Leading the market with pull broaching innovation

Fagersta, April 2012 – With strong market demand for new jet engines and power plants, manufacturers serving these markets face increasing pressure to optimise productivity. One of the most difficult and time-consuming processes relevant to these components consists of broaching blade root slots on turbine discs. Where others saw the challenge presented by this process, Seco recognized an opportunity to become a market leader.

Typically resembling the shape of a fir tree or incorporating a dovetail profile, root slots accept the mating foot of turbine blades to hold them securely in place. Linear, or pull, broaching offers the most efficient and productive process to machine these features. With this process, a broach containing a series of teeth removes metal from the disc. The teeth vary in size and shape, tapering to become progressively more like the desired final shape of the part.

Historically, broaching tools have been made from high speed steel (HSS), a relatively soft material compared to the titanium and high temperature alloys typically used to make turbine discs. As a result, multiple sets of broaches must be used for to complete a machining operation and manufacturers
frequently need to perform regrinding. This leads to large tool inventories and a slow process, creating high costs for manufacturers.

Seco began development of an indexable pull broaching system in the late 1990s. The first major success followed in 2004, with an indexable Broaching solution for a large power generation customer in Sweden. From that accomplishment, Seco expanded into the aerospace sector.

Compared to traditional HSS tools, Seco’s indexable pull broaching system offers the substantial benefits of increased cutting speed and elimination of regrinding operations. Cutting speeds can be increased by up to 400% in steel and in nickel-based alloys up to 5 times. The tooling system could actually cut even faster, but the maximum speed of today’s pull broaching machines limits the results.

Currently, Seco Sales in this segment continue to grow annually in the power generation and aerospace segments. The future holds huge potential for this relatively unexplored area, and the primary R&D facility for this technology is Seco’s Arboga Plant. The Arboga team recently completed work on a new range of multi-edge inserts (MEIs) to add to the previous disc mill type of insert, and soon will release a semi-finishing tool to complement the Jabro solid mill for finishing of fir tree features.

Seco currently offers roughing, semi-finishing and finishing tools in the dovetail program and a relatively new roughing tool for more elaborate fir tree broaching. Sweden, Norway and the USA have experienced strong demand for tools for internal keyways and splines, which will help guide future product development.

Johan Eriksson, a member of the Seco R&D team in Arboga, emphasises Seco’s commitment to maintaining its position as the market leader in pull broaching solutions by continuing development of the technology.

About Seco Tools:
Seco Tools is a leading manufacturer of high performance metal cutting tools. Seco’s product range includes a complete programme of tools and inserts for turning, milling, drilling, reaming and boring as well as complementary tool holding systems. With more than 25,000 standard products, Seco is a complete solutions provider for the metal cutting industry and equips machine tools from the spindle down to the cutting edge.

The company is headquartered in Fagersta, Sweden and represented in more than 50 countries worldwide with 40 subsidiaries, distributors and channel partners.

More information can be found at: www.secotools.com