



# Sunrock Ceramics Company

## Industrial High-Temperature Solutions

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Sunrock Ceramics is a Chicago-based manufacturer of high purity alumina kiln furniture and specialty refractory used in high-temperature thermal processing. Markets served include technical ceramics, powder metallurgy, ferrites, specialty glass, investment casting and other advanced material production that involves severe thermal cycling and/or aggressive chemistry. Sunrock emphasizes high quality and chemical purity, great customer service, fast turnaround and a wide selection of shapes and formulations to ensure the most economic system design for each application.

### Material Selection

Sunrock offers a range of alumina formulations for various applications, up to 99.6% alumina for use in chemically reactive applications such as highly reducing powder metallurgy sintering and piezo ceramic production. Other formulations are a composite of alumina and mullite, which provides improved thermal shock resistance while maintaining material strength at high temperature. Sunrock's formulations and production systems are designed to eliminate free silica in the ceramic body. Please see the data sheet comparisons on the following page. The silica ( $\text{SiO}_2$ ) shown on the data sheets is present as a component of the mullite ( $\text{Al}_2\text{O}_3\text{SiO}_2$ ) and is not free silica.

### Wide Variety of Shapes

Sunrock produces a wide assortment of shapes by either



pressing or thixotropic casting. High performance presses are used with an extensive library of existing tooling. Sunrock's tooling design allows for new shapes to be made with very reasonable tooling costs. As a complement to pressing, thixotropic casting is used for complex shapes or lower volume production. Sunrock offers a cast formulation that is completely free of clay, meaning that cast shapes are as chemically pure as the pressed parts and have similar high-temperature hot strength.

### Fast Turnaround and Dependable Delivery

Reliable availability of refractory consumables is critical to a smoothly functioning high-temperature firing operation. Fast turnaround with dependable delivery scheduling is a primary focus of

Sunrock. Also, many plate sizes and sagger and setter shapes are stock items. Please contact Sunrock for more information.

### Assistance in Kiln Furniture System Design

Your kiln furniture supplier should be a partner in developing the most economical design, taking into consideration the many inherent trade-offs involved. Please contact Sunrock to review and discuss design options for optimizing firing economics.



# Properties of the HPA Family of High Alumina Compositions

	HPA-85	HPA-91	HPA-95	HPA-99	HPA-CG*
<i>Nominal Chemical Composition, %</i>					
Al <sub>2</sub> O <sub>3</sub>	85.0	90.8	94.6	99.6	91.9
SiO <sub>2</sub>	14.8	9.1	5.1	0.1	7.9
Alkalis	0.1	0.1	0.2	0.2	0.1
Fe <sub>2</sub> O <sub>3</sub>	trace	trace	trace	trace	trace
Other	trace	trace	trace	trace	trace
<i>Typical Max Operating Temperature, °C</i>					
	1750	1775	1775	1870	1775
<i>Bulk Density, g/cc</i>					
	2.8	2.9	3.0	3.2	2.9
<i>Apparent Porosity, %</i>					
	15-18	15-18	15-18	15-18	16-18
<i>Thermal Expansion, (x10<sup>-6</sup>/°C)</i>					
	7.0	7.0	8.0	8.4	7.0
<i>Thermal Conductivity @ 1200°C, W/mk</i>					
	2.3	2.3	2.3	2.3	2.3
<i>Modulus of Rupture, MPa</i>					
@ambient	14	21	31	47	14
@1250°C	13	11	10	10	11
<i>Thermal Shock Resistance</i>					
	Very Good	Good	Fair	Poor	Very Good

\*HPA-CG is the standard coarser grain material used for pusher plates in reducing atmosphere pusher furnaces.

Values shown are typical properties under controlled conditions which are provided only as a general indication of expected material performance. These values should not be used for specifying products and they do not represent an explicit or implicit warranty of performance.