

# Zirconia material selection guide

Durable materials, right design

MgPSZ		Y-TZP		ATZ (10)	ATZ (20)
Izory®	Izory®HD	Dark HIPed	HIPed	HIPed	HIPed

PROPERTY	TEST METHOD	Izory®	Izory®HD	Dark HIPed	HIPed	ATZ (10) HIPed	ATZ (20) HIPed
Color		Ivory	Ivory	Tan	White or Gray	White	White
Chemistry (%)	ICP & EDS						
ZrO <sub>2</sub> + HfO <sub>2</sub> + MgO		99.50	97.14				
Y <sub>2</sub> O <sub>3</sub> + HfO <sub>2</sub> + ZrO <sub>2</sub>				99.50	99.70	89.95	79.95
Al <sub>2</sub> O <sub>3</sub>				0.25	0.25	10.00	20.00
Other	0.5	0.50	2.86	0.25	0.05	0.05	0.05
Density [g/cm <sup>3</sup> ]	ISO 18754	5.75	5.78	6.08	6.08	5.79	5.45
Water absorption	ASTM-373	nil	nil	nil	nil	nil	nil
Grain Size [μm]	ASTM E-112	70	20	0.4	0.4	0.7	0.7
Fracture Toughness K <sub>IC</sub> [MPa·m <sup>1/2</sup> ]	ASTM C-1421 - Chevron Notch	10	10	5	5	9	-
Loop Abrasion [mm <sup>3</sup> ]	ASTM G-174	0.150	0.100	0.100	0.100	0.020	-
Modulus of Elasticity MOE [GPa]	ASTM E-1876-99	214	214	214	214	296	296
Modulus of Rupture 4 pt MOR [MPa]	ASTM C-1161	575	650	1350	1350	1050	1600
Hardness Vickers [HV 1]	ASTM C-1327-08	1050	1225	1425	1660	1430	1550
Poisson Ratio	ASTM E-1876-99	0.31	0.31	0.32	0.32	0.27	0.27
Compressive Strength [MPa]	ASTM C-773	1760	1760	2580	2580	2100	-
Thermal Conductivity RT [W/m·K]	ASTM C-408	2.50	2.50	2.18	2.18	6.00	6.00
Coefficient of Thermal Exp. X10 <sup>-6</sup> /°C (25-1000°C)	ASTM C-372	10.2	10.2	10.7	10.7	9.0	9.0
Maximum Material Use Limit [°C]	No Load	500	500	1500	1500	1500	1500



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

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