

Manufacturing ENGINEERING

June 2009 Vol. 142 No. 6

Drilling Is Only the Beginning

Innovative tools start and finish the job

Jim Lorincz, Senior Editor

When Sure-Fab L.L.C. (Two Harbors, MN) wanted to speed up the process for putting a 5.125" (130-mm) counter bore 3.25" (82.5-mm) deep on the end of a large cylinder ram, it called on its drill supplier, Allied Machine & Engineering Corp. (Allied; Dover, OH). Sure-Fab is a contract manufacturer that specializes in manufacturing medium-to-large workpieces for the scrap, demolition, logging, material handling, and commercial towing equipment industries.

"Sure-Fab had heard about our Revolution Drill and our Opening Drill and wanted to see if they would work on this ram application, one of many different sizes they produce," explains Allied's Larry Stenger, field sales engineer. "I went to the facility with tools in hand and found, to my surprise, that there were two existing gundrilled holes 5' [1.5-m] deep on the end of the cylinder. They were currently using a Mitsubishi high-feed mill running at 1000 rpm and 60 ipm [1.5 m/min] to produce a roughed hole for the counter bore. This counter bore took about 38 min on average to produce, including indexing inserts after each part and, sometimes, during the process.

"The Revolution Drill was set to 2.46" [62.5 mm] and run at 930 fpm [283 m/min]. We had to be careful with the chip load because of the lack of centerline material and went with a conservative 0.0025 ipr [0.003 mm/rev], 3.25" [82.5-mm] deep flood application. We double-cut chips the whole way, and overcame a double interruption in an unbalanced cut [with more material on the bottom half of the tool than on the top]."

The Opening Drill was set to 5.01" (127 mm). "Because there was a lot of material being removed, we were double-cutting a lot of chips so we dropped to 350 fpm [106 m/min] with 0.006 ipr [0.15 mm/rev]. This tool was taking a wicked offset, no material at the bottom of the hole, and 0.630" [16 mm] on the top and interrupted the whole distance. The tool was set to 5.01" [127.3 mm] and it cut 5.01". The result was that 30 min was shaved off the application with minimal insert usage," Stenger says.



Allied's Opening Drill set to 5.01" (127.3 mm) went in over the top of the Revolution Drill and the two pre-existing holes in a 30 R_c 4140 cylinder ram, double-cutting chips while handling a 0.620" (15.75-mm) offset cut with flood coolant.