KONNECT®

FASTENING SYSTEMS

CONVERSION CHARTS

AU: 1300 KONNECT (566 632) | www.konnectfasteningsystems.com.au
NZ: 0508 KONNECT (566 632) | www.konnectfasteningsystems.co.nz

UNIT CONVERSION FACTORS & STANDARD THREAD LENGTH

UNIT CONVERSION FACTORS

	TO CONVERT →	TO →	MULTIPLY BY
MASS			
0.035274	ounce **(oz)**	gram **(g)**	28.349
2.20462	pound **(lb)**	kilogram **(kg)**	0.453592
0.001	tonne **(metric ton or mt)**	kilogram **(kg)**	1,000
0.984207	tonne UK **(long ton)**	tonne **(t)**	1.01605
0.001	kip **(kip)**	pound **(lb)**	1,000
$446.43x10^{-6}$	tonne UK **(long ton)**	pound **(lb)**	2,240
LENGTH			
0.0393701	inch **(in)**	millimetre **(mm)**	25.400
3.28084	foot **(ft)**	metre **(m)**	0.3048
1.09361	yard **(yd)**	metre **(m)**	0.91440
0.621371	mile **(mi)**	kilometre **(km)**	1.60934
39.370	thousandth of an inch **(thou)**	millimetre **(mm)**	0.02540
0.001	millimetre **(mm)**	micrometre **(micron or µm)**	1,000
0.02540	micrometre **(micron or µm)**	micro-inch **(µ")**	39.370
AREA			
2.47105	acre **(ac)**	hectare **(ha)**	0.40469
0.1550	square inch **(in^2)**	square centimetre **(cm^2)**	6.4516
10.7639	square feet **(ft^2)**	square metre **(m^2)**	0.092903
10,000	square metre **(m^2)**	hectare **(ha)**	0.0001
VOLUME			
0.21997	gallon UK **(UK gal)**	litre **(l or L)**	4.5461
0.26417	gallon US **(US gal)**	litre **(l or L)**	3.7854
0.001	litre **(l or L)**	millilitre **(ml)**	1000
0.35195	fluid ounce **(fl oz)**	millilitre **(ml)**	28.413
1.7598	pint UK **(pt)**	litre **(l or L)**	0.56826
0.001	cubic metre **(m^3)**	litre **(l or L)**	1,000
0.061024	cubic inch **(in^3)**	millilitre **(ml)**	16.3871
FORCE			
10,000	dyne **(dyn)**	newton **(N)**	0.00001
0.10197	kilogram-force **(kgf)**	newton **(N)**	9.80665
0.22481	pound-force **(lbf)**	newton **(N)**	4.44822
2.2046	pound-force **(lbf)**	kilogram-force **(kgf)**	0.45359
0.10036	tonne-force UK **(tf)**	kilonewton **(kN)**	9.9640
TORQUE			
0.7376	pound-force foot **(lbf ft)**	newton metre **(Nm)**	1.356
0.10197	kilogram-force metre **(kgf m)**	newton metre **(Nm)**	9.80665
8.851	pound-force inch **(lbf ft)**	newton metre **(Nm)**	0.1130
DIVIDE BY	**← TO**	**← TO CONVERT**	

	TO CONVERT →	TO →	MULTIPLY BY
PRESSURE AND STRESS			
1.000	newton/square metre **(N/m^2)**	pascal **(Pa)**	1.000
1.000	newton/square millimetre **(N/mm^2)**	megapascal **(MPa)**	1.000
0.001	megapascal **(MPa)**	kilopascal **(kPa)**	1000
0.001	gigapascal **(GPa)**	megapascal **(MPa)**	1000
0.006895	megapascal **(MPa)**	pound-force/square inch **(lbf/in² or psi)**	145.04
0.001	kilopound per square inch **(ksi)**	pound-force/square inch **(lbf/in² or psi)**	1000
15.444	megapascal **(MPa)**	ton-force (UK)/square inch **($tonf/in^2$)**	0.06475
10.000	millibar **(mbar)**	kilopascal **(kPa)**	0.1000
33.86	millibar **(mbar)**	inches mercury **(inHg)**	0.02953
68.948	millibar **(mbar)**	pound-force/square inch **(lbf/in² or psi)**	0.014504
0.14504	pound-force/square inch **(lbf/in² or psi)**	kilopascal **(kPa)**	6.89476
0.009869	atmosphere **(atm)**	kilopascal **(kPa)**	101.32
0.06804	atmosphere **(atm)**	pound-force/square inch **(lbf/in² or psi)**	14.696
DENSITY			
0.001	gram/cubic centimetr **(g/cm^3)**	kilogram/cubic metre **(kg/m^3)**	1000
$36.127x10^{-6}$	pound/cubic inch **(lb/in^3)**	kilogram/cubic metre **(kg/m^3)**	27680
16.0185	pound/cubic foot **(lb/ft^3)**	kilogram/cubic metre **(kg/m^3)**	0.06243
ENERGY, WORK AND HEAT			
0.73756	foot pound-force **(ft lbf)**	joule **(J)**	1.35582
0.2388	calorie **(cal)**	joule **(J)**	4.1868
1.10197	kilogram-force metre **(kgf m)**	joule **(J)**	9.80665
$9.478x10^{-4}$	British thermal unit **(Btu)**	joule **(J)**	1055.1
0.27778	kilowatt hour **(kWh)**	megajoule **(MJ)**	3.600
0.009478	therm **(EC)**	megajoule **(MJ)**	105.51
POWER			
1.000	watt **(W)**	joule/sec **(J/s)**	1.000
1.3410	horsepower **(HP)**	kilowatt **(kW)**	0.74570
3.4121	British thermal unit/hr **(Btu/h)**	watt **(W)**	0.2931
0.8598	kilocalorie/hour **(kcal/h)**	watt **(W)**	1.163
0.73757	foot pound-force/sec **(ft lbf/s)**	watt **(W)**	1.3558
0.10197	kilogram-force metre/sec **(kgf m/s)**	watt **(W)**	9.80665
DIVIDE BY	**← TO**	**← TO CONVERT**	

STANDARD THREAD LENGTH FOR BOLTS

NORMAL LENGTH OF BOLTS	NORMAL LENGTH OF THREAD
Up to and including 125mm	2D + 6mm
Over 125mm up to and including 200mm	2D + 12mm
Over 200mm	2D + 25mm

SPANNER SELECTION CHART

UNF / UNC	
Thread Size	**Spanner Size A/F**
inch	inch
1/4"	7/16"
5/16"	1/2"
3/8"	9/16"
7/16"	5/8"
1/2"	3/4"
9/16"	13/16"
5/8"	15/16"
3/4"	1-1/8"
7/8"	1-5/16"
1"	1-1/2"
1-1/8"	1-11/16"
1-1/4"	1-7/8"
1-3/8"	2-1/16"
1-1/2"	2-1/4"
1-3/4"	2-5/8"
2"	3"
2-2/14"	3-3/8"
2-1/2"	3-3/4"
2-3/4"	4-1/8"
3"	4-1/2"

BS (WHITWORTH)					
Thread Size	**Spanner Size A/F**			**Nearest Fitting Spanner Size**	
BS	Whit	inch	mm	inch	mm
1/4"	3/16" W	0.445	11.30	7/16"	12
5/16"	1/4" W	0.525	13.33	17/32"	14
3/8"	5/16" W	0.600	15.24	19/32"	16
7/16"	3/8" W	0.710	18.03	23/32"	18
1/2"	7/16" W	0.820	20.83	13/16"	21
9/16"	1/2" W	0.920	23.37	15/16"	24
5/8"	9/16" W	1.010	25.65	1"	26
3/4"	11/16" W	1.200	30.48	1-1/4"	31
7/8"	3/4" W	1.300	33.02	1-5/16"	33
1"	7/8" W	1.480	37.59	1-1/2"	38
1-1/8"	1" W	1.670	42.42	1-11/16"	43
1-1/4"	1-1/8" W	1.860	47.24	1-7/8"	48
1-3/8"	1-1/4" W	2.050	52.07	2-1/16"	52
1-1/2"	1-3/8" W	2.220	56.39	2-1/4"	57
1-3/4"	1-5/8" W	2.580	65.53	2-9/16"	66
2"	1-3/4" W	2.760	70.10	2-3/4"	70

Note: *Whitworth (W) = Old Standard*
BS = New Standard

METRIC	
Thread Size	**Spanner Size A/F**
mm	mm
M1.6	3.2
M2	4.0
M2.5	5.0
M3	5.5
M3.5	6.0
M4	7.0
M5	8.0
M6	10.0
M7	11.0
M8	13.0
M10	16.0
M12	18.0
M14	21.0
M16	24.0
M18	27.0
M20	30.0
M22	34.0
M24	36.0
M27	41.0
M30	46.0
M33	50.0
M36	55.0
M39	60.0
M42	65.0
M48	75.0
M52	80.0
M56	85.0
M60	90.0
M64	95.0
M68	100.0
M72	105.0
M76	110.0
M80	115.0
M85	120.0
M90	130.0
M95	135.0
M100	145.0
M105	150.0
M110	155.0

THREAD TABLE

THREAD TABLE

	PITCH (mm)		THREADS PER INCH						
	Coarse	Fine	Size		UNC	UN8	UNF	BSW	BSF
M3	0.50		1/8"	#5	40		44	40	
M3.5	0.60								
M4	0.70	0.5		#8	32		36		
M5	0.80	0.5	3/16"	#10	24		32	24	32
				#12	24		28		
M6	1.00	0.75	1/4"		20		28	20	26
M8	1.25	1.00	5/16"		18		24	18	22
M10	1.50	1.25	3/8"		16		24	16	20
			7/16"		14		20	14	18
M12	1.75	1.25	1/2"		13		20	12	16
M14	2.00	1.50	9/16"		12		18	12	16
M16	2.00	1.50	5/8"		11		18	11	14
M18	2.50	1.50							
M20	2.50	1.50	3/4"		10		16	10	12
M22	2.50	1.50	7/8"		9		14	9	11
M24	3.00	2.00	1"		8		12	8	10
M27	3.00		1-1/8"		7	8	12	7	9
M30	3.50	2.00	1-1/4"		7	8	12	7	9
M33	3.50	2.00	1-3/8"		6	8	12	6	8
M36	4.00	3.00	1-1/2"		6	8	12	6	8
M39	4.00		1-5/8"			8			
M42	4.50								
M45	4.50		1-3/4"		5	8		5	7
M48	5.00		1-7/8"			8			
M52	5.00		2"		4.5	8		4.5	7
M56	5.50		2-1/4"		4.5	8		4	
M60	5.50								
M64	6.00		2-1/2"		4	8		4	
M72			2-3/4"		4	8		3.5	
M80			3"		4	8		3.5	
M90			3-1/2"		4	8			
M100			4"		4	8			

TAPPING RECOMMENDATIONS

RECOMMENDED DRILLING SIZES FOR TAPPING (USING STANDARD DRILLS)

UNC (UNIFIED NATIONAL COARSE)

Tap Size	TPI	Tapping Drill		Clearance Drill	
		inch	mm	inch	mm
No. 1	64	#53	1.55	#46	2.10
No. 2	56	#51	1.85	#41	2.50
No. 3	48	#47	2.10	#35	2.80
No. 4	40	#43	2.35	#30	3.30
No. 5	40	#38	2.65	#29	3.50
No. 6	32	#36	2.85	#25	3.80
No. 8	32	#29	3.50	#16	4.50
No. 10	24	#25	3.90	#7	5.50
No. 12	24	#16	4.50	#1	5.80
1/4"	20	#7	5.10	17/64"	6.80
5/16"	18	F	6.60	21/64"	8.50
3/8"	16	5/16"	8.00	25/64"	10.00
7/16"	14	U	9.40	15/32"	12.00
1/2"	13	27/64"	10.80	17/32"	13.50
9/16"	12	31/64"	12.20	39/64"	15.50
5/8"	11	17/32"	13.50	11/16"	17.50
3/4"	10	21/32"	16.50	13/16"	20.50
7/8"	9	49/64"	19.50	15/16"	23.50
1"	8	7/8"	22.25	1-3/32"	27.50
1-1/8"	7	63/64"	25.00	1-7/32"	31.00
1-1/4"	7	1-7/64"	28.00	1-11/32"	34.00
1-3/8"	6	1-7/32"	30.50	1-1/2"	38.00
1-1/2"	6	1-11/32"	34.00	1-5/8"	41.00
1-3/4"	5	1-9/16"	39.50	1-7/8"	48.00
2"	4.5	1-25/32"	45.00	2-1/8"	54.00

UNF (UNIFIED NATIONAL FINE)

Tap Size	TPI	Tapping Drill		Clearance Drill	
		inch	mm	inch	mm
No. 0	80	3/64"	1.20	#48	1.90
No. 1	72	#53	1.50	#46	2.10
No. 2	64	#50	1.80	#41	2.50
No. 3	56	#45	2.10	#35	2.80
No. 4	48	#42	2.40	#30	3.30
No. 5	44	#37	2.70	#29	3.50
No. 6	40	#33	2.90	#25	3.80
No. 8	36	#29	3.50	#16	4.50
No. 10	32	#21	4.10	#7	5.10
No. 12	28	#14	4.70	#1	5.80
1/4"	28	#3	5.50	17/64"	6.80
5/16"	24	I	6.90	21/64"	8.50
3/8"	24	Q	8.50	25/64"	10.00
7/16"	20	25/64"	9.90	15/32"	12.00
1/2"	20	29/64"	11.50	17/32"	13.50
9/16"	18	33/64"	12.90	39/64"	15.50
5/8"	18	37/64"	14.50	11/16"	17.50
3/4"	16	11/16"	17.50	13/16"	20.50
7/8"	14	13/16"	20.50	15/16"	23.50
1"	12	59/64"	23.25	1-3/32"	27.50
1"*	14	15/16"	23.50	1-3/32"	27.50
1-1/8"	12	1-3/64"	26.50	1-7/32"	31.00
1-1/4"	12	1-11/64"	29.50	1-11/32"	34.00
1-3/8"	12	1-19/64"	32.75	1-1/2"	38.00
1-1/2"	12	1-27/64"	36.00	1-5/8"	41.00

***UNS**

UN (UNIFIED NATIONAL) CONSTANT PITCH SERIES

Tap Size	TPI	Tapping Drill		Clearance Drill	
		inch	mm	inch	mm
1-1/8"	8	1"	25.30	1-7/32"	31.00
1-1/4"	8	1-1/8"	28.50	1-11/32"	34.00
1-3/8"	8	1-1/4"	31.60	1-1/2"	38.00
1-1/2"	8	1-3/8"	34.80	1-5/8"	41.00
1-5/8"	8	1-1/2"	38.00	1-3/4"	45.00
1-3/4"	8	1-5/8"	41.20	1-7/8"	48.00
1-7/8"	8	1-3/4"	44.30	2	51.00
2"	8	1-7/8"	47.50	2-1/8"	54.00
2-1/4"	8	2-5/32"	55.00	2-3/8"	61.00

UNEF (UNIFIED NATIONAL EXTRA FINE)

Tap Size	TPI	Tapping Drill		Clearance Drill	
		inch	mm	inch	mm
No. 12	32	#13	4.70	1/4"	6.30
1/4"	32	#3	5.50	>\cx	7.00
5/16"	32	K	7.10	11/32"	8.70
3/8"	32	R	8.60	13/32"	10.30
7/16"	28	X	10.10	15/32"	12.00
1/2"	28	29/64"	11.70	9/16"	14.00
9/16"	24	33/64"	13.00	39/64"	15.50
5/8"	24	37/64"	14.75	11/16"	17.50
11/16"	24	41/64"	16.25	3/4"	19.00

TAPPING RECOMMENDATIONS

RECOMMENDED DRILLING SIZES FOR TAPPING (USING STANDARD DRILLS)

M (ISO METRIC COARSE)

Tap Size	Pitch	Tapping Drill		Clearance Drill	
		inch	mm	inch	mm
M1.6	0.35	#55	1.25	#50	1.80
M2	0.40	#52	1.60	#42	2.40
M2.5	0.45	#46	2.05	#33	2.90
M3	0.50	#40	2.50	#29	3.40
M3.5	0.60	#33	2.90	#23	3.90
M4	0.70	#30	3.30	#16	4.50
M5	0.80	#19	4.20	#3	5.50
M6	1.00	#9	5.00	F	6.60
M8	1.25	H	6.80	T	9.00
M10	1.50	Q	8.50	7/16"	11.00
M12	1.75	13/32"	10.30	17/32"	13.50
M14	2.00	15/32"	12.00	39/64"	15.50
M16	2.00	35/64"	14.00	11/16"	17.50
M18	2.50	39/64"	15.50	25/32"	20.00
M20	2.50	11/16"	17.50	7/8"	22.00
M22	2.50	49/64"	19.50	15/16"	24.00
M24	3.00	53/64"	21.00	1-1/32"	26.00
M27	3.00	61/64"	24.00	1-3/16"	30.00
M30	3.50	1-3/64"	26.50	1-5/16"	33.00
M33	3.50	1-5/32"	29.50	1-13/32"	36.00
M36	4.00	1-17/64"	32.00	1-17/32"	39.00
M42	4.50	1-15/32"	37.50	1-25/32"	45.00
M48	5.00	1-45/64"	43.00	2-1/16"	52.00
M52	5.00	1-55/64"	47.00	2-7/32"	56.00
M56	5.50	2"	50.50	2-7/16"	62.00

UNS (UNIFIED NATIONAL SPECIAL)

Tap Size	Pitch	Tapping Drill	
		inch	mm
1/4"	36	#1	5.70
1/4"	40	A	5.80
5/16"	36	L	7.30
5/16"	40	M	7.40
3/8"	36	S	8.90
3/8"	40	T	9.00
7/16"	18	W	9.90
7/16"	24	Y	10.20
1/2"	12	27/64"	10.90
1/2"	14	7/16"	11.20
1/2"	18	29/64"	11.50
1/2"	24	15/32"	11.80
9/16"	14	1/2"	12.80
5/8"	14	37/64"	14.50
3/4"	14	45/64"	17.50
3/4"	18	23/32"	18.00
3/4"	24	47/64"	18.25
7/8"	10	51/64"	20.00
7/8"	18	53/64"	21.00
7/8"	24	27/32"	21.25
1"	14	15/16"	24.00
1"	18	61/64"	24.25
1"	24	31/32"	26.50
1-1/8"	10	1-3/64"	26.50
1-1/8"	14	1-5/64"	27.00
1-1/8"	24	1-3/32"	27.75
1-1/4"	10	1-11/64"	29.75
1-1/4"	14	1-13/64"	30.25
1-1/4"	24	1-15/64"	31.00

M (ISO METRIC COARSE)

Tap Size	Pitch	Tapping Drill		Clearance Drill	
		inch	mm	inch	mm
MF8	1.0	J	7.0	T	9.00
MF10	1.25	S	8.8	7/16"	11.00
MF12	1.25	27/64"	10.8	17/32"	13.50
MF12**	1.5	Z	10.5	17/32"	13.50
MF14	1.5	31/64"	12.5	39/64"	15.50
MF16	1.5	9/16"	14.5	11/16"	17.50
MF18	1.5	21/32"	16.5	25/32"	20.00
MF20	1.5	47/64"	18.5	7/8"	22.00
MF24	2.0	13/16"	20.5	15/16"	24.00

**** ALTERNATIVE METRIC FINE**

ISO Rc SERIES BSPT (BRITISH STANDARD PIPE TAPER)

Tap Size	Pitch	Tapping Drill	
		inch	mm
1/16"	28	F	6.40
1/8"	28	Q	8.40
1/4"	19	7/16"	11.20
3/8"	19	37/64"	14.75
1/2"	14	23/32"	18.25
3/4"	14	15/16"	23.75
1"	11	1-3/16"	30.00
1-1/4"	11	1-17/32"	38.50

TAPPING RECOMMENDATIONS

RECOMMENDED DRILLING SIZES FOR TAPPING (USING STANDARD DRILLS)

ISO G SERIES BSP (BRITISH STANDARD PIPE) (PARALLEL)

Tap Size	Pitch	Tapping Drill	
		inch	mm
1/16"	28	H	6.80
1/8"	28	S	8.80
1/4"	19	15/32"	11.80
3/8"	19	39/64"	15.25
1/2"	14	3/4"	19.00
3/4"	14	31/32"	24.50
1"	11	1-7/32"	30.75
1-1/4"	11	1-9/16"	39.50

NPT (NATIONAL PIPE TAPER)

Tap Size	Pitch	Tapping Drill	
		inch	mm
1/16"	27	D	6.30
1/8"	27	R	8.50
1/4"	18	7/16"	11.00
3/8"	18	37/64"	14.50
1/2"	14	45/64"	18.00
3/4"	14	29/32"	23.00
1"	11-1/2	1-9/64"	29.00
1-1/4"	11-1/2	1-1/2"	38.00
1-1/2"	11-1/2	1-47/64"	44.00
2"	11-1/2	2-7/32"	56.00

BSF (BRITISH STANDARD FINE)

Tap Size	Pitch	Tapping Drill	
		inch	mm
3/16"	32	#21	4.00
7/32"	28	#14	4.60
1/4"	26	#4	5.30
5/16"	22	H	6.80
3/8"	20	P	8.30
7/16"	18	W	9.70
1/2"	16	7/16"	11.00
9/16"	16	1/2"	12.70
5/8"	14	9/16"	14.00
3/4"	12	21/32"	16.50

NPT (NATIONAL PIPE STRAIGHT)

Tap Size	Pitch	Tapping Drill	
		inch	mm
1/8"	27	S	9.00
1/4"	18	29/64"	11.50
3/8"	18	19/32"	15.00
1/2"	14	47/34"	18.50
3/4"	14	15/16"	23.50
1"	11-1/2	1-3/16"	30.00
1-1/4"	11-1/2	1-33/64"	38.50
1-1/2"	11-1/2	1-3/4"	44.50
2"	11-1/2	2-7/32"	57.00

BSF (BRITISH STANDARD FINE)

Tap Size	Pitch	Tapping Drill	
		inch	mm
1/16"	60	#56	1.20
3/32"	48	#49	1.85
1/8"	40	#38	2.55
5/32"	32	#30	3.20
3/16"	24	#26	3.70
7/32"	24	#15	4.50
1/4"	20	#7	5.10
5/16"	18	F	6.50
3/8"	16	O	7.90
7/16"	14	U	9.20
1/2"	12	Z	10.50
9/16"	12	31/64"	12.00
5/8"	11	35/64"	13.50

NPS (NATIONAL PIPE STRAIGHT)

Tap Size	TPI	UNC Tapping Drill		TPI	UNF Clearance Drill	
		inch	mm		inch	mm
No. 1	64	#51	1.70	72	#51	1.70
No. 2	56	#46	2.00	64	#46	2.00
No. 3	48	#42	2.30	56	#42	2.30
No. 4	40	#37	2.60	48	#37	2.60
No. 5	40	# 32	2.90	44	# 32	2.9
No. 6	32	# 30	3.20	40	# 30	3.2
No. 8	32	# 24	3.80	36	# 23	3.9
No.10	24	# 16	4.40	32	# 15	4.5
No.12	24	# 8	5.00	28	# 7	5.1
1/4"	20	A	5.80	28	B	6
5/16"	18	L	7.30	24	19/64"	7.5
3/8"	16	S	8.80	24	23/64"	9.1
7/16"	14	13/32"	10.30	20	27/64"	10.6

METRIC SPARK PLUG

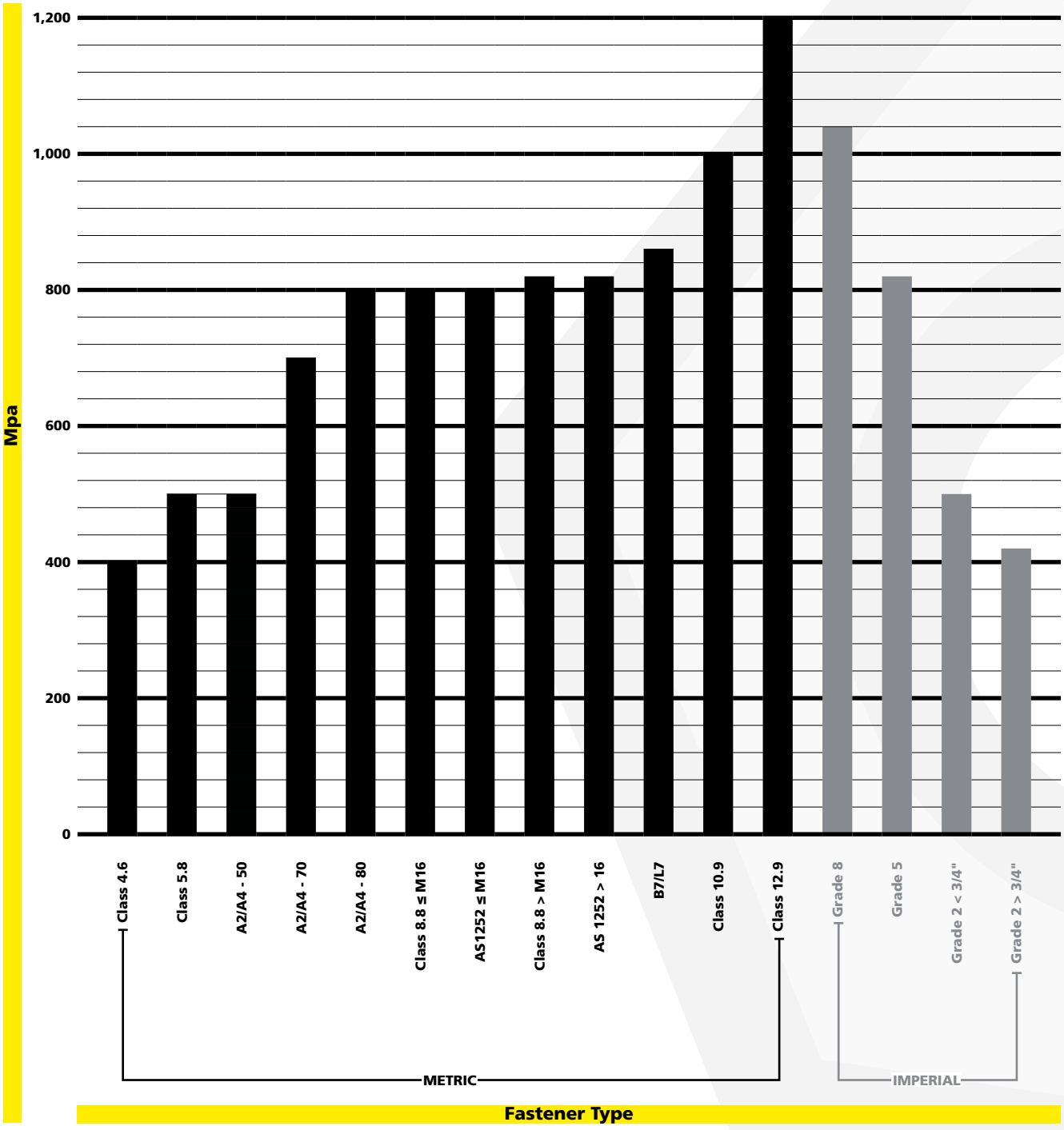
Tap Size	Tapping Drill	
	inch	mm
M10 x 1.0	T	9.00
M12 x 1.25	27/64"	10.80
M14 x 1.25	1/2"	12.80
M18 x 1.5	21/32"	16.50

THREADED FORMING (FLUTELESS TAPS) METRIC COARSE

Tap Size	Tapping Drill	
	inch	mm
M3 x 0.5	#34	2.80
M4 x 0.7	#26	3.70
M5 x 0.8	#14	4.60
M6 x 1.0	7/32"	5.50
M8 x 1.25	19/64"	7.40
M10 x 1.5	23/64"	9.30

FASTENER TENSILE CHART

FASTENER TENSILE CHART



TECHNICAL DATA FOR HEXAGON HEAD BOLTS AND SET SCREWS

PROPERTY CLASS 8.8 ISO METRIC COURSE PITCH HEAD AS1110/AS4291.1

Diameter	Tensile Stress Area of Thread	Proof Load of Bolt (ii)		Breaking Load of Bolt (Minimum) (i)		Bolt Tension Corresponding to 65% of Yield Load		Recommended Assembly Torque (iii)		Threads Pitch
	mm	kN	lbf	kN	lbf	kN	lbf	Nm	lbft	mm
M5	14.2	8.23	1850.2	11.35	2551.6	5.4	1210	5	4	0.80
M6	20.1	11.6	2607.8	16.1	3619.4	7.6	1710	9	7	1.00
M8	36.6	21.2	4765.9	29.2	6564.4	13.8	3100	22	16	1.25
M10	58.0	33.7	7576.1	46.4	10431.1	21.9	4920	44	32	1.50
M12	84.3	48.9	10993.2	67.4	15152.1	31.8	7150	77	57	1.75
M14	115	66.7	14994.8	92	20682.4	43.4	9680	121	90	2.00
M16	157	91	20457.6	125	28101.1	59.2	13310	190	140	2.00
M18	192	115	25853.0	159	35744.6	74.8	16690	269	198	2.50
M20	245	147	33046.9	203	45636.2	95.6	21490	370	270	2.50
M22	303	182	40915.2	252	56651.8	118.0	26390	520	380	2.50
M24	353	212	47659.5	293	65869.0	138.0	31020	640	470	3.00
M27	459	275	61822.4	381	85652.2	177.0	39480	968	700	3.00
M30	561	337	75760.6	466	104760.9	219.0	49230	1310	970	3.50
M33	694	416	93520.5	576	129489.9	270.0	60330	1785	1320	3.50
M36	817	490	110156.4	678	152420.4	319.0	71710	2300	1690	4.00

Notes: (i) Tensile Strength per Diameter is based on the following values: M5 to M16: 800 MPa (min), M18 to M36: 830 MPa (min). (ii) Proof Load Stress per Diameter is based on the following values: M5 to M16: 580 MPa (min), M18 to M36: 600 MPa (min). (iii) Torque values listed are for plain finish, uncoated fasteners.

PROPERTY CLASS 8.8 ISO METRIC FINE PITCH HEAD AS1110/AS4291.1

Diameter	Tensile Stress Area of Thread	Proof Load of Bolt (ii)		Breaking Load of Bolt (Minimum) (i)		Bolt Tension Corresponding to 65% of Yield Load		Recommended Assembly Torque (iii)		Threads Pitch
	mm	kN	lbf	kN	lbf	kN	lbf	Nm	lbft	mm
M8	39.2	22.7	5103.2	31.4	7058.9	14.8	3317.1	24	17.7	1.00
M10	61.2	35.5	7980.7	49.0	11015.6	23.1	5187.5	46	33.9	1.25
M12	92.1	53.4	12004.8	73.7	16568.4	34.7	7803.1	83	61.2	1.25
M14	125	72.5	16298.6	100	24728.9	47.1	10594.1	132	97.4	1.50
M16	167	96.9	21783.9	134	30124.4	63.0	14159.6	202	148.9	1.50
M18	216	130	29225.2	179	40240.8	84.5	18996.3	304	224.2	1.50
M20	272	163	36643.9	226	50806.8	106.0	23818.5	424	312.7	1.50
M22	333	200	44961.8	276	62047.3	130.0	29225.1	572	421.9	1.50
M24	384	230	51706.1	319	71714.0	149.5	33608.9	720	531.0	2.00
M27	496	298	66993.1	412	92621.3	193.7	43545.4	1048	772.9	2.00
M30	621	373	83853.7	515	115776.6	242.5	54504.9	1452	1070.9	2.00
M33	761	457	102737.7	632	142079.2	297.1	66779.4	1960	1445.6	2.00
M36	865	519	116675.8	718	161412.8	337.4	75839.2	2426	1789.3	3.00

Notes: (i) Tensile Strength per Diameter is based on the following values: M5 to M16: 800 MPa (min), M18 to M36: 830 MPa (min). (ii) Proof Load Stress per Diameter is based on the following values: M5 to M16: 580 MPa (min), M18 to M36: 600 MPa (min). (iii) Torque values listed are for plain finish, uncoated fasteners.

PROPERTY CLASS 8.8 ISO METRIC COURSE PITCH HEAD AS1110/AS4291.1

Nominal Diameter	Pitch of Thread	Shank Diametre		Width A/F		Head Thickness		Nut Thickness	
mm	mm	maximum	minimum	maximum	minimum	maximum	minimum	maximum	minimum
M5	0.80	5.0	4.82	8	7.78	3.65	3.35	4.7	4.40
M6	1.00	6	5.82	10	9.78	4.15	3.85	5.2	4.9
M8	1.25	8	7.78	13	12.73	5.45	5.15	6.8	6.44
M10	1.50	10	9.78	16	15.73	6.58	6.22	8.4	8.04
M12	1.75	12	11.73	18	17.73	7.68	7.32	10.8	10.37
M16	2	16	15.73	24	23.67	10.18	9.82	14.8	14.1
M20	2.50	20	19.67	30	29.67	12.72	12.28	18	16.9
M24	3.00	24	23.67	36	35.38	15.22	14.78	21.5	20.2

TECHNICAL DATA

TECHNICAL DATA FOR HEXAGON HEAD BOLTS AND SET SCREWS

UNC HEXAGON HEAD BOLTS AND SET SCREWS – GRADE 5 AS/NZS 2465:1999

Diameter	Tensile Stress Area of Thread	Proof Load of Bolt (iii)		Breaking Load of Bolt (Minimum) (i)		Bolt Tension Corresponding to 65% of Yield Load (ii)		Recommended Assembly Torque (iv)		Threads Per
	inch	lbf	kN	lbf	kN	lbf	kN	lbft	Nm	inch
1/4"	0.0318	2700	12.0	3800	16.9	1760	7.8	7	9.5	20
5/16"	0.0524	4450	19.8	6300	28.0	2890	12.9	15	20.3	18
3/8"	0.0775	6600	29.4	9300	41.4	4290	19.0	27	36.6	16
7/16"	0.1063	9050	40.3	12800	56.9	5880	26.2	43	58	14
1/2"	0.1419	12100	53.8	17000	75.6	7870	35.0	66	89	13
9/16"	0.182	15500	68.9	21800	97.4	10070	44.8	94	127	12
5/8"	0.226	19200	85.4	27100	121	12480	55.5	130	176	11
3/4"	0.334	28400	126.3	40100	178	18400	81.8	230	312	10
7/8"	0.462	39300	174.8	55400	246	25550	113.6	370	502	9
1"	0.606	51500	229.1	72700	323	33480	148.9	560	759	8
1-1/8"	0.763	56500	251.3	80100	356	36720	163.3	688	933	7
1-1/4"	0.969	71700	319	101700	452	46600	207	971	1317	7
1-1/2"	1.405	104000	463	147500	656	67600	301	1690	2291	6

Notes: (i) Tensile Strength per Diameter is based on the following values: 1/4" to 1": 120000 lbf/in (min), 1-1/8" to 1-1/2": 105000 lbf/in (min). (ii) Yield Stress per Diameter is based on the following values: 1/4" to 1": 92000 lbf/in (min), 1-1/8" to 1-1/2": 81000 lbf/in (min). (iii) Proof Load Stress per Diameter is based on the following values: 1/4" to 1": 85000 lbf/in (min), 1-1/8" to 1-1/2": 74000 lbf/in (min). (iv) Torque values listed are for plain finish, uncoated fasteners.

UNF HEXAGON HEAD BOLTS AND SET SCREWS – GRADE 5 AS/NZS 2465:1999

Diameter	Tensile Stress Area of Thread	Proof Load of Bolt (iii)		Breaking Load of Bolt (Minimum) (i)		Bolt Tension Corresponding to 65% of Yield Load (ii)		Recommended Assembly Torque (iv)		Threads Per
	inch	lbf	kN	lbf	kN	lbf	kN	lbft	Nm	inch
1/4"	0.0364	3100	13.8	4350	19.3	2020	9.0	8	10.8	28
5/16"	0.0580	4900	21.8	6950	30.9	3190	14.2	17	23.0	24
3/8"	0.0878	7450	33.1	10500	46.7	4840	21.5	30	40.7	24
7/16"	0.1187	10100	44.9	14200	63.2	6570	29.2	48	65	20
1/2"	0.1599	13600	60.5	19200	85.4	8840	39.3	74	100	20
9/16"	0.203	17300	77.0	24400	108.5	11245	50.0	105	142	18
5/8"	0.256	21800	97.0	30700	136.6	14170	63.0	150	203	18
3/4"	0.373	31700	41.0	44800	199.3	20610	91.7	260	352	16
7/8"	0.509	43300	193	61100	271.8	28150	125.2	410	555	14
1"	0.663	56400	250.9	79600	354.1	36660	163.1	610	827	12
1 SAE	0.679	57700	256.7	81500	362.5	37505	166.8	625	847	14

Notes: (i) Tensile Strength per Diameter is based on the following values: 120000 lbf/in (min). (ii) Yield Stress per Diameter is based on the following values: 92000 lbf/in (min). (iii) Proof Load Stress per Diameter is based on the following values: 85000 lbf/in (min). (iv) Torque values listed are for plain finish, uncoated fasteners.

TECHNICAL DATA FOR HEXAGON HEAD BOLTS AND SET SCREWS

UNC HEXAGON HEAD BOLTS AND SET SCREWS – GRADE 8 AS/NZS 2465:1999

Diameter	Tensile Stress Area of Thread	Proof Load of Bolt (iii)		Breaking Load of Bolt (Minimum) (i)		Bolt Tension Corresponding to 65% of Yield Load (ii)		Recommended Assembly Torque (iv)		Threads Per
	inch	lbf	kN	lbf	kN	lbf	kN	lbft	Nm	inch
1/4"	0.0318	3800	16.9	4750	21.1	2470	11.0	10	13.6	20
5/16"	0.0524	6300	28.0	7850	34.9	4100	18.2	21	28.5	18
3/8"	0.0775	9300	41.4	11600	51.6	6050	26.9	38	51.5	16
7/16"	0.1063	12800	56.9	15900	70.7	8320	37.0	60	81	14
1/2"	0.1419	17000	75.6	21300	94.8	11050	49.2	92	125	13
9/16"	0.182	21800	97.0	27300	121.4	14170	63.0	133	180	12
5/8"	0.226	27100	120.5	33900	150.8	17620	78.4	183	248	11
3/4"	0.334	40100	178.4	50100	222.9	26070	116.0	325	441	10
7/8"	0.462	55400	246.4	69300	308.3	36010	160.2	523	709	9
1"	0.606	72700	323.4	90900	404.3	47200	210.0	785	1064	8
1-1/8"	0.763	91600	407.5	114400	508.9	59500	264.7	1116	1513	7
1-1/4"	0.969	116300	517.3	145400	646.8	75500	335.8	1573	2133	7
1-1/2"	1.405	168600	750	210800	937.7	109500	487.1	2738	3712	6

Notes: (i) Tensile Strength per Diameter is based on the following values: 1/4" to 1": 120000 lbf/in (min), 1-1/8" to 1-1/2": 105000 lbf/in (min). (ii) Yield Stress per Diameter is based on the following values: 1/4" to 1": 92000 lbf/in (min), 1-1/8" to 1-1/2": 81000 lbf/in (min). (iii) Proof Load Stress per Diameter is based on the following values: 1/4" to 1": 85000 lbf/in (min), 1-1/8" to 1-1/2": 74000 lbf/in (min). (iv) Torque values listed are for plain finish, uncoated fasteners.

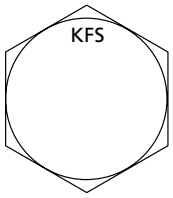
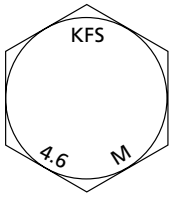
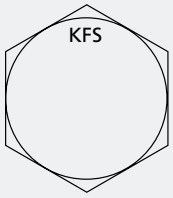
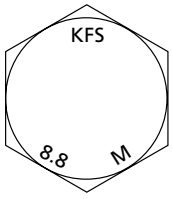
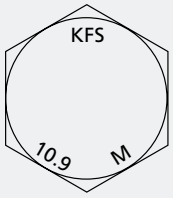
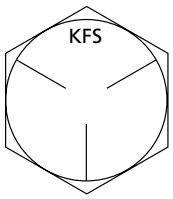
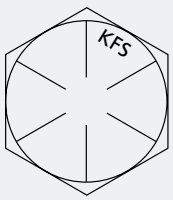
UNF HEXAGON HEAD BOLTS AND SET SCREWS – GRADE 8 AS/NZS 2465:1999

Diameter	Tensile Stress Area of Thread	Proof Load of Bolt (iii)		Breaking Load of Bolt (Minimum) (i)		Bolt Tension Corresponding to 65% of Yield Load (ii)		Recommended Assembly Torque (iv)		Threads Per
	inch	lbf	kN	lbf	kN	lbf	kN	lbft	Nm	inch
1/4"	0.0364	4350	19.3	5450	24.2	2830	12.6	12	16.3	28
5/16"	0.0580	6950	30.9	8700	38.7	4520	20.1	23	31.2	24
3/8"	0.0878	10500	46.7	13200	58.7	6830	30.4	43	58.3	24
7/16"	0.1187	14200	63.2	17800	79.2	9230	41.1	67	91	20
1/2"	0.1599	19200	85.4	24000	106.8	12500	55.6	104	141	20
9/16"	0.203	24400	108.5	30400	135.2	15860	70.5	149	202	18
5/8"	0.256	30700	136.6	38400	170.8	19960	88.8	207	281	18
3/4"	0.373	44800	199.3	56000	249.1	29120	129.5	363	492	16
7/8"	0.509	61100	271.8	76400	339.8	39720	176.7	577	782	14
1"	0.663	79600	354	99400	442.1	51740	230.2	859	1165	12
1 SAE	0.679	81500	362.5	101900	453.3	52962	235.6	883	1197	14
1-1/8"	0.856	102700	457	128400	571.2	66755	296.9	1251	1696	12
1-1/4"	1.073	128800	573	161000	716.2	83720	372.4	1744	2364	12
1-1/2"	1.581	189700	844	237200	1055	123305	548.5	3083	4179	12

Notes: (i) Tensile Strength per Diameter is based on the following values: 120000 lbf/in (min). (ii) Yield Stress per Diameter is based on the following values: 92000 lbf/in (min). (iii) Proof Load Stress per Diameter is based on the following values: 85000 lbf/in (min). (iv) Torque values listed are for plain finish, uncoated fasteners.

MARKINGS AND MECHANICAL PROPERTIES

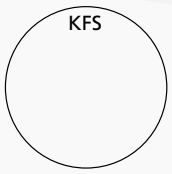
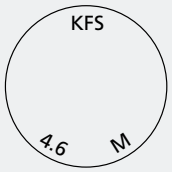
MARKINGS AND MECHANICAL PROPERTIES OF BOLTS AND NUTS

Marking	Standard	Description	Mechanical Properties			
				Property	lbf/in² (imperial)	MPa (Metric)
	AS/NZS 2451	Hexagon BSW Mild Steel	**Tensile Strength (min.)**		62720	432.5
			Yield Stress (min.)		35840	247
			Proof Load Stress			
	AS 1111 (dim.) AS 4291.1 (mech.)	Hexagon ISO Metric Commercial 4.6	**Tensile Strength (min.)**		58015	400
			Yield Stress		34809	240
			Proof Load Stress		32634	225
	AS/NZS 1393	Hexagon ISO Metric Coach Screws 4.6	**Tensile Strength**		58015	400
			Yield Stress			
			Proof Load Stress			
	AS 1111 (dim.) AS 4291.1 (mech.)	Hexagon ISO Metric Precision 8.8	**Tensile Strength (min.)**	**M5-16** **M20-39**	116030 120382	800 830
			Yield Stress	**M5-16** **M20-39**	92824 95725	640 660
			Proof Load Stress	**M5-16** **M20-39**	84122 87023	580 600
	AS 1111 (dim.) AS 4291.1 (mech.)	Hexagon ISO Metric Precision 10.9	**Tensile Strength (min.)**		150840	1040
			Yield Stress		136336	940
			Proof Load Stress		120382	830
	AS/NZS 2465	Hexagon Unified High Tensile UNC / UNF SAE Grade 5	**Tensile Strength**	**1/4" - 1"** **1-1/8" - 1-1/2"**	120000 10500	827 724
			Yield Stress	**1/4" - 1"** **1-1/8" - 1-1/2"**	92000 81000	634 558
			Proof Load Stress	**1/4" - 1"** **1-1/8" - 1-1/2"**	85000 74000	634 558
	AS/NZS 2465	Hexagon Unified High Tensile UNC / UNF SAE Grade 8	**Tensile Strength**		150000	1034
			Yield Stress		130000	896
			Proof Load Stress		120000	827

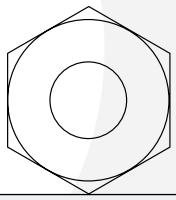
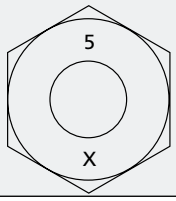
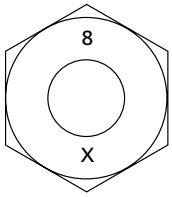
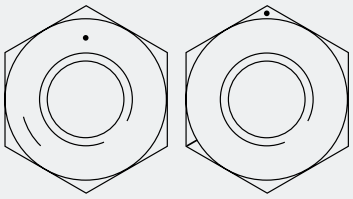
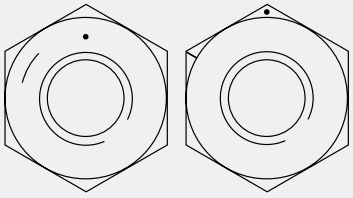
Note: In these examples KFS represents the manufacturer's symbol. Other bolt and nut markings exist and should be verified with the relevant supplier when encountered. For further information contact your local KONNECT branch.

MARKINGS AND MECHANICAL PROPERTIES OF BOLTS AND NUTS

BOLTS

Marking	Standard	Description	Mechanical Properties		
			Property	lbf/in² (imperial)	MPa (Metric)
	A.S.B. 108 ANSI B 18.5	Cup Square BSW Mild Steel	**Tensile Strength**	58240	402
			Yield Stress	29120	201
			Proof Load Stress		
	AS/NZS 1390	Cup Square ISO Metric 4.6	**Tensile Strength (min.)**	58015	400
			Yield Stress	34809	240
			Proof Load Stress	32634	225

NUTS

Marking	Standard	Description	Mechanical Properties			
			Property		lbf/in² (imperial)	MPa (Metric)
	AS/NZS 2451	Hexagon BSW Mild Steel Nuts	**Proof Load Stress (min.)**		62720	432.5
	AS 1112.1	Hexagon ISO Metric Nuts Prop. Class 5	**Proof Load Stress**		88473	610
	AS 1112.1	Hexagon ISO Metric Nuts Prop. Class 8	**Proof Load Stress**		124733	660
	AS/NZS 2465	Hexagon Unified High Tensile UNC / UNF Nuts SAE Grade 5	**Proof Load Stress**	≦ 1" UNC UNF	120000 109000	827 751
				> 1" UNC UNF	105000 94000	724 648
	AS/NZS 2465	Hexagon Unified High Tensile UNC / UNF Nuts SAE Grade 8	**Proof Load Stress**		150000	1034

Note: In these examples KFS represents the manufacturer's symbol. Other bolt and nut markings exist and should be verified with the relevant supplier when encountered. For further information contact your local KONNECT branch.