

# Aluminium – EN Standards for Extruded Products

The old BS1474 - 1987 standard has been replaced by a number of EN standards of which the most important are:

Standard	Scope
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**.

## Alloy Groups

Alloy Group	Main Alloying Element	Common Alloys	Previous Name
<b>1000 Series</b>	Pure	1050 / 1200	1B / 1C
<b>2000 Series</b>	Copper	2014	H15
<b>3000 Series</b>	Manganese	3103	N3
<b>4000 Series</b>	Silicon	Alclad 4343 / 4015	N21
<b>5000 Series</b>	Magnesium	5251 / 5083	N4 / N8
<b>6000 Series</b>	Magnesium Silicon	6063 / 6082	H9 / H30
<b>7000 Series</b>	Zinc Magnesium Copper	7020 / 7075	H17
<b>8000 Series</b>	Others	8011	

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

- ◆ **Group I** – 1000 series, 3000 series, 5005, 6101, 6005, 6106, 6060, 6063, 6463
- ◆ **Group II** – 2000 series, 7000 series, 5051, 5251, 5052, 5154, 5454, 5754, 5083, 5086



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## Diameter Tolerances – Round Bars

Diameter mm	Tolerances in mm Plus or Minus	
	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
221 to 270	1.3	2.0
271 to 320	1.6	2.5

## Dimensional Tolerances – Square Bars

Width Across Flats (mm)	Tolerances in mm Plus or Minus	
	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	0.40	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

## Dimensional Tolerances – Hexagon Bars

Width Across Flats (mm)	Tolerances in mm Plus or Minus	
	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

## Max Corner Radii – Square Bars

Width Across Flats (mm)	Tolerances in mm Plus or Minus	
	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

## 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

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# Aluminium – EN Standards for Extruded Products

## Width Tolerance – Rectangular Bars

Width Across Flats (mm)	Tolerances in mm Plus or Minus	
	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

## Squareness Tolerances – Rectangular Bars

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

## Thickness Tolerances for Rectangular Bars – Group I

Width Across Flats (mm)	Thickness Tolerances in mm Plus or Minus for given thickness range in mm								
	2-6	6.1-10	10.1-18	19-30	31-50	51-80	81-120	121-180	181-240
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	0.6	-	-	-
81 to 120	0.30	0.35	0.40	0.45	0.6	0.7	0.8	-	-
121 to 180	0.40	0.45	0.50	0.55	0.6	0.7	0.9	1.0	-
181 to 240	-	0.55	0.60	0.65	0.7	0.8	1.0	1.2	1.4
241 to 350	-	0.65	0.70	0.75	0.8	0.9	1.1	1.3	1.5
351 to 450	-	-	0.80	0.85	0.9	1.0	1.2	1.4	1.6
451 to 600	-	-	-	-	0.9	1.0	1.4	-	-



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# Aluminium – EN Standards for Extruded Products

## Thickness Tolerances for Rectangular Bars – Group II

Width Across Flats (mm)	Thickness Tolerances in mm Plus or Minus for given thickness range in mm								
	2-6	6.1-10	10.1-18	19-30	31-50	51-80	81-120	121-180	181-240
10 to 18	0.25	0.30	0.35	-	-	-	-	-	-
19 to 30	0.25	0.30	0.40	0.4	-	-	-	-	-
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	0.7	-	-	-
81 to 120	0.35	0.40	0.50	0.6	0.7	0.8	1.0	-	-
121 to 180	0.45	0.50	0.55	0.7	0.8	1.0	1.1	1.4	-
181 to 240	-	0.60	0.65	0.7	0.9	1.1	1.3	1.6	1.8
241 to 350	-	0.70	0.75	0.8	0.9	1.2	1.4	1.7	1.9
351 to 450	-	-	0.90	1.0	1.1	1.4	1.8	2.1	2.3
451 to 600	-	-	-	-	1.2	1.4	1.8	-	-

## Diameter Tolerances for Seamless & Porthole Round Tube

Diameter (mm) OD or ID	Max Deviation of Mean Diameter  + or – mm	Max Deviation 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



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# Aluminium – EN Standards for Extruded Products

## Wall Thickness Tolerances for SEAMLESS Round Tube

Wall Thickness (mm)	Tolerance Measured at Any Point (Plus or Minus %)
0.5 to 2.0	10
2.1 to 3.0	9
Over 3.0	8

## Tolerances on Width, Depth or Width Across Flats for Seamless & Porthole Tube

Width, Depth or Width Across Flats (mm)	Tolerances in mm Plus or Minus for given Circumscribing Circle Dimension in mm							
	Up to 100mm		101 to 200mm		201 to 300mm		301 to 350mm	
	Grp I	Grp II	Grp I	Grp II	Grp I	Grp II	Grp I	Grp II
<b>Up to 10</b>	0.25	0.4	0.3	0.5	0.35	0.55	0.4	0.6
<b>11 to 25</b>	0.30	0.5	0.4	0.7	0.5	0.8	0.6	0.9
<b>26 to 50</b>	0.50	0.8	0.6	0.9	0.8	1.0	0.9	1.2
<b>51 to 100</b>	0.70	1.0	0.9	1.2	1.1	1.3	1.3	1.6
<b>101 to 150</b>	-	-	1.1	1.5	1.3	1.7	1.5	1.8
<b>151 to 200</b>	-	-	1.3	1.9	1.5	2.2	1.8	2.4
<b>201 to 300</b>	-	-	-	-	1.7	2.5	2.1	2.8
<b>301 to 350</b>	-	-	-	-	-	-	2.8	3.5

## Tolerances on Wall Thickness for SEAMLESS Tube – Other Than Round Tube

Wall Thickness (mm)	Tolerances in mm Plus or Minus for given Circumscribing Circle Dimension in mm					
	Up to 100mm		101 to 300mm		301 to 350mm	
	Grp I	Grp II	Grp I	Grp II	Grp I	Grp II
<b>0.5 to 1.5</b>	0.25	0.35	0.35	0.50	-	-
<b>1.51 to 3.0</b>	0.30	0.45	0.50	0.65	0.75	0.9
<b>3.1 to 6.0</b>	0.50	0.6	0.75	0.90	1.0	1.2
<b>6.1 to 10</b>	0.75	1.0	1.0	1.3	1.2	1.5
<b>11 to 15</b>	1.0	1.3	1.2	1.7	1.5	1.9
<b>16 to 20</b>	1.5	1.9	1.9	2.2	2.0	2.5
<b>21 to 30</b>	1.9	2.2	2.2	2.7	2.5	3.1
<b>31 to 40</b>	-	-	2.5	-	2.7	-



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## Wall Thickness Tolerances for PORTHOLE Round Tube

Wall Thickness (mm)	Tolerance Measured at Any Point (Plus or Minus %)
0.5 to 2.0	7
2.1 to 3.0	6
Over 3.0	5

## Tolerances on Wall Thickness for PORTHOLE Tube – Other Than Round Tube

Wall Thickness (mm)	Tolerances in mm Plus or Minus for given Circumscribing Circle Dimension in mm					
	Up to 100mm		101 to 300mm		301 to 350mm	
	I	II	I	II	I	II
0.5 to 1.5	0.20	0.30	0.3	0.4	-	-
1.51 to 3.0	0.25	0.35	0.4	0.5	0.6	0.7
3.1 to 6.0	0.40	0.55	0.6	0.7	0.8	0.9
6.1 to 10	0.60	0.75	0.8	1.0	1.0	1.2
11 to 15	0.80	1.0	1.0	1.3	1.2	1.5
16 to 20	1.2	1.5	1.5	1.8	1.7	3.0
21 to 30	1.5	1.8	1.8	2.2	2.0	3.5
31 to 40	-	-	2.0	2.5	2.0	3.0
<p>♦ In this table alloys covered in the columns headed II are: 5051, 5251, 5052, 6012, 6018, 6351, 6061, 6262, 6081, 6082, 7 Series</p> <p>♦ Other alloys are covered in the columns headed I</p>						

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