



## NanoSilica HR-50

## Technical Data

### Description

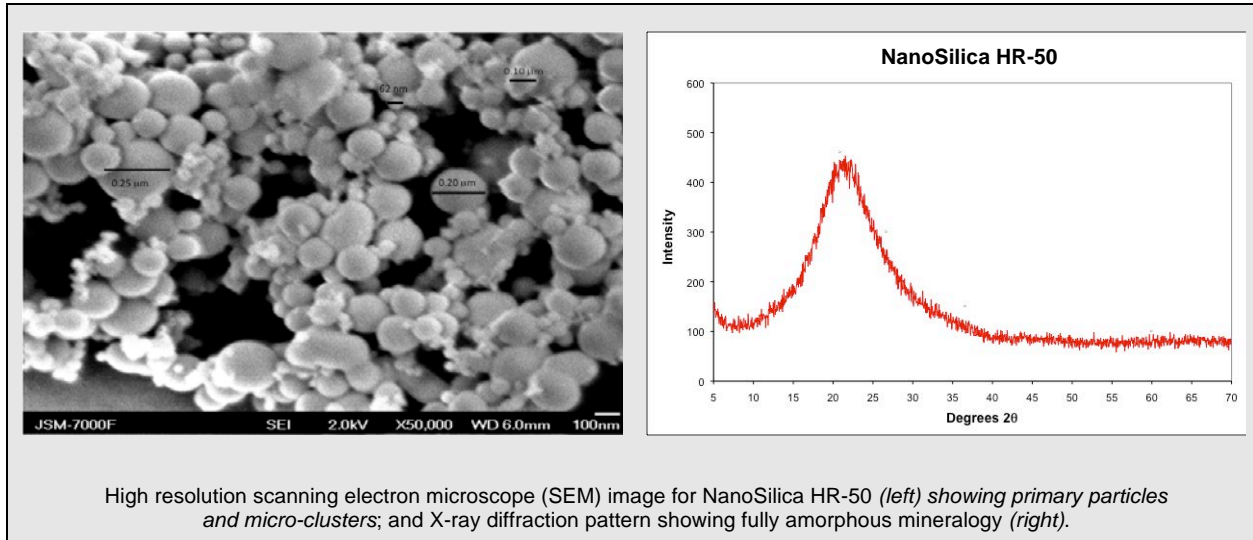
*NanoSilica HR-50* is a 100% recycled, fully X-ray amorphous silica, produced by a proprietary high temperature oxidative process. It is a white, submicron-sized powder of high purity and a surface area of 20-50 m<sup>2</sup>/g. The primary particles, sized between 60 and 300 nm (0.06-0.3 μm), are spherical and form loosely agglomerated micro-clusters up to about 3 μm.

*NanoSilica HR-50* exceeds the requirements of ASTM C1240 and is ideally suited for use as a high reactivity pozzolan in high performance concrete, grouts, overlays, fiber cement and related demanding applications, where high early/ultimate strength and excellent durability are required. The white color is also desirable for architectural concrete applications. In addition to its pozzolanic properties, it is also effective as a thickening and thixotropic rheology control agent in cementitious and polymer-containing formulations. It can also be used as a flow aid additive in the production of industrial mineral powders.

### Typical Chemical and Physical Properties

NOT FOR SPECIFICATION PURPOSES

Parameter	NanoSilica HR 50	ASTM C1240 Requirement	Test Method
<i>Chemical:</i>			
SiO <sub>2</sub> content, %	>99.7	85 min	ASTM C114
Mineral form	Amorphous	n/a	XRD CuKα
Free moisture, 110°C, %	<1.0	3.0 max	ASTM C566
Loss on ignition, 1000°C, %	<0.8	6.0 max	ASTM D7348
Na <sub>2</sub> O <sub>eq</sub> content, %	<0.05	n/a	ASTM C114
SO <sub>3</sub> content, %	<0.03	n/a	ASTM C114
Cl content, %	<0.07	n/a	ASTM C1152
pH	6.0	n/a	AFS 113-87S
<i>Physical:</i>			
Appearance of powder	Fluffy white	n/a	
Specific gravity	2.2	n/a	ASTM C153
Bulk density, vibrated, lb/ft <sup>3</sup>	23-25	n/a	ASTM C110
Specific surface area (BET), m <sup>2</sup> /g	20-50	15 min	ASTM C1069
Primary particle size range, nm	60-300	n/a	SEM
325 mesh (45 μm) retained, %	<0.05	10 max	Micron Air Jet
Pozzolanic strength index, 7d, %	142	105 min	ASTM C1240



### Applications for HR-50

High performance concrete

Concrete in aggressive environments

Grouts for post tensioning

Architectural concrete

Shotcrete

Coatings

### Benefits

High early / ultimate strength; faster formwork removal; reduced bleeding; low permeability

High durability: mitigation of ASR; imparts high resistance to sulfate/saline and chemical attack

Improved adhesion/cohesion; low Cl ion permeability; salt resistance

Efflorescence control; color retention; faster demolding; improved surface finishing

Good stiction; thixotropic cohesive mixes; high strength and durability

Abrasion and chemical resistance; color neutrality; waterproofing

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## Product Information/Customer Service

Phone: 678-729-9333; Fax: 678-750-0105

Email: [technicalsales@vitrominerals.com](mailto:technicalsales@vitrominerals.com)

Standard Packages: 20-Kg bags, 800 Kg/pallet, 43 x 48 pallet, shrinkwrapped; or 600-Kg supersacks, 42 x 42 pallet.

FOB Greenville, SC.

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**Health Hazard Warning:** Prolonged inhalation of dust associated with the materials described in this data sheet can cause delayed lung injury. Avoid creating dust when handling, using or storing. Follow OSHA Safety and Health Standards for fugitive dust. Current Material Safety Data Sheet containing safety information is available and should be consulted before usage.

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