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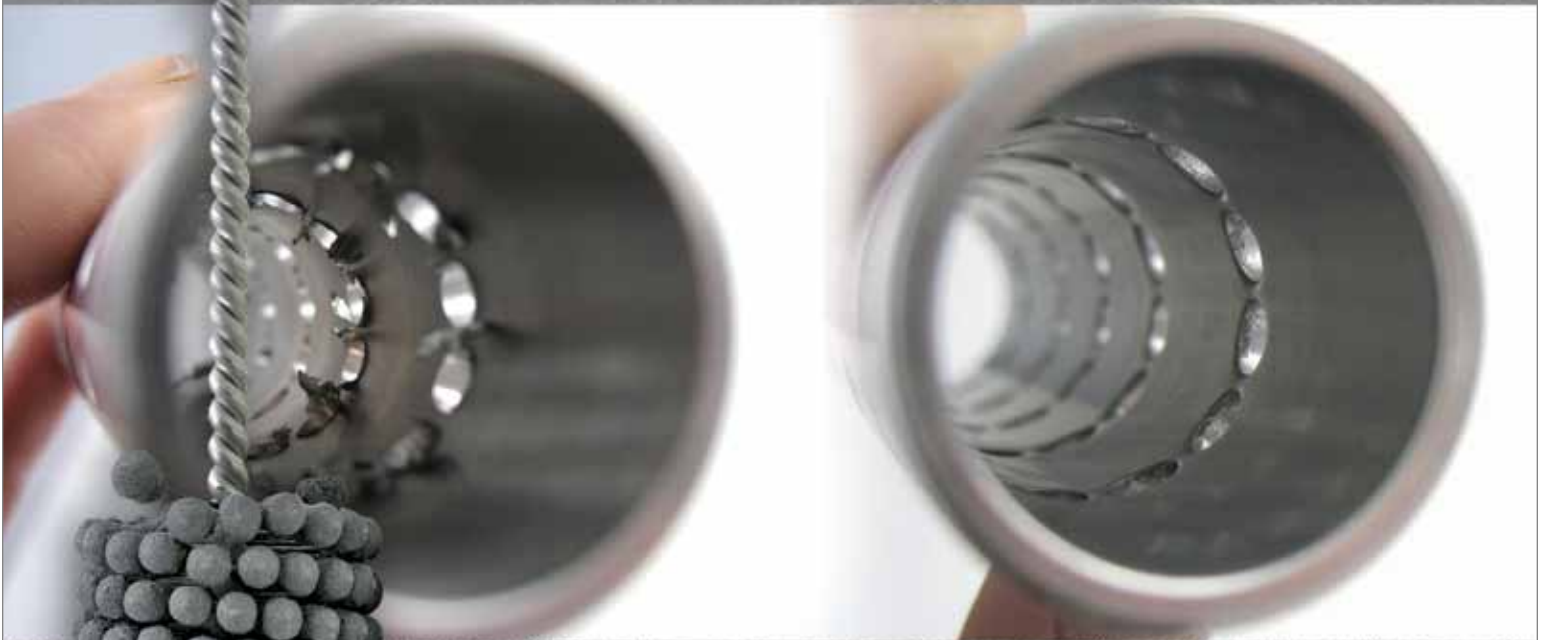
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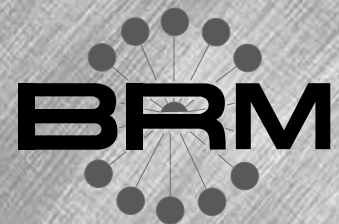
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**BRUSH RESEARCH  
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# FLEX HONING — TAKING IT TO THE BIG STUFF

*When it comes to, rebuilding or servicing large pumps, valves and cylinder bores, honing can make all the difference in performance and service life. One device, the ball-style hone, provides a highly efficient and portable solution.*

Overhauling big diesel engines or servicing big pumps and valves used in the oil and gas industry means dealing with big bores. If the inside diameter (ID) of those bores is not cleaned or resurfaced correctly, the consequences are likely to be fewer operating hours between overhauls or degraded performance.

For example, after installation in the field, valves and pumps often require maintenance to clean IDs of foreign material ranging from rust and corrosion to accumulated chemicals and biological matter.

“With hydraulic and hydronic pumps and valves used in mills, petrochemical plants and process industries, critical tolerances sometimes similar to those of internal combustion engines – diesel, gasoline and natural gas powered – apply to pumps of many styles and applications,” says Patrick Sullivan, a veteran facilities management consultant.

One of the most versatile and easy-to-use tools that is used throughout industry today to perform maintenance on cylindrical IDs is the flexible ball-style hone. Somewhat resembling a spinning bottlebrush, this tool is characterized by the abrasive globules that are permanently mounted to flexible filaments that are attached to a center shaft. This extremely flexible, low cost tool can be used virtually anywhere for sophisticated surfacing, de-burring, edge-blending, cleaning and rebuilding.

“In chemical, refining and natural gas operations, honing may be required to remove corrosion or the formation of clay, wax or other solids may prevent proper valve operation or block lubricants,” Sullivan says.

For big bore engines powering pumps used in natural gas pipeline operations it is crucial to service life that the cylinder liner walls be deglazed, refinished and crosshatched when these engines are overhauled.

“These engines have pistons as wide as your hat,” says Clarence Mayers, coordinator for Diesel Supply Company (Odessa, TX). “We sell ball-style hones to users and repair shops who overhaul the big bore diesels so that they can get a longer service life cycle. Mainly they use it on cylinder liner walls so that the new

rings can seat properly and prevent excessive oil consumption.”

The engines powering big oceangoing vessels such as tankers and freighters are popular applications for large-bore flexible hones. Marine service shops that perform maintenance on big ship engines as well as pumps and valves are often scheduled to service them as soon as the vessels come into port.

The flexible ball-style hone produces a controlled surface condition unobtainable by any other method. It can de-burr, clean out passages or provide IDs with a super-smooth plateau finish free of cut, torn and folded metal.

In metering tube applications, where ID tolerances are sometimes 0.001 in., a flexible hone can be highly useful in the fabrication, installation or servicing of tubes. With internal surface finished that must be unrestricted in order to accurately measure and control the flow of massive amounts of fluids and gases, this tool can help ensure that surface finishes are kept smooth and unobstructed.



Although large-diameter flexible ball-style hones are somewhat unique, they are needed to resurface liners and cylinder bores in larger engines such as the Worthington, Clark, Ingersoll-Rand and Cooper-Bessemer models used for heavy-duty applications.

Available in various grit sizes and standard diameters (4 mm to 36 inches are standard sizes), Brush Research Manufacturing (BRM) offers a line of Flex-Hones that are uniquely suited to the task, as they have been for many years with large bore applications.

Mayers also points out that the flexible hone does an especially good job of clearing the ports on 2-cycle diesel engine liners. An-

other type of hone can get hung up in the port area and break off hone material that could wreak havoc when the engine is operating. Or, it could break off part of the liner in the port area or cause the reinstalled ring to strike and break off (port clipping), either or which could cause severe damage.

“The unique design of the Flex-Hone allows it to pass right over ports, smoothing down all of the rough spots where the firing pressure of combustion chamber causes the rings to load from the back side and push out against the cylinder wall,” explains Mayers. “This type of hone smooths out all of the rough spots around the ports or anywhere else on liner walls, top to bottom.”

In the process of thoroughly cleaning and resurface cylinder liners from top to bottom, some hones could get hung up. However, a large flexible hone can be used without any such snags.

The engines powering big oceangoing vessels such as tankers and freighters are popular applications for large-bore flexible hones. Marine service shops that perform maintenance on big ship engines are often scheduled to service them as soon as the vessels come into port.

“Getting top-to-bottom cylinder or liner wall coverage is difficult to do with other tools,” Mayers says. “The flexible hones that we deal with are probably 12-18 inches wide. So, if you run it two or three inches past the bottom of the 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.”

Whether used for cleaning, de-burring or plateau finishing, the tool provides a low-temperature abrading process that exposes the undisturbed base metal structure to produce a long wearing surface. Available in various grits and sizes, the Flex-Hone is a resilient, flexible, honing tool with a soft cutting action. The abrasive globules each have independent suspension that is self-centering, self-aligning to the bore, and self-compensating for wear.

Established in 1958, Brush Research Manufacturing has been solving difficult finishing problems with brushing technology in the sophisticated environments of nuclear energy, aerospace and computer technology as well as industrial applications.



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