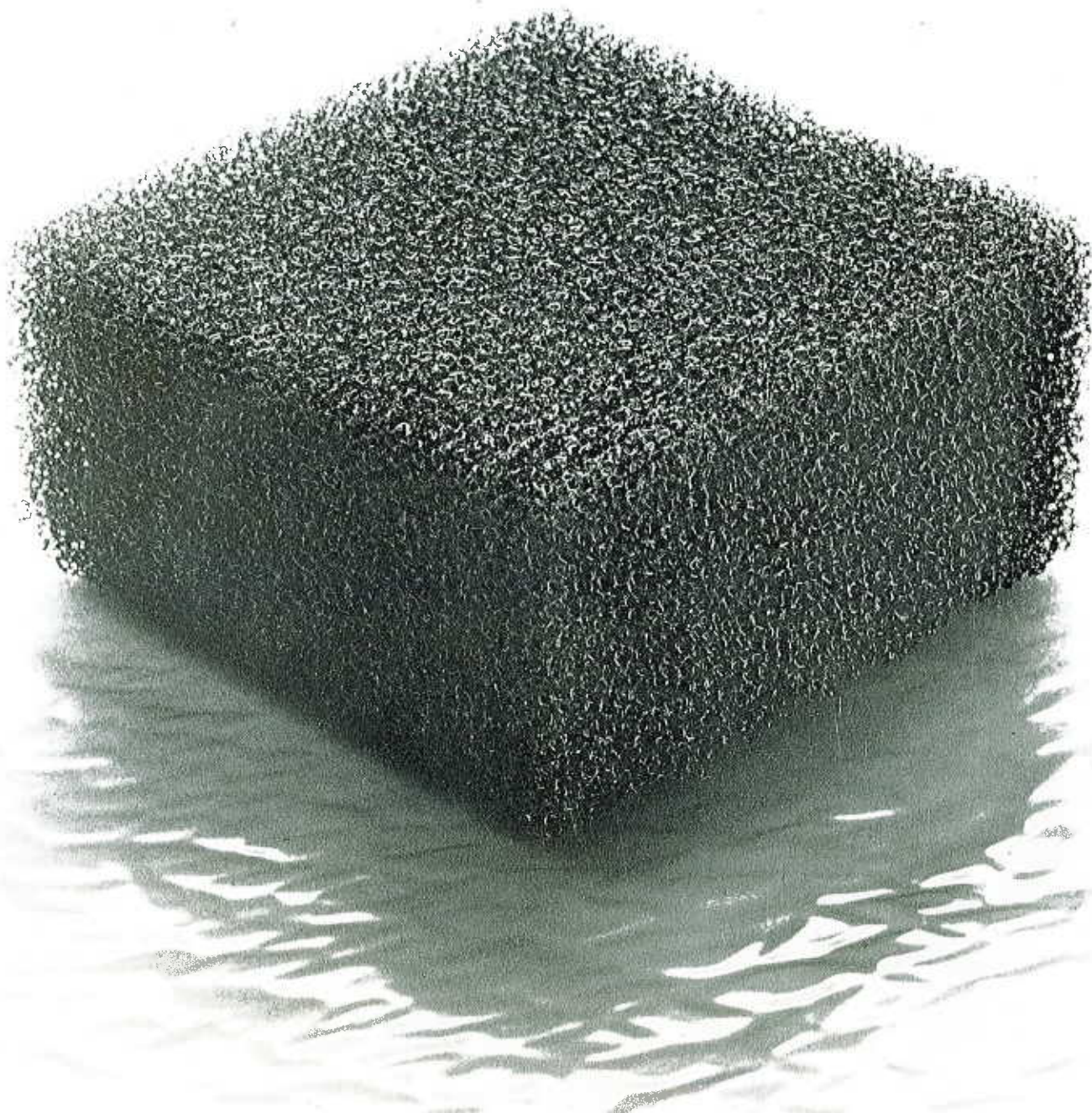


RETICULATED VITREOUS CARBON

A NEW FORM OF CARBON



RETICULATED VITREOUS CARBON (RVC)*

WHAT IS RVC?

RVC is a new open pore foam material composed solely of vitreous carbon. Vitreous carbon, as the name implies, is a form of glass-like carbon which combines some of the properties of glass with some of those of normal industrial carbons. RVC has an exceptionally high void volume (97%), high surface area combined with self-supporting rigidity, low resistance to fluid flow, and resistance to very high temperatures in non-oxidizing environments. It is now available in a wide range of pore size grades weighing about 3 pounds per cubic foot.

WHAT IS DISTINCTIVE ABOUT RVC?

- Exceptional chemical inertness over a very wide temperature range.
- Unique high-temperature strength combined with low bulk thermal conductivity.
- Unusual rigid geometry which provides a large surface area combined with low pressure drop to fluid flow, along with great ability to hold infused materials within controlled porosity sizes.
- Electrical conductivity.

HOW CAN RVC BE USED?

- Porous Electrodes—for electrochemical processes that require very high current distribution areas, low electrical or fluid flow resistance, and minimal cell volume loss to electrodes.
- High Temperature Insulation—for inert gas and vacuum furnaces where its ease of fabrication, self-supporting nature, low density, low outgassing, low heat capacity and excellent K value combine to improve efficiency and reduce costs over conventional insulating materials.
- Filters and Demisters—for molten metals, corrosive chemicals, high or low temperature gases and liquids, where maximum chemical inertness combined with good filtration and detainment is needed.
- Storage Batteries—in high energy density batteries, such as the sodium/sulfur and lithium aluminum/iron disulfide systems, where its unique "caging" effect on infused materials benefits performance, reduces cost.
- Scaffolds—for biological growth (it is non-toxic and biologically inert) in pollution-control systems, as a catalyst or catalyst support, in tower packings, where low pressure drop combined with large available surface area and chemical inertness is required.

- Semi-Conductor Manufacture—offers unique advantages in etching and diffusion treatment carriers, reduces manufacturing cost.
- Acoustic Control—a specially densified form combines outstanding high temperature resistance in non-oxidizing environments with excellent noise absorption in the 250 Hz to 3 kHz range.

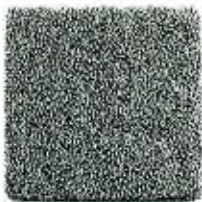
WHAT ARE RVC'S PROPERTIES?

CHEMICAL PROPERTIES

RVC is composed of one of the most chemically inert forms of carbon known. Its oxidation resistance is unusual for a carbon. In spite of RVC's large surface area it does not support combustion after heating to bright incandescence in air followed by removal of the heat source. It is also highly resistant to intercalation by materials which disintegrate graphite.

RVC is also inert to a wide range of very reactive acids, bases, and organic solvents. At high temperatures it will form carbides, but is inert to non-carbide forming metals and is not wetted by many molten metals. Heating in air at 600°F enhances its adsorption properties. Because of RVC's large surface area, heating above 600°F in air will result in significant oxidation at rates which increase with increasing temperature.

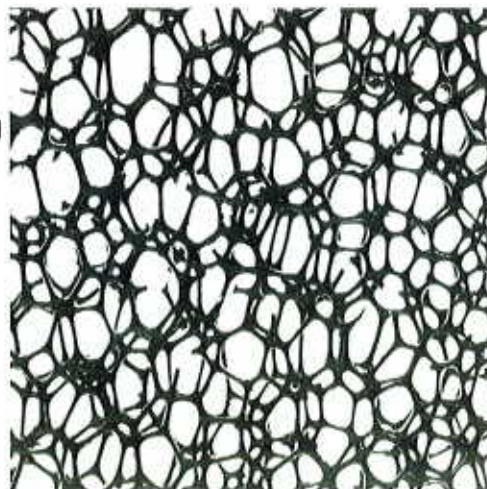
30 PPI



10 PPI



80 PPI



60 PPI

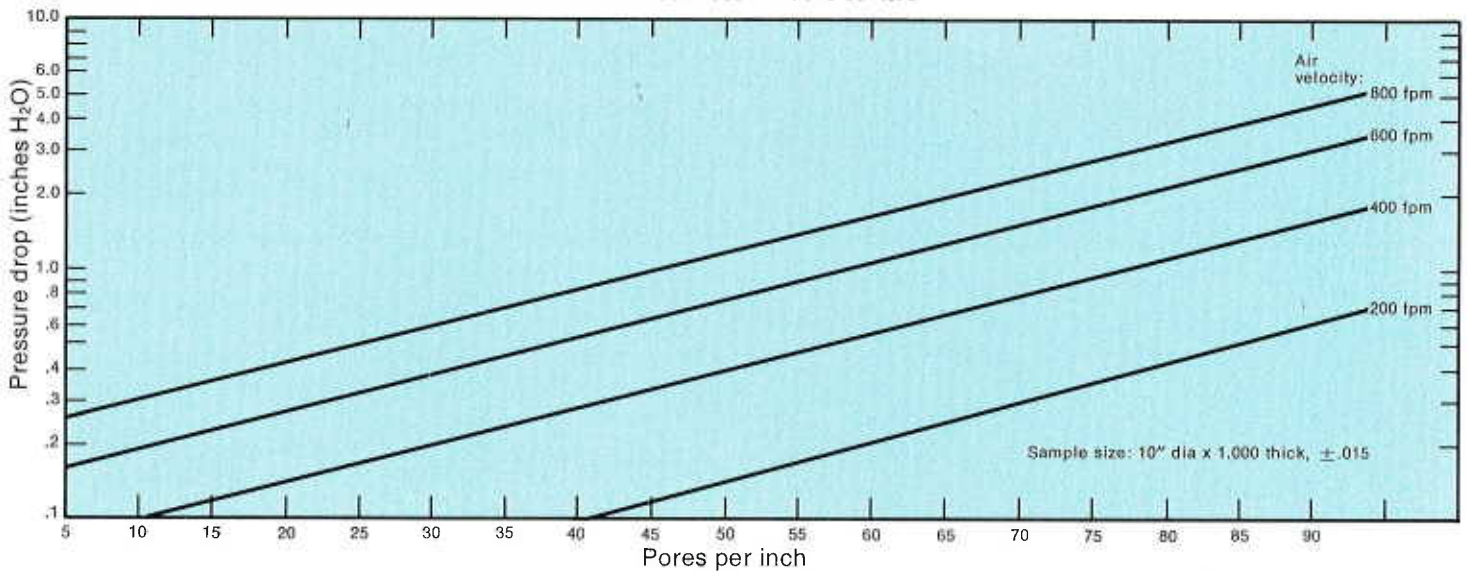
Several of the available pore size grades of RVC. (PPI = Pores Per Linear Inch)

Enlarged view showing the open cell (reticulated) structure of RVC.

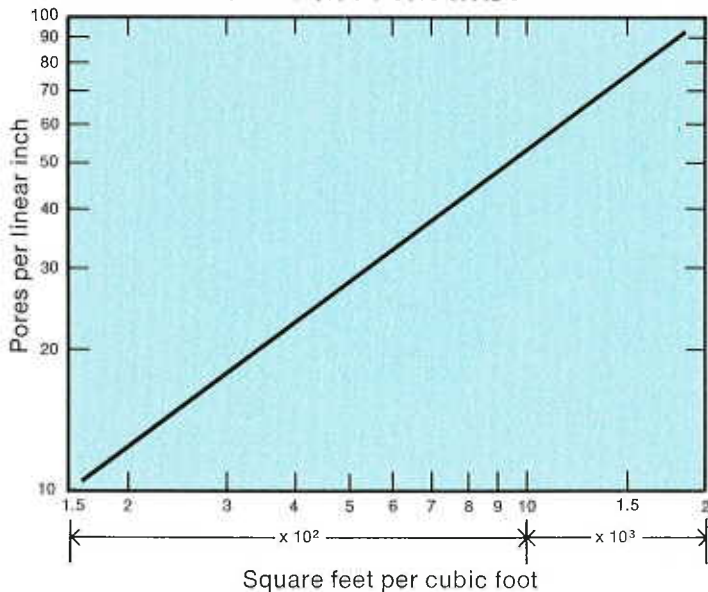
PHYSICAL PROPERTIES

NOMINAL VALUES, ALL PORE SIZES, STANDARD GRADE			
Relative Density, %	.3	Thermal Shock Resistance	Excellent
Bulk Density, lbs/ft ³	.3.1	Shrinkage to 2000°F	Nil
Ligament Density, lbs/ft ³	.93	Volatiles to 2000°F	Nil
Bulk Resistivity, 10 ⁻⁴ ohm cm	.500	Melting Point (sublimes)	6330°F
Ligament Resistivity, 10 ⁻⁴ ohm cm	.50	Temperature Limitation: in air	600°F
		in non-oxidizing atmosphere	6330°F

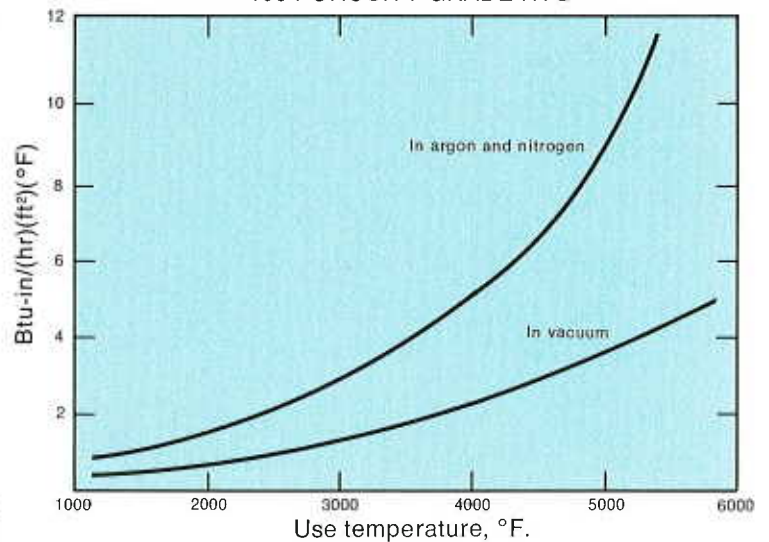
NOMINAL RESISTANCE TO AIR FLOW
FOR ALL RVC POROSITIES



APPROXIMATE SURFACE AREA
OF ALL RVC POROSITIES



TYPICAL EFFECTIVE THERMAL CONDUCTIVITY
—100 POROSITY GRADE RVC—



HOW IS RVC MADE AVAILABLE?

PORE SIZE GRADES Pores per linear inch (PPI)			
Nominal Pore Size Grade	Pore Size Range		Suggested Minimum Sheet Thickness (In.)
	Minimum	Maximum	
100	90	110	1/16
80	70	90	1/16
60	55	65	1/8
45	40	50	1/8
30	25	35	3/16
20	15	25	1/4
10	8	15	1/2
5	3	8	3/4

PHYSICAL CHARACTERISTICS

NOMINAL VALUES, STANDARD GRADE & PORES	
Compression Strength	40-70 psi*
Tensile Strength	25-50 psi
Modulus of Elasticity	4.5-9 x 10 ³ psi
Shear Modulus	4.4 x 10 ³ psi
Hardness	6-7 Mohs
Specific Heat	0.3 BTU/lb/°F
Thermal Expansion Coefficient	
30-200°F	1.2 ppm/°F
200-1800°F	1.8 ppm/°F

*NOTE: Higher strength materials available on special order.

STANDARD SIZES

RVC is manufactured in billet form in the following dimensions:

Length	23 in.
Width	11 in.
Thickness	4 in.

Larger sizes are available on special order. The material is not supplied in bulk, but as an end item product produced to the customer's drawing specifications. ERG's engineering department will assist you in determining how RVC should be machined and fabricated to best meet your needs.

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NOTE

Reticulated Vitreous Carbon (RVC) is covered by U.S. patents of ERG. ERG has not granted any licenses to others under its RVC patents, and has a policy of strictly enforcing its patents against unlicensed third parties violating them.

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