Fired refractory shapes : Cerox®

Product Name	Cerox 100	Cerox 120	Cerox 200	Cerox FC 200	Cerox 700	Cerox 720	Cerox 730	Cerox 1000	Cerox 1200	Cerox 1300	Cerox 1400
Chemical analysis, % weight basis after firing											
Alumina, Al_2O_3	47	51	74		90	90	90	93	>99	64	35
Silica, SiO_2	50	46	22		10	9	10	5	0.4	12	5
Zirconia, ZrO_2	-	-	-		-	-	-	-	-	23	-
Silicon carbide, SiC	-	-	-		-	-	-	-	-	-	59
Ferric oxide, Fe_2O_3	1.0	0.6	1.0		0.2			0.5	0.1	0.2	0.2
Titanium oxide, TiO_2	1.9	1.5	2.3		0.1			0.7	trace	0.1	0.1
Magnesium oxide, MgO	0.1	trace									
Alkalies, as Na_2O	0.1	0.3	0.2				trace	0.2	0.1	0.2	0.2
Bulk density, pcf (kg/m³) ASTM C 134	154 (2468)	136 (2179)	161 (2580)	157 (515)	173 (2772)	176 (2820)	172 (2456)	179 (2869)	183 (2933)	190 (3045)	161 (2580)
Apparent porosity, % ASTM C 20	20			23	19	16	19	17	21	17	21
Permeability, ft/hr•ft²•in., psi (MPa)	4 (0.03)	3 (0.02)	4 (0.03)						6	4 (0.03)	
Modulus of rupture, psi (MPa), ASTM C 583											
@ 75°F (24°C)	1200 (8.28)		1600 (11.03)	1500 (10.34)	1600 (11.03)	2400 (16.55)	1300 (8.97)-	1600 (11.03)	5000 (34.48)	3000 (20.69)	1800 (12.41)
@ 2300°F (1260°C)	2400 (16.55)		2000 (13.79)	1800 (12.41)	2400 (16.55)	4800 (33.10)			2600 (17.93)		2200 (15.17)
@ 2600°F (1426°C)	1000 (6.89)		1100 (7.59)	1000 (6.89)	1900 (13.10)	3700 (25.52)	-	900 (6.21)	1400 (9.65)	2300 (15.86)	1000 (6.89)
@ 2800°F (1538°C)	600 (4.14)		800 (5.51)	700 (4.83)	1000 (6.89)	1600 (11.03)		700 (4.83)		1400 (9.66)	500 (3.44)
Cold crushing strength, psi (MPa), ASTM C 133											
@ 2800°F (1538°C)	--		7000 - 10000 (48 - 69)	5000 - 8000 (34 - 55)	8000 - 10000 (55 - 69)	9000 - 10000 (62 - 76)	-			8000 - 11000 (55 - 76)	-
Permanent linear change, % ASTM C 113											
5 hrs. @ 3000°F (1648°C)	-	-3.3	-		-			-3.3	-		
5 hrs. @ 3200°F (1760°C)		-	-1.3		-0.4	-1.0	-		-1.3	-0.4	-1.0
Deformation under hot load, % @ 25 psi (0.17 MPa), ASTM C 16											
1 1/2 hrs. @ 2640°F (1448°C)	-	0.4	-		-	0.0	-		-	0.0	-
1 1/2 hrs. @ 2800°F (1538°C)		-				-				0.2	1.6
1 1/2 hrs. @ 2850°F (1566°C)		-	6.0		0.2	0.3			3.6	-	
1 1/2 hrs. @ 3000°F (1760°C)			0		-	1.3			0.5		
Abrasion loss, cm², ASTM C 704	-	10.0	7.0		6.5	4.5	-	5.0	4.5	4.0	5.0
Coefficient of reversible thermal expansion, in./in.•°F•10⁻⁶	-		3.3		4.3	4.0	3.7	4.7	5.8	3.4	3.3
Spall resistance, relative	good		very good			good	very good	fair	low	excellent	very good

Safety Data Sheet (SDS): are available for all our products. Data sheets, in other languages, can also be found by visiting our website.
Please visit our website **www.morganthermalceramics.com** and click on the Safety Data Sheets Quick Link on our home page.

Fired refractory shapes : Cerox® pre-fired refractory shapes

Product Name	Cerox 90V	Cerox FS-99V	Cerox 90P	Cerox 95P	Cerox FS-85P
Method of forming	thixitropic cast		pressed	pressed	pressed
Chemical analysis, % weight basis after firing					
Alumina, Al_2O_3	91	0.7	90	95	14
Silica, SiO_2	8	99	8.6	4.0	85
Ferric oxide, Fe_2O_3	0.15	0.1	0.4		0.3
Titanium oxide, TiO_2	0.1	trace	0.2	-	0.7
Calcium + Magnesium oxide, CaO + MgO	0.04	0.1	0.1		0.15
Alkalies, $Na_2O + K_2O$	0.15		0.3		0.45
Bulk density, pcf (kg/m³) ASTM C 134	176 (2820)	113 (1811)	178 (2853)	188 (3013)	109 (1510)
Apparent porosity, % ASTM C 20	20	12	23	20	22
Classification temperature rating, °F (°C)	3090 (1699)	2800 (1538)	3090 (1699)	3100 (1704)	2750 (1510)
Modulus of rupture, psi (MPa), ASTM C 583	2500 (17.2)	1150 (7.9)	4000 (27.6)	4100 (28.3)	510 (3.5)
Coefficient of thermal expansion, in./in.•°F	4.1	0.2	4.2	4.5	3.2
Thermal conductivity, BTU•in./hr•ft²•°F (W/m•K), ASTM C 417					
mean temperature @ 2000°F (1093°C)	16.0 (2.3)		22.0 (3.2)	10.6 (1.5)	9.5 (1.37)

Fired refractory shapes : Valcor®

Product Name	Valcor G	ValcorG-AZ
Chemical analysis, % weight basis after firing		
Alumina, Al_2O_3	93	64
Silica, SiO_2	5	12
Zirconia, ZrO_2	-	23
Ferric oxide, Fe_2O_3	0.5	0.2
Titanium oxide, TiO_2	0.7	0.1
Magnesium oxide, MgO	trace	
Alkalies, as Na_2O	0.2	
Bulk density, pcf (kg/m³), ASTM C 134	179 (2868)	190 (3045)
Apparent porosity, % ASTM C 20	17	
Permeability, ft/hr•ft²•in., psi (MPa)	4	
Melting point, °F (°C)	3560 (1960)	3200 (1760)
Hot modulus of rupture, psi, ASTM C 583		
@ 75°F (24°C)	1600 (11)	3000 (21)
@ 2300°F (1260°C)		
@ 2600°F (1426°C)	900 (6.2)	2300 (16)
@ 2800°F (1538°C)	700 (4.8)	1400 (9.7)
Permanent linear change, %, ASTM C 113		
5 hrs. @ 3000°F (1648°C)	-	-0.4
5 hrs. @ 3200°F (1760°C)	-1.9	-
Deformation under hot load, % @ 25 psi, ASTM C 16		
1 1/2 hrs. @ 2640°F (1448°C)	3.6	0.2
Coefficient of reversible thermal expansion, in./in.•°F•10^{-6}	4.7	3.4

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