

ASTM A354



Scope

The ASTM A354 specification covers the chemical and mechanical requirements of quenched and tempered alloy steel bolts, studs, and other externally threaded fasteners 4" and under in diameter. Two strength levels, grade BC and grade BD, are summarized in the chart to the right. This specification is unrestricted in its configuration and can be a headed bolt, bent bolt, or threaded rod.

Grades		
A354 BD	Research conducted on bolts of similar material and manufacture indicates that hydrogen-stress cracking or stress cracking corrosion may occur on hot-	A354 grade BD bolts are higher in strength than A354 grade BC and equal in strength to ASTM A490 bolts. Unlike ASTM A490 however, the A354 BD specification is unrestricted in its configuration. Since A490 bolts are heavy hex structural bolts and do not exceed 1-1/2" diameter, specification A354 BD should be considered for anchor bolts, threaded rods, other styles of headed bolts, and bolts larger than 1-1/2" diameter where similar mechanical properties are desired. A354 grade BD does not require a magnetic particle test as is required by the A490 specification.
A354 BC	Lower in strength than grade BD.	

Mechanical Properties					
Grade	Size	Tensile, ksi, min	Yield, ksi, min	Elong %, min	RA %, min
BC	1/4 - 2-1/2	125	109	16	50
	2-5/8 - 4	115	99	16	45
BD	1/4 - 2-1/2	150	130	14	40
	2-5/8 - 4	140	115	14	40

Chemical Properties		
Element	Sizes 1/4 to 1-1/2	Sizes above 1-1/2
Carbon	0.30 - 0.53%	0.35 - 0.53%
Phosphorus, max	0.04%	0.04%
Sulfur, max	0.04%	0.05%

Recommended Nuts and Washers			
Nuts			Washers
Grade BC		Grade BD	
Plain	Galvanized	Plain	
A563C Heavy Hex	A563DH Heavy Hex	A563DH Heavy Hex	F436

* Nuts of other grades load stresses greater than the specified grade are suitable. Follow the link for an ASTM A563 Nut Compatibility Chart.