ENGINEERING EDGE

(Vietnam) Industrial JSC

Fasteners for Oil, Gas and Petrochemical Industry

Manufactured according to DIN, ISO, EN, ANSI, ASME and ASTM standards.

bsi. ISO 9001 Quality Management

bsi.

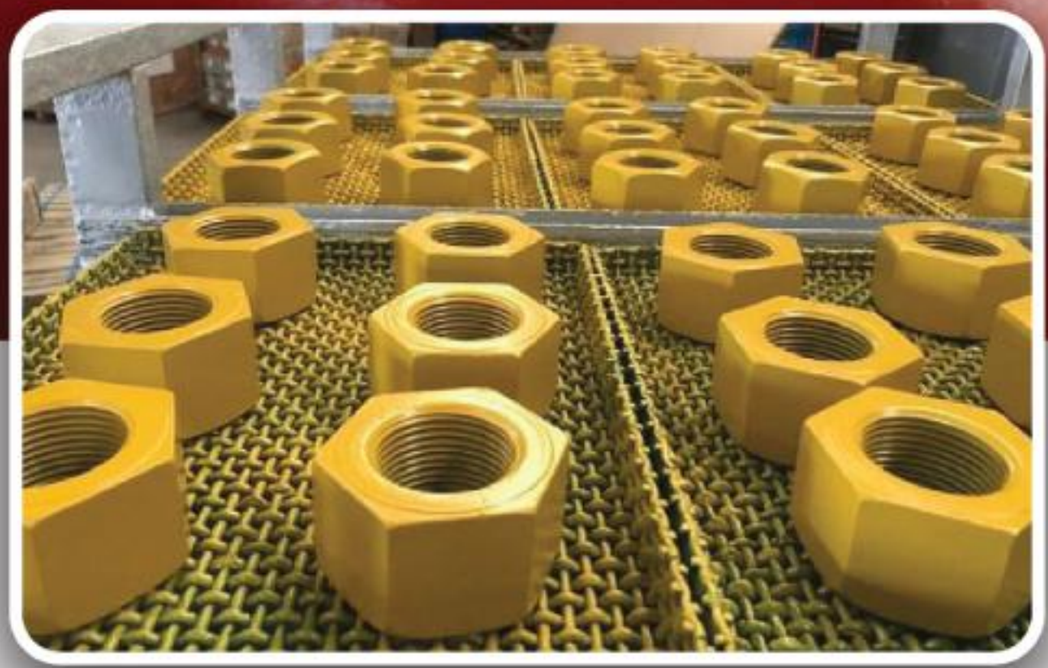
ANAB ACCREDITED ISO/IEC 17021 MANAGEMENT SYSTEMS CERTIFICATION BODY

TÜV SÜD

35 years est. since 1989

DYNO® STRUCTURAL FASTENERS

DYNO
STRUCTURAL FASTENERS



Engineering Edge Vietnam Industrial Joint Stock Company

The parent company, Engineering Edge SINGAPORE has been involved in the fastener business since 1989. They specialised in manufacturing corrosion resistant fasteners for the construction, industrial and petrochemical industries. With clienteles growing in Vietnam, the Singapore office relocated their production to Vietnam in 2005, hence the formation of Engineering Edge Vietnam Industrial JSC (EEVN). The new facility is located in the hub of Vietnam's petrochemical city, Vung Tau. This facility has the ability to manufacture and supply various types of fasteners to serve all petrochemical customers.

FASTENERS FOR STRUCTURAL JOINTS

Hex Bolt: ASTM A325, A325M, A193

Hex Nut: ASTM A194, A230, A193

Washer: ASTM F436, F844

FASTENERS FOR OIL & GAS

Stud Bolt: ASTM A193, A320

Hex Nut: ASTM A194, A563

FASTENING SET FOR PIPEWORKS

U-Bolt: ASTM F1412-22

Hex Nut: ASTM A194, A230, A193

Washer: ASTM F436, F844

DYNO STRUCTURAL FASTENERS

OUR COATING TECHNOLOGY

CORROSHIELD® FLUOROCARBON COATING

CORROSHIELD® fluorocarbon coating has low coefficient of friction or slipperiness. It is non-stick, chemically inert with excellent dielectric strength and has an high operating temperature. Other characteristics of **CORROSHIELD®** fluorocarbon coating is also highly resistant to weathering, corrosion and UV radiation. In addition, it has high level of hardness, good abrasion resistance, and is highly durable.

COLD GALVANISING

Cold galvanising functions as a primer to protect steel surfaces from corrosion. It is an effective way of sealing the steel surfaces from moisture, protecting it from rust. Unlike regular paint or epoxies that creates an impermeable barrier as a mean of protection, cold galvanising provides corrosion protection to steel by electrical means.

HOT DIPPED GALVANISING

Hot dipped galvanising is the process of coating fasteners by immersing it in a bath of molten zinc. Hot dipped galvanising provides long-term corrosion protection. It is also maintenance free and is more environmentally friendly than any other corrosion protection methods.

COLOURS

We can supply our fasteners in various colours according to your needs.

COATING OPTIONS

PLAIN

FLUOROCARBON PTFE

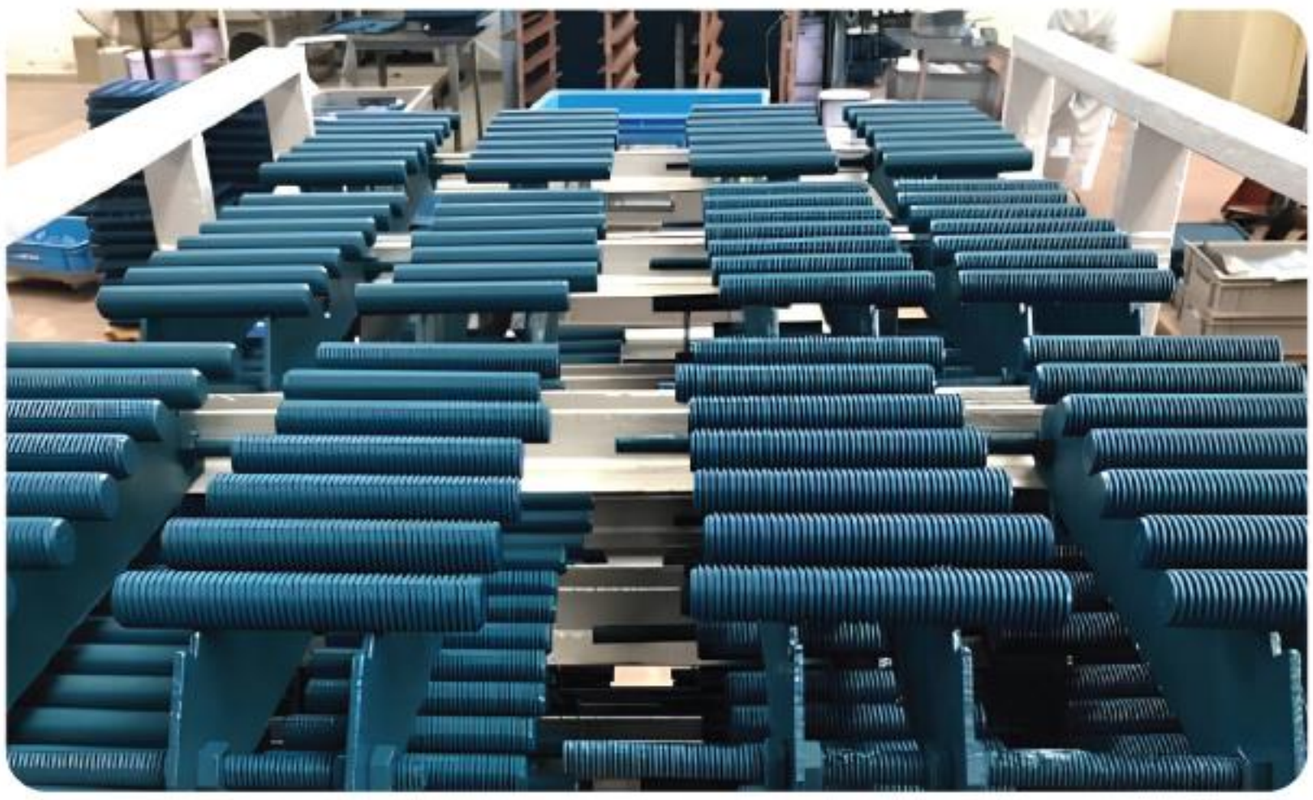
BLACK OXIDE

CLEAR ZINC

YELLOW ZINC

HOT-DIP GALVANIZING

CORROSHIELD® PTFE COATING



*Coating specification is compliant with AS3566.2 (2002)

CLEAR ZINC

HOT-DIP GALVANIZING

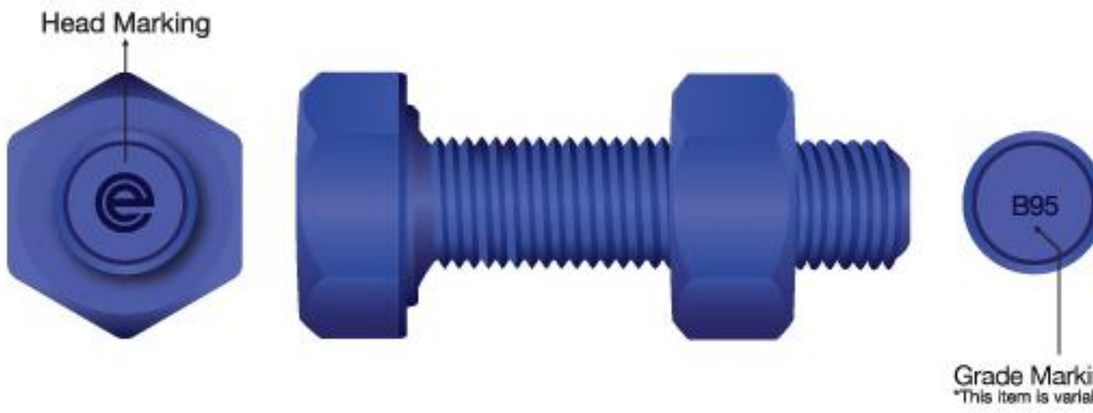
PTFE COATING

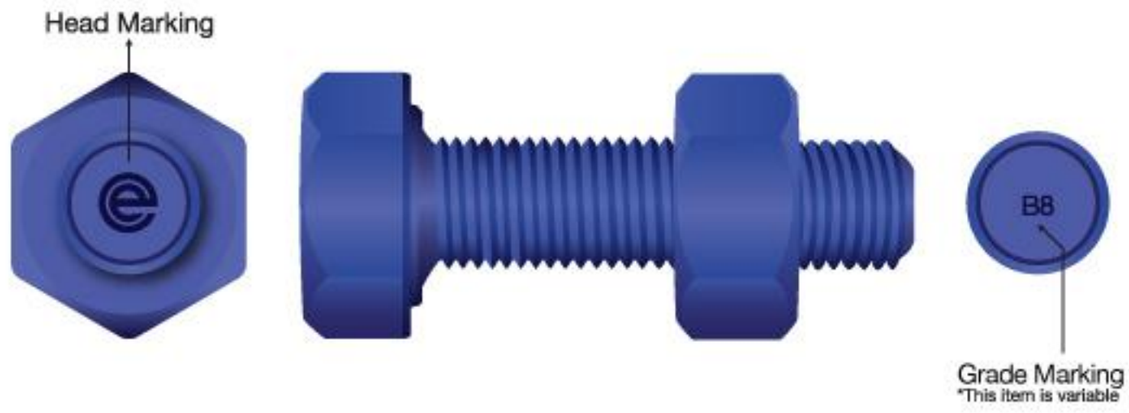
PIPE FLANGES

LEAK-PROOF INTERSECTION

HIGH PRESSURES & TEMPERATURE

PIPPING & FLUID HANDLING SYSTEMS





STUD BOLTS

ASTM A193 / A193M

APPLICATIONS

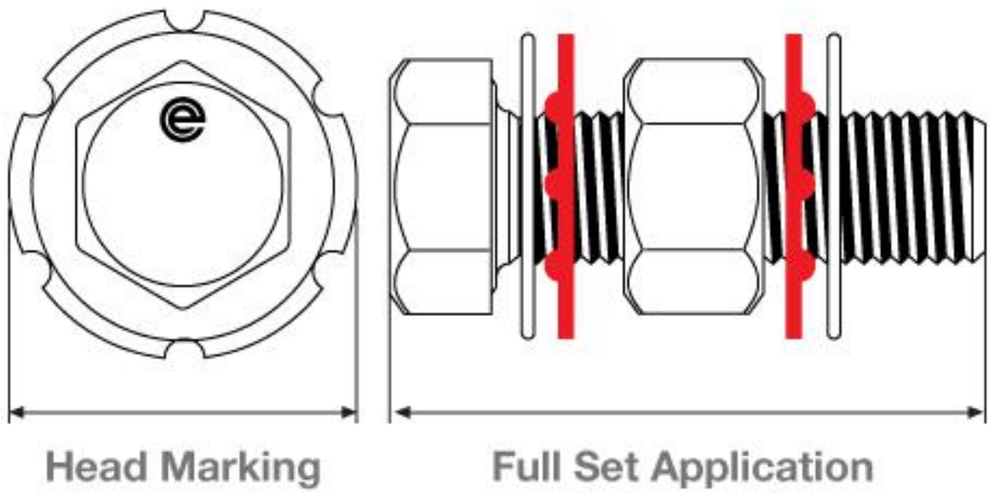
- For pressure vessels, valves, flanges and fittings for high temperature service.

THREAD STANDARDS

- ANSI/ASME B1.1
- ANSI/ASME B1.13M

DIMENSIONAL STANDARDS

- ANSI/ASME B18.31.2
- ANSI/ASME B18.31.1M
- ANSI/ASME B18.2.1

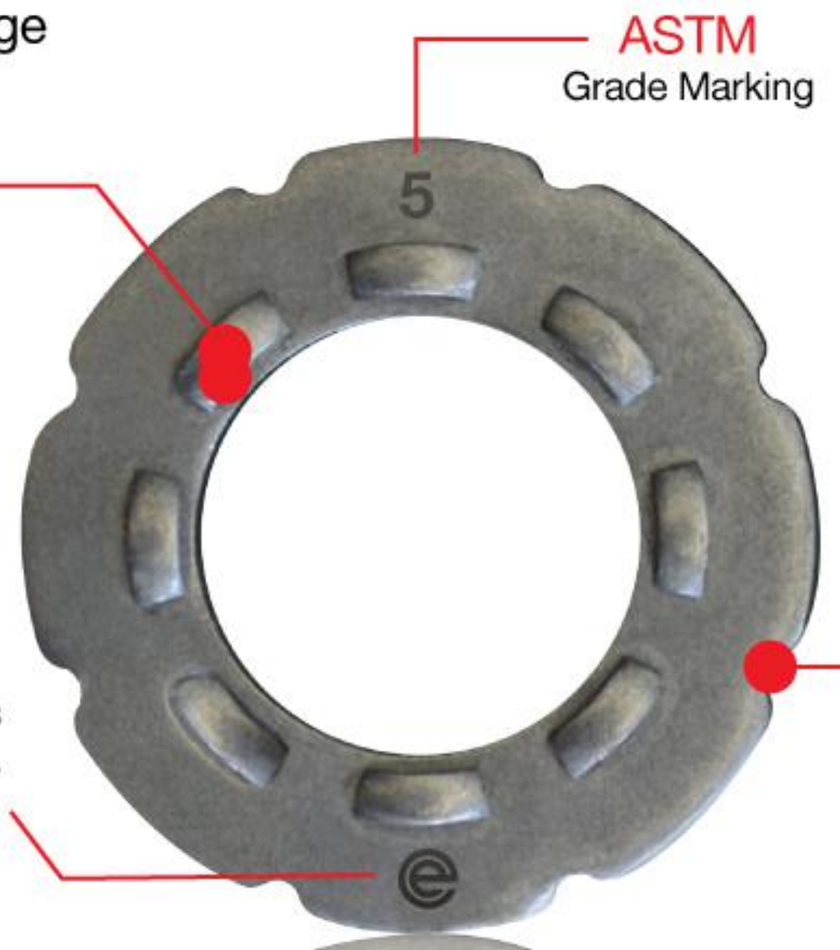


RIGHTITE™

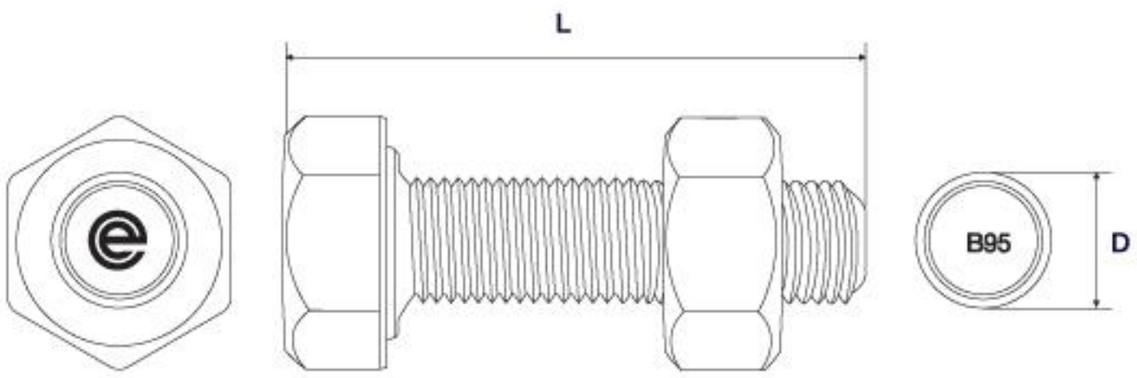
Achieve the right tension.

Compressible Device

- Suitable for A325/A325M & A490/A490M Bolt.
- Measure it using a Feeler gauge or Dial gauge



DYNO
STRUCTURAL FASTENERS



STUD BOLTS

ASTM A193 / A193M HIGH TEMPERATURE SERVICE

DIMENSIONAL SPECIFICATION (INCH) FOR STUD BOLTS AS PER ASME B18.2.1

Nom. Thread Diameter (D)	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	11/8	11/4	13/8	11/2	13/4
Nominal Length (L)	1 — 20 inches													

Nom. Thread Diameter (D)	2	21/4	21/2	23/4	3	31/4	31/2	33/4	4
Nominal Length (L)	1 — 20 inches								

GRADE CLASSIFICATION AND HEAT TREATMENTS FOR STUD BOLTS AS PER ASTM A193/A193M

FERRITIC STEELS

Class	No Classification - Quenched and Tempered						
Grade	B5	B6	B6X	B7	B7M	B16	B16+
Marking	B5	B6	B6X	B7	B7M or B7M	B16	B16R

AUSTENITIC STEELS

Class	1 — Carbide Solution Treated									
Grade	B8	B8C	B8M	B8P	B8T	B8LN	B8MLN	B8CLN	B8CLNCuB	B8ML4CuN
Marking	B8	B8C	B8M	B8P	B8T	B8F/B8LN	B8G/B8MLN	B8Y/B8CLN	B8CLNCuB	B8YY/B8ML4CuN

Class	1A — Carbide Solution Treated After Finishing												
Grade	B8A	B8CA	B8MA	B8PA	B8TA	B8LNA	B8MLNA	B8NA	B8MNA	B8MLCuNA	B8CLNA	B8CLNCuBA	B8ML4CuNA
Marking	B8A	B8B B8CA	B8D B8MA	B8H B8PA	B8J B8TA	B8L B8LNA	B8K B8MLNA	B8V B8MA	B8W B8MNA	B9K B8MLCuNA	B8Z B8CLNA	B8ZA B8CLNCuBA	B8ZZ B8MLCuNA

Class	1B — Carbide Solution Treated Nitrogen-Bearing S/Steel		
Grade	B8N	B8MN	B8MLCuN
Marking	B8N	B8Y or B8MN	B9J or B8MLCuN

Class	1C — Carbide Solution Treated Nitrogen-Bearing S/Steel			
Grade	B8R	B8RA	B8S	B8SA
Marking	B9A or B8R	B9B/B8RA	B9D/B8S	B9F/B8SA

Class	1D — Carbide Solution Treated Rapid Cooling from Rolling Temperature											
Grade	B8	B8M	B8P	B8LN	B8MLN	B8N	B8MN	B8R	B8S	B8CLN	B8ML4CuN	B8CLNCuB
Marking	B94	B95	B96	B97	B98	B99	B100	B101	B102	B103	B104	B105

Class	2 — Carbide Solution Treated and Strain-Hardened							
Grade	B8	B8C	B8P	B8T	B8N	B8M	B8MN	B8MLCuN
Marking	B8SH	B8CSH	B8PSH	B8TSH	B8NSH	B8MSH	B8YSH	B8JSH

Class	2B - Carbon Solution Treated and Strain-Hardened	
Grade	B8	B8M2
Marking	B9	B9G or B8M2

Class	2C - Carbon Solution Treated and Strain-Hardened
Grade	B8M3
Marking	B9H or B8M3

FERRITIC STEEL

Material Grade	Diameter (Inches)	Tensile Strength, (min, ksi)	Yield Strength, (min, 0.2% offset, ksi)	Elongation in 4D, (min, %)	Reduction Area, (min, %)	Hardness (Max)	
B5 4 to 6% chromium	up to 4, incl	100	80	16	50	-	-
B6 13% chromium	up to 4, incl	110	85	15	50	-	-
B6X 13% chromium	up to 4, incl	90	70	16	50	26 HRC	-
B7 Chromium molybdenum	$2^{1/2}$ and under	125	105	16	50	35 HRC	321 HBW
	over $2^{1/2}$ to 4	115	95	16	50	35 HRC	321 HBW
	over 4 to 7	100	75	18	50	35 HRC	321 HBW
B7M[a] Chromium molybdenum	4 and under	100	80	18	50	99 HRB	235 HBW
	over 4 to 7	100	75	18	50	99 HRB	235 HBW
B16 Chromium molybdenum vanadium	$2^{1/2}$ and under	125	105	18	50	35 HRC	321 HBW
	over $2^{1/2}$ to 4	110	95	17	45	35 HRC	321 HBW
	over 4 to 8	100	85	16	45	35 HRC	321 HBW

AUSTENITIC STEEL

Material Grade	Diameter (Inches)	Tensile Strength, (min, ksi)	Yield Strength, (min, 0.2% offset, ksi)	Elongation in 4D, (min, %)	Reduction Area, (min, %)	Hardness (Max)	
Class 1 and 1D: B8, B8M, B8P, B8LN, B8MLN, B8CLN	All Diameter	75	30	30	50	96 HRB[b]	223 HBW
Class 2: B8, B8C, B8P, B8T, B8N	[d] $^{3/4}$ and under	125	100	12	35	35 HRC	321 HBW
	over $^{3/4}$ to 1, incl	115	80	15	35	35 HRC	321 HBW
	over 1 to $1^{1/4}$, incl	105	65	20	35	35 HRC	321 HBW
	over $1^{1/4}$ to $1^{1/2}$, incl	100	50	28	45	35 HRC	321 HBW
Class 2: B8M, B8MN, B8MLCuN[d]	$^{3/4}$ and under	110	95	15	45	35 HRC	321 HBW
	over $^{3/4}$ to 1, incl	100	80	20	45	35 HRC	321 HBW
	over 1 to $1^{1/4}$, incl	95	65	25	45	35 HRC	321 HBW
	over $1^{1/4}$ to $1^{1/2}$, incl	90	50	30	45	35 HRC	321 HBW
Class 2B: B8, B8M2[d]	2 and under	95	75	25	40	35 HRC	321 HBW
	over 2 to $2^{1/2}$, incl	90	65	30	40	35 HRC	321 HBW
	over $2^{1/2}$ to 3, incl	80	55	30	40	35 HRC	321 HBW

FERRITIC STEEL

Ferritic Steel																
Grade	Description and UNS Designation	Class	Carbon	Manganese	Phosphorus	Sulfur	Silicon	Chromium	Nickel	Molybderium	Copper	Columbium[f]	Titanium	Vanadium	Aluminium	Nitrogen
B5	5% Chromium		0.10 min	1.00	0.040	0.030	1.00	4.0-6.0	-	0.40-0.65	-	-	-	-	-	-
Product Analysis Variation[a]			0.01	0.03	0.005	0.005	0.05	0.10	-	0.05	-	-	-	-	-	-
B6, B6X	12% Chromium (410) S41000		0.08-0.15	1.00	0.040	0.030	1.00	11.5-13.5	-	-	-	-	-	-	-	-
Product Analysis Variation[a]			0.01 over	0.03	0.005	0.005	0.05	0.15	-	-	-	-	-	-	-	-
B7, B7M	Chromium Molybdenum[c]		0.38-0.48[b]	0.75-1.00	0.035	0.040	0.15-0.35	0.80-1.15	-	0.15-0.25	-	-	-	-	-	-
Product Analysis Variation[a]			0.02	0.04	0.005	0.005	0.02	0.05	-	0.02	-	-	-	-	-	-
B16	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	-	-	-	0.25-0.35	0.015[e]	-
Product Analysis Variation[a]			0.02	0.03	0.005	0.005	0.02	0.05	-	0.03	-	-	-	0.03	-	-

Austenitic Steel																
Grade	Description and UNS Designation	Class	Carbon	Manganese	Phosphorus	Sulfur	Silicon	Chromium	Nickel	Molybderium	Copper	Columbium[f]	Titanium	Vanadium	Aluminium	Nitrogen
B8, B8A	304, S30400	1,1A, 1D,2	0.08	2.00	0045	0.030	1.00	18.0-20.0	8.0-11.0	-	-	-	-	-	-	-
Product Analysis Variation[a]			0.01	0.04	0.010	0.005	0.05	0.20	0.15	-	-	-	-	-	-	-
B8C, B8CA	347, S304700	1,1A, 1D,2	0.08	2.00	0.045	0.030	1.00	17.0 - 19.0	9.0 - 12.0	-	-	10 x C to 1.10	-	-	-	-
Product Analysis Variation[a]			0.01	0.04	0.010	0.005	0.05	0.20	0.15	-	-	0.05 under	-	-	-	-
B8M, B8MA B8M2, B8M3	316, S31600	1,1A, 1D,2	0.08	2.00	0.035 > 0.045	0.030	1.00	16.0-18.0	10.0-14.0	2.00-3.00	-	-	-	-	-	-
Product Analysis Variation[a]			0.01	0.04	0.010	0.005	0.05	0.20	0.015 > 0.15	0.10	-	-	-	-	-	-
B8P, B8PA	S30500	1,1A, 1D,2	0.12	2.00	0.045	0.030	1.00	17.0-19.0	11.0-13.0	-	-	-	-	-	-	-
Product Analysis Variation[a]			0.04 > 0.01	0.04	0.010	0.005	0.05	0.15 > 0.20	0.15	-	-	-	-	-	-	-
BN, B8NA	304N, S30451	1A,1B, 1D,2	0.06 > 0.08	2.00	0.045	0.030	1.00	18.0-20.0	8.0-11.0	-	-	-	-	-	-	0.10-0.16
Product Analysis Variation[a]			0.01	0.04	0.010	0.005	0.05	0.20	0.15	-	-	-	-	-	-	0.01
B8MN, B8MNA	316N, S31651	1A,1B, 1D,2	0.08	2.00	0.045	0.030	0.10 > 1.00	16.0-18.0	10.0-13.0	2.00-3.00	-	-	-	-	-	0.10-0.16
Product Analysis Variation[a]			0.01	0.04	0.010	0.005	0.05	0.20	0.15	0.10	-	-	-	-	-	0.01
B8ML-CuN, B8ML-CuNA	S31254	1A,1B, 1D,2	0.020	1.00	0.030	0.010	0.80	19.5-20.5	17.5-18.5	6.0-6.5	0.50 1.00	-	-	-	-	0.18-0.25
Product Analysis Variation[a]			0.005	0.03	0.005	0.002	0.05	0.20	0.15	0.10	-	-	-	-	-	0.02
BBT, B8TA	321, S32100	1,1A,2	0.08	2.00	0.045	0.030	1.00	17.0-19.0	9.0-12.0	-	-	-	5x (C+N) to 0.70	-	-	0.10
Product Analysis Variation[a]			0.01	0.04	0.010	0.005	0.05	0.20	0.15	-	-	-	-	-	-	-
BBR, B8RA	S20910	1C,1D	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	-	0.10-0.30	-	0.20-0.40
Product Analysis Variation[a]			0.01	0.05	0.005	0.005	0.05	0.25	0.15	0.10	-	0.05	-	0.02	-	0.02
BBS, B8SA	S21800	1C,1D	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
Product Analysis Variation[a]			0.01	0.06	0.005	0.005	0.15	0.20	0.10	-	-	-	-	-	-	0.01
BBS, B8SA	S30453	1,1A,1D	0.030	2.00	0.045	0.030	1.00	18.0-20.0	8.0-11.0	-	-	-	-	-	-	0.10-0.16
Product Analysis Variation[a]			0.005	0.04	0.010	0.005	0.05	0.20	0.15	-	-	-	-	-	-	0.01

Grade	Description and UNS Designation	Class	Carbon	Manganese	Phosphorus	Sulfur	Silicon	Chromium	Nickel	Molybderium	Copper	Columbium[F]	Titanium	Vanadium	Aluminium	Nitrogen
B8MLN, B8MLNA	S31653	1,1A,1D	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
Product Analysis Variation[B]			0.005	0.04	0.010	0.005	0.05	0.20	0.15	0.10	-	-	-	-	-	0.01
B8CLN, B8CLNA	347LN, S34751	1,1A,1D	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
Product Analysis Variation[B]			0.002 under, 0.005 over	0.04	0.01	0.005	0.05	0.20	0.15	-	-	0.05	-	-	-	0.01
B8CLCuB, B8CLCuBA	S34752[G]	1,1A,1D	0.005 - 0.02	2.00	0.035	0.010	0.60	17.0-19.0	10.0-13.0	0.20-1.20	2.50-3.50	0.20-0.50; 15 x carbon content min	-	-	-	0.06-0.12
Product Analysis Variation[B]			0.002 under, 0.005 over	0.04	0.01	0.005	0.05	0.20	0.15	-	0.15	0.15	0.05	-	-	0.01
B8ML4CuN, B8ML4CuNA	S31730	1,1A,1D	0.030	2.00	0.040	0.010	1.00	17.0-19.0	15.0-16.5	3.0-4.0	4.0-5.0	-	-	-	-	0.045
Product Analysis Variation[B]			0.005	0.04	0.005	0.002	0.05	0.20	0.15	0.10	0.15	-	-	-	-	0.01

Notes

[A]Values are maximums unless a range or a minimum is indicated. Where ellipses appear in this table, there is no requirement and the element need not be determined or reported. The intentional addition of Bi, Se, Te, and Pb is not permitted.

[B]Product Analysis—Individual determinations sometimes vary from the specific limites as shown in the tables. The several determinations of any individual element in a heat may not vary both above and below the specified range. Product variation limits are over for maximums, over or under for ranges, and under for minimums, unless otherwise indicated.

[C]Typical steel compositions used for this grade include 4140, 4142, 4145, 4140H, 4142H, and 4145H.

[D]For bar sizes over 31/2in. [90mm], inclusive, the carbon content may be 0.50% max. For the B7M grade, a minum carbon of 0.28% is permitted, provided that the required tensile properties are met in the section sizes involved, the use of AISI 4130 or 4130H is allowed.

[E]Total of soluble and insoluble.

[F]Columbium and Niobium are alternate names for element 41 in the Periodic Table of the Elements.

[G]For S34752—Boron content shall be 0.001-0.005 for both heat and product analysis

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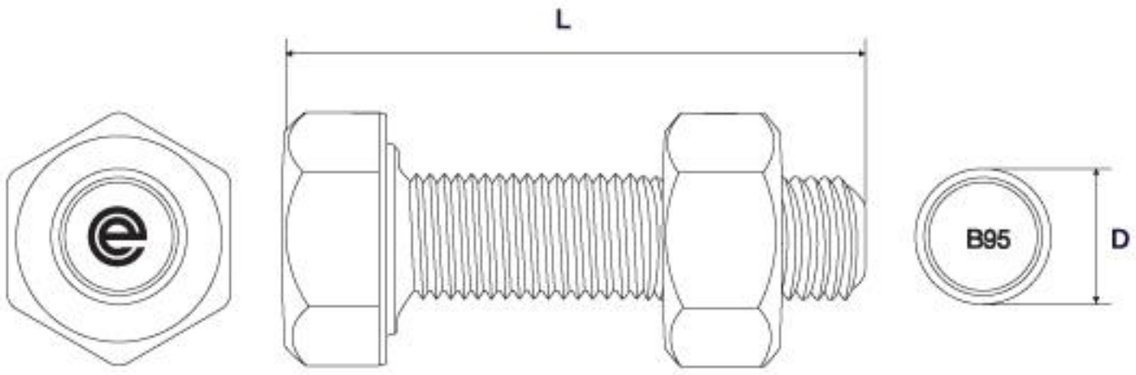


STUD BOLTS

ASTM A320 / A320M LOW TEMPERATURE SERVICE

DIMENSIONAL SPECIFICATION (INCH) FOR STUD BOLTS AS PER ASME B18.2.1

Nom. Thread Diameter (D)	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	11/8	11/4	13/8	11/2	13/4
Nominal Length (L)	1 — 20 inches													

Nom. Thread Diameter (D)	2	21/4	21/2	23/4	3	31/4	31/2	33/4	4
Nominal Length (L)	1 — 20 inches								

DIMENSIONAL SPECIFICATION (METRIC) FOR STUD BOLTS AS PER ASME B18.2.3.1

Nom. Thread Diameter (D)	M6	M8	M10	M12	M16	M20	M24	M30	M36
Nominal Length (L)	20 — 500 mm								

Nom. Thread Diameter (D)	M42	M48	M56	M64	M72	M80	M90	M100
Nominal Length (L)	20 — 500 mm							

GRADE CLASSIFICATION AND HEAT TREATMENTS FOR STUD BOLTS AS PER ASTM A320/A320M

FERRITIC STEELS

Class	No Classification - Quenched and Tempered										
Grade	L7	L7M	L70	L7A	L71	L7B	L72	L7C	L73	L43	L1
Marking	L7	L7M	L70	L7A	L71	L7B	L72	L7C	L73	L43	L1

AUSTENTIC STEELS

Class 1	No Classification - Quenched and Tempered							
Grade	B8	B8C	B8M	B8F	B8P	B8T	B8LN	B8MLN
Marking	B8	B8C	B8M	B8F	B8P	B8T	B8F or B8LN	B8G or B8MLN

Class 1A	Carbide Solution Treated After Finishing							
Grade	B8A	B8CA	B8MA	B8FA	B8PA	B8TA	B8LNA	B8MLNA
Marking	B8A	B8B or B8CA	B8D or B8MA	B8FA	B8H or B8PA	B8J or B8TA	B8L or B8LNA	B8K or B8MLNA

Class 2	Carbide Solution Treated and Strained-Hardened					
Grade	B8	B8C	B8M	B8T	B8F	B8P
Marking	B8SH	B8CSH	B8MSH	B8TSH	B8FSH	B8PSH

ASTM A194/A194M HEAVY HEXAGONAL NUT COMPATIBLE GRADES

FERRITIC STEELS

A320 / A320M — Grade	L7	L7A	L7B	L7C	L43	L1	L70	L71	L72	L73
A194 / A194M — Grade	4 AND 7									

AUSTENITIC STEELS

A320 / A320M — Class	1 AND 2							
A320 / A320M — Grade	B8	B8C	B8M	B8T	B8F	B8P	B8LN	B8MLN
A194 / A194M — Grade	8, 8C, 8M, 8T, 8F, 8P, 8LN, and 8MLN							

A320 / A320M — Class	1A							
A320 / A320M — Grade	B8A	B8CA	B8MA	B8TA	B8FA	B8PA	B8LNA	B8MLNA
A194 / A194M — Grade	8, 8C, 8M, 8T, 8F, 8P, 8LN, and 8MLN							

FERRITIC STEELS

Material Grade	Diameter (Inches)	Tensile Strength, (min, ksi)	Yield Strength, (min, 0.2% offset, ksi)	Elongation in 4D, (min, %)	Reduction Area, (min, %)	Hardness (Max)	
L7, L7A, L7B, L7C, L70, L71, L72, L73	$2^{1/2}$ and under[e]	125	105	16	50	35 HRC	321 HBW
L7M	$2^{1/2}$ and under*	100	80	18	50	99 HRB	235 HBW[a]

AUSTENITIC STEEL

Material Grade	Diameter (Inches)	Tensile Strength, (min, ksi)	Yield Strength, (min, 0.2% offset, ksi)	Elongation in 4D, (min, %)	Reduction Area, (min, %)	Hardness (Max)	
Class 1 - B8, B8M	All Diameter	75	30	30	50	96 HRB	223 HB
Class 2 - B8	$^{3/4}$ and under	125	100	12	35	35 HRC	321 HB
	over $^{3/4}$ to 1, incl	115	80	15	35	35 HRC	321 HB
	over 1 to $1^{1/4}$, incl	105	65	20	35	35 HRC	321 HB
	over $1^{1/4}$ to $1^{1/2}$, incl	100	50	28	45	35 HRC	321 HB

[a] To meet the tensile requirements, the Brinell hardness shall be over 200 HBW (93 HRB).

[b] For sizes 3/4 in. in diameter and smaller, a maximum hardness of 241 HBW (100 HRB) is permitted.

[d] For diameters 1-1/2 and over, center (core) properties may be lower than indicated by test reports which are based on values determined at 1/2 radius.

[e] These upper diameter limits were established on the basis that these were the largest sizes commonly available that consistently met specification property limits. They are not intended as absolute limits beyond which bolting materials could no longer be certified to the specification.

ASTM A320/A320M-2024
ALLOY STEEL AND STAINLESS STEEL BOLTING FOR LOW TEMPERATURE SERVICE

TABLE 3 CHEMICAL REQUIREMENTS (COMPOSITION, %)[A]

Type ...	Ferritic Steels											
Grade ...	L7, L7M, L70		L7A, L71		L7B, L72		L7C, L73		L43		L1	
	Range,%	Product Variation,% Over or Under	Range,%	Product Variation,% Over or Under	Range,%	Product Variation,% Over or Under	Range,%	Product Variation,% Over or Under	Range,%	Product Variation,% Over or Under	Range,%	Product Variation,% Over or Under
Carbon	0.38-0.48[C]	0.02	0.35-0.40	0.02	0.35-0.40	0.02	0.38-0.43	0.02	0.38-0.43	0.02	0.17-0.24	0.01
Manganese	0.75-1.00	0.04	0.70-0.90	0.03	0.70-0.90	0.03	0.75-1.00	0.04	0.60-0.85	0.03	0.70-1.40	0.04
Phosphorus, max	0.035	0.005 over	0.035	0.005 over	0.035	0.005 over	0.035	0.005 over	0.035	0.005 over	0.035	0.005 over
Sulfur, max	0.040	0.005 over	0.040	0.005 over	0.040	0.005 over	0.040	0.005 over	0.040	0.005 over	0.050	0.005 over
Silicon	0.15-0.35	0.02	0.15-0.35	0.02	0.15-0.35	0.02	0.15-0.35	0.02	0.15-0.35	0.02	0.15-0.30	0.02
Nickel	...	...	...	...	...	...	0.40-0.70	0.03	1.65-2.00	0.05	...	...
Chromium	0.80-1.10	0.05	...	...	0.80-1.10	0.05	0.40- 0.60	0.03	0.70- 0.90	0.03	...	...
Molybdenum	0.15-0.25	0.02	0.20-0.30	0.02	0.15-0.25	0.02	0.20-0.30	0.02	0.20-0.30	0.02	...	...
Boron	...	...	...	...	...	...	...	...	...	...	0.001-0.003	...

Type ...	Austenific Steels, Classes 1, 1a, and 2[D]			
Grade ...	B8, B8A		B8C, B8CA	
UNS Designation ...	S 30400 (304)		S 34700 (347)	
	Range, %	Product Variation, % Over or Under	Range, %	Product Variation, % Over or Under
Carbon, max	0.08	0.01 over	0.08	0.01 over
Manganese, max	2.00	0.04 over	2.00	0.04 over
Phosphorus, max	0.045	0.010 over	0.045	0.010 over
Sulfur, max	0.030	0.005 over	0.030	0.005 over
Silicon, max	1.00	0.05 over	1.00	0.05 over
Nickel	8.0-11.0	0.15	9.0-12.0	0.15
Chromium	18.0-20.0	0.20	17.0-19.0	0.20
Niobium[E] + Tantalum	...	...	10 x carbon content, min - 1.10 max	0.05 under

ASTM A320/A320M-2024
ALLOY STEEL AND STAINLESS STEEL BOLTING FOR LOW TEMPERATURE SERVICE

TABLE 3 CHEMICAL REQUIREMENTS (COMPOSITION, %)[A] CONTINUED

Type ...	Austenific Steels, Classes 1, 1a, and 2[D]									
Grade ...	B8T, B8TA		B8P, B8PA		B8F, B8FA				B8M, B8MA	
UNS Designation ...	S 32100 (321)		S 30500		S 30300 (303)		S 32323 (303Se)		S 31600 (316)	
	Range,%	Product Variation,% Over or Under	Range,%	Product Variation,% Over or Under	Range,%	Product Variation,% Over or Under	Range,%	Product Variation,% Over or Under	Range,%	Product Variation,% Over or Under
Carbon, max	0.08	0.01 over	0.12	0.01 over	0.15	0.01 over	0.15	0.01 over	0.08	0.01 over
Manganese, max	2.00	0.04 over	2.00	0.04 over	2.00	0.04 over	2.00	0.04 over	2.00	0.04 over
Phosphorus, max	0.045	0.010 over	0.045	0.010 over	0.20	0.010 over	0.20	0.010 over	0.045	0.010 over
Sulfur	0.030, max	0.005 over	0.030, max	0.005 over	0.15, min	0.020	0.06, max	0.010 over	0.030, max	0.005 over
Silicon, max	1.00	0.05 over	1.00	0.05 over	1.00	0.05 over	1.00	0.05 over	1.00	0.15
Nickel	9.0-12.0	0.15	11-13.0	0.15	8.0-10.0	0.10	8.0-10.0	0.10	10.0-14.0	0.20
Chromium	17.0-19.0	0.20	17.0-19.0	0.20	17.0-19.0	0.20	17.0-19.0	0.20	16.0-18.0	0.10
Molybdenum	...	...	...	...	...	...	...	...	2.00-3.00	...
Selenium	...	...	...	...	...	...	0.15-0.35	0.03 under	...	...
Titanium	5 x (C+N) min-0.7 max	0.05 under	...		...	...	...	...	...	
Nitrogen	0.10, max	0.01	...	...	...	...	...	...	...	...

Type ...	Austenific Steels, Classes 1, 1a, and 2[D]			
Grade ...	B8, B8A		B8C, B8CA	
UNS Designation ...	S 30400 (304)		S 34700 (347)	
	Range, %	Product Variation, % Over or Under	Range, %	Product Variation, % Over or Under
Carbon, max	0.030	0.005 over	0.030	0.005 over
Manganese, max	2.00	0.04 over	2.00	0.04 over
Phosphorus, max	0.045	0.010 over	0.045	0.010 over
Sulfur, max	0.030	0.005 over	0.030	0.005 over
Silicon, max	1.00	0.05 over	1.00	0.05 over
Nickel	8.0-11.0	0.15	10.0-13.0	0.15
Chromium	18.0-20.0	0.20	16.0-18.0	0.20
Molybdenum	...	...	2.00-3.00	0.10
Nitrogen	0.10-0.16	0.01	0.10-0.16	0.01

Notes

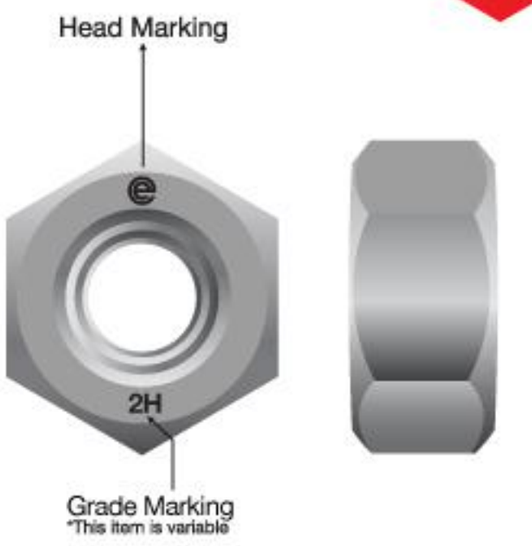
[A]The intentional addition of Bi, Se, Te, and Pb is not permitted except for Grade B8F, in which selenium is specified and required.

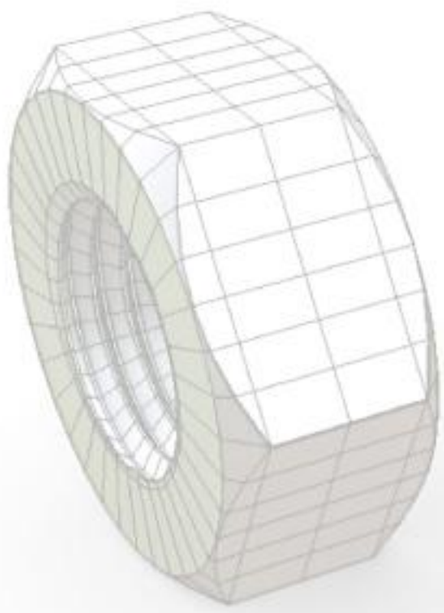
[B]Typical steel compositions used for this grade include 4140, 4142, 4145, 4140H, 4142H, AND 4145H.

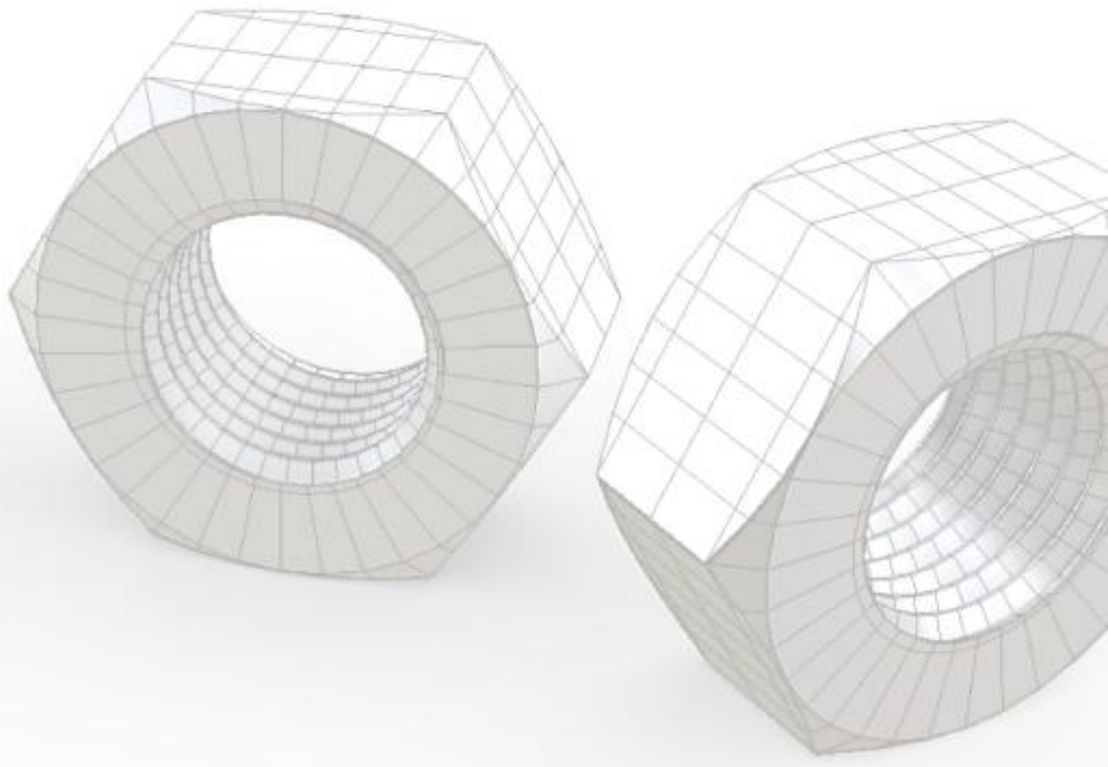
[C]For the L7M grade, a minium carbon content 0f 0.28% is permitted provided that the required tensile properties are met in the section sizes involved; the use of AISI 4130 or 4130H is allowed.

[D]Class 1 are made from solution-treated material. Class 1A products (B8A, B8CA, B8MA, B8PA, and B8TA) are solution-treated in the finished condition. Class 2 products are solution-treated and strain-hardened.

[E]Niobium and columbium are interchangeable names for the same element and both names are acceptable for use in A01.22 specifications.







HEX NUTS

ASTM A194, A194M

APPLICATIONS

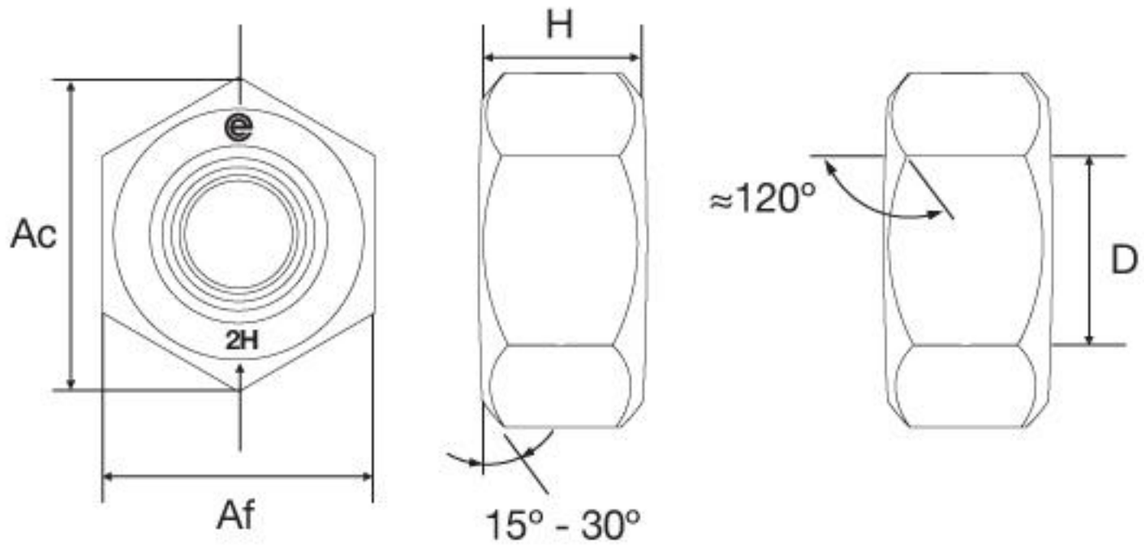
- For high pressure or high temperature service, or both, covering nut size 1/4 inches through 4 inches and metric M6 through M100 nominal.

THREAD STANDARDS

- ANSI/ASME B1.1
- ANSI/ASME B1.13M

DIMENSIONAL STANDARDS

- ANSI/ASME B18.2.2
- ANSI/ASME B18.2.4.6M



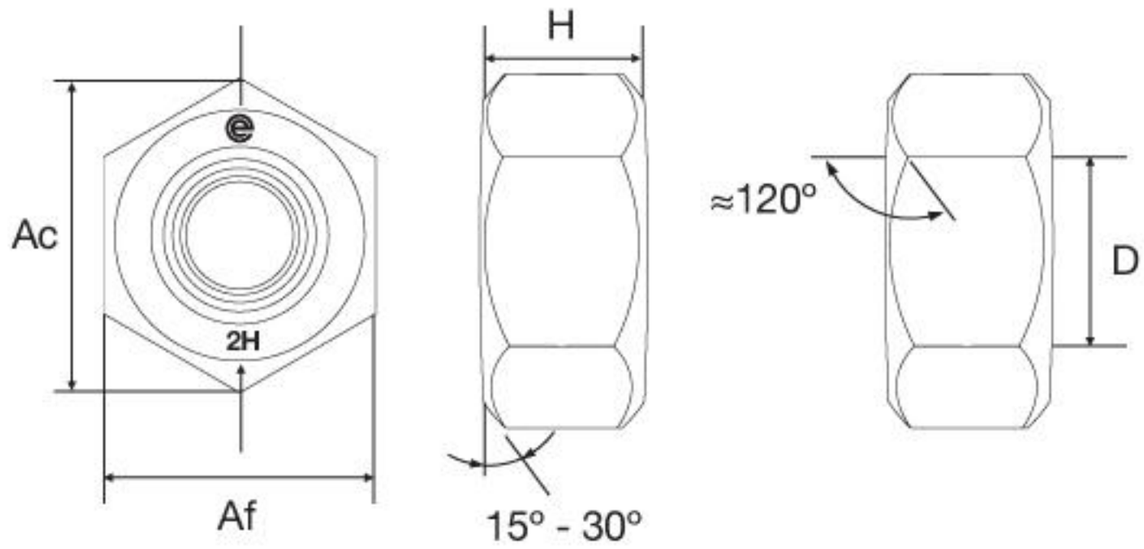
DIMENSIONAL SPECIFICATIONS FOR HEAVY HEXAGONAL NUTS AS PER ASME B18.2.2

Nom. Thread Diameter (D)	Fraction	1-4	5-16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1
	Decimal	1.125	1.25	1.375	1.5	1.6250	1.8750	1.75	2.25	2.5	
Width Across Flat (Af)		1/2	9/16	1-1/16	3/4	7/8	15/16	1-1/16	1-1/4	1-7/16	1-5/8
Across Corners (Ac)	Max	0.577	0.65	0.794	0.866	1.01	1.088	1.227	1.443	1.66	1.876
	Min	0.556	0.622	0.763	0.83	0.83	1.037	1.175	1.382	1.589	1.796
Nut Thickness (H)		15/64	19/64	23/64	27/64	31/64	35/64	39/64	47/64	55/64	63/64
Washer Face Height (F)		0.016									

Nom. Thread Diameter (D)	Fraction	1-1/8	1-1/4	1-3/8	1-1/2	1-5/8	1-3/4	1-7/8	2	2-1/4	2-1/2	2-3/4
	Decimal	1.125	1.25	1.375	1.5	1.6250	1.75	1.8750		2.25	2.5	2.75
Width Across Flat (Af)		1-13/16	2	2-3/16	2-3/8	2-9/16	2-3/4	2-15/16	3-1/8	3-1/2	3-7/8	4-1/4
Across Corners (Ac)	Max	2.093	2.309	2.526	2.742	2.959	3.175	3.392	3.608	4.041	4.474	4.907
	Min	2.002	2.209	2.416	2.622	2.828	3.035	3.242	3.449	3.862	4.275	4.688
Nut Thickness (H)		1-7/64	1-7/32	1-11/32	1-15/32	1-19/32	1-23/32	1-27/32	1-31/32	2-13/64	2-29/64	2-45/64
Washer Face Height (F)		0.016										

Nom. Thread Diameter (D)	Fraction	3	3-1/4	3-1/2	3-3/4	4
	Decimal		3.25	3.5	3.75	
Width Across Flat (Af)		4-5/8	5	5-3/8	5-3/4	6-1/8
Across Corners (Ac)	Max	5.34	5.774	6.207	6.64	7.703
	Min	5.102	5.515	5.928	6.341	6.755
Nut Thickness (H)		2-61/64	3-3/16	3-7/16	3-11/16	3-15/16
Washer Face Height (F)		0.016				

DYNO
STRUCTURAL FASTENERS



DIMENSIONAL SPECIFICATIONS FOR HEAVY HEXAGONAL NUTS AS PER ASME B18.2.4.6M

Nom. Thread Diameter (D)		M12	M14	M16	M20	M22	M24	M27
Thread Pitch (P)		1.75	2	2	2.5	2.5	3	3
Width Across Flat (Af)		21	24	27	34	36	41	46
Across Corners (Ac)	Max	24.25	27.71	31.18	39.26	41.57	47.34	53.12
	Min	22.78	26.17	29.56	37.29	39.55	45.2	50.85
Thickness (H)	Max	12.3	14.3	17.1	20.7	23.6	24.2	27.6
	Min	11.9	13.6	16.4	19.4	22.3	22.9	26.3
Washer Face Diameter (Dw)		19.2	22	24.9	31.4	33.3	38	42.8
Washer Face Height (F)		0.4-0.8	0.4-0.8	0.4-0.8	0.4-0.8	0.4-0.8	0.4-0.8	0.4-0.8

Nom. Thread Diameter (D)		M30	M36	M42	M48	M56	M64	M72
Thread Pitch (P)		3.5	4	4.5	5	5.5	6	6
Width Across Flat (Af)		50	60	70	80	90	100	110
Across Corners (Ac)	Max	57.74	69.28	80.93	92.38	103.92	115.47	127.02
	Min	55.37	66.44	77.41	88.46	99.41	110.35	121.3
Thickness (H)	Max	30.7	36.6	42	48	56	64	72
	Min	29.1	35	40.4	46.4	54.1	62.1	70.1
Washer Face Diameter (Dw)		45.6	55.9	64.5	73.7	82.8	92	101.1
Washer Face Height (F)		0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2

Nom. Thread Diameter (D)		M80	M90	M100
Thread Pitch (P)		6	6	6
Width Across Flat (Af)		120	135	150
Across Corners (Ac)	Max	138.56	155.88	173.21
	Min	132.24	148.77	165.3
Thickness (H)	Max	80	90	100
	Min	78.1	87.8	97.8
Washer Face Diameter (Dw)		110.2	124	137.8
Washer Face Height (F)		1.2-0.6	1.2-0.6	1.2-0.6

HARDNESS STANDARDS AS PER ASTM A194

Grade and Type	Completed Nuts			Sample Nut after Treatment as in 8.1.5	
	Brinell Hardness	Rockwell Hardness		Brinell Hardness, min	Rockwell Hardness B Scale, min
		C-Scale	B-Scale		
1	121 min	...	70 min	121	70
2	159 to 352	...	84 min	159	84
2H to 1-1/2 in. or M36, incl	248 to 327	24 to 35	...	179	89
2H over 1-1/2 in. or M36	212 to 327	35 max	95 min	147	79
2HM and 7M	159 to 235	...	84 to 99	159	84
3, 7, 16, 43	248 to 327	24 to 35	...	201	94
6 and 6F	228 to 271	20 to 28	...	...	...
8, 8C, 8CLN, 8CLNCuB, 8M, 8T, 8F, 8P, 8N, 8MN, 8LN, 8MLN, 8MLCuN, 8ML4CuN, and 9C	126 to 300	32 max	60 min	...	...
8A, 8CA, 8CLNA, 8CLNCuBA, 8MA, 8TA, 8FA, 8PA, 8NA, 8MNA, 8LNA, 8MLNA, 8MLCuNA, 8ML4CuNA, and 9CA	126 to 192	...	60 to 90	...	...
8R, 8RA, 8S, and 8SA	183 to 271	25 max	88 min	...	...

^ Where ellipses (...) appear in this table there is no requirement.

PROOF LOAD USING THREADED MANDREL AS PER ASTM A194

Nominal Size (Inches)	Thread per Inch	Stress Area (In.^{2})	Proof Load, lbf[A]							
			Grades 1		Grades 2, 2HM, 6, 6F, 7M		Grades 2H, 3, 7, 16		All Types of Grade 8, Grades 9C and 9CA	
			Heavy Hex[B]	Hex[C]	Heavy Hex[D]	Hex[E]	Heavy Hex[F]	Hex[G]	Heavy Hex[H]	Hex[I]
1/4	20	0.0316	4,130	3,820	4,770	4,300	5,570	4,770	2,540	2,380
5/16	18	0.0524	6,810	6,290	7,860	7,070	9,170	7,860	4,190	3,930
3/8	16	0.0774	10,080	9,300	11,620	10,460	13,560	11,620	6,200	5,810
7/16	14	0.1063	13,820	12,760	15,940	14,350	18,600	15,940	8,500	7,970
1/2	13	0.1419	18,450	17,030	21,280	19,160	24,830	21,280	11,350	10,640
9/16	12	0.182	23,660	21,840	27,300	24,570	31,850	27,300	14,560	13,650
5/8	11	0.226	29,380	27,120	33,900	30,510	39,550	33,900	18,080	16,950
3/4	10	0.334	43,420	40,080	50,100	45,090	58,450	50,100	26,720	25,050
7/8	9	0.462	60,060	55,440	69,300	62,370	80,850	69,300	36,960	34,650
1	8	0.606	78,780	72,720	90,900	81,810	106,000	90,900	48,480	45,450
1-1/8	8	0.790	102,700	94,800	118,500	106,700	138,200	118,500	63,200	59,250
1-1/4	8	1.000	130,000	120,000	150,000	135,000	175,000	150,000	80,000	75,000
1-3/8	8	1.233	160,200	148,000	185,000	166,500	215,800	185,000	98,640	92,450
1-1/2	8	1.492	194,000	170,040	223,800	201,400	261,100	223,800	119,360	111,900

[A] See limit for proof load test in 8.2.2.1. The proof load for jam nuts shall be 46% of the tabulated load. [B] Based on proof stress of 130,000 psi. [C] Based on proof stress of 120,000 psi.
[D] Based on proof stress of 150,000 psi. [E] Based on proof stress of 135,000 psi. [F] Based on proof stress of 175,000 psi. [G] Based on proof stress of 150,000 psi
[H] Based on proof stress of 80,000 psi. [I] Based on proof stress of 75,000 psi..

ASTM A194/A194M-2024
CARBON STEEL, ALLOY STEEL, AND STAINLESS STEEL NUTS FOR BOLTS FOR HIGH PRESSURE OR HIGH TEMPERATURE SERVICE, OR BOTH

TABLE 1 CHEMICAL REQUIREMENTS (COMPOSITION, %)[A, B, C, D, I]

Grade	Description and UNS Designation	Carbon	Manganese	Phosphorous	Sulfur[E]	Silicon	Chromium	Nickel	Molybdenum	Titanium	Niobium[H]	Nitrogen	Copper	Selenium	Vanadium	Aluminium
1	Carbon	0.15 min	1.00	0.040	0.050	0.40	...	...	...	...	...	...	...	...	...	...
2, 2HM, and 2H	Carbon	0.40 min	1.00	0.040	0.050	0.40	...	...	...	...	...	...	...	...	...	...
3	(501) S50100	0.10 min	1.00	0.040	0.030	1.00	4.0-6.0	...	0.40-0.65	...	...	...	...	...	...	...
6	(410) S41000	0.08-0.15	1.00	0.040	0.030	1.00	11.5-13.5	...	...	...	...	...	...	...	...	...
6F	(416) S41600	0.15	1.25	0.060	0.15 min	1.00	12.0-14.0	...	...	...	...	...	...	...	...	...
6F	(416Se) S41623	0.15	1.25	0.060	0.060	1.00	12.0-14.0	...	...	...	...	...	...	0.15 min	...	...
7[G], 7M[G]	Chromium Molyderium[G]	0.38-0.48	0.75-1.0	0.035	0.04	0.15-0.35	0.80-1.10	...	0.15-0.25	...	...	...	...	...	...	...
43	Nikel Chronium Molyderium	0.38-0.43	0.60-0.85	0.035	0.04	0.15-0.35	0.70-0.90	1.65-2.0	0.20-0.30	...	...	...	...	...	...	...
8, 8A	(304) S30400	0.08	2.00	0.045	0.030	1.00	18.0-20.0	8.0-11.0	...	...	...	...	...	...	...	...
8C, 8CA	(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	(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	...	...	...	...
8CLNCuB, 8CLNCuBA	S34752[J]	0.005 0.020	2.00	0.035	0.010	0.60	17.0-19.0	10.0-13.0	0.20-1.20	...	0.20-0.50, 15 x Carbon content, min	0.06-0.12	2.50-3.50	...	...	...
8M, 8MA	(316) S31600	0.08	2.00	0.045	0.030	1.00	16.0-18.0	10.0-14.0	2.00-3.00	...	...	...	...	...	...	...
8T, 8TA	(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	...	...	...	...
8F, 8FA	(303) S30300	0.15	2.00	0.20	0.15 min	1.00	17.0-19.0	8.0-10.0	...	...	...	...	...	...	...	...
8F, 8FA	(303Se) S30323	0.15	2.00	0.20	0.06	1.00	17.0-19.0	8.0-10.0	...	...	...	...	...	0.15 min	...	...
8P, 8PA	(303Se) S30500	0.12	2.00	0.045	0.030	1.00	17.0-19.0	11.0-13.0	...	...	...	...	...	...	...	...
8N, 8NA	(304N) S30451	0.08	2.00	0.045	0.030	1.00	18.0-20.0	8.0-11.0	...	...	...	0.10-0.16	...	...	...	...
8LN, 8LNA	(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	(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	...	...	...	...
8MLN, 8LMNA	(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	...	...	...	...
8R, 8RA[F]	(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	...	...	0.10-0.30	...
8S, 8SA	(NITRONIC 60) S21800	0.10	7.0-9.0	0.060	0.030	3.50-4.5	16.0-18.0	8.0-9.0	...	...	...	0.08-0.18	...	...	...	...
8ML, CuN, 8MLCuNA	(254) 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	0.50-1.00	...	...	...
8ML4CuN	(317) 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	4.0-5.0	...	...	...
9C, 9CA	(AL-6XN) 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	0.75	...	...	...
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	...	...	...	...	...	0.25-0.35	0.15[B]

[A]The intentional addition of Bi, Se, Te, and Pb is not permitted except for Grade 6F, 8F, and 8FA, in which Se is specified and required.
[B]Total aluminium, soluable and insoluble.
[C]Maximum, unless minimum or range is indicated.
[D]Where elipses (...) 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 analysics for sulfur over 0.060% max is not technologically approporiate.
[F]As described in Specification A276/A276M.
[G]Typical Steel compositions used for this grade include 4140, 4142, 4145, 4140H, 4142H, and 4145H.
[H]Niobium (Nb) and Columbium (Cb) are alternate names for element 41 in the Periodic Table of the Elements.
[I]Product Analysis - Individual determinations sometimes vary from the specified range. Product variation limits are over for maximums, over or under for ranges, and under for minimums, unless otherwise indicated.
[J]Boron content shall be in the range 0.001-0.005

U-BOLTS

ASTM F1412-22

APPLICATIONS

- Used to support pipework or secure objects to poles, or walls. Its U-shape wraps around the pipe or object, providing a secure and stable fastening, helping to distribute the load evenly and ensure stability in various structural applications.

AVAILABLE MATERIAL

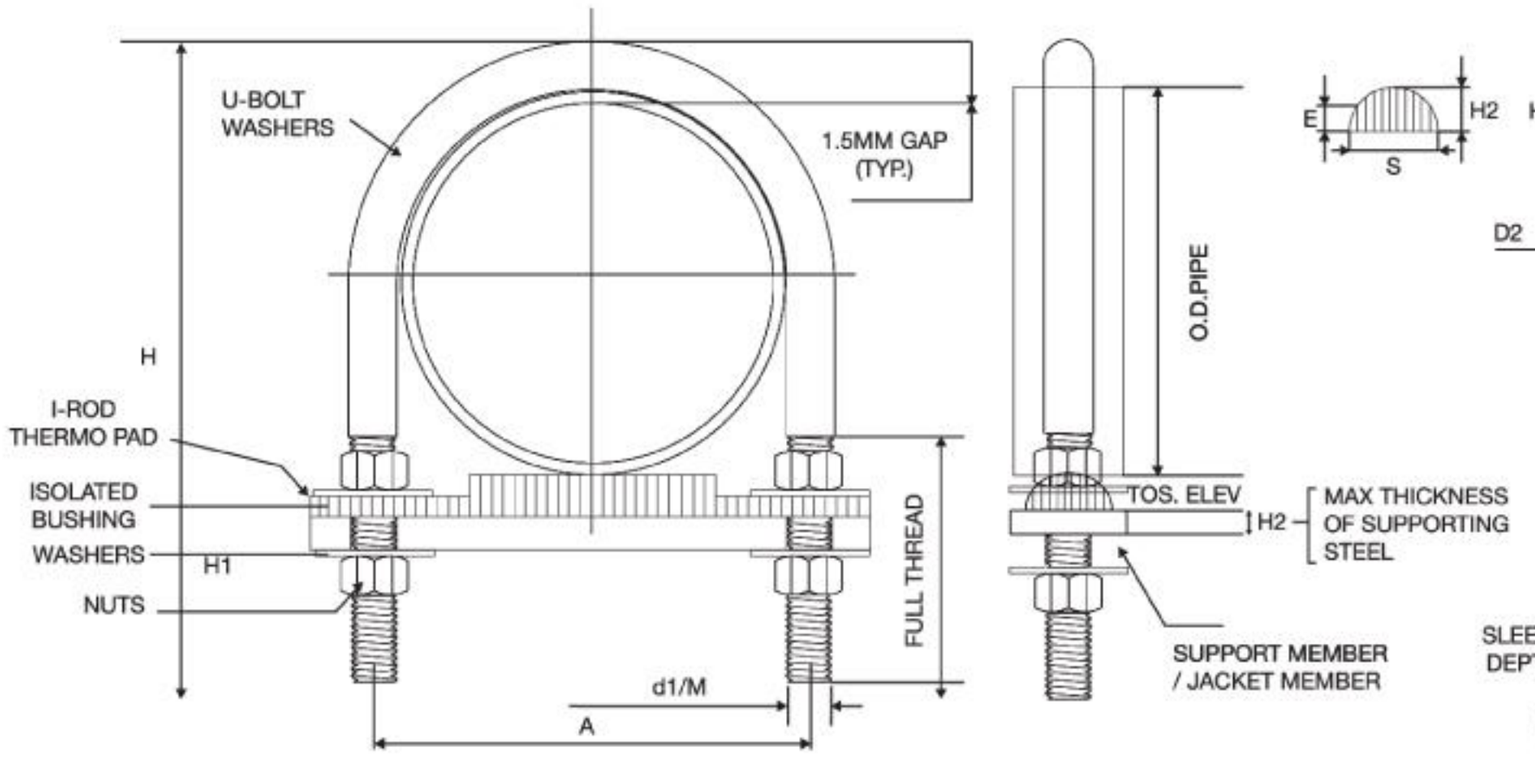
- Carbon Steel
- Stainless Steel, SS304, SS316

AVAILABLE COATINGS

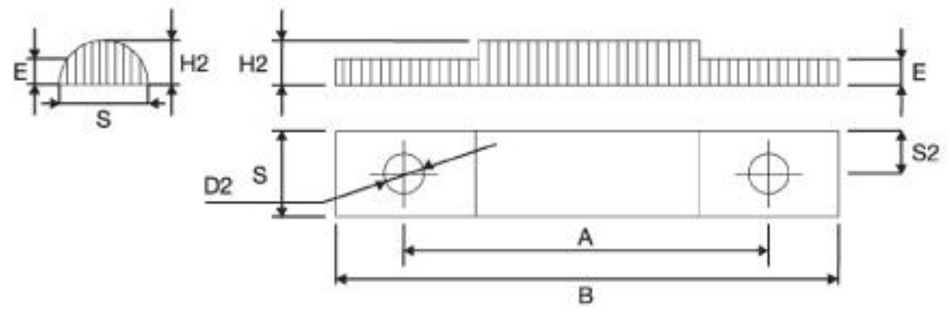
- Steel comes in Plain , Zinc Plated and Hot Dip Galvanized (HDG)

DYNO STRUCTURAL FASTENERS

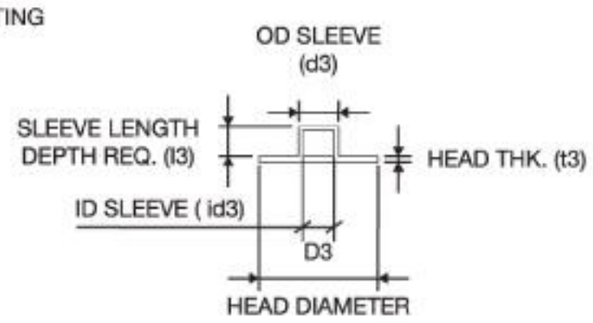
U-BOLT GUIDE TYPE A (SET)



NON GRIPPING HALF ROUND I-ROD THERMOPLASTIC PAD



ISOLATED BUSHING



ASSEMBLY GUIDE

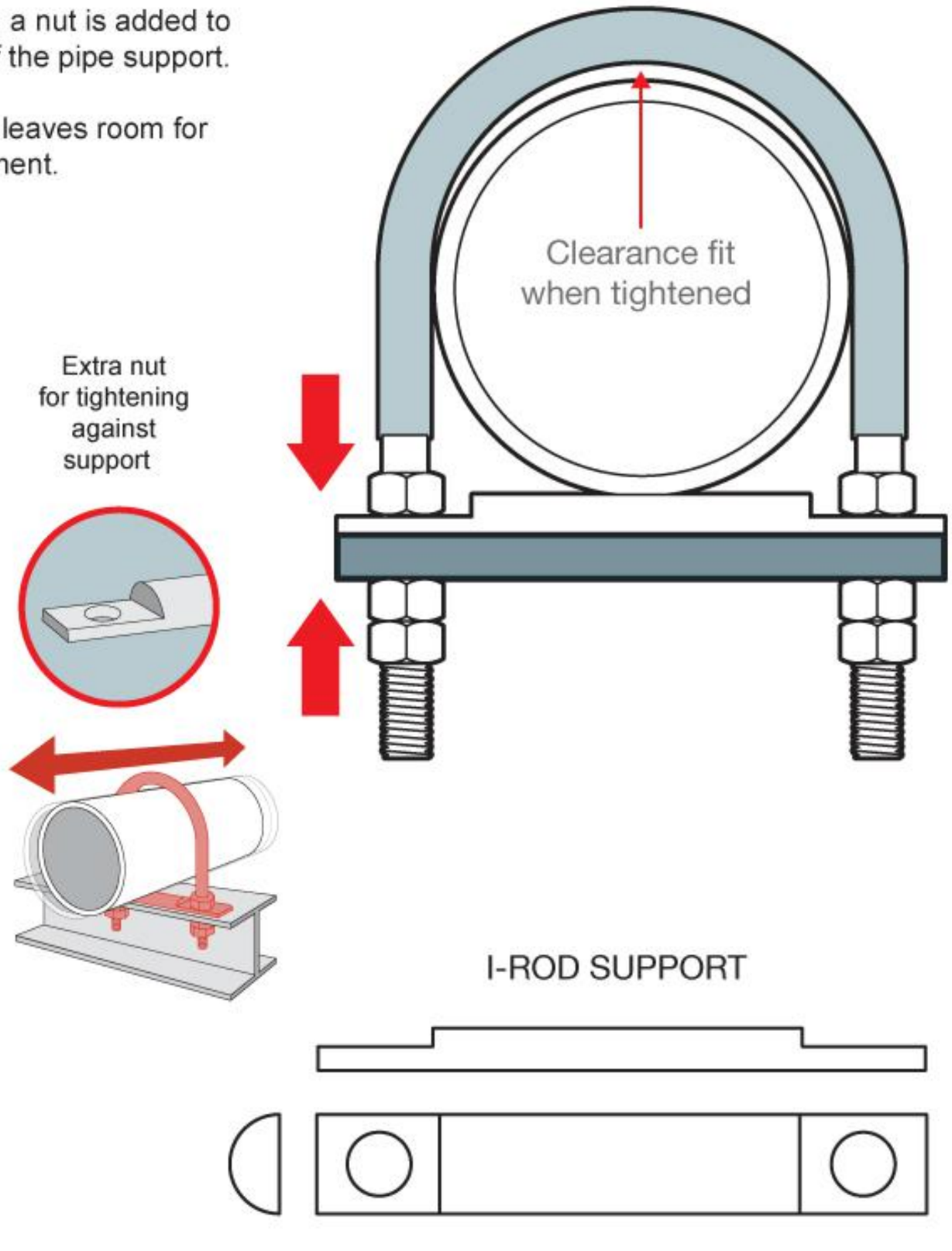
Nominal pipe size		T Max Note 2	U-Bolt (Note 1)							Non-Gripping I-Rod (Note 1)					Isolated Bushing (Note 1)				
			d1		A	H	L	H1	Max. Load	B	S	H2	E	d2	d3	id3	l3	D3	t3
inch	mm	mm	inch	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/2”	Ø21.3	10	1/4”	M6	31	80	180	60	220	60	20	10	5	9	8	6.1	5 to 30 (see requ. purc. & note 1,2)	12.2	2
3/4”	Ø26.7	10	1/4”	M6	37	84	190	60	220	70	20	10	5	9	8	6.1		12.2	2
1”	Ø33.4	10	3/8”	M10	47	87	200	60	550	76	25	12.5	6	13	12	10.1		24	2
1-1/2”	Ø48.3	10	3/8”	M10	62	102	240	64	550	102	25	12.5	6	13	12	10.1		24	2
2”	Ø60.3	10	3/8”	M10	74	114	270	64	550	114	25	12.5	6	13	12	10.1		24	2
2-1/2”	Ø73.0	16	1/2”	M14	91	133	320	76	1025	128	25	12.5	6	17	16	14.1		30	3
3”	Ø88.9	16	1/2”	M14	107	148	355	76	1025	152	25	12.5	6	17	16	14.1		30	3
4”	Ø114.3	16	1/2”	M14	132	173	420	76	1025	178	25	12.5	6	17	16	14.1		30	3
6”	Ø168.3	16	5/8”	M16	188	241	590	95	1640	230	25	12.5	6	19	18	16.1		34.5	3
8”	Ø219.1	20	5/8”	M16	239	292	720	95	1640	280	25	12.5	6	19	18	16.1		34.5	3
10”	Ø273.1	20	3/4”	M20	297	351	870	102	2460	344	38	19	10	23	22	20.2		36	3
12”	Ø323.9	20	7/8”	M24	355	408	1015	108	3420	406	38	19	10	28	27	24.2		44	3
14”	Ø355.6	20	7/8”	M24	387	440	1100	108	3420	432	38	19	10	28	27	24.2		44	3
16”	Ø406.4	20	7/8”	M24	437	491	1230	108	3420	484	38	19	10	28	27	24.2		44	3
18”	Ø457.0	20	1”	M27	491	551	1380	121	4500	550	38	19	10	31	30	27.5		50	3
20”	Ø508.0	20	1”	M27	542	602	1510	121	4500	600	38	19	10	31	30	27.5		50	3
24”	Ø610.0	20	1”	M27	644	703	1770	121	4500	700	38	19	10	31	30	27.5		50	3
26”	Ø660.0	20	1”	M27	694	754	1900	121	4500	750	38	19	10	31	30	27.5		50	3
28”	Ø711.0	20	1”	M27	745	805	2030	121	4500	800	38	19	10	31	30	27.5		50	3

1. U-Bolt, Non-Gripping I-Rod and isolated bushing dimensions be only for reference, refer purchase requirement for more information, and these dimension shall be confirmed by vendor.
2. Where supporting steel is thicker or heavier, dimensions “H” U-Bolt height shall be incresed accordingly.
3. I-Rod adhesive shall be compatible with maximum operating temperature and shall be sipplied by vendor.
4. Installation procedure shall be followed by vendor.

NON-GRIPPING

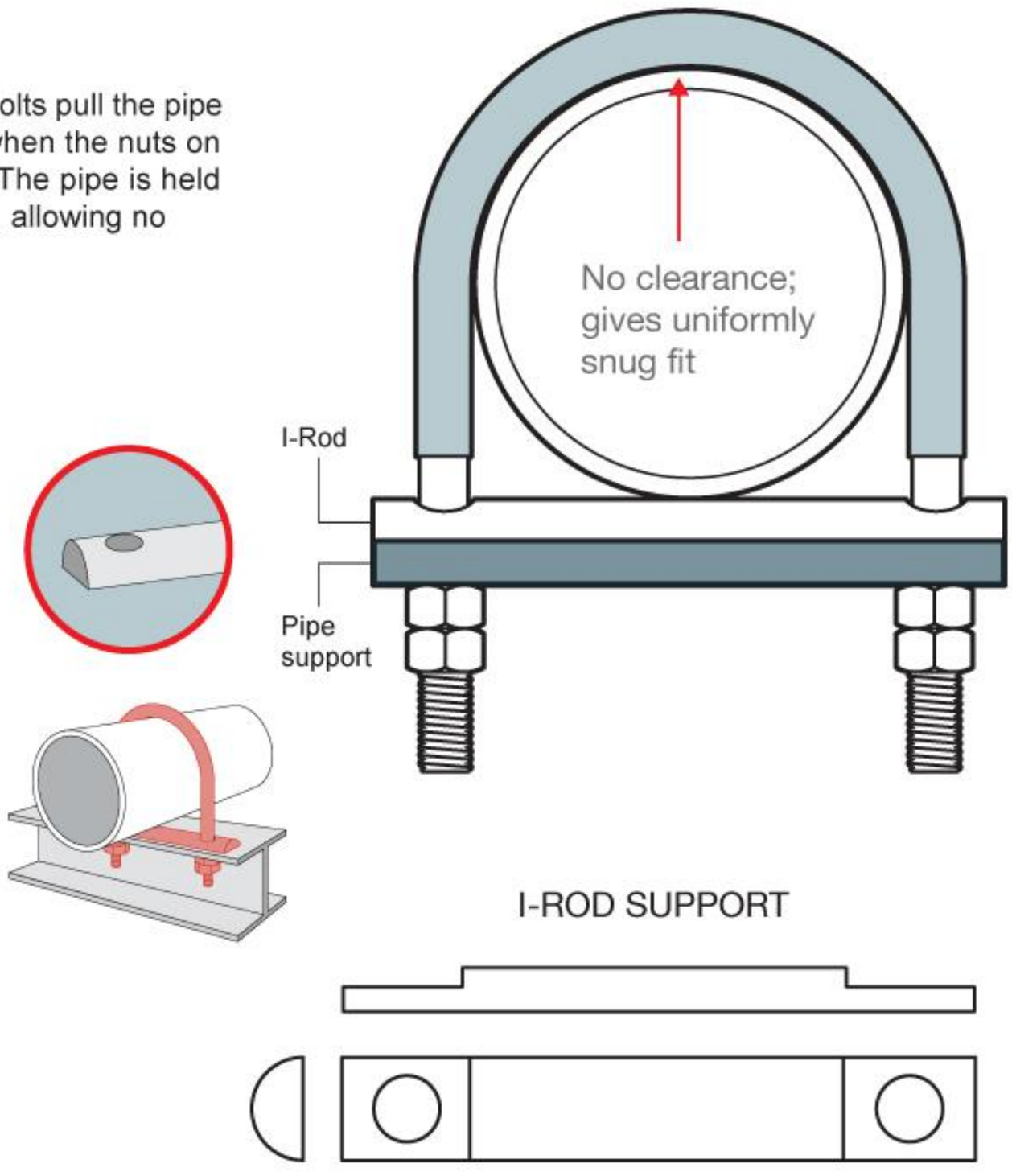
In non-gripping installations, a nut is added to the U-Bolt on the top side of the pipe support.

Enables easy assemblyand leaves room for sliding and rotational movement.



GRIPPING

In these installations, U-Bolts pull the pipe firmly against the I-Rod when the nuts on each side are tightened. The pipe is held tightly to the pipe support, allowing no movement.



DYNO
STRUCTURAL FASTENERS

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