Representative zirconia plunger assembly configurations.

Zirconia Plungers

Product ID / SKU: FWM/ZR-PLUNGER-001

Material: Zirconia Ceramic Family

Product type: Zirconia Ceramics Component

Polished zirconia plungers for metering, dosing, filling and precision fluid-handling systems.

Zirconia (ZO201N) Typical Properties

Property	ZO201N typical value	Condition / method
Density	6.0 g/cm³	JIS R 1634
Water absorption	0 %	JIS C 2141
Vickers hardness	12.3 GPa	HV9.807N (9.807 N load); JIS R 1610
Three-point flexural strength	1000 MPa	Three-point bending; JIS R 1601
Young’s modulus	200 GPa	JIS R 1602
Poisson’s ratio	0.31	JIS R 1602
Fracture toughness (SEPB)	6 MPa·m½	JIS R 1607
Linear thermal expansion, 40-400°C	10.5 × 10^{-6}/K	40-400°C; JIS R 1618
Linear thermal expansion, 40-800°C	11.0 × 10^{-6}/K	40-800°C; JIS R 1618
Thermal conductivity	3 W/(m·K)	20°C; JIS R 1611
Specific heat capacity	0.46 J/(g·K)	JIS R 1611
Material thermal-shock temperature difference	300°C	Water immersion; relative method; JIS R 1648
Dielectric strength	11 kV/mm	JIS C 2141
Volume resistivity, 20°C	10^{13} Ω·cm	20°C; JIS C 2141
Volume resistivity, 300°C	10^{6} Ω·cm	300°C; JIS C 2141
Volume resistivity, 500°C	10^{3} Ω·cm	500°C; JIS C 2141
Relative permittivity	33.0	1 MHz; JIS C 2141

Property	ZO201N typical value	Condition / method
Dielectric loss tangent	0.0016	1 MHz; JIS C 2141

Product Geometry & Configuration

Product parameter	Configuration	Basis
Material system	Zirconia Ceramic Family	Material family; grade selected for the application
Component forms	Solid ceramic plungers; Ceramic plungers with mechanical connection features; Matched plunger-and-cylinder sets	Drawing-defined configurations
Geometry and dimensions	Custom sizes available	Part drawing and mating interfaces
Functional surfaces	Contact, locating, joining or insulating surfaces as applicable	Surface finish and acceptance criteria on the drawing