INDUSTRIAL FASTENERS INSTITUTE
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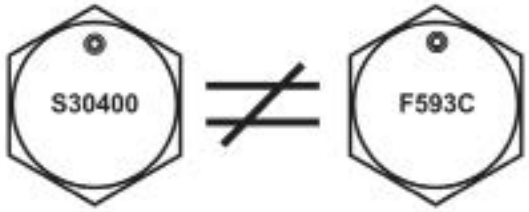
Stainless - 304 vs F593

Not All Stainless Bolt and Nut Markings Assure Conformance to Standards



No Standard
No Requirements

ASTM F593
Defined Requirements

Be sure when filling a purchaser's order for stainless steel bolts and/or nuts that they are provided exactly what they ask for. Many stainless steel bolts and nuts are simply marked "304" or "316". These markings do not indicate compliance with any particular industrial standard. They do not assure the purchaser of any chemistry, strength, or performance characteristics as are spelled out in the ASTM standards. The markings imply that the chemistry meets the requirements of the UNS S30400 or S31600 material, but that is not assured or mandated by any standards body like SAE, ASME, or ASTM. Bolts and nuts marked in this way may meet all of the requirements of one or more of the ASTM standards, but since these are not the markings required by ASTM there is no indication or assurance of such compliance.

If a purchaser just states, "I want 18-8 bolts and nuts." Or "I want 304 stainless bolts and nuts." Then those marked simply "304" are probably suitable. If the purchaser makes any reference to ASTM fasteners marked "304" or "316" are not suitable because they are not properly marked to comply with ASTM standards.

To assure purchasers they have stainless steel fasteners that will provide specific chemistry and physical characteristics, either ASTM A193 or ASTM A593 should be specified for bolts and either ASTM A194 or ASTM A594 should be specified for nuts. Below is a table that shows the difference between specifying an ASTM standard verses fasteners simply marked "304" or "316".

In addition to grade marking, ASTM requires bolts and nuts to be marked with a manufacturer's identification mark.

If stainless steel bolts and nuts are requested because they are intended to meet specific application requirements, they should be specified by using an appropriate standard reference. This is the only way to assure that the desired performance will be provided by the fasteners. It is good practice to specify fasteners that are marked and verified as meeting a specific ASTM standard instead of requesting fasten ers referring to the parts by slang or generic terms only, such as "18-8", "304" or "316".

For more information about the proper use of fastener standards send questions to the author at techinfo@indfast.org or subscribe to the state-of-theart online technical support service, IFI Technology Connection, at www.indfast.org.

Bolts

Marking	Standard	Chemistry	Tensile Strength	Yield Strength	Hardness
304	None	None	None	None	None
B8	ASTM A193	Type 304 stainless steel	75 ksi min.	30 ksi min.	HRB 96 max.
B8A	ASTM A193	Type 304 stainless steel	75 ksi min.	30 ksi min.	HRB 90 max.
F593C	ASTM F593 1/4 thru 5/8	Type 304 stainless steel	100 - 150 ksi	65 ksi min.	HRB 90 - HRC 32
F593D	ASTM F593 3/4 thru 1-1/2	Type 304 stainless steel	85 - 140 ksi	45 ksi min.	HRB 85 - HRC 32
316	None	None	None	None	None
B8M	ASTM A193	Type 316 stainless steel	75 ksi min.	30 ksi min.	HRB 96 max.
B8MA	ASTM A193	Type 316 stainless steel	75 ksi min.	30 ksi min.	HRB 90 max.
F593G	ASTM F593 1/4 thru 5/8	Type 316 stainless steel	100 - 150 ksi	65 ksi min.	HRB 90 - HRC 32
F593H	ASTM F593 3/4 thru 1-1/2	Type 316 stainless steel	85 - 140 ksi	45 ksi min.	HRB 85 - HRC 32

Nuts

Marking	Standard	Chemistry	Proof Load	Hardness
304	None	None	None	None
8	ASTM A194	Type 304 stainless steel	Heavy Hex, 80 ksi Hex, 75 ksi	HRB 60 - 105
8A	ASTM A194	Type 304 stainless steel	Heavy Hex, 80 ksi Hex, 75 ksi	HRB 60 - 90
F594C	ASTM F594	Type 304 stainless steel	100 ksi	HRB 95 - HRC 32
F594D	ASTM F594	Type 304 stainless steel	85 ksi	HRB 80 - HRC 32
316	None	None	None	None
8M	ASTM A194	Type 316 stainless steel	Heavy Hex, 80 ksi Hex, 75 ksi	HRB 60 - 105
8MA	ASTM A194	Type 316 stainless steel	Heavy Hex, 80 ksi Hex, 75 ksi	HRB 60 - 90
F594G	ASTM A594	Type 316 stainless steel	100 ksi	HRB 95 - HRC 32
F594H	ASTM F594	Type 316 stainless steel	85 ksi	HRB 80 - HRC 32

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