

Wuerth Industrial Services Malaysia

INCH FASTENERS





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Dear Würth Industrie Service Customers!

Within the Würth Group Würth Industrie Service is responsible for supplying the industrial sector as a full service provider of C-Parts. Originally the company was founded as an independent subsidiary in the "Industriepark Würth" Bad Mergentheim in January 1999, by the outsourcing of the Industry Division of the Adolf Würth GmbH & Co. KG in Künzelsau.

A wide range of C-Parts as well as one of a kind supply concept make Würth Industrie Service the perfect supplier for C-Parts in the industry sector. Our product range focuses on the needs and demands of the industry sector for manufacturing, which includes assembly material for constructions, machines and vehicles as well as equipment for their maintenance.

Most U.S. companies that utilise inch fasteners in their assembly process, export those products or also have

productions sites in Europe. This is why it was important to us to add inch fasteners to our already wide range of C-parts.

This brochure serves to give an overview of the characteristics of these products. Furthermore, it provides additional information on the mechanical properties as well as the according standards.

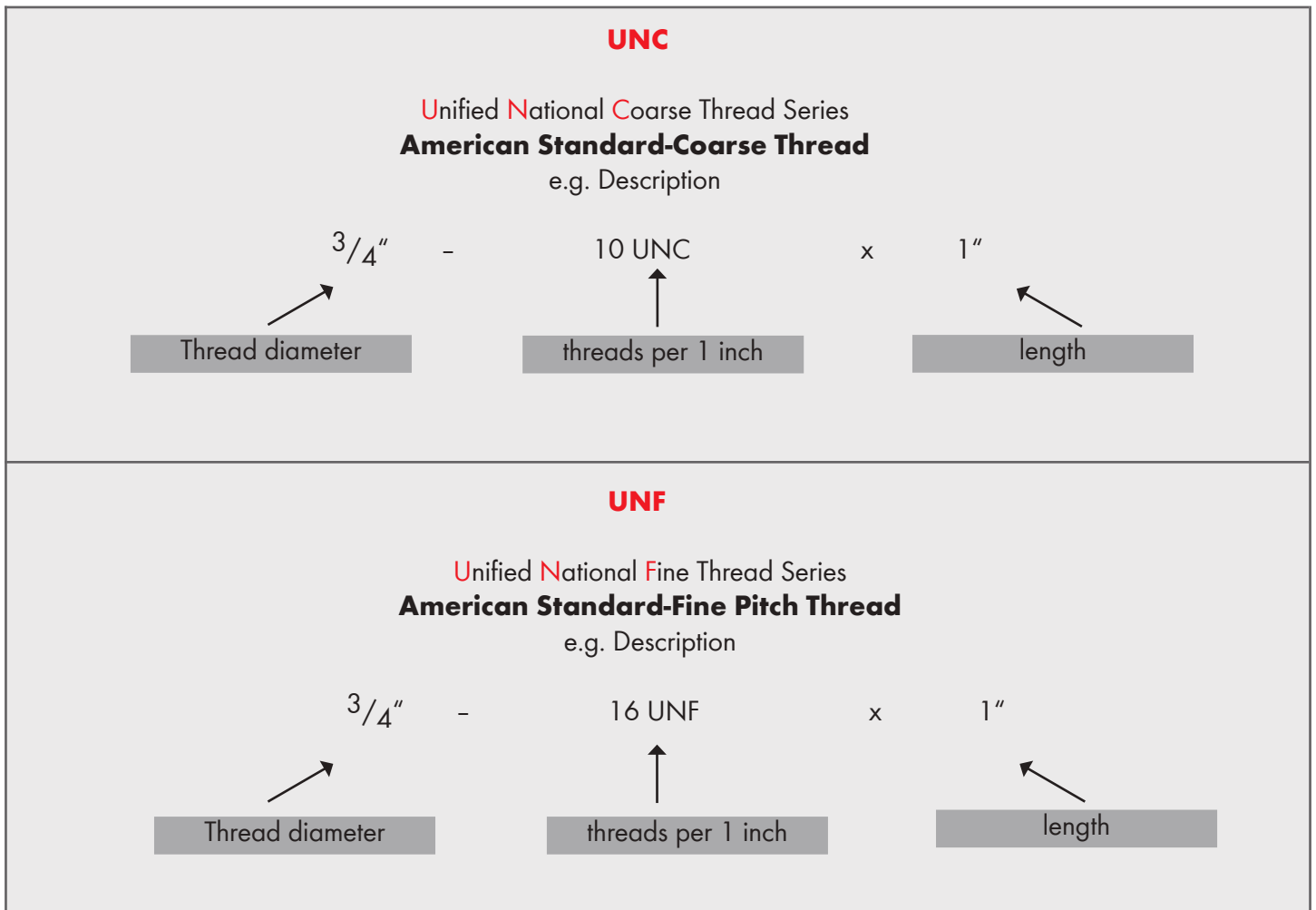
We look forward to do business with you and thank you for your trust.



Dr. Uwe Hasselmann
Head of Technical Department

In this brochure we want to introduce two types of threads to you. These are the **American Standard-Coarse Thread UNC** and the **Standard-Fine Pitch Thread UNF**. Both of these threads are part of the new standard assortment of Würth Industrie Service.

The difference between the metric and the american thread is that the metric range shows the lead of the thread (e.g. M8 x 1,25 mm) and the american range shows the threads per one inch (25,4 mm).



Besides the threads there are other differences between inch and metric items. Inch fasteners are not just used in the U.S. but for instance also in Great Britain. The difference between an American thread and an English thread is the thread angle as shown below:

Difference between thread angle UNC (America) and BSW (Great Britain)

UNC = American Standard-Coarse Thread, 60° thread angle

BSW = British Standard-Coarse Thread, 55° thread angle

1 Inch = 25,4 mm

Inch	mm Ø	UNC	UNF
No. 0	1,524		80
No. 1	1,854	64	72
No. 2	2,184	56	64
No. 3	2,515	48	56
No. 4	2,845	40	48
No. 5	3,175	40	44
No. 6	3,505	32	40
No. 8	4,166	32	36
No.10	4,826	24	32
No. 12	5,486	24	28
1/4"	6,350	20	28
5/16"	7,938	18	24
3/8"	9,525	16	24
7/16"	11,112	14	20
1/2"	12,700	13	20
9/16"	14,288	12	18
5/8"	15,875	11	18
11/16"	17,462		
3/4"	19,050	10	16
13/16"	20,638		
7/8"	22,225	9	14
15/16"	23,812		
1"	25,400	8	12 (14 UNS)
1 1/8"	28,575	7	12
1 1/4"	31,750	7	12
1 3/8"	34,925	6	12
1 1/2"	38,100	6	12
1 9/16"	39,688		
1 5/8"	41,275		
1 3/4"	44,450	5	
2"	50,800	4 1/2	
2 1/4"	57,150	4 1/2	
2 1/2"	63,500	4	

Screws		
Standard	English Description	German Description
ANSI B18.2.1	Hex Bolts	Sechskantschraube Voll- und Teilgewinde
ANSI B18.2.1	Hex Cap Screws	Sechskantschraube Voll- und Teilgewinde
ANSI B18.2.3.1M	Hex Cap Screws metric	Sechskantschraube Voll- und Teilgewinde Metrisch
ANSI B18.2.3.2M	Formed Hex Screws metric	Sechskantschraube Metrisch
ANSI B18.2.3.3M	Heavy Hex Screws metric	Sechskantschraube, schwere Ausführung Metrisch
ANSI B18.2.3.4M	Hex Flange Screws metric	Flanschkopf-Sechskantschraube Metrisch
ANSI B18.2.3.5M	Hex Bolts metric	Sechskantschraube Metrisch
ANSI B18.2.3.6M	Heavy Hex Bolts metric	Sechskantschraube, schwere Ausführung Metrisch
ANSI B18.2.3.7M	Heavy Hex Structural Bolts metric	Sechskantschraube, schwere Ausführung Metrisch
ANSI B18.2.3.8M	Hex Lag Screws metric	Sechskantschraube Metrisch
ANSI B18.2.3.9M	Heavy Hex Flange Screws metric	Flanschkopf-Sechskantschraube, schwere Ausführung Metrisch
ANSI B18.3	Socket Cap, Shoulder and Set Screws	Zylinderkopfschraube, Passschulter-schraube und Gewindestifte
ANSI B18.3.1M	Socket Head Cap Screws metric	Innensechskant-Schraube Metrisch
ANSI B18.5	Carriage Bolts	Schlossschraube
ANSI B18.5.2.2M	Round Head Square Neck Bolts metric	Hammerschraube Metrisch
ANSI B18.6.2	Slotted Head Cap Screws, Square Head Set Screws, Flat Countersunk Screws	Schlitzkopfschraube, Vierkantkopfschraube, Senkkopfschraube
ANSI B18.6.2	Slotted Head Cap Screws, Square Head Set Screws, Round Head Cap Screws	Schlitzkopfschraube, Vierkantkopfschraube, Zylinderkopfschraube
ANSI B18.6.2	Slotted Head Cap Screws, Square Head Set Screws, Fillister Head Cap Screws	Schlitzkopfschraube, Vierkantkopfschraube, Linsenkopfschraube
ANSI B18.6.3	Machine Screws, Flat Head, Roundhead, Panhead	Senkkopfschraube, Linsenkopf, Flachkopf,...
ANSI B18.6.7M	Machine Screws, Flat Head metric	Senkkopfschraube Metrisch
ANSI B18.6.7M	Machine Screws, Oval Head metric	Schraube mit ovalem Kopf Metrisch
ANSI B18.6.7M	Machine Screws, Pan Head metric	Flachkopfschraube Metrisch
ANSI B18.6.7M	Metric Screws, Hex Head metric	Sechskantschraube Metrisch
ANSI B18.6.7M	Metric Machine Screws, Hex Flange Head metric	Sechskantschraube m. Flansch Metrisch
ANSI B18.17	Wing Nuts, Thumb Screws and Wing Screws	Flügelmutter, Flügelmutterschraube
ANSI B18.6.4	Thread Forming, Hex Head	Blechschrabe m. Sechskantkopf
ANSI B18.6.4	Thread Forming, Hex Washer Head	Blechschrabe m. Sechskantkopf und angepresster Scheibe
ANSI B18.6.5M	Thread Forming, Flat Head metric	Blechschrabe m. Senkkopf Metrisch
ANSI B18.6.5M	Thread Forming, Oval Head metric	Blechschrabe m. Rundkopf Metrisch
ANSI B18.6.5M	Thread Forming, Pan Head metric	Blechschrabe m. Flachkopf Metrisch
ANSI B18.6.5M	Thread Forming, Hex Head metric	Blechschrabe m. Sechskantkopf Metrisch
ANSI B18.6.5M	Thread Forming, Hex Flange Head metric	Blechschrabe m. Sechskantflanschkopf Metrisch

Washers		
Standard	English Description	German Description
ANSI B18.21.1	Lock Washers - Helical Spring	Sicherungsscheibe
ANSI B18.21.2M	Lock Washers - Helical Spring metric	Sicherungsscheibe Metrisch
ANSI B18.21.2M	Lock Washers - Internal or External Tooth metric	Zahnscheibe Metrisch
ANSI B18.21.2M	Lock Washers - Countersunk External metric	Sicherungsscheibe mit Senkung Metrisch
ANSI B18.21.2M	Lock Washers - External and Internal Tooth Washer metric	Zahnscheibe Metrisch
ANSI B18.22M	Plain Washers metric	Scheibe Metrisch
ANSI B18.22.1	Plain Washers	Scheibe

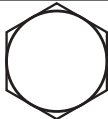





Nuts		
Standard	English Description	German Description
ANSI B18.2.2	Hex Jam Nuts	Sechskant-Gegenmutter
ANSI B18.2.4.1M	Hex Nuts, Style 1 metric	Sechskantmutter, Typ 1 Metrisch
ANSI B18.2.4.2M	Hex Nuts, Style 2 metric	Sechskantmutter, Typ 2 Metrisch
ANSI B18.2.4.3M	Slotted Hex Nuts metric	Schlitzmutter Metrisch
ANSI B18.2.4.4M	Hex Flange Nuts metric	Flanschmutter Metrisch
ANSI B18.2.4.5M	Hex Jam Nuts metric	Sechskant-Gegenmutter Metrisch
ANSI B18.2.4.6M	Heavy Hex Nuts metric	Sechskantmutter, schwere Ausführung Metrisch
ANSI B18.16.3M	Prevailing - Torque Hex Flange Nuts metric	Sechskant-Flansch-Torsionsmutter Metrisch
ANSI B18.16.3M	Prevailing - Torque Hex Nuts metric	Sechskant-Torsionsmutter Metrisch

Pins		
Standard	English Description	German Description
ANSI B18.8.1	Clevis Pins and Cotter Pins - Clevis Pins	Lastösenbolzen
ANSI B18.8.1	Clevis Pins and Cotter Pins - Cotter Pins	Lastösenbolzen
ANSI B18.8.2	Taper Pins, Dowel Pins	Kegelstift

Rivets		
Standard	English Description	German Description
ANSI B18.1.1	Small Solid Rivets, Flat Head	Niete klein mit Flachkopf
ANSI B18.1.1	Small Solid Rivets, Countersunk Head	Niete klein mit Senkkopf
ANSI B18.1.1	Small Solid Rivets, Button Head	Niete klein mit Halbrundkopf
ANSI B18.1.2	Large Rivets, Button Head	Niete groß mit Halbrundkopf
ANSI B18.1.2	Large Rivets, Countersunk Head	Niete groß mit Senkkopf
ANSI B18.1.3M	Small Solid Rivet, Flat Head metric	Flachkopfniete, klein Metrisch
ANSI B18.1.3M	Small Solid Rivet, Round Head metric	Halbrundniete, klein Metrisch
ANSI B18.1.3M	Small Solid Rivet, Countersunk Head metric	Senkkopfniete, klein Metrisch

Retaining Rings		
Standard	English Description	German Description
ANSI B27.7M	Cross Section Retaining Rings - Basic External metric	Sprengring - Außen Metrisch
ANSI B27.7M	Cross Section Retaining Rings - Basic Internal metric	Sprengring - Innen Metrisch
ANSI B27.7M	Cross Section Retaining Rings - E-Ring External metric	Sprengring - E-Ring Außen Metrisch

Alongside the ANSI- (American National Standards Institute) Standards **with inch threads**, are the according ANSI-Standards for **metric parts ("M")**.





















	Steel Screws				Stainless Steel	
Head Marking						
Product Specification	Grade 2	Grade 5	Grade 8	Socket Cap Screw	Stainless Steel (18-8)	Stainless Steel
Nominal Size Range	1/4 - 3/4 (>3/4 - 1 1/2)	1/4 - 1 (>1-1 1/2)	1/4 - 1 1/2	<1/2 (>1/2 - 2)	1/4 - 1 1/2	1/4 - 1 1/2
Material	Low/Med. Carbon Steel	Medium Carb. Steel Heat Treated	Medium Carb. Steel Heat Treated	Alloy Steel Heat Treated	SS 302, 303, 304, 305	SS 316
Tensile Strength Min. PSI	74.000 (60.000)	120.000 (105.000)	150.000	180.000 (170.000)	85.000	85.000
Yield Strength Min. PSI	57.000 (36.000)	91.000 (81.000)	130.000	162.000 (153.000)	45.000	45.000
Proof Load PSI	55.000 (33.000)	85.000 (74.000)	120.000	140.000 (135.000)	-	-
Hardness Min. Max.	HRB-70 HRB-95	HRC-19 HRC-34	HRC-33 HRC-39	HRC-38 HRC-45	HRB-80	HRB-80
matching Nut	Mild Steel	Grade 5	Grade 8	-	304 (18-8)	316

145 PSI = 1 MPA

Mechanical Properties		
Standard	English Description	German Description
SAE J429	Mechanical and Material Requirements for Mechanical Fasteners	Mechanische Eigenschaften von Verbindungselementen
ASTM A574	Alloy Steel Socket Head Cap Screws	Mechanische Eigenschaften für hochfeste Innensechskant-Schrauben
ANSI B27.7M	Cross Section Retaining Rings - E-Ring External metric	Sprengring - E-Ring Außen Metrisch

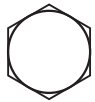
Metric and Inch Class Comparison

The classes and grades are **not** equal, they are just similar!

INCH Fasteners		METRIC Fasteners			
	Pounds per Inch ² (psi)	(MPa)	Megapascal		
	Grade 2 (over 3/4")	58.015	≈ 400	class 4.6	
		60.000	≈ 414		
		60.916	≈ 420	class 4.8	
	Grade 2 (up to 3/4")	74.000	≈ 510		
		72.519	≈ 500	class 5.6	
		75.420	≈ 520	class 5.8	
		87.023	≈ 600	class 6.8	
	Grade 5 (over 1")	105.000	≈ 724		
	Grade 5 (up to 1")	120.000	≈ 827		
		120.381	≈ 830	class 8.8	 
		130.534	≈ 900	class 9.8	
	Grade 7	133.000	≈ 916		
	Grade 8	150.000	≈ 1034		
		150.839	≈ 1040	class 10.9	 
	ASTM A574 ≤ 1/2" - 180,000 psi > 1/2" - 170,000 psi	176.946	≈ 1220	class 12.9	 
	L 9® (Grade 9) (Proprietary product)	180.000	≈ 1240	class 12.9	



Screw and Bolt Heads



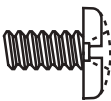
Grade 2 Hex



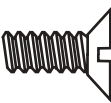
Grade 5 Hex



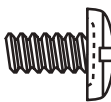
Grade 8 Hex



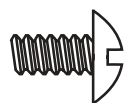
Pan



Flat



Slotted Round



Round



Square Shoulder



Fillister



Oval



Indented Hex

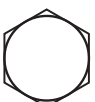


Binding

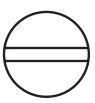


Trimmed Hex

Screw Head Drives



Hexagon (External Drive)



Slotted



Hexagon (Internal Drive)



Torx



Acorn



Phillips Plus Drive

Screw Thread Points

Type A



Thin sheet metal applications

Type B



Shallow holes in composite material

Type AB



Heavier sheet metal applications

Type C



Heavy sheet metal & die castings

Type F



Heavy gage sheet metal, die castings etc

Type 1



General machine screw thread fastener

Type 17



Self-drilling in thin metals

Type 23



Soft metal castings

Type 25



Plastic & composites

Cup Point



Against hardened shafts

Drill Point



Self drilling applications

Round Point



Where end friction without cutting action is desirable

Half Dog Point



For permanent locations

Needle Point



Self piercing point used in light metals

Nail Point



For locking against soft material

Full or partial thread

Extract from the standard ASME B18.2.1

Maximum distance from surface to first full thread pitch (lg)
and minimum length of shaft (ls)

No- minal diame- ter	1/4		5/16		3/8		7/16		1/2		9/16	
	lg	ls	lg	ls	lg	ls	lg	ls	lg	ls	lg	ls
1 1/4	0.50	0.25										
1 3/8	0.63	0.38	0.50	0.22								
1 1/2	0.75	0.50	0.62	0.35	0.50	0.19						
1 5/8	0.88	0.62	0.75	0.47	0.62	0.31						
1 3/4	1.00	0.75	0.88	0.60	0.75	0.44	0.63	0.27				
1 7/8	1.12	0.88	1.00	0.72	0.88	0.56	0.75	0.39	0.63	0.24		
2	1.25	1.00	1.12	0.85	1.00	0.59	0.88	0.52	0.75	0.38		
2 1/8	1.38	1.12	1.25	0.97	1.12	0.81	1.00	0.64	0.88	0.49	0.75	0.33
2 1/4	1.50	1.25	1.38	1.10	1.25	0.94	1.12	0.77	1.00	0.52	0.88	0.46
2 3/8	1.62	1.38	1.50	1.22	1.38	1.06	1.25	0.89	1.12	0.74	1.00	0.58
2 1/2	1.75	1.50	1.62	1.35	1.50	1.19	1.38	1.02	1.25	0.86	1.12	0.75
2 5/8	1.88	1.62	1.75	1.47	1.62	1.31	1.50	1.14	1.38	0.99	1.25	0.83
2 3/4	2.00	1.75	1.88	1.60	1.75	1.44	1.62	1.27	1.50	1.12	1.38	0.96
2 7/8	2.12	1.88	2.00	1.72	1.88	1.56	1.75	1.39	1.62	1.24	1.50	1.08
3	2.25	2.00	2.12	1.85	2.00	1.69	1.88	1.52	1.75	1.36	1.62	1.21
3 1/4	2.50	2.25	2.38	2.10	2.25	1.94	2.12	1.77	2.00	1.62	1.88	1.46
3 1/2	2.75	2.50	2.62	2.35	2.50	2.19	2.38	2.02	2.25	1.86	2.12	1.71
3 3/4	3.00	2.75	2.88	2.60	2.75	2.44	2.62	2.27	2.50	2.12	2.38	1.96
4	3.25	3.00	3.12	2.85	3.00	2.69	2.88	2.52	2.75	2.36	2.62	2.21
4 1/4	3.50	3.25	3.38	3.10	3.25	2.94	3.12	2.77	3.00	2.62	2.88	2.46
4 1/2	3.75	3.50	3.62	3.35	3.50	3.19	3.38	3.02	3.25	2.86	3.12	2.71
4 3/4	4.00	3.75	3.88	3.60	3.75	3.44	3.62	3.27	3.50	3.12	3.38	2.96
5	4.25	4.00	4.12	3.85	4.00	3.69	3.88	3.52	3.75	3.36	3.62	3.21
5 1/4	4.50	4.25	4.38	4.10	4.25	3.94	4.12	3.77	4.00	3.62	3.88	3.46
5 1/2	4.75	4.50	4.62	4.35	4.50	4.19	4.38	4.02	4.25	3.87	4.12	3.71
5 3/4	5.00	4.75	4.88	4.60	4.75	4.44	4.63	4.27	4.50	4.12	4.38	3.96
6	5.25	5.00	5.12	4.85	5.00	4.69	4.88	4.52	4.75	4.36	4.62	4.21
6 1/4	5.25	5.00	5.12	4.85	5.00	4.69	4.88	4.52	4.75	4.36	4.62	4.21
6 1/2	5.50	5.25	5.38	5.10	5.25	4.94	5.12	4.77	5.00	4.62	4.88	4.46
6 3/4	5.75	5.50	5.62	5.35	5.50	5.19	5.38	5.02	5.25	4.86	5.12	4.71
7	6.00	5.75	5.88	5.80	5.75	5.44	5.62	5.27	5.50	5.12	5.38	4.96
7 1/4	6.25	6.00	6.12	5.85	6.00	5.69	5.88	5.52	5.75	5.36	5.62	5.20
7 1/2	6.50	6.25	6.38	6.10	6.25	5.94	6.12	5.77	6.00	5.62	5.88	5.46
7 3/4	6.75	6.50	6.62	6.35	6.50	6.19	6.38	6.02	6.25	5.87	6.12	5.71
8	7.00	6.75	6.88	6.60	6.75	6.44	6.62	6.27	6.50	6.12	6.38	5.96
8 1/4	7.25	7.00	7.12	6.85	7.00	6.69	6.88	6.52	6.75	6.36	6.62	6.21
8 1/2	7.50	7.25	7.38	7.10	7.25	6.94	7.12	6.77	7.00	6.62	6.88	6.46
8 3/4	7.75	7.50	7.62	7.35	7.50	7.19	7.38	7.02	7.25	6.86	7.12	6.71
9	8.00	7.75	7.88	7.60	7.75	7.44	7.62	7.27	7.50	7.12	7.38	6.96
9 1/4	8.25	8.00	8.12	7.85	8.00	7.69	7.88	7.52	7.75	7.36	7.62	7.21
9 1/2	8.50	8.25	8.38	8.10	8.25	7.94	8.12	7.77	8.00	7.62	7.88	7.46
9 3/4	8.75	8.50	8.62	8.35	8.50	8.19	8.38	8.02	8.25	7.86	8.12	7.71
10	9.00	8.75	8.88	8.60	8.75	8.44	8.62	8.27	8.50	8.12	8.38	7.96

Full or partial thread

Extract from the standard ASME B18.2.1

Maximum distance from surface to first full thread pitch (lg)
and minimum length of shaft (ls)

No- minal diame- ter	5/8		3/4		7/8		1		1 1/8		1 1/4	
	lg	ls	lg	ls	lg	ls	lg	ls	lg	ls	lg	ls
1 1/4	Nominal lengths above the grey line are thread to head!											
1 3/8												
1 1/2												
1 5/8												
1 3/4												
1 7/8												
2												
2 1/8												
2 1/4												
2 3/8	0.88	0.42										
2 1/2	1.00	0.55										
2 5/8	1.12	0.67	0.88	0.38								
2 3/4	1.25	0.80	1.00	0.50								
2 7/8	1.38	0.92	1.12	0.62	0.88	0.32						
3	1.50	1.05	1.25	0.75	1.00	0.44						
3 1/4	1.75	1.30	1.50	1.00	1.25	0.69	1.00	0.38				
3 1/2	2.00	1.55	1.75	1.25	1.50	0.94	1.25	0.62				
3 3/4	2.25	1.80	2.00	1.50	1.75	1.19	1.50	0.88	1.25	0.54		
4	2.50	2.05	2.25	1.75	2.00	1.44	1.75	1.12	1.50	0.79	1.25	0.54
4 1/4	2.75	2.30	2.50	2.00	2.25	1.69	2.00	1.38	1.75	1.04	1.50	0.79
4 1/2	3.00	2.55	2.75	2.25	2.50	1.94	2.25	1.62	2.00	1.29	1.75	1.04
4 3/4	3.25	2.80	3.00	2.50	2.75	2.19	2.50	1.88	2.25	1.54	2.00	1.29
5	3.50	3.05	3.25	2.50	3.00	2.44	2.75	2.12	2.50	1.79	2.25	1.54
5 1/4	3.75	3.30	3.50	3.00	3.25	2.69	3.00	2.38	2.75	2.04	2.50	1.79
5 1/2	4.00	3.55	3.75	3.25	3.50	2.94	3.25	2.62	3.00	2.29	2.75	2.04
5 3/4	4.25	3.80	4.00	3.50	3.75	3.19	3.50	2.88	3.25	2.54	3.00	2.29
6	4.50	4.05	4.25	3.75	4.00	3.44	3.75	3.12	3.50	2.79	3.25	2.54
6 1/4	4.50	4.05	4.25	3.75	4.00	3.44	3.75	3.12	3.50	2.79	3.25	2.54
6 1/2	4.75	4.30	4.50	4.00	4.25	3.69	4.00	3.38	3.75	3.04	3.50	2.79
6 3/4	5.00	4.55	4.75	4.25	4.50	3.94	4.25	3.63	4.00	3.29	3.75	3.04
7	5.25	4.80	5.00	4.50	4.75	4.19	4.50	3.88	4.25	3.54	4.00	3.29
7 1/4	5.50	5.05	5.25	4.75	5.00	4.44	4.75	4.12	4.50	3.79	4.25	3.54
7 1/2	5.75	5.30	5.50	5.00	5.25	4.69	5.00	4.38	4.75	4.04	4.50	3.79
7 3/4	6.00	5.55	5.75	5.25	5.50	4.94	5.25	4.62	5.00	4.29	4.75	4.04
8	6.25	5.80	6.00	5.50	5.75	5.19	5.50	4.88	5.25	4.54	5.00	4.29
8 1/4	6.50	6.05	6.25	5.75	6.00	5.44	5.75	5.12	5.50	4.79	5.25	4.54
8 1/2	6.75	6.30	6.50	6.00	6.25	5.69	6.00	5.38	5.75	5.04	5.50	4.79
8 3/4	7.00	6.55	6.75	6.25	6.50	5.94	6.25	5.62	6.00	5.29	5.75	5.04
9	7.25	6.80	7.00	6.50	6.75	6.19	6.50	5.88	6.25	5.54	6.00	5.29
9 1/4	7.50	7.05	7.25	6.75	7.00	6.44	6.75	6.12	6.50	5.79	6.25	5.54
9 1/2	7.75	7.30	7.50	7.00	7.25	6.89	7.00	6.38	6.75	6.04	6.50	5.79
9 3/4	8.00	7.55	7.75	7.25	7.50	6.94	7.25	6.62	7.00	6.29	6.75	6.04
10	8.25	7.80	8.00	7.50	7.75	7.19	7.50	6.88	7.25	6.54	7.00	6.29



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SURVEY INCH FASTENERS

YOUR individual poster for separating - fast and easy!

NUTS											
2H	2 WAY LOCK	ACORN	ALLEN	CASTLE	COUPLING	FIBER LOCK	FINISHED HEX	FLANGE	FLEXILOC	FORGED WING	
FORMED WING	HEAVY HEX	HEX	HEX JAM	HEX SLOTTED	KEPS	METAL LOCK	NE NYLON INSERT	NTE NYLON INSERT	PAL	REGULAR SQUARE	
RIV	SLAB WELD	SQUARE	STRUX	TEE	U NUT	UNTORUE LOCK	WELD	WHEEL	WHIZ LOCK FLANGE	WIRE	

POINTS					HEADS					PROTECTIVE FINISHES			
TYPE A	TYPE B	TYPE AB	TYPE C	TYPE F	GRADE 2 HEX	GRADE 5 HEX	GRADE 8 HEX	ACORN	BINDING	Finish	Finish Color	Corrosion Resistance	Suggested Material
TYPE U	TYPE 1	TYPE 17	TYPE 23	TYPE 25	FILLISTER	FLAT	HEX	INDENT. HEX	OVAL	Black Zinc	Black	Very Good	All
CONE	CUPPED	DIE	HALF DOG	NAIL	PAN	PHIL. PLUS DRIVE	PHIL. FIN WASH.	ROUND	SLOTTED DRIVE	Brass	Brass	Fair	Steel
PINCH	ROLLED	ROUND	SELF DRILLING	SELF PIERCING	SOCKET DRIVE	SQ. SHOULDER	TORX DRIVE	TRIMMED HEX	TRUSS	Bronze	Varied	Fair	Steel
										Cadmium	Silver Gray	Very Good	Steel
										Copper	Copper	Fair	Steel
										Iridite	Olive, Green, Black, Red, Blue, Bronze	Good	Ferrous Metals
										Nickel	Silver	Very Good	Steel
										Oxide (Black)	Lustre Black	Fair	All
										Painted	Any	Good	All
										Parkerized	Dull Gray, Black	Fair	Steel
										Phos & Oil	Black	Very Good	Steel
										Stalgard	Dull Silver	Excellent	All
										Tinning (electro)	Silver, Gray	Good	Steel
										Trivalent Zinc	Varied	Good	Steel
										Zinc (electroplated)	Gray	Good	Steel

NOMINAL SIZE & THREAD / INCH SERIES DESIGNATION					
Size	Basic	Thread	Size	Basic	Thread
0.80	0.0600	UNF	7/16-20	0.4375	UNF
1.64	0.0730	UNC	1/2-13	0.5000	UNC
1.72	0.0730	UNF	1/2-20	0.5000	UNF
2.56	0.0860	UNC	9/16-12	0.5625	UNC
2.64	0.0860	UNF	9/16-18	0.5625	UNF
3.48	0.0990	UNC	5/8-11	0.6250	UNC
3.56	0.0990	UNF	5/8-18	0.6250	UNF
4.40	0.1120	UNC	3/4-10	0.7500	UNC
4.48	0.1120	UNF	3/4-16	0.7500	UNF
5.40	0.1250	UNC	7/8-9	0.8750	UNC
5.44	0.1250	UNF	7/8-14	0.8750	UNF
6.32	0.1380	UNC	1-8	1.0000	UNC
6.40	0.1380	UNF	1-12	1.0000	UNF
8.32	0.1640	UNC	1-14	1.0000	UNS
8.36	0.1640	UNF	1 1/8-7	1.1250	UNF
10.24	0.1900	UNC	1 1/8-8	1.1250	8 SERIES
10.32	0.1900	UNF	1 1/8-12	1.1250	UNF
12.24	0.2160	UNC	1 1/4-7	1.2500	UNC
12.28	0.2160	UNF	1 1/4-8	1.2500	8 SERIES
1/4-20	0.2500	UNC	1 1/4-12	1.2500	UNF
1/4-28	0.2500	UNF	1 3/8-6	1.3750	UNF
5/16-18	0.3125	UNC	1 3/8-8	1.3750	8 SERIES
5/16-24	0.3125	UNF	1 3/8-12	1.3750	UNF
3/8-16	0.3750	UNC	1 1/2-6	1.5000	UNC
3/8-24	0.3750	UNF	1 1/2-8	1.5000	8 SERIES
7/16-14	0.4375	UNC	1 1/2-12	1.5000	UNF

HOW TO SPECIFY																									
<p>1/4 - 20 x 4 Hex Head Cap Screw Grade 8 with Zinc & Yellow</p>																									
<table border="1"> <thead> <tr> <th>Step</th> <th>Action</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Nominal Size</td> <td>1/4"</td> </tr> <tr> <td>2</td> <td>Threads per Inch</td> <td>20</td> </tr> <tr> <td>3</td> <td>Product Length</td> <td>4"</td> </tr> <tr> <td>4</td> <td>Product Name</td> <td>Hex Head Cap Screw</td> </tr> </tbody> </table>	Step	Action	Example	1	Nominal Size	1/4"	2	Threads per Inch	20	3	Product Length	4"	4	Product Name	Hex Head Cap Screw	<table border="1"> <thead> <tr> <th>Step</th> <th>Action</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>Material</td> <td>Grade 8</td> </tr> <tr> <td>6</td> <td>Protective Finish</td> <td>Zinc & Yellow</td> </tr> </tbody> </table>	Step	Action	Example	5	Material	Grade 8	6	Protective Finish	Zinc & Yellow
Step	Action	Example																							
1	Nominal Size	1/4"																							
2	Threads per Inch	20																							
3	Product Length	4"																							
4	Product Name	Hex Head Cap Screw																							
Step	Action	Example																							
5	Material	Grade 8																							
6	Protective Finish	Zinc & Yellow																							

CONVERSION							
Inch		Metric		Inch		Metric	
Fraction	Decimal	MM	Fraction	Decimal	MM	Fraction	MM
1/128	0.007813	0.198438	31/64	0.484375	12.303125		
1/64	0.015625	0.396875	1/2	0.500000	12.700000		
1/32	0.031250	0.793750	33/64	0.515625	13.096875		
3/64	0.046875	1.190625	17/32	0.531250	13.493750		
1/16	0.062500	1.587500	35/64	0.546875	13.890625		
3/64	0.078125	1.984375	9/16	0.562500	14.287500		
3/32	0.093750	2.381250	37/64	0.578125	14.684375		
7/64	0.109375	2.778125	19/32	0.593750	15.081250		
1/8	0.125000	3.175000	39/64	0.609375	15.478125		
9/64	0.140625	3.571875	5/8	0.625000	15.875000		
5/32	0.156250	3.968750	41/64	0.640625	16.271875		
11/64	0.171875	4.365625	21/32	0.656250	16.668750		
3/16	0.187500	4.762500	43/64	0.671875	17.065625		
13/64	0.203125	5.159375	3/4	0.750000	19.050000		
7/32	0.218750	5.556250	49/64	0.765625	19.446875		
15/64	0.234375	5.953125	25/32	0.781250	19.843750		
1/4	0.250000	6.350000	51/64	0.796875	20.240625		
17/64	0.265625	6.746875	13/16	0.812500	20.637500		
9/32	0.281250	7.143750	53/64	0.828125	21.034375		
19/64	0.296875	7.540625	7/8	0.875000	22.225000		
5/16	0.312500	7.937500	57/64	0.890625	22.621875		
21/64	0.328125	8.334375	29/32	0.906250	23.018750		
11/32	0.343750	8.731250	59/64	0.921875	23.415625		
23/64	0.359375	9.128125	15/16	0.937500	23.812500		
3/8	0.375000	9.525000	61/64	0.953125	24.209375		
25/64	0.390625	9.921875	31/32	0.968750	24.606250		
7/16	0.437500	11.112500	63/64	0.984375	25.003125		
29/64	0.453125	11.509375	1	1.000000	25.400000		
15/32	0.468750	11.906250					

WASHERS			
BEARING LOCK	BELLEVILLE	EXT. TOOTH LOCK	FENDER
FLAT	HEX	INT. TOOTH LOCK	LOAD INDICATOR
ROUND MALLEABLE	SPLIT LOCK	SQUARE BEVEL	T-SLOT

HEAD MARKINGS		TENSILE STRENGTH		YIELD STRENGTH	
Property Class (Metric)	Strength Grade (Inch)	Megapascal	Pounds per Inch ²	Megapascal	Pounds per Inch ²
5.8	Grade 2	520	75,420 (PC 5.8)	420	55,114 (PC 5.8) 55,000 Grade 2
8.8	Grade 5	830	120,381 (PC 8.8) 120,000 Grade 5	660	87,023 (PC 8.8) 85,000 Grade 5
10.9	Grade 8	1,040	150,839 (PC 10.9) 150,000 Grade 8	940	120,381 (PC 10.9) 120,000 Grade 8
12.9	ASTM A574 Socket Head Cap Screw	1,220	176,946 (PC 12.9) 180,000 A574	1,110	159,541 (PC 12.9) 162,000 A574

INCH FASTENERS

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MW-Schweikert – AH -1' - 03/14

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