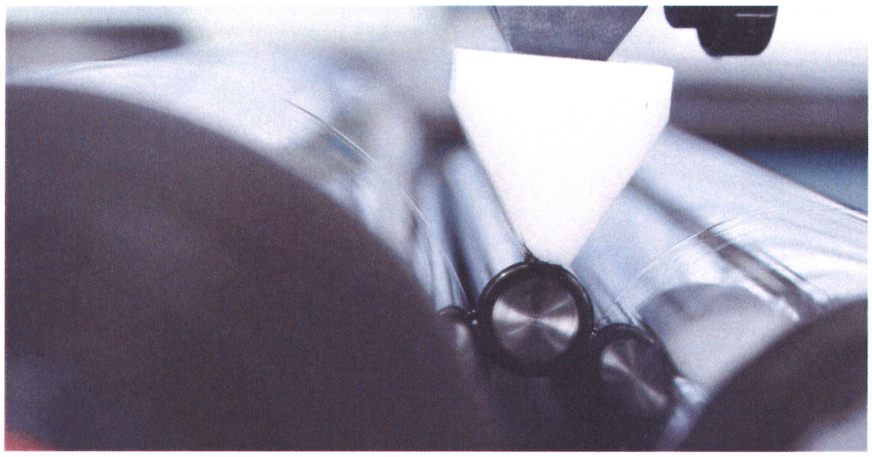
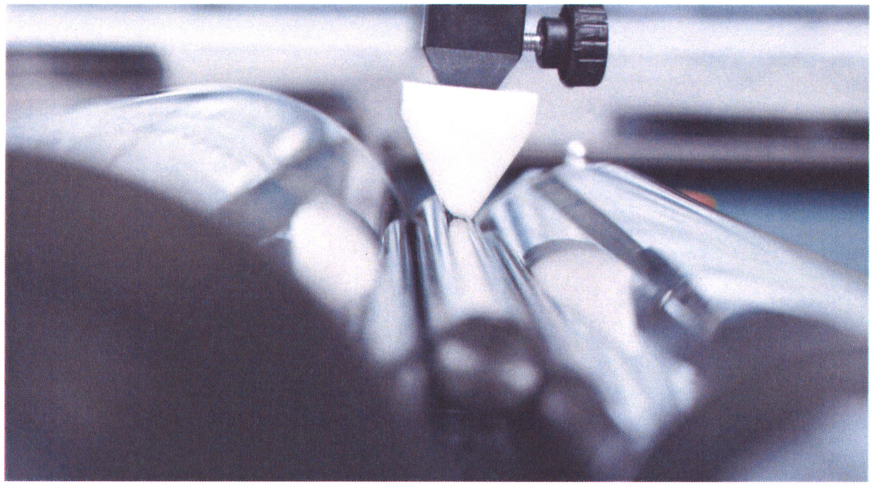
Lapping it up





STAHLI Cylindrical Lapping is an effective alternative to the classical superfinishing of cylindrical workpieces.

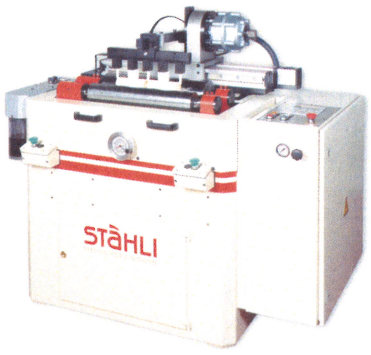
The surface defining qualities of lapping and polishing with finely distributed loose abrasive can be of much higher quality than many fixed/bond abrasive processes. Higher quality in flat lapping and polishing versus fixed/bond processes is known by many in the industry. This also translates to the processing of cylindrical parts.

If superfinishing with vibrating fixed abrasive stones with either a turning machine or in mass production fashion on a through feed machine is not good enough in either diameter tolerance or surface finish, the STAHLI cylindrical lapping process could be of interest for you. This enables the user to slowly machine a workpiece. For example; it can machine a tungsten carbide rod with 20 mm diameter and 300 mm length into a µm or even sub-µm tolerances with a polished surface finish around 0.02 µm Ra.

Roundness cannot be effectively influenced by cylindrical lapping alone. A quality pre-grind is still essential. Normally a workpiece would be ground 10-15 µm higher than nominal thickness and then be lapped into tolerance. Depending on material hardness, density and surface (diameter, length) this would take between 1-10 minutes. For example, AL2O3 is processed much quicker than tungsten carbide.

With the CLM and the FLM 500-R systems, STAHLI offers two basic machine concepts for cylindrical lapping and three working modes on the CLM system.

The CLM (Cylindrical Lapping Machine) applies a similar system to centreless grinding with the workpiece rotating between two variable driven cylinders and a pressure device on top that will apply force to the workpiece. There is a version with two sets of working rollers of 150 mm for shorter workpieces and a version with one set of rollers sized at 500 mm for longer workpieces. Both are available with a manual pressure device for variable pressure application. This enables the user to decide where pressure should be applied and material should be taken off. Through this sub µm tolerances can be achieved by a skilled worker. The other option is to use an automatic pressure device, which enables the worker to walk away from the machine once it's running. This option will be less precise, albeit more economical.



The FLM 500-R is a special flat lapping machine that has a second lapping wheel on top, which will run the opposite way of the lower wheel. Workpieces are held in a round carrier slightly angled to the centre of the carrier. This will allow for a relative speed all over the workpiece and therefore will allow material removal. In this system as many as 50-200 workpieces can be machined to a µm tolerance in one batch with very high surface finish quality.

STAHLI CLM and FLM 500-R explanatory videos can be found at **www.stahli.com** and on youtube.

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