



# COME AND JOIN WITH US!

**Aerospace Manufacturing** hears from joining technology and assembly specialist, Böllhoff about its Helicoil Tangfree - the tang-free coil thread insert for high-strength threads.

**L**ast year, Böllhoff celebrated the 65th birthday of Helicoil, a product that has grown and reinvented itself over the years. The Helicoil allows you to create, reinforce and repair threads for high resistance fasteners.

This year Böllhoff is celebrating another birthday. Still within the Helicoil family, it is the 10th anniversary of the Helicoil Tangfree insert, developed and produced by the Böllhoff in Germany. The Böllhoff Group is one of the competence leaders in fastening technology, particularly in the Helicoil market and Helicoil Tangfree has many benefits that address the needs of customers and the market.

The main advantage of the Helicoil Tangfree insert is that no tang is required for the installation - therefore, tang break and tang removal operations are eliminated, which leads to a reduced installation time.

In terms of the installation time, comparisons between the Helicoil Plus and the Helicoil Tangfree show these results: whilst both have an installation time of 10 seconds, the tang breaking and removal time is 5 seconds for the Plus and zero for the Tangfree, so the total cycle time - including tang breaking and removal - is 15 and 10 seconds respectively. This means Helicoil Tangfree offers a cycle time reduction of up to 33% compared to Helicoil Plus. There is also a quality, non-negligible

role, which eliminates the risk of foreign object damage (FOD). With the absence of a tang, there is no risk of forgetting the tang after its removal.

#### Beating wear and tear

Helicoil Tangfree thread inserts are made of austenitic chrome-nickel steel (minimum tensile strength 1,400N/mm<sup>2</sup>). The high surface quality of the rolled thread ensures a high-strength, wear-resistant thread with an extremely small and constant thread friction torque. Strength is the main characteristic and benefit of the Helicoil Tangfree.

In fact, without thread inserts, force is distributed on the first third coils. With a Helicoil, it is distributed over all coils. This gives it a better, more reproducible surface definition. The thread insert has a much more even contact surface, and also has the advantage of matching imperfections in the screw and the internal thread, thereby increasing the contact surface area. With a thread insert, the average diameter of the thread - which takes up the force of the screw - is larger and therefore mathematically increases the support surface.

Also, the friction coefficient is both lower and less dispersive than that of a machined thread. Torsion stress from the screw is considerably reduced. Compared to tapped threads, the surface roughness of the Helicoil Tangfree is reduced by 90%. Therefore,

→ Böllhoff recently celebrated the 65th anniversary of the Helicoil (above)

→ Screwlock: the screw is locked by one or several polygonal-shaped threads clamping the flanks of the screwed-in screw (below)

a higher, constant preload-force is achieved for repeated cycles at the same tightening torque. The utilisation of the yield point of high-strength screws is improved. The thread insert is more resistant to pulling out in the event of high stress or in the case of repeated stress.

The standard material of the Helicoil Tangfree prevents seizing of screws under environmental influences. Helicoil Tangfree thread inserts of nickel-based materials are available for thermally highly stressed screw joints. Elasticity and spring force remain constant. With its stainless characteristics, the Helicoil Tangfree forms a corrosion free seal between the support and the screw. It therefore prevents unscrewability due to atmospheric or thermal corrosion conditions.

The Helicoil Tangfree insert corresponds to today's trend towards





lightweight construction because this method of thread reinforcement combines minimum space requirements and high strength. High-strength screws are therefore perfectly suitable for low-shear materials. Furthermore, a reduced number of joints and smaller screw sizes saves material, installation space and weight - at high fatigue strength. These are definite advantages of the Helicoil system.

Helicoil Tangfree inserts are used all around the world in diverse applications, particularly in the aerospace sector. Böllhoff thread inserts meet aerospace current technical standards NA0276 (compliant to

→ Böllhoff has developed its Free Running helicoil where tang break and removal are not required (above)

→ Helicoil E-PSG 256 Quick Exchange ensures excellent tool life, process reliability and reduced installation time (right)

MA1565 standards) for metric sizes and NAS1130 (compliant to NASM8846 standards) for imperial sizes. With the use of light alloys to reduce part weight, the demand for the Helicoil Tangfree system is increasing. Tangfree branded inserts are key components in the build of cabins, propulsion systems, structures for civil and military aircraft, and in the space sector.

Böllhoff Tangfree thread inserts can prevent customers losing time in removing the tang and avoid FOD risks. Inserts are mounted in cast aluminium, magnesium or stainless steel in hydraulic block, door actuator, cockpit equipment and structure pieces.

Böllhoff says it has developed two versions of Tangfree, the first of these is the basic version, 'Free Running' where tang break and removal isn't required. Combined with the matching installation tools, this current innovation in the Helicoil technology is a perfect addition to the Helicoil product family. The second version is Screwlock where the screw is locked by one or several polygonal-shaped threads clamping the flanks of the screwed-in screw. The elastically resilient frictional locking results in prevailing torques compliant to the specifications of

NASM8846 and MA1565 respectively for imperial and metric sizes.

Additionally, by developing the Helicoil E-PSG 256 Quick Exchange system, Böllhoff says it has set new standards for demanding industries. This next generation electrical installation tool enables the reliable assembly of Helicoil Tangfree inserts and other Helicoil types. Helicoil E-PSG 256 Quick Exchange is an optimal solution to ensure excellent tool life, process reliability and reduced installation time. Helicoil Tangfree products are identical in form and fit to other Helicoil types except there is no need for tang removal, which results in very significant reduced installation time and quality gain.

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