



Bright Bar Dimensional Tolerances B.S.970 Part 3 1991

Tolerances for cold drawn bar							
Section	Size, diameter or width across flats				Permitted variation		
	mm				mm		
Round	≥	6	≤	18	+0	to	-0.070
	>	18	≤	30	+0	to	-0.085
	>	30	≤	50	+0	to	-0.100
	>	50	≤	80	+0	to	-0.120
	>	80	≤	100	+0	to	-0.140
Square and hexagon	≥	6	≤	18	+0	to	-0.090
	>	18	≤	30	+0	to	-0.110
	>	30	≤	50	+0	to	-0.130
	>	50	≤	80	+0	to	-0.160
	>	80	≤	105	+0	to	-0.250
Flat (width)	<	18			+0	to	-0.110
	>	18	≤	30	+0	to	-0.130
	>	30	≤	50	+0	to	-0.160
	>	50	≤	80	+0	to	-0.190
	>	80	≤	100	+0	to	-0.220
	>	100	≤	130	+0	to	-0.350
	>	130	≤	160	+0	to	-1.000
	>	160	≤	320	+1.0	to	-1.000
Flat (thickness)	<	18			+0	to	-0.110
	>	18	≤	30	+0	to	-0.130
	>	30	≤	50	+0	to	-0.250
	>	50	≤	80	+0	to	-0.350

Notes:

1. Thickness shall be measured within 12mm of the edge for flats.
2. The diameter of round bars in the as drawn length shall be measured at a distance of at least 150mm from the end of the bar. Where round bars have been re-cut to a exact length the diameter shall be measured at least 10mm from the end of the bar.
3. The cross-sectional measurement of hexagons, squares and flat bars shall be measured at least 25mm from the end of the bar.

Note: The very ends of such bars might not necessarily meet the requirements of table 1 but these should not be regarded as defective if the remainder is in accordance with the above table.



Tolerances for turned bars						
Size, diameter				Permitted variation		
mm				mm		
≥	6	≤	18	+0	to	-0.070
>	18	≤	30	+0	to	-0.085
>	30	≤	50	+0	to	-0.100
>	50	≤	80	+0	to	-0.120
>	80	≤	120	+0	to	-0.140

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Round	Drawn Non Quenched and Tempered condition - h10 (see table below) Quenched and Tempered condition - h11 (see table below)			
	Turned All conditions - h10			
Square and Hexagon	> 1mm	≤ 80mm	-	h11
	> 80mm		-	h12

Nominal dimension					Tolerance class to ISO 286-21)						
mm					h6	h7	h8	h9	h10	h11	h12
>	1	to	≤	3	0.006	0.010	0.014	0.025	0.040	0.060	0.100
>	3	to	≤	6	0.008	0.012	0.018	0.030	0.048	0.075	0.120
>	6	to	≤	10	0.009	0.015	0.022	0.036	0.058	0.090	0.150
>	10	to	≤	18	0.011	0.018	0.027	0.043	0.070	0.110	0.180
>	18	to	≤	30	0.013	0.021	0.033	0.052	0.084	0.130	0.210
>	30	to	≤	50	0.016	0.025	0.039	0.062	0.100	0.160	0.250
>	50	to	≤	80	0.019	0.030	0.046	0.074	0.120	0.190	0.300
>	80	to	≤	120	0.022	0.035	0.054	0.087	0.140	0.220	0.350
>	120	to	≤	180	0.025	0.040	0.063	0.100	0.160	0.250	0.400
>	180	to	≤	200	0.029	0.046	0.072	0.115	0.185	0.290	0.460

1) The above deviation values are negatively disposed about the nominal dimension.
For example a 20mm nominal diameter having a tolerance class h9 is 20mm +0 -0.052mm or 19.948/20.000mm.



Out of section

Maximum deviation from "out of round" or "difference between opposing faces" for squares or hexagons shall neither be greater than half the specified tolerance nor above the upper limit of the tolerance.

Edges of non-round bars (flats, squares, hexagons)

Dimension ≤ 150mm - bars may have an undefined profile within 0.2mm of the hypothetical corner.

Dimension > 150mm - bars may have an undefined profile within 0.5mm of the hypothetical corner unless sharp corners specifically agreed.

In the case of flat products the width is the controlling dimension.

Tolerance for cold drawn flats							
Width					Deviation		ISO 286-2 class
mm					mm	mm	
			≤	18	+0	-0.11	h11
>	18		≤	30	+0	-0.13	h11
>	30		≤	50	+0	-0.16	h11
>	50		≤	80	+0	-0.19	h11
>	80		≤	100	+0	-0.22	h11
>	100		≤	150	+0.50	-0.50	
>	150		≤	200	+1.00	-1.00	
>	200		≤	300	+2.00	-2.00	
>	300		≤	400	+2.50	-2.50	
Width					Deviation ¹⁾		
mm					mm	mm	
>	3		≤	6	+0	-0.075	h11
>	6		≤	10	+0	-0.090	h11
>	10		≤	18	+0	-0.11	h11
>	18		≤	30	+0	-0.13	h11
>	30		≤	50	+0	-0.16	h11
>	50		≤	60	+0	-0.19	h11
>	60		≤	80	+0	-0.30	h12
>	80		≤	100	+0	-0.35	h12

1) The tolerances in the table apply to low carbon (0.20% maximum) and low carbon free-cutting steels only. For all other steels the quoted tolerances are increased by 50%.



Dimensional Inspection

- Round bars – not less than 150mm from end of bar.
- Round bars - cut to length – not less than 10mm from end of bar.
- Non-round bars – not less than 25mm from end of bar.

Dimensional tolerance for machined flats and squares

Flats:	Width	> 125mm	+0 -0.35mm
	Thickness	≥ 80mm	
Squares:		≥ 110mm	+0 -0.35mm

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