

## PIONEERING SURFACE SOLUTION FOR HARD-METAL CUTTING TOOLS

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The new **SISTRAL®-plus** tool coating can withstand the increasingly tough requirements in the field of hard-metal cutting.

Rising temperatures, high cutting and feed rates, extremely hard workpieces – the requirements for hard-metal cutting tools are continuously increasing.

In addition, dynamic metal-working procedures such as trochoidal milling put strain on much greater lengths of the cutting edges. How can a tool coating help you keep one step ahead of such requirements?

## CHALLENGE

When workpieces are made from hardened steel (up to 66 HRC), tools quickly reach their limits. These load limits are becoming more significant every day in the aerospace industry, in mould building for the plastics industry and in plant engineering.

Here, cutting edges are exposed to high temperatures and cutting forces and thus wear out much faster, especially when used in dry cutting. Commercially available tool coatings are of only limited help in withstanding these increased requirements and improving service life.

The development department at voestalpine eifeler Vacotec GmbH decided to take on this challenge and find an optimised layer for the specific requirements in hard-metal cutting. They took our well-known SISTRAL® hard-metal cutting coating as their starting point.



## SOLUTION

This development work resulted in a coating based on the successful predecessor, the SISTRAL® coat. Like this modern classic, SISTRAL®-plus is a complex, nanostructured coating architecture. It is generated in the PVD systems of voestalpine eifeler Vacotec.

The coating structure is tailored to hard metal tools with excellent layer adhesion and a friction-reducing top coat. The special coating structure combines optimal wear resistance at high temperatures with an insensitivity towards high pressure loads.

The top coat, with an innovative teal colour, reduces friction and assists in good chip removal.

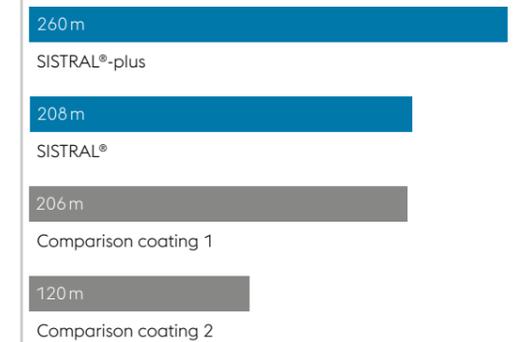
## TESTING UNDER REAL CONDITIONS

In order to test the new coating in operation, customer tools were tested with the new coating and then compared to other tool coatings. To this end, tests were conducted with end mills from various manufacturers in various machining operations.

Across all tested operating parameters, tools with the new SISTRAL®-plus coating statistically demonstrated consistently longer service lives. Service life increased by around 30% on average.



Feeding path until tool change  
(Breakage at wear mark width = 0.10 mm)



### Information on the test procedure

Machine: Hamuel VS4000  
Procedure: Copy milling, dry  
Tools: VHM milling cutter spherical head, D = 10 mm  
Material: S790 / 66 HRC

“We were able to measure cutting performance on an identical workpiece. Tools coated with SISTRAL®-plus lasted 30% longer on average. I am impressed every time at the potential offered by a PVD coating that is just 3 µm thick. For series production, this means fewer tool changes or higher cutting parameters, and thus an immediate increase in productivity.”

A. Hollweck, Product Manager at voestalpine eifeler Coating

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ONE STEP AHEAD.