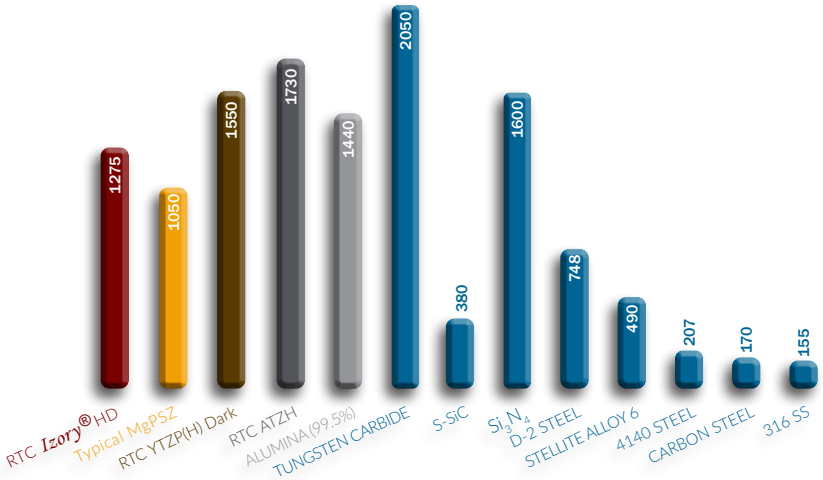
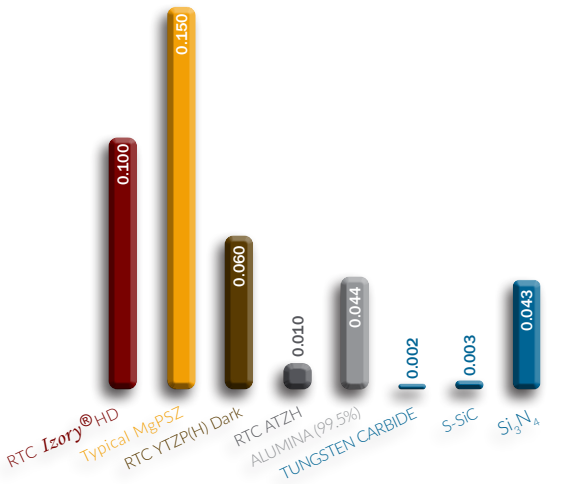
Material selection guide

Durable materials, right design

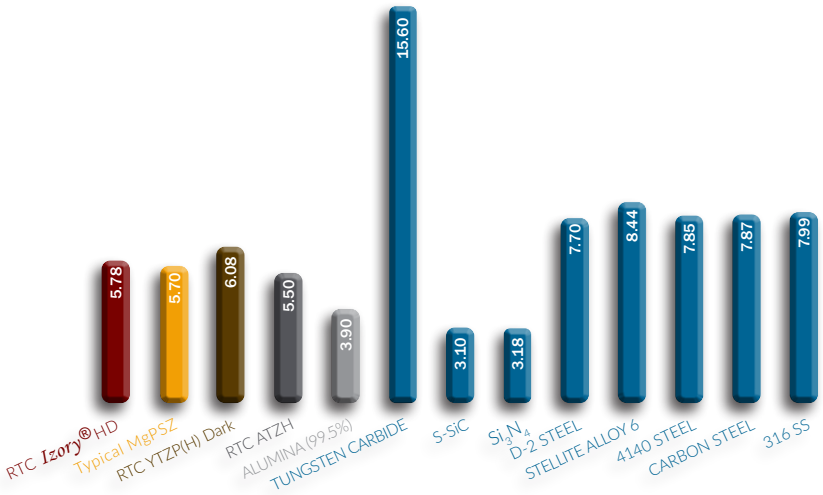
HARDNESS VICKERS *[kg/mm²]*



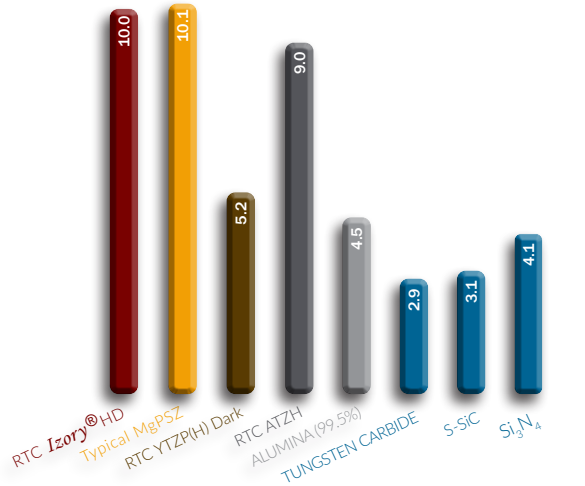
LOOP ABRASION *[ASTM G 174]* *[mm³]*



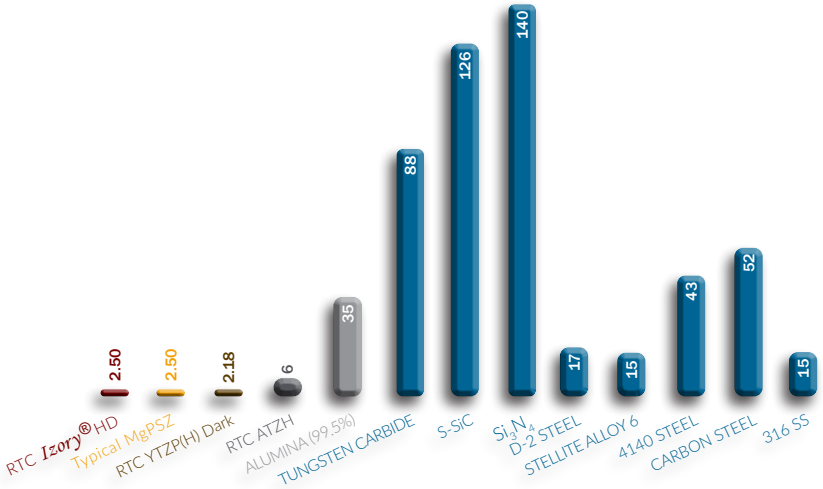
DENSITY *[g/cm³]*



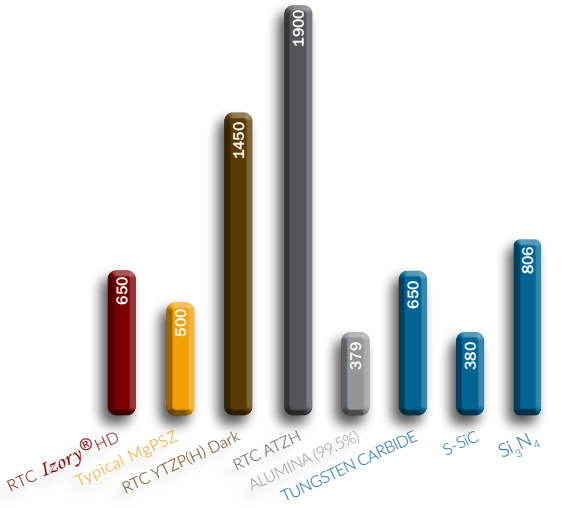
FRACTURE TOUGHNESS K_{IC} *[ASTM C-1421]* *[MPam^1/2]*



THERMAL CONDUCTIVITY RT *[W/m°K]*



MODULUS OF RUPTURE MOR *[ASTM C-1161]* *[MPa]*



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

Contact:
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www.refractron.com
`Newark, NY 14513, USA

122019

Refractron

Material selection guide

Durable materials, right design

		MgPSZ		Y-TZP		ATZ
		Izory®	*Izory*®HD	Dark HIPed	HIPed	HIPed
PROPERTY	**TEST METHOD**					
Color		Ivory	Ivory	Tan	White or Gray	White
Chemistry (%)	ICP & EDS					
$ZrO_2 + HfO_2 + MgO$		99.50	97.14			
$Y_2O_3 + HfO_2 + ZrO_2$				99.50	99.70	79.95
Al_2O_3				0.25	0.30	20.00
Other	0.5	0.50	2.86	0.05	0.05	0.05
Density *[g/cm³]*	ISO 18754	5.75	5.78	6.08	6.08	5.50
Water absortion	ASTM-373	nil	nil	nil	nil	nil
Grain Size *[µm]*	ASTM E-112	70	20	0.4	0.4	0.7
Fracture Toughness K_{Ic} *[MPa·m^1/2]*	ASTM C-1421 - Chevron Notch	10	10	5	5	9
Loop Abrasion *[mm³]*	ASTM G-174	0.150	0.100	0.060	0.060	0.010
Modulus of Elasticity MOE *[GPa]*	ASTM E-1876-99	214	214	214	214	296
Modulus of Rupture 4 pt MOR *[MPa]*	ASTM C-1161	575	650	1450	1550	1900
Hardness Vickers *[HV 1]*	ASTM C-1327-08	1150	1275	1550	1550	1730
Poisson Ratio	ASTM E-1876-99	0.31	0.31	0.32	0.32	0.27
Compressive Stregth *[MPa]*	ASTM C-773	1760	1760	2580	2580	2100
Thermal Condutivity RT *[W/m°K]*	ASTM C-408	2.50	2.50	2.18	2.18	6.00
Coefficient of Thermal Exp. $X10^{-6}$/°C *(25-1000°C)*	ASTM C-372	10.2	10.2	10.7	10.7	9.0
Maximum Material Use Limit *[°C]*	No Load	500	500	1500	1500	1500

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