



**ASTM A 193/A 193M ALLOY STEEL, CARBON STEEL AND STAINLESS STEEL BOLTING FOR HIGH TEMPERATURE SERVICE**

ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Other	Hardness	Tensile (Mpa)	Yield (Mpa)	Elong. in Area %	Redu
A193B8-B8A AISI Type 304	0.08	2.00 max	1.00 max	0.03 max	0.045 max	18.00 20.00	8.00 10.50	-	-	223HB	515	205	30	50
A193B8-B8MA AISI Type 316	0.08 max	2.00 max	1.00 max	0.03 max	0.045 max	16.00 18.00	10.00 14.00	2.00 3.00		223HB 223HB	515	205	30	50
A193B8T-B8TA AISI Type 321	0.08 max	2.00 max	1.00 max	0.03 max	0.045 max	17.00 19.00	9.00 12.00	-	Ti > 5xC < 0.70	223HB	515	205	30	50
A193B8C-B8CA AISI Type 347	0.08 max	2.00 max	1.00 max	0.03 max	0.045 max	17.00 19.00	9.00 13.00	-	Cb+Ta > 10 xC < 1.10	192HB	515	205	30	50
A193B6-B6X AISI Type 410	0.15 max	1.00	1.00 max	0.03 max	0.040 max	11.50 13.50	-	-	-	-	760	585	15	50
A193B7-B7M Alloy Steel (Cr. Mo)	0.37 0.49	0.65 1.10	0.15 0.35	0.04 max	0.035 max	0.75 1.20	-	0.15 0.25	-	-	860	720	16	50
A193B5 AS-5% Cr.AISI50 1	0.10 min	1.00 max	1.00 max	0.03 max	0.040 max	4.00 6.00	-	0.40	-	-	690	550	16	50

**ASTM A 194/194M CARBON STEEL, ALLOY STEEL & STAINLESS STEEL NUTS BOLTS FOR HIGH PRESSURE & HIGH TEMPERATURE SERVICE**

<b>A1948/8A AISI Type 304</b>	<b>0.08 max</b>	<b>2.00 max</b>	<b>1.00 max</b>	<b>0.030 max</b>	<b>0.045 max</b>	<b>18.00 20.00</b>	<b>8.00 10.50</b>	-	-	-	-	<b>126 - 300 Grade 8</b> <b>126 - 192 Grade 8 A</b>
A1948M/8MA AISI Type 316	0.08 max	2.00 max	1.00 max	0.030 max	0.045 max	16.00 18.00	10.00 14.00	2.00 3.00	-	-	-	126 -300 Grade 8m 126-192 Grade 8 MA
A194/8T/8TA AISI Type 321	0.08 max	2.00 max	1.00 max	0.030 max	0.045 max	17.00 19.00	9.00 12.00	-	Ti > 5xC < 0.70	-	-	126-300 Grade 8 T
A194/8C/8CA AISI Type 347	0.08 max	2.00 max	1.00 max	0.030 max	0.045 max	17.00 19.00	9.00 13.00	-	Cb+Ta > 10 xC < 1.10	-	-	126-300 Grade 8C 126-192 Grade 8 CA
A194-6 AISI Type 410	0.15 max	1.00 max	1.00 max	0.030 max	0.040 max	11.50 13.50	-	-	-	-	-	228-271
A19422HM & 2H Carbon Steel	0.40 max	1.00 max	0.40 max	0.050 max	0.040 max	-	-	-	-	-	-	159-352Gr.2 248- 352Gr.2H 159- 237Gr.2HM