





Mechanical Requirement Guidelines for Carbon Steel Externally Threaded Fasteners

Grade Designation	Nominal Size of Product in.	Material and Treatment	Mechanical Requirements						Grade Identification Marking
			Proof Load Stress ksi	Yield Strength ksi Min	Tensile Strength ksi Min	Product, Hardness, Rockwell			
						Surface Max	Core Min	Core Max	
A307 Gr. A	1/4 to 4	low or medium carbon steel	—	—	60	—	B69	B100	None Specified
A307 Gr. B	1/4 to 4		—	—	60 min 100 max	—	B69	B95	
SAE Gr. 1	1/4 to 1-1/2		33	36	60	—	B70	B100	
SAE Gr. 2	1/4 to 3/4	low or medium carbon steel, cold worked	55	57	74	—	B80	B100	None Specified
SAE Gr. 5	1/4 to 1 1-1/8 to 1-1/2	medium carbon steel; the product is quenched and tempered	85 74	82 81	120 105	30N54 30N50	C25 C19	C34 C30	
A449 Type 1	1/4 to 1 1-1/8 to 1-1/2 1-3/4 to 3		85 74 55	92 81 58	120 105 90	— — —	C25 C19 B91	C34 C30 B100	
A325 Type 1	1/2 to 1 1-1/8 to 1-1/2		85 74	92 81	120 105	— —	C24 C19	C35 C31	
SAE Gr. 5.2	1/4 to 1	low carbon boron steel; the product is quenched and tempered	85	92	120	30N56	C26	C36	
A449 Type 2	1/4 to 1		85	92	120	—	C25	C34	
A325 Type 2	1/2 to 1 1-1/8 to 1-1/2		85 74	92 81	120 105	— —	C24 C19	C35 C31	
A325 Type 3	1/2 to 1 1-1/8 to 1-1/2	atmospheric corrosion resistant steel; the product is quenched and tempered	85 74	92 81	120 105	— —	C24 C19	C35 C31	A325
SAE Gr. 8	1/4 to 1-1/2	medium carbon alloy steel; the product is quenched and tempered	120	130	150	30N58.6	C33	C39	
A354 Gr. BD	1/4 to 2-1/2 2-3/4 to 4		120 105	130 115	150 140	— —	C33 C31	C39 C38	
A490 Type 1	1/2 to 1-1/2		120	130	150 min 170 max	— —	C33	C38	
SAE Gr. 8.2	1/4 to 1	low carbon boron steel; the product is quenched and tempered	120	130	150	30N58.6	C33	C39	
A490 Type 2	1/2 to 1		120	130	150 min 170 max	—	C33	C38	
A490 Type 3	1/2 to 1-1/2	atmospheric corrosion resistant steel; the product is quenched and tempered	120	130	150 min 170 max	—	C33	C38	A490
See Note: 1, 4			2	2	2				3

NOTES:

1. In general, identification markings shall be located on the top of the product head and preferably shall be raised.
2. SAE Grade 2 products are available in lengths 6 in. and shorter only.