



# Ceramic Microspheres

## White Grades

### Introduction

3M™ White Ceramic Microspheres are unique, semi-transparent, white-colored, fine particle size, high-strength microspheres. These products are typically used to reduce VOC levels; increase filler loadings; improve hardness; and add burnish, scrub and abrasion resistance to a variety of coating formulations. Due to the ceramic chemistry of these products, they are also UV transparent down to 250 nm and have utility in radiation-curable and thin-film powder coatings.

### Material Description

Properties	3M Ceramic Microspheres White Grades
Shape	Solid Spheres
Composition	Alkali Alumino Silicate Ceramic
Color, Unaided Eye	White

### Typical Physical Properties

Not for specification purposes

Properties	3M Ceramic Microspheres White Grades	
True Density	2.4 g/cc (20.0 lbs/gal)	
Bulk Density	1.5 g/cc (12.6 lbs/gal)	
Whiteness ("L" Value)	95+ (Hunter L,a,b scale)	ASTM D 2244
Crush Strength	> 4,200 kg/cm <sup>2</sup> (> 60,000 psi)	
pH	9.0 - 12.0	ASTM E 70
Hardness	6	Mohs Scale
Softening Point	1,020°C (1,870°F)	
Refractive Index: Predominant	1.53	Becke Line
Dielectric Constant	3.19	
UV Light Transmission	UV Transparent down to 250 nm	
Thermal Conductivity	2.3 W/mK	

Properties		3M Ceramic Microspheres White Grades		
		W-210	W-410	W-610
Particle Size (microns)	95 <sup>th</sup> Percentile	12	24	40
	90 <sup>th</sup> Percentile	9	15	28
	50 <sup>th</sup> Percentile	3	4	10
	10 <sup>th</sup> Percentile	1	1	1
Surface Area (m <sup>2</sup> /cc)		5	3	3
Oil Absorption*		46	44	28

\*gm oil/100cc microspheres

## 3M™ Ceramic Microspheres White Grades Formulating Information

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3M™ White Ceramic Microspheres are best dispersed by using sand, ball and roller mills. For optimal dispersion, microspheres should be added to the grind stage along with pigments and other filler materials. Use of a dispersant can aid in the wet-out and dispersion of these products.

### Product Safety and Handling

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Please read and follow the precautions and directions for use in the product label and Material Safety Data Sheet before using this product. Material Safety Data Sheets for this product are available from 3M Customer Service at 800-367-8905 or from your local 3M sales representative.

### Resources

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3M microspheres are supported by global sales, technical and customer service resources, with fully-staffed technical service laboratories in the U.S., Europe, Japan, Latin America and Southeast Asia. Users benefit from 3M's broad technology base and continuing attention to product development, performance, safety and environmental issues.

For additional technical information on microspheres in the United States, call 3M Energy and Advanced Materials Division, 800 367 8905.

For other 3M global offices and information on additional 3M products, visit our web site at: [www.3M.com](http://www.3M.com)

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