

## CASE STUDY

### PRODUCT - FLEX-HONE® TOOL

### APPLICATION - PUMP MANUFACTURER

## Deburring/Finishing Tool Improves Quality, Cuts Cost for Pump Manufacturer

A flexible surface deburring/finishing tool has improved quality and cut cost in the honing of burrs created in the manufacture of miniaturized air-driven liquid pumps. The burrs occur when holes are drilled in an aluminum sleeve used in the air drive system. The new method, the company reports, paid for itself immediately.

Haskel Inc., Burbank, CA, manufactures a wide variety of compressed air driven pumps for use in a cross-section of industrial applications. It was with the company's Model M series pump that the company was experiencing some quality control problems with the air cycling sleeve. Model M pumps power output is nominally 1/3 hp. The sleeve must meet the company's specification of 16 micro-finish.

To produce the sleeve, which is about 2- inches long, Haskel machines the part from 13/16- inch diameter aluminum bar stock. After machining, the sleeve is put on a conventional drilling machine, where an operator drills two series of holes around the sleeve, one series has 1/8-inch holes; the other 3/32 inch holes. During the drilling process, burrs are created along the inside diameter of the sleeve. If the burrs are not removed, they could cause major damage to the pump. This could occur since a pool slides back and forth like a piston with O-rings inside the sleeve to open and close the holes. During the cycling action, a loose burr would cause excessive wear on the O-rings.

After drilling, the sleeve is taken to a work station where an operator uses a no-burr tool to put an edge break on each one of the holes. Even after this step, very small burrs still remain lodged inside the sleeve.

In the past, Haskel would send the sleeves to an outside vendor where the minute burrs were removed in an entirely manual operation. After thus deburring, which proved both costly and time consuming, the sleeves were brought back to the plant for assembly.

To solve the problem of eliminating the small burrs, Haskel adopted an innovative deburring/finishing system known as Flex-Hone®. Manufactured by Brush Research Manufacturing Co., In., Los Angeles, CA, the system consists of a resilient-based hone with abrasive laminated to the ends of high-density nylon filaments. At Haskel the hone is placed in a standard drill chuck. The improved deburring operation at Haskel now proceeds

smoothly and efficiently. After the preliminary deburring operation, the sleeves are taken to the Flex-Hone station. At this point, the operator places a pan of kerosene beneath the Flex-Hone and loads the pan with the sleeves, which become lubricated with the liquid. At the same time, he activates the drill motor, which rotates the hone at about 100 rpm. He then lifts a sleeve to the revolving hone and makes five or six passes.



Operator begins final deburring operation on the inside diameter of the aluminum sleeve used in M-series compressed Air-driven pumps Manufactured at Haskel Inc.'s Burbank, CA facility.

Inside the sleeve, the Flex-Hone has a spring-like action, which causes the tool to knock out any burrs remaining in the holes. The parts are then ready for burnishing.

With an annual production of 10,000-20,000 sleeves per year, the company uses two or three Flex-Hones per standard order of 2,500 parts. The hones are 11-mm diameter, 180-grit silicon carbide.

As a result of using the Flex-Hone tool, a Haskel spokesman says that not only can the company maintain better quality control, but also the cost savings have paid back the system many times over. He estimates that Haskel is now saving 40% of the total cost of producing the part as opposed to jobbing it out.