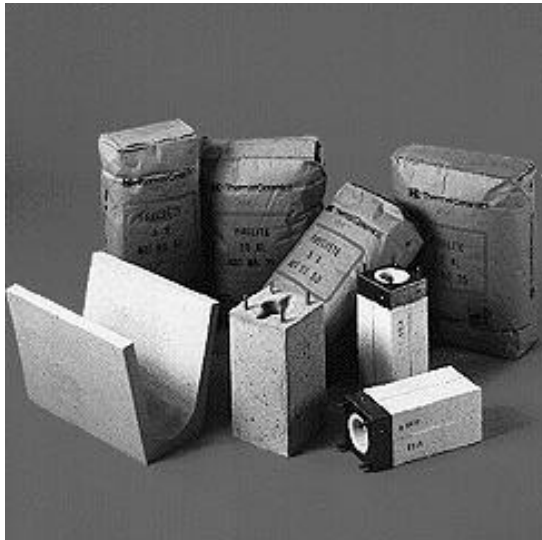




**ISO 9002
Certified**

Dense Concretes Firecrete™



The two charts below summarize Thermal Ceramics range of dense concretes.

The aim is to aid a quick selection of the appropriate concrete.

The chart in the back page provides full details of the product physical properties as determined by our laboratory test results.

Characteristics	Type of Firecrete											
	97	95	4 X	3 X	3 X-G	HT	HT-G	STD	2400	2400-G	2400HS	C2
High strength	XX	XX	XX	X	X	X	X	X	X	X	XX	XX
Classification t. °C	1800	1800	1650	1650	1650	1540	1540	1400	1315	1315	1315	1260
Abrasion resistance	X	XX	XX	XX	XX	X	X	X	X	X	X	XX
Low % Fe ₂ O ₃	XX	XX	X	X								
Low % SiO ₂	XX	XX										
Cast installation	X	X	X	X		X		X	X		X	X
Gun installation					X		X			X		X

Applications	97	95	4 X	3 X	3 X-G	HT	HT-G	STD	2400	2400-G	2400HS	C2
Reducing atmosphere	X	X	X	X	X							
Ammonia production & where hydrogen atm. are encountered		X										
New furnace building			X	X	X			X	X	X	X	X
Furnace repairs			X	X	X			X	X	X	X	X
Burner blocks casting		X	X	X	X	X	X					
Door linings and car tops				X	X			X	X			
Crucible furnace lining				X	X	X						
Special shapes lining			X	X	X							
Boiler linings						X	X	X	X	X		
Nuclear furnace lining	X											



Product Information

Dense Concretes Firecrete™

Characteristics

Firecrete Type	97*	95*	4 X*	3 X*	3X-G*	HT	HT-G	STD*	2400	2400-G	2400 HS	C2*		
Method of application	Cast	Cast	Cast	Cast	Gun	Cast	Gun	Cast	Gun	Cast	Gun	Cast	Gun	
Max. sv. temperature °C	>1800	>1800	1650	1650	1650	1540	1540	1400	1315	1315	1315	1260		
°F	>3270	>3270	3000	3000	3000	2800	2800	2550	2400	2400	2400	2300		
Pyrometric cone equiv.	40	40	33	33	33	29	29	16	15	15	15	15		
Basic raw material	Tabular Alumina	Tabular Alumina	Chamotte corundum	Chamotte corundum	Chamotte corundum	Chamotte	Chamotte	Chamotte	Chamotte	Chamotte	Chamotte	Chamotte		
Maximum Grain size mm.	7	3	5	5	5	5	5	5	3	3	3	3		
Density (kg/m3)														
• As placed	3030	2830	2430	2410	2350	2220	2250	2260	2280	2110	2130	2180	2200	2300
• Oven dried at 105°C	2850	2620	2210	2190	2150	1980	2000	2090	2090	1850	1910	2050	2000	2090
• After 5 h firing at 815°C	2780	2550	2160	2150	2050	1900	1910	1970	2010	1750	1810	1960	1850	2000
Cold crushing strength (MPa)***														
• Oven dried at 105°C	49.0	66.7	39.2	31.4	34.3	19.6	21.6	36.3	39.2	22.5	30.4	30	58.8	63.7
• After 5 hr firing at 815°C	30.4	60.8	34.3	21.6	30.4	11.8	13.7	27.4	30.4	14.7	25.5	25	35.3	40.2
1000°C	29.4	60.8	29.4	16.7	22.5	9.8	11.8	22.5	25.5	14.7	24.5	-	29.4	34.3
1200°C	34.3	59.8	26.5	16.7	20.6	10.8	13.7	17.6	17.8	18.6	26.5	-	26.5	32.3
1400°C	37.3	58.3	24.5	26.5	-	22.5	25.5	35.3	37.3	-	-	-	-	-
1600°C	-	51.0	-	52.9	-	-	-	-	-	-	-	-	-	-
Permanent linear change (%)														
• After 5 hr firing at 815°C	- 0.1	- 0.1	- 0.2	- 0.1	- 0.2	- 0.2	- 0.2	- 0.2	- 0.2	- 0.2	- 0.2	0.3	- 0.2	- 0.2
1000°C	- 0.1	- 0.1	-	- 0.1	- 0.2	- 0.2	- 0.2	- 0.2	- 0.2	- 0.2	- 0.2	0.3	- 0.4	- 0.3
1200°C	- 0.2	- 0.1	- 0.2	- 0.2	- 0.2	- 0.3	- 0.3	- 0.3	- 0.3	- 0.4	- 0.4	0.5	- 0.8	- 0.7
1400°C	- 0.3	- 0.2	- 0.2	- 0.4	- 0.3	- 0.5	- 0.5	- 0.5	-	-	-	-	-	-
1600°C	+ 0.1	- 0.3	-	+ 0.2	-	-	-	-	-	-	-	-	-	-
Thermal Cond. (W/m.K)**														
ASTM-C-417-84														
At mean temperature of 400°C	-	-	1.02	0.97	0.97	0.64	0.66	0.59	0.56	0.58	0.58	0.47	0.49	
600°C	1.80	1.28	1.07	1.02	1.02	0.73	0.75	0.64	0.60	0.62	0.62	0.49	0.50	
800°C	1.83	1.28	1.14	1.09	1.09	0.81	0.84	0.71	0.68	0.69	0.69	0.54	0.56	
1000°C	1.86	1.40	1.28	1.22	1.22	0.92	0.95	0.81	0.79	0.80	0.80	0.70	0.74	
1200°C	1.89	1.51	1.58	1.50	1.50	1.01	1.05	0.93	-	-	-	-	-	
Estimated weight (kg) of dry material required per m3 of construction (no allowance for waste)	2800	2570	2190	2170	2100	1950	1970	1980	2020	1800	1850	1900	1900	2020
Estimated weight (kg) of water required per 100 kg dry material	8	10	11	11	12	14	14	14	13	17	15	18	16	14
Chemical composition														
Al ₂ O ₃	96.7	94.1	60.0	53.4	53.4	47.1	47.0	41.6	31.9	31.8	33.8	41.7		
SiO ₂	< 0.1	< 0.1	33.1	39.6	38.5	45.3	45.3	40.0	48.9	48.9	44.0	33.7		
Fe ₂ O ₃	0.1	0.1	1.0	1.1	1.3	1.5	1.5	5.2	4.9	4.9	6.8	5.7		
TiO ₂ (Tr + Trace)	Tr.	Tr.	1.1	1.6	1.6	1.4	1.3	1.8	1.4	1.4	1.3	1.5		
CaO	2.4	4.9	3.7	3.3	4.0	4.0	4.0	10.7	9.0	9.0	12.6	13.7		
MgO + K ₂ O + Na ₂ O	< 0.4	< 0.4	0.55	0.3	0.3	0.4	0.4	0.3	3.5	3.6	1.3	2.9		
Ig. Loss	0.2	0.5	0.3	0.2	0.8	0.2	0.4	0.3	0.3	0.3	0.2	0.6		
Packaging in bags of (kg)	50	50	50	50	50	50	50	50	50	50	50	50		

* Firecretes 97, 95, 3X, 4X, 3X-G, STD and C2 are "high strength" concretes as classified by ASTM-C-401-84

** To convert W/m.K to Btu in/ft²/h/°F, multiply by 6.93 to kcal/m.h. °C, multiply by 0.86

*** To convert MPa to kg/cm², multiply by 10.2

**** Properties obtained from material vibrated at 50 Hz for 3 - 4 minutes

The values given herein are typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Therefore, the data contained herein should not be used for specification purposes. Check with your Thermal Ceramics office to obtain current information.