

# Introduction

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Alcoa Fastening Systems' (AFS) Recoil manufacturing operations are located in Australia, with sales and warehouse facilities strategically located in North America, Asia, and Europe. Extensive worldwide distribution, coupled with the company's manufacturing strategy, offers significant advantages to end users.

Alcoa Fastening Systems ensures a global consistency of quality design standards in manufacturing the full range of wire thread inserts in one production facility. Users around the world can be assured of high standards and the consistency of all AFS products.

Inserts are manufactured in standard sizes for all metric and inch thread forms. A comprehensive design facility is available to ensure that non-standard inserts can be manufactured for special part requirements.

Prompt availability of products to customers worldwide is ensured by an efficient international freight service and a network of stocking distributors. Alcoa Fastening Systems is committed to the highest quality products and operating systems and employs a strict quality management system in accordance with:

- AS9100 accreditation
- ISO9001 accreditation
- TS16949 accreditation
- Society of British Aerospace Companies (SBAC)
- TS157 approval
- ISO14001 Environmental Systems

Alcoa Fastening Systems will provide technical assistance to production engineers so that optimum installation efficiency can be achieved and maintained. Recoil brand coils are available to the following international and customer standards:

- NASM122076 Series - Free Running - UNC
- NASM124651 Series - Free Running - UNF
- NASM21209 Series – Locking UNC and UNF
- NASM8846
- BS7751 - Metric - Coarse
- BS7752 - Metric - Fine
- BS7753
- BS4377
- MA3279, MA3280, MA3281 - Metric - Free Running
- MA3329, MA3330, MA3331 - Metric - Self Locking
- AS6733 Series - UNF - Unplated
- AS8455 Series - UNF - Cadmium Plated
- AGS3600 Series - UNF - Cad. Plated - Self Locking
- AGS3700 Series - Nimonic Alloy 90 - Self Locking
- General Electric - C981, N926 Series, N913
- LN9499, LN9039
- DIN8140
- BACI12AE - Boeing

# Recoil Range

The Recoil system consists of precision inserts, quality high speed taps, and easy-to-use installation tools which are used for repairing damaged screw threads or creating strong new threads. Recoil helically wound screw-thread inserts are generally manufactured from Type 304 (18-8) stainless steel wire cold rolled into a diamond shaped cross section. Recoil inserts can be supplied in other materials such as Inconel X750, Inconel 625, Nimonic 90, Nitronic 60, Phosphor Bronze and Type 316 stainless steel.

Recoil inserts are available in either standard free running form or screw lock type which provides an internal locking feature. Inserts are manufactured for every thread form including UNC, UNF, BSC, BSW, BSP, BSF, BA, NPT and ISO Metric thread sizes. Inserts are available in 5 different standard lengths. 1D, 1.5D, 2D, 2.5D and 3D. Special lengths are available on request.

## Thread Repair Kits

A full range of Recoil thread repair kits, covering the majority of sizes commonly in use today, is available from AFS. Recoil kits contain an HSS tap, installation tools, tang break tools, drills, stainless steel inserts, and instructions, in a sturdy reusable container. Recoil problem-solving repair kits are available in single or multiple size format.

## Installation Tooling

Alcoa Fastening Systems also offers a selection of work arms and power tooling, including high efficiency pneumatic and electric installation tools for in-line production or repetitive maintenance situations. A range of associated tooling is available to facilitate insert installation, including manual installation tooling and manual, spring, and pneumatic operated tang breakoff tools.

## Taps and Gauges

Optimum results can be achieved with Recoil taps and gauges to suit hand-tapping through to volume production requirements. Using the "Go - NoGo" gauge, tapped holes can be gauged to enable a precision fit.



# How a Recoil Insert Works

Recoil inserts are formed from high quality stainless steel wire with a diamond shaped cross section, wound to the shape of a spring thread. Once the wire is wound into a helical coil and installed into a tapped hole, it provides a permanent and wear resistant thread in the parent material that is generally stronger than the original thread. The inserts are designed to be greater in diameter than the tapped hole and compress as they are installed. This allows maximum surface contact area with the tapped thread, safely and permanently anchoring the inserts into place. The insert's compensatory action shares the load over the entire bolt and hole, increasing pull out and torque out strength. With a Recoil insert in place, load and stress are more evenly distributed over the assembly.

## Where to Use Recoil Inserts

### Original Equipment Manufacture

AFS offers innovative manufacturers the opportunity to design high quality product using lighter weight materials such as aluminum and magnesium alloys while still achieving high strength and reliability in the threaded fastener assembly. Recoil brand inserts are widely used by manufacturers in:

- Automotive
- Consumer Electronics
- Ship Building
- Power Generation
- Manufacturing Equipment
- Industrial Electronics
- Aerospace – Avionics, Engines, Airframe
- Defense
- Transport

### Repair

When you encounter a damaged thread Recoil offers:

- Quickest and simplest method of repair to stripped or damaged threads
- A superior thread with great holding power
- Most cost-effective method of repair
- Returns thread to the original size
- Generally stronger than the original female thread

### Insert Material

Recoil inserts are generally manufactured from Type 304 stainless steel (18-8), however inserts are available in a range of materials for special applications:

- Stainless Steel Grade 304 (AS7245) Austenitic Corrosion Resistant Steel For normal applications up to 425°C (800°F)
- Stainless Steel Grade 316 (AISI316) Austenitic Corrosion Resistant Steel For Marine applications up to 425°C (800°F)
- Inconel X - 750 (AS7246) Nickel Alloy. For high temperature applications 425°C - 550°C (800°F - 1020°F) or where low permeability is required.
- Phosphor Bronze (DIN17677 or BS2783 PB 102) (300°C) For electrical bonding joints or low permeability
- Nimonic 90 (HR 503) for high temperature applications. (650°C/1200°F)
- Nitronic 60 (UNS S21800) Austenitic antigalling alloy

### Special purpose

- Materials such as Inconel 625 and Spring Steel Grade are also available to special order

### Type

There are two basic types of Recoil inserts available:

- Free running inserts which provide a standard female thread
- Locking inserts which provide a locking function for the female thread when the fasteners installed



# How a Recoil Insert Works

## Insert installation and retention

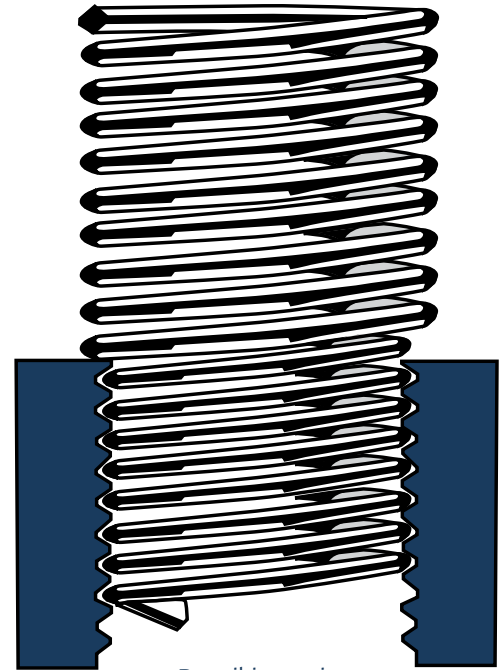
Uninstalled, Recoil inserts are greater in diameter than the tapped hole in the parent material into which they are to be installed. During the assembly operation the diameter of the leading coil is reduced thereby permitting entry of the insert into the tapped hole. When the insert is installed at the correct depth, the coils expand and permanently retains the insert in place. Unlike many 'solid' insert types, it is not necessary to use locking, swaging or keying operations to locate and retain Recoil inserts. Stress concentration problems which typically occur in the parent material when using solid inserts are therefore eliminated. A Recoil insert will dimensionally adjust both radially and axially, to any expansion or contraction within the parent material.

Typical thread and angle errors may cause:

- Limited contact point
- Poor flank contact between bolt to parent thread
- Unequal distribution of bolt load over engaged threads
- Failure of threaded components when loaded

Recoil inserts reduce thread pitch and angle errors to provide:

- Greater fastener strength
- Greater contact area
- Equally distributed load over all tapped threads
- Reduced stress concentration thereby extending fatigue life



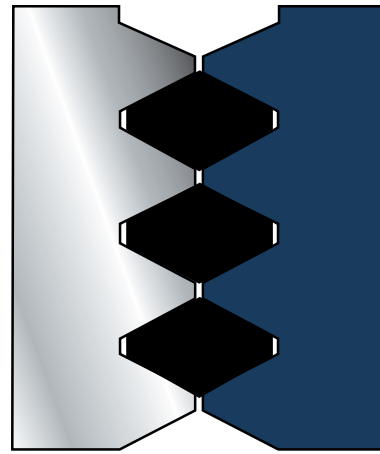
Recoil insert in semi-installed position



Angle error



Pitch error

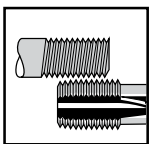


Recoil compensation effect

## How to install Recoil inserts.



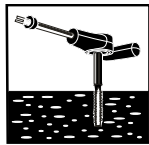
1. **DRILL:** Drill to clear out the damaged thread with drill size as specified on kit (if necessary).



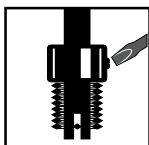
2. **CHECK:** Ensure tap thread matches bolt.



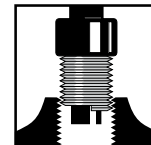
3. **TAP:** Place tap into tap wrench or use the square drive in the installation tool if provided. (Square drive tool only suitable for tapping non-ferrous alloys.)



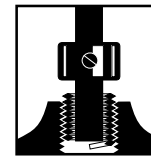
3a. **TAP HOLE:** Tap hole to the required depth using correct procedures (if unsure contact your dealer).



4. **SET TOOL:** Place insert on installation tool, positioning the adjustable top so that the insert tang is centered in the tang slot.



5. **INSTALL:** Wind insert in with light downward pressure until 1/4 to 1/2 turn below the surface.



6. **TANG REMOVAL:** Do not attempt to twist tang off with tool. Lift tool from tang, turn tool 90° and tap down sharply. Use Tang Break Tool where supplied. For sparkplug and large fine thread inserts, use long nose pliers to pull tang out.

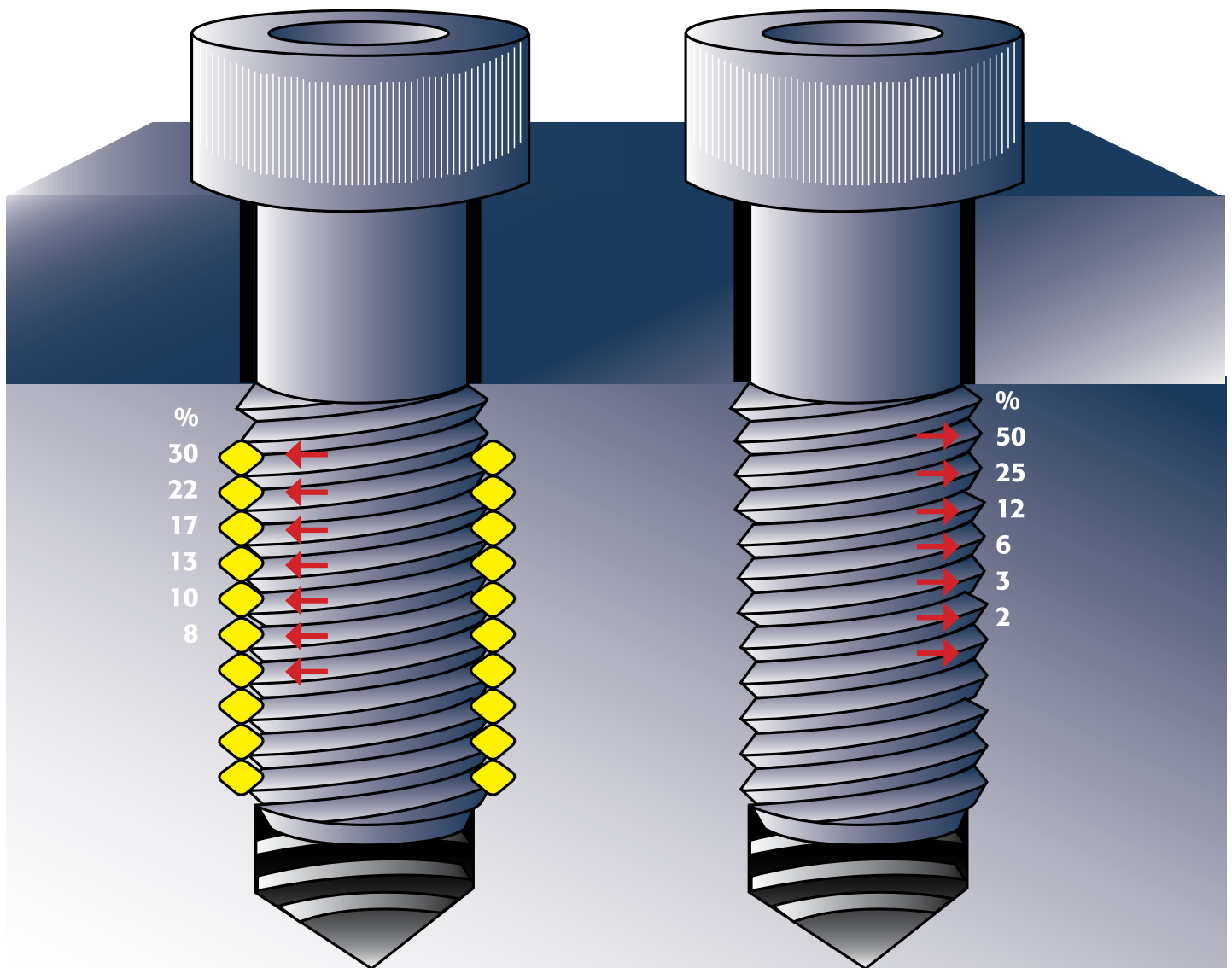
# How a Recoil Insert Works

The diagram below depicts graphically the advantages a Recoil insert has over a conventional thread. In conventional threaded joints over 75% of the load is placed on the first three threads of the assembly. The Recoil insert on the left shows how the spring-like design of the insert allows the shear loading to be transformed into a preferable "hoop stress" or radial loading over the entire length of the insert. This provides a much stronger thread than can be obtained by conventional drilling or tapping.

This improved strength allows designers to select a fastener based on the minimum strength of the bolt, also allowing them to select smaller diameters and shorter thread lengths confidently even in low strength materials such as magnesium or aluminium alloys. (Refer to page 62 - Design Considerations)

## Bolt with Recoil Insert

## Standard Bolt in Material



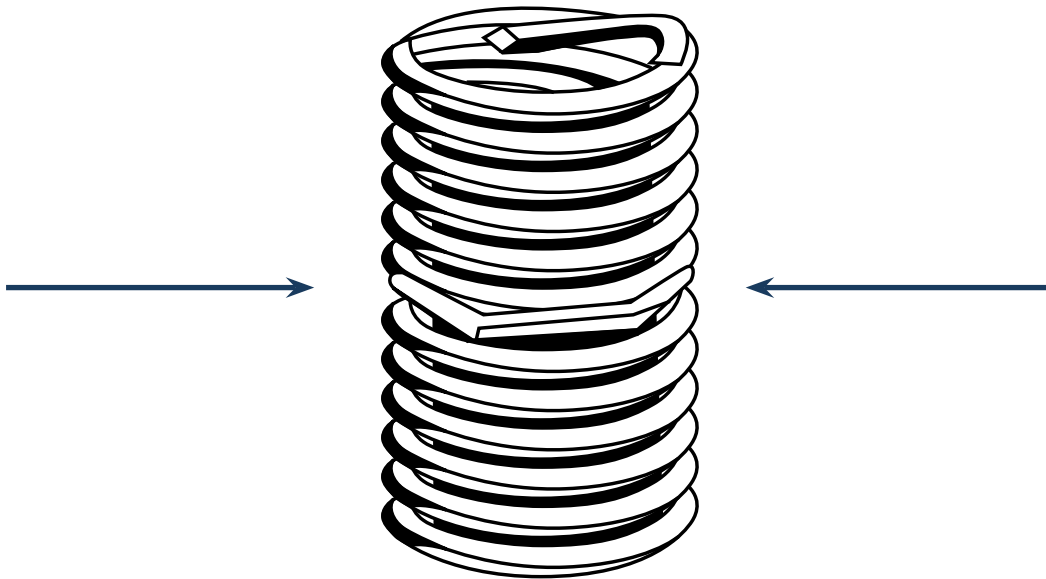
High strength  
stress spread more evenly

Lower strength  
stress concentrated on first threads

# How a Locking Insert Works

The Recoil screw-locking insert is designed to provide a screw-locking feature which will retain screws or bolts under the most severe vibration or varying temperature conditions. The insert locking configuration comprises a series of uniquely designed locking chords which, upon the engagement of a screw or bolt, deflect radially to permit the installation of the bolt. Upon bolt entry, these straight segments are flexed outwardly, creating pressure on the bolt. This pressure is applied between the flanks of the bolt thread so that contact area is maximized. Locking inserts retain locking torque over numerous assembly cycles. Refer to relevant specifications for insert life. Each Recoil screw-locking insert type has a specifically designed locking configuration. This ensures that the insert meets its design specification requirements. Therefore the shape, depth, and number of locking chords will inevitably vary for differing thread types and sizes.

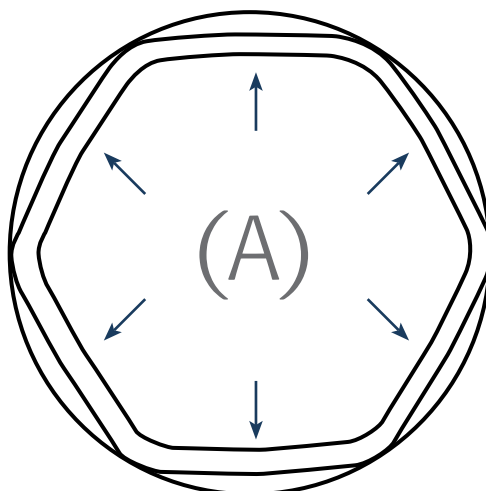
**Note: It is recommended that a cadmium plated or dry-film lubricated screw/bolt is used for screw-locking inserts applications. (See Lubricants and Coatings page)**



## Locking Insert Design

Should a specific locking torque or function be required, AFS engineers can develop parts to suit customers' needs. As the bolt is wound through the locking chords of the insert it deflects the wire as shown by the internal arrows (A). This deflection causes the insert to push against the bolt resulting in a repeatable locking function from the insert.

**Note: Installation of Recoil screw-locking inserts requires use of the Recoil Prewinder tooling.**



# Locking Insert Torque Values

Locking torque values for unified inserts conform to NASM8846. Locking torque values for metric Recoil inserts conform to MA3329, MA3330 and MA3331.

Unified Coarse (UNC)		
Nominal Thread Size	Max Locking Torque	Min Locking Torque
2 (.086") - 56	20 oz.in	3 oz.in
3 (.099") - 48	32 oz.in	7 oz.in
4 (112") - 40	48 oz.in	10 oz.in
5 (.125") - 40	75 oz.in	13 oz.in
6 (.138") - 32	6 lb.in	1.0 lb.in
8 (.164") - 32	9 lb.in	1.5 lb.in
10 (.190") - 24	13 lb.in	2.0 lb.in
12 (.216") - 24	24 lb.in	3.0 lb.in
1/4 (.250") - 20	30 lb.in	4.5 lb.in
5/16 (.3125") - 18	60 lb.in	7.5 lb.in
3/8 (.3750") - 18	80 lb.in	12.0 lb.in
7/16 (.4375") - 14	100 lb.in	16.5 lb.in
1/2 (.5000") - 13	150 lb.in	24.0 lb.in
9/16 (.5625") - 12	200 lb.in	30.0 lb.in
5/8 (.6250") - 11	300 lb.in	40.0 lb.in
3/4 (.7500") - 10	400 lb.in	60.0 lb.in
7/8 (.8750") - 9	600 lb.in	82.0 lb.in
1 (1.000") - 8	800 lb.in	110.0 lb.in
11/8 (1.1250") - 7	900 lb.in	137.0 lb.in
11/4 (1.250") - 7	1000 lb.in	165.0 lb.in
13/8 (1.3750") - 6	1150 lb.in	185.0 lb.in
11/2 (1.5000") - 6	1350 lb.in	210.0 lb.in

Metric Coarse Series		
Nominal Thread Size	Max Locking Torque	Min Locking Torque
M2.2 x 0.45	0.14 Nm	0.02 Nm
M2.5 x 0.45	0.23 Nm	0.05 Nm
M3 x 0.5	0.45 Nm	0.1 Nm
M3.5 x 0.6	0.68 Nm	0.12 Nm
M4 x 0.7	0.9 Nm	0.15 Nm
M5 x 0.8	1.6 Nm	0.3 Nm
M6 x 1	3 Nm	0.4 Nm
M7 x 1	4.5 Nm	0.6 Nm
M8 x 1.25	6 Nm	0.8 Nm
M10 x 1.5	10.5 Nm	1.4 Nm
M12 x 1.75	15.5 Nm	2.1 Nm
M14 x 2	23.5 Nm	3 Nm
M16 x 2	31.5 Nm	4.2 Nm
M18 x 2.5	42 Nm	5.5 Nm
M20 x 2.5	54 Nm	7 Nm
M22 x 2.5	67.5 Nm	9 Nm
M24 x 3	80 Nm	10.5 Nm
M27 x 3	94 Nm	12 Nm
M30 x 3.5	108 Nm	14 Nm
M33 x 3.5	122 Nm	15.5 Nm
M36 x 4	136 Nm	17.5 Nm
M39 x 4	150 Nm	19.5 Nm

Unified Fine (UNF)		
Nominal Thread Size	Max Locking Torque	Min Locking Torque
3 (.099) - 56	32 oz.in	7oz.in
4 (.112) - 48	48 oz.in	10 oz.in
6 (.138) - 40	6 lb.in	1.0 lb.in
8 (.164) - 36	9 lb.in	1.5 lb.in
10 (.190) - 32	13lb.in	2.0 lb.in
1/4 (.2500) - 28	30 lb.in	3.5 lb.in
5/16 (.3125) - 24	60 lb.in	6.5 lb.in
3/8 (.3750) - 24	80 lb.in	9.5 lb.in
7/16 (.4375) - 20	100 lb.in	14.0 lb.in
1/2 (.5000) - 20	150 lb.in	18.0 lb.in
9/16 (.5625) - 18	200 lb.in	24.0 lb.in
5/8 (.6250) - 18	300 lb.in	32.0 lb.in
3/4 (.7500) - 16	400 lb.in	50.0 lb.in
7/8 (.8750) - 14	600 lb.in	70.0 lb.in
1 (1.0000) - 12	800 lb.in	90.0 lb.in
11/8 (1.1250) - 12	900 lb.in	117.0 lb.in
11/4 (1.2500) - 12	1000 lb.in	143.0 lb.in
13/8 (1.3750) - 12	1150 lb.in	165.0 lb.in
11/2 (1.5000) - 12	1350 lb.in	190.0 lb.in

Metric Fine Series		
Nominal Thread Size	Max Locking Torque	Min Locking Torque
M8 x 1	6 Nm	0.8 Nm
M10 x 1	10.5 Nm	1.4 Nm
M10 x 1.25	10.5 Nm	1.4 Nm
M12 x 1.25	15.5 Nm	2.1 Nm
M12 x 1.5	15.5 Nm	2.1 Nm
M14 x 1.5	23.5 Nm	3 Nm
M16 x 1.5	31.5 Nm	4.2 Nm
M18 x 1.5	42 Nm	5.5 Nm
M20 x 1.5	54 Nm	7 Nm
M22 x 1.5	67.5 Nm	9 Nm
M18 x 2	42 Nm	5.5 Nm
M20 x 2	54 Nm	7 Nm
M22 x 2	67.5 Nm	9 Nm
M24 x 2	80 Nm	10.5 Nm
M27 x 2	94 Nm	12 Nm
M30 x 2	108 Nm	14 Nm
M33 x 2	122 Nm	15.5 Nm
M36 x 2	136 Nm	17.5 Nm
M39 x 2	150 Nm	19.5 Nm
M36 x 3	136 Nm	17.5 Nm
M39 x 3	150 Nm	19.5 Nm

Note: Unplated, heat-treated screws or stainless steel screws should not be used with screw-lock inserts. An antiseize compound (Molybdenum Disulphide, etc) should be applied to the screw to minimize galling and achieve maximum cycle life. Also available are inserts plated with cadmium per QQ-P-416, Type II, or dry film lubricant per MIL-L-46010 (no graphite) which improves wear life of the screw and insert. Note: It is imperative that the bolts fully engage all locking coils for correct torque and all insert coils for maximum strength.

# Lubricants and Coatings

It is important that correct selection of the most suitable fastening lubricant or coating is made at the design stage for long term security within the bolted joint. The ideal finish or coating for the insert is dependent upon the optimum coefficient of friction (governed by the bolt material and surface finish) and the required service conditions of the assembled parts, e.g. temperature, chemical influences, humidity, and dust. The coefficient of friction ( $\mu$ ) of most threaded components will generally vary between  $\mu = 0.15$  and  $\mu = 0.35$ . For example differences occur between bolts made of Grade 8.8 steel (Werkstoff 1.0503), compared with the same size of bolt produced from an austenitic stainless steel X5 CrNi 18-9, (Werkstoff 1.4301). Differences also occur between bolts having different surface coatings, such as electro-galvanizing, hot galvanizing, cadmium plating, or chromium plating.

## Typical Recoil wire thread insert finishes and coatings

PLATING / FINISH	PART NUMBER SUFFIX	APPLICABLE PROCESS SPECIFICATION
Silver Plating	AG	DTD 939
Cadmium Plating	C	QQP-416 or DEF STD 03-19
Dry Film Lubricant	D	AS5272
Red Dye	Not Applicable	Applied to all Recoil locking inserts for identification where called for by specification*
Tin Plating	SN	identification where called for by specification*
Copper	Cu	identification where called for by specification*

\* Recoil inserts may also be dyed in other colors such as Green and Blue for identification purposes.

MATERIAL TYPE	MAX. TEMPERATURE		TYPICAL APPLICATIONS (SEE SECTION ON LUBRICANTS)	COATINGS
	PEAK	CONTINUOUS		
Stainless 304	425°C (800°F)	315°C (600°F)	Most general applications in all materials	Non-finished Dry film lubricant Silver Cadmium
Stainless 316 (Y)	425°C (800°F)	315°C (600°F)	Improved corrosion resistance Salt water applications	Non-finished Dry film Lubricant Silver Cadmium
Nitronic 60 (T)	425°C (800°F)	315°C (600°F)	Anti-galling	Dry film lubricant
Phosphor Bronze (P)	300°C (572°F)	235°C (455°F)	Copper parts Non magnetic / Low permeability applications	Cadmium Silver
Inconel x 750 (X)	650°C (1200°F)	550°C (1020°F)	Aerospace / Turbines / Corrosive atmospheres / High temperature use	Silver Copper
Nimonic 90 (N)	650°C (1200°F)	550°C (1020°F)	Aerospace / Turbine applications	Silver

## Phosphor Bronze (P)

Designed for electrical applications, Recoil Phosphor Bronze inserts provide no outside interference of signals. This characteristic ensures their successful use in electrical bonding joints and related operations. These advanced inserts have been successfully employed in the manufacturing of a wide range of sensitive electrical equipment including circuit boards, telecommunications control boxes, and medical instrumentation and equipment.



## Inconel (X)

Inconel X-750 is an alloy material with excellent high heat resistance and strength characteristics. Used in demanding applications like gas turbines and auto lambda sensor repairs, these inserts can withstand temperatures of 1020°F and can be certified to GE Power Generation standards. Inconel X-625 material possesses very high corrosion resistance and is used in sub-sea platforms and other critical salt water and marine applications.



## 316 Stainless (Y)

Often used in highly corrosive applications, Recoil 316 Stainless Steel inserts provide a high degree of reliable corrosion resistance. In freshwater, saltwater, even chlorine environments, the inserts are designed to deliver years of failure-proof threadholding performance.



## Nitronic 60 Inserts (N)

Designed for applications where galling can be a problem, Recoil Nitronic 60 inserts' wear-resistant, anti-galling characteristics eliminate the need for additional lubrication. Based on the reduction in friction they provide, these inserts deliver more consistent clamping torque. In addition, Nitronic 60 inserts are suitable for use with stainless steel screws.





# Finishes and Coatings

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## Silver Plating (AG)

Primarily used to reduce the effects of galling (seizure) of screw threads in high temperature service applications. Silver plating is the most commonly used coating for aero-engine fasteners providing an even degree of lubrication up to a maximum service temperature of about 650°C (1200°F). The plated silver is electrolytically deposited in typical thicknesses up to 6.3µm (0.00025"). Silver plated wire thread inserts may be installed into various housing materials including magnesium alloys, aluminum alloys, corrosion and heat resistant materials, etc.

**Caution must be emphasized where inserts are to be installed into titanium alloy components which may exceed a service temperature of 300°C (570°F). Silver plated inserts are not recommended with titanium housings as stress corrosion, resulting from the combination of silver with titanium may occur in the housing material.**

## Cadmium Plating (C)

In mildly corrosive or marine environments, cadmium plating is the preferred treatment for providing protection against pitting of the insert/bolt materials and to minimize the risk of thread seizure. Plating thickness may vary depending on particular applications, between 2µm - 5µm (0.0001" - 0.0002"). Following cadmium plating, either a bronze or olive drab chromate finish will be used to provide uniformity in the overall finish. It should be noted that cadmium plated parts must not:

- Be subjected to temperatures exceeding 235°C (455°F)
- Come into contact with fuel or hot oil
- Come into contact with food or drinking water
- Be used with titanium components either directly or indirectly as, at elevated temperatures, embrittlement and subsequent component failure may occur

**Warning: Cadmium is a highly toxic compound. Because of its poisonous nature extreme care must be taken when handling.**

## Dry Film Lubricants (D)

Used for mildly corrosive or high temperature applications, dry film lubricants comprise suspensions of small particles of solid lubricants such as molybdenum disulphide (MoS<sub>2</sub>) or PTFE, in organic or inorganic binders. They are applied as a thin film (5µm - 20µm) to grease-free metal surfaces. Through careful selection of appropriate additives and solvents, specific lubricants may be formulated to suit most industrial applications to service temperatures around 315°C (600°F). Special high temperature lubricant coatings are available for use up to 425°C (800°F). Recoil inserts may be coated with dry film lubricant in either the non-finished (passivated) condition or after cadmium plating treatment for maximum corrosion protection.

## Tin Plating (SN)

As per ISO2093, used for moderate corrosive condition typically in automotive applications

## Red Dye Coating

Recoil screw-locking inserts are, generally color coded with a red dye coating for identification purposes only. This organic resin based dye does not affect the installation or function of the inserts and normally does not need to be removed. However, if in extreme conditions of cleanliness (such as precision instrument assembly in clean room conditions) removal of the dye may be desired. The red dye may be removed by soaking the inserts in a denatured alcohol solution prior to use. To prevent galling or seizing when using an unplated or corrosion resistant screw/bolt in a screw-locking insert, we recommend the use of an anti-seize compound on the bolt threads.

# Corrosion Protection

Under some service conditions, Recoil inserts and their mating parts may be subjected to a degree of corrosion, the severity of which is dependent upon the particular application. Factors such as differing material types, atmospheric conditions, chemical attack, and even frequency of use will have an appreciable effect on the longevity of the bolted joint.

The following are recommendations to minimize corrosion within the bolted Recoil insert assemblies. Normal Service: Natural atmospheric environment with the screw/bolt permanently installed into the insert not adjacent to salt water.

## Normal Service:

Natural atmospheric environment with the screw/bolt permanently installed into the insert not adjacent to salt water.

## Severe Service:

Mildly contaminated atmospheric environments involving moisture, occasional exposure to a chloride air or sea spray, and where the screw/bolt may be removed from the insert for extended periods of time.

## Extreme Severe Service:

Assembly is exposed to salt water, corrosive atmosphere, high temperature, or the screw/bolt is frequently removed from the assembly, allowing the ingress of water into a blind hole. In addition to methods 1, 2 and 3 below, further corrosion protection can be achieved by:

- Using blind holes wherever possible
- Using a sealing, insulating, or step-down type washer under the head of the bolt
- Using bolts that extend completely through the entire length of the insert
- In critical applications, the use of a non-hardening seal or compound over the joint and protecting bolt thread is recommended

Note - For extremely severe service conditions involving temperatures in excess of 425°C (800°F) or contact with acids, alkalis or sea water, stainless steel inserts are not recommended.

## Gas and Water Applications

Where gas or water threads are being manufactured or repaired it is important that an AFS sales office be consulted regarding the type of seal that will be provided in this situation. A wire insert may not provide a satisfactory thread seal.

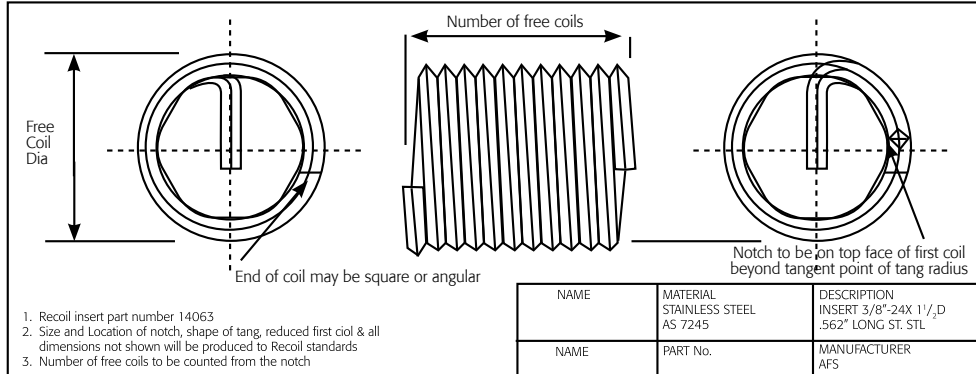
PARENT MATERIAL	SERVICE CONDITIONS		
	NORMAL	SEVERE	EXTREME SEVERE
Aluminum	None	Methods 2 or 3	Methods 1, 2 & 3
Magnesium	Methods 2 or 3	Methods 2 and 3	Methods 1, 2 & 3

METHOD 1	TYPICAL CORROSION RECOMMENDATIONS	
	METHOD 2	METHOD 3
Parent Material Protection Aluminum: For oxide coating use Alodine, Anodize, Iridite, or similar. Iridite 14 or 14-2 (MIL-C-554) is recommended for critical parts rather than anodizing (MIL-S-5002)	Coat the insert with one of the following: Cadmium per QQ-P-416, Type II 0.0001" thick; or Dry Film Lubricant per MIL-L-893 (must be free of graphite)	Separate the parent material from the insert by using liquid zinc chromate primer, Federal Specification TT-P-1757. Apply the primer to the hole sparingly and install while the primer is still wet.

# MS Insert Dimensional Data

## Drawing Call-Out

An example of a typical drawing specification for a Recoil insert is shown below:



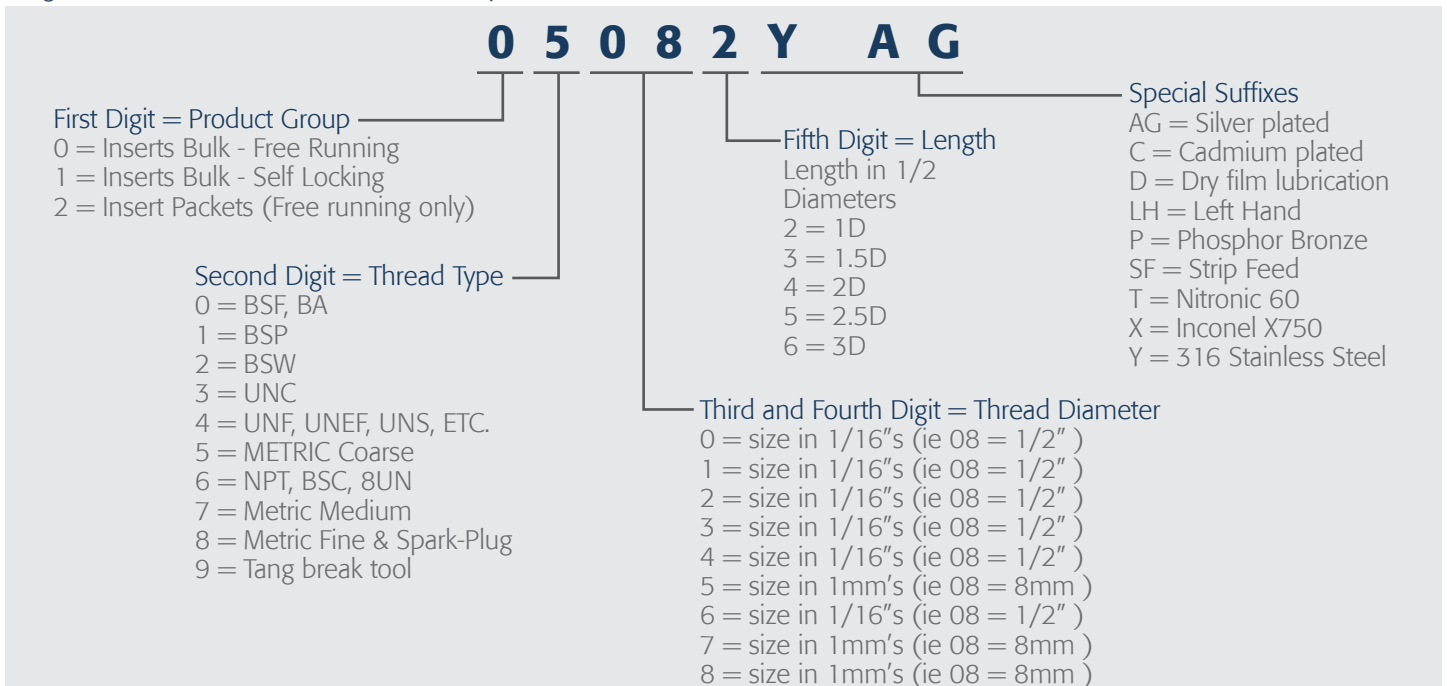
A typical drawing call-out for a Recoil screw-locking insert 3/8" - 24 x 1 1/2 dia. long Class 3B Unified Fine Thread (UNF) is shown. Drawing call-outs can be simply defined by using a production sequence process sheet to provide the operational steps with the drawing showing dimensional limits and data. (Example shown below)

- 1) Drill hole 25/64" (.3906") diameter, depth .812" plus your normal standard for drilling depth.
- 2) Countersink 120° +/-5° .42"/.45" diameter.
- 3) Tap with Recoil STI Tap No. 44065 (class 3B) full thread depth .600".
- 4) Gauge with Recoil Gauge No. 64063 or according to your inspection requirements.
- 5) Install Recoil screw-lock insert 14063 with Recoil Inserting Tool No. 54061.
- 6) Break off driving tang with Recoil Tang Break-off Tool No. 59280M.

## Recoil Thread Insert Part Numbering System

Recoil insert product part numbering system uses a logically structured 5 digit basic part number. Suffixes are typically added to differentiate between special or non-standard features. This guide defines the structure of Recoil part numbers and may be used for reference to identify a Recoil insert from its part number.

## Diagram of Recoil Insert Part Number Example



Example - O5082-YAG = M8 - 1.25 x1D 316SS, silver plated insert

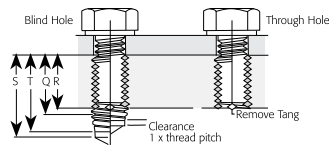
# Recoil Metric Insert Part Number Call-Out and Dimensional Data

Thread Nominal	Recoil Spec - Free Running Free				Recoil Spec - Screw Locking Free				MA Spec				BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"				
	Nominal Length	Part Number	Coil Dia Min./Max.	Number of Coils	Part Number	Coil Dia Min./Max.	Number of Coils	Free Running Part Number	Screw Locking Part Number	Insert Length inch	mm	Number of Coils	Free Coil Dia Min./Max.	Q	R	S	T
M2 x 0.4	1							05022		0.079	2.0			2.00	1.60	3.80	3.40
	1.5							05023		0.118	3.0	5.5	2.5	3.00	2.60	4.80	4.40
	2							05024	Upon Request	0.157	4.0	7.75	2.7	4.00	3.60	5.80	5.40
	2.5							05025		0.197	5.0	10.125		5.00	4.60	6.80	6.40
	3							05026		0.236	6.0	12.375		6.00	5.60	7.80	7.40
M2.2 x 0.45	1	05012			15012		3.0	05012MA	15012MA	0.087	2.2	3.125		2.20	1.75	4.23	3.98
	1.5	05013			15013	2.8	5.25	05013MA	15013MA	0.13	3.3	5.375	2.80	3.30	2.85	5.33	4.88
	2	05014			15014	2.95	7.55	05014MA	15014MA	0.173	4.4	7.625	3.00	4.40	3.95	6.43	5.98
	2.5	05015			15015		9.75	05015MA	15015MA	0.217	5.5	9.875		5.50	5.05	7.53	7.08
	3	05016			15016		12.0	05016MA	15016MA	0.26	6.6	12.125		6.60	6.15	8.63	8.18
M2.5 x 0.45	1	05252		3.40	15252		3.2	05252MA	15252MA	0.098	2.5	3.375		2.50	2.05	4.53	4.08
	1.5	05253	3.10	6.20	15253	3.25	5.6	05253MA	15253MA	0.15	3.8	5.750	3.20	3.75	3.30	5.78	5.33
	2	05254	3.20	8.95	15254	3.45	8.0	05254MA	15254MA	0.197	5.0	8.125	3.70	5.00	4.55	7.03	6.58
	2.5	05255		11.45	15255		10.35	05255MA	15255MA	0.248	6.3	10.500		6.25	5.80	8.28	7.83
	3	05256		14.05	15256		12.6	05256MA	15256MA	0.295	7.5	12.750		7.50	7.05	9.53	9.08
M3 x 0.5	1	05032			15032		3.6	05032MA	15032MA	0.118	3.0	3.750		3.00	2.50	5.25	4.75
	1.5	05033	3.65	6.95	15033	3.80	6.22	05033MA	15033MA	0.177	4.5	6.375	3.80	4.50	4.00	6.75	6.25
	2	05034	3.80	9.75	15034	3.95	8.73	05034MA	15034MA	0.236	6.0	8.875	4.35	6.00	5.50	8.25	7.75
	2.5	05035		12.55	15035		11.22	05035MA	15035MA	0.295	7.5	11.375		7.50	7.00	9.75	9.25
	3	05036		15.35	15036		13.72	05036MA	15036MA	0.354	9.0	13.875		9.00	8.50	11.25	10.75
M3.5 x 0.6	1	05352		4.00	15352		3.6	05352MA	15352MA	0.138	3.5	3.750		3.50	2.90	6.20	5.60
	1.5	05353	4.30	6.75	15353	4.40	6.23	05353MA	15353MA	0.209	5.3	6.375	4.40	5.25	4.65	7.95	7.35
	2	05354	4.46	9.45	15354	4.55	8.6	05354MA	15354MA	0.276	7.0	8.625	4.95	7.00	6.40	9.70	9.10
	2.5	05355		12.15	15355		11.23	05355MA	15355MA	0.346	8.8	11.375		8.75	8.15	11.45	10.85
	3	05356		14.85	15356		13.6	05356MA	15356MA	0.413	10.5	13.625		10.50	9.90	13.20	12.60
M4 x 0.7	1	05042		3.85	15042			05042MA	15042MA	0.157	4.0	3.625		4.00	3.30	7.15	6.45
	1.5	05043	4.90	6.55	15043			05043MA	15043MA	0.236	6.0	6.125	5.05	6.00	5.30	9.15	8.45
	2	05044	5.15	9.15	15044			05044MA	15044MA	0.315	8.0	8.625	5.60	8.00	7.30	11.15	10.45
	2.5	05045		11.85	15045			05045MA	15045MA	0.394	10.0	11.125		10.00	9.30	13.15	12.45
	3	05046		14.45	15046			05046MA	15046MA	0.472	12.0	13.625		12.00	11.30	15.15	14.45
M5 x 0.8	1	05052		4.45	15052			05052MA	15052MA	0.197	5.0	4.125		5.00	4.20	8.60	7.80
	1.5	05053	6.00	7.35	15053			05053MA	15053MA	0.295	7.5	6.875	6.25	7.50	6.70	11.10	10.30
	2	05054	6.20	10.25	15054			05054MA	15054MA	0.394	10.0	9.625	6.80	10.00	9.20	13.60	12.80
	2.5	05055		13.15	15055			05055MA	15055MA	0.492	12.5	12.375		12.50	11.70	16.10	15.30
	3	05056		16.05	15056			05056MA	15056MA	0.591	15.0	15.125		15.00	14.20	18.60	17.80
M6 x 1	1	05062		4.15	15062			05062MA	15062MA	0.236	6.0	4.000		6.00	5.00	10.50	9.50
	1.5	05063	7.25	6.95	15063			05063MA	15063MA	0.354	9.0	6.750	7.40	9.00	8.00	13.50	12.50
	2	05064	7.45	9.75	15064			05064MA	15064MA	0.472	12.0	9.500	7.95	12.00	11.00	16.50	15.50
	2.5	05065		12.55	15065			05065MA	15065MA	0.591	15.0	12.125		15.00	14.00	19.50	18.50
	3	05066		15.35	15066			05066MA	15066MA	0.709	18.0	14.875		18.00	17.00	22.50	21.50
M7 x 1	1	05072		5.15	15072			05072MA	15072MA	0.276	7.0	4.875	8.65	7.00	6.00	11.50	10.50
	1.5	05073	8.35	8.45	15073			05073MA	15073MA	0.413	10.5	8.000	9.20	10.50	9.50	15.00	14.00
	2	05074	8.65	11.70	15074			05074MA	15074MA	0.551	14.0	11.125		14.00	13.00	18.50	17.50
	2.5	05075		15.00	15075			05075MA	15075MA	0.689	17.5	14.125		17.50	16.50	22.00	21.00
	3	05076		18.30	15076			05076MA	15076MA	0.827	21.0	17.250		21.00	20.00	25.50	24.50

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

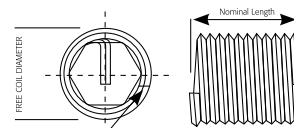
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.



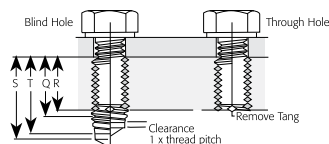
# Recoil Metric Insert Part Number Call-Out and Dimensional Data

Thread Nominal	Nominal Length	Recoil Spec - Free Running Free			Recoil Spec - Screw Locking Free			MA Spec		BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"								
		Part Number	Coil Dia Min./Max.	Number of Coils	Part Number	Coil Dia Min./Max.	Number of Coils	Free Running Part Number	Screw Locking Part Number	Insert Length inch	mm	Number of Coils	Free Coil Dia Min./Max.	Q	R	S	T	
M8 x 0.75	1	08082		8.60	18082				18082	0.315	8	7.85		8.00	7.25	11.38	10.63	
	1.5	08083	9.00	13.75	18083				18083	0.472	12	12.6		12.00	11.25	15.38	14.63	
	2	08084	9.18	18.75										16.00	15.25	19.38	18.63	
M8 x 1	1	07082		6.15	17082			07082MA	17082	0.315	8.0	5.875		8.00	7.00	12.50	11.50	
	1.5	07083	9.40	9.85	17083	AS PER "MA SPECIFICATION"		07083MA	17083	0.472	12.0	9.375	9.70	12.00	11.00	16.50	15.50	
	2	07084	9.65	13.65	17084			07084MA	17084	0.63	16.0	13.000	10.25	16.00	15.00	20.50	19.50	
	2.5	07085		17.45	17085			07085MA	17085	0.787	20.0	16.500		20.00	19.00	24.50	23.50	
	3	07086		21.15	17086			07086MA	17086	0.945	24.0	20.125		24.00	23.00	28.50	27.50	
M8 x 1.25	1	05082		4.55	15082	AS PER "MA SPECIFICATION"		05082MA	15082MA	0.394	10.0	4.500		8.00	6.75	13.63	12.38	
	1.5	05083	9.60	7.55	15083			05083MA	15083MA	0.472	12.0	7.375	9.80	12.00	10.75	17.63	16.38	
	2	05084	9.80	10.55	15084			05084MA	15084MA	0.63	16.0	10.250	10.35	16.00	14.75	21.63	20.38	
	2.5	05085		13.55	15085			05085MA	15085MA	0.787	20.0	13.250		20.00	18.75	25.63	24.38	
	3	05086		16.55	15086		05086MA	15086MA	0.945	24.0	16.125		24.00	22.75	29.63	28.38		
M9 x 1	1	07092		7.05		Upon Request				0.354	9.0			9.00	8.00	13.50	12.50	
	1.5	07093	10.41	11.35							0.531	13.5			13.50	12.50	18.00	17.00
	2	07094	10.65	15.65							0.709	18.0			18.00	17.00	22.50	21.50
	2.5	07095		19.85							0.886	22.5			22.50	21.50	27.00	26.00
	3	07096		24.15							1.063	27.0			27.00	26.00	31.50	30.50
M9 x 1.25	1	05092		5.35		Upon Request				0.354	9.0			9.00	7.75	14.63	13.38	
	1.5	05093	10.68	8.75							0.531	13.5			13.50	12.25	19.13	17.88
	2	05094	10.92	12.15							0.709	18.0			18.00	16.75	23.63	22.38
	2.5	05095		15.55							0.886	22.5			22.50	21.25	28.13	26.88
	3	05096		18.95							1.063	27.0			27.00	25.75	32.63	31.38
M10 x 1	1	08102		8.05			08102MA	18102MA	0.394	10.0	7.625		10.00	9.00	14.50	13.50		
	1.5	08103	11.34	12.75			08103MA	18103MA	0.591	15.0	12.00	11.95	15.00	14.00	19.50	18.50		
	2	08104	11.63	17.55			08104MA	18104MA	0.787	20.0	16.50	12.5	20.00	19.00	24.50	23.50		
	2.5	08105		22.25			08105MA	18105MA	0.984	25.0	21.00		25.00	24.00	29.50	28.50		
	3	08106		26.95			08106MA	18106MA	1.181	30.0	25.50		30.00	29.00	34.50	33.50		
M10 x 1.25	1	07102		6.05	17102		07102MA	17102MA	0.394	10.0	5.875		10.00	8.75	15.63	14.38		
	1.5	07103	11.80	9.85	17103		07103MA	17103MA	0.591	15.0	9.500	12.10	15.00	13.75	20.63	19.38		
	2	07104	12.10	13.55	17104		07104MA	17104MA	0.787	20.0	13.125	12.65	20.00	18.75	25.63	24.38		
	2.5	07105		17.35	17105		07105MA	17105MA	0.984	25.0	16.750		25.00	23.75	30.63	29.38		
	3	07106		21.15	17106		07106MA	17106MA	1.181	30.0	20.375		30.00	28.75	35.63	34.38		
M10 x 1.5	1				15102		05102	15102MA	0.394	10.0	4.875		10.00	8.50	16.75	15.25		
	1.5				15103		05103	15103MA	0.591	15.0	8.000	11.95	15.00	13.50	21.75	20.25		
	2				15104		05104	15104MA	0.787	20.0	11.125	12.50	20.00	18.50	26.75	25.25		
	2.5				15105		05105	15105MA	0.984	25.0	14.250		25.00	23.50	31.75	30.25		
	3				15106		05106	15106MA	1.181	30.0	17.375		30.00	28.50	36.75	35.25		
M11 x 1	1	08112		8.95					0.433	11.0			11.00	12.00	15.50	14.50		
	1.5	08113	12.40	14.15					0.866	22.0			16.50	15.50	21.00	20.00		
	2	08114	12.70	19.35					1.083	27.5			22.00	21.00	26.50	25.50		
	2.5	08115		24.55					1.299	33.0			27.50	26.50	32.00	31.00		
	3	08116		29.75					0.433	11.0			33.00	32.00	37.50	36.50		

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

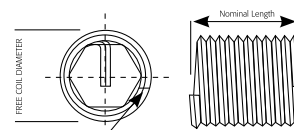
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.



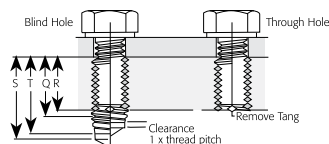
# Recoil Metric Insert Part Number Call-Out and Dimensional Data

Thread Nominal	Nominal Length	Recoil Spec - Free Running Free			Recoil Spec - Screw Locking Free			MA Spec		BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"						
		Part Number	Coil Dia Min./Max.	Number of Coils	Part Number	Coil Dia Min./Max.	Number of Coils	Free Running Part Number	Screw Locking Part Number	Insert Length inch	mm	Number of Coils	Free Coil Dia Min./Max.	Q	R	S
M11 x 1.25	1	07112		6.90									11.00	9.75	16.63	15.38
	1.5	07113	12.83	11.00					0.650	16.5			16.50	15.25	22.13	20.88
	2	07114	13.10	15.15	Upon Request				0.866	22.0			22.00	20.75	27.63	26.38
	2.5	07115		19.35					1.083	27.5			27.50	26.25	33.13	31.88
	3	07116		23.45					1.299	33.0			33.00	31.75	38.63	37.38
M11 x 1.5	1	05112		5.55					0.433	11.0			11.00	9.50	17.75	16.25
	1.5	05113	12.95	9.05					0.650	16.5			16.50	15.00	23.25	21.75
	2	05114	13.25	12.55	Upon Request				0.866	22.0			22.00	20.50	28.75	27.25
	2.5	05115		16.05					1.083	27.5			27.50	26.00	34.25	32.75
	3	05116		19.45					1.299	33.0			33.00	31.50	39.75	38.25
M12 x 1	1	08122-1.0		10.25					0.472	12.0			12.00	11.00	16.50	15.50
	1.5	08123-1.0	13.55	15.35					0.709	18.0			18.00	17.00	22.50	21.50
	2	08124-1.0	13.90	21.30	Upon Request				0.945	24.0			24.00	23.00	28.50	27.50
	2.5	08125-1.0							1.181	30.0			30.00	29.00	34.50	33.50
	3	08126-1.0							1.417	36.0			36.00	35.00	40.50	39.50
M12 x 1.25	1	08122		7.65	18122			18122MA	0.472	12.0	7.250		12.00	10.75	17.63	16.38
	1.5	08123	13.70	12.15	18123	AS PER "MA SPECIFICATION"		18123MA	0.709	18.0	11.625	14.30	18.00	16.75	23.63	22.38
	2	08124	14.05	16.65	18124		18124MA	0.945	24.0	15.875	15.00	24.00	22.75	29.63	27.38	
	2.5	08125		21.25	18125		18125MA	1.181	30.0	20.250		30.00	28.75	35.63	34.38	
	3	08126		25.75	18126		18126MA	1.417	36.0	24.500		36.00	34.75	41.63	40.38	
1	07122		5.85	17122				07122MA	0.472	12.0	6.000		12.00	10.50	18.75	17.25
M12 x 1.5	1.5	07123	14.00	9.50	17123	AS PER "MA SPECIFICATION"		07123MA	0.709	18.0	9.625	14.25	18.00	16.50	24.75	23.25
	2	07124	14.30	13.23	17124		07124MA	0.945	24.0	13.375	14.95	24.00	22.50	30.75	29.25	
	2.5	07125		16.85	17125		07125MA	1.181	30.0	17.000		30.00	28.50	36.75	32.25	
	3	07126		20.6	17126		07126MA	1.417	36.0	20.750		36.00	34.50	42.75	41.25	
M12 x 1.75	1				15122	AS PER "MA SPECIFICATION"		05122	0.472	12.0	5.000		12.00	10.25	19.88	18.13
	1.5				15123		05123	15123MA	0.709	18.0	8.250	14.30	18.00	16.25	25.88	24.13
	2				15124		05124	15124MA	0.945	24.0	11.500	15.00	24.00	22.25	31.88	30.13
	2.5				15125		05125	15125MA	1.181	30.0	14.625		30.00	28.25	37.88	36.13
	3				15126		05126	15126MA	1.417	36.0	17.875		36.00	34.25	43.88	42.13
M13 x 1.5	1	07132	15.20	6.65					0.512	13.0			13.00	11.50	19.75	18.25
	1.5	07133	15.53	10.75									19.50	18.00	26.25	24.75
	2	07134		14.95									26.00	24.50	32.75	31.25
M13 x 1.75	1	05132		5.50									13.00	11.25	20.88	19.13
	1.5	05133	15.35	9.05					0.768	19.5			19.50	17.75	27.38	25.63
	2	05134	15.75	12.60	Upon Request								26.00	24.25	33.88	32.13
	2.5	05135		16.1									32.50	30.75	40.38	38.63
	3	05136		19.65									39.00	37.25	46.88	45.13
M13 x 1.25	1	08132		8.35					0.512	13.0			13.00	11.75	18.63	17.38
	1.5	08133	14.70	13.25									19.50	18.25	25.13	23.88
	2	08134	15.05	18.25	Upon Request								26.00	24.75	31.63	30.38
	2.5	08135		23.15									32.50	31.25	38.13	36.88
	3	08136		28.15									39.00	37.75	44.63	43.38

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

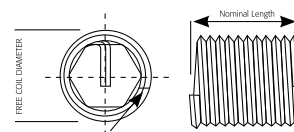
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.



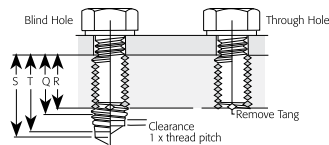
# Recoil Metric Insert Part Number Call-Out and Dimensional Data

Thread Nominal	Recoil Spec - Free Running Free					Recoil Spec - Screw Locking Free			MA Spec		BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"						
	Nominal Length	Part Number	Coil Dia Min./Max.	Number of Coils	Part Number	Coil Dia Min./Max.	Number of Coils	Free Running Part Number	Screw Locking Part Number	Insert Length inch	mm	Number of Coils	Free Coil Dia Min./Max.	SCREW "D"			
														Q	R	S	T
M14 x 1.5	1	07142		7.35	17142		6.98	07142MA	17142MA	0.551	14.0	7.125	14.00	12.50	20.75	19.25	
	1.5	07143	16.15	11.75	17143	17.30	11.23	07143MA	17143MA	0.827	21.0	11.375	16.55	21.00	19.50	27.75	26.25
	2	07144	16.55	16.25	17144	17.60	15.48	07144MA	17144MA	1.102	28.0	15.625	17.25	28.00	26.50	34.75	33.25
	2.5	07145		20.65	17145		19.85	07145MA	17145MA	1.378	35.0	20.000		35.00	33.50	41.75	40.25
	3	07146		25.05	17146		24.10	07146MA	17146MA	1.654	42.0	24.250		42.00	40.50	48.75	47.25
M14 x 2	1				15142			05142	15142MA	0.551	14.0	5.125	14.00	12.00	23.00	21.00	
	1.5				15143			05143	15143MA	0.827	21.0	8.500	16.65	21.00	19.00	30.00	28.00
	2				15144			05144	15144MA	1.102	28.0	11.750	17.35	28.00	26.00	37.00	35.00
	2.5				15145			05145	15145MA	1.378	35.0	15.000		35.00	33.00	44.00	42.00
	3				15146			05146	15146MA	1.654	42.0	18.375		42.00	40.00	51.00	49.00
M15 x 1.5	1	07152		7.95						0.591	15.0		15.00	13.50	21.75	20.25	
	1.5	07153	17.25	12.75						0.886	22.5		22.50	21.00	29.25	27.75	
	2	07154	17.65	17.45	Upon Request					1.181	30.0		30.00	28.50	36.75	35.25	
	2.5	07155		22.25					1.476	37.5			37.50	36.00	44.25	42.75	
	3	07156		26.95					1.772	45.0			45.00	43.50	51.75	50.25	
M15 x 2	1	05152		5.55						0.591	15.0		15.00	13.00	24.00	22.00	
	1.5	05153	17.70	9.15						0.886	22.5		22.50	20.50	31.50	29.50	
	2	05154	18.10	12.70	Upon Request					1.181	30.0		30.00	28.00	39.00	37.00	
	2.5	05155		16.30					1.476	37.5			37.50	35.50	46.50	44.50	
	3	05156		19.85					1.772	45.0			45.00	43.00	54.00	52.00	
M16 x 1.5	1	07162		8.65	17162		8.65	07162MA	17162MA	0.63	16.0	8.250	16.00	14.50	22.75	21.25	
	1.5	07163	18.20	13.75	17163	18.20	13.75	07163MA	17163MA	0.945	24.0	13.125	18.90	24.00	22.50	30.75	29.25
	2	07164	18.60	18.85	17164	18.60	18.85	07164MA	17164MA	1.26	32.0	18.000	19.60	32.00	30.50	38.75	37.25
	2.5	07165		23.85	17165		23.85	07165MA	17165MA	1.575	40.0	22.750		40.00	38.50	46.75	45.25
	3	07166		28.95	17166		28.95	07166MA	17166MA	1.89	48.0	27.625		48.00	46.50	54.75	53.25
M16 x 2	1	05162		6.10	15162			05162MA	15162MA	0.63	16.0	6.125	16.00	14.00	25.00	23.00	
	1.5	05163	18.35	9.60	15163			05163MA	15163MA	0.945	24.0	9.750	18.80	24.00	22.00	33.00	31.00
	2	05164	18.55	13.70	15164			05164MA	15164MA	1.26	32.0	13.500	19.60	32.00	30.00	41.00	39.00
	2.5	05165		17.50	15165			05165MA	15165MA	1.575	40.0	17.250		40.00	38.00	49.00	47.00
	3	05166		21.15	15166			05166MA	15166MA	1.89	48.0	21.000		48.00	46.00	57.00	55.00
M18 x 1.5	1	08182		9.85	18182			08182MA	18182MA	0.709	18.0	9.500	18.00	16.50	24.75	23.25	
	1.5	08183	20.35	15.45	18183			08183MA	18183MA	1.063	27.0	15.000	21.05	27.00	25.50	33.75	32.25
	2	08184	20.75	21.05	18184			08184MA	18184MA	1.417	36.0	20.375	21.75	36.00	34.50	42.75	41.25
	2.5	08185		26.75	18185			08185MA	18185MA	1.772	45.0	25.875		45.00	43.50	51.75	50.25
	3	08186		32.35	18186			08186MA	18186MA	2.126	54.0	31.375		54.00	52.50	60.75	59.25
M18 x 2	1	07182			17182				17182MA	0.709	18.0	7.000	18.00	16.00	27.00	25.00	
	1.5	07183			17183				17183MA	1.063	27.0	11.125	21.15	27.00	25.00	36.00	34.00
	2	07184			17184				17184MA	1.417	36.0	15.375	21.85	36.00	34.00	45.00	43.00
	2.5	07185			17185				17185MA	1.772	45.0	19.500		45.00	43.00	54.00	52.00
	3	07186			17186				17186MA	2.126	54.0	23.625		54.00	52.00	63.00	61.00
M18 x 2.5	1	05182			15182				15182MA	0.709	18.0	5.375	18.00	15.50	29.25	26.75	
	1.5	05183			15183				15183MA	1.063	27.0	8.875	21.30	27.00	24.50	38.25	35.75
	2	05184			15184			15184MA	1.417	36.0	12.250	22.00	36.00	33.50	47.25	44.75	
	2.5	05185			15185				15185MA	1.772	45.0	15.625		45.00	42.50	56.25	53.75
	3	05186			15186				15186MA	2.126	54.0	19.000		54.00	51.50	65.25	62.75

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

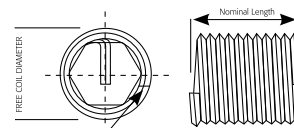
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.



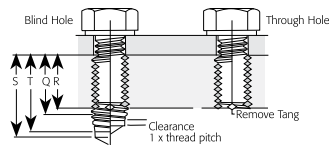
# Recoil Metric Insert Part Number Call-Out and Dimensional Data

Thread Nominal	Recoil Spec - Free Running Free				Recoil Spec - Screw Locking Free				MA Spec		BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"						
	Nominal Length	Part Number	Coil Dia Min./Max.	Number of Coils	Part Number	Coil Dia Min./Max.	Number of Coils	Free Running Part Number	Screw Locking Part Number	Insert Length inch	Number of Coils	Free Coil Dia Min./Max.	Q	R	S	T	
M20 x 1.5	1	08202		11.25	18202			08202MA	18202MA	0.787	20.0	10.750	20.00	18.50	26.75	25.25	
	1.5	08203	22.08	17.65	18203			08203MA	18203MA	1.181	30.0	16.875	23.15	30.00	36.75	35.25	
	2	08204	22.50	23.95	18204			08204MA	18204MA	1.575	40.0	22.875	24.00	40.00	46.75	45.25	
	2.5	08205		30.35	18205			08205MA	18205MA	1.969	50.0	28.875		50.00	56.75	55.25	
	3	08206		36.75	18206			08206MA	18206MA	2.362	60.0	35.000		60.00	66.75	65.25	
M20 x 2	1	07202		8.05	17202			07202MA	17202MA	0.787	20.0	7.875	20.00	18.00	29.00	27.00	
	1.5	07203	22.97	12.75	17203			07203MA	17203MA	1.181	30.0	12.500	23.20	30.00	28.00	39.00	37.00
	2	07204	23.40	17.45	17204			07204MA	17204MA	1.575	40.0	17.250	24.05	40.00	38.00	49.00	47.00
	2.5	07205		22.25	17205			07205MA	17205MA	1.969	50.0	21.875		50.00	48.00	59.00	57.00
	3	07206		26.95	17206			07206MA	17206MA	2.362	60.0	26.500		60.00	58.00	69.00	67.00
M20 x 2.5	1				15202			05202	15202MA	0.787	20.0	6.125	20.00	17.50	31.25	28.75	
	1.5				15203			05203	15203MA	1.181	30.0	9.875	23.55	30.00	27.50	41.25	38.75
	2				15204			05204	15204MA	1.575	40.0	13.625	24.40	40.00	37.50	51.25	48.75
	2.5				15205			05205	15205MA	1.969	50.0	17.375		50.00	47.50	61.25	58.75
	3				15206			05206	15206MA	2.362	60.0	21.125		60.00	57.50	71.25	68.75
M22 x 1.5	1	08222		12.55				08222MA	18222MA	0.866	22.0	11.875	22.00	20.50	28.75	27.25	
	1.5	08223	23.90	19.75				08223MA	18223MA	1.299	33.0	18.500	25.55	33.00	31.50	39.75	38.25
	2	08224	24.45	26.65				08224MA	18224MA	1.732	44.0	25.125	26.45	44.00	42.50	50.75	49.25
	2.5	08225		33.65				08225MA	18225MA	2.165	55.0	31.625		55.00	53.50	61.75	60.25
	3	08226		40.65				08226MA	18226MA	2.598	66.0	38.250		66.00	64.50	72.75	71.25
M22 x 2	1	07222		9.05	17222			07222MA	17222MA	0.787	20.0	8.750	22.00	20.00	31.00	29.00	
	1.5	07223	25.00	14.25	17223			07223MA	17223MA	1.181	30.0	13.750	25.60	33.00	31.00	42.00	40.00
	2	07224	25.40	19.45	17224			07224MA	17224MA	1.575	40.0	18.875	26.50	44.00	42.00	53.00	51.00
	2.5	07225		24.65	17225			07225MA	17225MA	1.969	50.0	23.875		55.00	53.00	64.00	62.00
	3	07226		30.15	17226			07226MA	17226MA	2.362	60.0	29.000		66.00	64.00	75.00	73.00
M22 x 2.5	1				15222			05222	15222MA	0.866	22.0	6.750	22.00	19.50	33.25	30.75	
	1.5				15223			05223	15223MA	1.299	33.0	10.875	25.90	33.00	30.50	44.25	41.75
	2				15224			05224	15224MA	1.732	44.0	14.875	26.90	44.00	41.50	55.25	52.75
	2.5				15225			05225	15225MA	2.165	55.0	19.000		55.00	52.50	66.25	63.75
	3				15226			05226	15226MA	2.598	66.0	23.125		66.00	63.50	77.25	74.75
M24 x 1.5	1	08242		13.85	18242					0.945	24.0		24.00	22.50	30.75	29.25	
	1.5	08243	26.10	21.55	18243	26.10	21.55			1.417	36.0		36.00	34.50	42.75	41.25	
	2	08244	26.60	29.15	18244	26.60	29.15			1.89	48.0		48.00	46.50	54.75	53.25	
	2.5	08245		36.85	18245		36.85			2.362	60.0		60.00	58.50	66.75	65.25	
	3	08246		44.45	18246		44.45			2.835	72.0		72.00	70.50	78.75	77.25	
M24 x 2	1	07242		9.95	17242			07242MA	17242MA	0.945	24.0	9.500	24.00	22.00	33.00	31.00	
	1.5	07243	27.00	15.65	17243			07243MA	17243MA	1.417	36.0	15.000	28.10	36.00	34.00	45.00	43.00
	2	07244	27.50	21.45	17244			07244MA	17244MA	1.89	48.0	20.375	29.10	48.00	46.00	57.00	55.00
	2.5	07245		27.15	17245			07245MA	17245MA	2.362	60.0	25.875		60.00	58.00	69.00	67.00
	3	07246		32.85	17246			07246MA	17246MA	2.835	72.0	31.250		72.00	70.00	81.00	79.00
M24 x 3	1				15242			05242	15242MA	0.945	24.0	6.125	24.00	21.00	37.50	34.50	
	1.5				15243			05243	15243MA	1.417	36.0	10.000	28.00	36.00	33.00	49.50	46.50
	2				15244			05244	15244MA	1.89	48.0	13.750	29.00	48.00	45.00	61.50	58.50
	2.5				15245			05245	15245MA	2.362	60.0	17.500		60.00	57.00	73.50	70.50
	3				15246			05246	15246MA	2.835	72.0	21.375		72.00	69.00	85.50	82.50

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

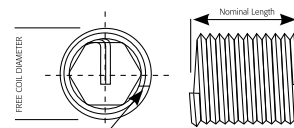
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.





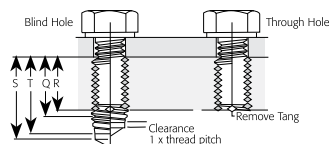
# Recoil Metric Insert Part Number Call-Out and Dimensional Data

Thread Nominal	Nominal Length	Recoil Spec - Free Running Free			Recoil Spec - Screw Locking Free			MA Spec		BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"						
		Part Number	Coil Dia Min./Max.	Number of Coils	Part Number	Coil Dia Min./Max.	Number of Coils	Free Running Part Number	Screw Locking Part Number	Insert Length inch	mm	Number of Coils	Free Coil Dia Min./Max.	Q	R	S
M26 x 1.5	1	08262		15.15					1.024	26.0			26.50	24.50	32.75	31.25
	1.5	08263	28.10	23.45					1.535	39.0			39.00	37.50	45.75	44.25
	2	08264	28.60	31.75	Upon Request				2.047	52.0			52.00	50.50	58.75	57.25
	2.5	08265		40.05					2.559	65.0			65.00	63.50	71.75	70.25
	3	08266		48.35					3.071	78.0			78.00	76.50	84.75	83.25
M27 x 1.5	1	08272		15.85					1.063	27.0						
	1.5	08273	29.10	24.45					1.594	40.5						
	2	08274	29.6	33.15	Upon Request				2.126	54.0						
	2.5	08275		41.8					2.657	67.5						
	3	08276		50.45					3.189	81.0						
M27 x 2	1	07272		11.08	17272		07272MA	17272MA	1.063	27.0	10.875		27.00	25.00	36.00	34.00
	1.5	07273	30.40	17.40	17273	AS PER "MA SPECIFICATION"	07273MA	17273MA	1.594	40.5	17.000	31.30	40.50	38.50	49.50	47.50
	2	07274	30.85	23.87	17274		07274MA	17274MA	2.126	54.0	23.250	32.30	54.00	52.00	63.00	61.00
	2.5	07275		30.2	17275		07275MA	17275MA	2.657	67.5	29.375		67.50	65.50	76.50	74.50
	3	07276		36.52	17276		07276MA	17276MA	3.189	81.0	35.500		81.00	79.00	90.00	88.00
1	07272		11.08	17272	07272MA		17272MA	1.063	27.0	7.000		27.00	24.00	40.50	37.50	
M27 x 3	1.5	15273		17.40	15273	AS PER "MA SPECIFICATION"	05273	15273MA	1.594	40.5	11.250	31.40	40.50	37.50	54.00	51.00
	2	15274		23.87	15274		05274	15274MA	2.126	54.0	15.500	32.40	54.00	51.00	67.50	64.50
	2.5	15275		30.2	15275		05275	15275MA	2.657	67.5	19.750		67.50	64.50	81.00	78.00
	3	15276		36.52	15276		05276	15276MA	3.189	81.0	24.000		81.00	78.00	94.50	91.50
	1	08302		17.45						1.181	30.0					
M30 x 1.5	1.5	08303	32.50	26.95					1.772	45.0						
	2	08304	32.80	36.55	Upon Request				2.362	60.0						
	2.5	08305		46.05					2.953	75.0						
	3	08306		55.55					3.543	90.0						
	1	07302		12.48	17302		07302MA	17302MA	1.181	30.0	12.250		30.00	28.00	39.00	37.00
M30 x 2	1.5	07303	33.55	19.58	17303	AS PER "MA SPECIFICATION"	07303MA	17303MA	1.772	45.0	19.125	34.50	45.00	43.00	54.00	52.00
	2	07304	34.00	26.54	17304		07304MA	17304MA	2.362	60.0	25.875	35.70	60.00	58.00	69.00	67.00
	2.5	07305		33.62	17305		07305MA	17305MA	2.953	75.0	32.750		75.00	73.00	84.00	82.00
	3	07306		40.58	17306		07306MA	17306MA	3.543	90.0	39.500		90.00	88.00	99.00	97.00
	1	05302-3			15302-3				15302-3MA	1.181	30.0	7.875		30.00	27.00	43.50
M30 x 3	1.5	05303-3	AS PER "MA SPECIFICATION"		15303-3	AS PER "MA SPECIFICATION"		15303-3MA	1.772	45.0	12.500	34.90	45.00	42.00	58.50	55.50
	2	05304-3		15304-3	15304-3MA		2.362	60.0	17.125	36.10	60.00	57.00	73.50	70.50		
	2.5	05305-3		15305-3	15305-3MA		2.953	75.0	21.875		75.00	72.00	88.50	85.50		
	3	05306-3		15306-3	15306-3MA		3.543	90.0	26.500		90.00	87.00	103.50	100.50		
	1	05302			6.65		15302				1.181	30.0			30.00	26.50
M30 x 3.5	1.5	05303	34.85	10.75	15303				1.772	45.0			45.00	41.50	60.75	57.25
	2	05304	35.35	14.89	15304				2.362	60.0			60.00	56.50	75.75	72.25
	2.5	05305		18.95	15305				2.953	75.0			75.00	71.50	90.75	87.25
	3	05306		23.13	15306				3.543	90.0			90.00	86.50	105.75	102.25
	1	07332		13.93	17332			17332MA	1.299	33.0	13.625		33.00	31.00	42.00	40.00
M33 x 2	1.5	07333	36.70	21.67	17333	AS PER "MA SPECIFICATION"	Upon Request	17333MA	1.949	49.5	21.125	37.80	49.50	47.50	58.50	56.50
	2	07334	37.15	39.42	17334		17334MA	2.598	66.0	28.625	39.20	66.00	64.00	75.00	73.00	
	2.5	07335		37.03	17335		17335MA	3.248	82.5	36.000		82.50	80.50	91.50	89.50	
	3	07336		44.78	17336		17336MA	3.898	99.0	43.500		99.00	97.00	108.00	106.00	

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

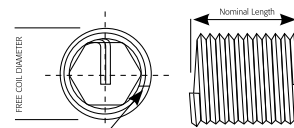
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.



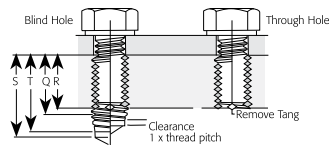
# Recoil Metric Insert Part Number Call-Out and Dimensional Data

Thread Nominal	Nominal Length	Recoil Spec - Free Running Free			Recoil Spec - Screw Locking Free			MA Spec		BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"							
		Part Number	Coil Dia Min./Max.	Number of Coils	Part Number	Coil Dia Min./Max.	Number of Coils	Free Running Part Number	Screw Locking Part Number	Insert Length inch	mm	Number of Coils	Free Coil Dia Min./Max.	Q	R	S	T
M33 x 3	1	07332-3		9.05	17332-3MA					1.299	33.00	8.750	33.00	30.00	46.50	43.50	
	1.5	07333-3	37.65	14.25	17333-3MA					1.949	49.50	13.875	38.10	49.50	46.50	63.00	60.00
	2	07334-3	38.00		17334-3MA					2.598	66.00	19.000	39.50	66.00	63.00	79.50	76.50
	2.5	07335-3			17335-3MA					3.248	82.50	24.125		82.50	79.50	96.00	93.00
	3	07336-3			17336-3MA					3.898	99.00	29.250		99.00	96.00	112.50	109.50
M33 x 3.5	1	05332		7.55	15332					1.299	33.0		33.00	29.50	48.75	45.25	
	1.5	05333	38.20	11.95	15333					1.949	49.5		49.50	46.00	65.25	61.75	
	2	05334	38.55	16.40	15334					2.598	66.0		66.00	62.50	81.75	78.25	
	2.5	05335		21.15	15335					3.248	82.5		82.50	79.00	98.25	94.75	
	3	05336		25.30	15336					3.898	99.0		99.00	95.50	114.75	111.25	
M36 x 1.5	1	08362		22.15	18362					1.417	36.0		36.00	34.50	42.75	41.25	
	1.5	08363	38.45	33.95	18363					2.126	54.0		54.00	52.50	60.75	59.25	
	2	08364	38.95	45.75	18364					2.835	72.0		72.00	70.50	78.75	77.25	
	2.5	08365		57.65	18365					3.543	90.0		90.00	88.50	96.75	95.25	
	3	08366		69.45	18366					4.252	108.0		108.00	106.50	114.75	113.25	
M36 x 2	1	07362-2		16.15	17362-2					1.417	36.0	15.000	36.00	34.00	45.00	43.00	
	1.5	07363-2	39.52	25.05	17363-2	AS PER "MA SPECIFICATION"				2.126	54.0	23.250	41.00	54.00	52.00	63.00	61.00
	2	07364-2	40.05	33.75	17364-2	AS PER "MA SPECIFICATION"				2.835	72.0	31.375	42.40	72.00	70.00	81.00	79.00
	2.5	07365-2		42.65	17365-2	AS PER "MA SPECIFICATION"				3.543	90.0	39.500		90.00	88.00	99.00	97.00
	3	07366-2		51.45	17366-2	AS PER "MA SPECIFICATION"				4.252	108.0	47.750		108.00	106.00	117.00	115.00
M36 x 3	1							07362		1.417	36.0	9.750	36.00	33.00	49.50	46.50	
	1.5							07363		2.126	54.0	15.250	41.30	54.00	51.00	67.50	64.50
	2				Upon Request			07364		2.835	72.0	20.875	42.70	72.00	69.00	85.50	82.50
	2.5							07365		3.543	90.0	26.500		90.00	87.00	103.50	100.50
	3							07366		4.252	108.0	32.000		108.00	105.00	121.50	118.50
M36 x 4.0	1	05362		7.00	15362					1.417	36.0		36.00	32.00	54.00	50.00	
	1.5	05363	41.90	11.35	15363					2.126	54.0		54.00	50.00	72.00	68.00	
	2	05364	42.40	15.75	15364					2.835	72.0		72.00	68.00	90.00	86.00	
	2.5	05365		20.05	15365					3.543	90.0		90.00	86.00	108.00	104.00	
	3	05366		24.35	15366					4.252	108.0		108.00	104.00	126.00	122.00	
M39 x 2	1	08392		16.95	18392				08392MA	1.535	39.0	16.375	39.00	37.00	48.00	46.00	
	1.5	08393	42.40	26.25	18393	AS PER "MA SPECIFICATION"			08393MA	2.303	58.5	25.250	44.30	58.50	56.50	67.50	65.50
	2	08394	43.05	35.55	18394	AS PER "MA SPECIFICATION"			08394MA	3.071	78.0	34.125	45.70	78.00	76.00	87.00	85.00
	2.5	08395		44.85	18395	AS PER "MA SPECIFICATION"			08395MA	3.839	97.5	43.000		97.50	95.50	106.50	104.50
	3	08396		54.15	18396	AS PER "MA SPECIFICATION"			08396MA	4.606	117.0	51.87		117.00	115.00	126.00	124.00
M39 x 3	1	07392		10.95	17392					1.535	39.0	10.750	39.00	36.00	52.50	49.50	
	1.5	07393	43.87	17.15	17393	AS PER "MA SPECIFICATION"				2.303	58.5	16.750	44.40	58.50	55.50	72.00	69.00
	2	07394	44.30	23.35	17394	AS PER "MA SPECIFICATION"		Upon Request		3.071	78.0	22.750	45.80	78.00	75.00	91.50	88.50
	2.5	07395		29.55	17395	AS PER "MA SPECIFICATION"				3.839	97.5	28.875		97.50	94.50	111.00	108.00
	3	07396		35.75	17396	AS PER "MA SPECIFICATION"				4.606	117.0	34.875		117.00	114.00	130.50	127.50
M39 x 4	1	05392		7.80	15392					1.535	39.0		39.00	35.00	57.00	53.00	
	1.5	05393	45.05	12.50	15393					2.303	58.5		58.50	54.50	76.50	72.50	
	2	05394	45.55	17.15	15394					3.071	78.0		78.00	74.00	96.00	92.00	
	2.5	05395		21.85	15395					3.839	97.5		97.50	93.50	115.50	111.50	
	3	05396		23.55	15396					4.606	117.0		117.00	113.00	135.00	131.00	

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

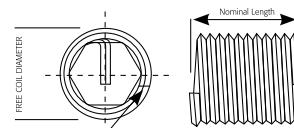
Fitted Insert:

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.



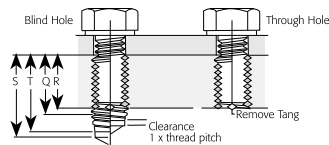
# Recoil Metric Insert Part Number Call-Out and Dimensional Data

Thread Nominal	Nominal Length	Recoil Spec - Free Running Free			Recoil Spec - Screw Locking Free			MA Spec		BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"						
		Part Number	Coil Dia Min./Max.	Number of Coils	Part Number	Coil Dia Min./Max.	Number of Coils	Free Running Part Number	Screw Locking Part Number	Insert Length inch	mm	Number of Coils	Free Coil Dia Min./Max.	Q	R	S
M42 x 2	1	08422		19.15					1.654	42.0			42.00	40.00	51.00	49.00
	1.5	08423	44.70	29.45					2.480	63.0			63.00	61.00	72.00	70.00
	2	08424	45.50	39.85	Upon Request				3.307	84.0			84.00	82.00	93.00	91.00
	2.5	08425		50.15									105.00	103.00	114.00	112.00
	3	08426		60.45									126.00	124.00	135.00	133.00
M42 x 3	1	07422		11.75					1.654	42.0			42.00	39.00	55.50	52.50
	1.5	07423	47.20	18.45					2.480	63.0			63.00	60.00	76.50	73.50
	2	07424	47.85	26.05	Upon Request				3.307	84.0			84.00	81.00	97.50	94.50
	2.5	07425		31.75									105.00	102.00	118.50	115.50
	3	07426		38.45									126.00	123.00	139.50	136.50
M42 x 4.5	1	05422		7.35					1.654	42.0			42.00	37.50	62.25	57.75
	1.5	05423	48.5	11.85					2.480	63.0			63.00	58.50	83.25	78.75
	2	05424	49.00	16.35	Upon Request				3.307	84.0			84.00	79.50	104.25	99.75
	2.5	05425		20.85									105.00	100.50	125.50	120.75
	3	05426		25.35									126.00	121.50	146.25	141.75
M42 x 4	1	05422-4		8.50					1.654	42.0			42.00	38.00	60.00	56.00
	1.5	05423-4	48.50	13.45					2.480	63.0			63.00	59.00	81.00	77.00
	2	05424-4	49.00	18.65	Upon Request				3.307	84.0			84.00	80.00	102.00	98.00
	2.5	05425-4		23.65									105.00	101.00	123.00	119.00
	3	05426-4		28.65									126.00	122.00	144.00	140.00
M45 x 3	1	07452		12.70									45.00	42.00	58.50	55.50
	1.5	07453	50.30	19.85					2.657	67.5			67.50	64.50	81.00	78.00
	2	07454	51.00	26.95	Upon Request								90.00	87.00	103.50	100.50
	2.5	07455		34.15									112.50	109.50	126.00	123.00
	3	07456		41.25									135.00	132.00	148.50	145.50
M48 x 3	1	07482		13.65									48.00	45.00	61.50	58.50
	1.5	07483	52.50	21.25					2.835	72.0			72.00	69.00	85.50	82.50
	2	07484	53.5	28.85	Upon Request								96.00	93.00	109.50	106.50
	2.5	07485		36.45									120.00	117.00	133.50	130.50
	3	07486		44.15									144.00	141.00	157.50	154.50
M48 x 5	1	05482											48.00	45.00	70.50	65.50
	1.5	05483	55.47	12.15					2.835	72.0			72.00	67.00	94.50	89.50
	2	05484	56.4	17.10	Upon Request								96.00	91.00	118.50	113.50
	2.5	05485											120.00	115.00	142.50	137.50
	3	05486											144.00	139.00	166.50	161.50
M48 x 4	1.5	05483-4	53.80	15.56	Upon Request				2.835	72.0			72.00	68.00	90.00	86.00
			54.30													
M52 x 5	1.5	05523	59.53	13.45	Upon Request				3.071	78.0			78.00	73.00	100.50	95.50
	2	05524	60.25	18.00									104.00	99.00	126.50	121.50
M52 x 3	1	07522	57.37	15.00	Upon Request				3.071	78.0						
	1.5	07523	57.90	23.20									78.00	75.00	91.50	88.50

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

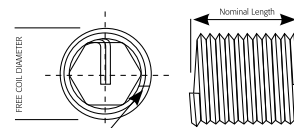
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.



Thread Nominal	Strip Feed Pt No. Free Running	Strip Feed Pt No. Locking	Strip Feed Pt No. MA Free Running	Strip Feed Pt No. MA Locking	No. of Inserts
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**Magazined on Reels Dia 200**

M2.2 x 0.45	05012SF	15012SF	15012MASF		1000
	05013SF	15013SF	15013MASF		1000
	05014SF	15014SF	15014MASF		1000
M2.5 x 0.45	05252SF	15252SF	15252MASF		1000
	05253SF	15253SF	15253MASF		1000
	05254SF	15254SF	15254MASF		1000
	05255SF	15255SF	15255MASF		1000
M2.6 x 0.45	05262SF				1000
	05263SF				1000
	05264SF				1000
	05265SF				1000
M3 x 0.5	05032SF	15032SF	15032MASF		1000
	05033SF	15033SF	15033MASF		1000
M3.5 x 0.6	05352SF	15352SF	15352MASF		1000
	05353SF	15353SF	15353MASF		1000
	05354SF	15354SF	15354MASF		1000
M4 x 0.7	05042SF	15042SF	15042MASF		1000
M6 x 1.0	05062SF	15062SF	15062MASF		500
M12 x 1.25	Upon Request	Upon Request	Upon Request	Upon Request	
	Upon Request	Upon Request	Upon Request	Upon request	
M12 x 1.75	05122SF	15122SF		15122MASF	125
	05123SF	15123SF		15123MASF	125
	05124SF	15124SF		15124MASF	125

Thread Nominal	Strip Feed Pt No. Free Running	Strip Feed Pt No. Locking	Strip Feed Pt No. MA Free Running	Strip Feed Pt No. MA Locking	No. of Inserts
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**Magazined on Reels Dia 290**

M3 x 0.5	05034SF	15034SF		15034MASF	1000
	05035SF	15035SF		15035MASF	1000
M4 x 0.7	05043SF	15043SF		15043MASF	1000
	05044SF	15044SF		15044MASF	1000
	05045SF	15045SF		15045MASF	500
	05046SF	15046SF		15046MASF	500
M5 x 0.8	05052SF	15052SF		15052MASF	1000
	05053SF	15053SF		15053MASF	1000
	05054SF	15054SF		15054MASF	500
	05055SF	15055SF		15055MASF	600
M6 x 1	05063SF	15063SF		15063MASF	500
	05064SF	15064SF		15064MASF	500
	05065SF	15065SF		15065MASF	500
M8 x 1	07082SF	17082SF		17082MASF	500
	07083SF	17083SF		17083MASF	500
	07084SF	17084SF		17084MASF5	500

Thread Nominal	Strip Feed Pt No. Free Running	Strip Feed Pt No. Locking	Strip Feed Pt No. MA Free Running	Strip Feed Pt No. MA Locking	No. of Inserts
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**Magazined on Reels Dia 385**

M8 x 0.75	08082SF	18082SF			500
	08083SF	18083SF			500
M8 x 1.25	05083SF	15083SF		15083MASF	500
	05084SF	15084SF		15084MASF	500
M9 x 1	Upon Request				
M9 x 1.25	Upon Request				
M10 x 1	08102SF	18102SF		18102MASF	500
	08103SF	18103SF		18103MASF	500
	08104SF	18104SF		18104MASF	500
M10 x 1.25	07102SF	17102SF		17102MASF	500
	07103SF	17103SF		17103MASF	500
	07104SF	17104SF		17104MASF	500
M10 x 1.5	05102SF	15102SF		15102MASF	500
	05103SF	15103SF		15103MASF	500
	05104SF	15104SF		15104MASF	500
M11 x 1	Upon Request				
M11 x 1.25	Upon Request				
M11 x 1.5	Upon Request				



Request Info



1-800-453-1692

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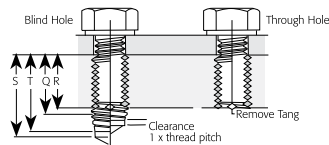
# Recoil Inch Insert Part Number Call-Out and Dimensional Data

Thread Nominal UNC	Nominal Length Dia	Free Running Part Number	Screw Locking Part Number	Insert Length		Number of Coils	Free Coil Dia		BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"			
				inches	mm		Min.	Max	Q	R	S	T
#2 - 56	1D	03522	13522	0.086	2.2	3.000			0.086	0.068	0.166	0.148
	1.5D	03523	13523	0.129	3.3	5.250	.110		0.129	0.111	0.209	0.191
	2D	03524	13524	0.172	4.4	7.375	.119		0.172	0.154	0.252	0.234
	2.5D	03525	13525	0.215	5.5	9.625			0.215	0.197	0.295	0.277
	3D	03526	13526	0.258	6.6	11.875			0.258	0.240	0.338	0.320
#3 - 48	1D	03532	13532	0.099	2.5	2.875			0.099	0.078	0.193	0.172
	1.5D	03533	13533	0.149	3.8	5.000	.128		0.148	0.127	0.242	0.221
	2D	03534	13534	0.198	5	7.250	.139		0.198	0.177	0.292	0.271
	2.5D	03535	13535	0.248	6.3	9.375			0.248	0.227	0.342	0.321
	3D	03536	13536	0.297	7.5	11.500			0.297	0.276	0.391	0.370
#4 - 40	1D	03542	13542	0.112	2.8	2.750			0.112	0.087	0.224	0.199
	1.5D	03543	13543	0.168	4.3	4.750	.144		0.168	0.143	0.28	0.255
	2D	03544	13544	0.224	5.7	6.750	.159		0.224	0.199	0.336	0.311
	2.5D	03545	13545	0.280	7.1	8.875			0.280	0.255	0.392	0.367
	3D	03546	13546	0.336	8.5	10.875			0.336	0.311	0.448	0.423
#5 - 40	1D	03552	13552	0.112	2.8	3.250			0.125	0.100	0.237	0.212
	1.5D	03553	13553	0.168	4.3	5.500	.158		0.187	0.162	0.300	0.275
	2D	03554	13554	0.224	5.7	7.750	.173		0.250	0.225	0.362	0.337
	2.5D	03555	13555	0.280	7.1	10.000			0.312	0.287	0.425	0.400
	3D	03556	13556	0.336	8.5	12.250			0.375	0.350	0.487	0.462
#6 - 32	1D	03562	13562	0.138	3.5	2.750			0.138	0.107	0.279	0.247
	1.5D	03563	13563	0.207	5.3	4.750	.178		0.207	0.176	0.348	0.316
	2D	03564	13564	0.276	7	6.875	.193		0.276	0.245	0.417	0.385
	2.5D	03565	13565	0.345	8.8	8.875			0.345	0.314	0.486	0.454
	3D	03566	13566	0.414	10.5	10.750			0.414	0.383	0.555	0.523
#8 - 32	1D	03582	13582	0.164	4.2	3.500			0.164	0.133	0.305	0.273
	1.5D	03583	13583	0.246	6.2	6.000	.205		0.246	0.215	0.387	0.355
	2D	03584	13584	0.328	8.3	8.375	.220		0.328	0.297	0.469	0.437
	2.5D	03585	13585	0.410	10.4	10.750			0.410	0.379	0.551	0.519
	3D	03586	13586	0.492	12.5	13.250			0.492	0.461	0.633	0.601
#10 - 24	1D	03602	13602	0.190	4.8	2.875			0.190	0.148	0.377	0.336
	1.5D	03603	13603	0.285	7.2	5.000	.244		0.285	0.243	0.472	0.431
	2D	03604	13604	0.380	9.7	7.125	.259		0.380	0.338	0.567	0.526
	2.5D	03605	13605	0.475	12.1	9.250			0.475	0.433	0.662	0.621
	3D	03606	13606	0.570	14.5	11.375			0.570	0.528	0.757	0.716
#12 - 24	1D	03622	13622	0.216	5.5	3.500			0.216	0.174	0.404	0.362
	1.5D	03623	13623	0.324	8.2	6.000	.270		0.324	0.282	0.512	0.470
	2D	03624	13624	0.432	11	8.375	.285		0.432	0.390	0.620	0.578
	2.5D	03625	13625	0.540	13.7	10.625			0.540	0.498	0.727	0.686
	3D	03626	13626	0.648	16.5	13.125			0.648	0.606	0.836	0.794
1/4-20	1D	03042	13042	0.250	6.4	3.375			0.250	0.200	0.475	0.425
	1.5D	03043	13043	0.375	9.5	5.750	.310		0.375	0.325	0.600	0.550
	2D	03044	13044	0.500	12.7	8.000	.330		0.500	0.450	0.725	0.675
	2.5D	03045	13045	0.625	15.9	10.375			0.625	0.575	0.850	0.800
	3D	03046	13046	0.750	19.1	12.750			0.750	0.700	0.975	0.925

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

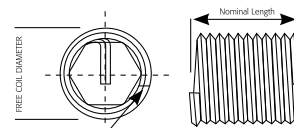
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.



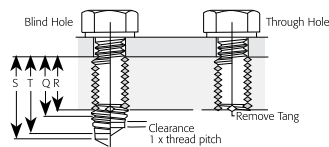
# Recoil Inch Insert Part Number Call-Out and Dimensional Data

Thread Nominal UNC	Nominal Length Dia	Free Running Part Number	Screw Locking Part Number	Insert Length		Number of Coils	Free Coil Dia		BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"			
				inches	mm		Min.	Max	Q	R	S	T
5/16-18	1D	03052	13052	0.313	8	4.000			0.312	0.257	0.562	0.507
	1.5D	03053	13053	0.470	11.9	6.625	.380		0.469	0.413	0.719	0.663
	2D	03054	13054	0.626	15.9	9.250	.400		0.625	0.569	0.875	0.819
	2.5D	03055	13055	0.783	19.9	11.875			0.781	0.726	1.031	0.976
	3D	03056	13056	0.939	23.9	14.625			0.937	0.882	1.187	1.132
3/8-16	1D	03062	13062	0.375	9.5	4.375			0.375	0.312	0.656	0.594
	1.5D	03063	13063	0.563	14.3	7.250	.452		0.562	0.500	0.844	0.781
	2D	03064	13064	0.750	19.1	10.000	.472		0.750	0.687	1.031	0.969
	2.5D	03065	13065	0.938	23.8	12.875			0.937	0.875	1.219	1.156
	3D	03066	13066	1.125	28.6	15.750			1.125	1.062	1.406	1.344
7/16-14	1D	03072	13072	0.438	11.1	4.500			0.437	0.366	0.759	0.687
	1.5D	03073	13073	0.657	16.7	7.375	.526		0.656	0.585	0.978	0.906
	2D	03074	13074	0.876	22.3	10.250	.551		0.875	0.804	1.196	1.125
	2.5D	03075	13075	1.095	27.8	13.125			1.094	1.022	1.415	1.343
	3D	03076	13076	1.314	33.4	16.125			1.312	1.241	1.634	1.562
1/2-13	1D	03082	13082	0.500	12.7	4.875			0.500	0.423	0.846	0.769
	1.5D	03083	13083	0.750	19.1	7.875	.597		0.750	0.673	1.096	1.019
	2D	03084	13084	1.000	25.4	11.000	.622		1.000	0.923	1.346	1.269
	2.5D	03085	13085	1.250	31.8	14.125			1.250	1.173	1.596	1.519
	3D	03086	13086	1.500	38.1	17.125			1.500	1.423	1.846	1.769
9/16-12	1D	03092	13092	0.563	14.3	5.125			0.562	0.479	0.937	0.854
	1.5D	03093	13093	0.845	21.5	8.250	.669		0.844	0.760	1.219	1.135
	2D	03094	13094	1.126	28.6	11.500	.694		1.125	1.042	1.500	1.417
	2.5D	03095	13095	1.408	35.8	14.750			1.406	1.323	1.781	1.698
	3D	03096	13096	1.689	42.9	17.125			1.687	1.604	2.062	1.979
5/8-11	1D	03102	13102	0.625	15.9	5.250			0.625	0.534	1.034	0.943
	1.5D	03103	13103	0.938	23.8	8.500	.742		0.937	0.846	1.347	1.256
	2D	03104	13104	1.250	31.8	11.750	.767		1.250	1.159	1.659	1.568
	2.5D	03105	13105	1.563	39.7	15.000			1.562	1.471	1.972	1.881
	3D	03106	13106	1.875	47.6	18.375			1.875	1.784	2.284	2.193
11/16-11	1D	03112	Upon Request	0.688	17.5	5.75			17.46	15.15	27.85	25.54
	1.5D	03113	Upon Request	1.032	26.2	9.80	.809		26.19	23.88	36.58	34.28
	2D	03114	Upon Request	1.376	35	12.95	.826		34.93	32.62	45.32	43.01
	2.5D	03115	Upon Request	1.720	43.7	16.55			43.66	41.35	54.05	51.74
	3D	03116	Upon Request	2.064	52.4	20.15			52.39	50.08	62.78	60.47
3/4-10	1D	03122	13122	0.750	19.1	5.875			0.750	0.650	1.200	1.100
	1.5D	03123	13123	1.125	28.6	9.375	.881		1.125	1.025	1.575	1.475
	2D	03124	13124	1.500	38.1	13.000	.906		1.500	1.400	1.950	1.850
	2.5D	03125	13125	1.875	47.6	16.500			1.875	1.775	2.325	2.225
	3D	03126	13126	2.250	57.2	20.125			2.250	2.150	2.700	2.600
7/8-9	1D	03142	13142	0.875	22.2	6.250			0.875	0.764	1.375	1.264
	1.5D	03143	13143	1.313	33.3	10.000	1.022		1.312	1.201	1.812	1.701
	2D	03144	13144	1.750	44.5	13.750	1.052		1.750	1.639	2.250	2.139
	2.5D	03145	13145	2.188	55.6	17.500			2.187	2.076	2.687	2.576
	3D	03146	13146	2.625	66.7	21.250			2.625	2.514	3.125	3.014

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

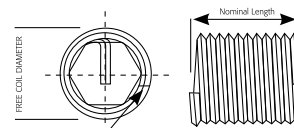
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.



# Recoil Inch Insert Part Number Call-Out and Dimensional Data

Thread Nominal UNC	Nominal Length Dia	Free Running Part Number	Screw Locking Part Number	Insert Length		Number of Coils	Free Coil Dia Min. Max	BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW "D"			
				inches	mm			Q	R	S	T
1" - 8	1D	03162	13162	1.000	25.4	6.375		1.000	0.875	1.563	1.437
	1.5D	03163	13163	1.500	38.1	10.125	1.166	1.500	1.375	2.062	1.937
	2D	03164	13164	2.000	50.8	14.000	1.196	2.000	1.875	2.562	2.437
	2.5D	03165	13165	2.500	63.5	17.750		2.500	2.375	3.062	2.937
	3D	03166	13166	3.000	76.2	21.625		3.000	2.875	3.562	3.437
1 1/8 - 7	1D	03182	13182	1.125	28.6	6.125		1.125	0.982	1.768	1.625
	1.5D	03183	13183	1.688	42.9	9.875	1.315	1.687	1.545	2.330	2.187
	2D	03184	13184	2.250	57.2	13.625	1.355	2.250	2.107	2.893	2.750
	2.5D	03185	13185	2.813	71.4	17.500		2.812	2.670	3.455	3.312
	3D	03186	13186	3.375	85.7	21.250		3.375	3.232	4.018	3.875
1 1/4 - 7	1D	03202	13202	1.250	31.8	7.000		1.250	1.107	1.893	1.750
	1.5D	03203	13203	1.875	47.6	11.250	1.443	1.875	1.732	2.518	2.375
	2D	03204	13204	2.500	63.5	15.375	1.483	2.500	2.357	3.143	3.000
	2.5D	03205	13205	3.125	79.4	19.500		3.125	2.982	3.768	3.625
	3D	03206	13206	3.750	95.3	23.750		3.750	3.607	4.393	4.250
1 3/8 - 6	1D	03222	13222	1.375	34.9	6.500		1.375	1.208	2.125	1.958
	1.5D	03223	13223	2.063	52.4	10.500	1.598	2.062	1.896	2.812	2.646
	2D	03224	13224	2.750	69.9	14.375	1.643	2.750	2.583	3.500	3.333
	2.5D	03225	13225	3.438	87.3	18.375		3.437	3.270	4.187	4.021
	3D	03226	13226	4.125	104.8	22.250		4.125	3.958	4.875	4.708
1 1/2 - 6	1D	03242	13242	1.500	38.1	7.250		1.500	1.333	2.250	1.083
	1.5D	03243	13243	2.250	57.2	11.500	1.727	2.250	2.083	3.000	2.833
	2D	03244	13244	3.000	76.2	15.875	1.772	3.000	2.833	3.750	3.583
	2.5D	03245	13245	3.750	95.3	20.125		3.750	3.583	4.500	4.333
	3D	03246	13246	4.500	114.3	24.500		4.500	4.333	5.250	5.083

Thread Nominal UNF	Nominal Length Dia	Part Number	Recoil Spec		MS Spec				Free Coil Dia Min/Max	BASIC LENGTH OF INSERT NOMINAL DIAMETER OF SCREW 'D'				
			Free Running Min/Max	Number of coils	Free Running Part Number	Screw Locking Part Number	Insert Length Inches mm	Number of coils		Q	R	S	T	
#3 - 56	1D	04532		3.60	04532MS	14532	0.099	2.5	3.375		0.099	0.081	0.179	0.161
	1.5D	04533		6.05	04533MS	14533	0.149	3.8	5.625	.131	0.148	0.130	0.228	0.210
	2D	04534	3.15 - 3.25	8.65	04534MS	14534	0.198	5	8.000	.146	0.198	0.180	0.278	0.260
	2.5D	04535		11.25	04535MS		0.248	6.3	10.375		0.248	0.230	0.328	0.310
	3D	04536		13.75	04536MS		0.297	7.5	12.625		0.297	0.279	0.377	0.359
#4 - 48	1D	04542		3.55	04542MS	14542	0.112	2.8	3.375		0.112	0.091	0.206	0.185
	1.5D	04543		5.95	04543MS	14543	0.168	4.3	5.625	.147	0.168	0.147	0.262	0.241
	2D	04544	3.57 - 3.67	8.25	04544MS	14544	0.224	5.7	7.875	.162	0.224	0.203	0.318	0.297
	2.5D	04545		10.95	04545MS		0.280	7.1	10.250		0.280	0.259	0.374	0.353
	3D	04546		13.35	04546MS		0.336	8.5	12.500		0.336	0.315	0.430	0.409
#6 - 40	1D	04562		3.55	04562MS	14562	0.138	3.5	3.500		0.138	0.113	0.250	0.225
	1.5D	04563		6.15	04563MS	14563	0.207	5.3	6.000	.173	0.207	0.182	0.319	0.294
	2D	04564	4.38 - 4.50	8.65	04564MS	14564	0.276	7	8.375	.193	0.276	0.251	0.388	0.363
	2.5D	04565		11.15	04565MS		0.345	8.8	10.750		0.345	0.320	0.457	0.432
	3D	04566		13.75	04566MS		0.414	10.5	13.250		0.414	0.389	0.526	0.501

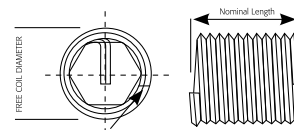
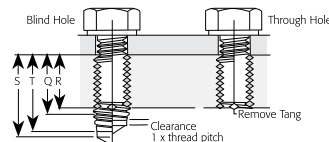
Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.

### Fitted Insert:

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
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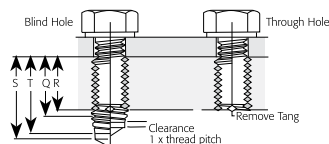
# Recoil Inch Insert Part Number Call-Out and Dimensional Data

Thread Nominal UNF	Nominal Length Dia	Part Number	Recoil Spec		MS spec				BASIC LENGTH OF INSERT					
			Free Running Free Coil Dia Min/Max	Number of coils	Free running Part Number	Screw Locking Part Number	Insert Length Inches mm	Number of coils	FreeCoil Dia Min/Max	NOMINAL DIAMETER OF SCREW 'D'				
										Q	R	S	T	
#8 - 36	1D	04582	5.14 - 5.28	3.85	04582MS	14582	0.164	4.2	3.875	.204 .224	0.164	0.136	0.289	0.261
	1.5D	04583		6.85	04583MS	14583	0.246	6.2	6.500		0.246	0.218	0.371	0.343
	2D	04584		9.35	04584MS	14584	0.328	8.3	9.125		0.328	0.300	0.453	0.425
	2.5D	04585		11.95	04585MS		0.410	10.4	11.625		0.410	0.382	0.535	0.507
	3D	04586		14.65	04586MS		0.492	12.5	14.250		0.492	0.464	0.617	0.589
#10 - 32	1D	04602	5.85 - 6.00	4.25	04602MS	14602	0.190	4.8	4.125	.236 .256	0.190	0.159	0.331	0.299
	1.5D	04603		7.05	04603MS	14603	0.285	7.2	6.875		0.285	0.254	0.426	0.394
	2D	04604		9.95	04604MS	14604	0.380	9.7	9.500		0.380	0.349	0.521	0.489
	2.5D	04605		12.25	04605MS	14605	0.475	12.1	12.000		0.475	0.444	0.616	0.584
	3D	04606		15.65	04606MS	14606	0.570	14.5	14.875		0.570	0.539	0.711	0.679
#12 - 28	1D				04622MS		0.216	5.5	4.25	.265 .275	5.49	4.58	9.57	8.66
	1.5D				04623MS		0.324	8.2	7.30		8.23	7.32	12.31	11.40
	2D				04624MS	Upon Req.	0.432	11	9.85		10.97	10.07	15.05	14.15
	2.5D						0.540	13.7						
	3D						0.648	16.5						
1/4-28	1D	04042	7.60-7.80	5.05	04042MS	14042	0.250	6.4	5.000	.306 .326	0.250	0.214	0.411	0.375
	1.5D	04043		8.45	04043MS	14043	0.375	9.5	8.250		0.375	0.339	0.536	0.500
	2D	04044		11.65	04044MS	14044	0.500	12.7	11.375		0.500	0.464	0.661	0.625
	2.5D	04045		14.95	04045MS	14045	0.625	15.9	14.500		0.625	0.589	0.786	0.750
	3D	04046		18.15	04046MS	14046	0.750	19.1	17.625		0.750	0.714	0.911	0.875
5/16-24	1D	04052	9.45-9.65	5.55	04052MS	14052	0.313	8	5.500	.380 .400	0.312	0.271	0.500	0.458
	1.5D	04053		9.05	04053MS	14053	0.470	11.9	8.875		0.469	0.428	0.656	0.615
	2D	04054		12.55	04054MS	14054	0.626	15.9	12.250		0.625	0.583	0.812	0.771
	2.5D	04055		16.15	04055MS	14055	0.783	19.9	15.625		0.781	0.740	0.969	0.927
	3D	04056		19.65	04056MS	14056	0.939	23.9	19.000		0.937	0.896	1.125	1.083
3/8-24	1D	04062	11.00-11.20	7.05	04062MS	14062	0.375	9.5	6.875	.448 .468	0.375	0.333	0.562	0.521
	1.5D	04063		11.25	04063MS	14063	0.563	14.3	11.000		0.562	0.521	0.750	0.708
	2D	04064		15.45	04064MS	14064	0.750	19.1	15.000		0.750	0.708	0.937	0.896
	2.5D	04065		19.75	04065MS	14065	0.938	23.8	19.125		0.937	0.896	1.125	1.083
	3D	04066		23.95	04066MS	14066	1.125	28.6	23.125		1.125	1.083	1.312	1.271
7/16-20	1D	04072	12.96-13.20	6.85	04072MS	14072	0.438	11.1	6.625	.524 .549	0.437	0.387	0.662	0.612
	1.5D	04073		11.05	04073MS	14073	0.657	16.7	10.625		0.656	0.606	0.881	0.831
	2D	04074		15.25	04074MS	14074	0.876	22.3	14.625		0.875	0.825	1.100	1.050
	2.5D	04075		19.75	04075MS	14075	1.095	27.8	18.500		1.094	1.044	1.319	1.269
	3D	04076		23.45	04076MS	14076	1.314	33.4	22.500		1.312	1.262	1.537	1.488
1/2-20	1D	04082	14.60-14.90	8.05	04082MS	14082	0.500	12.7	7.875	.592 .617	0.500	0.450	0.725	0.675
	1.5D	04083		12.75	04083MS	14083	0.750	19.1	12.375		0.750	0.700	0.975	0.925
	2D	04084		17.45	04084MS	14084	1.000	25.4	16.875		1.000	0.950	1.225	1.175
	2.5D	04085		22.05	04085MS	14085	1.250	31.8	21.375		1.250	1.200	1.475	1.425
	3D	04086		26.75	04086MS	14086	1.500	38.1	25.875		1.500	1.450	1.725	1.675
9/16-18	1D	04092	16.38-16.68	8.15	04092MS	14092	0.563	14.3	8.000	.666 .691	0.562	0.507	0.812	0.757
	1.5D	04093		12.85	04093MS	14093	0.845	21.5	12.500		0.844	0.788	1.094	1.038
	2D	04094		17.65	04094MS	14094	1.126	28.6	17.125		1.125	1.068	1.375	1.319
	2.5D	04095		22.45	04095MS	14095	1.408	35.8	21.750		1.406	1.351	1.656	1.601
	3D	04096		27.15	04096MS	14096	1.689	42.9	26.250		1.687	1.632	1.937	1.882

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

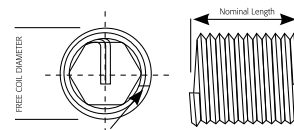
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.





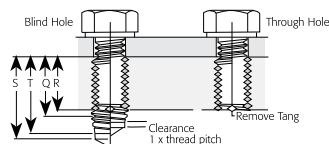
# Recoil Inch Insert Part Number Call-Out and Dimensional Data

Thread Nominal UNF	Nominal Length Dia	Part Number	Recoil Spec		MS spec				BASIC LENGTH OF INSERT						
			Free Running Free Coil Dia Min/Max	Number of coils	Free running Part Number	Screw Locking Part Number	Insert Length Inches mm	Number of coils	FreeCoil Dia Min/Max	NOMINAL DIAMETER OF SCREW 'D'					
										Q	R	S	T		
5/8-18	1D	04102	18.00-18.30	9.25	04102MS	14102	0.625	15.9	9.000	.733	0.625	0.569	0.875	0.819	
	1.5D	04103		14.55	04103MS	14103	0.938	23.8	14.125		0.937	0.882	1.187	1.132	
	2D	04104		20.05	04104MS	14104	1.250	31.8	19.250		.758	1.250	1.194	1.500	1.444
	2.5D	04105		25.05	04105MS	14105	1.563	39.7	24.250		1.562	1.507	1.812	1.757	
	3D	04106		30.45	04106MS	14106	1.875	47.6	29.375		1.875	1.819	2.125	2.069	
3/4-16	1D	04122	21.20-21.60	9.95	04122MS	14122	0.750	19.1	9.750	.876	0.750	0.687	1.031	0.969	
	1.5D	04123		15.55	04123MS	14123	1.125	28.6	15.125		1.125	1.062	1.406	1.344	
	2D	04124		21.35	04124MS	14124	1.500	38.1	20.625		.901	1.500	1.437	1.781	1.719
	2.5D	04125		26.85	04125MS	14125	1.875	47.6	26.000		1.875	1.812	2.156	2.094	
	3D	04126		32.65	04126MS	14126	2.250	57.2	31.500		2.250	2.187	2.531	2.469	
7/8-14	1D	04142	24.97 - 25.33	10.15	04142MS	14142	0.875	22.2	9.875	1.021	0.875	0.804	1.196	1.125	
	1.5D	04143		16.15	04143MS	14143	1.313	33.3	15.500		1.051	1.312	1.241	1.634	1.562
	2D	04144		22.05	04144MS	14144	1.750	44.5	21.125		1.750	1.679	2.071	2.000	
	2.5D	04145		27.85	04145MS	14145	2.188	55.6	26.625		2.187	2.116	2.509	2.437	
	3D	04146		33.75	04146MS	14146	2.625	66.7	32.250		2.625	2.554	2.946	2.875	
1" - 12	1D	04162	28.47 - 28.83	9.95	04162MS	14162	1.000	25.4	9.625	1.169	1.000	0.917	1.375	1.292	
	1.5D	04163		15.65	04163MS	14163	1.500	38.1	15.000		1.199	1.500	1.417	1.875	1.792
	2D	04164		21.35	04164MS	14164	2.000	50.8	20.500		2.000	1.917	2.375	2.292	
	2.5D	04165		27.15	04165MS	14165	2.500	63.5	26.000		2.500	2.417	2.875	2.792	
	3D	04166		32.95	04166MS	14166	3.000	76.2	31.500		3.000	2.917	3.375	3.292	
1" - 14	1D	04162-14	28.07 - 28.43	11.95	04162-14MS	14162-14	8.364	25.4	11.500	1.156	25.40	23.59	33.56	31.75	
	1.5D	04163-14		18.55	04163-14MS	14163-14	9.641	38.1	17.875		1.186	38.10	36.29	46.26	44.45
	2D	04164-14		25.05	04164-14MS	14164-14	11.059	50.8	24.250		1.186	50.80	48.99	58.96	57.15
	2.5D	04165-14		31.75	04165-14MS	14165-14	13.043	63.5	30.625		63.50	61.69	71.66	69.85	
	3D	04166-14		38.35	04166-14MS	14166-14	14.745	76.2	37.000		76.20	74.39	84.36	82.55	
1 1/8 - 12	1D	04182	31.72 - 32.10	11.55	04182MS	14182	1.125	28.6	11.125	1.304	1.125	1.042	1.500	1.417	
	1.5D	04183		17.95	04183MS	14183	1.688	42.9	17.250		1.334	1.687	1.604	2.062	1.979
	2D	04184		24.35	04184MS	14184	2.250	57.2	23.375		2.250	2.167	2.625	2.542	
	2.5D	04185		30.85	04185MS	14185	2.813	71.4	29.500		2.812	2.729	3.187	3.104	
	3D	04186		37.35	04186MS	14186	3.375	85.7	35.750		3.375	3.292	3.750	3.667	
1 1/4 - 12	1D	04202	34.90 - 35.30	12.95	04202MS	14202	1.250	31.8	12.500	1.439	1.250	1.167	1.625	1.542	
	1.5D	04203		20.15	04203MS	14203	1.875	47.6	19.375		1.469	1.875	1.792	2.250	2.167
	2D	04204		27.45	04204MS	14204	2.500	63.5	26.250		2.500	2.417	2.875	2.792	
	2.5D	04205		34.55	04205MS	14205	3.125	79.4	33.000		3.125	3.042	3.500	3.417	
	3D	04206		41.75	04206MS	14206	3.750	95.3	39.875		3.750	3.667	4.125	4.042	
1 3/8 - 12	1D	04222	38.22 - 38.52	14.25	04222MS	14222	1.375	34.9	13.750	1.575	1.375	1.292	1.750	1.667	
	1.5D	04223		22.25	04223MS	14223	2.063	52.4	21.375		1.610	2.062	1.979	2.437	2.354
	2D	04224		30.15	04224MS	14224	2.750	69.9	28.875		3.437	3.354	3.812	3.729	
	2.5D	04225		38.15	04225MS	14225	3.438	87.3	36.500		4.125	4.042	4.500	4.417	
	3D			46.05					44.000						
1 1/2 - 12	1D	04242	41.38 - 41.78	15.85	04242MS	14242	1.500	38.1	15.250	1.710	1.500	1.417	1.875	1.792	
	1.5D	04243		24.55	04243MS	14243	2.250	57.2	23.500		1.745	2.250	2.167	2.625	2.542
	2D	04244		33.05	04244MS	14244	3.000	76.2	31.625		3.000	2.917	3.375	3.292	
	2.5D	04245		41.75	04245MS	14245	3.750	95.3	39.875		3.750	3.667	4.125	4.042	
	3D	04246		50.35	04246MS	14246	4.500	114.3	48.125		4.500	4.417	4.875	4.792	

Drill Depth: The minimum drilling depth "S" allows for one pitch chip clearance between the tip of the tap and the bottom of the drilled hole. "S" minimum allows for tap clearance, the maximum amount of insert set-down and countersink. Where a spiral pointed tap is used, the drill depths shown should be increased to allow for chip clearance.

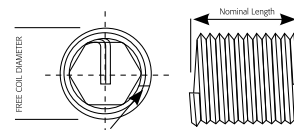
**Fitted Insert:**

- R = Maximum length of engaged portion of screw when tang is removed.
- Q = Minimum full tapped thread length.
- T = Minimum tapping depth - including 3 1/2 threads of plug tap.
- S = Minimum drill depth - excluding point.



Note: Recoil metric inserts are made to Din locking torque requirements. Military specification MA parts need to be specifically ordered by adding MA to the standard part number above.

Note: Dimensions shown are for MA parts only.



# Recoil Strip Feed Part Number Call-Out and Dimensional Data

Magazined on Reels Dia 200				Magazined on Reels Dia 290		
Thread Nominal Free Running	Strip Feed Part Number Locking	Strip Feed Part Number	No. of Inserts	Strip Feed Part Number Free Running	Strip Feed Part Number Locking	No. of Inserts
#2-56	03522SF	13522SF	1000	03525SF 03526SF	13525SF 13526SF	1000 1000
	03523SF	13523SF	1000			
	03524SF	13524SF	1000			
#3-56	03532SF		1000	03535SF 03536SF	13535SF 13536SF	1000 1000
	03533SF		1000			
	03534SF		1000			
#4-40	03542SF	13542SF	1000	03544SF 03545SF 03546SF	13544SF 13545SF 13546SF	1000 1000 1000
	03543SF	13543SF	1000			
#5-40	03552SF	13552SF	1000	03555SF 03556SF	13555SF 13556SF	1000 1000
	03553SF	13553SF	1000			
	03554SF	13554SF	1000			
#6-32	03562SF	13562SF	1000	03563SF 03564SF 03565SF 03566SF	13563SF 13564SF 13565SF 13566SF	1000 1000 1000 1000
#8-32				03582SF	13582SF	1000
				03583SF	13583SF	1000
				03584SF	13584SF	1000
				03585SF	13585SF	500
				03586SF	13586SF	500
#10-24				03602SF	13602SF	1000
				03603SF	13603SF	500
				03604SF	13604SF	500
				03605SF	13605SF	500
				03606SF	13606SF	500
#12-24				03622SF	13622SF	1000
				03623SF	13623SF	500
				03624SF	13624SF	500
				03625SF	13625SF	500
				03626SF	13626SF	500
1/4-20				03042SF	13042SF	500
				03043SF	13043SF	500
				03044SF	13044SF	250
				03045SF	13045SF	250
				03046SF	13046SF	250
5/16-18				03052SF	13052SF	250
				03053SF	13053SF	250
				03054SF	13054SF	250
3/8-16				03062SF	13062SF	250
				03063SF	13063SF	250
				03064SF	13064SF	250

# Recoil Strip Feed Part Number Call-Out and Dimensional Data

Magazined on Reels Dia 200				Magazined on Reels Dia 290			
Thread Nominal Free Running	Strip Feed Part Number Locking	Strip Feed Part Number	No. of Inserts	Strip Feed Part Number Free Running	Strip Feed Part Number Locking	No. of Inserts	
7/16-14				03072SF	13062SF	125	
				03073SF	13063SF	125	
1/4-28				04042SF	14042SF	500	
				04043SF	14043SF	500	
				04044SF	14044SF	500	
				04045SF	14045SF	250	
				04046SF	14046SF	250	
				04052SF	14052SF	250	
5/16-24				04053SF	14053SF	250	
				04054SF	14054SF	250	
				04055SF	14055SF	250	
				04056SF	14056SF	250	
	3/8-24				04062SF	14062SF	250
					04063SF	14063SF	250
				04064SF	14064SF	250	
				04065SF	14065SF	250	
				04066SF	14066SF	250	
				04602SF	14602SF	1000	
#10-32				04603SF	14603SF	500	
				04604SF	14604SF	500	
				04605SF	14605SF	500	
				04606SF	14606SF	500	
#12-28				04622SF	14622SF	1000	
				04623SF	14623SF	1000	
				04624SF	14624SF	1000	
				04625SF	14625SF	500	
				04626SF	14626SF	500	
#3 - 56	04532SF	14532SF	1000	04534SF	14534SF	1000	
	04533SF	14533SF	1000	04535SF	14535SF	1000	
				04536SF	14536SF	1000	
#4 - 48	04542SF	14542SF	1000	04544SF	14544SF	1000	
	04543SF	14543SF	1000	04545SF	14545SF	1000	
				04546SF	04546SF	1000	
#6 - 40	04562SF	14562SF	1000	04564SF	14564SF	1000	
	04563SF	14563SF	1000	04565SF	14565SF	1000	
				04566SF	14566SF	1000	
#8 - 36				04582SF	14582SF	1000	
				04583SF	14583SF	1000	
				04584SF	14584SF	500	
				04585SF	14585SF	500	
				04586SF	14586SF	500	



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