

Higher process reliability in threading: the right coating makes the difference

Balzers, Liechtenstein, November 2022 – **Screw connections play an important role in the cost-intensive and safety-relevant components used in mechanical engineering. The required internal threads are usually manufactured at the end of the production process and their production is technically demanding. If the necessary thread quality is not achieved or a threading tool breaks, this can lead to scrap or costly production interruptions. Coatings for threading tools from the Oerlikon Balzers brand ensure high process reliability, increase tool life and enable shorter cycle times thanks to their surface properties exactly designed for these applications.**

In metalworking, one thing holds true: screws hold the world together. So a variety of types of threads can be found in almost all machines and units, turbines and engine blocks, gearboxes and even in everyday objects such as mobile phones. Many factors have to interact in their production, and in addition to tool parameters such as the substrate, geometry and design of the cutting edge, the coating plays an essential role.

Threading often comes at the end of production. The more complex the production process, and therefore the more expensive the component, the greater the damage would be if the tool failed. The workpiece would either no longer be usable and would have to be disposed of or be reworked, which costs time and money. In both cases, the result is high material and labor costs and lower production efficiency.

Increasing requirements for threading tools

In order to save weight or material, or to enable a more compact design, shorter thread taps are often specified – another challenge for the manufacturing industry, which at the same time has to increase its productivity and reduce its production costs. The goal is extending tool service life and increasing process stability while continuing to produce high-quality threads. This can only be achieved with a low coefficient of friction, which leads to a low torque with fewer peak loads and also ensures safe chip flow during thread production.

BALIQ – the perfect coating technology for threading tools

Only premium-quality tools can meet all these requirements and ensure an economical and reliable manufacturing process with consistent production quality together with the often tight tolerances. Where standard TiN and TiCN coatings for tool optimization reach their limits in threading, the BALIQ coating family from Oerlikon Balzers offers a more efficient alternative. It is based on S3p (Scalable Pulsed Power Plasma) technology, which intelligently combines the advantages of arc evaporation and magnetron sputtering, and it produces exceptionally smooth and defect-free surfaces.

BALIQ thin-film coatings prevent material adhesion and built-up edges even on materials that are difficult to cut. The homogeneous coating thickness distribution ensures extremely precise cutting edges. This enables a consistent chip flow, minimizing scrap and preventing expensive and time-consuming mechanical reworking. As a result, BALIQ offers significantly longer tool life, higher process reliability and greater efficiency in all application conditions.

BALIQ AUROS – a special coating for steel and cast iron

BALIQ AUROS (AlCrN+TiN) has been specially developed for forming and tapping in alloy and carbon steel. While the AlCrN base layer offers very high wear resistance, the top layer has a low chemical affinity to the material to be machined and is therefore a reliable way to prevent material build-up. Tailored coating properties, combined with a defect-free coating surface and minimal torque, enable high performance and significantly better process stability for threading tools.

When threading in medium carbon steel (C45), an end user was able to produce 4,500 threads at a cutting speed of 30 m/min – an increase of around 30 per cent compared to a TiCN-coated tool that only achieved 3,500 threads.

BALIQ ANTOS – the preferred choice for tapping stainless steel

Oerlikon Balzers recently introduced BALIQ ANTOS, a high-performance coating specifically designed for tapping into stainless steel. BALIQ ANTOS also has a multilayer structure: the AlCrN base layer ensures very high wear resistance, and the WC/C top layer gives it an extremely dense and smooth surface. Due to dry lubrication and a low coefficient of friction, this top layer enables a smooth cutting-in phase with lower torque peaks. Above all, these properties ensure reliable machining of stainless steels.

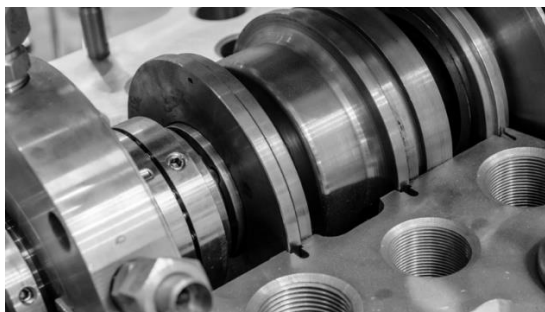
For more information on Oerlikon Balzers' BALIQ coatings for threading, visit:

BALIQ AUROS: <https://www.oerlikon.com/balzers/baliq-auros/>

BALIQ ANTOS: <https://www.oerlikon.com/balzers/baliq-antos/>



BALIQ AUROS is based on Oerlikon Balzers' innovative S3p technology and reduces welding of the tool surface with the workpiece to enable top-quality tapping and forming results.



(Image Source: Shutterstock Inc.)

In mechanical engineering, screws hold the world together, but without threads they are useless. High-quality threading tools coated with solutions from Oerlikon Balzers improve machining quality, increase tool service life and enable shorter cycle times.

For more information, please contact:

Petra Ammann
Head of Product Marketing Communications
Oerlikon Surface Solutions
T +423 388 7500
petra.ammann@oerlikon.com
www.oerlikon.com/balzers

About the Oerlikon Surface Solutions division

Oerlikon is a leading global provider of surface and additive manufacturing solutions and services. The division offers an extensive portfolio of market-leading thin-film, thermal spray and additive manufacturing technologies, equipment, components and materials. Emission reduction in transportation, maximized longevity and performance of tools and components, increased efficiency and intelligent materials are hallmarks of its leadership. Pioneering technology for decades, the division serves customers with standardized and customized solutions across a worldwide network of more than 170 sites in 37 countries.

With its technology brands – Oerlikon Balzers, Oerlikon Metco and Oerlikon AM – the Oerlikon Surface Solutions division focuses on technologies and services that improve and maximize performance, function, design, reliability and sustainability, which are innovative, game-changing advantages for customers in the automotive, aviation, tooling and general industries and in the luxury, medical, semiconductor, power generation and oil & gas markets.

The division is part of the publicly listed Oerlikon Group (SIX: OERL), headquartered in Switzerland, which has 12,000 employees and generated CHF 2.65 billion in revenue in 2021. For more information see www.oerlikon.com/surface-solutions