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Ceramic - Chemical Resistance

	Acids - concentrated	Acids - dilute	Alkalis	Halogens	Metals
Alumina/Silica/Boria Al_2O_3 62/SiO2 24/B2O3 14	Fair	Good	Poor-Fair	-	Good
Alumina/Silica/Boria Al_2O_3 70/SiO2 28/B2O3 2	Fair	Good	Poor-Fair	-	-
Alumina Al_2O_3	Good	Good	Good	Good	Good
Alumino-silicate Glass SiO_2 57/Al_2O3 36/CaO/MgO/ BaO	Fair	Good	Good	-	-
Aluminum Nitride - Machinable AlN / BN	-	Fair	Poor	-	-
Aluminum Nitride AlN	Poor	Fair	Fair	-	Good
Beryllia BeO 99.5	Poor	Fair	Fair	Fair	Good
Boron Carbide - Hot-pressed B_4C	Fair	Good	Fair	Fair	Fair
Boron Nitride BN	Fair	Fair	Fair	Poor	Good
Leachable Ceramic SiO_2 50/$ZrSiO_4$ 40/Al2O3 10	Fair	Fair	Poor	Fair	Good
Magnesium Oxide MgO	-	-	-	-	Good
Potassium Aluminosilicate Muscovite Mica	Fair	Good	Good	-	-
Quartz - Fused SiO_2	Good	Good	Fair	Good	Fair
Ruby Al_2O_3 /Cr2O3 /Si2O3	Good	Good	Good	Good	Good
Sapphire Al_2O_3 99.9	Good	Good	Good	Good	Good
Silicon Carbide - Hot-pressed SiC	Good	Good	Good-Poor	Good-Poor	Fair
Silicon Carbide - Reaction Bonded SiC	Good	Good	Fair	Fair	Fair
Silicon Nitride - Hot-pressed Si_3N_4	Fair	Good	Good-Poor	Good	Fair

Ceramic - Chemical Resistance

	Acids - concentrated	Acids - dilute	Alkalis	Halogens	Metals
Silicon Nitride - Reaction Bonded Si_3N_4	Fair	Good	Fair	Good	Fair
Silicon Nitride/Aluminum Nitride/Aluminum Oxide Sialon	Good	Good	Fair	-	-
Titanium Diboride TiB_2	Fair	Good	Fair	Good	Good
Titanium Dioxide TiO_2 99.6%	Fair	Good	Poor	-	Poor
Zirconia - stabilized with Magnesia ZrO_2/MgO	Fair	Good	Good-Poor	Fair	Good-Fair

Ceramic - Electrical Properties

	Dielectric constant	Dielectric strength kV mm^{-1}	Volume resistivity Ohmcm
Alumina/Silica/Boria Al_2O_3 62/SiO2 24/B2O3 14	5.2 @ 9.4GHz	-	-
Alumina/Silica/Boria Al_2O_3 70/SiO2 28/B2O3 2	5.7 @ 9.4GHz	-	-
Alumina Al_2O_3	9.0-10.1	10-35	$> 10^{14}$ @25C
Aluminum Nitride - Machinable (BNP-2) AlN / BN	7.1	-	-
Aluminum Nitride - Machinable AlN / BN	7.3	40	1.8×10^{13} @25C
Aluminum Nitride AlN	9.2	35	$> 10^{13}$ @25C
Beryllia BeO 99.5	6.5-7.5	10-14	$> 10^{14}$ @25C
Boron Carbide - Hot-pressed B_4C	-	-	0.1-10 @25C
Boron Nitride BN	4.3	40-200	10^{11}-10^{14} @25C
Potassium Aluminosilicate Muscovite Mica	6.0-6.6	40-200	10^{12} @25C
Quartz - Fused SiO_2	3.8	25-40	10^{18} @25C
Ruby Al_2O_3 /Cr2O3 /Si2O3	7.5-11.5	15-50	10^{14} @25C
Sapphire Al_2O_3 99.9	7.5-11.5	15-50	$> 10^{14}$ @25C
Silicon Carbide - Hot-pressed SiC	40	-	10^{3}-10^{5} @25C
Silicon Carbide - Reaction Bonded SiC	-	-	10^{2}-10^{3} @25C
Silicon Nitride - Hot-pressed Si_3N_4	10	-	10^{12}-10^{15} @25C
Silicon Nitride - Reaction Bonded Si_3N_4	10	-	$> 10^{7}$ @25C

Ceramic - Electrical Properties

	Dielectric constant	Dielectric strength kV mm^{-1}	Volume resistivity Ohmcm
Silicon Nitride/Aluminum Nitride/Aluminum Oxide Sialon	-	-	10^{12}-10^{17} @25C
Titanium Diboride TiB_2	-	-	$15x10^{-6}$ @25C
Titanium Dioxide TiO_2 99.6%	80-100	-	10^{13}-10^{18} @25C
Tungsten Carbide/Cobalt WC 94/Co 6	-	-	$2x10^{-6}$ @25C

Ceramic - Mechanical Properties

	Compressive strength MPa	Fracture toughness MPam(0.5)	Hardness - Knoop kgf mm^{-2}	Hardness - Vickers kgf mm^{-2}	Poisson's ratio	Shear strength MPa	Tensile modulus GPa
Alumina/Silica/Boria Al_2O_3 62/SiO2 24/B2O3 14	-	-	-	-	-	-	140
Alumina/Silica/Boria Al_2O_3 70/SiO2 28/B2O3 2	-	-	-	-	-	-	185
Alumina Al_2O_3	2200-2600	-	2100	1500-1650	-	330	300-400
Alumina Al_2O_3 99.5	300-3000	-	-	-	-	-	-
Aluminum Nitride - Machinable (BNP-2) AlN / BN	< 1070	-	3.42 - 4.91	-	-	-	34.1 (parallel)
Aluminum Nitride - Machinable AlN / BN	1000	-	-	560	-	-	160
Aluminum Nitride AlN	-	-	-	1100	-	450	-
Beryllia BeO 99.5	1550-1850	-	-	1100-1300	-	180-250	340-400
Boron Carbide - Hot-pressed B_4C	1400-3400	-	2800-3500	3200	-	-	440-470
Boron Carbide B_4C	200-300	-	-	-	-	-	-
Boron Nitride BN	30-120	-	-	-	-	12-25	20-35
Potassium Aluminosilicate Muscovite Mica	190-280	-	-	2-3	-	215-265	-
	-	-	-	Mohs	-	-	-
Quartz - Fused SiO_2	1100	-	820	1000	-	70	72-74
Ruby Al_2O_3 /Cr2O3 /Si2O3	2100	-	2000	2500-3000	-	-	350-390
Sapphire Al_2O_3 99.9	2100	-	2000	1600-1800	-	-	350-390
Silicon Carbide - Hot-pressed SiC	1000-1700	-	-	2400-2800	-	210-380	200-500
Silicon Carbide - Reaction Bonded SiC	2000-3500	-	-	2500-3500	-	-	410
Silicon Carbide SiC	-	-	-	2500	-	-	-

Ceramic - Mechanical Properties

	Compressive strength MPa	Fracture toughness MPam(0.5)	Hardness - Knoop kgf mm^{-2}	Hardness - Vickers kgf mm^{-2}	Poisson's ratio	Shear strength MPa	Tensile modulus GPa
Silicon Nitride - Gas Pressure Sintered Si_3N_4	-	7.0	-	1450	-	-	-
Silicon Nitride - Hot-pressed Si_3N_4	2000-3500	-	-	1700-2200	-	480-960	280-310
Silicon Nitride - Reaction Bonded Si_3N_4	550-650	-	-	800-1000	-	190-240	170-220
Silicon Nitride/Aluminum Nitride/Aluminum Oxide Sialon	> 3500	-	-	1650-1800	-	-	280-300
Sindanyo® H91 POC/POL	90	-	-	-	-	-	-
Titanium Diboride TiB_2	-	-	-	3000	0.18-0.20	300-600	520-570
Titanium Dioxide TiO_2 99.6%	800-1000	-	-	980	-	-	250-300
Tungsten Carbide/Cobalt WC 94/Co 6	5300-7000	-	-	1430-1580	0.21-0.22	-	634-666
Zirconia - stabilized with Magnesia ZrO_2/MgO	1500-2000	-	-	1200	-	414	200
Zirconia - stabilized with Yttria ZrO_2/Y_2O3	2000	-	-	1250	-	-	200

Ceramic - Physical Properties

	Apparent porosity %	Density g cm^{-3}	Refractive index	Useful optical transmission range	Water absorption - saturation %
Alumina/Silica/Boria Al_2O_3 62/SiO2 24/B2O3 14	0	2.7	1.57	-	0
Alumina/Silica/Boria Al_2O_3 70/SiO2 28/B2O3 2	-	3.05	1.62	-	-
Alumina/Silica Al_2O_3 80/SiO2 20	-	3.1	-	-	-
Alumina Al_2O_3	0	3.9	-	-	0
Alumina Al_2O_3 99.5	0	3.89	-	-	-
Alumino-silicate Glass SiO_2 57/Al_2O3 36/CaO/MgO/ BaO	45	2.65	1.54	-	-
Aluminum Nitride - Machinable (BNP-2) AlN / BN	0	2.90	-	-	-
Aluminum Nitride - Machinable AlN / BN	0	2.95	-	-	-
Aluminum Nitride AlN	-	3.33	-	500-3000nm	0
Beryllia BeO 99.5	0	2.86	-	-	0.07
Boron Carbide - Hot-pressed B_4C	< 3	2.45-2.52	-	-	-
Boron Carbide B_4C	-	2.52	-	-	-
Boron Nitride BN	2-15	1.9-2.2	-	-	-
Leachable Ceramic SiO_2 50/$ZrSiO_4$ 40/Al2O3 10	25	2.1	-	-	14
Magnesium Oxide MgO	< 1%	3.40	-	-	-
Potassium Aluminosilicate Muscovite Mica	-	2.6-3.2	1.5-1.6	450-700nm	Very Low
Quartz - Fused SiO_2	0	2.2	1.46	180-2500nm	0
Ruby Al_2O_3 /Cr2O3 /Si2O3	0	3.98	-	150-5500nm	0

Ceramic - Physical Properties

	Apparent porosity %	Density g cm^{-3}	Refractive index	Useful optical transmission range	Water absorption - saturation %
Sapphire Al_2O_3 99.9	0	3.985	1.71-1.79	200-5500nm	0
Silicon Carbide - Hot-pressed SiC	0	3.15	-	-	-
Silicon Carbide - Reaction Bonded SiC	0	3.10	-	-	-
Silicon carbide/Silica/Alumina/Magnesia SiC 90/SiO_2 7/Al_2O3 1.5/MgO 1.5	-	0.55	-	-	-
Silicon Carbide SiC	-	3.2	-	-	-
Silicon Nitride - Gas Pressure Sintered Si_3N_4	0	3.24	-	-	-
Silicon Nitride - Hot-pressed Si_3N_4	0	3.11	-	-	-
Silicon Nitride - Reaction Bonded Si_3N_4	15-23	2.4	-	-	-
Silicon Nitride/Aluminum Nitride/Aluminum Oxide Sialon	0.01	3.24	-	-	-
Silicon Nitride Si_3N_4	-	3.44	-	-	-
Sindanyo® H91 POC/POL	-	1.6	-	-	-
Superwool® Silica/Calcia/Magnesia	-	0.21	-	-	-
Titanium Diboride TiB_2	-	4.5	-	-	-
Titanium Dioxide TiO_2 99.6%	0	4.05	-	-	-
Tungsten Carbide/Cobalt WC 94/Co 6	-	14.95	-	-	-
Yttrium Oxide Y_2O_3	-	5.03	-	-	-
Zirconia - stabilized with Magnesia ZrO_2/MgO	0	5.74	-	-	0

Ceramic - Physical Properties

	Apparent porosity %	Density g cm^{-3}	Refractive index	Useful optical transmission range	Water absorption - saturation %
Zirconia - stabilized with Yttria ZrO_2/Y_2O3	-	5.9	-	-	-
Zirconia - unstabilized ZrO_2 99	-	6.1	-	-	-

Ceramic - Thermal Properties

	Coefficient of thermal expansion x10^{-6} K^{-1}	Melting point C	Specific heat J K^{-1} kg^{-1}	Sublimation point C	Thermal conductivity W m^{-1} K^{-1}	Upper continuous use temperature C
Alumina/Silica/Boria Al_2O_3 62/SiO2 24/B2O3 14	3 @20-1000C	-	1100 @25C	1800	-	1200-1400
Alumina/Silica/Boria Al_2O_3 70/SiO2 28/B2O3 2	5 @20-1000C	-	1000 @500C	1800	-	1350-1650
Alumina/Silica Al_2O_3 80/SiO2 20	-	-	-	-	-	1600
Alumina Al_2O_3	8.0 @20-1000C	2100	850-900 @25C	-	26-35 @20C	1700
Alumina Al_2O_3 99.5	8.3 @20-1000C	-	850 @25C	-	26.0 @20C	1800
Alumino-silicate Glass SiO_2 57/Al_2O3 36/CaO/MgO/ BaO	5 @20-1000C	-	-	-	-	900
Aluminum Nitride - Machinable (BNP-2) AlN / BN	5.1 @23-800C	-	-	-	92 @25C	1000 (air)
	-	-	-	-	-	1900 (oxidising atm)
Aluminum Nitride - Machinable AlN / BN	5.2 @20-1000C	-	-	-	100 @20C	1000 - 1900
Aluminum Nitride AlN	4.4 @20-1000C	2200	800 @25C	2500	175 - 190 @20C	1000-1800
Beryllia BeO 99.5	8.4-9.0 @20-1000C	-	1020-1120 @25C	-	260-300 @20C	1800-1900
Boron Carbide - Hot-pressed B_4C	5.6 @20-1000C	2450	950 @25C	-	30-90 @20C	600-800
Boron Carbide B_4C	-	2450	-	-	-	600-800
Boron Nitride BN	1.0-36 @20-1000C	-	800-2000 @25C	2600-2800	15-50 @20C	950-2500
Leachable Ceramic SiO_2 50/$ZrSiO_4$ 40/Al2O3 10	1.98 @20-1000C	-	-	-	-	1050
Magnesium Oxide MgO	-	-	-	-	-	2200
Potassium Aluminosilicate Muscovite Mica	9-36 @20-1000C	-	50 @25C	-	0.5-7 @20C	500-600
Quartz - Fused SiO_2	0.54 @20-1000C	1715	670-740 @25C	-	1.46 @20C	1100-1400
Ruby Al_2O_3 /Cr2O3 /Si2O3	5.8 @20-1000C	2050	750 @25C	-	35-40 @20C	1800-1950

Ceramic - Thermal Properties

	Coefficient of thermal expansion $x10^{-6}$ K^{-1}	Melting point C	Specific heat $J\ K^{-1}\ kg^{-1}$	Sublimation point C	Thermal conductivity $W\ m^{-1}\ K^{-1}$	Upper continuous use temperature C
Sapphire Al_2O_3 99.9	5.8 @20-1000C	2050	750 @25C	-	35-40 @20C	1800-1950
Silicon Carbide - Hot-pressed SiC	4.5 @20-1000C	2650-2950	670-710 @25C	-	90-160 @20C	1500-1650
Silicon Carbide - Reaction Bonded SiC	4.3-4.6 @20-1000C	-	1100 @25C	-	150-200 @20C	1350
Silicon carbide/Silica/ Alumina/Magnesia SiC 90/SiO_2 7/Al_2O3 1.5/MgO 1.5	-	-	-	-	-	1480
Silicon Carbide SiC	-	2650-2950	-	-	-	-
Silicon Nitride - Gas Pressure Sintered Si_3N_4	RT-1000	-	-	-	25	-
	3.6	-	-	-	22	-
Silicon Nitride - Hot-pressed Si_3N_4	3.3 @20-1000C	-	680-800 @25C	1900	15-43 @20C	1100-1650
Silicon Nitride - Reaction Bonded Si_3N_4	3.3 @20-1000C	-	690 @25C	-	10-16 @20C	1200-1500
Silicon Nitride/Aluminum Nitride/Aluminum Oxide Sialon	3.3-3.7 @20-1000C	-	620-710 @25C	-	20 @20C	1000
Silicon Nitride Si_3N_4	-	-	-	1900	-	-
Sindanyo® H91 POC/POL	-	-	-	-	-	700
Titanium Diboride TiB_2	6-7 @20-1000C	3000	-	-	50-70 @20C	1000-2000
Titanium Dioxide TiO_2 99.6%	8-10 @20-1000C	1850	-	-	2.5-5.0 @20C	-
Tungsten Carbide/Cobalt WC 94/Co 6	4.6-5.0 @20-1000C	-	200-480 @25C	-	60-80 @20C	600-630
Yttrium Oxide Y_2O_3	8.1 @20-1000C	2400	-	-	8-12 @20C	-
Zirconia - stabilized with Magnesia ZrO_2/MgO	5-10 @20-1000C	-	400-500 @25C	-	1.5-2.5 @20C	1000

Ceramic - Thermal Properties

	Coefficient of thermal expansion $x10^{-6}$ K^{-1}	Melting point C	Specific heat J K^{-1} kg^{-1}	Sublimation point C	Thermal conductivity W m^{-1} K^{-1}	Upper continuous use temperature C
Zirconia - stabilized with Yttria ZrO_2/Y_2O3	10 @20-1000C	2700	400-500 @25C	-	2.5 @20C	2200
Zirconia - unstabilized ZrO_2 99	-	2650	-	-	-	2200