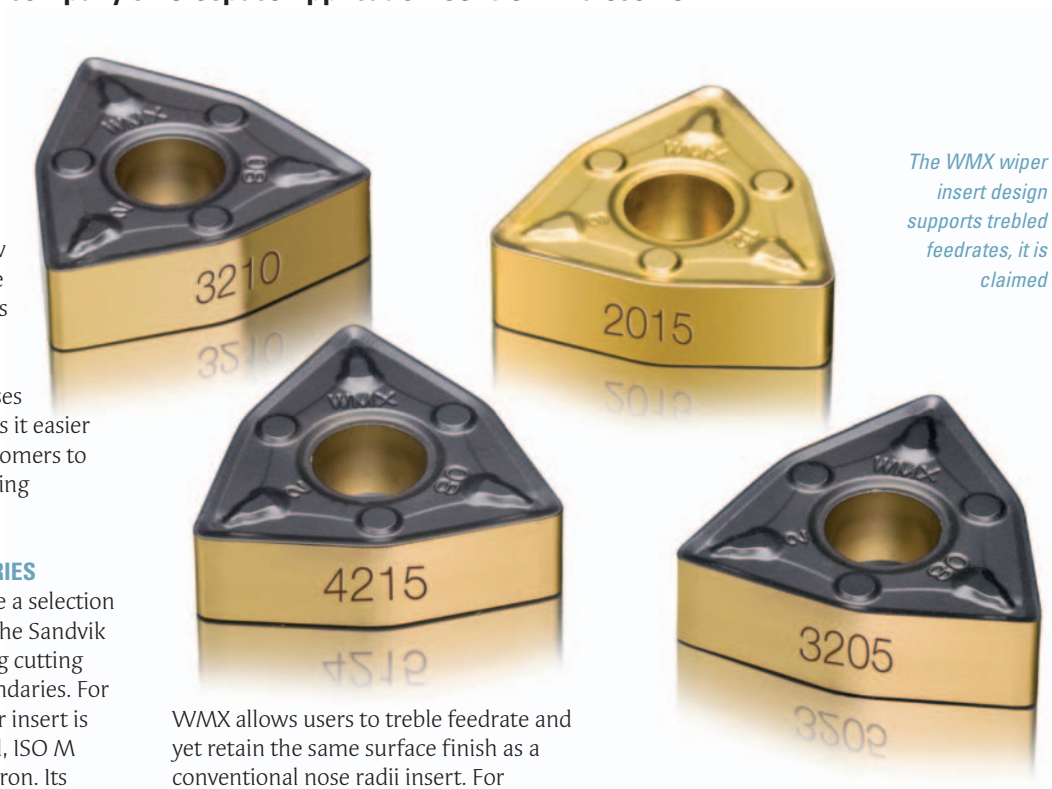
Aerospace effort

The unveiling of Sandvik Coromant's latest tranche of new products also provided Steed Webzell with the opportunity to visit the company's Aerospace Application Centre in Halesowen



The WMX wiper insert design supports trebled feedrates, it is claimed

Such is the level of innovation at Sandvik Coromant that it releases between 2,000 and 3,000 new products every year. To ensure the marketing department has time to catch its breath, the company bundles its new products into bi-annual releases called 'CoroPaks'. It also makes it easier for existing and potential customers to get to grips with the new tooling technology on offer.

PUSHING CUTTING BOUNDARIES

This autumn's releases include a selection of innovations that continue the Sandvik Coromant tradition of pushing cutting tool technologies to new boundaries. For instance, the new WMX wiper insert is targeted at turning ISO P steel, ISO M stainless steel and ISO K cast iron. Its secret is an optimised nose radius that enables high surface finish characteristics to be achieved without compromising feedrate.

According to Sandvik Coromant, the WMX allows users to treble feedrate and yet retain the same surface finish as a conventional nose radii insert. For instance, using WMX wiper inserts (CNMG shape, GC4215 grade), it is possible to achieve 0.66 micron surface finish when cutting EN8 steel at 350 m/min with a feedrate of 0.5 mm/rev for roughing (0.4 mm/rev finishing).

New from a rotating tools perspective is the CoroMill 690, a long-edge cutter designed to give high productivity when

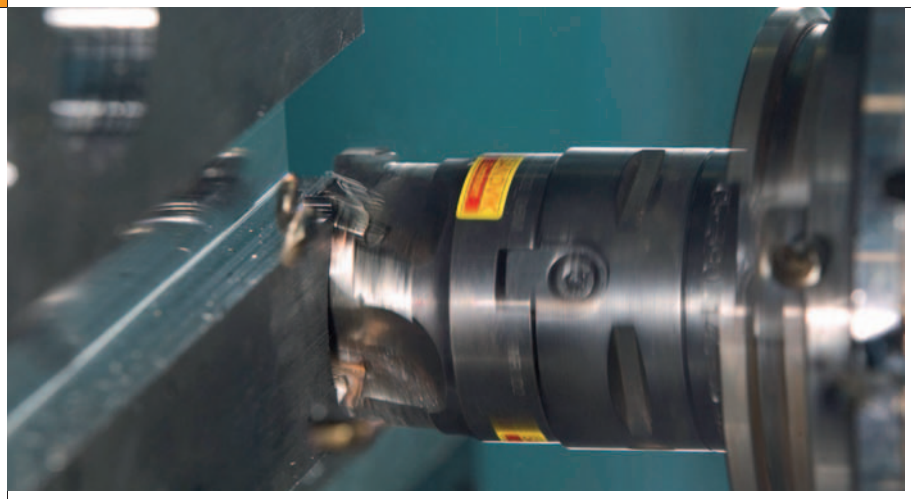
Sharp grades for light turning

Sandvik Coromant is introducing two new sharp and tough insert grades, GC1125 for stainless steel and GC1515 for steel applications. The inserts are suitable for use where applications demand a sharp cutting edge with high edge-line integrity when light turning.

Designed for short engagements, machining of small parts, or when additional edge toughness is needed, typical applications include interrupted cuts, machining into shoulders and internal finishing.

GC1125 provides high edge sharpness for secure, burr-free machining of stainless steels and gives the toughness required for intermittent cuts. It is also a strong performer in sticky materials and a good choice for vibration-free machining. The improved edge line strength and sharpness maintain good chip control, surface finish and tool life at lower feedrates.

GC1515, for steel machining, benefits from the combination of a wear resistant coating and a tough edge, providing the ability to produce more components per cutting edge, while maintaining close tolerances, with a minimal number of off-set corrections.



The CoroMILL 490 range is now available for ISO K cast iron applications

peripheral edge milling titanium alloys used typically for structural aerospace components such as airframes, wings, fuselages and landing gear. Additional applications for CoroMill 690 include circular interpolation from a pre-drilled hole, edging, contouring and repeated square-shoulder milling.

The new cutter uses four-edged inserts for economic 2D profile operations. Each insert is secured by Sandvik Coromant's innovative iLock interface, which provides high levels of axial support to prevent insert breakages on the bottom row. CoroMill 690 has a Coromant Capto design that provides users with additional stability and shank clearance, essential when machining long overhangs and reaches. The cutter is available in diameters of 50 to 100 mm and will perform well on ISO 40 machines.

Furthermore, every insert pocket on CoroMill 690 has a threaded coolant hole to accept a nozzle for high pressure coolant delivery to optimise chip evacuation, a great advantage when face or shoulder milling in cavities, pockets or full slots. Users of low pressure coolant systems (typically 10 bar or less) can use the threaded holes to insert restricted flow nozzles or plugs to generate higher pressure where it is needed most. However, CoroMill 690 cannot be used for ramping or helical milling from solid – a result of its true 90° shoulder.

Solutions for aerospace such as CoroMill 690 are almost certain to become more frequent following the establishment of Sandvik Coromant's Aerospace Application Centre at its UK headquarters in Halesowen.

"The Aerospace Application Centre allows us to focus on specific aerospace components and features, and generate solutions," says centre manager Paul Smith.

"Each project we decide to undertake has to meet certain Sandvik Coromant requirements. For instance, there has to be a genuine market demand for the solution; unfortunately, it's simply not economically viable to develop new tooling solutions to problems faced by individual sub-contractors, for example."

LATEST MACHINING TECHNIQUES

At the Aerospace Application Centre, the latest machining techniques are deployed on machines such as a Mazak Integrex 200-III, twin spindle B-axis turn-mill centre. Strategies include: spiral cut length; cutting with high pressure coolant; 'roll-in' techniques when milling to save overloading the spindle bearings and providing greater tool life; trochoidal turning; pocketing strategies; and B-axis turning.

Sandvik Coromant says that the Aerospace Application Centre is at full capacity, and the company is understandably guarded about current projects. However, as an example, the company is happy to say that it has worked extensively with a leading aerospace OEM in recent times to develop a solution for machining landing gear components manufactured from Ti-5553, an increasingly popular titanium alloy that is gradually overtaking old favourites such as Ti-64.

The Advanced Manufacturing Research Centre in Sheffield, of which Sandvik Coromant is a Level 1 sponsor and collaborator, has also been heavily involved in this and many other projects.

Other recent work has looked at varying the axial depth of cut when performing 5-axis machining on turbine blades to avoid insert notch wear.

"Overall the Aerospace Application Centre has already been instrumental in highlighting issues where product development is needed," says Mr Smith.

"From research carried out here, Sandvik Coromant Application Guides have been developed for titanium milling, blade machining and multi-task machining."□

Cast iron bet for milling

New additions to the CoroMill 490 milling cutter family are now available for ISO K cast iron applications. Since its introduction for ISO P steel earlier this year, Sandvik Coromant says that customers have reported productivity increases exceeding 40 per cent, some even citing more than 50 per cent, using CoroMill 490 for shallow-cut face and shoulder milling.

CoroMill 490's performance, versatility and productivity are now available for machining cast iron. The programme extension includes five new insert grades and geometries, two for ISO K cast iron and three for ISO P steel.

CoroMill 490 gives true 90° cuts without sharp steps or mismatch. Its application versatility for face and shoulder milling reduces tool costs and tool inventories, while its smooth cutting action is said to reduce sound levels. CoroMill 490 inserts have four cutting edges with advanced geometry design and grades that give sharper edge lines and simultaneously reduce cutting forces.

CoroMill 490 maximises the potential of smaller machining centres with 30 to 40 taper size spindles that are often used in the shallow cutting of near net-shape castings and forgings.