milsons®

Delivering New Zealand's
Leading Fastening Experience

Fastener Range

Why Smart Customers Choose Milsons

Milsons know you need product delivered on time and to exact quantities and specifications. We focus our business on making that happen by employing a “how can we help” attitude to all areas of our business, ensuring we think innovatively in answering our customers’ needs.

What started out in 1947 as a family run metal casting business, through relentless customer service and innovation, soon turned into a multi-faceted business. The first imports of engineering supplies in the mid 1970s lead to the Milsons you know today – still a 100% New Zealand owned, family business, and a leading supplier of quality metal fasteners.

Partnering with our customers to succeed together, Milsons is known for our friendly, knowledgeable and efficient team. At every level in the business, we are dedicated to delivering on our mission:

At Milsons, we’re dedicated to providing extraordinary fastener experiences by prioritizing strong relationships, unwavering reliability, and unmatched speed.

Scott Davis

Scott Davis
Managing Director & Co-owner

We’re QUIKSmart!

Q

Quality

- Products made to industry standards.
- Stringent quality control procedures.
- ISO 9001 certification for quality assurance.

U

Unmatched Service

- Same-day dispatch for orders before 4 p.m.
- Swift response times at every point.
- Friendliest support and customer service.

I

Integrity

- 100% Kiwi, and family owned.
- Valuing relationships and keeping promises.
- Commitment to asking, “How can we help?”

K

Knowledge

- +45 years proven track record in fasteners.
- Knowledgeable sales and product teams.
- Top-tier, expert global suppliers.

Delivering New Zealand’s Leading Fastening Experience

Fastener Range
Contents:

New Products

NEW products and sizes are often being added to the Milsons range. Please visit our website **milsons.co.nz** for up to date information.

milsons®

milsons.co.nz 0800 507 444

Delivering New Zealand's Leading Fastening Experience

Extended Contents:

New Products

NEW products and sizes are continuously being added to the Milsons range.

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Anchors

Anchors connect structural components (usually metal parts like brackets, plates, etc.) to base materials such as concrete, plasterboard and brick.

There are two types of anchors: mechanical and chemical. The choice of anchor depends on a variety of factors, such as the strength and depth of the base material, as well as external elements such as temperature and corrosion.

Their installation requires drilling a hole larger than the fastener. Anchors will have features (metal flaps, sleeves, threads) that engage to create friction with the walls of the drilled hole as the anchor is tightened. In chemical anchors, a resin is used to fill in the extra space and secure the anchor in the hole.

- Chem Set Studs
- Hollow Wall Anchors
- Drop In Anchors
  - Standard
  - Lipped
- Nylon Plugs
- Pin Anchors
  - Metal Pin Anchors
  - Nylon Pin Anchors
    - Mushroom Head
    - Round Head
- Plasterboard Anchors
- Screw Bolts
  - Countersunk Screw Bolts
  - Eye Screw Bolts
  - Hex Flanged Screw Bolts
- Sleeve Anchors
  - C Hook Sleeve Anchors
  - Countersunk Sleeve Anchors
  - Hex Sleeve Anchors
  - O Hook Sleeve Anchors
- Split Drive Anchors
  - Countersunk
  - Mushroom Head
- Threaded Rod Anchors
  - Steel Horisontal
  - Steel Vertical
  - Timber Horisonal
  - Timber Vertical
  - Concrete Vertical
- Wedge Anchors

Shop here:

Anchors

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Chem Set Studs

Finishes Available:

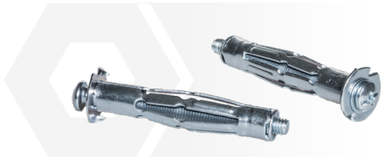
316 G

Grade

316 Stainless
Grade 5.8

∅ Diameter	↤↦ Length
M8	110
M10	110 - 300
M12	160
M16	190
M20	260
M24	300

Hollow Wall Anchors



Finishes Available:

Z

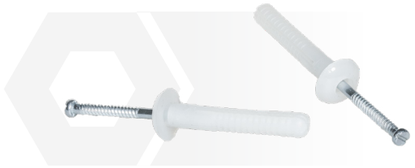
Grade

Mild Steel
Steel

∅ Diameter	↤↦ Length
1/8	13/16” - 16/24”
3/16	10/16”

Nylon Pin Anchors

Mushroom Head



Finishes Available:

Z

Grade

Nylon

∅ Diameter	↤↦ Length
M5	25
M6	50 - 75
M6.5	25 - 40

Nylon Pin Anchors

Round Head

Finishes Available:

304 Z

Grade

Nylon

∅ Diameter	↤↦ Length
M5	25
M6.5	25 - 40

Drop In Anchors

Standard

Finishes Available:

316 YZ

Grade

316 Stainless
Mild Steel
Steel

∅ Diameter	↤↦ Length
M6	25
M8	30
M10	40
M12	50
M16	65
M20	80

Drop In Anchors

Lipped

Finishes Available:

YZ

Grade

Mild Steel

∅ Diameter	↤↦ Length
M10	30 - 40

Plasterboard Anchors

Finishes Available:

S

Grade

Mild Steel
Nylon

Countersunk Screw Bolts

Finishes Available:

G YZ

Grade

Mild Steel
Steel

∅ Diameter	↤↦ Length
M6.5	50 - 100
M8	50 - 100
M10	60 - 100
M12	75 - 150

Nylon Plugs

Finishes Available:

S

Grade

Nylon

∅ Diameter	↤↦ Length
M5	25
M6	30
M8	40
M10	50

Metal Pin Anchors

Finishes Available:

Z

Grade

Mild Steel
Steel

∅ Diameter	↤↦ Length
M5	22
M6.5	22 - 50

Eye Screw Bolts

Finishes Available:

YZ

Grade

Mild Steel
Steel

∅ Diameter	↤↦ Length
M6.5	50
M8	55
M10	65
M12	75

Hex Flanged Screw Bolts

Finishes Available:

316 G YZ Bi

Grade

316 Stainless
Mild Steel
Steel

∅ Diameter	↤↦ Length
M6	30 - 100
M8	60 - 100
M10	60 - 150
M12	75 - 200
M16	100 - 150

Anchors

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

C Hook Sleeve Anchors

Finishes Available:

YZ

∅ Diameter	↤↦ Length
M8	45

Grade

Steel

Countersunk Sleeve Anchors

Finishes Available:

YZ

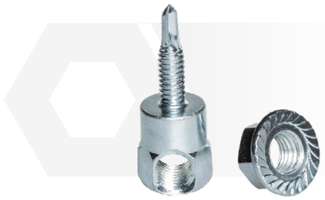
∅ Diameter	↤↦ Length
M6.5	36 - 75
M8	60 - 100
M10	75 - 100

Grade

Mild Steel
Steel

Threaded Rod Anchors

Steel Horisontal



Finishes Available:

316 Z

∅ Diameter	↤↦ Length
M10	1”

Grade

Mild Steel
Steel

Threaded Rod Anchors

Steel Vertical

Finishes Available:

316 Z

∅ Diameter	↤↦ Length
M10	1”

Grade

Mild Steel
Steel

Hex Sleeve Anchors

Finishes Available:

316 G YZ

∅ Diameter	↤↦ Length
M6.5	36 - 75
M8	40 - 90
M10	40 - 125
M12	60 - 130
M16	60 - 145
M20	75 - 150

Grade

316 Stainless
Mild Steel
Steel

O Hook Sleeve Anchors

Finishes Available:

YZ

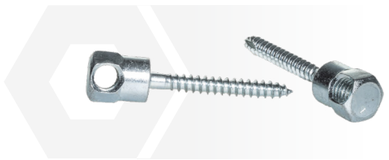
∅ Diameter	↤↦ Length
M8	45

Grade

Steel

Threaded Rod Anchors

Timber Horisontal



Finishes Available:

Z

∅ Diameter	↤↦ Length
M10	1” - 2”

Grade

Steel

Threaded Rod Anchors

Timber Vertical

Finishes Available:

Z

∅ Diameter	↤↦ Length
M10	1” - 2”

Grade

Steel

Split Drive Anchors

Countersunk

Finishes Available:

316 Z

∅ Diameter	↤↦ Length
M6.5	50 - 100

Grade

316 Stainless
Steel

Split Drive Anchors

Mushroom Head

Finishes Available:

316 Z

∅ Diameter	↤↦ Length
M5	38 - 50
M6.5	38 - 75

Grade

316 Stainless
Steel

Threaded Rod Anchors

Concrete Vertical

Finishes Available:

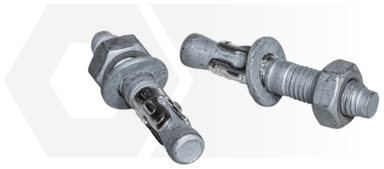
Z

∅ Diameter	↤↦ Length
M10	40

Grade

Steel

Wedge Anchors



Finishes Available:

316 G

∅ Diameter	↤↦ Length
M8	90
M10	60 - 120
M12	80 - 180
M16	100 - 180
M20	120 - 200

Grade

316 Stainless
Mild Steel

Wedge Anchor Installation Guide

This resource gives detailed instructions (with illustrations) on how to install a wedge anchor properly. With wedge anchors, it is important to drill accurate hole sizes since these fasteners use friction to work. Find information on the recommended drill size and hole depth for wedge anchors of different sizes.

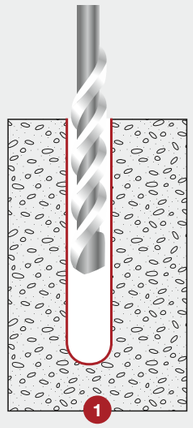
Recommended Drilll Size and Hole Depth

Diameter, mm	Length, mm	Drill size, mm	Min. Hole Depth, mm
8	90	8	55
10	60	10	45
10	75	10	55
10	90	10	60
10	120	10	60
12	80	12	60
12	100	12	60
12	120	12	80
12	140	12	80
12	180	12	80
16	100	16	80
16	105	16	80
16	125	16	100
16	140	16	100
16	180	16	100
20	120	20	100
20	125	20	100
20	160	20	120
20	200	20	120

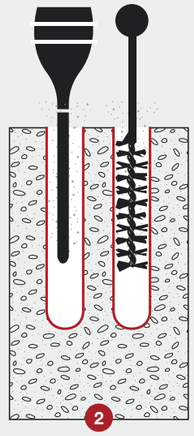
Wedge Anchor Table

Diameter, mm	Length, mm	Drill Size, mm	Hole Depth, mm
8	110	10	80
10	130	12	90
12	160	14	110
16	190	18	125
20	260	22	150
24	300	26	160

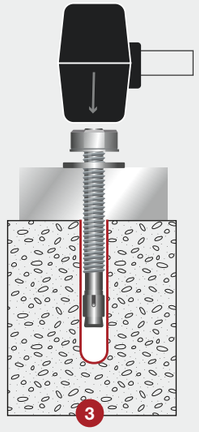
How to Install



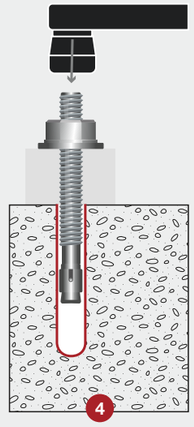
Use the table above to determine the correct size drill bit and the correct hole depth.



Use air and a wire brush to thoroughly clear the hole of dush and any other material. Alternatively, clean the hole by moving the drill bit up and down, and suctioning the dust.



Using a hammer, tap the anchor into the hole until the washer contacts the item being fixed into the concrete.



With correct size socket or spanner tighten anchor to specified torque. vInstallation complete!

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Hollow Wall Anchor Installation Guide

This guide will give you detailed instructions (with illustrations) on how to install Hollow Wall Anchors properly. There is also information on the wall board thickness, and drill size for different size anchors.

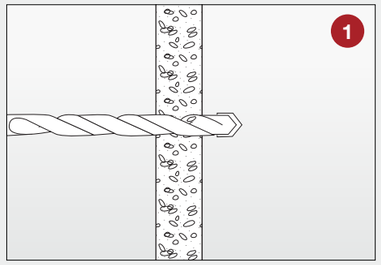
Common Applications

- Coat Hooks
- Wall Mounts
- Curtain Poles
- Kitchen cupboards
- Wall Shelves

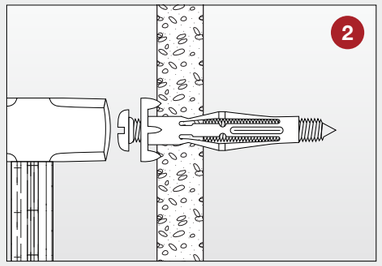
Information Table

Milsons Code	Diameter	Wall Board Thickness	Drill Size	Thread Size
HWA1/8WT1624	1/8	16mm - 24mm	8mm	4mm
HWA1/8WT316	1/8	13mm - 16mm	8mm	4mm
HWA3/16WT1016	3/16	10mm - 16mm	10mm	5mm

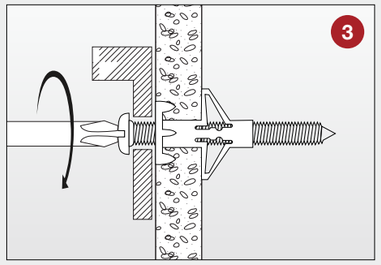
Installation Instructions



1. Use the above table to select the right size anchor for your wall board. Then drill the hole into your wall boards using the recommended drill bit size noted above.



2. Insert your wall anchor and tap home with a mallet or hammer. Ensure the teeth dig into the wall board.



3. Press firmly on the screw with a screw driver, and turn screw clockwise until the barrel crimps are pressed firmly against the inside of the wallboard.

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Screws

Screws are threaded fasteners that are used to connect two parts together. In contrast to bolts, screws do not require nuts to secure them. Also, the head of the screw will often have small slits, crosses or grooves to engage a tool, like a screwdriver. They come in different dimensions and shapes, depending on their application.

- Bugle Butten Screws
- Deep Drilling Screws
- Gypsum Screws
- Machine Screws
  - Countersunk Phillips
  - Panhead Phillips
  - Round Head Slot
- Particle Board Screws
  - Bugle Square Type 17
  - Countersunk Phillips Ribbed
  - Countersunk Square
  - Countersunk Square Ribbed
  - Countersunk Square Type 17
  - Countersunk Square Type 17 Ribbed
- Self Drilling Screws
  - Bugle Phillips
  - Button Phillips
  - Countersunk Phillips
  - Countersunk Square
  - Hex Washer Face
  - Hex Washer Face Neo
  - Pan Phillips Drive
  - Pan Square
  - Wafer Head Phillips
  - Wafer Head Square
  - Wing Tek Phillips
  - Wing Tek Square
- Self Tapping Screws
  - Countersunk Phillips
  - Countersunk Pozi
  - Countersunk Square
  - Countersunk Square Type 17
  - Hex Washer Face Type 17
  - Hex Washer Face Neo Type 17
  - Pan Head Pozi
  - Pan Head Square
  - Pan Head Square Type 17
  - Pan Head Phillips
  - Stitching Button
  - Wafer Head Phillliips Type 17
  - Wafer Head Square Type 17
- Steel Framing Screws
- Truck Deck Screws
  - Bugle Phillips
  - Countersunk Phillips
- Blue Purlin Screws
- Decking Screws

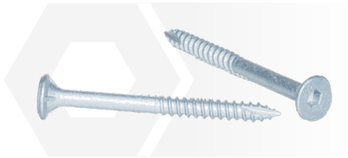
Shop here:

Screws

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Bugle Batten Screws

Type 17 - Ribbed



∅ Diameter	⟷ Length
14 Gauge	50 - 200

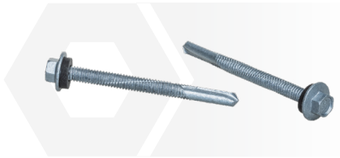
Finishes Available:

316 G YZ

Grade

316 Stainless Steel

Deep Drilling Screws



∅ Diameter	⟷ Length
12 Gauge	32 - 75

Finishes Available:

G

Grade

Steel

Particle Board Screws

Bugle - Square - Type 17

∅ Diameter	⟷ Length
8 Gauge	1 1/4" - 2"
10 Gauge	3"

Finishes Available:

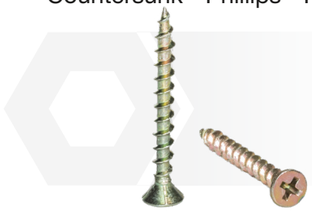
304

Grade

304 Stainless

Particle Board Screws

Countersunk - Phillips - Ribbed



∅ Diameter	⟷ Length
8 Gauge	1 1/2" - 3"

Finishes Available:

YZ

Grade

Steel

Gypsum Screws

∅ Diameter	⟷ Length
6 Gauge	25 - 45

Finishes Available:

YZ

Grade

Steel

Thread Type

Fine pitch
Standard

Machine Screws

Countersunk Phillips

∅ Diameter	⟷ Length
1/4"	2" - 4"
10-24 G	1/2" - 2 1/2"
M3	6 - 20
M4	6 - 50
M5	8 - 50
M6	12 - 70

Finishes Available:

304

Grade

304 Stainless

Thread Type

Standard
UNC

Particle Board Screws

Countersunk - Square

∅ Diameter	⟷ Length
8 Gauge	3/4" - 2"
10 Gauge	2" - 4"
12 Gauge	1 1/4" - 2 1/2"

Finishes Available:

304

Grade

304 Stainless

Particle Board Screws

Countersunk - Square - Ribbed

∅ Diameter	⟷ Length
6 Gauge	1/2" - 1 1/4"
8 Gauge	3/4" - 2"
10 Gauge	1 1/4" - 4"

Finishes Available:

304 G YZ

Grade

304 Stainless
Steel

Machine Screws

Pan Head Phillips

∅ Diameter	⟷ Length
8-32 G	1/2"
10-24 G	3/4" - 3"
M3	6 - 50
M4	5 - 50
M5	6 - 100
M6	10 - 100
M8	20 - 50

Finishes Available:

304

Grade

304 Stainless

Thread Type

Standard
UNC

Machine Screws

Round Head Slot

∅ Diameter	⟷ Length
1/8"	1" - 2"
3/16"	1" - 3"
1/4"	1 1/4" - 3"

Finishes Available:

Br

Grade

Brass

Particle Board Screws

Countersunk - Square - Type 17

∅ Diameter	⟷ Length
8 Gauge	3/4" - 1"
10 Gauge	1 1/2" - 3"

Finishes Available:

304

Grade

304 Stainless

Particle Board Screws

Countersunk - Square - Type 17 - Ribbed

∅ Diameter	⟷ Length
8 Gauge	3/4" - 2 1/2"
10 Gauge	1 1/4" - 4"
12 Gauge	2 1/2" - 4"

Finishes Available:

316 304

Grade

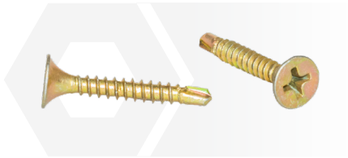
304 Stainless
316 Stainless

Screws

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Self Drilling Screws

Bugle - Phillips



∅ Diameter	⟷ Length
M6	25 - 45

Finishes Available:

YZ

Grade

Steel

Self Drilling Screws

Button - Phillips

∅ Diameter	⟷ Length
M8	12 - 30

Finishes Available:

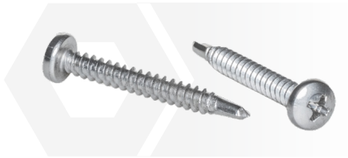
G YZ

Grade

Steel

Self Drilling Screws

Pan - Phillips Drive



∅ Diameter	⟷ Length
8 Gauge	1”
10 Gauge	1 1/4” - 2”

Finishes Available:

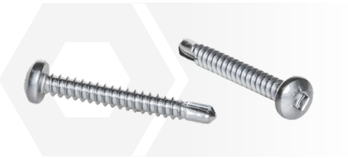
410

Grade

410 Stainless

Self Drilling Screws

Pan - Square



∅ Diameter	⟷ Length
8 Gauge	1/2” - 1 1/2”
10 Gauge	5/8” - 2”

Finishes Available:

410

Grade

410 Stainless

Self Drilling Screws

Countersunk - Phillips

∅ Diameter	⟷ Length
6 Gauge	20
8 Gauge	25
10 Gauge	30-65
10 Gauge	1” - 2”

Finishes Available:

410 G YZ

Grade

410 Stainless
Steel

Thread Type

Fine pitch
Standard

Self Drilling Screws

Countersunk - Square

∅ Diameter	⟷ Length
8 Gauge	3/4” - 1 1/2”
10 Gauge	3/4” - 2”
10 Gauge	30 - 65

Finishes Available:

410 G YZ

Grade

410 Stainless
Steel

Self Drilling Screws

Wafer Head - Phillips

∅ Diameter	⟷ Length
8 Gauge	12
10 Gauge	12 - 40

Finishes Available:

G YZ

Grade

Steel

Thread Type

Fine pitch
Standard

Self Drilling Screws

Wafer Head - Square

∅ Diameter	⟷ Length
10 Gauge	16 - 40

Finishes Available:

G

Grade

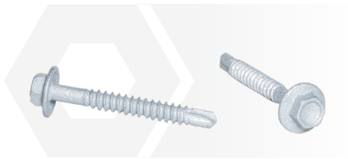
Steel

Thread Type

Fine pitch
Standard

Self Drilling Screws

Hex Washer Face



∅ Diameter	⟷ Length
8 Gauge	12 - 20
10 Gauge	16 - 25
12 Gauge	20 - 75
14 Gauge	11 - 150

Finishes Available:

410 G YZ

Grade

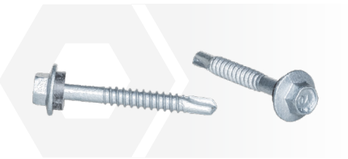
410 Stainless
Steel

Thread Type

Fine pitch
Standard

Self Drilling Screws

Hex Washer Face Neo



∅ Diameter	⟷ Length
10 Gauge	16 - 25
12 Gauge	20 - 75
14 Gauge	22 - 150

Finishes Available:

G

Grade

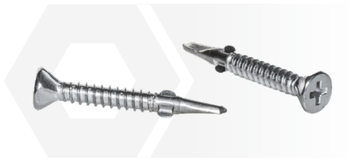
Steel

Thread Type

Fine pitch
Standard

Self Drilling Screws

Wing Tek - Phillips



∅ Diameter	⟷ Length
6 Gauge	50
8 Gauge	32
10 Gauge	35 - 75
12 Gauge	50 - 60

Finishes Available:

410 G YZ

Grade

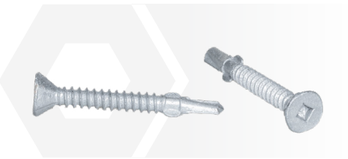
410 Stainless
Steel

Thread Type

Fine pitch
Standard

Self Drilling Screws

Wing Tek - Square



∅ Diameter	⟷ Length
8 Gauge	32
10 Gauge	35 - 75
12 Gauge	50 - 60

Finishes Available:

410 G YZ

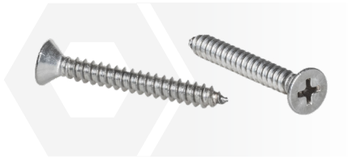
Grade

410 Stainless
Steel

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Self Tapping Screws

Countersunk - Phillips



∅ Diameter	⟷ Length
4 Gauge	1”
6 Gauge	5/8” - 1”
8 Gauge	5/8” - 1 1/4”
10 Gauge	1 1/4” - 2”
12 Gauge	1/2” - 2 1/2”
14 Gauge	3/4” - 2”

Finishes Available:

304

Grade

304 Stainless

Self Tapping Screws

Countersunk - Pozi

∅ Diameter	⟷ Length
4 Gauge	3/8” - 1”
6 Gauge	3/8” - 1 1/2”
8 Gauge	3/8” - 2 1/2”
10 Gauge	5/8” - 3”
12 Gauge	5/8” - 2 1/2”
14 Gauge	1” - 2”

Finishes Available:

316 304

Grade

304 Stainless
316 Stainless

Self Tapping Screws

Pan Head - Pozi

∅ Diameter	⟷ Length
4 Gauge	3/8” - 1”
6 Gauge	3/8” - 1 1/2”
8 Gauge	3/8” - 2”
10 Gauge	1/2” - 2 1/2”
12 Gauge	3/4” - 2”
14 Gauge	3/4” - 2”

Finishes Available:

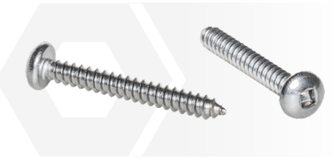
316 304

Grade

304 Stainless
316 Stainless

Self Tapping Screws

Pan Head - Square



∅ Diameter	⟷ Length
4 Gauge	3/8” - 1 1/4”
6 Gauge	3/8” - 2”
8 Gauge	3/8” - 2 1/2”
10 Gauge	1/2” - 4”
12 Gauge	1/2” - 4”
14 Gauge	3/4” - 4”

Finishes Available:

316 304

Grade

304 Stainless
316 Stainless

Self Tapping Screws

Countersunk - Square

∅ Diameter	⟷ Length
4 Gauge	1/2” - 1”
6 Gauge	3/8” - 2”
8 Gauge	3/8” - 3”
10 Gauge	1/2” - 4”
12 Gauge	3/4” - 4”
14 Gauge	3/4” - 4”

Finishes Available:

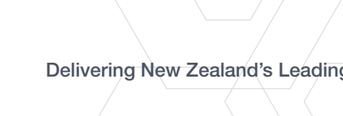
316 304

Grade

304 Stainless
316 Stainless

Self Tapping Screws

Countersunk - Square - Type 17



∅ Diameter	⟷ Length
10 Gauge	20 - 25
12 Gauge	25 - 75
14 Gauge	25 - 150

Finishes Available:

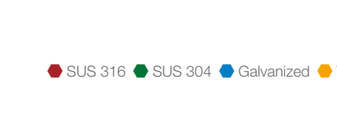
304

Grade

304 Stainless

Self Tapping Screws

Pan Head - Square - Type 17



∅ Diameter	⟷ Length
6 Gauge	3/4”
10 Gauge	3/4” - 2”

Finishes Available:

304

Grade

304 Stainless

Self Tapping Screws

Pan Head- Phillips

∅ Diameter	⟷ Length
6 Gauge	1/4” - 1 1/2”
8 Gauge	1/2” - 2”
10 Gauge	1/2” - 4”
12 Gauge	3/4” - 2 1/2”
14 Gauge	3/4” - 1 1/2”

Finishes Available:

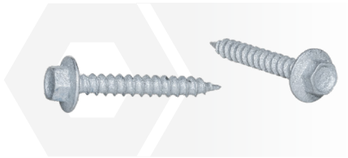
304

Grade

304 Stainless

Self Tapping Screws

Hex Washer Face - Type 17



∅ Diameter	⟷ Length
10 Gauge	20 - 25
12 Gauge	25 - 75
14 Gauge	25- 150

Finishes Available:

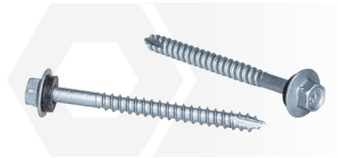
316 304 G YZ

Grade

304 Stainless
316 Stainless
Steel

Self Tapping Screws

Hex Washer Face Neo - Type 17



∅ Diameter	⟷ Length
10 Gauge	20 - 25
12 Gauge	25 - 75
14 Gauge	25 - 200

Finishes Available:

G

Grade

Steel

Self Tapping Screws

Stitching - Button

∅ Diameter	⟷ Length
M8	16

Finishes Available:

YZ

Grade

Steel

Self Tapping Screws

Wafer Head - Phillips - Type 17

∅ Diameter	⟷ Length
M10	25 - 45

Finishes Available:

G YZ

Grade

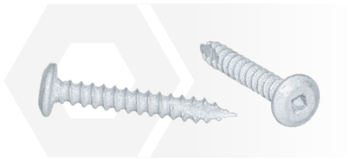
Steel

Screws

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Self Tapping Screws

Wafer Head - Square - Type 17



∅ Diameter	↤↦ Length
M10	25 - 45

Finishes Available:

G

Grade

Steel

Steel Framing Screws

Needle Point - Phillips

∅ Diameter	↤↦ Length
M6	15

Finishes Available:

G

Grade

Steel

Truck Deck Screws

Bugle - Phillips

∅ Diameter	↤↦ Length
M6	45 - 50

Finishes Available:

Z

Grade

Steel

Truck Deck Screws

Countersunk - Phillips

∅ Diameter	↤↦ Length
M6	25 - 60

Finishes Available:

Z

Grade

Steel

Blue Purlin Screws

Countersunk – Torx – Type 17

∅ Diameter	↤↦ Length
10 Gauge	80

Finishes Available:

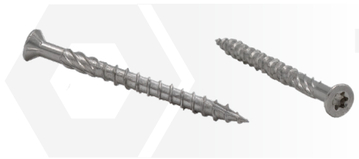
BR

Grade

Steel

Decking Screws

Countersunk Flush Head - Torx - Type 17



∅ Diameter	↤↦ Length
10 Gauge	60 - 75
10 Gauge	60 - 75

Finishes Available:

316 304

Grade

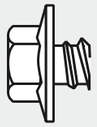
304 Stainless
316 Stainless

SUS 316 SUS 304 Galvanized Zinc Blue Ruspert

Screws – Head Types, Drive Types, and Drill Points

This resource gives clear illustrations of the different types of screws. It explains the different head types, drive types (which screwdriver to use), and the different drill points for self-drilling and self-tapping screws. This will ensure that you pick the correct screw for your application.

Head Types



Hex Washer Face

Hex Washer Face with Neoprene Washer

Counter Sunk / CSK / Flat Head

Wafer Head

Pan Head

Bugle Head

Drive Types

External Hex Drive

Internal Hex Drive

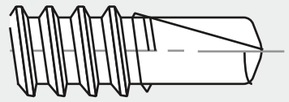
Phillips Drive

Pozi Drive

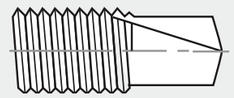
Square Drive

Drill Types

Drilling Screws

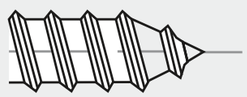


Drill Point with Type ASD Thread

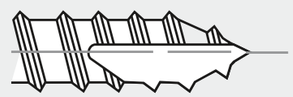


Drill Point with Type BSD Thread

Tapping Screws



Standard



Type 17

Structurals – HSFG

HSFG Bolts are high strength structural bolts that are tightened to create specific tension in the bolt. This tension prevents the steel members in a joint from moving relative to each other because of the frictional resistance.

Designed to be used in heavy-duty engineering applications, HSFG (High Strength Friction Grip) Bolts are made from grade 8.8 high tensile and "structural grade" steels which boast superior tensile strength, fatigue and corrosion resistance.

For this reason HSFG Bolts will often be found in structures like bridges, where strength, vibration resistance and shock resistance are essential.

- Structural Assemblies
- Structural Nut
- Structural Washer

Shop here:

Structurals – HSFG

Structural Bolts, Nuts & Washers

Assemblies

∅ Diameter	↔ Length
M12	30 - 200
M16	40 - 300
M20	40 - 400
M22	60 - 200
M24	50 - 400
M27	75 - 260
M30	75 - 400
M36	90 - 350

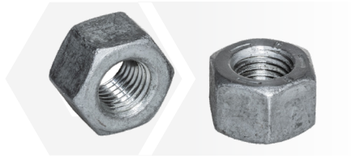
Finishes Available:

G

Grade

HSFG – 8.8
K0HSFG – 8.8

Structural Nuts



∅ Diameter
M12
M16
M20
M22
M24
M27
M30
M36

Finishes Available:

G

Grade

HSFG – 8.8
K0HSFG – 8.8

Structural Washers

∅ Diameter
M12
M16
M20
M24
M30
M36

Finishes Available:

Z

Grade

HSFG – 8.8
K0HSFG – 8.8

New Products

ⓘ NEW products and sizes are often being added to the Milsons range. Please visit our website **milsons.co.nz** for up to date information.

Key to Finishes

A480	Stainless Steel A480	B	Black	YZ	Yellow Zinc Plated	Bi	Bimetal
316	Stainless Steel 316	Z	Zinc Plated	S	Self Colour	410	SUS 410
304	Stainless Steel 304	G	Galvanized	Br	Brass		

ⓘ Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

High Strength Friction Grip (HSFG) Bolts

What are HSFG bolts?

High Strength Friction Grip (HSFG) bolts are high strength steel bolted connections whose bolt shanks contain a pre-induced tension. This ensures that it is the friction between the two steel plates that will carry any external loads. They are also known as 'slip- resistant' connections, because the connection is so tight that there is no slip between the plates.

HSFGs adhere to the AS 1252.1:2016 standard, which outlines the specifications and characteristics of high strength structural bolt assemblies.

Applications of HSFG Bolts

They are commonly used in construction, such as steel bridges, which experience a lot of cyclic loading or vibrations. The preloaded tension means that the tension doesn't fluctuate as much as an ordinary steel bolt, giving it better fatigue resistance. The connections here would be permanent, so once tightened, the bolt can't be reused.

How HSFGs different from normal bolt assemblies?

The primary difference is that HSFGs work through friction provided by the pre-induced tension, whereas normal bolts work via shear stress in the bolt shank. As a result, HSFGs are used for permanent connections, unlike regular bolts which can be removed.

HSFGs are used for specific applications (e.g. exposed to a lot of vibrations) only, unlike ordinary bolts which are multi-purpose.

HSFG and k-classes (K0)

These bolted connections depend on a specific predetermined minimum preload.

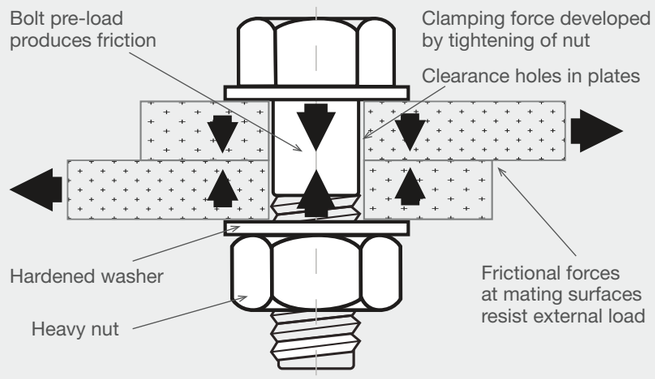
The torque needed to tighten any bolted connection is calculated according to the formula:

$$T = F \times D \times K$$

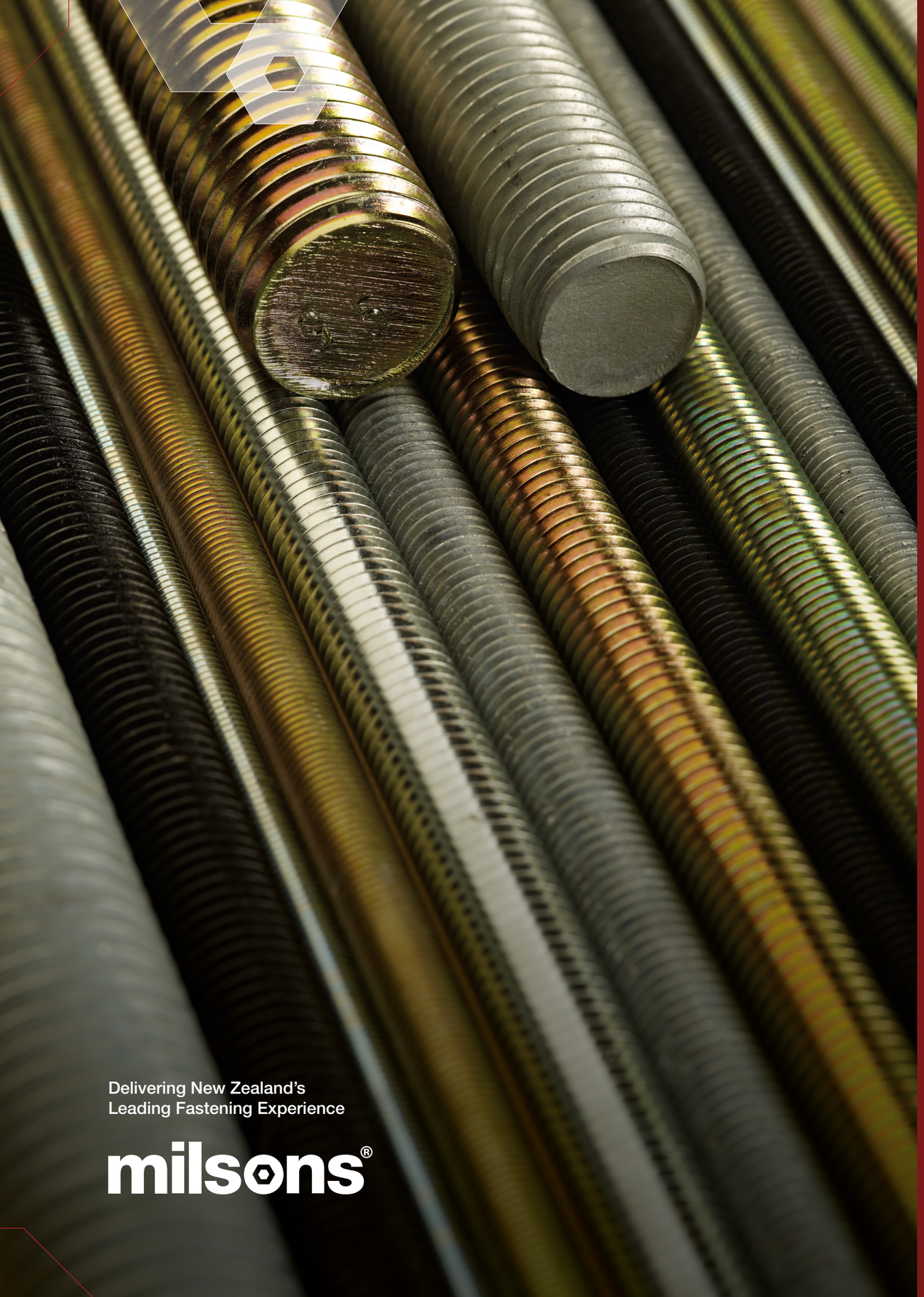
Where T= torque, F= tension needed for bolt, d= diameter of the bolt. There will be a certain amount of energy lost due to friction during tightening, which is what the 'k' factor accounts for. Each k-class of bolts, would have a certain range of k values.

The k-class of a HSFG bolt refers to the torque needed to tighten the bolt. Here, K0 means that there is no specific k-value for the torque to be determined.

How HSFG Bolts work:



The data provided in this document is for general guidance only and should not be solely relied upon when working to stringent specifications. We recommend consulting with qualified experts regarding any technical queries. This information may change without written notice.



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Leading Fastening Experience

milsons®

Threaded Rods

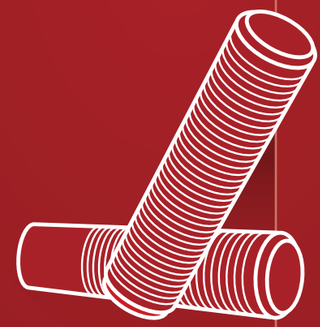
Threaded Rods, also referred to as Threaded Bar, are steel rods with continuous threads along their entire length. Unlike regular screws, they lack a forged head or shank, resulting in a consistent diameter throughout the entire threaded rod.

Threaded Rods can be cut into different lengths, making them useful in applications where a standard bolt or screw is not long enough.

Unlike bolts and screws, they do not have an overhanging head to accommodate a tool. Hence, threaded rods needing to be installed using anchors, or secured with two nuts on either end.

- Threaded Rods
  - Imperial
  - Metric
  - Metric Fine

Shop here:



Threaded Rods

Threaded Rods

Imperial

∅ Diameter	⟷ Length
1/4”	24” - 36”
5/16”	24” - 36”
3/8”	24” - 36”
7/16”	24”
1/2”	24” - 36”
5/8”	24” - 36”
3/4”	24” - 36”
7/8”	24” - 36”
1”	24” - 36”
1 1/8”	24”
1 1/4”	24”
1 1/2”	24”

Finishes Available:

316 Z YZ

Grade	Thread Type
316 Stainless	BSW
Grade 2	UNC
Grade 5	UNF

Threaded Rods

Metric

∅ Diameter	⟷ Length
M3	1000
M4	1000
M5	1000
M6	1000
M8	1000 - 2000
M10	1000 - 3000
M12	1000 - 3000
M14	1000
M16	1000 - 3000
M18	1000
M20	1000 - 3000
M22	1000
M24	1000 - 3000
M27	1000
M30	1000 - 3000
M33	1000
M36	1000 - 3000
M42	1000 - 3000
M48	3000
M56	3000

Finishes Available:

316 304 A480 B Z G YZ S

Grade

304 Stainless
316 Stainless
A480 Stainless
Class 8.8
Class 10.9
Mild Steel

Threaded Rods

Metric Fine

∅ Diameter	⟷ Length
M10	1000
M12	1000
M14	1000
M16	1000
M18	1000
M24	1000

Finishes Available:

YZ

Grade

Class 8.8

Cut-to-Size

Milsons offers a convenient **Cut-to-Size Service**

New Products

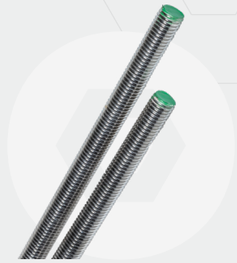
NEW products and sizes are often being added to the Milsons range. Please visit our website **milsons.co.nz** for up to date information.

Key to Finishes

A480	Stainless Steel A480	B	Black	YZ	Yellow Zinc Plated	Bi	Bimetal
316	Stainless Steel 316	Z	Zinc Plated	S	Self Colour	410	SUS 410
304	Stainless Steel 304	G	Galvanized	Br	Brass		

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Guide to Threaded Rod



Threaded Rod, also referred to as Threaded Bar, are Steel Rods with continuous threads along their entire length. Unlike regular screws, they lack a forged head or shank, resulting in a consistent diameter throughout the entire Threaded Rod.

Applications of threaded rods and how to choose:

- **Construction:**
  In construction, threaded rod frequently serves as essential structural supports, facilitating robust connections between materials such as wood, metal, and concrete.
- **Machinery and Equipment:**
  Threaded rods also play a pivotal role in heavy machinery and equipment, where they secure foundations and ensure precise positioning for various components.
- **Manufacturing:**
  In the manufacturing sector, threaded rod is often incorporated into jigs, fixtures and other types of manufacturing equipment. Their high level of strength allows for easy adjustments to fit the requirements of the equipment.
- **Electrical Applications:**
  Electricians frequently use Threaded Rod to support cable trays, wiring and various other electrical elements. Additionally, it can serve as an effective grounding rod, ensuring a stable connection to earth.
- **Automotive Applications:**
  Threaded Rod plays a crucial role in the automotive industry, servicing as essential components in engine and transmission mounts, suspension parts and drivetrain elements.

Types of threaded rod

Threaded rod comes in different types of steel, finishes and thread types. Milsons offers threaded rod in four categories:

- **Metric:**
  Standard metric threads ranging from M3 to M56.
- **Metric Fine:**
  Same as above, but with finer thread pitch.
- **Imperial UNC:**
  Standard imperial coarse threads, ranging from 5/16 to 1 ½”
- **Imperial UNF:**
  Same as above, but with finer thread pitch.

They also exist in different materials and finishes, and each one is suited for different applications. Milsons offers the following finishes:

- **Plain:**
  Plain threaded rod is a common choice, frequently employed in construction projects where the materials remain concealed within the structure, protected from the elements.
- **Zinc:**
  Zinc-plated threaded rod introduces corrosion resistance, making it suitable for environments exposed to weather or chemicals.
- **Yellow zinc:**
  Similar to Zinc Plating, but featuring a yellow chromate top coating, Yellow Zinc offers improved durability and corrosion resistance. The robust look of the yellow chromate is often more appealing in industries such as electrical and plumbing, where fittings are exposed.
- **Galvanised:**
  Galvanised finishes offer superior corrosion resistance, compared to zinc plating, making them ideal for outdoor applications.
- **Stainless steel:**
  Stainless Steel Threaded Rods offer excellent durability and corrosion resistance, making them extremely beneficial for use in outdoor and marine applications. It’s strength enables it to withstand a great deal of tension without breaking or bending.

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Bolts

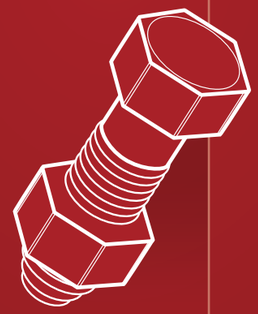
A bolt is a mechanical fastener characterized by a threaded shaft. Typically, bolts are inserted through unthreaded holes in components, and a nut is screwed onto the threaded end to create a clamping force. This clamping force helps secure multiple parts together, preventing axial movement and contributing to the formation of a bolted joint.

Bolts come in various types, shapes, and sizes, and they are widely used in construction, machinery, and various other applications to join and fasten components securely.

The design of a bolt includes a head, (often hexagonal) and a shaft with external threading. The specific type and characteristics of bolts can vary based on their intended use and the materials involved.

- Coach Bolts & Nuts
- Coach Bolts Only
- Coach Screws
- Hex Bolts & Nuts
  - Half Spread
  - Imperial
  - Metric
  - Metric Fine
  - Structural Assemblies
- Purlin Bolts & Nuts
- Set Screws
  - Imperial
  - Metric

Shop here:



Bolts

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Coach Bolts & Nuts

Diameter	Length
M6	20-120
M8	20 - 200
M10	20 - 350
M12	30 - 450
M16	50 - 450
M20	75 - 400

Finishes Available:

316 304 G B Z

Grade

304 Stainless
316 Stainless
Mild Steel

Coach Bolts Only

Diameter	Length
M6	20 - 100
M8	20 - 110
M10	30 - 200
M12	40 - 400
M16	80 - 400
M20	-

Finishes Available:

316 304 G B Z

Grade

304 Stainless
316 Stainless
Mild Steel

requires check/update
as i can't single out bolts
only from current website

Hex Bolts & Nuts

Metric Fine

Diameter	Length
M8	20 - 50
M10	25 - 150
M12	20 - 150
M14	25 - 150
M16	30 - 120
M18	40 - 120
M20	40 - 110
M22	40 - 75
M24	90

Finishes Available:

B Z

Grade

Class 8.8

Hex Bolts & Nuts

Structural Assemblies

Diameter	Length
M12	30 - 200
M16	40 - 300
M20	40 - 400
M22	60 - 200
M24	50 - 400
M27	75 - 260
M30	75 - 400
M36	90 - 350

G

Grade

HSFG - 8.8
K0HSFG - 8.8

Coach Screws

Diameter	Length
M6	30 - 130
M8	30 - 150
M10	40 - 180
M12	40 - 400
M16	50 - 400
M20	100 - 400

Finishes Available:

316 304 G

Grade

304 Stainless
316 Stainless
Mild Steel

Hex Bolts & Nuts

Half Thread

Diameter	Length
M12	100 - 450
M16	140 - 600
M20	350 - 500

Finishes Available:

G

Grade

Mild Steel

Purlin Bolts & Nuts

Diameter	Length
M12	30
M16	35

Finishes Available:

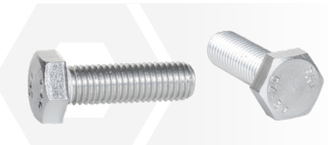
Z G

Grade

Class 8.8

Set Screws

Imperial



Diameter	Length
10-24G	1”
1/4”	1/2” - 1 1/2”
5/16”	1/2” - 2”
3/8”	3/4” - 2”
7/16”	1 1/2”
1/2”	3/4” - 4”
9/16”	1 1/4”
5/8”	1” - 2”
3/4”	1 1/2” - 4”
7/8”	2” - 2 1/4”
1”	3”

Finishes Available:

316 304 B Z

Grade

304 Stainless
316 Stainless
Grade 2
Grade 5
Grade 8

Thread Type

BSW
UNC
UNF

Hex Bolts & Nuts

Imperial

Diameter	Length
1-12 Gauge	2” - 10”
1-14 Gauge	2” - 10”
1/4”	1/2” - 6”
5/16”	1/2” - 6”
3/8”	3/4” - 6”
7/16”	1” - 6”
1/2”	1” - 8”
9/16”	1” - 6”
5/8”	1” - 16”
3/4”	1/2” - 16”
7/8”	2” - 16”
1”	1” - 16”
1 1/8”	3” - 10”
1 1/4”	3” - 16”
1 1/2”	4” - 16”
1 3/4”	6” - 10”
2”	8” - 12”

Finishes Available:

316 304 B Z

Grade

304 Stainless
316 Stainless
Grade 5
Grade 8

Thread Type

UNC
UNF

Hex Bolts & Nuts

Metric

Diameter	Length
M5	16 - 50
M6	12 - 150
M8	12 - 160
M10	16 - 300
M12	20 - 600
M14	25 - 200
M16	25 - 600
M18	30 - 280
M20	30 - 1000
M22	75 - 150
M24	40 - 1000
M27	80 - 240
M30	60 - 400
M33	80 - 280
M36	80 - 180
M42	200
M48	130 - 180

Finishes Available:

316 304 B Z G

Grade

304 Stainless
316 Stainless
Class 8.8

Class 10.9
Mild Steel

Set Screws

Metric

Diameter	Length
M4	10 - 50
M5	10 - 60
M6	10 - 100
M8	12 - 120
M10	16 - 120
M12	20 - 150
M14	20 - 75
M16	25 - 120
M18	30
M20	30 - 120
M22	40 - 100
M24	40 - 100
M30	70 - 100
M36	100
M48	100

Finishes Available:

316 304 B Z G

Grade

304 Stainless
316 Stainless

Class 8.8
Mild Steel

New Products

NEW products and sizes are often being added to the Milsons range. Please visit our website **milsons.co.nz** for up to date information.

SUS 316 SUS 304 Zinc Galvanized Black

UNC and UNF Bolt Tightening Torque

It is vital that bolts and other threaded fasteners are tightened with the right force, so that they can clamp components properly. If it is not accurate, it may cause failure of the component and joint via bolt shearing (sliding apart) or tensile failure (pulling apart).

If a bolt is under-torqued, the bolt will not clamp and hold the parts properly. If it is over-torqued, the bolt could break.

Determining Bolt Tightening Torques

What is torque? Torque is the twisting force at a joint when you apply a force at the end (of a spanner, for example). Mathematically, it is the force multiplied by the distance to the joint. The torque will depend on a number of factors such as:

+ Diameter and size of bolt :
  The torque will increase with the bolt size.
+ Type of metal the bolt is made from, and its properties:
  Properties like tensile, shear and yield strength are important here.
+ Number of threads (coarse vs fine threads):
  Finer threads have a higher tightening torque
+ Surface finish on the material and treatments like lubrication, galvanizing or waxing: Galvanized ones need a higher tightening torque than plain ones, and lubrication will reduce the tightening torque

Below are the approximate values of torque that need to be applied to different imperial bolt sizes. As stated above, there are a number of factors that affect tightening torque. The values in these tables should only be used as a guide. The exact tightening torque will need to be determined using a torque wrench.

Table 1
UNC Tightening Torque

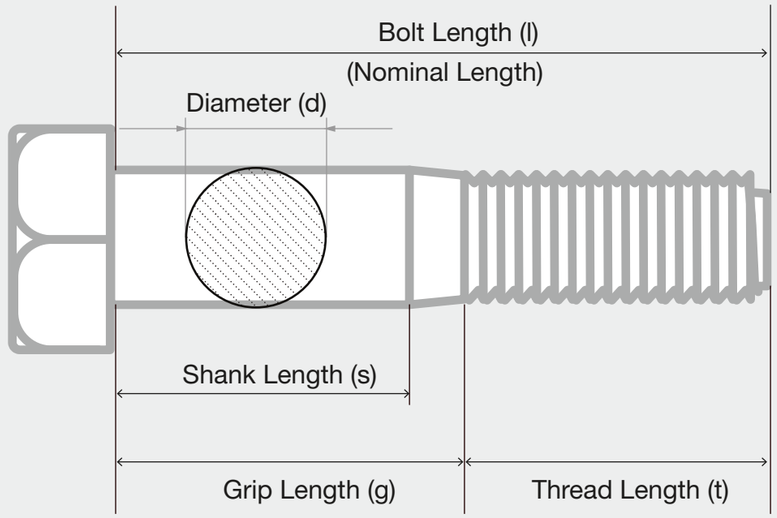
		Recommended Tightening Torque			
		SAE Grade 5		SAE Grade 8	
Nominal Size (in)	Threads per inch	Nm	lbft	Nm	lbft
1/4”	20	9.5	7	14	10
5/16”	18	20	15	28.5	21
3/8”	16	36	27	51.5	38
7/16”	14	59	43	81	60
1/2”	13	90	66	125	92
9/16”	12	129	95	180	133
5/8”	11	176	130	248	183
3/4”	10	312	230	441	325
7/8”	9	502	370	709	523
1”	8	760	560	1064	785
1 1/8”	7	935	690	1513	1116
1 1/4”	7	1316.5	971	2135	1575
1 3/8”	6	1727	1274	2800	2065
1 1/2”	6	2291	1690	3715	2740

Table 2
UNF Tightening Torque

		Recommended Tightening Torque			
		SAE Grade 5		SAE Grade 8	
Nominal Size (in)	Threads per inch	Nm	lbft	Nm	lbft
1/4"	28	11	8	16	12
5/16"	24	23	17	31	23
3/8"	24	41	30	58	43
7/16"	20	65	48	91	67
1/2"	20	100	74	141	104
9/16"	18	142	105	202	149
5/8"	18	203	150	281	207
3/4"	16	352.5	260	492	363
7/8"	14	556	410	782	577
1"	12	827	610	1165	859
1 1/8"	12	1047	772	1697.5	1252
1 1/4"	12	1458	1075	2365	1744
1 3/8"	12	1965	1449	3187.5	2351
1 1/2"	12	2578	1901	4180	3083

Bolt Measurements Diagram

This resource outlines different bolt measurements and how to determine thread and shank lengths. These dimensions are important when you want to figure out strength and amount of thread engagement on the fastener.



Formula To Calculate The Thread Length Of Partial Thread Bolts

A Guide For: DIN 931, ISO 4014

Bolts up to and including 125mm long:

$$t = 2d + 6$$

Bolts 130mm - 200mm long:

$$t = 2d + 12$$

Bolts 220mm and longer:

$$t = 2d + 25$$

Key:

t = Thread Length
d = Bolt Diameter
l = Bolt Length
g = Grip Length
s = Shank Length
Units in mm

Formula to calculate grip length:

$$g = s - t$$

Socket Head

Socket Head Screws are a specific type of screw that contain a hexagonal hole in the screwhead, designed to fit an allen key. They are short with a flat end, and the shaft is often threaded all the way.

Socket Head Screws are commonly used in machinery, automotive, electronics and furniture assembly, where a low-profile, flush-mounting screw is desired.

Milsons stocks several types of socket head screws:

- **Button Head Screws**
  - Imperial
  - Metric
- **Cap Screws**
  - Imperial
  - Metric
  - Metric Fine
- **Low Head Cap Screws**
- **Countersunk Screws**
  - Imperial
  - Metric
- **Grub Screws**
  - Imperial
  - Metric
  - Metric Fine
- **Pressure Plugs**
- **Shoulder Screws**
  - Imperial
  - Metric

Shop here:

Socket Head

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Button Head Screws

Imperial

∅ Diameter	⟷ Length
5/16”	5/8” - 2”
3/8”	1” - 2”
1/4”	3/8” - 1 1/2”
10-24 G	5/8” - 2”

Finishes Available:

304 B

Grade

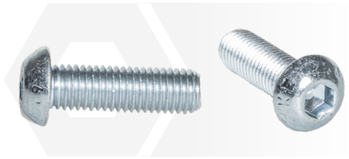
304 Stainless
Class 10.9

Thread Type

UNC
UNF

Button Head Screws

Metric



∅ Diameter	⟷ Length
M3	6 - 40
M4	6 - 40
M5	8 - 60
M6	8 - 70
M8	10 - 90
M10	10 - 100
M12	16 - 90
M16	40 - 50

Finishes Available:

316 304 B Z

Grade

304 Stainless
316 Stainless
Class 10.9

Countersunk Screws

Imperial

∅ Diameter	⟷ Length
3/16”	1/2” - 2”
1/4”	1/2” - 3”
5/16”	3/4” - 3”
3/8”	3/4” - 2”
7/16”	1 1/2” - 2”
1/2”	3/4” - 2 1/2”
5/8”	1 1/2” - 3 1/2”
3/4”	1 1/2” - 5”
8-32 G	3/4”
10-24 G	2” - 2 1/2”
10-32 G	5/8”

Finishes Available:

304 B

Grade

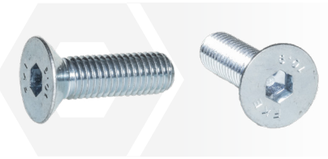
304 Stainless
Class 12.9

Thread Type

UNC
UNF

Countersunk Screws

Metric



∅ Diameter	⟷ Length
M3	6 - 25
M4	6 - 50
M5	8 - 80
M6	8 - 100
M8	12 - 140
M10	16 - 150
M12	20 - 180
M14	30 - 70
M16	30 - 160
M20	40 - 140
M24	80 - 120

Finishes Available:

316 304 B Z

Grade

304 Stainless
316 Stainless
Class 10.9

Cap Screws

Imperial

∅ Diameter	⟷ Length
6-32 G	1/2”
10-24 G	1” - 1 1/2”
10-32 G	1/2”
1/8”	3/8”
3/16”	1/2” - 2 1/2”
1/4”	3/8” - 4”
5/16”	3/4” - 4”
3/8”	3/4” - 6”
7/16”	1” - 6”
1/2”	1” - 4 1/2”
5/8”	1” - 9”
3/4”	1 1/2” - 8”
7/8”	2 1/2” - 5”
1”	2 1/2” - 4”
1 1/4”	3”
1 1/2”	3” - 8”

Finishes Available:

304 B Z

Grade

304 Stainless
Class 12.9

Thread Type

BSW
UNC
UNF

Cap Screws

Metric

∅ Diameter	⟷ Length
M2.5	16
M3	4 - 70
M4	6 - 80
M5	8 - 90
M6	10 - 240
M7	20
M8	10 - 200
M10	10 - 200
M12	20 - 200
M14	30 - 200
M16	25 - 240
M18	40 - 120
M20	30 - 300
M22	90
M24	40 - 300
M30	80 - 200
M36	100 - 120

Finishes Available:

316 304 B Z

Grade

304 Stainless
316 Stainless
Class 12.9

Grub Screws

Imperial

∅ Diameter	⟷ Length
3/16”	3/16” - 1 1/2”
1/4”	1/4” - 1 1/4”
5/16”	1/2” - 2”
3/8”	3/8” - 1 1/4”
7/16”	1/2”
1/2”	1/2” - 1 1/2”
5/8”	1” - 3”

Finishes Available:

304 B

Grade

304 Stainless
Class 12.9

Thread Type

BSW
UNC
UNF

Grub Screws

Metric

∅ Diameter	⟷ Length
M3	3 - 12
M4	4 - 40
M5	5 - 30
M6	6 - 50
M8	8 - 70
M10	10 - 50
M12	12 - 100
M16	16 - 100
M20	20 - 40
M24	25 - 60

Finishes Available:

316 304 B Z

Grade

304 Stainless
316 Stainless
Class 10.9
Class 12.9

Cap Screws

Metric Fine

∅ Diameter	⟷ Length
M10	20 - 60
M12	30 - 90
M14	40 - 60
M16	40 - 120
M18	50 - 60
M20	50 - 70

Finishes Available:

B

Grade

Class 12.9

Low Head Cap Screws

∅ Diameter	⟷ Length
M6	16 - 20
M8	16 - 20
M10	20 - 50
M12	50

Finishes Available:

B

Grade

Class 10.9

Grub Screws

Metric Fine

∅ Diameter	⟷ Length
M8	10 - 12
M10	10 - 25

Finishes Available:

B

Grade

304 Stainless
316 Stainless
Class 12.9

Pressure Plugs

∅ Diameter	⟷ Length
1 1/2”	3/8”
1/2”	3/8”
1/4”	3/8”
1/8”	3/8”
3/4”	3/8”
3/8”	3/8”

Finishes Available:

304 B

Grade

304 Stainless
Class 12.9

Socket Head

Shoulder Screws

Imperial

∅ Diameter	⟷ Length
1/4”	1”
3/8”	1/2” - 1 3/4”
1/2”	1/2” - 3 1/4”
5/8”	3 1/2”

Finishes Available:

S

Grade

Class 12.9

Shoulder Screws

Metric

∅ Diameter	⟷ Length
M6	10 -20
M8	12 - 50
M10	16 - 50
M12	16 - 100
M16	25 - 120
M20	40 - 80

Finishes Available:

S Z

Grade

Class 12.9
Mild Steel

New Products

NEW products and sizes are often being added to the Milsons range. Please visit our website **milsons.co.nz** for up to date information.

Key to Finishes

A480	Stainless Steel A480	B	Black	YZ	Yellow Zinc Plated	Bi	Bimetal
316	Stainless Steel 316	Z	Zinc Plated	S	Self Colour	410	SUS 410
304	Stainless Steel 304	G	Galvanized	Br	Brass		

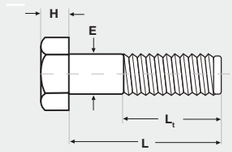
Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Hex Head and Socket Head – General Dimensions

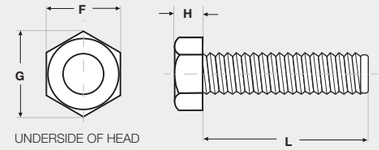
This resource provides detailed illustrations on how the dimensions of different hex head and socket head fasteners are measured. Dimensions such as the bolt head height, thread length, chamfer dimensions, diameter of fastener, etc. It is important to get these dimensions right, as they determine factors such as strength and dimensional tolerances for the bolts.

Hex Head Products

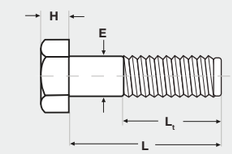
Hex Head Bolt



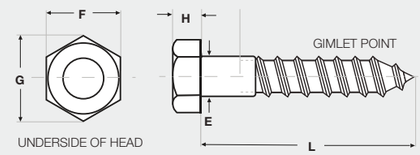
Set Screw



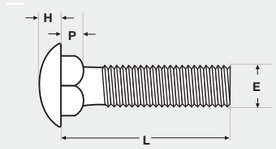
Hex Head Bolt



Coach Screw



Coach Bolt



Key

A = Head diameter.

C = Top chamfer or radius on Socket Product.

D = Shank diameter.

E = Thread, and full body, or shoulder diameter

F = Across the flat measurement (socket size)

G = Across the corners measurement.

H = Depth of Head.

J = Across the flats measurement for internal hexagon drive.

K = Shoulder neck diameter.

L = Product length. Measured from under the head except for Flat head Product, which is measured as overall length .

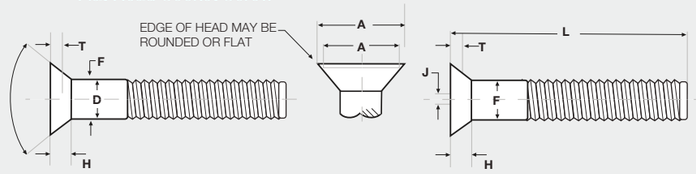
Lt = Thread length.

P = Depth of square neck on Coach bolt.

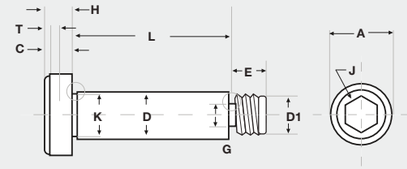
T = Effective depth of internal driving recess.

Socket Head Products

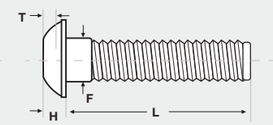
Flat Head Socket Screw



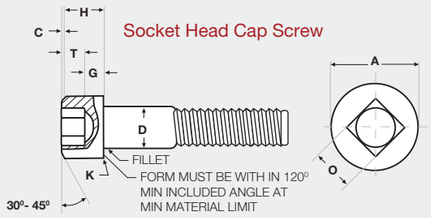
Shoulder Bolt



Button Head Socket Screw



Socket Head Cap Screw



The data provided in this document is for general guidance only and should not be solely relied upon when working to stringent specifications. We recommend consulting with qualified experts regarding any technical queries. This information may change without written notice.

Delivering New Zealand's
Leading Fastening Experience

milsons®

Nuts

Nuts are a type of hardware component that typically feature a small, flat, or hexagonal piece with a threaded hole. Nuts are used in conjunction with bolts and other threaded fasteners to secure two or more components together. The threaded hole in a nut allows it to be tightened onto the threaded shaft of a bolt, creating a secure and stable joint.

Nuts come in various shapes and sizes, with the type of nut used depending on the specific application and the type of fastener being used.

- Barrel Nuts
- Coupling Nuts
- Conelock Nuts
  - Imperial
  - Metric
- Dome Nuts
  - Imperial
  - Metric
- Fuji Lock Nuts
- Half Nuts
- Hex Nuts
  - Imperial
  - Metric
  - Metric Fine
- Serrated Flange Nuts
- Nyloc Nuts
  - Imperial
  - Metric
- Structural Nuts
- Strut Nuts
  - No Spring
  - Short Spring
  - Long Spring
- Tee Nuts
- Wedge Nuts
- Wing Nuts
  - Imperial
  - Metric

Shop here:

Nuts

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Barrel Nuts

∅ Diameter
M5
M6
M8

Finishes Available:

316

Grade

316 Stainless

Coupling Nuts

∅ Diameter	↔ Length
M6	18
M8	24 - 25
M10	30 - 40
M12	36 - 40
M16	48 - 50
M20	50 - 60
M24	50 - 72
M30	90

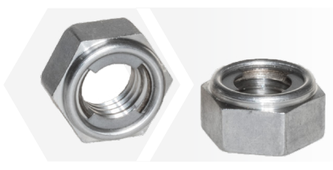
Finishes Available:

316 Z G YZ

Grade

316 Stainless
Mild Steel

Fuji Lock Nuts



∅ Diameter
M4
M5
M6
M8
M10
M12
M16

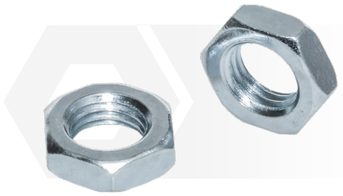
Finishes Available:

304

Grade

304 Stainless

Half Nuts



∅ Diameter
M8
M10
M12
M16
M20
M12
M16

Finishes Available:

316 Z

Grade

316 Stainless
Mild Steel

Conelock Nuts

Imperial

∅ Diameter
1/4”
1/2”
3/4”
3/8”
5/8”
5/16”
7/8”
7/16”
9/16”
1”
1 1/2”
1 1/4”
1 1/8”

Finishes Available:

B Z

Grade

304 Stainless
Steel

Thread Type

UNC
UNF

Conelock Nuts

Metric

∅ Diameter
M6
M8
M10
M12
M14
M16
M18
M20
M24
M30
M36

Finishes Available:

Z

Grade

Class 10

Hex Nuts

Imperial

∅ Diameter	
1/2”	9/16”
1/4”	1”
1/8”	1 1/2”
3/4”	1 1/4”
3/8”	1 1/8”
5/8”	1 3/4”
5/16”	1 12”
5/32”	2”
7/8”	
7/16”	10-24 Gauge

Finishes Available:

316 304 B Z Br

Grade

304 Stainless
316 Stainless
Brass
Grade 2 Grade 5
Grade 8

Thread Type

BSW
UNC
UNF

Hex Nuts

Metric

∅ Diameter	
M3	M16
M4	M18
M5	M20
M6	M22
M8	M24
M10	M27
M12	M30
M14	M33
	M36
	M39
	M42
	M48
	M56
	M64

Finishes Available:

316 304 A480 B Z G Br

Grade

304 Stainless
316 Stainless
A480 Stainless

Brass
Class 5 Class 8
Class 10

Dome Nuts

Imperial

∅ Diameter
1/4”
3/8”
3/16”
5/16”

Finishes Available:

316 304

Grade

304 Stainless
316 Stainless

Dome Nuts

Metric

∅ Diameter
M5
M6
M8
M10
M12
M16
M20
M24

Finishes Available:

316 304 Br

Grade

304 Stainless
316 Stainless
Brass

Hex Nuts

Metric Fine

∅ Diameter
M8
M10
M12
M14
M16
M18
M20
M22
M24

Finishes Available:

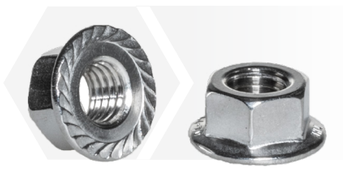
B Z

Grade

Class 8

Serrated Flange Nuts

Metric



∅ Diameter
M4
M5
M6
M8
M10
M12
M14
M16
M20

Finishes Available:

316 304 Z YZ

Grade

304 Stainless
316 Stainless
Class 8

Nuts

Nyloc Nuts

Imperial

Finishes Available:

316 304 Z

Grade

304 Stainless
316 Stainless
Grade 2

Thread Type

BSW
UNC
UNF

∅ Diameter
1”
1 1/2”
1 1/4”
1 1/8”
1 3/4”
1/2”
1/4”
2”
3/4”
3/8”
3/16”
5/8”
5/16”
7/8”
7/16”
9/16”
10-24 Gauge

Nyloc Nuts

Metric

Finishes Available:

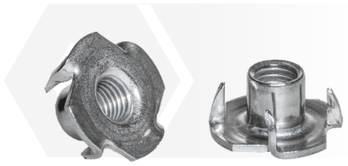
316 304 Z G

Grade

304 Stainless
316 Stainless
Class 6

∅ Diameter
M3
M4
M5
M6
M8
M10
M12
M14
M16
M18
M20
M22
M24
M30
M36
M39
M42

Tee Nuts



∅ Diameter
M6
M8
M10

Finishes Available:

304 Z

Grade

304 Stainless
Mild Steel

Wedge Nuts

∅ Diameter
M8
M10

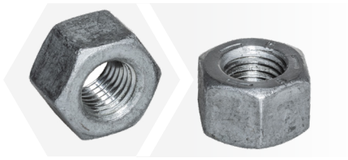
Finishes Available:

Z

Grade

Mild Steel

Structural Nuts



∅ Diameter
M12
M16
M20
M22
M24
M27
M30
M36

Finishes Available:

G

Grade

Class 8.8 - HSFG
K0HSFG - 8.8

Strut Nuts

No Spring

∅ Diameter
M10

Finishes Available:

Z

Grade

Mild Steel

Wing Nuts

Imperial

∅ Diameter
1/2”
1/4”
3/8”
3/16”

Finishes Available:

304 Z

Grade Label

304 Stainless
Mild Steel

Wing Nuts

Metric

∅ Diameter
M5
M6
M8
M10
M12
M16

Finishes Available:

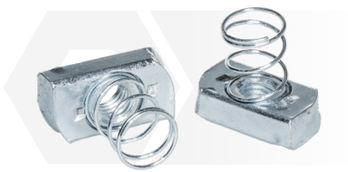
316 304 Z

Grade Label

304 Stainless
316 Stainless
Mild Steel

Strut Nuts

Short Spring



∅ Diameter
M8
M10

Finishes Available:

Z

Grade

Mild Steel
Steel

Strut Nuts

Long Spring

∅ Diameter
M8
M10

Finishes Available:

Z

Grade

Mild Steel
Steel

Key to Finishes

A480	Stainless Steel A480	B	Black	YZ	Yellow Zinc Plated	Bi	Bimetal
316	Stainless Steel 316	Z	Zinc Plated	S	Self Colour	410	SUS 410
304	Stainless Steel 304	G	Galvanized	Br	Brass		

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Hex Bolt & Nut Marking Identification

This resource provides clear illustrations of different markings on hex head bolts and nuts. The hex head of the bolt or nut will often contain different markings from the manufacturer which gives information on the different grades and classes of steel that the bolts are made from. The sheet contains markings for both imperial and metric bolts.

Hex Bolt

Metric

MM = Manufacturers Marking
4.6 = Mild Steel
4.8 = Mild Steel
8.8 = High Tensile (Class 8)
10.9 = High Tensile (Class 10)

Imperial

MM = Manufacturers Marking
3 Lines = Grade 5

MM = Manufacturers Marking
6 Lines = Grade 8

Hex Nut

Metric

MM = Manufacturers Marking

Tensile Ratings:
|5| = Class 5
|8| = Class 8
|10| = Class 10

Imperial Grade 5

Marking Type A

| = Reference Point
(at 12 o'clock position)
• = Tensile Marking = Grade 5
(at 4 o'clock position)
MM = Manufacturers Marking
(at 8 o'clock position)

Marking Type B

MM = Manufacturers Marking
Tensile Rating:
3 Lines = Grade 5

Imperial Grade 8

Marking Type A

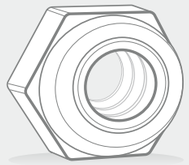
| = Reference Point
(at 12 o'clock position)
• = Tensile Marking = Grade 8
(at 2 o'clock position)
MM = Manufacturers Marking
(at 8 o'clock position)

Marking Type B

MM = Manufacturers Marking
Tensile Rating:
6 Lines = Grade 8

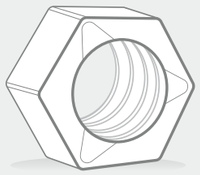
Locking Nuts

This resource provides information (with illustrations) on the different types of locking nuts stocked by Milsons (conelock nuts, half nuts, serrated flange, Fuji lock and half nut). It also outlines the different applications and material grades for each type of locking nut.



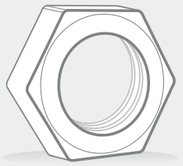
Nyloc Nuts

Nyloc Nuts (also know as Nylon-Insert lock Nuts) are a type of lock nut that have a nylon collar (or inset) that increases the friction on the thread. They are an ideal economical option for environments that have vibration or motion that could loosen the nut. Nyloc Nuts are typically Mild steel (Class 6 or Grade 2).



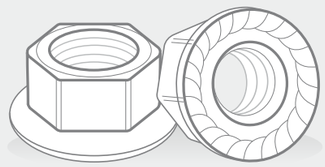
Conelock Nuts

Conelock Nuts are a one-piece lock nut. They have distorted threads at the top of the nut that cause them to lock into the thread. Conelock nuts are suitable for application with vibration or motion that may cause a nut to loosen and differ from Nyloc Nuts as they are typically High tensile (Class 10 or Grade 8). Also, being a one-piece steel nuts allows them to work in high temper¬ature and more harsh chemical environments.



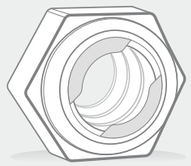
Half Nuts

Half Nuts (also known as a thin nut, jam nut, or lock nut) are often used in pairs or in conjunction with a full nut in a locking arrange¬ment where the two nuts are tightened together to lock them in place. They are also used in applications that required a higher thread engagement.



Serrated Flange Nuts

Serrated Flange Nuts are a one-piece Nut that look similar to a Standard Hex Nut, however, they have a Flanged base with serration on its bearing surface. When the nut is tightened onto a mating sur¬face these serrations score the surface to achieve a locking fit.



Fuji Lock Nuts

Fuji Lock Nuts have a special type of spring, called a friction ring, secured under the top face of the nut. When the nut is wound onto a thread this spring comes into contact with the threads and is pushed upward, therefore putting it under tension. This tension causes the nut threads to push against the thread that is receiv¬ing it, therefore locking the nut, and preventing loosening under vibration.

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Leading Fastening Experience

milsons®

Washers

Washers are essential components in various applications, serving as protective, spacing and load-distributing devices. A crucial component in maintaining the integrity and functionality of fasteners like bolts or screws, these small discs placed underneath a nut, and/or bolt head, prevent damage to the material being fastened by improving the stability and longevity of the connection.

Milsons stock several types of washers:

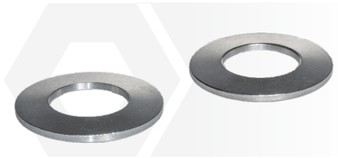
- Belleville Washers
- Cup Washers
- External Tooth Lock Washers
- Internal Tooth Lock Washers
- Fender Washers
- Mini Fender Washers
- Hardened Washers
- Heavy Washers
- Light Washers
- Neoprene Washers
- Spring Washers
- Square Washers
- Structural Washers
- Wedge Lock Washers

Shop here:

Washers

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Belleville Washers



∅ Diameter
- M3
- M4
- M6
- M7
- M8
- M10
- M12
- M14
- M16
- M20

Finishes Available:

304

Grade

304 Stainless

Cup Washers

∅ Diameter
- 6 Gauge
- 8 Gauge
- 10 Gauge
- 12 Gauge

Finishes Available:

304

Grade

304 Stainless

Hardened Washers

∅ Diameter
- 1”
- 1 1/2”
- 1 1/4”
- 1 1/8”
- 1 3/4”
- 1 3/8”
- 1/2”
- 1/4”
- 3/4”
- 3/8”
- 5/8”
- 5/16”
- 7/8”
- 7/16”
- 9/16”
- M6
- M8
- M10
- M12
- M14
- M16
- M18
- M20
- M24
- M30
- M36
- M39

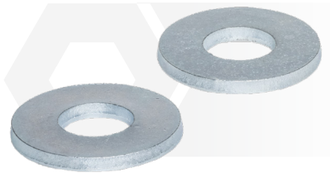
Finishes Available:

YZ

Grade

F436

Heavy Washers



∅ Diameter
- 1”
- 1 1/2”
- 1 1/4”
- 1 1/8”
- 1 3/4”
- 1 3/8”
- 1 5/8”
- 1 7/8”
- 1/2”
- 1/4”
- 2”
- 3/4”
- 3/8”
- 5/8”
- 5/16”
- 7/8”
- 7/16”
- 9/16”
- M6
- M8
- M10
- M12
- M14
- M16
- M18
- M20
- M22
- M24
- M25
- M27
- M30
- M33
- M36
- M39
- M42
- M45
- M48
- M52

Finishes Available:

316 304 B Z G

Grade

304 Stainless
316 Stainless

External Tooth Lock Washers

∅ Diameter
- M4

Finishes Available:

304

Grade

304 Stainless

Internal Tooth Lock Washers

∅ Diameter
- M3
- M4
- M6
- M8

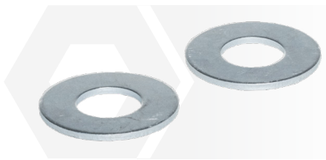
Finishes Available:

304

Grade

304 Stainless

Light Washers



∅ Diameter
- 1”
- 1/2”
- 1/4”
- 1/8”
- 3/4”
- 3/8”
- 3/16”
- 5/8”
- 5/16”
- 5/32”
- 7/16”
- 9/16”
- M3
- M4
- M5
- M6
- M7
- M8
- M10
- M12
- M14
- M16
- M20
- M24

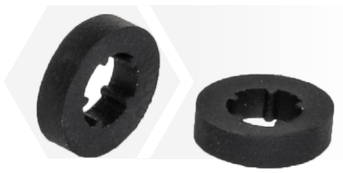
Finishes Available:

316 304 Z Br

Grade

304 Stainless
316 Stainless
Brass

Neoprene Washers



∅ Diameter
- M10
- M12
- M14

Finishes Available:

B

Grade

Neoprene

Fender Washers

∅ Diameter
- 1/2”
- 1/4”
- 3/8”
- 3/16”
- 5/16”
- M5
- M6
- M8
- M10
- M12

Finishes Available:

316 304 Z

Grade

304 Stainless
316 Stainless
Mild Steel

Mini Fender Washers

∅ Diameter
- 1/4”
- 3/16”
- 5/16”
- M5
- M6
- M8
- M10

Finishes Available:

316 304 Z

Grade

304 Stainless
316 Stainless

Spring Washers

∅ Diameter
- 1”
- 1 1/2”
- 1 1/4”
- 1/2”
- 1/4”
- 3/4”
- 3/8”
- 3/16”
- 5/8”
- 5/16”
- 7/8”
- 7/16”
- 9/16”
- M3
- M4
- M5
- M6
- M8
- M10
- M12
- M14
- M16
- M18
- M20
- M22
- M24
- M30
- M36

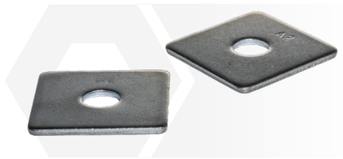
Finishes Available:

316 304 B Z G

Grade

304 Stainless
316 Stainless

Square Washers



∅ Diameter
- M8
- M10
- M12
- M16
- M20
- M24
- M30
- M36
- M48

Finishes Available:

316 304 G

Grade

304 Stainless
316 Stainless
Mild Steel

Washers

Structural Washers

∅ Diameter
M12
M16
M20
M24
M30
M36

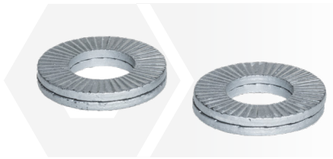
Finishes Available:

G

Grade

Class 8.8 - HSFG
K0HSFG - 8.8

Wedge Lock Washers



∅ Diameter	
1”	M3
1/2”	M4
1/4”	M5
3/4”	M6
3/8”	M8
	M10
	M12
	M14
	M16
	M18
	M20
	M24
	M27
	M30
	M36

Finishes Available:

316 Z

Grade

316 Stainless

New Products

NEW products and sizes are often being added to the Milsons range. Please visit our website **milsons.co.nz** for up to date information.

Key to Finishes

A480 Stainless Steel A480	B Black	YZ Yellow Zinc Plated	Bi Bimetal
316 Stainless Steel 316	Z Zinc Plated	S Self Colour	410 SUS 410
304 Stainless Steel 304	G Galvanized	Br Brass	

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Hardened Washers — Standard Tolerances

For circular washers, there are standard tolerances that its dimensions should adhere to. These tolerances are based on the ASTM standard F436, which outlines the specifications for washer dimensions. The tables below include these dimensions in both metric and imperial measurements.

As with most components, tolerances are needed to account for dimensional variations that may occur during manufacturing. It is important to account for them to ensure that components fit in the final product.

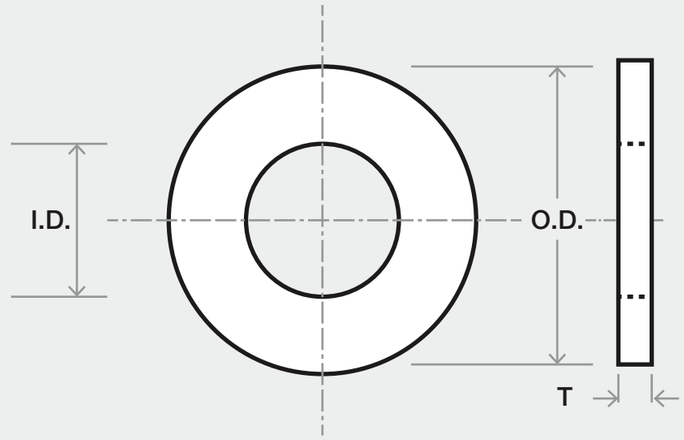
When it comes to washers, the internal diameter is important, as that is where the bolt or screw will go in. Hence, the tolerance on this would be stricter. With the external diameter, there can be a wider range in tolerance since it is not engaging with any other component. As washers are used under the head of a bolt or screw, their thickness would also be an important dimension.

The tolerances for the inner and outer diameters of the washers according to F436 is included in the table below.

Tolerances

Tolerance Dimensions in inches / mm	Nominal Sizes			
	Less than 1	1 to 1 ½	1 ½ to 3	Greater than 3
Inside Diameter, in	-0, +0.032	-0, +0.063	-0, +0.063	-0, +0.125
Inside Diameter, mm	-0, +0.813	-0, +1.600	0, +1.600	-0, +3.175
Outside Diameter, in	-/+ 0.032	-/+ 0.063	-/+ 0.063	-/+ 0.125
Outside diameter, mm	-/+ 0.813	-/+ 1.600	-/+ 1.600	-/+ 3.175

Measurement Guide



The data provided in this document is for general guidance only and should not be solely relied upon when working to stringent specifications. We recommend consulting with qualified experts regarding any technical queries. This information may change without written notice.

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milsons®

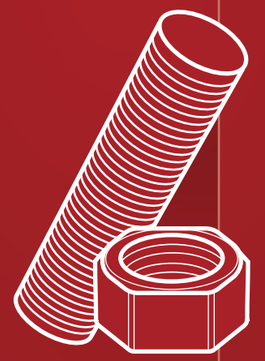
Stud Bar & Nuts

Stud bars are threaded rods that, unlike screws and bolts, have no protruding heads. Because of this, they need to be secured with a nut on each side. Milsons carry a range of stud & nuts which are made to ATSM A193/ASTM A194 standards. These are commonly used to connect flanges in the piping network.

Milsons offers the following parts in this category:

- B7 Nuts
- B7 Studs
- B8M Nuts
- B8M Studs
- L7 Nuts
- L7 Studs

Shop here:



Stud Bar and Nuts

Also available **assembled**

B7 Nuts

Finishes Available:

B G YZ

Grade	Thread Type
B7	UN8 UNC

∅ Diameter
1”
1 1/2”
1 1/4”
1 1/8”
1 3/4”
1 3/8”
1 5/8”
1 7/8”
1/2”
2”
2 1/2”
2 1/4”
3/4”
5/8”
7/8”

B7 Studs

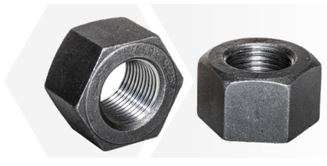
Finishes Available:

B

Grade	Thread Type
B7	UN8 UNC

∅ Diameter	↤↦ Length
1”	2000
1 1/2”	2000
1 1/4”	2000
1 1/8”	2000
1 3/4”	2000
1 3/8”	2000
1 5/8”	2000
1 7/8”	2000
1/2”	2000
2”	2000
2 1/2”	2000
2 1/4”	2000
3/4”	2000
5/8”	2000
7/8”	2000

B8M Nuts



Finishes Available:

316

Grade	Thread Type
B8M	UN8 UNC

∅ Diameter
1”
1 1/2”
1 1/4”
1 1/8”
1/2”
3/4”
5/8”
7/8”

B8M Studs

Finishes Available:

316

Grade	Thread Type
B8M	UN8 UNC

∅ Diameter	↤↦ Length
1”	2000
1 1/2”	2000
1 1/4”	2000
1 1/8”	2000
1/2”	2000
3/4”	2000
5/8”	2000
7/8”	2000

L7 Nuts

Finishes Available:

B YZ

Grade	Thread Type
B7	UN8 UNC

∅ Diameter
1”
1 1/2”
1 1/4”
1 1/8”
1/2”
3/4”
5/8”
7/8”

L7 Studs

Finishes Available:

B

Grade	Thread Type
B7	UN8 UNC

∅ Diameter	↤↦ Length
1”	2000
1 1/2”	2000
1 1/4”	2000
1 1/8”	2000
1/2”	2000
3/4”	2000
5/8”	2000
7/8”	2000

Cut-to-Size

Milsons offers a convenient **Cut-to-Size Service** ↤↦

SUS 316 Black Galvanized Yellow Zinc

Stud Bolt Technical Information
Grades of Alloy Steel for Stud Bolts & Nuts

Milsons offer a range of B7, B8M, and L7 studs in diameters ranging from 1/2” to 2-1/2”. These are widely used in the Petrochemical Industry to bolt flanges in high and low temperature environments. We offer a cut to measure service to allow maximum flexibility with your stud length – simply tell us the length you require, and we will make it happen. Furthermore, we also can get our stud bolt finished in Yellow Zinc, Micron 25 Yellow Zinc, Galv as required. Size Range: 1/2” – 2-1/2”

Finish Options:

- Plain
- Yellow Zinc (Gold Passivated)
- Micron 25 Yellow Zinc
- Galvanised

	Stud Bolts			Nuts		
Marking Symbol Grade	**B7**	**L7**	**B8M CLASS 2**	**2H**	**7**	**8M**
Temperature Range	**Min:** -30°C **Max:** 400°C	**Min:** -100°C **Max:** -30°C	**Min:** -250°C **Max:** 600°C	Min: -30°C Max: 400°C	Min: -100°C Max: 565°C	Min: -250°C Max: 600°C
Material Specification	ASTMA193/ A193M AISI 4140	ASTMA320/ A320M AISI 4140	ASTM- 193/A193M AISI Type 316	ASTMA194/ A194M Carbon Steel	ASTMA194/ A194M 4140	ASTMA194/ A194M AISI Type 316
Chemical Composition						
Carbon	0.37-0.49	0.38-0.48	0.08 **max**	0.40 min	0.37-0.49	0.08 max
Silicon	0.15-0.35	0.15-0.35	1.00 **max**	0.40 max	0.15-0.35	1.00 max
Manganese	0.65-1.10	0.75-1.00	2.00 **max**	1.00 max	0.65-1.10	2.00 max
Nickel			10.00-14.00			10.00-14.00
Chromium	0.75-1.20	0.80-1.10	16.00-18.00		0.75-1.20	16.00-18.00
Molybdenum	0.15-0.25	0.15-0.25	2.00-3.00		0.15-0.25	2.00-3.00
Vanadium						
Sulphur	0.040 **max**	0.040 **max**	0.030 **max**	0.050 max	0.040 max	0.030 max
Phosphorus	0.035 **max**	0.035 **max**	0.045 **max**	0.040 max	0.035 max	0.045 max
Mechanical Properties						
Limiting Ruling Section	2.1/2” and under	2.1/2” and under	–	1.1/2” and under	1.1/2” and under	1.1/2” and under
Minimum Tensile Strength	860Mpa	860Mpa	515Mpa			
Yield Strength Min. 0.2% Offset	720Mpa	725Mpa	205Mpav			
Minimum Elongation in 4D%	16	16	30			
Minimum Reduction of Area%	50	50	50			
Brinell Hardness			223HB or 96HRB	248-327HB	248-327HB	126-300HB
Brinell Hardness (after Treatment)				179HB min	201HB min	

The data provided in this document is for general guidance only and should not be solely relied upon when working to stringent specifications. We recommend consulting with qualified experts regarding any technical queries. This information may change without written notice.

Delivering New Zealand's
Leading Fastening Experience

milsons®

Engineering Supplies

In addition to fasteners, Milsons also stocks engineering supplies, which consist of tools to be used with fasteners.

These include hex wrenches and allen keys, (used to tighten or loosen bolts/socket screws), key steel (steel to make keys in gears and pulleys), and shaft collars (used to hold bearings and sprockets onto shafts).

- Grease Nipples
  - 45 Degree
  - 67 Degree
  - 90 Degree
  - Straight
- Hexagon Wrenches
  - Short Arm
  - Long Arm
  - Ball End
- Key Steel
- Shaft Collars

Shop here:

Grease Nipples

45 Degree

∅ Diameter
1/4”
1/8”
M6
M8
M10

Finishes Available:

304 Z

Grade	Thread Type
304 Stainless Steel	BSP Standard UNF

Grease Nipples

67 Degree

∅ Diameter
1/8”
M8

Finishes Available:

Z

Grade	Thread Type
Steel	BSP Standard

Grease Nipples

90 Degree

∅ Diameter
1/4”
1/8”
5/16”
M6
M8
M10

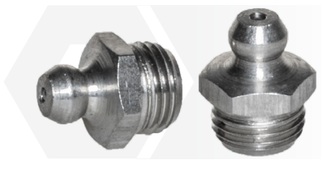
Finishes Available:

304 Z

Grade	Thread Type
304 Stainless Steel	BSP Standard UNF

Grease Nipples

Straight



∅ Diameter
1/4”
1/8”
5/16”
M6
M8
M10

Finishes Available:

304 Z

Grade	Thread Type
304 Stainless Steel	BSF BSP Standard UNF

Hexagon Wrenches

Short Arm

∅ Diameter
3/8”
3/16”
5/8”
7/8”
7/16”

M1.5
M2
M2.5
M3
M4
M5
M6
M8
M10
M12
M14
M17
M19
M22
M27

Finishes Available:

B Z

Grade
Class 10.9 Class 12.9

Hexagon Wrenches

Long Arm

∅ Diameter
1”
1/2”
1/4”
3/8”
3/16”
5/8”

M3
M5
M6
M8
M10
M12
M14
M17
M19
M22
M24
M27

Finishes Available:

B

Grade
Class 10.9 Class 12.9

Hexagon Wrenches

Ball End

∅ Diameter
M10

Finishes Available:

B

Grade	Thread Type
Class 10.9	Standard

Key Steel

∅ Diameter
1”
1 1/2”
1 1/4”
1 1/8”
1 3/8”
1/2”
1/4”
1/8”
3/4”
3/8”
3/16”
5/8”
5/16”
7/8”
7/16”
9/16”

M3
M4
M5
M6*
M7
M8*
M10*
M12*
M14*
M16
M18
M20*
M22
M24
M25
M28
M32
M36
M40

|↔| Length
all 300 mm
* 1000 mm

Finishes Available:

316 304 S

Grade
304 Stainless 316 Stainless

Shaft Collars

∅ Diameter
1/2”
1/4”
3/4”
3/8”
5/8”
7/8”
1”
1 1/2”
1 1/4”
1 1/8”
1 3/4”
1 3/8
2”
2 1/2”
2 1/4”
3”
3 1/2”

M8
M10
M12
M16
M20
M25
M30
M35
M40
M45
M50
M60
M75
M100

Finishes Available:

304 YZ S

Grade
304 Stainless

New Products

NEW products and sizes are often being added to the Milsons range. Please visit our website **milsons.co.nz** for up to date information.

Key to Finishes

A480	Stainless Steel A480	B	Black	YZ	Yellow Zinc Plated	Bi	Bimetal
316	Stainless Steel 316	Z	Zinc Plated	S	Self Colour	410	SUS 410
304	Stainless Steel 304	G	Galvanized	Br	Brass		

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Guide to Grease Nipples

What are grease nipples?

Grease nipples, also known as grease fittings or zerk fittings, are permanent fittings on mechanical systems that supply lubricant to components like bearings. They function as a valve, allowing grease to be fed into the system via a grease gun - opening under pressure and closing afterward.

A grease nipple is fitted to the bearing housing using either a threaded connection (which can be sourced from Milsons) or by utilising a straight push-fit method - where the grease nipple is hammered into place. Because grease nipples are permanent fittings, it is important to choose the correct one.

Factors to consider when choosing your grease fitting:

When selecting grease fittings, it is important to consider the following factors:

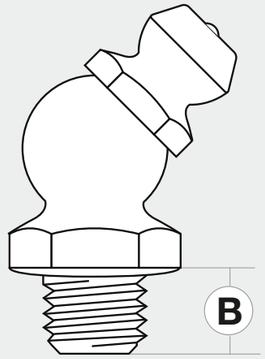
- Location of grease nipple: Ensure easy access for a grease gun and check for nearby moving parts.
- Environment: Consider temperature and moisture levels to determine the appropriate finishing on the grease nipple. Milsons offers a range of finishings, including zinc to improve corrosion resistance.

Dimensions to consider when choosing grease fitting:

When selecting a grease fitting, there are three key dimensions to consider:

- Thread length (labelled ‘B’ in the diagram above): This is the length of the male thread between the hexagonal base of the grease nipple and the bottom. This dimension is quite critical as it serves as the primary connection to the bearing and can be a potential point of failure. Milsons offers Metric, BSP and UNF/UNC thread types.
- Angle of grease fitting: This refers to the angle between the threaded part of the fitting and the nipple. Angled grease nipples are useful because they can give you greater accessibility and reach with a grease gun. Milsons offers four fitting angles: Straight, 90 degree or right angle, 45 degree and 67 degree.

With a straight fitting, the grease gun is applied from the top. A 90-degree fitting allows access from the side. Fittings with a 45-degree or 67-degree angle enable grease gun access at an angle, simplifying the greasing process.



Grease Nipple
45 Degree

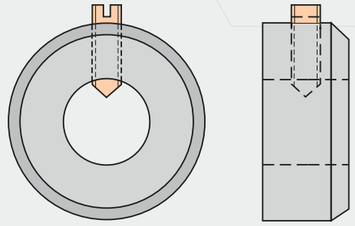
Grease Nipple
67 Degree

Grease Nipple
90 Degree

Grease Nipple
Straight

Guide to Shaft Collars

Shaft collars play an important role in power transmission applications and machinery. Like gear sprockets and bearings, they are designed to fit around a shaft and ensure that it runs smoothly. They are small metal or plastic discs that fit on to a shaft.



Applications and benefits

The main purpose of shaft collars is to ensure that crucial components like sprockets and bearings stay in place while the machinery is running. They will ensure that vibrations will be minimised and secure key components in things like gearbox assemblies and motors. This is extremely important because any deviation in spinning components like gears and pulleys can cause machine failure.

In summary, the roles of a shaft collar are to:

- Secure components in place
- Ensure enough space between key components
- Minimise vibrations on a spinning shaft

There are many different types of shaft collars with different working mechanisms. It is important to choose the correct ones for your application. Choosing incorrect shaft collars could damage the shaft or other important mechanical parts.

Failure of set screw shaft collars

One common cause of failure in set screw shaft collars is the material of the set screw being softer than that of the shaft. The shaft collar’s main connection to the shaft collar is through the set screw.

If the set screw material is softer or weaker than the shaft material, the connection would not be that strong since the screw would deform. As a result, set screw shaft collars are not suitable for hardened steel shafts (these usually have a hardness of Rockwell C 48-55). Ensure you check with the manufacturer that the set screw material is suitable for your application.

Another common cause for failure would be that the set screw material is not suitable for the environment it is operating in (i.e.. corrosion resistance). Set screws that are plated with zinc (you can find them on Milsons here) will have better corrosion resistance.

Set Screw Shaft Collars

One of the first types of shaft collars, set screw shaft collars secure the collar on to the shaft through a set screw at the top. When the screw is fully tightened, it will dig into the shaft and hold the collar in place on the shaft.

Set screw shaft collars are great because they offer a secure connection to the shaft with the set screw. They are good for light-weight applications with smaller rotational forces. However, since the set screw digs into the shaft, they are not appropriate for applications where you want the shaft’s to be unaffected. Hence, set screw shaft collars are best for applications that are permanent.

You can find the set screw shaft collars offered by Milsons here. For a secure connection, the material of the collar and set screw need to be stronger than the shaft material. Another important factor is the thread engagement between the shaft and set screw.

Choosing a shaft collar

Here are some factors to consider when choosing a shaft collar:

- Dimensions: Inner and outer diameter (ID & OD) and respective tolerances.
- Weight of shaft collar
- Material of the set screw and shaft: As stated above, the material of the shaft cannot be harder than that of the set screw. You can use the Rockwell hardness scale to determine this. Usually, set screw collars are not suitable for hardened shafts.
- Material of shaft collar (Milsons offers SUS304 that has good corrosion and heat resistance)
- Surface finish (Milsons offers yellow zinc that has superior corrosion resistance).

Pins

Pins are unthreaded fasteners inserted through pre-drilled holes to secure or fasten objects together. Pins come in different shapes and designs, each serving specific functions in various applications.

Milsons stocks three types of pins

Cotter Pins are bent metal pins with a split at one end. They are commonly used to secure bolts and other fasteners by passing the pin through a hole in the fastener and then spreading the ends to prevent it from coming out.

Dowel pins are cylindrical rods used to aligh and join two or more components precisely. They fit into corresponding holes in the parts, ensuring proper alignment during assembly.

Roll Pins are hollow, cylindrical pins that compress when inserted into a hole. They are often used to secure two parts together by fitting into a drilled hole and expanding to create a tight fit.

- Cotter Pins
- Dowel Pins
- Roll Pins

Shop here:

Pins

Cotter Pins

∅ Diameter	I↔I Length
M1.6	25
M2.0	20 - 50
M2.5	25 - 50
M2.8	50
M3.2	20 - 80
M3.6	50
M4	20 - 80
M5	25 - 80
M6.3	40 - 100
M8	50 - 100
M10	63 - 150
M13	100

Finishes Available:

304 Z

Grade

304 Stainless
Mild Steel

Dowel Pins

∅ Diameter	I↔I Length
1/2”	3/4” - 1 1/2”
1/4”	3/4” - 3 3/8”
1/8”	1/2” - 1”
3/4”	2 1/2” - 3”
3/8”	1”
3/16”	3/4”
M4	10 -30
M6	16 - 50
M8	20 - 90
M10	20 - 100
M12	25 - 80
M16	28 - 30
M20	60

Finishes Available:

B S

Roll Pins

∅ Diameter	I↔I Length
M2	25
M2.5	20 - 30
M3	8
M5	30 - 45
M6	20 - 60
M8	30 - 50
M10	40 - 80
M12	45 - 60

Finishes Available:

B

New Products

NEW products and sizes are often being added to the Milsons range. Please visit our website **milsons.co.nz** for up to date information.

Key to Finishes

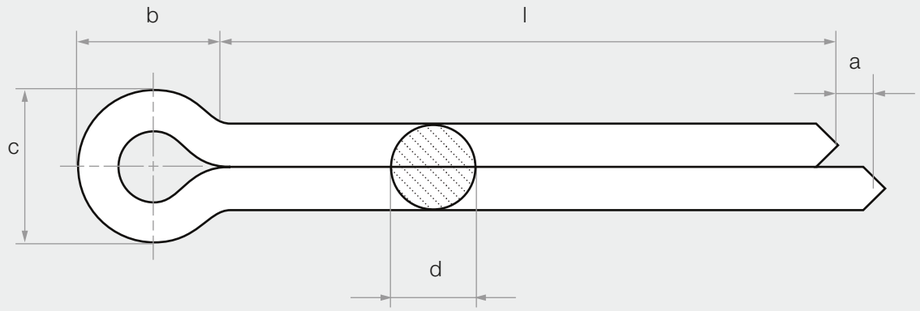
A480 Stainless Steel A480	B Black	YZ Yellow Zinc Plated	Bi Bimetal
316 Stainless Steel 316	Z Zinc Plated	S Self Colour	410 SUS 410
304 Stainless Steel 304	G Galvanized	Br Brass	

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

How To Measure a Cotter Pin

Also known as a Split Pin

This data sheet provides an illustrated description of the dimensions of a cotter pin. It contains information on the height and width of the eye, cotter pin length, offset and diameter.



The Cotter Pin has two main measurements, **the diameter,** and **the effective length.** The easiest way to obtain these measurements is by using a pair of Vernier Calipers.

Key:

c = Width of the eye
b = Height of the eye
d = Diameter
l = Effective length
a = Offset end

Diameter of Cotter Pin

The diameter of a Cotter Pin is measured from a point where both tines are flush together. Refer to ‘**d**’ in the diagram below.

Effective Length of Cotter Pin

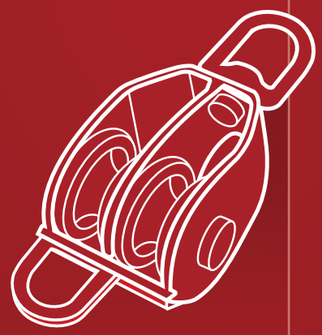
The effective length of a Cotter Pin is measured on the shortest tine. To obtain this measurement, measure from the tip of the shortest tine, to where it begins to taper up into the head. Refer to ‘**l**’ on the diagram above.

Stainless Hardware

Stainless Hardware components are designed with superior material properties to withstand coastal environments. These fasteners are made from 316 Stainless Steel. This grade of steel is commonly used in industrial applications, as they possess higher yield and tensile strengths.
Most fasteners in this category are used in marine applications.

- Bow Shackles
- Collared Eye Bolts
- D Rings
- D Shackles
  - Captive Pin
  - Long
  - Short
- Eye Bolts with Nuts / Washers
- Eye Nuts
- Mame Swivels
- S Hooks
- Screw Eyes
- Spring Hook with Eyelets
- Square Eye Plates
- Swage Eye Terminals
- Swage Terminals
- Swivels Eye & Eye
- Swivels Jaw & Jaw
- Turnbuckles
  - Eye & Eye
  - Hook & Eye
  - Jaw & Jaw
  - Jaw & Terminal
- U Bolt Nuts & Washers
- Wire Eye Straps
- Wire Rope Grips
- Wire Rope Thimbles

Shop here:



Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Bow Shackles

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M12

Collared Eye Bolts

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M6
M8
M10

Eye Bolts With Nut & Washer

Finishes Available:

316

Grade

316 Stainless

∅ Diameter	↔ Length
M6	40 - 100
M8	60 - 130
M10	80 - 150
M12	100 - 150

Eye Nuts

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M6
M8
M10
M12
M16

D Rings

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M5
M6

D Shackles

Captive Pin

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M5
M6
M8
M10
M12

Mame Swivels

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M25

S Hooks

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M6

D Shackles

Long

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M4
M5
M10

D Shackles

Short

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M4
M5
M6
M8
M10
M12
M16
M19

Screw Eyes

Finishes Available:

316

Grade

316 Stainless

∅ Diameter	↔ Length
M6	60
M8	60
M10	80

Spring Hooks With Eyelet

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M5
M6
M8
M10

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Square Eye Plates

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M5
M6
M8

Swage Eye Terminals

Finishes Available:

316

Grade

316 Stainless

∅ Diameter	↤↦ Length
M4	50

Turnbuckles

Hook & Eye

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M5
M6
M8
M10

Turnbuckles

Jaw & Jaw

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M8

Swage Terminals

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M6

Swivels Eye & Eye

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M8

Turnbuckles

Jaw & Terminal

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M6

U Bolt Nuts & Washers

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M8
M10

Swivels Jaw & Jaw

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M8

Turnbuckles

Eye & Eye

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M5
M6
M8
M10

Wire Eye Straps

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M5
M6

Wire Rope Grips

Finishes Available:

316

Grade

316 Stainless

∅ Diameter
M3
M4
M5
M6
M8

Stainless Hardware

Wire Rope Thimbles

Finishes Available:

316

Grade

316 Stainless

∅ Diameter

M8

M10

Round Rings

Finishes Available:

316

Grade

316 Stainless

∅ Diameter

M5

New Products

NEW products and sizes are often being added to the Milsons range. Please visit our website **milsons.co.nz** for up to date information.

Key to Finishes

A480	Stainless Steel A480	B	Black	YZ	Yellow Zinc Plated	Bi	Bimetal
316	Stainless Steel 316	Z	Zinc Plated	S	Self Colour	410	SUS 410
304	Stainless Steel 304	G	Galvanized	Br	Brass		

Note: not all Lengths, Grades, and Finishes are available in all Diameters, visit our website for more detail.

Types of Stainless Steel

Stainless Steel differs from Carbon Steel as it has the addition of Chromium, and must be at least 11% Chromium to be classified as Stainless Steel. This level of Chromium is the minimum amount required to form a passive film of chromium oxide, which in turn prevents the formation and spread of iron oxide (rust). However, Stainless Steel is not completely impervious to corrosion. It can oxidise and tarnish, but is highly corrosion resistant in comparison to Carbon Steel.

Milsons stock general fasteners in two main grades of Stainless Steel, 304 and 316. Both of these grades belong to the 300 series Austenitic family of stainless steel.

The exception to this is our Self Drilling Screws in Stainless Steel. We stock the 410 grade which is part of the Martensitic family of Stainless Steel. This is because, unlike 300 series, the 410 grade can be hardened, which is required for a stainless self drilling screw.

	304	316
Description	304 Stainless Steel, also referred to as A2 Stainless Steel, is a general purpose grade that is selected for applications that require greater corrosion resistance than provided by Carbon Steel, or Carbon Steel with Zinc or Galv plating. 304 is also safe for use in application that directly contact foodstuffs or produce. Therefore, it is commonly used for sinks, tabletops, stoves, refrigerators, pots, pans dairy equipment, brewing industry equipment, fruit industry, food processing plants, pipelines, and many more applications.	316 Stainless Steel, also referred to as A4 Stainless Steel, is similar to 304, but offers greater corrosion resistance. 316 achieves a higher level of corrosion resistance than 304 as it has the addition of Molybdenum as well as higher levels of Nickel. Because of its increased corrosion resistance, 316 covers most applications of 304 but is also suitable for use in marine and coastal environments.
Chemical Composition	18% chromium 8% nickel	16% chromium 10% nickel 2% molybdenum

Range of Items Milsons Stock in Stainless Steel

- Bolts
- Nuts
- Washers
- Threaded Rod
- Screws
- Marine Hardware
- Cotter Pins
- Key Steel
- Shaft Collars
- B8M Stud Bar

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Our History

+75 years with Milsons

1947

After E.N.Davis perfected castings in his garage, this was where it all started.

1953

E.N.Davis Ltd became an incorporated company manufacturing metal castings in Palmerston North NZ.

Late 50s

In the late 50's the next generation, Robbie Davis, started working in the foundry, gaining his apprenticeship in moulding.

Mid 70s

E.N. Davis Ltd. diversified through providing metals such as bronze and brass to support engineers, alongside the foundry products.

1976

E.N. Davis Ltd changed name to Milsons Foundry.

1981

Milson Metals was born.

milson metals
speed and reliability 100% guaranteed

1995

Milson Metals started to import its own key steel, grease nipples, and silver steel etc.

2012

Milsons Ltd, a stand-alone fastener wholesale business was established, catalyzing the move to the current 17,000 m² warehouse.

2014

Milsons expanded to offer construction and stainless steel fastener ranges.

2019

Milsons launched their online ordering platform.

CELEBRATING 1947 75TH 2022 ANNIVERSARY!

2023

Milsons expand to service new markets, offering new fastener ranges for Engineering and Construction customers.

milsons®

milsons.co.nz 0800 507 444

Delivering New Zealand's Leading Fastening Experience

milsons®

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