

Product Information

Thermo-Sil® Castables

Thermo-Sil Castables are individually formulated for customer specific applications. All castable products consist of the highest quality fused silica and cements and are designed for ease of use with 30 to 40 minute "working" times. Thermo-Sil Castables are noted for their superior performance in areas requiring precision, durability, and resistance to thermal shock. Thermo-Sil Castables are packaged in 50 lb. (22.7 KG) plastic-lined paper bags, 40 per pallet.

Thermo-Sil Castable TG

Thermo-Sil Castable TG is a low cost, industrial grade castable for general industrial uses requiring extreme thermal shock resistance and general toughness. Castable TG is formulated using high quality fused silica grog and high purity calcium aluminate cement. Castable TG is also available in a low cement version which results in higher strengths.

Thermo-Sil Castable 120

Thermo-Sil Castable 120 is a low cost, fused silica based castable designed for use as a durable insulating material in induction heating units. This castable is a thermal shock-resistant nonreceptor that directs all the energy to the product being heated. Thermo-Sil Castable 120 exhibits very low shrinkage and can serve as a high temperature tooling material.

Thermo-Sil Castable ICL

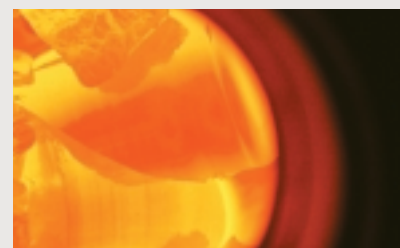
Thermo-Sil Castable ICL is a modified version of Castable 120 that includes a small amount of abrasion resistant ceramic. Castable ICL is used in areas where abrasion in an induction heating system may be the primary mode of failure.

Thermo-Sil Castable 220

Thermo-Sil Castable 220 is primarily employed as a precision high temperature tooling material. Specific applications include the high temperature forming of glass and titanium products. The castable is comprised of precisely sized high purity fused silica, silicon carbide, and a calcium aluminate binder. This castable is designed to produce highly accurate tools ranging in size from less than 0.014 m³ to more than 2.0 m³. Cast shrinkage is negligible and the tools remain true and accurate through 1,000°C.



Thermo-Sil® Kiln Bonded Shapes



Thermo-Sil HS

Thermo-Sil HS is a relatively fine-grained slip and aggregate kiln fired product. This body yields high bending and cold crushing strengths while exhibiting superior resistance to thermal shock. Typical products manufactured using the HS product vary from high precision durable shapes, such as rollers for glass tempering furnaces, to heavy-duty liners for corrosive chemical transfer applications.

Thermo-Sil ISOMOLDED™ Shapes

Thermo-Sil ISOMOLDED fused silica shapes are unique to Ceradyne Thermo Materials. They are primarily used in applications which require shapes of large mass or superior resistance to compressive loads at high temperatures. The engineered ISOMOLDED fused silica body consists of relatively large grains bound with special slips. The kiln fired shapes demonstrate extraordinary consistency of density with minimal porosity in even the largest mass castings. Products typical of this body include high temperature precision press platens, load bearing refractory bolsters, and high longevity coke oven door plugs.

Thermo-Sil UHS Shapes

Thermo-Sil UHS Shapes are primarily thin-walled shapes where the process of shell casting is usually used to obtain rather high strengths and finely detailed surfaces.

Typical Properties of Ceradyne Thermo-Sil® Fused Silica Materials

Property	Units	HS	UHS	Isomolded™	Castable TG	Castable 120	Castable 220
Bulk Density	g/cc	1.99-2.02	1.920-2.02	2.00-2.04	1.824-1.840	1.856	2.06-2.12
Apparent Porosity (ASTM C-20)	vol %	8-10	8-12	7-8	13-15	13-15	13-15
Water Absorption (ASTM C-20)	vol%	8-10	8-12	3-4	13-15	13-15	13-15
Compressive Strength (ASTM C-133)	MPa	48.3-51.7	172.4-241.4	69.0-82.8	27.6-41.4	27.6-41.4	48.3-51.7
Modulus of Rupture (ASTM C-133)	MPa	17.2-20	54.5-57.9	10.3-12.4	6.9-10.3	8.3-10.3	10.3-12.4
Linear Shrinkage (@ 1,100° C)	%	nil	nil	nil	0.2-0.4	0.2	nil
Elastic Modulus	GPa	37.2	36.5-40.0	34.5	–	–	–
Flexural Strength	MPa	17.2-20.0	54.5-57.9	10.3-12.4	6.9-10.3	8.3-10.3	10.3-12.4
Crystalline Content	vol %	< 1	< 0.5	< 2	< 2	< 2	< 2
Thermal Conductivity	W/m°C	0.84	0.75	0.84	0.62	0.62	0.72
Coefficient of Thermal Expansion	10 ⁻⁶ /°C	0.6	0.5	0.6	0.8	0.8	1.7
Specific Heat	J/g°C						
	@ 20°C	1.0	1.0	1.0	1.0	1.0	–
	@ 800°C	0.63	0.63	0.63	–	–	–
Dielectric Constant (@ 20° C)	–	–	3.27-3.31	–	–	–	–
Loss Tangent (@ 20° C)	–	–	0.001	–	–	–	–

1. Unless otherwise indicated, properties were determined at room temperature.
2. The above stated values are typical and are not to be considered as specification values. Ceradyne, Inc. assumes no liability for the use of any of the above data.



The world leader in fused silica ceramic technology

 ceradyne, inc.

THERMO MATERIALS DIVISION

P.O. Box 925 | 3449 Church Street | Scottdale, GA 30079 | Phone: 404.292.4242 | Fax: 404.292.9557