

PRESS RELEASE

Tooling Application Story – Disc Milling Part-off



HORN M101 SYSTEM CUT ABOVE THE COMPETITION AT SRD ENGINEERING

By utilising Horn Type M101 disc milling cutters, precision engineer SRD Engineering Ltd has gained extreme improvement in part-off/cut-off operations, reducing overall cycle times by around 10 minutes per component. In addition the inserted carbide tooling can process large quantities of components before the need for insert exchange arises, whereas an HSS saw required re-sharpening after each component. Moreover, a single insert geometry/coating can be utilized on a wide variety of exotic materials, rationalising the requirement for different geometries/coatings for different material specifications.

In a world where time is everything there is always a chance that a useful innovation might be overlooked. Where cutting tools are concerned the time needed to evaluate new tool 'A' against established tool 'B' can be an unaffordable luxury when set against the overwhelming need to deliver 'yesterday'.

Family owned and Bicester based for 23 years, SRD has profited from a fairly open-door policy to tool try-outs and has also been a regular investor in high performance machine tools and equipment.. This is a partial necessity, given the variety of 'difficult' materials such as stainless steel, titanium, Inconel and other 'exotics' that it processes.

Components are produced to high precision for applications ranging from medical to agricultural and motor sport to satellites, typically in batches of 10 to 100-off.

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The success of this overall strategy can be measured by relocation to new premises in Bicester during 2014. This has been followed by acquisition of an adjacent factory unit – doubling overall shop floor space - early in 2015.

Adoption of the Horn Type M101 disc milling cutter for cut-off/part-off applications has played a not inconsiderable part of this success. An in-house 'contest' to improve on HSS slot cutting saw performance saw Type M101 demonstrate substantial superiority over inserted carbide disc mill solutions offered by other well-known tooling brands.

Key advantages are the flexibility of the cutter body/blade which allows machining close to the job/material interface. This combines with the insert design to generate positive low cutting forces, and allows the cutter/inserts to be used across a wide variety of exotic materials. Further flexibility is afforded by availability of the S101 inserts in 1.6 mm and 2.0 mm widths.

SRD milling team leader Chris Bryant comments. "This class of component is machined from a billet mounted in a vertical machining centre with a 4th axis table. Using the saw/disc mill allows almost complete machining whereas previous tooling options produced a compromised finish on the part-off face and lengthy cycle time."

Cutting data for the 128 tooth HSS tooling was 75rev/min with feed rate of 8mm. By comparison the 100 mm diameter, 9 insert Horn M101 operates at 378 rev/min with program feed of 68 mm/min. This gives cutting speed Vc of 120 m/min and 0.02mm feed per tooth. Each cutting edge is provided by a single-ended Horn S101 insert, located and secured by a quick-change self-clamping system. The 2mm wide sintered insert incorporates a moulded chip breaker and is available in a variety of specialised grades and coatings.

SRD machinist Michael Reading noted from the off that the 101 was/is a well-developed product. "One of its notable qualities - one that you associate with a smooth, efficient cutting tool - is the sound it generates." he said. "Another positive feature is the flat surface provided by the assembled tool so that minimal preparation of the cut face is needed for further machining. Likewise the high consistency, positive geometry and long service life of the inserts have established it as the 'go-to' solution for sawing and part-off."

“Type M101 has proved to be a very reliable, efficient tool.” Mr Bryant concluded. “We previously had to plan for a certain amount of waste/sacrificial material or rework in associated manufacturing processes but that is no longer the case. Moreover the lead-time and high costs/tool inventory associated with regrinding HSS tooling is no longer an issue. Introduction of the Horn tool has been very much a win-win exercise.”

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