.65	0.70	0.75	0.8
351 to 450	-	-	0.80	0.85	0.9
451 to 600	-	-	-	-	0.9

THICKNESS TOLERANCES FOR RECTANGULAR BAR - GROUP I

Width Across Flats (mm)	Tols +/-			
	51-80mm	81- 120mm	121- 180mm	181- 240mm
10 to 18	-	-	-	-
19 to 30	-	-	-	-
31 to 50	-	-	-	-
51 to 80	0.6	-	-	-
81 to 120	0.7	0.8	-	-
121 to 180	0.7	0.9	1.0	-
181 to 240	0.8	1.0	1.2	1.4
241 to 350	0.9	1.1	1.3	1.5
351 to 450	1.0	1.2	1.4	1.6
451 to 600	1.0	1.4	-	-



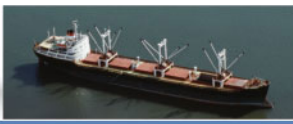
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THICKNESS TOLERANCES FOR RECTANGULAR BAR-GROUP II

Width Across Flats (mm)	Tols +/-	Tols +/-	Tols +/-	Tols +/-	Tols +/-
	2-6mm	6.1-10mm	10.1-18mm	19-30mm	31-50mm
10 to 18	0.25	0.30	0.35	-	-
19 to 30	0.25	0.30	0.40	0.40	-
31 to 50	0.30	0.30	0.40	0.5	0.5
51 to 80	0.30	0.35	0.45	0.6	0.7
81 to 120	0.35	0.40	0.5	0.6	0.7
121 to 180	0.45	0.50	0.55	0.7	0.8
181 to 240	-	0.60	0.65	0.7	0.9
241 to 350	-	0.70	0.75	0.8	0.9
351 to 450	-	-	0.9	1.0	1.1
451 to 600	-	-	-	-	1.2

THICKNESS TOLERANCES FOR RECTANGULAR BAR-GROUP II

Width Across Flats (mm)	Tols +/-	Tols +/-	Tols +/-	Tols +/-
	51-80mm	81-120mm	121-180mm	181-240mm
10 to 18	-	-	-	-
19 to 30	-	-	-	-
31 to 50	-	-	-	-
51 to 80	0.7	-	-	-
81 to 120	0.8	1.0	-	-
121 to 180	1.0	1.1	1.4	-
181 to 240	1.1	1.3	1.6	1.8
241 to 350	1.2	1.4	1.7	1.9
351 to 450	1.4	1.8	2.1	2.3
451 to 600	1.4	1.8	-	-



Aluminium Alloy - EN Standards for Aluminium Extrusions

DIAMETER TOLERANCES FOR SMLS & PORTHOLE ROUND TUBE

Diam. (mm) OD or ID	Max Deviation of Mean Diam. mm (+/-)	Max Dev. at Any Point mm	Max Dev. at Any Point mm	Max Dev. at Any Point mm
		Not Annealed or Heat Treated	Heat-Treated	Annealed
8 to 18	0.25	0.4	0.6	1.5
19 to 30	0.30	0.5	0.7	1.8
31 to 50	0.35	0.6	0.9	2.2
51 to 80	0.40	0.7	1.1	2.6
81 to 120	0.60	0.9	1.4	3.6
121 to 200	0.90	1.4	2.0	5.0
201 to 350	1.4	1.9	3.0	7.6
351 to 450	1.9	2.8	4.0	10.0

TOL - WIDTH,DEPTH,WIDTH A/F FOR SMLS & P/HOLE TUBE

Width, Depth or Width A/F	Ovality Tols (+/- mm)		Ovality Tols (+/- mm)	
	Group I 0 to 100mm	Group I 101 to 200	Group I 201 to 300	Group I 301 to 350
Up to 10	0.25	0.30	0.35	0.40
11 to 25	0.30	0.40	0.50	0.60
26 to 50	0.50	0.60	0.80	0.90
51 to 100	0.70	0.90	1.10	1.30
101 to 150	-	1.10	1.30	1.50
151 to 200	-	1.30	1.50	1.80
201 to 300	-	-	1.70	2.10
301 to 350	-	-	-	2.80

WALL THICKNESS TOLS FOR SEAMLESS ROUND TUBE

Wall Thickness (mm)	Tolerance Measured at any Point (+/- %)
0.5 to 3.0	10
3.0 to 5.0	9
Over 5.0	8

TOL - WIDTH,DEPTH,WIDTH A/F FOR SMLS & P/HOLE TUBE

Width, Depth or Width A/F	Ovality Tols (+/- mm)		Ovality Tols (+/- mm)	
	Group II 0 to 100mm	Group II 101 to 200mm	Group II 201 to 300mm	Group II 301 to 350mm
Up to 10	0.40	0.50	0.55	0.60
11 to 25	0.50	0.70	0.80	0.90
26 to 50	0.80	0.90	1.0	1.20
51 to 100	1.0	1.20	1.30	1.60
101 to 150	-	1.50	1.70	1.80
151 to 200	-	1.90	2.20	2.40
201 to 300	-	-	2.50	2.80
301 to 350	-	-	-	3.50



Aluminium Alloy - EN Standards for Aluminium Extrusions

TOLS ON WT FOR SMLS TUBE - OTHER THAN ROUND TUBE

Wall Thickness (mm)	Tols (+/- mm) for given Circumscribing Circle	Tols (+/- mm) for given Circumscribing Circle	Tols (+/- mm) for given Circumscribing Circle
	Up to 100mm Group I	101 to 300mm Group I	301 to 350mm Group I
0.5 to 1.5	0.25	0.35	-
1.51 to 3.0	0.30	0.50	0.75
3.1 to 6.0	0.50	0.75	1.0
6.1 to 10	0.75	1.0	1.2
11 to 15	1.0	1.2	1.5
16 to 20	1.5	1.9	2.0
31 to 30	1.9	2.2	2.5
31 to 40	-	2.5	2.7

TOLS ON WT FOR SMLS TUBE - OTHER THAN ROUND TUBE

Wall Thickness (mm)	Tols (+/- mm) for given Circumscribing Circle	Tols (+/- mm) for given Circumscribing Circle	Tols (+/- mm) for given Circumscribing Circle
	Up to 100mm Group II	101 to 300mm Group II	301 to 350mm Group II
0.5 to 1.5	0.35	0.50	-
1.51 to 3.0	0.45	0.65	0.9
3.1 to 6.0	0.60	0.90	1.2
6.1 to 10	1.0	1.3	1.5
11 to 15	1.3	1.7	1.9
16 to 20	1.9	2.2	2.5
21 to 30	2.2	2.7	3.1
31 to 40	-	-	-

WALL THICKNESS TOLERANCES FOR PORTHOLE ROUND TUBE

Wall Thickness (mm)	Tolerance Measured at Any Point (+/- %)
3.0	7
3.0 to 5.0	6
Over 5.0	5

TOLS ON WT FOR P/HOLE TUBE - OTHER THAN ROUND TUBE

Wall Thickness (mm)	Tols (+/- mm) for given Circumscribing Circle	Tols (+/- mm) for given Circumscribing Circle	Tols (+/- mm) for given Circumscribing Circle
	Up to 100mm Group I	101 to 300mm Group I	301 to 350mm Group I
0.5 to 1.5	0.20	0.30	-
1.51 to 3.0	0.25	0.40	0.60
3.1 to 6.0	0.40	0.60	0.80
6.1 to 10.0	0.60	0.80	1.0
11 to 15	0.80	1.0	1.2
16 to 20	1.2	1.5	1.7
21 to 30	1.5	1.8	2.0
31 to 40	-	2.0	2.0



Aluminium Alloy - EN Standards for Aluminium Extrusions

TOLS ON WT FOR P/HOLE TUBE - OTHER THAN ROUND TUBE

Wall Thickness (mm)	Tols (+/- mm) for given Circumscribing Circle	Tols (+/- mm) for given Circumscribing Circle	Tols (+/- mm) for given Circumscribing Circle
	Up to 100mm Group II	101 to 300mm Group II	301 to 350mm Group II
0.5 to 1.5	0.30	0.40	-
1.51 to 3.0	0.35	0.50	0.70
3.1 to 6.0	0.55	0.70	0.90
6.1 to 10	0.75	1.0	1.2
11 to 15	1.0	1.3	1.5
16 to 20	1.5	1.8	2.0
21 to 30	1.8	2.2	2.5
31 to 40	-	2.5	3.0

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REVISION HISTORY

Datasheet Updated 13 November 2018

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