

# Hess NCS Grades

ISSUE 2/2008  
 REVISION 1/2009  
 REVIEW N/A

## CHEMICAL ANALYSIS AND PHYSICAL PROPERTIES

**Chemical Name:** Amorphous Aluminum Silicate

TYPICAL ANALYSIS	GENERAL PROPERTIES
• Silicon Dioxide: 76.2%	• Appearance: White powder
• Aluminum Oxide: 13.5%	• Hardness (MOHS): 6
• Ferric Oxide: 1.1%	• pH: 7.2
• Ferrous Oxide: 0.1%	• Radioactivity: None
• Sodium Oxide: 1.6%	• Softening Point: 900 degrees C
• Potassium Oxide: 1.8%	• Water Soluble Substances: 0.15%
• Calcium Oxide: 0.8%	• Loss on Ignition - 5%
• Titanium Oxide: 0.2%	• GE Brightness: 84
• Magnesium Oxide: .05%	• Specific Gravity: 2.5
• Moisture: <1.0%	• Reactivity: Inert
• Crystalline SiO <sub>2</sub> : None Detected	(except in the presence of calcium hydroxide or hydrofluoric acid)

## DESCRIPTION

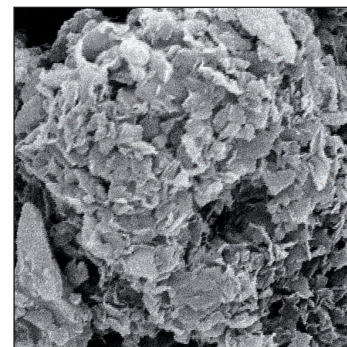
Amorphous (non-crystalline) in structure and composed primarily of aluminum silicate, pumice is a naturally calcined volcanic glass foam consisting of highly vesicular strands permeated with tiny air bubbles. It is these frothy, friable glass vesicles that, when carefully refined to various grades, give pumice its unique and infinitely useful qualities.

## GRADE APPLICATIONS

**Use:** A true functional paint and coatings filler. The NCS particles fully integrate and *mesh* into the polymer networks of various coatings. This results in a much more functionally useful, reinforced pigment than is possible with typical platey extenders such as mica and talc.



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A scanning electron microscope photograph showing the frothy nature of NCS, even crushed to a 10-micron size particle.

In addition, Hess NCS products provide outstanding scrub and burnish resistance due to the particle hardness (6 Mohs hardness).

The lower density of our NCS grades (.051 gal/lb) allows for a volume replacement, rather than a per pound replacement, providing a considerable cost savings.

*(continues)*

# Hess NCS Grades

Use: An ultra-reactive natural pozzolan for glass fiber panel cement applications, precast concrete pieces, and decorative stone and brick veneer products.

## TOXICOLOGICAL INFO

Classified as Nuisance Dust only. Silica-Group 3. Crystalline Silica (respirable) has been identified as a “group 1” carcinogen by the International Agency for Research on Cancer (IARC). OSHA therefore requires all products containing more than .1% crystalline silica to be labeled as a cancer hazard.

Hess NCS products are non-hazardous, crystalline silica free to the detectable limit of .05%)

## REGULATORY INFO

Not regulated.

## GRADE SIZES

Hess offers seven Non-Crystalline Silica (NCS) grades that range from 3 microns to 20 microns in average particle size.

## PACKAGING OPTIONS

- 1 lb or 1 kg resealable bag
- 50 lb [22.7 kg] bags (palletted)
- 2000 lb [907 kg] super sacks (palletted)
- Bulk shipped in rail car or tractor trailer

## DISTRIBUTOR NETWORK

We have stocking distributors in 23 countries on every continent except Antarctica, allowing us to deliver product quickly and economically worldwide.

## NCS-3 PARTICLE SIZE SPECIFICATION

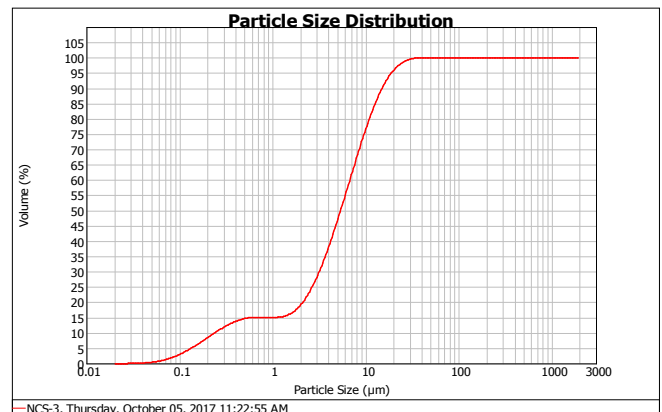
Dx	MICRON [MM] SIZE
D90	< 13 [0.013]
D50	2-4 [0.002-0.004]

TEST METHOD: Refer to Standard Method

## LOOSE BULK DENSITY (ASTM C29)

**35 lb/per cubic foot [560.6 kg/per cubic meter]**

## TYPICAL PARTICLE DISTRIBUTION CURVE



## NCS-5 PARTICLE SIZE SPECIFICATION

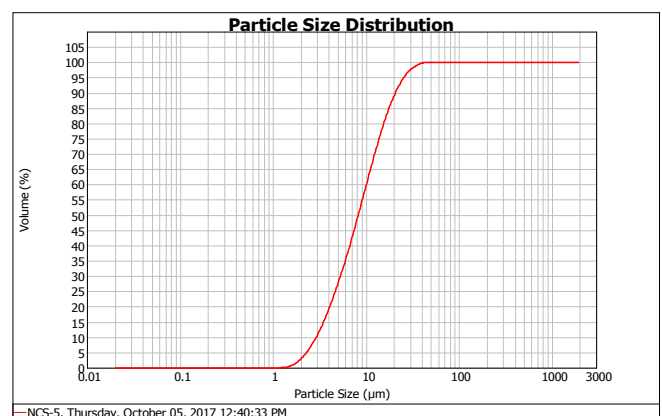
Dx	MICRON [MM] SIZE
D90	< 20 [0.020]
D50	3-6 [0.003-0.006]

TEST METHOD: Refer to Standard Method

## NCS-5 LOOSE BULK DENSITY (ASTM C29)

**36 lb/per cubic foot [576.6 kg/per cubic meter]**

## TYPICAL PARTICLE DISTRIBUTION CURVE



## NCS-8 PARTICLE SIZE SPECIFICATION

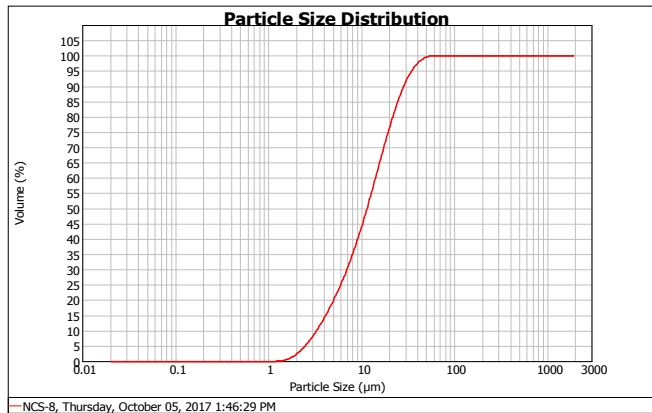
Dx	MICRON [MM] SIZE
D90	< 31 [0.031]
D50	7-9 [0.007-0.009]

TEST METHOD: Refer to Standard Method

## NCS-8 LOOSE BULK DENSITY (ASTM C29)

**38 lb/per cubic foot [608.7 kg/per cubic meter]**

## TYPICAL PARTICLE DISTRIBUTION CURVE



## NCS-10 PARTICLE SIZE SPECIFICATION

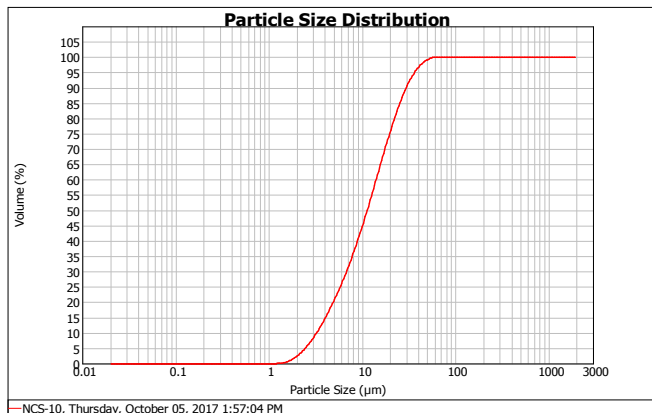
Dx	MICRON [MM] SIZE
D99.5	< 60 [0.06]
D90	0 - 40 [0.04]
D50	9 - 12 [0.009-0.012]

TEST METHOD: Refer to Standard Method

## NCS-10 LOOSE BULK DENSITY (ASTM C29)

**40 lb/per cubic foot [640.7 kg/per cubic meter]**

## TYPICAL PARTICLE DISTRIBUTION CURVE



## NCS-12 PARTICLE SIZE SPECIFICATION

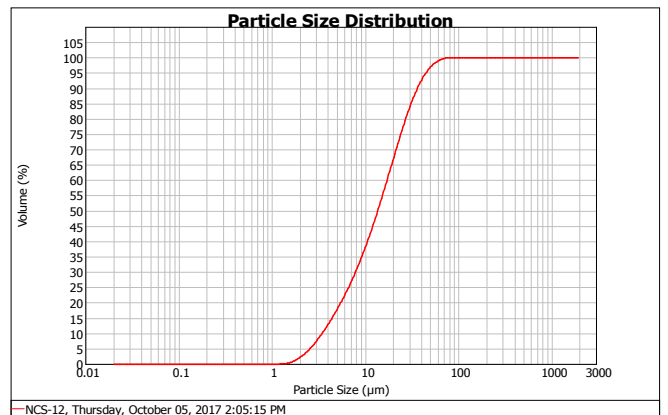
Dx	MICRON [MM] SIZE
D99.5	< 60 [0.060]
D90	< 40 [0.040]
D50	12-14 [0.012-0.014]

TEST METHOD: Refer to Standard Method

## NCS-12 LOOSE BULK DENSITY (ASTM C29)

**42 lb/per cubic foot [672.7 kg/per cubic meter]**

## TYPICAL PARTICLE DISTRIBUTION CURVE



## NCS-15 PARTICLE SIZE SPECIFICATION

Dx	MICRON [MM] SIZE
D99.5	< 75 [0.075]
D90	< 40 [0.04]

TEST METHOD: Refer to Standard Method

## NCS-15 LOOSE BULK DENSITY (ASTM C29)

**44 lb/per cubic foot [704.8 kg/per cubic meter]**

## NCS-20 PARTICLE SIZE SPECIFICATION

Dx	MICRON [MM] SIZE
D90	52 - 72 [0.052-0.072]
D50	0 - 40 [0.04]

TEST METHOD: Refer to Standard Method

## NCS-20 LOOSE BULK DENSITY (ASTM C29)

**46 lb/per cubic foot [736.8 kg/per cubic meter]**

**CHARACTERISTICS OF HESS NON-CRYSTALLINE SILICA GRADES****Chemical Name:** Amorphous Aluminum Silicate

<b>TYPICAL PROPERTIES</b>	<b>NCS-3</b>	<b>NCS-5</b>	<b>NCS-8</b>	<b>NCS-10</b>	<b>NCS-12</b>
Mean Particle Size (volume, microns)	6.7	10.3	14.0	14.2	17.2
ISO Brightness (dry)	83	82	80	78	76
Oil Absorption (cc/100g) ASTM D281	44.1	41.6	35.9	34.5	34.9
Hegman Grind	8.0	7.75	7.0	6.5	5.5
325 Mesh Residue (%)	<0.04	<0.04	<0.08	<0.4	<1.5
Moisture (%)	<1.0	<1.0	<1.0	<1.0	<1.0
Specific Gravity	2.35	2.35	2.35	2.35	2.35
Pounds / Cubic Foot Dry	38.1	37.6	42.9	43.5	46.1

<b>CHEMICAL PROPERTIES</b>	<b>NCS-3</b>	<b>NCS-5</b>	<b>NCS-8</b>	<b>NCS-10</b>	<b>NCS-12</b>
SiO <sub>2</sub>	>73	>73	>73	>73	>73
Al <sub>2</sub> O <sub>3</sub>	>10	>10	>10	>10	>10
Acid Insolubles (%)	<1	<1	<1	<1	<1

<b>PARTICLE SIZE DISTRIBUTION</b>	<b>NCS-3</b>	<b>NCS-5</b>	<b>NCS-8</b>	<b>NCS-10</b>	<b>NCS-12</b>
Finer than 44 microns (%)	100.0	100.0	98.2	97.5	94.4
Finer than 7 microns (%)	62.1	42.7	32.9	33.9	26.9
Finer than 1 micron (%)	0.0	0.0	0.0	0.0	0.0



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*Mining and refining the purest commercial  
deposit of white pumice on the planet.*