BRM
BRUSH RESEARCH
MANUFACTURING

CASE STUDY

PRODUCT - FLEX-HONE® TOOL

APPLICATION - COMPRESSOR MANUFACTURER

Deburring/Finishing Tool Improves Quality and Cuts Costs

A new surface deburring and finishing tool, has improved quality, and cut costs in the honing of burrs created during the boring of cylinders in the manufacture of hermetic and semi-hermetic compressors. The system, according to a company spokesman, is the most costeffective means of performing the deburring operation.

Copeland Corporation, Sidney, OH, produces accessible and welded motor compressors and condensing units range in capacities from 1/4hp to 100hp. The company manufactures 750,000 compressors per year. The bodies of the compressors are cast by outside vendors and shipped to Copeland's plant.

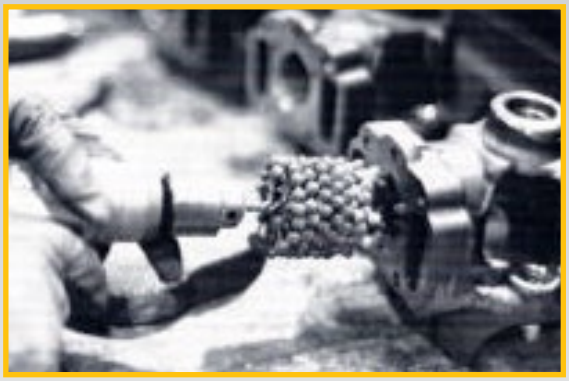
According to Bruce Demers, manufacturing engineer at the company, Copeland maintains very rigid standards in cleaning and deburring the parts.This occurs, he says, because contaminants, such as cast iron dust, chips and burrs, loose in an assembled compressor can cause the unit to fail.

The deburring operation at Copeland is particularly critical since a burr is raised on each compressor's head deck at the cylinder at the time the cylinder is bored. The compressors range from one cylinder up to nine in tandem units.

To find an efficient solution to its deburring problem. Copeland adopted an innovative deburring/finishing tool known as Flex-Hone. Manufactured by Brush Research Manufacturing Co., Inc., Los Angeles, CA, the tool consists of a resilient-based hone with abrasive laminated to the ends of high-density nylon filaments. At Copeland the hone is placed in a hand-held air tool and secured by a standard key chuck. The compressor deburring at Copeland now works as follows: the castings arrive at the plant and are placed on one of three dial index machines, where all the machine dimensions on the body are created. The head deck is milled twice to the company's micro-requirement of 125rms.

The part is then put into a finish boring machine. It is during this procedure that a burr is formed at the head surface where the bore intersects. Besides being a potential contaminant, the burr is unacceptable for another reason. If the burr remained there, it could allow the head to improperly seat, which would not permit the gasket to seal. In either case the completed compressor could leak.

At this point, after boring, an operator places the casting on one of its machines surfaces so that the cylinder is horizontal. He then takes the air tool and Flex-Hones the burr. The hone rotates at about 100 rpm.



Operator can eliminate the burr around the cylinder's port in two seconds. Hone features 180 grit silicone carbide abrasive on high-density filaments.

The hones vary in diameter from 1-inch to 3-inch and are 180 grit silicon carbide. Copeland makes compressors with 15-20 different bore sizes so each Flex-Hone will accommodate a range of sizes, with the hone being slightly larger than the bore.

An operator can easily deburr a part in two seconds with the tool. The company, Demers, observes, has experienced no problems with the deburring/finishing system. Last year's total usage of the Flex- Hone amounted to 2400 units, which averaged out to 312 pieces per hone.

As a-result of using the Flex-Hone tool, Demers says that Copeland has been able to maintain high quality standards at minimal cost. Without the tool the company would face two costly options. The first alternative would be for the company to add a chamfering or deburring tool to its boring heads. This would necessitate purchasing new boring heads at a cost of between $1000-$2000 each. The company now operates with 30 boring heads.

The other alternative would be manual deburring, which would require .25 minutes labor per part. Direct labor costs for this approach would exceed $50,000. Not only is this figure unacceptably high, but also, Demers points out, the company would experience decreased capacity.

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