



Military and Aerospace Standard Wire Thread Inserts



Engineering speed, reliability and agility.

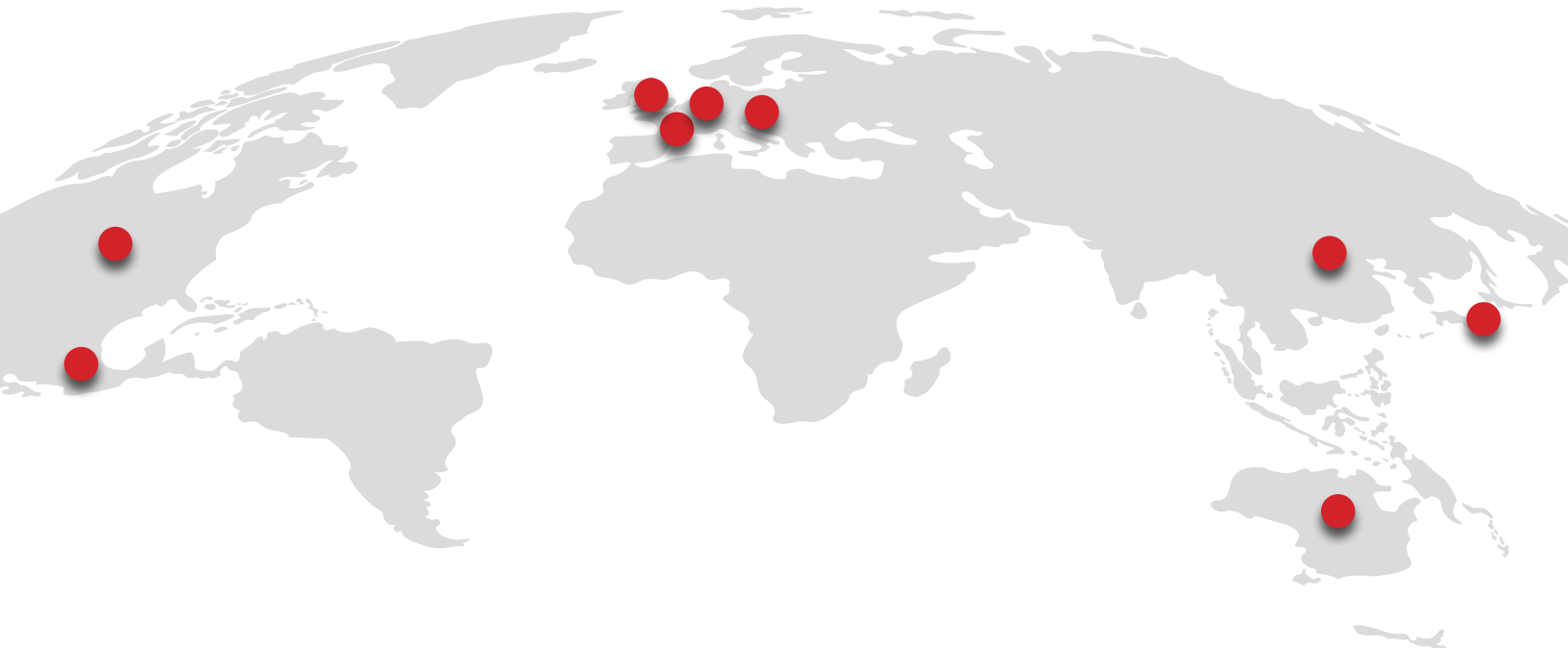
Howmet Fastening Systems Recoil® brand manufacturing operations are located in Australia, with sales and warehouse facilities strategically located in North America, Europe and Asia. We deliver high value, innovative solutions and are committed to program management excellence in support of the leading aerospace and defense systems around the world. We employ a strict quality management system to ensure global consistency of quality design standards

in manufacturing the full range of wire thread inserts in one production facility.

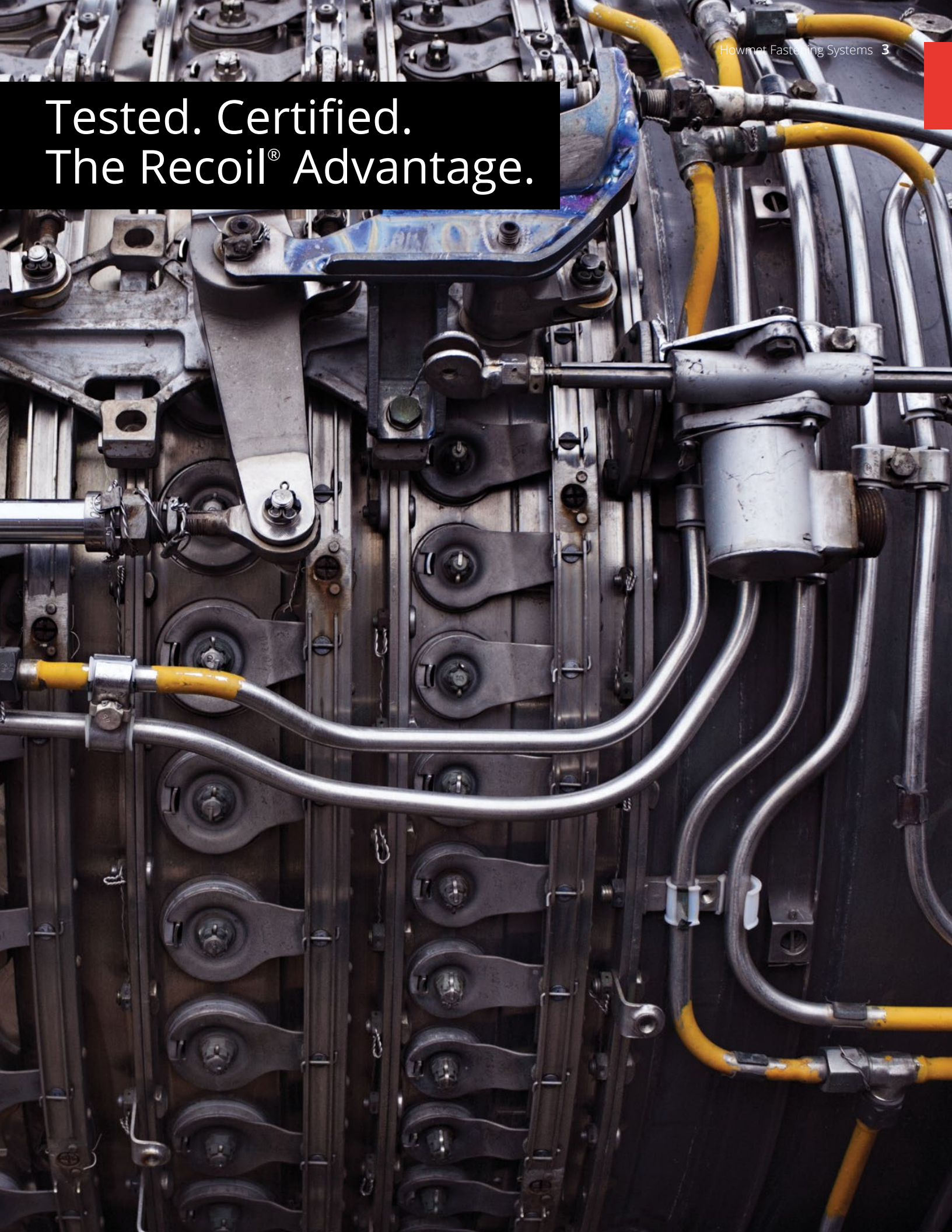
The Recoil value assures high standards and the consistency of all our products. Prompt availability of products to customers through our extensive worldwide distribution network of stocking distributors, coupled with our manufacturing strategy, offers significant advantages to end users worldwide.

Howmet fastening systems supports international customers across a variety of industrial markets.

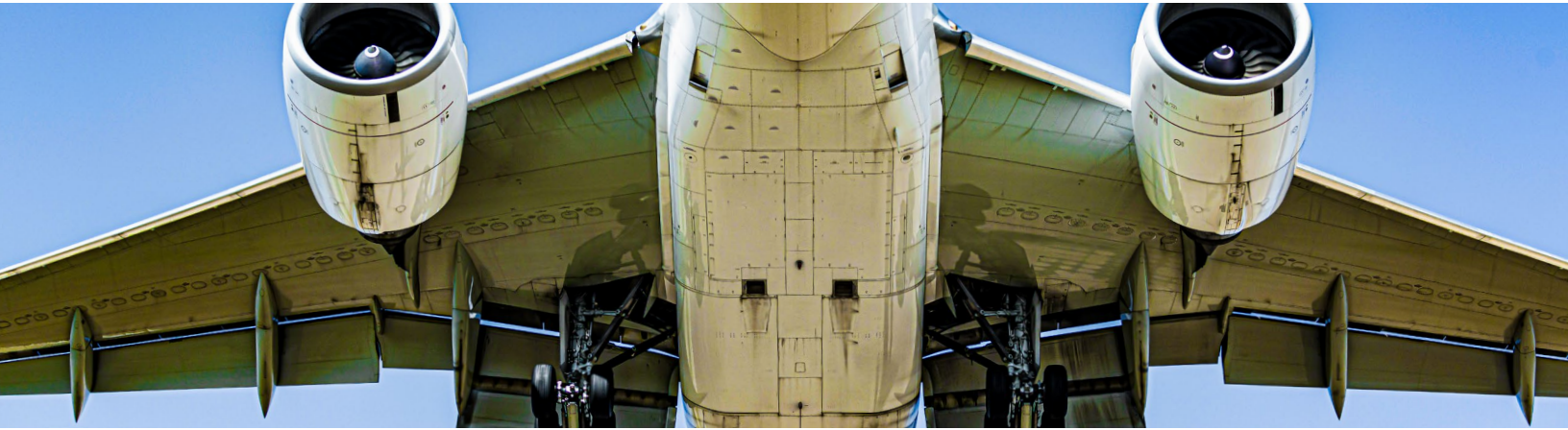
- Australia
- China
- France
- Germany
- Hungary
- Japan
- Mexico
- United Kingdom
- USA



Tested. Certified.
The Recoil[®] Advantage.



Recoil® Wire Thread Inserts



Recoil® thread inserts create high strength, wear-free and heat-resistant threads of the highest precision in low strength materials. Manufactured in free running and locking version, tanged and tangless®.

Recoil® thread inserts are available in a wide range of imperial or metric sizes and in a variety of thread forms. They are supplied in a range of materials and offer several surface treatments and coatings designed to prevent corrosion and galling.

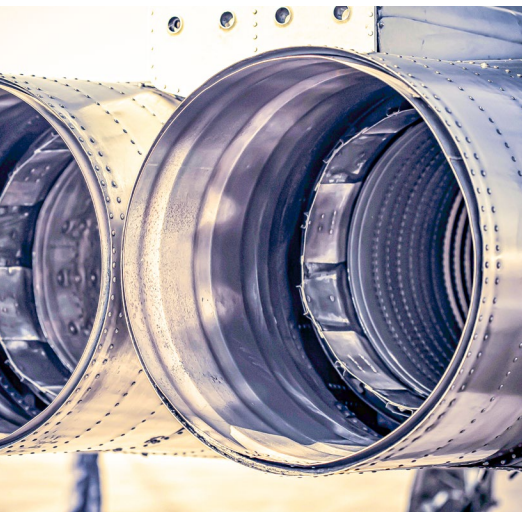
Recoil® inserts have been manufactured by Howmet Fastening Systems in Australia for over thirty years. Produced to proven design specifications and accredited worldwide by the most demanding of aerospace and

defense industries, we provide one of the widest ranges of insert solutions and technical accreditations in the world.

Recoil® is the brand that is used and trusted globally.

The purpose of this guide is to provide the buyer, designer and customer easy access to the numerous quality accreditations and classification series details that are in place worldwide.

Recoil® wire thread inserts are also manufactured to comply with individual customer requirements and a wide range of standards, including NASM, DIN, MA, BS, AGS and BAC112AE details, which are available on request.



Quality Management Systems Accreditations

- EN AS 9100
- EN ISO 9001
- ISO 14001
- IATF 16949

Military and Aerospace Standards

- NSAM21209
- NASM122076 to NASM122275
- NASM124651 to NASM124850
- MA3279
- MA3280
- MA3281
- MA3329
- MA3330
- MA3331
- AGS3700
- LN9039
- LN9499
- NA0276
- NAS1130

Recoil® Product Standards

| PART NUMBER | MATERIALS | | | | FINISHES | | | | | TYPE | | | | THREAD | | | |
|--------------------------|-----------------|--------|---------------|---------|----------------|---------------|---------------|---------------------|------|--------------|------------|--------|----------|--------|-----|---------------|-------------|
| | STAINLESS STEEL | BRONZE | INCONEL X 750 | NIMONIC | CADMIUM PLATED | DRY FILM LUBE | SILVER PLATED | SELF FINISH OR BARE | DYED | FREE RUNNING | SCREW LOCK | TANGED | TANGLSS® | UNC | UNF | METRIC COURSE | METRIC FINE |
| AGS3700 | | | | ● | | | ● | | | | ● | ● | | | ● | | |
| AGS4677 | ● | | | | ● | | | | | | ● | ● | | | | ● | ● |
| AS6733 | ● | | | | | | | ● | | ● | | ● | | | ● | | |
| AS6734 | ● | | | | | | | ● | | ● | | ● | | ● | | | |
| AS8455 | ● | | | | ● | | | | | ● | | ● | | | ● | | |
| AS8456 | ● | | | | ● | | | | | ● | | ● | | ● | | | |
| DIN65536 | | ● | | | | | ● | ● | | | ● | ● | | | | ● | ● |
| EN2942 | | | ● | | | | ● | | | | ● | ● | | | | ● | |
| EN2944 | ● | | | | | | | ● | ● | | ● | ● | | | | ● | |
| EN3542 | | | ● | | | | | ● | ● | | ● | ● | | | | ● | |
| LN9039 | ● | | | | | | | ● | ● | ● | | ● | | | | ● | |
| LN9039A | ● | | | | ● | | | | | ● | | ● | | | | ● | |
| LN9499 | ● | | | | | | | ● | ● | | ● | ● | | | | ● | |
| LN9499A | ● | | | | ● | | | | | | ● | ● | | | | ● | |
| MA3279 | | | | | | | | ● | | ● | | ● | | | | ● | ● |
| MA3280 | | | | | | ● | | | | ● | | ● | | | | ● | ● |
| MA3281 | | | | | ● | | | | | ● | | ● | | | | ● | ● |
| MA3329 | | | | | | | | ● | | | ● | ● | | | | ● | ● |
| MA3330 | | | | | | ● | | | | | ● | ● | | | | ● | ● |
| MA3331 | ● | | | | ● | | | | | | ● | ● | | | | ● | ● |
| NASM122076 to NASM122275 | ● | | | | ● | ● | | ● | | ● | | ● | | ● | ● | | |
| NASM124651 to NASM124850 | ● | | | | ● | | | ● | | ● | | ● | | ● | ● | | |
| NASM21209 | ● | | | | ● | ● | | ● | ● | | ● | ● | | ● | ● | | |
| NA0276 | ● | | | | ● | ● | | ● | | ● | ● | | ● | | | ● | ● |
| NAS1130 | ● | | | | | | | ● | | ● | ● | | ● | ● | ● | | |

Detailed Recoil® Product References are available for download at hfsindustrial.com:

[Recoil®-Technical Catalogue – RC0007-AUS 0520](#)

[Recoil®-Product Conversion – HFS7045 0122](#)

[Recoil®-Tangless Wire Thread Inserts – HFS7045 0921](#)

[Recoil®-Wire Thread Inserts and Tooling – HFS6611 0120](#)

Insert Material Guide

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



304 Stainless (Standard)

Most general applications in all materials.
Manufactured to AS7245.



Phosphor Bronze (P)

Designed for electrical applications, Phosphor Bronze inserts provide no outside interference of signals and are ideal for circuit boards, telecommunications control boxes and medical equipment.



Nimonic 90 (N)

Designed for aerospace and turbine applications, Nimonic 90 is an austenitic alloy for use in high temperature applications. These inserts can withstand long term temperatures of 1100°F/600°C and short term temperatures up to 1650°F / 900°C.



Inconel (X)

Inconel X-750 is an alloy material with excellent high heat resistance and strength characteristics. 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.



Nitronic 60 Inserts (T)

Designed for applications where galling can be a problem, Recoil Nitronic 60 inserts' wear-resistant characteristics eliminate the need for additional lubrication. These inserts deliver more consistent clamping torque and are suitable for use with stainless steel screws.

Materials

| 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 Zinc Nickel |
| Nimonic 90 (N) | 650°C (1200°) | 550°C (1020°F) | Aerospace / Turbine applications | Silver |
| Nitronic 60 (T) | 425°C (800°F) | 315°C (600°F) | Anti-galling | Dry film lubricant |
| Phosphur 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 |



Insert Coatings and Platings

Recoil® aerospace wire thread inserts are available in the following finishes:



Silver Plating

- Recommended to reduce galling of threads at high temperatures
- For use up to 1200° F / 650°C
- Material Specifications:
QQ-S-365 / SAE AMS 2411 / EN2786 / DTD939
- Color: silver white



Cadmium Plating

- Provides high corrosion resistance
- Provides lubrication to prevent galling
- Not recommended for new designs due to its toxic nature
- Material Specifications:
QQ-P-416 Type II / DEF STD 03-19
- Color: gold to yellow. olive drab for NASM21209

Recoil® thread inserts for aerospace are available in the following surface finishes and platings depending on the Recoil® base material:

| MATERIAL | NON-FINISHED | DRY FILM LUBRICANT | CADMIUM PLATING | SILVER PLATING | ZINC NICKEL |
|---------------------------|--------------|--------------------|-----------------|----------------|-------------|
| Stainless Steel Grade 304 | ● | ● | ● | ● | ● |
| Bronze | ● | | | | |
| Inconel X 750 | ● | ● | | ● | |
| Nimonic 90 | ● | | | ● | |
| Nitronic 60 | ● | ● | | | |
| Stainless 316 | ● | | | | |

Other finishes are available on request.



Dry Film Lubricant

- Provides additional lubrication in high friction applications
- High temperature resistance up to 400°F / 240°C
- Highly recommended with Recoil® screwlock inserts
- Mildly corrosion resistant
- Material Specifications:
MIL-L46010 / AS5272
- Color: gray



Color Coding

- Facilitates verification of insert installation
- Allows for quick identification of similar size inserts
- Colors: red, green and blue
- In general all Recoil® locking inserts (imperial and metric dimensions) are supplied with a red coloring in accordance with NASM21209.
- Colorings of the Recoil® thread inserts for identification purpose according to customer specific requirements are also available.



Zinc Nickel

- See the tech catalog for information
- Zinc Nickel electroplating is an alloy coating
- Zinc nickel has equivalent or better corrosion properties when compared to Cadmium
- RoHS compliant
- Material Specification:
AMS2417
- Color: Undyed – Gray color,
Dyed - Blue

Recoil® Tools



Tapping Tools



Gauges



Manual Installation Tools



Pneumatic, Electric and Battery Installation Tools



Tang Removal Tools



Stripfeed Systems

Recoil® Tangless® Tools



Repair Kits



Tangless® Installation Mandrel (Hex)



Tangless® Front End Assembly



Howmet Fastening Systems

Industrial Division Brands



Huck, Marson, Recoil, Keysert, Camloc and Simmonds are trademarks of Howmet Aerospace Inc. and/or its subsidiaries.

Tangless is a registered trademark of Advanex Inc.

North America

Waco Operations

PO Box 8117
8001 Imperial Drive
Waco, TX 76714-8117
Tel: +1 800-388-4825
Fax: +1 800-798-4825
sales.waco@howmet.com

Kingston Operations

1 Corporate Drive
Kingston, NY 12401
Tel: +1 800-278-4825
Fax: +1 845-334-7333
sales.kingston@howmet.com

Tracy Operations

1925 North MacArthur Drive
Tracy, CA 95376
Tel: +1 800-826-2884
Fax: +1 800-573-2645
sales.idg@howmet.com

Global

Telford Operations

Unit C, Stafford Park 7
Telford, Shropshire
England TF3 3BQ
Tel: +44 (0) 1952-290011
Fax: +44 (0) 1952-290459
sales.telford@howmet.com

Melbourne Operations

1508 Centre Road
Clayton, Victoria
Australia 3168
Tel: +613-8545-3333
Fax: +613-8545-3390
hfsmel.sales@howmet.com

Tokyo Operations (Japan & Korea)

8F CIRCLES Nihonbashi-
Bakurocho Bldg
1-5-12 Nihonbashi-Bakurocho
103-0002 Tokyo Japan
Tel: +81-3-5642-8360
Tel: +81-3-5642-8361 x8365
Fax: +81-3-5644-5772

Suzhou Operations

58 Yinsheng Road,
SIP Suzhou, Jiangsu
215126 China
Tel: +86-512-62863800-8888

hfsindustrial.com

[YouTube.com/HFSIndustrial](https://www.youtube.com/HFSIndustrial)

The information contained in this publication is only for general guidance, and is not intended to create any warranty, express, implied, or statutory; all warranties are contained only in Howmet Fastening Systems' written quotations, acknowledgments, and/or purchase orders. It is recommended that the user secure specific, up-to-date data and information regarding each application and/or use of such products.