The American Society for Testing and Materials is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.

ASTM F594 Stainless steel nuts.

ASTM F594 covers the chemical and mechanical requirements for stainless steel nuts in diameters ranging from 1/4″ to 1-1/2″ inclusive and for use with fasteners conforming to ASTM F593. These nuts are for general purpose usage, and are available in seven alloy groups. Below is a basic summary of the common grades within the ASTM F594 specification. A number of other less common grades of ASTM F594 exist, but are not detailed in the description below. The Mechanical table here is limited to Alloy groups 1 and 2, as those are the most common and the Chemical table is only showing the most common alloy grades used for their respective alloy groups. More detailed information can be found in the ASTM F594 standard on the ASTM website.

F594 Alloy Groups

Alloy Group	Alloy Designation	Alloy Type
1	303, 304, 304L, 305, 384, XM1, 18-9LW, 302HQ, 303Se	Austenitic
2	316, 316L	Austenitic
3	321, 347	Austenitic
4	430, 430F	Ferritic
5	410, 416, 416Se	Martensitic
6	431	Martensitic
7	630 (17-4)	Precipitation Hardening
*The selection of an alloy within each group is at the discretion of the manufacturer unless the purchaser requests a specific alloy.		

F594 Mechanical Properties / Condition

Alloy Group	Condition	Marking	Diameter Range	Proof Stress, Hex Nuts, ksi	Proof Stress, Heavy Hex Nuts, ksi	Rockwell Hardness
1	AF	F594A	1/4 to 1-1/2	**70**	**76**	B85 max
	A	F594B	1/4 to 1-1/2	**75**	**81**	B65 to 95
	CW1	F594C	1/4 to 5/8	**100**	**108**	B95 to C32
	CW2	F594D	3/4 to 1-1/2	**85**	**92**	B80 to C32
2	AF	F594E	1/4 to 1-1/2	**70**	**76**	B85 max
	A	F594F	1/4 to 1-1/2	**75**	**81**	B65 to 95
	CW1	F594G	1/4 to 5/8	**100**	**108**	B95 to C32
	CW2	F594H	3/4 to 1-1/2	**85**	**92**	B80 to C32

F594 Chemical Requirements

Element, max except as shown	Alloy Group 1, Type 304	Alloy Group 2, Type 316
Carbon	0.08%	0.08%
Manganese	2.00%	2.00%
Phosphorus	0.045%	0.045%
Sulfur	0.030%	0.030%
Silicon	1.00%	1.00%
Chromium	18.0 to 20.0%	16.0 to 18.0%
Nickel	8.0 to 10.5%	10.0 to 14.0%
Copper	1.00%	
Molybdenum		2.00 to 3.00%

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