

# TOLERANCES

## HR CARBON AND ALLOY BARS

### Rounds and Squares

Specified Size in Inches	Variation from Size in Inches		Out of Round* or Square in Inches
	Over	Under	
Up to 5/16, incl.	.005	.005	.008
Over 5/16 to 7/16, incl.	.006	.006	.009
Over 7/16 to 5/8, incl.	.007	.007	.010
Over 5/8 to 3/4, incl.	.008	.008	.012
Over 3/4 to 1, incl.	.009	.009	.013
Over 1 to 1 1/8, incl.	.010	.010	.015
Over 1 1/8 to 1 1/4, incl.	.011	.011	.016
Over 1 1/4 to 1 3/8, incl.	.012	.012	.018
Over 1 3/8 to 1 1/2, incl.	.014	.014	.021
Over 1 1/2 to 2, incl.	1/64	1/64	.023
Over 2 to 2 1/2, incl.	1/32	0	.023
Over 2 1/2 to 3 1/2, incl.	3/64	0	.035
Over 3 1/2 to 4 1/2, incl.	1/16	0	.046
Over 4 1/2 to 5 1/2, incl.	5/64	0	.058
Over 5 1/2 to 6 1/2, incl.	1/8	0	.070
Over 6 1/2 to 8 1/4, incl.	5/32	0	.085
Over 8 1/4 to 9 1/2, incl.	3/16	0	.100
Over 9 1/2 to 10, incl.	1/4	0	.120

\*Out-of-round is the difference between the maximum and minimum diameters of a round bar measured at the same cross section. Out-of-square is the difference in the two dimensions at the same cross section of a square bar—each dimension being the distance between opposite faces.

### HEXAGONS AND OCTAGONS

Specified Sizes Between Opposite Sides, in.	Permissible Variations from Specified Size, in.		Out-of-Hexagon (Carbon Steel and Alloy Steel) or Out-of-Octagon (Alloy Steel), in.*
	Over	Under	
To 1/2, incl.	0.007	0.007	0.001
Over 1/2 to 1, incl.	0.010	0.010	0.015
Over 1 to 1 1/2, incl.	0.021	0.013	0.025
Over 1 1/2 to 2, incl.	1/32	1/64	1/32
Over 2 to 2 1/2, incl.	3/64	1/64	3/64
Over 2 1/2 to 3 1/2, incl.	1/16	1/64	1/16
Over 3 1/2 to 4 1/2, incl.	5/64	1/64	5/64

\*Out-of-hexagon or out-of-octagon is the greatest difference between any two dimensions at the same cross section between opposite faces.

### SQUARE EDGE AND ROUND EDGE FLATS

Tolerances apply to thickness in Inches

Specified width in Inches	.023 - .230 excl.	Variations from Thickness in Inches (Tolerances are over or under)						Variations from width in Inches	
		Under 1/4	1/4 - 1/2	1/2 - 1	1 - 2	2 - 3	Over 3	Over	Under
Up to 1	0.007	.007	.008	.010	—	—	—	1/64	1/64
Over 1-2	0.007	.007	.012	.015	1/32	—	—	1/32	1/32
Over 2-4	0.008	.008	.015	.020	1/32	3/64	3/64	1/16	1/32
Over 4-6	0.009	.009	.015	.020	1/32	3/64	3/64	3/32	1/16
Over 6-8	—	.015	.016	.025	1/32	3/64	**	1/8**	3/32**

\* Not produced as bar flats.

\*\* Thickness and width tolerances for flats over 6" to 8", incl., in width and over 3" in thickness should be established in each instance.

**Standard Straightness** — 1/4" in any 5 feet, or 1/4" × number of feet of length divided by 5.

**Special Straightness** — 1/8" in any 5 feet, or 1/8" × number of feet of length divided by 5.