

Types of Inserts

There are two designs of Heli-Coil inserts...

STANDARD, which provides a smooth free-running thread; and, **SCREW-LOCK** which provides self-locking torque on the male member by a series of "chords" on one or more of the insert coils. They are available in inch series coarse and fine and metric series, coarse and fine. Inch series Screw-Lock inserts are dyed red for identification.



Standard Heli-Coil Insert



Screw-Lock Heli-Coil Insert

Heli-Coil inserts are precision formed screw thread coils worked into a diamond shape. The resultant surface finish is a mirror-like 8-16 micro inches. This wire is then wound into a spiral coil which when installed into Heli-Coil tapped holes, provides permanent conventional 60° internal screw threads. This assembled insert accommodates any standard bolt or screw (MIL-S-7742) and MIL-S-8879 (UNJ controlled radius root) male threaded members. (See page 8 for material availability.)

Heli-Coil inserts are larger in diameter before installation than the tapped hole. During installation the inserting tool applies torque to the tang reducing the diameter of the leading coil permitting it to enter the tapped thread. After installation each high tensile stainless steel coil of the insert expands outward with a spring-like action permanently anchoring the insert.

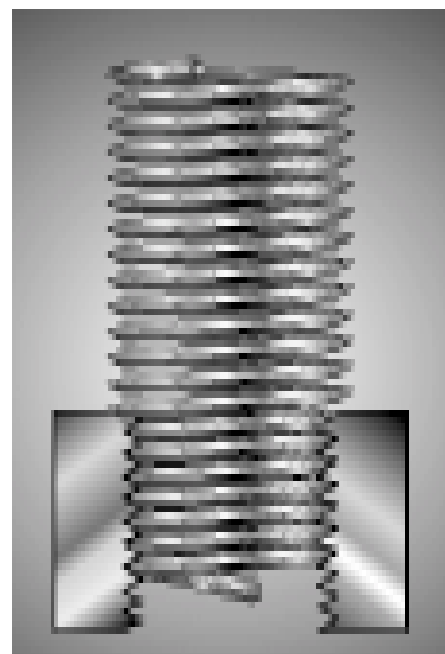


Illustration of the Retention Principle

Size Range:

- UNC #2 through 1-1/2
- UNF #2 through 1-1/2
- Metric Coarse M2 through M39
- Metric Fine M8 through M39

Inserts are also available in UNEF, UNS, 8UN, 12UN, 16UN, Spark Plug and Pipe Thread.

FEATURES & BENEFITS...

Heli-Coil inserts provide

a positive means for protecting and strengthening tapped threads in any material. The unique design features of the insert offer many benefits...

- **Stronger Assemblies.**

Tapped threads are strengthened because the inherent flexibility of the insert provides a more balanced distribution of dynamic and static loads throughout the length of thread engagement. This flexibility also compensates for variation in lead and angle error allowing each coil to carry its share of the load.

- **No Thread Wear.**

Thread life is dramatically increased even after repeated assembly and disassembly, because the insert hardness and surface finish practically eliminate erosion of the thread form due to friction.

- **Corrosion Resistance.**

Under normal environmental conditions, Heli-Coil inserts minimize galvanic action within the threaded assembly because of their superior corrosion resistance.

- **Design Flexibility.**

Bolt tensile strength can be balanced against parent material shear strength, assuring bolt failure rather than parent material damage. Five insert lengths are available in each thread size.

- **Eliminate Stress.**

Virtually no stress is introduced into the parent material because there is no staking,

locking, swaging or keying in place — the outward spring-like action of the insert holds it in place.

- **Minimize Space & Weight**

Heli-Coil inserts allow use of smaller bosses, flanges and fasteners than any other insert. Heli-Coil inserts can generally be incorporated in existing designs, where no provision has been made for an insert, without increasing boss size.

- **Minimize Total Cost.**

Cost savings abound. Lower insert cost, lower installation cost, and Heli-Coil inserts provide design flexibility by allowing a wide choice of parent materials while maintaining maximum threaded assembly strength.

- **True Clamping Torque.**

Maximum clamping action and bolt tension are assured with minimum wrench torque, because of the mirror-smooth surface finish of Heli-Coil inserts.

- **Wide Temperature Range.**

Heli-Coil stainless steel inserts can be used in temperatures ranging from -320°F to +800°F.

- **Quality & Reliability.**

Stringent Quality Assurance and Engineering Standards are rigidly enforced in all phases of the manufacturing process. This assures integrity of your product design.

High Production

Heli-Coil inserts are available mounted on plastic strips and wound onto reels (500 or 1000 inserts per reel). With power installation tooling, use of strip feed inserts will substantially increase installation rates by minimizing handling.

Universal Acceptance

Heli-Coil Standard and Screw-lock Inserts are the original — and have an extensive background of tension, torque, shear, vibration and fatigue tests conducted by American industry's leading companies as well as the U.S. Military. Successful applications in the fields of aviation, electronics, industrial, automotive and military equipment provide a wealth of experience and confidence in the performance and reliability of Heli-Coil inserts.

Total Design Service

In addition to the benefits listed above, Heli-Coil provides a wide range of support to solve fastening problems. This manual is one of them — the following pages are presented in a manner to make it easy to "design-in" Heli-Coil inserts to take advantage of the extraordinary benefits they provide.

Additionally, our Sales Engineers, Applications Engineers and Design Engineers are available for consultation of specific designs. When the product gets to the manufacturing phase, our extensive experience in production tooling and installation techniques ensures that you can indeed make your product better with Heli-Coil inserts.

Heli-Coil offers three types of locking inserts for multiple applications...

Screw-Lock Inserts:

- Positive self-locking torque, complying with NASM 8846, MA1565 and MIL-N-25027.
- A resilient locking mechanism (applies to Heli-Coil screw-lock inserts) that grips the bolt and prevents it from loosening under vibration or impact.
- Repeated assembly and disassembly without appreciable loss of self-locking torque.
- Savings in space, weight and money, through the elimination of lock wiring, lock nuts, lock washers, chemical compounds, plastic pellets/patches and other locking mechanisms.

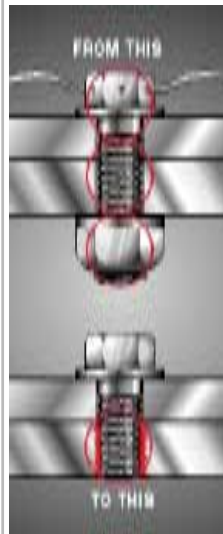
Hi-Torque Inserts:

- Similar to Screw-Lock except higher prevailing torque compensates for reduced friction in highly lubricated applications.
- Ideal for higher vibration applications.
- Approximate 40 % increase in prevailing torque levels.
- Available in #10 through 3/8" UNF only
- Meets **AS3094, 3095, 3096, 3097**

Stud-Lock Inserts:

- Highest prevailing torque insert available.
- Enables use of threaded rod for space-saving stud applications.
- Allows for any class fit of threaded rod.
- Eliminates inconsistencies caused by interference-fit studs.
- Available for both straight and step studs, #10 through 1/2" UNC and UNF.
- Meets **AS3080, 3081, 3082, 3083**

LOCKING FEATURES & BENEFITS...



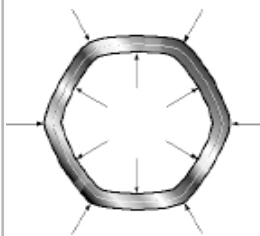
Locks Adjustment Screws. This simple design allows permanent, positive adjustment of screws in any position, secure against vibration or impact.



Inaccessible or Miniaturized Assemblies. Heli-Coil Screw-Lock insert permits the installation of the lock from the front or top. No blind fumbling for assembly of lock washers or lock nuts behind or underneath.



Lock Set Screws. Positively locks assembly against loosening at desired adjustment – protects threads against stripping under high torque – permits use of light housing materials.



The locking action is achieved by one or more of the insert coils having a series of straight segments or "chords". When the bolt enters the "grip" coil, these chordal segments flex outward, creating pressure on the bolt. The pressure is exerted between the flanks of the bolt thread to establish an extensive positive and consistent self-locking torque over more cycles than any other prevailing torque mechanism.

Military Standards

Heli-Coil inserts and tooling comply with the following Standards and Specifications:

- **NASM 122076 thru NASM 122275.** Insert, corrosion resistant Helical Coil Coarse Thread (Inch Series)
- **NASM 124651 thru NASM 124850.** Insert, corrosion resistant Helical Coil Fine Thread (Inch Series)
- **NASM 21209.** Insert Screw Thread – Self Locking (Inch Series)
- **NASM 33537.** Insert – Standard Dimensions, Assembly
- **NASM 8846.** Insert, Screw Thread, Helical Coil
- **MA1565.** Insert, Screw Thread, Helical Coil (Metric Series)

- **MA1567.** Insert, Screw Thread, Helical Coil (Metric Series), Standard Dimensions, Assembly
- **MA3279, 3280, 3281.** Insert, Screw Thread, Helical Coil (Metric Series), Screw-Locking
- **A-A-59158.** Tools for inserting and extracting Helical Coil Inserts
- **FED-STD-H28.** Screw Thread Standards for Federal/Services
- **AS3094 thru 3097**
- **AS3080 thru 3083** Special Locking Torque Inserts

Note: Heli-Coil Hi-Torque and Stud-Lock inserts are made to order only. Contact Heli-Coil Applications Engineering at (203) 830-3274 for Hi-Torque and Stud-Lock part numbers and application assistance.

Heli-Coil insert material

Heli-Coil inserts are available in a wide choice of materials to suit specific application needs. Contact Heli-Coil Applications Engineering to determine the correct material for your specific application.



304 Stainless Steel

- Standard, general purpose material
- Stocked in most sizes
- Ideal for original equipment applications, repair, and over-haul

Material Spec: AS7245

Temperature range: up to 800°F
Tensile: 200,000 – 250,000 PSI
Hardness: RHc 43-50
Corrosion resistance: Moderate
Magnetic Permeability: 2-10 G/o (depending on wire size)



Inconel X750

- Used in areas exposed to high temperatures
- Typical uses: gas turbine engines, nuclear applications, well drilling
- Non-magnetic

Material Spec: AS7246

Temperature range: up to 1,000°F
Tensile: 200,000 PSI
Hardness: RHc 43-50
Corrosion resistance: High
Magnetic Permeability: <1 G/o



Phosphor Bronze

- Ideal for salt water applications
- Non-magnetic
- Excellent electrical conductivity

Temperature range: up to 250°F
Tensile: 140,000
Hardness: HRB 95
Corrosion resistance: High
Magnetic Permeability: <1 G/o



Nitronic 60™

- Superb galling resistance
- Compatible with stainless steel screws
- Ideal for use in vacuum environments
- Requires no additional coatings or plating
- Particle free
- Non-magnetic

Material Spec: UNS S21800

Temperature range: up to 500°F
Tensile: 200,000 PSI
Hardness: RHc 43-50
Corrosion resistance: Moderate
Magnetic Permeability: <1 G/o



Titanium

- Superior strength-to-weight ratio
- Corrosion resistant
- Excellent low temperature stability

Material Spec: AMS 4957 & AMS 4958A

Temperature range: up to 600°F
Tensile: 150,000 to 220,000 PSI
Hardness: RHc 35-43
Corrosion resistance: High
Magnetic Permeability: non-magnetic

Nitronic 60™ is a trademark of AK Steel

Heli-Coil screw lock torque data

Heli-Coil Screw-Lock inserts meet the locking torque value of Tables I and II shown below. The values shown conform to NASM 8846 (inch series) or MA1565 (metric series) requirement.

IMPORTANT NOTE: When using heat-treated steel screws or stainless steel screws with a Screw-Lock insert, an anti-seize compound **MUST** be applied to the screw or insert to minimize galling and maximize cycle life. To improve the wear life of the screws in Screw-Lock insert applications, specify Dry Film Lubricant (Molybdenum Disulfide), cadmium plating or Primer Free coating be applied to the insert.

TABLE I. Heli-Coil Insert Locking Torque – Inch

Thread Size	Max. Locking Torque	Min. Locking Torque 15 th Cycle
INCH COARSE		
1 (.073)-64	15 oz-in	2 oz-in
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 (.2500)-20	30 lb-in	4.5 lb-in
5/16 (.3125)-18	60 lb-in	7.5 lb-in
3/8 (.3750)-16	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
1-1/8 (1.1250)-7	900 lb-in	137.0 lb-in
1-1/4 (1.2500)-7	1000 lb-in	165.0 lb-in
1-3/8 (1.3750)-6	1150 lb-in	185.0 lb-in
1-1/2 (1.5000)-6	1350 lb-in	210.0 lb-in
INCH FINE		
2 (.086)-64	20 oz-in	3 oz-in
3 (.099)-56	32 oz-in	7 oz-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	13 lb-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 (1.000)-14*	800 lb-in	92.0 lb-in
1 (1.000)-12	800 lb-in	90.0 lb-in
1-1/8 (1.1250)-12	900 lb-in	117.0 lb-in
1-1/4 (1.2500)-12	1000 lb-in	143.0 lb-in
1-3/8 (1.3750)-12	1150 lb-in	165.0 lb-in
1-1/2 (1.5000)-12	1350 lb-in	190.0 lb-in

TABLE II. Heli-Coil Insert Locking Torque – Metric

Thread Size	Max. Locking Torque N.m	Min. Locking Torque 15 th Cycle N.m
METRIC COARSE		
M2x0.4	0.12	0.003
M2.2x0.45	0.14	0.02
M2.5x0.45	0.23	0.05
M3x0.5	0.45	0.1
M3.5x0.6	0.68	0.12
M4x0.7	0.9	0.15
M5x0.8	1.6	0.3
M6x1	3	0.4
M7x1	4.5	0.6
M8x1.25	6	0.8
M10x1.5	10.5	1.4
M12x1.75	15.5	2.1
M14x2	23.5	3
M16x2	31.5	4.2
M18x2.5	42	5.5
M20x2.5	54	7
M22x2.5	67.5	9
M24x3	80	10.5
M27x3	94	12
M30x3.5	108	14
M33x3.5	122	15.5
M36x4	136	17.5
M39x4	150	19.5
METRIC FINE		
M8x1	6	0.8
M10x1	10.5	1.4
M10x1.25	10.5	1.4
M12x1.25	15.5	2.1
M12x1.5	15.5	2.1
M14x1.5	23.5	3
M16x1.5	31.5	4.2
M18x1.5	42	5.5
M20x1.5	54	7
M22x1.5	67.5	9
M18x2	42	5.5
M20x2	54	7
M22x2	67.5	9
M24x2	80	10.5
M27x2	94	12
M30x2	108	14
M33x2	122	15.5
M36x2	136	17.5
M39x2	150	19.5
M36x3	136	17.5
M39x3	150	19.5

* These sizes are not included in NASM 8846. Torque values shown are interpolated from sizes that are included. All torque data derived for stainless inserts only.

Assembly Strength

Heli-Coil offers maximum design flexibility while adhering to conservative engineering practice allowing use of Heli-Coil inserts in virtually any application or material. Five lengths of inserts are available. In this design manual the lengths are listed as multiples of the nominal thread diameter of the screw; 1, 1-1/2, 2, 2-1/2, and 3. This choice of insert

length balances the bolt tensile strength against the shear strength of the parent material. This allows for the design of assemblies where the bolt will fail before the parent material. Tables III and IV below show the length of insert to be used with different combinations of bolts and parent materials.

Guidelines for use of table:

1. When the parent material shear strength falls between two listed values, use the lower of the two values.
2. Parent material shear strengths are for room temperature. For applications at elevated temperatures, the shear strength of the material at that temperature must be determined for proper selection of bolt and insert length.
3. Be sure that the engaged thread length of the bolt is at least as long as the full tapped thread depth for the size selected (Dimension "H", Tables VII & VIII, pages 18 & 19).

Shear strength of parent material (PSI) (Alum., Mag., Steel)	Table III – Inch Bolt & Heli-Coil Insert Selection Guide Bolt Material Minimum Ultimate Tensile Strength (PSI)								
	54,000	75,000	96,000	108,000	125,000	132,000	160,000	180,000	220,000
10,000	2	2-1/2	3	3	—	—	—	—	—
15,000	1-1/2	1-1/2	2	2-1/2	2-1/2	3	3	—	—
20,000	1	1-1/2	1-1/2	2	2	2	2-1/2	3	3
25,000	1	1	1-1/2	1-1/2	1-1/2	2	2	2-1/2	2-1/2
30,000	1	1	1	1-1/2	1-1/2	1-1/2	2	2	2-1/2
40,000	1	1	1	1	1	1-1/2	1-1/2	1-1/2	2
50,000	1	1	1	1	1	1	1	1-1/2	1-1/2

Shear strength of parent material MPa (megapascals) (Alum., Mag., Steel)	Table IV – Metric Bolt & Heli-Coil Insert Selection Guide Bolt Material Minimum Ultimate Tensile Strength MPa (megapascals)							
	300	400	500	600	800	1000	1200	1400
70	1.5	2	2.5	2.5	—	—	—	—
100	1	1.5	1.5	2	2.5	3	—	—
150	1	1	1.5	1.5	2	2	2.5	3
200	1	1	1	1	1.5	1.5	1.5	2.5
250	1	1	1	1	1	1.5	1.5	2
300	1	1	1	1	1	1.5	1.5	1.5
350	1	1	1	1	1	1	1.5	1.5

Assembly strength is a function of shear area and the shear strength of both the bolt and parent material. For detailed charts on specific load values, Heli-Coil Technical Bulletin 68-2 (inch) or Engineering Standard PP15 (metric) covers the complete range of sizes, parent materials and bolt strengths.

Type of Conditions & Protective Methods

Parent Material	Normal	Severe	Extremely Severe
Aluminum	None	1 & 2	1 & 2
Magnesium	1	1, & 2 or 3	1, 2 & 3

Corrosion Protection Methods

Method 1 – Parent Material Protection

ALUMINUM: For oxide coating use Alodine, Anodize, Iridite, Hard Coat or similar. Iridite 14 or 14-2 (MIL-C-5541) is recommended for critical parts rather than anodizing (MIL-S-5002).

MAGNESIUM: For oxide coating use Iridite 15 or dichromate surface treatments. For HAE finishes, always plug tapped holes first.

Method 2 – Coat the insert with one of the following:

Cadmium per QQ-P-416, Type II, .0001" thick; or Dry Film Lubricant per AS 5272 (MIL-L 46010) (no graphite).

Method 3 – Utilize Heli-Coil Primer-Free coated inserts or 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 the insert while the primer is still wet.

In addition to the above methods, further corrosion protection can be achieved by:

1. Using blind holes wherever possible.
2. Using a sealing, insulating or step-down (5052 Alum.) washer under the head of the bolt.
3. Using bolts that extend completely through the length of the insert.
4. In critical applications, using a non-hardening sealer or compound on the threaded assembly.

Corrosion Protection

The effect of corrosion on threaded assemblies is dependent on many factors — environment, types of metals used, sealing mechanisms and length of service. The following recommendations apply for minimizing the effects of corrosion on Heli-Coil stainless steel insert assemblies at operating temperatures less than 800°F, using carbon steel or alloy steel bolts.

The following definitions apply...

Normal Service – Natural atmosphere environment with the screw always assembled in the insert.

Severe Service – Mildly contaminated atmospheric conditions involving moisture, occasional exposure to salty air or sea spray and the screw may be left out of the insert for extended periods of time.

Extremely Severe Service – Assembly is exposed to salt water, corrosive atmosphere and/or the screw is out of the assembly frequently allowing a blind hole to trap water.

Heli-Coil insert specifications – inch

Nominal Thread Size	Type		Size Designation	"Q" Nominal Length					Outside Diameter		Number of Coils Nominal Length				
	Standard Insert No.	Screw-Lock Insert No.		1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.	Min.	Max.	1 Dia.	1-1/2 Dia.	2 Dia.	2-1/2 Dia.	3 Dia.
UNIFIED COARSE															
1 (.073)-64	1185	3585	01CN	0.073	0.110	0.146	0.182	0.219	.095	.103	2-3/4	4-7/8	6-7/8	8-7/8	10-7/8
2 (.086)-56	1185	3585	02CN	0.086	0.129	0.172	0.215	0.258	.110	.119	3	5-1/4	7-3/8	9-5/8	11-7/8
3 (.099)-48	1185	3585	03CN	0.099	0.148	0.198	0.248	0.297	.128	.139	2-7/8	5	7-1/4	9-3/8	11-1/2
4 (.112)-40	1185	3585	04CN	0.112	0.168	0.224	0.280	0.336	.144	.159	2-3/4	4-3/4	6-3/4	8-7/8	10-7/8
5 (.125)-40	1185	3585	05CN	0.125	0.188	0.250	0.312	0.375	.158	.173	3-1/4	5-1/2	7-3/4	10	12-1/4
6 (.138)-32	1185	3585	06CN	0.138	0.207	0.276	0.345	0.414	.178	.193	2-3/4	4-3/4	6-7/8	8-7/8	10-7/8
8 (.164)-32	1185	3585	2CN	0.164	0.246	0.328	0.410	0.492	.205	.220	3-1/2	6	8-3/8	10-3/4	13-1/4
10 (.190)-24	1185	3585	3CN	0.190	0.285	0.380	0.475	0.570	.244	.259	2-7/8	5	7-1/8	9-1/4	11-3/8
12 (.216)-24	1185	3585	1CN	0.216	0.324	0.432	0.540	0.648	.270	.285	3-1/2	6	8-3/8	10-5/8	13-1/8
1/4 (.2500)-20	1185	3585	4CN	0.250	0.375	0.500	0.625	0.750	.310	.330	3-3/8	5-3/4	8	10-3/8	12-3/4
5/16 (.3125)-18	1185	3585	5CN	0.312	0.469	0.625	0.781	0.938	.380	.400	4	6-5/8	9-1/4	11-7/8	14-5/8
3/8 (.3750)-16	1185	3585	6CN	0.375	0.562	0.750	0.938	1.125	.452	.472	4-3/8	7-1/4	10	12-7/8	15-3/4
7/16 (.4375)-14	1185	3585	7CN	0.438	0.656	0.875	1.094	1.312	.526	.551	4-1/2	7-3/8	10-1/4	13-1/8	16-1/8
1/2 (.5000)-13	1185	3585	8CN	0.500	0.750	1.000	1.250	1.500	.597	.622	4-7/8	7-7/8	11	14-1/8	17-1/8
9/16 (.5625)-12	1185	3585	9CN	0.562	0.844	1.125	1.406	1.688	.669	.694	5-1/8	8-1/4	11-1/2	14-3/4	17-7/8
5/8 (.6250)-11	1185	3585	10CN	0.625	0.938	1.250	1.562	1.875	.742	.767	5-1/4	8-1/2	11-3/4	15	18-3/8
3/4 (.7500)-10	1185	3585	12CN	0.750	1.125	1.500	1.875	2.250	.881	.906	5-7/8	9-3/8	13	16-1/2	20-1/8
7/8 (.8750)-9	1185	3585	14CN	0.875	1.312	1.750	2.188	2.625	1.022	1.052	6-1/4	10	13-3/4	17-1/2	21-1/4
1 (1.000)-8	1185	3585	16CN	1.000	1.500	2.000	2.500	3.000	1.166	1.196	6-3/8	10-1/8	14	17-3/4	21-5/8
1-1/8 (1.1250)-7	1185	3585	18CN	1.125	1.688	2.250	2.812	3.375	1.315	1.355	6-1/8	9-7/8	13-5/8	17-1/2	21-1/4
1-1/4 (1.2500)-7	1185	3585	20CN	1.250	1.875	2.500	3.125	3.750	1.443	1.483	7	11-1/4	15-3/8	19-1/2	23-3/4
1-3/8 (1.3750)-6	1185	3585	22CN	1.375	2.062	2.750	3.438	4.125	1.598	1.643	6-1/2	10-1/2	14-3/8	18-3/8	22-1/4
1-1/2 (1.5000)-6	1185	3585	24CN	1.500	2.250	3.000	3.750	4.500	1.727	1.772	7-1/4	11-1/2	15-7/8	20-1/8	24-1/2
UNIFIED FINE															
2 (.086)-64	1191	3591	02CN	0.086	0.129	0.172	0.215	0.258	.110	.119	3-1/2	5-7/8	8-3/8	10-3/4	13-1/8
3 (.099)-56	1191	3591	03CN	0.099	0.148	0.198	0.248	0.297	.131	.146	3-3/8	5-5/8	8	10-3/8	12-5/8
4 (.112)-48	1191	3591	04CN	0.112	0.168	0.224	0.280	0.336	.147	.162	3-3/8	5-5/8	7-7/8	10-1/4	12-1/2
6 (.138)-40	1191	3591	06CN	0.138	0.207	0.276	0.345	0.414	.173	.193	3-1/2	6	8-3/8	10-3/4	13-1/4
8 (.164)-36	1191	3591	2CN	0.164	0.246	0.328	0.410	0.492	.204	.224	3-7/8	6-1/2	9-1/8	11-5/8	14-1/4
10 (.190)-32	1191	3591	3CN	0.190	0.285	0.380	0.475	0.570	.236	.256	4-1/8	6-7/8	9-1/2	12-1/4	14-7/8
1/4 (.2500)-28	1191	3591	4CN	0.250	0.375	0.500	0.625	0.750	.306	.326	5	8-1/4	11-3/8	14-1/2	17-5/8
5/16 (.3125)-24	1191	3591	5CN	0.312	0.469	0.625	0.781	0.938	.380	.400	5-1/2	8-7/8	12-1/4	15-5/8	19
3/8 (.3750)-24	1191	3591	6CN	0.375	0.562	0.750	0.938	1.125	.448	.468	6-7/8	11	15	19-1/8	23-1/8
7/16 (.4375)-20	1191	3591	7CN	0.438	0.656	0.875	1.094	1.312	.524	.549	6-5/8	10-5/8	14-5/8	18-1/2	22-1/2
1/2 (.5000)-20	1191	3591	8CN	0.500	0.750	1.000	1.250	1.500	.592	.617	7-7/8	12-3/8	16-7/8	21-3/8	25-7/8
9/16 (.5625)-18	1191	3591	9CN	0.562	0.844	1.125	1.406	1.688	.666	.691	8	12-1/2	17-1/8	21-3/4	26-1/4
5/8 (.6250)-18	1191	3591	10CN	0.625	0.938	1.250	1.562	1.875	.733	.758	9	14-1/8	19-1/4	24-1/4	29-3/8
3/4 (.7500)-16	1191	3591	12CN	0.750	1.125	1.500	1.875	2.250	.876	.901	9-3/4	15-1/8	20-5/8	26	31-1/2
7/8 (.8750)-14	1191	3591	14CN	0.875	1.312	1.750	2.188	2.625	1.021	1.051	9-7/8	15-1/2	21-1/8	26-5/8	32-1/4
1 (1.000)-14*	1191	3591	16CN	1.000	1.500	2.000	2.500	3.000	1.156	1.186	11-1/2	17-7/8	24-1/4	30-5/8	37
1 (1.000)-12	1191	3591	161CN	1.000	1.500	2.000	2.500	3.000	1.169	1.199	9-5/8	15	20-1/2	26	31-1/2
1-1/8 (1.1250)-12	1191	3591	18CN	1.125	1.688	2.250	2.812	3.375	1.304	1.334	11-1/8	17-1/4	23-3/8	29-1/2	35-3/4
1-1/4 (1.2500)-12	1191	3591	20CN	1.250	1.875	2.500	3.125	3.750	1.439	1.469	12-1/2	19-3/8	26-1/4	33	39-7/8
1-3/8 (1.3750)-12	1191	3591	22CN	1.375	2.062	2.750	3.438	4.125	1.575	1.610	13-3/4	21-3/8	28-7/8	36-1/2	44
1-1/2 (1.5000)-12	1191	3591	24CN	1.500	2.250	3.000	3.750	4.500	1.710	1.745	15-1/4	23-1/2	31-5/8	39-7/8	48-1/8

*Inactive for new design.

1185-4CNY375S

Type	Size	Material	Finish	Length	Packaging
1185 Free Running, Coarse	See Chart	CN – Stainless Steel	Blank – None	See Chart	Blank – Bulk
1191 Free Running, Fine		BN – Phosphor Bronze	Y – Cadmium		S – Strip Feed
3585 Screw-Lock, Coarse		TN – Inconel X	V – Silver		
3591 Screw-Lock, Fine		EN – Nitronic 60	W – Dry Film Lubricant		
		GN – Titanium	HG – Primer Free		

Complete Part No. Example:
1/4-20 x .375 Free Running Insert, Cadmium plated on Strip Feed.

Notes on Insert Specifications:

- Nominal Length is a computed value and cannot be measured. It is the actual assembled length + 1/2 pitch.
- The number of coils are counted 90° from the tang.
- Grip Coil(s) Location: for 1, 1-1/2 and 2 diameter long inserts, Grip Coil Location = 1/2 the number of free coils. For 2-1/2 and 3 diameter long inserts, Grip Coil Location (distance from the tang) is the same as 2 diameter long inserts.