

BOLTS :

ASTM A193 GRADE B7/B7M HEAVY HEX BOLTS
ASTM A325/A325M TYPE 1 STRUCTURAL BOLTS
ASTM A490/A490M TYPE 1 STRUCTURAL BOLTS
SAE J429 GRADE 2/5/8 HEX BOLTS
DIN 6914 CLASS 8.8/10.9/12.9 STRUCTURAL BOLTS
DIN 931 933 CLASS 8.8/10.9/12.9 HEX BOLTS
DIN 912 CLASS 8.8/10.9/12.9 HEX SOCKET HEAD BOLTS
DIN 6921 CLASS 8.8/10.9/12.9 HEX FLANGE BOLTS
ISO 4014/4017 CLASS 8.8/10.9/12.9 HEX BOLTS
AS 1252 GRADE 8.8 HIGH STRENGTH STEEL BOLTS



NINGBO TOPBOLT METALWORKS CO.,LTD

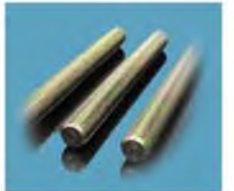
THREADED RODS:

ASTM A193 GRADE B7/B7M/B8/B8M/B16 THREADED RODS/STUD BOLTS/ROUND BARS

ASTM A320 GRADE L7/L7M/B8/B8M THREADED RODS/STUD BOLTS/ROUND BARS

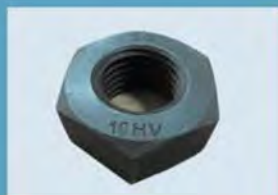
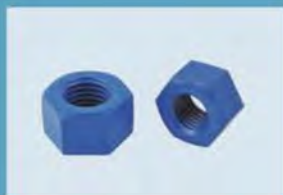
DIN 975/976 CLASS 4.8, 8.8, 10.9, 12.9 THREADED RODS

SAE GARDE 2/5/8 & ASTM A307 GRADE A/B THRADED RODS



NUTS:

ASTM A194 GRADE 2H/2HM/7/7M/8/8M HEAVY HEX NUTS
 ASTM A563M 10S HEAVY HEX NUTS
 SAE J995 GRADE 2/5/8 HEX NUTS
 DIN 6015 CLASS 8/10 HEAVY HEX NUTS
 DIN 934 CLASS 4/6/8/10 HEX NUTS
 DIN 6923 CLASS 8/10 HEX FLANGE NUTS
 ISO 4032 CLASS 4/6/8/10 HEX NUTS
 AS 1252 GRADE 8 HIGH STRENGTH STEEL NUTS



WASHERS:

ASTM F436/F436M TYPE 1 FLAT WASHERS
 DIN 125A FLAT WASHERS
 DIN 127B SPRING WASHERS
 DIN 6916 FLAT WASHERS
 AS 1252 STRUCTURAL WASHERS
 DTI WASHERS/ASTM F959/959M



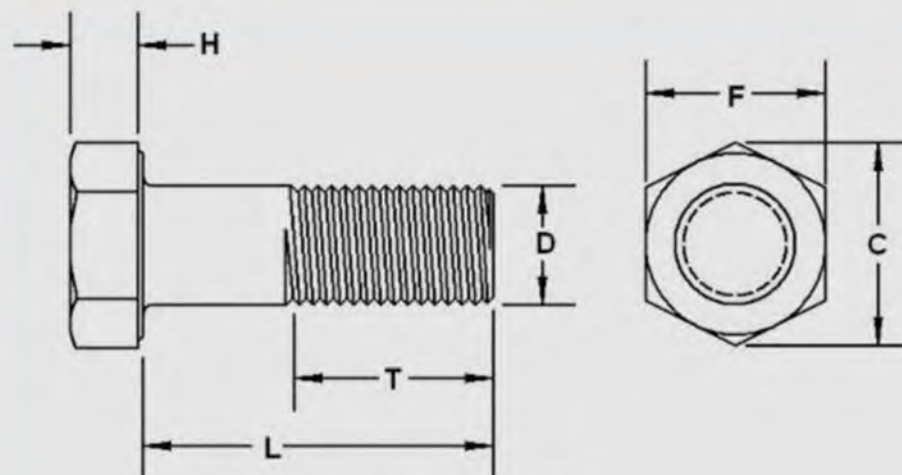


NINGBO TOPBOLT METALWORKS CO.,LTD

**BOLTS, NUTS,
THREADED RODS,
STUD BOLTS, WASHERS**

ASME B18.2.6 / ASME B18.2.6M
ASTM A325/A490 TYPE 1
ASTM A325M/A490M TYPE 1
HEAVY HEX STRUCTURAL BOLTS

THREAD: UNC/UN



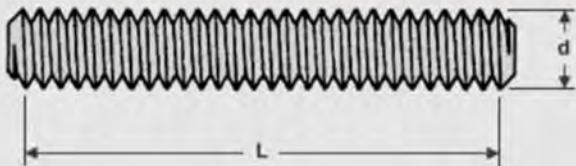
STRUCTURAL BOLTS

Bolt Diameter	D	F			C		H			T
	Body Diameter	Width Across Flats			Width Across Corners		Height			Thread
		Max	Basic	Max	Min	Max	Min	Basic	Max	Min
1/2"	0.515	7/8	0.875	0.850	1.010	0.969	5/16	0.323	0.302	1.00
5/8"	0.642	1-1/16	1.062	1.031	1.227	1.175	25/64	0.403	0.378	1.25
3/4"	0.768	1-1/4	1.250	1.212	1.443	1.383	15/32	0.483	0.455	1.38
7/8"	0.895	1-7/16	1.438	1.394	1.660	1.589	35/64	0.563	0.531	1.50
1"	1.022	1-5/8	1.625	1.575	1.876	1.796	39/64	0.627	0.591	1.75
1 1/8"	1.149	1-13/16	1.812	1.756	2.093	2.002	11/16	0.718	0.658	2.00
1 1/4"	1.277	2	2.000	1.938	2.309	2.209	25/32	0.813	0.749	2.00
1 3/8"	1.404	2-3/16	2.188	2.119	2.526	2.416	27/32	0.878	0.810	2.25
1 1/2"	1.531	2-3/8	2.375	2.300	2.742	2.622	15/16	0.974	0.902	2.25

BOLTS, NUTS,
THREADED RODS,
STUD BOLTS, WASHERS

Threaded Rods, Stud Bolts :
ASTM A193 Grade B7/B7M/B8/B8M/B16

Threaded Rods, Stud Bolts :
ASTM A320 Grade L7/L7M/B8/B8M



DESCRIPTION	Grade	Temperature Range	Strength and Ductility					
			Tensile Min. psi	Yield	Reduction of Area R/A	Elongation EL	Alloy Type	AISI
ASTM A-193	B7	High Temp. from 0 – 480°C	125,000	100,000	50	16	Cr-Mo	(4140)
ASTM A-193	B7M	High Temp. from 0 – 450°C	100,000	80,000	50	18	Cr-Mo	(4140)
ASTM A-193	B16	High Temp. from 0 – 550°C	125,000	105,000	50	18	Cr-Mo V	(4140M)
ASTM A-320	L7	Low Temp. -101°C	125,000	105,000	50	16	Cr-Mo	-4140
ASTM A-320	L7M	Low Temp. -73°C	100,000	80,000	50	18	Cr-Mo	-4140
ASTM A-193	B8	Low Temp. -200 – 650°C	75,000	30,000	50	30	18% CR – 8% Ni	(304)
ASTM A-193	B8M	Low Temp. -200 – 750°C	75,000	30,000	50	30	16%Cr – 10% Ni	(316)
ASTM A-320	B8	Low Temp. -200 – 650°C	75,000	30,000	50	30	18% Cr – 8% Ni	(304)
ASTM A-320	B8M	Low Temp. -200 – 750°C	75,000	30,000	50	30	16% Cr – 10% Ni	(316)



BOLTS, NUTS,
THREADED RODS,
STUD BOLTS, WASHERS

Description&Size&Material									
THREAD RODS&STUD BOLTS			Diameter	Materials	HEAVY HEX NUTS			Diameter	Materials
ASTM A193 Grade B7/B7M			1/4"-4"	B7 (4140)	ASTM A194 Grade 2H/2HM			1/4"-4"	C1040
ASTM A320 Grade L7/L7M			1/4"-3"	B7 (4140)	DIN934 H=D Grade 2H/2HM			1/4"-4"	C1045
SAE J429 Grade 2/5/8			3/16"-2"	C1018 C1035	ASTM A194 Grade 7/7M			1/2"-2"	B7 (4140)
DIN 975 Class 4.8/8.8/10.9			M6-M52	C1018 40CR4	DIN934 H=D Grade 7/7M			1/2"-2"	B7 (4140)
ASTM A193 Grade B16			1/4"-3"	12CrMoV					
ASTM A193 Grade B8/B8M			1/4"-3"	S304/316	STRUCTURAL NUTS				
ASTM A320 Grade B8/B8M			1/4"-3"	S304/316	ASTM A563 Grade A/B/ C/DH			1/4"-4"	C1040 C1045
					DIN 6915 Class 10			M12-M42	
STRUCTURAL BOLTS									
ASTM A325 Type 1			1/2"-1 1/2"	C1045/41Cr4	FLANGE NUTS				
ASTM A490 Type 1			1/2"-1 1/2"	41Cr4 42CrMo	IFI 145 Grade 2/Grade 5/ Grade 8			1/4"-1 1/2"	Q235/C1035/ C1045
DIN6914 Class 10.9			M12-M42		DIN 6923 Class 4/ 5/ 6/8/10			M4-M36	
FLANGE BOLTS									
IFI 111 Grade 2/ Grade 5/Grade 8			1/4"-1 1/2"	Q235/C1035/ C1045	ANSI Grade 2/Grade 5/Grade 8			1/4"-4"	Q235 C1035 C1045 40CR
DIN6921 Grade 4.8/6.8/8.8/10.9			M4-M36		DIN934 Class 4/Class 5/Class 6			M4-M100	42CrMo
HEX BOLTS					DIN934 Class 8/Class 10/Class 12			M4-M100	
CASTLE NUTS									
ASTM A307 Grade A/Grade B			1/4"-2"	C1035 C1045 41Cr4 42CrMo	ANSI B18.2.4.3M Grade 2/Grade 5			3/4"-1 1/2"	C1035 C1045
ANSI Grade 2/ Grade 5 / Grade 8			1/4"-3"		DIN935 Class 6/ Class 8			M20-M36	
DIN931 Class 8.8 /10.9/12.9			M6-M80		FLAT WASHERS				
DIN933 Class 8.8 /10.9/12.9			M6-M80		ASTM F436			3/8"-4"	C1045
DIN960 Class 8.8 /10.9/12.9			M6-M80		DIN6916 HV 10			M12-M42	C1045
DIN961 Class 8.8 /10.9/12.9			M6-M80		DIN125 / DIN126			M4-M100	C1018/C1045
CARRIAGE BOLTS									
ANSI/ ASME B18.5 (IFI C-40)			1/4"-3/4"	C1035 C1045	ANSI/ASME B18.2.1.1			1/4"-3 1/2"	65Mn
DIN603 Class 4.8/ 6.8/8.8			M5-M20		DIN127A / DIN127B			M4-M100	C1070
Chemical Composition of Material									
MATERIALS	C%	Si%	Mn%	B%	Ti%	P%	S%	Cr%	Mo%
12CrMoV	0.08-0.15	0.17-0.37	0.40-0.70	V%(0.15-0.30)		≤0.030	≤0.030	0.30-0.60	0.25-0.35
B7 (4140)	0.38-0.42	0.15-0.35	0.65-0.95			≤0.025	≤0.025	0.80-1.10	0.15-0.25
20MnTiB	0.17-0.24	0.17-0.37	1.30-1.60	0.0005-0.0035	0.04-0.10	≤0.035	≤0.035		
41Cr4	0.37-0.45	0.17-0.37	0.50-0.80			≤0.030	≤0.030	0.80-1.10	
C1045	0.42-0.50	0.17-0.37	0.50-0.80			≤0.035	≤0.035	≤0.25	
C1035	0.32-0.40	0.17-0.37	0.50-0.80			≤0.035	≤0.035	≤0.25	
Mechanical Properties									
Performance	Tensile Strength (Stress) N/mm ² σ b ≥		Yield Strength N/mm ² σ q ≥		Elongation δ ≥ %	Contraction ψ ≥ %	HRC	Tempering (°C)	Quenching (°C)
A193-B7	862 (125000 PSI)		724 (105000 PSI)		16	50	26-35	593(min)	820-880
A320-L7	862 (125000 PSI)		724 (105000 PSI)		16	50	26-35	593(min)	820-880
12.9s	1220		1080		8	44	39-44		
10.9s	1040		940		10	48	33-39		
8.8s	800 m16 ≤ d ≤ m16 830		660		12	52	24-31		