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SGS JetStream technology delivers cool performance benefits

SGS Carbide Tool is a company with a global reputation for developing and commercialising cutting tool technology that ultimately provides engineering and manufacturing businesses with significant advantages. One such successful development is the Patented JetStream coolant feeding technology offered on a number of the high performance tool ranges manufactured by SGS.

Extensive research and development applied by SGS engineers to the JetStream technology over a number of years has resulted in a method of ensuring coolant is efficiently supplied to the shear zone – the interface between the cutting edge of the tool and the raw material of the workpiece that is being cut away. The coolant helps maintain thermal stability, provides lubrication for the cutting action and also flushes the swarf away to reduce the chance of 'stirring' or re-machining the chips.

Of course, coolant supplied through-the-tool can also deliver fluid to this high stress, high temperature area. However, as Executive Vice President of Manufacturing, Jeff Burton, explains: "Coolant holes have a slight weakening effect on the business end of the tool, and in cases where the hole or holes only exit the end, the tool needs to be over the workpiece for the coolant feed to be effective.

"JetStream does not weaken the tool and it provides cooling when the tip is not over the workpiece. The two methods could be used together providing the coolant pumping capacity of the machine tool is sufficient. However, in many cases customers will also want to run the flood

coolant. JetStream efficiently removes the chips out of a pocket or slot, but they can accumulate on the workpiece top surface and need to be removed by some means, such as flood coolant."

During the research and development of the JetStream technology, SGS engineers experimented with different slot locations on the circumference of the tool, helical versus straight feed slots were tested, and different tool types that might benefit from JetStream were applied to various material cutting trials. Once the extensive tests settled these issues, the optimum design was selected and it has remained unchanged since its introduction.

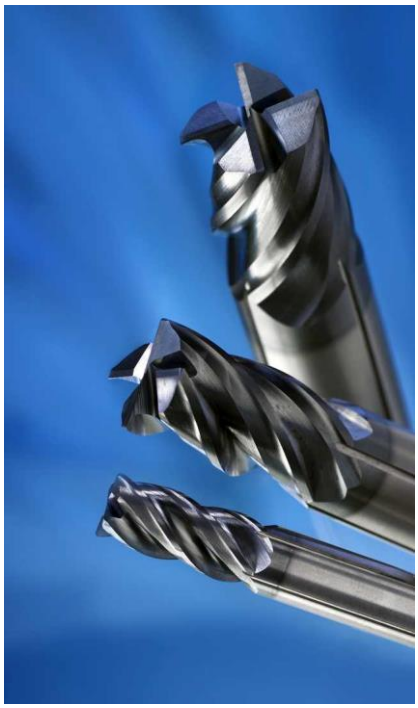
The water miscible coolant, which remains at the coolant suppliers' recommended strength of usually 5 to 8 per cent, is fed via the X channel ground into the back of the tool shank. This feeds the coolant to the side grooves that transfer the fluid to the shear zone. The exact grinding profile of the slots used is a closely guarded secret. Although they are open channels, the slots retain the cutting fluid even at elevated spindle speeds.

"We have tested JetStream in aluminium at up to 10,000 rpm," Jeff Burton states. "At that speed, with 1,000 psi coolant pressure, and using a standard length tool, the effects of centrifugal force were minimal and JetStream was still effectively delivering the coolant precisely to the targeted area. JetStream has become a must on Z-Carb-AP roughing aerospace applications, in some cases has doubled tool life when applied to titanium, stainless steels, Inconel and other difficult to machine materials."

He concludes: "It is a fact that the correct application of coolant can improve tool life and reduce cutting loads, as well as improve machining accuracy and surface finish. With JetStream technology manufacturing businesses can be sure that the coolant is reaching the correct location – the shear zone. We find it particularly beneficial during deep slotting or pocketing operations, where normal flood cooling has difficulty removing the chips."

***Caption**:*

(JS1.jpg) Available from SGS, the Patented JetStream technology delivers significant cutting tool performance benefits by ensuring coolant is delivered to the shear zone



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(JS3.jpg)