Have you benchmarked your supply chain?

Zirconia plungers for high pressure pumps

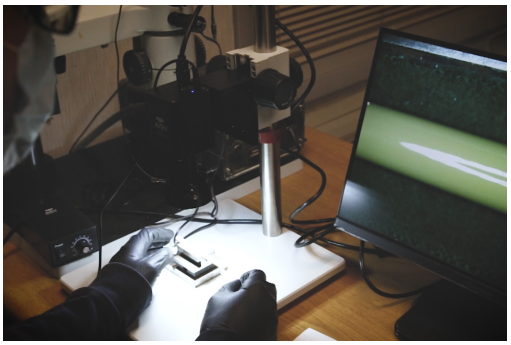
Why specify Refractron Plungers?

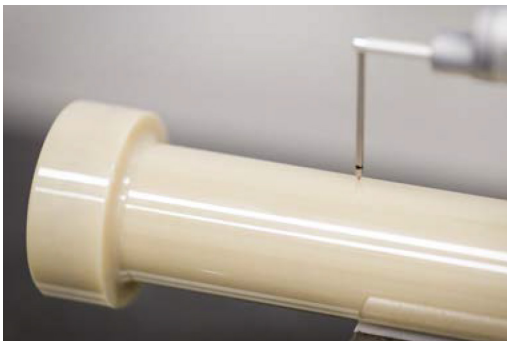
- To improve seal life
- For corrosion and wear resistance
- Longer lasting alternative to steel, carbide and alumina
- For precise and accurate dimensions

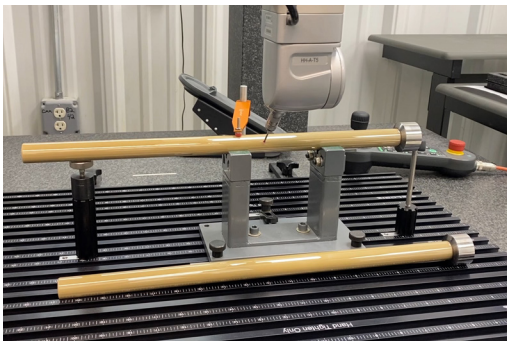
Improve Reliability
Increase Profitability

Why choose Refractron?

- Experienced, domestic manufacturer
- Responsive service and support
- Custom designs
- Inventory of plungers for standard pumps







1.315.573.1134
adamo@refractron.com
www.refractron.com
5750 Stuart Avenue,
Newark, NY 14513, USA

012025

Refractron

Refractron Advanced Ceramics

Zirconia for severe service and high pressure systems

PROPERTIES	MgPSZ	Y-TZP	ATZ (10)
	Izory® HD	Dark HIPed	HIPed
COLOR	Ivory	Tan	White
CHEMISTRY: $ZrO_2 + HfO_2 + MgO$ [%]	97.14		
$ZrO_2 + HfO_2 + Y_2O_3$ [%]		99.50	89.95
Al_2O_3 [%]		0.25	10
Other [%]	2.86	0.25	0.05
DENSITY [g/cm³] ISO 18754	5.78	6.08	5.79
WATER ABSORPTION ASTM-373	nil	nil	nil
GRAIN SIZE [µm] ASTM E-112	20	0.4	0.7
FRACTURE TOUGHNESS K_{IC} [MPAm$^{1/2}$] ASTM C-1421	10	5.2	9.0
LOOP ABRASION [mm³] ASTM G174 (d)	0.100	0.100	0.020
MODULUS OF ELASTICITY MOE [GPa] ASTM E1876-99	214	214	296
MODULUS OF RUPTURE 4pt MOR [MPa] ASTM C-1161	650	1350	1050
HARDNESS VICKERS [HV1] ASTM C1327-08	1225	1425	1430
POISSON RATIO ASTM E1876-99	0.31	0.32	0.27
COMPRESSIVE STRENGTH [MPa] ASTM C773	1760	2580	2100
THERMAL CONDUCTIVITY RT [W/m K] ASTM C408	2.50	2.18	6.00
COEFFICIENT OF THERMAL EXP. x10⁻⁶/°C [25-1000 °C] ASTM C372	10.2	10.7	9.0
MAXIMUM USE LIMIT [°C] ISO 18754	500	1500	1500

NOTES: Typical values are not intended to be used as a specification. Contact Refractron for application suitability.

Refractron is a privately owned company that has been making durable ceramics for over 40 years at its 90,000 ft² factory in Newark, New York, approximately 30 miles east of Rochester.

The factory, which is ISO 9001:2015 and ITAR certified, is home to a team of application, design and process engineers to support our customers. The factory has all the production and testing equipment necessary to develop and manufacture dense zirconia plungers. Our comprehensive grind shop allows us to offer custom products with tight tolerances and a pristine surface finish. Our on-site labs and our partnership with Alfred University's College of Ceramics allows detailed characterization of our materials and products.

The products are used in a vast array of industries including oil & gas, wire & cable, medical equipment, chemical processing, waterjet cutting, mining, waste water, drinking water and semiconductors.

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