Precision Pumps & Ventilator Components

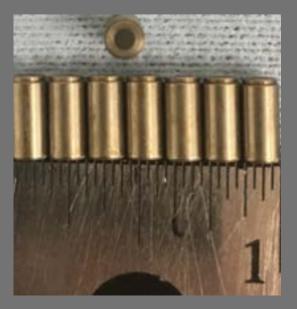
SURFACE FINISHING OF MEDICAL PARTS



Diamond Lapping Advantages

Allows water based process
Parts are easy to clean
Avoid incompatibilities with oil
Minimal lapping waste
One step processing
High throughput
Consistent, predictable performance

Stainless Steel Plungers filled with Rubber or Silicone (~ 0.15" OD x 0.25" height)





Lapping of Stainless Steel Parts filled with Rubber & Silicone for Ventilators

The quality of sealing surfaces in medical devices, such as ventilators, is critical to reliable performance. It is important to precisely control the surface roughness and overall dimensions.

This can be a challenge when the surface is comprised of dissimilar materials, such as stainless steel and rubber or silicone. Engis has developed a precision lapping process to address these needs.

Lapping Machine Options





For Development of Small-Scale Manufacturing FastLap FL-15 Lapping Machine

For Large Scale Manufacturing Engis FastLap machine with pneumatics

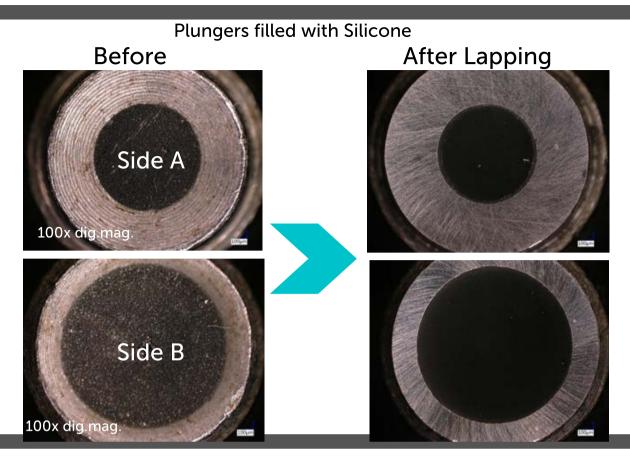
Consumables & Accessories

- Hyprez S4889 Diamond Slurry
- -Water Based
- -Easy to clean
- Hyprez C250 Lap Plate
- -Stable Performance
- -High volume
- **Hyprez Accessories**
- -Ceramic rings with custom fixtures-Diamond plated conditioning rings-Minimiser Slurry Dispenser
- -Auto Stirrer





Surface Finish Improvements



Surface Roughness Before & After Lapping AS RECEIVED (Stainless Steel Measurements)

A	Ra	Plungers filled w/RUBB	BER	- 24-1	Ra	-		+277.89		
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Plungers filled w/SILICONE										
		Plungers tilled w/SILIC	ONF_	100 C		11				
- Al-	Ra	Plungers filled w/SILIC		4	Ra	1000	and the second s	+364.37		
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3 4 5 Max Min	µin 73.36 68.64 66.23 73.62 55.80 73.62 55.80		+7005.94 Peak nm Valley	2 3 4 5 Max Mín	µin 1.08 1.03 0.98 0.95 1.08 0.95	Size X 351	un Size Y 263	← Peak nm Valley ♥		

Precision Pumps & Ventilator Components

CASE STUDY SUMMARY



Surface Finish Surface Roughness (Ra) Flatness (PV) Lapping time	AS RECEIVED matte, rough 55 - 75 min n/a n/a	AFTER DIAMOND LAPPING semi-reflective, smooth 0.8 - 1.0 min ≤ 0.00015 in 30-40 min/side
Material Removal Rate	n/a	Plungers filled w/RUBBER: »1um/min (0.00004"/min) Plungersfilled w/SILICONE: »2um/min (0.0008"/min)

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