Bar Markings

There are a number of important ways to identify reinforcing bar from the production mill to the fabrication shop to the job site. This documentation and marking system helps provide a wealth of useful information about the manufacturing and composition of each bar of reinforcing steel.

Reinforcing Bar Identification

Each individual reinforcing bar is manufactured with a series of individual markings:

- The top letter or symbol identifies the producing mill and deformation pattern.
- The next marking is the bar size.
- The third marking symbol designates the manufacturing material — usually either "S" for carbon-steel (ASTM A615) or "W" for low-alloy steel (ASTM A706).
- Finally, there will be a grade marking (4 or 5, for 420 or 520) or by the addition of one line (420) or two lines (520) that must be at least five deformations long.
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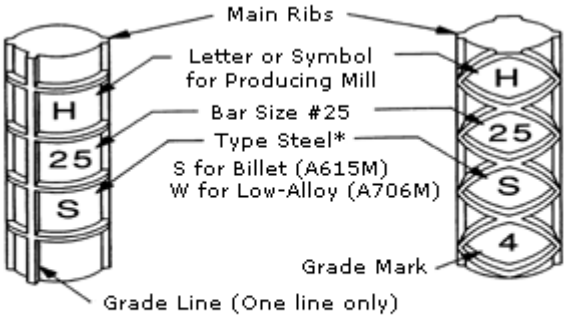
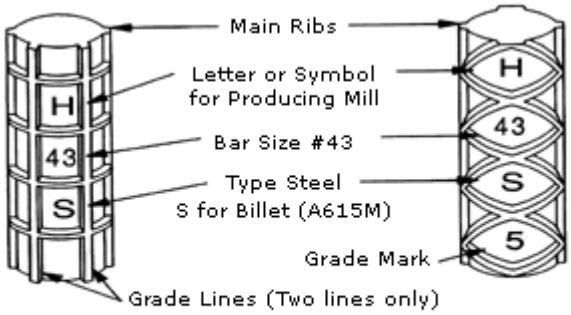


Grade 420



Grade 520

inch-pound grade	metric grade	Minimum Yield Strength	
		in pounds per square inch	in megapascals
Grade 40	Grade 280	40,000	280
Grade 60	Grade 420	60,000	420
Grade 75	Grade 520	75,000	520

In the United States, the size designations of these mild steel bars used to reinforce concrete are set by ASTM International. Distributors usually stock rebar in 20- and 60-foot lengths.

Most bars are “deformed,” that is, a pattern is rolled onto them which helps the concrete get a grip on the bar. The exact patterns are not specified, but the spacing, number and height of the bumps are. Between 1947 and 1968, a separate standard (ASTM A 305) covered the deformations. Since 1968 the deformation requirements have been incorporated into the basic standard. Plain bars are also made, but are used only in special situations in which the bars are expected to slide (for example, crossing expansion joints in highway pavement).

Three grades are defined, with metric equivalents:

According to the standard (sec. 20.3.5), “it shall be permissible to substitute a metric size bar of Grade 280 for the corresponding inch-pound size bar of Grade 40, a metric size bar of Grade 420 for the corresponding inch-pound size bar of Grade 60, and a metric size bar of Grade 520 for the corresponding inch-pound size bar of Grade 75.” Nothing is said regarding substituting inch-pound size bars when the specification is metric.

The size designations up through size 8 are the number of eighths of an inch in the diameter of a plain round bar having the same weight per foot as the deformed bar. So, for example, a number 5 bar would have the same mass per foot as a plain bar 5/8 inch in diameter. The metric size is the same dimension expressed to the nearest millimeter.

Sizes and Dimensions

Bar designation number	Nominal diameter in inches (not including the deformations)	Metric designation number	Weight in pounds per foot
3	0.375	10	0.376
4	0.500	13	0.668
5	0.625	16	1.043
6	0.750	19	1.502
7	0.875	22	2.044
8	1.000	25	2.670
9	1.128	29	3.400
10	1.270	32	4.303