

CHEMICAL COMPOSITION FOR STUD BOLTS

Grade of alloy steel for Stud-Bolts to BS 1750 , ASTM A 193 and A 320

1	SYMBOL	B7	B7M	B16	B8	B8M	B8T	L7 / L7M	L43
2	Type	Ferritic	Ferritic	Austenitic	Austenitic Unstabilized	Austenitic	Austenitic Stabilized	Ferritic	Ferritic
3	Service conditions	High Temp.	High Temp.	High Temp.	High Low. Temp.	High Low. Temp.	High Low. Temp.	Low Temp.	Low Temp.
4	Material specification								
	ASTM	A193 Grade B7	A193 Grade B7M	A193 Gr. B16	A193 Grade B8	A193 Grade B8M	A193 Grade B8T	A320 Grade L7	A320 Grade L43
5	Chemical composition	%	%	%	%	%	%	%	%
	C.	0.37---0.49	0.37---0.49	0.36---0.47	0.08 max.	0.08 max.	0.08 max.	0.38---0.48	0.38---0.43
	Mn.	0.65---1.10	0.65---1.10	0.45---0.70	2.00 max.	2.00 max.	2.00 max.	0.75---1.00	0.60---0.85
	Si.	0.15---0.35	0.15---0.35	0.15---0.35	1.00 max.	1.00 max.	1.00 max.	0.15---0.35	0.15---0.35
	P.	0.035 max.	0.035 max.	0.035 max.	0.045 max.	0.045 max.	0.045 max.	0.035 max.	0.040 max.
	S.	0.04 max.	0.04 max.	0.04 max.	0.030 max.	0.030 max.	0.030 max.	0.040 max.	0.040 max.
	Cr.	0.75---1.20	0.75---1.20	0.80---1.15	18.00---20.00	16.00---18.00	17.00---9.00	0.80---1.10	0.70---0.90
	Ni.	---	---	---	8.00---10.50	10.00---14.00	9.00---12.00	---	1.65---2.00
	Mo.	0.15---0.25	0.15---0.25	0.50---0.65	---	2.00---3.00	---	0.15-0.25	0.20---0.30
	V.	---	---	0.25---0.35	---	---	---	---	---
	Ti.	---	---	---	---	---	5xCMIN	---	---
6	Brinell Hardness	Not applicable	max. 20 RC	Not applicable	223 B.H.N. max.	223 B.H.N. max.	223 B.H.N. max.	Not applicable	Not applicable
7	Impact Value	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	20 ft. lbf. at 1500 F	20 ft. lbf. 1500F min
8	Physicals per ASTM A 193 & B.S. 1506-621 & B.S. 4882.								
	U.T.S.	88kg/MM2min	70.3 min.	88kg/MM2min	52.75/MM2min	52.75kg/MM2	52.75kg/MM2	88kg/MM2	88kg/MM2
	Elongation	16% min	18% min	18% min	30% min	30% min	30% min	16% min	16% min
	Yield	70.39kg/MM2	56.26 min.	73.8kg/MM2	21.1kg/MM2min	21.1kg/MM2	21.1kg/MM2	73.8kg/MM2	73.8kg/MM2
	Reduction area	50% min	50% min	50% min	50% min	50% min	50% min	50% min	50% min
9	Heat treatment	Oil quenched & tempered	Oil quenched & tempered	Oil quenched & tempered	Carbide solution treated	Carbide solution treated	Carbide solution treated	Oil quenched & tempered	Oil quenched & tempered
10	Tempering temperature	11000F min 5930C	11500F min 6200C	12000F min 6500C	---	---	---	11000F min 5930C min	11000F min 5930C min