

CHEMICAL COMPOSITION (ASTM A194)

Grade Symbol	Material	UNS Number	Carbon, %	Manganese, %	Phosphorus, %	Sulfur, ^E %	Silicon, %	Chromium, %	Nickel, %	Molybdenum, %	Titanium, %	Columbium %	Nitrogen, %	Other Elements, %
1 2, 2HM, and 2H 4 ^G	carbon		0.15 min	1.00	0.040	0.050	0.40	...	...	...	...	...	...	...
	carbon		0.40 min	1.00	0.040	0.050	0.40	...	...	...	...	...	...	...
	carbon, molybdenum		0.40-0.50	0.70-0.90	0.035	0.040	0.15-0.35	...	...	0.20-0.30	...	...	...	...
3 6 6F 6F	Type 501		0.10 min	1.00	0.040	0.030	1.00	4.0-6.0	...	0.40-0.65	...	...	...	...
	Type 410	S41000	0.08-0.15	1.00	0.040	0.030	1.00	11.5-13.5	...	...	...	...	...	...
	Type 416	S41600	0.15	1.25	0.060	0.15 min	1.00	12.0-14.0	...	...	...	...	...	...
	Type 416Se	S41623	0.15	1.25	0.060	0.060	1.00	12.0-14.0	...	...	...	...	...	Selenium, 0.15 min
7, 7M	Type 4140/4142/4145, 4140H, 4142H, 4145H		0.38-0.48	0.75-1.0	0.035	0.04	0.15-0.35	0.80-1.10	...	0.15-0.25	...	...	...	...
	Type 304	S30400	0.08	2.00	0.045	0.030	1.00	18.0-20.0	8.0-11.0	...	...	...	...	...
8, 8A 8C, 8CA	Type 304	S30400	0.08	2.00	0.045	0.030	1.00	17.0-19.0	9.0-12.0	...	...	...	...	...
	Type 347	S34700	0.08	2.00	0.045	0.030	1.00	17.0-19.0	9.0-12.0	...	...	10 x carbon content, min 1.10	...	...
8CLN, 8CLNA	Type 347LN	S34751	0.005-0.020	2.00	0.045	0.030	1.00	17.0-19.0	9.0-13.0	...	...	0.20-0.50, 15 x carbon content, min	0.06-0.10	...
	Type 316	S31600	0.08	2.00	0.045	0.030	1.00	16.0-18.0	10.0-14.0	2.00-3.00	...	...	...	...
8M, 8MA 8T, 8TA	Type 321	S32100	0.08	2.00	0.045	0.030	1.00	17.0-19.0	9.0-12.0	...	5 x (C+N) min - 0.70 max	...	0.10	...
	Type 303	S30300	0.15	2.00	0.20	0.15 min	1.00	17.0-19.0	8.0-10.0	...	...	...	...	...
8F, 8FA 8F, 8FA	Type 303Se	S30323	0.15	2.00	0.20	0.06	1.00	17.0-19.0	8.0-10.0	...	...	...	...	Selenium, 0.15 min
	Type 305	S30500	0.12	2.00	0.045	0.030	1.00	17.0-19.0	11.0-13.0	...	...	...	...	...
8P, 8PA 8N, 8NA	Type 304N	S30451	0.08	2.00	0.045	0.030	1.00	18.0-20.0	8.0-11.0	...	...	...	0.10-0.16	...
	Type 304LN	S30453	0.030	2.00	0.045	0.030	1.00	18.0-20.0	8.0-11.0	...	...	...	0.10-0.16	...
8MN, 8MNA	Type 316N	S31651	0.08	2.00	0.045	0.030	1.00	16.0-18.0	10.0-13.0	2.00-3.00	...	...	0.10-0.16	...
	Type 316LN	S31653	0.030	2.00	0.045	0.030	1.00	16.0-18.0	10.0-13.0	2.00-3.00	...	...	0.10-0.16	...
8MLN, 8MLNA 8R, 8RAF	XM19	S20910	0.06	4.0-6.0	0.045	0.030	1.00	20.5-23.5	11.5-13.5	1.50-3.00	...	0.10-0.30	0.20-0.40	Vanadium, 0.10-0.30
	Type 8SA	S21800	0.10	7.0-9.0	0.060	0.030	3.5-4.5	16.0-18.0	8.0-9.0	...	...	...	0.08-0.18	...
8MLCuN, 8MLCuNA 8BML4CuN	S31254	S31254	0.020	1.00	0.030	0.010	0.80	19.5-20.5	17.5-18.5	6.0-6.5	...	...	0.18-0.22	Copper, 0.50-1.00
	S31730	S31730	0.030	2.00	0.040	0.010	1.00	17.0-19.0	15.0-16.5	3.0-4.0	...	...	0.045	Copper 4.0-5.0
9C, 9CA	N08367	N08367	0.030	2.00	0.040	0.030	1.00	20.0-22.0	23.5- 25.5	6.0-7.0	0.18-0.25	Copper 0.75

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CONTINUED

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16	Chromium Molybdenum Vanadium		0.36–0.47	0.45–0.70	0.035	0.040	0.15–0.35	0.80–1.15	...	0.50–0.65	Vanadium, 0.25–0.35 Aluminum ^B 0.015

^A The intentional addition of Bi, Se, Te, and Pb is not permitted except for Grades 6F, 8F, and 8FA, in which Se is specified and required.

^B Total aluminum, soluble and insoluble.

^C Maximum, unless minimum or range is indicated.

^D Where ellipses (-) appear in this table there is no requirement and the element need not be determined or reported.

^E Because of the degree to which sulfur segregates, product analysis for sulfur over 0.060 % max is not technologically appropriate.

^F As described in Specification A276.

^G Grade 4 is expected to be withdrawn within approximately 2 years. Grade 7 is an acceptable substitute for Grade 4. See 7.2.

