Pistons and Shafts

Ceramaret manufactures high quality pistons in Sapphire, High Purity Alumina and TZP (Tetragonal Zirconia Polycrystalline) Zirconia (ZrO_2) ceramics for HPLC pumps and precision liquid dispensers. The materials are inert and resistant to most solvents. Their extreme hardness combined with a perfect surface finish (Ra < 0,025µm or 1 µinch) insure minimum friction and maximum seal life.

Ceramaret also manufactures piston / liner sets for metering pumps and valve applications. Adjustment between the piston and the cylinder is within 3 microns, insuring a leak free adjustment and maximum durability.
Custom-made shafts in TZP zirconia (ZrO_2) and in alumina ceramics (Al_2O_3) are also available. These are made from a range of blanks available from stock and finished upon request. These shafts, just as the pistons, can be delivered bare or mounted on a ferule to customer's specifications.

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Pistons for HPLC pumps and precision dispensers

General dimensions:

Minimum :
- Diameter 0,40 mm (.016") with length up to 30,00 mm (1,181").
- Diameter 0,50 mm (.020") with length up to 50,80 mm (2,000").

Maximum :
- Diameter 25,40 mm (1,000") with length up to 150,00 mm (5,900").

General Tolerances :
- OD ≥ +/- 0,005 mm (+/-.0002").
- Length +/- 0,100 mm (+/-.004").

Surface finish :
- N1 (<1 μin) obtainable between diameter 0,50 mm (.020") by maximum length of 50,80 mm (2,000") and 10,00 mm (.394") by maximum length of 44,45 mm (6/16").
- N3 for diameters > 10,00 mm (.394") in zirconia.
- N4 for diameters > 10,00 mm (.394") in alumina.

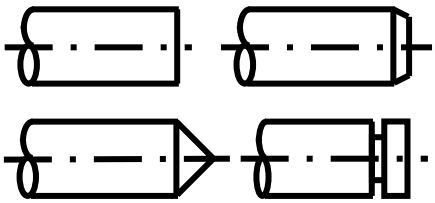
Quality assurance procedure

Dimensions and characteristics to be tested	Test equipment	AQL
Piston only		
Piston diameter	Digital micrometer	1 Level II
Piston length	Caliper	1 Level II
Geometry of ends	Shadowgraph 20X	1 Level S4
Roundness	Talyrond	1 Level S4
Surface finish	Talysurf	5 samples 0 A 1 R
Groove (if any)	Shadowgraph 20X	1,5 Level II
Visual inspection for chips, cracks, internal and external defects	Binocular 25X	1,5 Level II
Piston with ferule		
Dimensions of the ferule	Micrometer and caliper	1 Level II
Length of the piston from a reference surface of the ferule	Vertical micrometer	1 Level II
Concentricity of the piston with the ferule	Ceramaret test-fixture	1 Level S4
Resistance traction / compression	Ceramaret assembly press	100%

Pistons with ferule are assembled by cold press-fitting giving:

- Optimal traction / compression resistance and maximum concentricity between both components (0,050 to 0,100 mm or .002" to .004").
- No distortion of the ferule and no thermal shock to both components, as opposed to fitting by heat shrinking.
- No needs for adhesives sensitive to chemical solvents

General configuration available (one or both ends)



Other configurations available on request

Specifications subject to change without prior notice