310M Machinable Ceramic Blocks

Rescor™ 310 Foam is composed of over 99% pure fused Silica Ceramic and withstands temperatures to 3000ºF.

310 Ceramic Foam features low thermal expansion, high thermal shock resistance, low thermal conductivity and high thermal reflectance.

It is resistant to oxidizing and reducing atmospheres, molten metals, steam, corrosive gases, most acids, chemicals and solvents.

Does not contain organics and will not out-gas in vacuum atmospheres.

White Hot, 2000ºF, Ceramic Foam parts can be immersed in water without cracking.

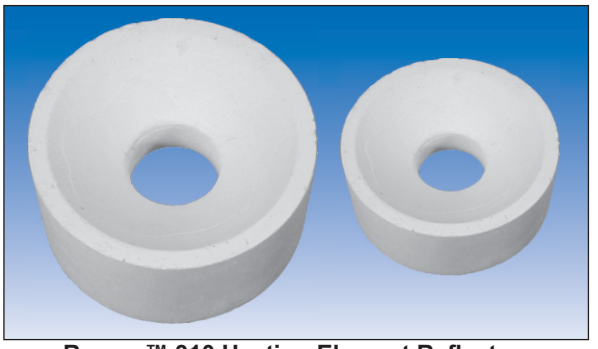
Rescor™ 310 is easily cut, sawed and drilled.

Can produce highly detailed parts with unique properties suitable for many applications.

Applications Include: Miniature heater forms, heat reflectors, instrumentation parts and assemblies, radiant heater panels, severe thermal shock applications, etc.

Typical Tolerances are -0.015" to +0.060".

Cat. No.	Size
310M-1	4.5” x 6” x 9”
310M-2	4.5” x 9” x 12”
310M-3	4.5” x 12” x 18”
310-4	Trial Kit (Misc. Pieces)
901A-1	Hardener (Quart)



Rescor™ 310 Heating Element Reflectors

Rescor™ TYPE GRADE	310M High Strength Machinable	311 Insulating Blocks
Max Service Temp. ºF	3000	2600
Mixed Density (lb. / ft^3)	50	50
Porosity (%)	63	52
Thermal Expansion (x10^{-6}/ºF)	0.30	2.90
Thermal Cond. (BTU-in/Hr. Ft^{2}ºF)	1.30	2.40
Compressive Strength (psi)	1200	500
Flexural Strength (psi)	520	250
Dielectric Constant (@ 1 MHz)	3.17	2.17
Loss Factor (@ 1 MHz)	0.0002	0.02
Volume Resistivity (ohm-cm)	10^9	10^8

311 Ceramic Blocks

Economical Rescor™ 311 Foam is composed of Alumina Silica Ceramic and withstands temperatures to 3000ºF.

Low Cost 311 Ceramic Foam is used for applications where the strength and fine grain structure of Rescor™ 310 foam is not required.

It is resistant to oxidizing and reducing atmospheres, molten metals, steam, corrosive gases, most acids, chemicals and solvents.

No organics. Will not out-gas in vacuum atmospheres.

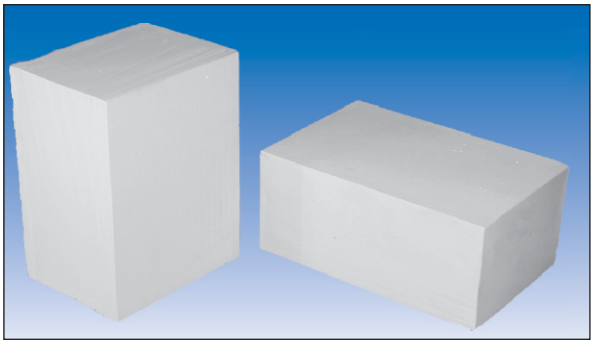
Rescor™ 311 is easily cut, sawed and drilled.

Larger shapes are easily produced.

Just prime the surfaces with the 901A liquid hardener (pg 50) and join surfaces with 901 adhesive (pg 51) or seal joints with 7020 Ceramic Putty (pg 51).

These assemblies can then be machined to the final sizes and shapes.

Surfaces are rough with some porosity. Sizes are nominal. Also available, Rescor™ 740, a unique castable ceramic foam, great for fabricating very large or irregular shapes *(page 59.)*



Rescor™ 311 Ceramic Foam Blocks

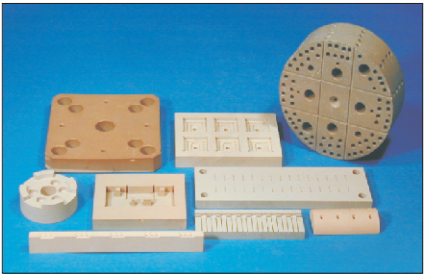
Cat. No.	Size
311-1	2.5” x 4.5” x 9”
311-2	2 pack
311-3	4 pack

2300ºF Ceramic Putty Ideal for Sealing Joints *(See page 51)*

Cat. No.	Size
7020-5	Three- 4oz. Dispenser tubes 11 oz.
7020-3	Caulking cartridges

MACHINABLE CERAMICS INSTRUCTIONS

310 - 914 - 960 - 915 - 56L



MACHINING TOOLS

Use only sharp cutting tools, carbide cutting tools are preferred. Check tools for sharpness frequently. Ceramics can cause rapid wear of cutting edges. Clamp work firmly to avoid vibration and chatter.

LUBRICATION

Keep a continuous stream of water on the work and tool. Insufficient lubrication will cause dulling of cutting tools and chipping of the ceramic. Lubrication is a must for precision work. Lubricants recommended include Cimstar 40 Pink, Supercut S67 and Quaker 103.

CUTTING

Use bonded silicon carbide or diamond cut off wheel with speeds of 6000 - 8000 S.F.M. (2000-2500 rpm). Cut down into work.

BANDSAW

Blade type continuous coat, carbide grit. Use a band speed of 100 feet per minute.

DRILLING

Use Carbide drills, Carboloy 883 or equivalent. For high speed drills, drill slower. Never drill all the way through. Use a drill jig and drill from both sides. Re-sharpen bits every 3 - 4 holes.

Drill Size	RPM	Feed - RPI	Drill Size	RPM	Feed - RPI
1/4 inch	300	0.005	3/4 inch	200	0.010
1/2 inch	250	0.007	1 inch	100	0.012

MILLING

Cutting Speed (surface ft. per min.)..... 20-35
Chip Load (inches per tooth)..... 0.002
Depth of Cut (inches)..... 0.150-0.200

THREADING

Use a diamond wheel with a tool post grinder or tungsten carbide tools.

TAPPING

Use high speed steel or carbide. Drill size should allow for 70% thread form. Use lubricant.

TURNING

Use carbide tool bits or silicon carbide wheels on post grinder.

Tool Type.....Carboloy 883
Cutting Speed (surface ft. per min.)..... 30-50
Feed Rate (inches per revolution)..... 0.002-0.005
Depth of Cut (inches)..... 0.150-0.250

GRINDING

Use a silicon carbide, resinoid bonded wheel at the recommended speeds. Use a soft, coarse grained wheel for heavy grinding. Use a hard, fine grained wheel for finishing.

No heat treating is required, however, shrinkage may occur in use. A test piece should be exposed to the service temp. (for the usage time) to check for shrinkage before committing to making actual parts.

NOTE: Cotronics ceramics particles are abrasive clean machines thoroughly after machining.