

# Hydraulics & pneumatics

A Penton Publication  
August 2008

SERVING FLUID POWER AND MOTION CONTROL ENGINEERS WORLDWIDE

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**On the cover:** MinExpo returns to Las Vegas bigger than ever, with scores of fluid power exhibits. Photo courtesy of the National Mining Association (NMA).

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# Have you tried flexible honing?

When it comes to manufacturing, rebuilding, or servicing large pumps, valves, and cylinder bores, honing with a ball-style device can make a big difference in performance and service life.

The Flex-Hone can be used with a rotating spindle such as a hand drill or CNC machine and is available for bores to 36 in.



**S**ervicing big pumps, valves, and hydraulic cylinders means dealing with big bores. After installation in the field, they often require maintenance to rid the bore of scratches and foreign material ranging from rust and corrosion to accumulated deposits. Improper cleaning and resurfacing of those bores can mean fewer operating hours between servicing as well as degraded performance.

Hydraulic cylinders require specific surface finishes and critical tolerances to optimize the efficiency and life span of their seals. Surface corrosion,

nicks, and scratches in the cylinder wall surface can cause premature seal wear and cylinder failure.

## Going the traditional route

Rigid honing is a common material removal process in which rigid abrasive stones are forced against cylinder walls under high pressure to improve cylinder geometry. Factors such as size, concentricity, ovality, and uniformity are controlled by honing. It can remove material from hydraulic cylinders quickly and accurately while holding extremely tight tolerances.

However, rigid honing requires an expensive honing machine and precise set-up to achieve accuracy. It often requires sending the cylinders out and is rarely a portable process. The stones are rigid and under pressure, so sufficient material must be removed from the bore to insure the hone "cleans up" around the cylinder. Clearing cross holes, ports, and interruptions in the bore is also problematic.

## A flexible solution

A less expensive and more portable alternative exists with flexible honing. Flex honing is a surface finish-

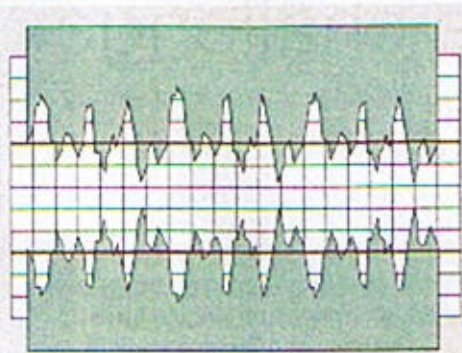
ing process — not a material removal process. It removes loose, torn, and folded metal, creating an oil holding, plateau finish that optimizes ring or seal life and performance. The process is ideal for new cylinders and has the added benefit of portability in rebuilding applications.

Resembling a spinning bottle-brush, the flexible ball-style hone contains abrasive globules permanently mounted to flexible filaments that are attached to a central shaft. It can be used virtually anywhere for sophisticated surfacing, deburring, edge-blending, cleaning, and rebuilding, and plateau finishing. The surface it produces results in consistent material flow and eliminates laminar turbulence issues associated with a rough finish.

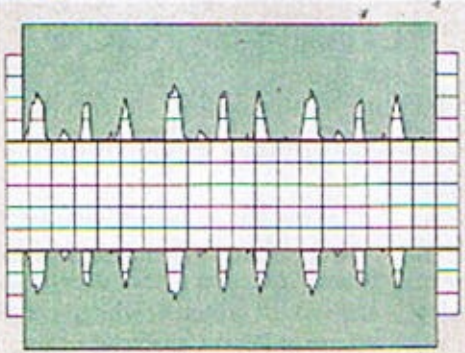
Flexible honing is a low-temperature abrading process that exposes the undisturbed base metal to produce a long wearing surface free of fragmented, amorphous, or smeared metal from previous operations. Each abrasive globule has an independent suspension that is self-centering, self-aligning to the bore, and self-compensating for wear.

The flexible hone often is used after traditional rigid honing to improve a cylinder's surface finish and deburr ports and cross-drilled holes. The tool provides the optimum sealing surface in rebuilding applications where cylinder geometry is not an issue and rigid honing is not required.

Before



After



These two graphs illustrate the difference honing can make to a cylinder's bore. The surface has been honed to remove loose, torn, and folded metal for a smoother finish.

#### Honed in on success

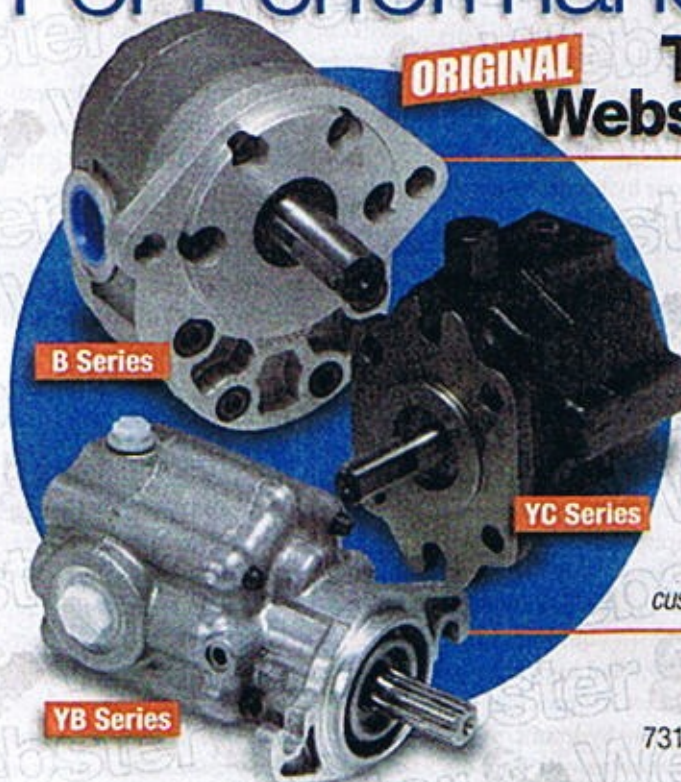
Brush Research Mfg., Los Angeles, offers a line of flexible hones, called Flex-Hones, in a variety of grit sizes and diameters to 36 in. and suitable for large bore applications.

"Getting top-to-bottom cylinder or liner wall coverage is difficult to do with other tools," says Clarence Mayers, coordinator for Diesel Supply Co., Odessa, Texas. "Our flexible hones are approximately 12- to 18-in.

wide. So if the hone runs 2 or 3 in. past the bottom of a liner, that's not a problem. Most of the hone is still inside the cylinder, so it can go down and complete the bottom of the piston travel area. The same applies to the top of the liner, where it gets chamfered because of where the top ring travel ends. The Flex-Hone can blend that area quite easily."

Michael Miller of Brush Research Mfg. Co. Inc. provided details for this article. For information, call (323) 261-2193, e-mail [info@brush-research.com](mailto:info@brush-research.com), or visit [www.brush-research.com](http://www.brush-research.com).

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