

# Snow Shoe Refractories, LLC

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# SPARTAN® 90D

## Product Data

### Scope:

A ceramic bonded, 90% high alumina brick made from high purity ingredients. Its ceramic bonding makes it a premium refractory product with low porosity, excellent hot properties, and resistance to extreme temperature and service conditions. It will find use in induction furnaces, incinerators, carbon black furnaces, and chemical processing units.

Chemical Analysis (Wt.% - Calcined Basis)	
SiO <sub>2</sub>	9.3
Al <sub>2</sub> O <sub>3</sub>	90.0
TiO <sub>2</sub>	0.1
Fe <sub>2</sub> O <sub>3</sub>	0.1
CaO	0.1
MgO	0.1
Alkalies	0.3

PCE: 41+

Physical Properties				
	English Units		SI Units	
	Average	Standard Deviation	Average	Standard Deviation
<b>Bulk Density</b>	188.5	4.5	3,020	70
	(lbs/ft <sup>3</sup> )		(kg/m <sup>3</sup> )	
<b>Apparent Porosity (%)</b>	14.6	1.5		
<b>Modulus of Rupture</b>				
at 68°F (20°C)	2,600	535	17.9	3.6
at 2700°F (1480°C)	1,670	350	11.5	2.4
	(psi)		(MPa)	
<b>Crushing Strength</b>				
at 68°F (20°C)	11,000 - 14,000		76 - 96	
	(psi)		(MPa)	
<b>Linear Change (%)</b>				
after 2910°F (1600°C) reheat			nil	
<b>Hot Load Deformation (%)</b>				
at 3000°F (1650°C) 100 hr. hold			0 to -0.02	
<b>Creep, DIN Furnace (%)</b>				
at 2800°F (1538°C) 20 <sup>th</sup> -50 <sup>th</sup> Hr.			-0.05	
<b>Thermal Expansion</b>	English Units		SI Units	
	4.7x10 <sup>-6</sup> in/in/°F		8.5x10 <sup>-6</sup> cm/cm/°C	

The data given above are average results of our common sized products and are subject to variation. One standard deviation is given when adequate data is available. These results should not be used for specification purposes.