Aluminium – EN Standards for Rolled Products

The old BS1470 standard has been replaced by nine EN standards:

Standard	Scope
EN485-1	Technical conditions for inspection and delivery
EN485-2	Mechanical Properties
EN485-3	Tolerances for HOT Rolled Material
EN485-4	Tolerances for COLD Rolled material
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 BS1470 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.
- Mechanical Properties – Similar but not identical. Also, 0.2% Proof Stress must now be quoted on test certificates.
- Thickness Tolerances – Considerably tighter for alloys 1050A & 3103. To reflect manufacturing difficulty the tolerances for alloys 5251, 5083 & 6082 are now wider than this, although still a little tighter than in BS1470.
- Length & Width Tolerances – These tend to be tighter and are now all on the plus side (i.e. minus zero).
- Flatness Tolerances – These are considerably tighter.

Chemical Composition

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
1000 Series	Pure	1050 / 1200	1B / 1C
2000 Series	Copper	2014	H15
3000 Series	Manganese	3103	N3
4000 Series	Silicon	Alclad 4343 / 4015	N21
5000 Series	Magnesium	5251 / 5083	N4 / N8
6000 Series	Magnesium Silicon	6063 / 6082	H9 / H30
7000 Series	Zinc Magnesium Copper	7020 / 7075	H17
8000 Series	Others	8011	

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Length Tolerances

Thickness (mm)	Hot Rolled EN485-3 Minus 0mm Plus:	Cold Rolled EN485-4 Minus 0mm Plus:
0.2 to 3.0	8.0mm	6.0mm
3.0 to 6.0	8.0mm	8.0mm
6.0 to 12.0	10.0mm	10.0mm
12.0 to 50.0	12.0mm	-
Over 50.0	14.0mm	-

Applies to lengths 2001mm to 3000mm

Width Tolerances

Width (mm)	Hot Rolled EN485-3 Minus 0mm Plus:	Cold Rolled EN485-4 Minus 0mm Plus:
0.2 to 3.0	-	3.0mm
3.1 to 6.0	7.0mm	4.0mm
6.1 to 12.0	7.0mm	5.0mm
12.1 to 50.0	8.0mm	-
51.0 to 200	8.0mm	-
201 to 400	12.0mm	

Applies to widths 1001mm to 2000mm for hot rolled and 501mm to 1250mm for cold rolled. For 1500mm wide cold rolled the tolerances are plus 4mm, 5mm & 5mm.

Thickness Tolerances – Hot Rolled

Thickness (mm)	Tolerance (+ or –) in mm for given width in mm	
	1250	**1500**
2.5 to 4.0	0.28	0.28
4.1 to 5.0	0.30	0.30
5.1 to 6.0	0.32	0.32
6.1 to 8.0	0.35	0.40
8.1 to 10.0	0.45	0.50
10.1 to 15.0	0.50	0.60
15.1 to 20	0.60	0.70
21 to 30	0.65	0.75
31 to 40	0.75	0.85
41 to 50	0.90	1.0
51 to 60	1.1	1.2
61 to 80	1.4	1.5
81 to 100	1.7	1.8
101 to 150	2.1	2.2
151 to 220	2.5	2.6
221 to 350	2.8	2.9
351 to 400	3.5	3.7

Flatness Tolerances

Product	Thickness	Max Deviation over a 2500mm length	Max Deviation over a 1250mm width
Cold Rolled	0.5 to 3.0 3.0 to 6.0	10.0mm 7.5mm	5.0mm 3.75m
Hot Rolled	6.0 to 200	5.0mm	2.5mm

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Thickness Tolerances – Cold Rolled

Note that for thickness tolerances of cold rolled material the alloys are split into two groups:

- Group I – 1000 series, 3000 series, 4006, 4007, 5005, 5050, 8011A
- Group II – 2000 series, 6000 series, 7000 series, 3004, 5040, 5049, 5251, 5052, 5154A, 5454, 5754, 5182, 5083, 5086

Thickness mm	Tolerance on thickness (+ or –) in mm					
	1000mm Wide		1250mm Wide		1500mm Wide	
	Group I	Group II	Group I	Group II	Group I	Group II
0.20 to 0.40	0.02	0.03	0.04	0.05	0.05	0.06
0.41 to 0.50	0.03	0.03	0.04	0.05	0.05	0.06
0.51 to 0.6	0.03	0.04	0.05	0.06	0.06	0.07
0.61 to 0.8	0.03	0.04	0.06	0.07	0.07	0.08
0.81 to 1.0	0.04	0.05	0.06	0.08	0.08	0.09
1.01 to 1,20	0.04	0.05	0.07	0.09	0.09	0.10
1.21 to 1.50	0.05	0.07	0.09	0.11	0.10	0.12
1.51 to 1.80	0.06	0.08	0.10	0.12	0.11	0.13
1.81 to 2.0	0.06	0.09	0.11	0.13	0.12	0.14
2.1 to 2.5	0.07	0.10	0.12	0.14	0.13	0.15
2.6 to 3.0	0.08	0.11	0.13	0.15	0.15	0.17
3.1 to 3.5	0.10	0.12	0.15	0.17	0.17	0.19
3.6 to 4.0	0.15		0.20		0.22	
4.1 to 5.0	0.18		0.22		0.24	
5.1 to 6.0	0.20		0.24		0.25	
6.1 to 8.0	0.24		0.30		0.31	
8.1 to 10.0	0.27		0.33		0.36	
10.1 to 12.0	0.32		0.38		0.40	
12.1 to 15.0	0.36		0.42		0.43	
15.1 to 20	0.38		0.44		0.46	
21 to 25	0.40		0.46		0.48	
26 to 30	0.45		0.50		0.53	
31 to 40	0.50		0.55		0.58	
41 to 50	0.55		0.60		0.63	

When measuring thickness a zone 10mm wide from the edges of the product shall be disregarded.

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