



E-SPHERES[®] Hollow Ceramic Microspheres

TECHNICAL DATA

APPLICATION: THERMAL INSULATION COATINGS

DESCRIPTION: Advanced functional additive and reinforcing filler with spherical hollow structure and ceramic composition. Key product characteristics include: low density, high compressive strength, thermal resistance (high melting point), chemically unreactive or inert and unique white colour.

APPLICATION: E-SPHERES[®] Hollow Ceramic Microspheres (HCM) are widely utilised in the coatings industry, to formulate coatings with enhanced thermal insulation capabilities, due to the very low coefficient of thermal conductivity and partial vacuum inside the microsphere. E-SPHERES[®] also improve value and performance of surface coatings by enhancing physical characteristics via density reduction, improved rheological performance, increased thermal and fire rating properties and enhancement of non-slip properties. Typical applications include:

- Intumescent coatings
- Fire retardant paint
- Thermal insulation coatings
- Scratch resistant coatings
- Fire rated timber coatings
- Others

These are only examples of possible applications.

ADVANTAGES

Density and weight reduction
Improved rheology/flow properties
Fire rating performance
Thermal insulation characteristics
Improved acoustic properties
Improved wear (abrasion) resistance
Colour and gloss retention
Cost reduction

VALUE IN USE

volume displacement by low density filling material
act as miniature ball bearings / smooth surface and spherical geometry
due to the non-combustible nature and high temperature melting point
resulting from its low thermal conductivity and ceramic composition
capacity to limit sound transfer and vibration within the binder matrix
resulting from the surface hardness and high compressive strength
microspheres are kept coated in resin unlike other randomly shaped additives
extending the volume of high cost resins with lower cost hollow ceramic filler

CHEMICAL COMPOSITION: These figures are for general representation only, not for specification purposes:

Silicon Dioxide SiO ₂ (Silica)	55 – 60%	Iron Oxide Fe ₂ O ₃ (Hematite)	0.4 – 0.5%
Aluminium Oxide Al ₂ O ₃ (Alumina)	36 – 40%	Titanium Dioxide TiO ₂ (Rutile)	1.4 – 1.6%

E-SPHERES[®] HCM can be described as aluminosilicate microspheres.



TYPICAL PHYSICAL PROPERTIES (for general representation only, not for specification purposes)

Property	Value
Physical Form	Free flowing powder
Colour	White: SL Series, Off-White: ES Series
Geometry	Spherical shape (hollow)
Particle Size	20 – 500 microns *
Relative Density	0.65 – 0.95 g/cc
Bulk Density	0.35 – 0.45 g/cc
Compressive Strength	4,800 psi (33 MPa)
Oil Absorption	~ 7g / 100g **
pH of Water Dispersion	6 - 8
Thermal Conductivity	0.1 W/m/°C
Melting Point	1500 °C – 1800 °C
Hardness	6 Mohs scale
Refractive Index	1.53

* Consult product specifications for grades of particle size and distribution.

** g of oil / 100g E-SPHERES®

GENERAL: E-SPHERES® HCM when utilised in formulated thermal insulating and fire rated coatings, provide major benefits and add value through enhanced performance of specialised paints. Beyond just improving thermal properties, they enhance surface durability and other mechanical and chemical resistance properties, enabling manufacturers to further improve existing products or assist to develop new ones.

E-SPHERES® are not classified as dangerous goods - they are non combustible, non flammable, non reactive, non corrosive and non toxic. E-SPHERES® are compatible with waterborne, solvent based, acrylic, polyurethane, epoxy and other types of binder systems (resins). For more about formulating information or suggested starting point, please contact EnviroSpheres.

DISCLAIMER: The information stated represents typical values; all advice given should be taken as a guide only. Both are given in good faith and are to the best of EnviroSpheres' knowledge; true and accurate at the time of publishing this technical data sheet. This information is intended to give a fair description of the product and its capabilities under specific conditions. No guarantee of the accuracy and integrity of the information is made and persons receiving the information should apply technical skills and conduct their own tests to determine its suitability in all respects for their particular purpose. Users are solely responsible for the application, use and outcomes when utilising the products. EnviroSpheres assumes no liability for the use of this information, results, products related or the outcome, as most variables are in control of the user and not EnviroSpheres.

Before handling, refer to the Safety Data Sheet for health and safety information of products. Ensure that all personnel using this product have read and understood this technical data sheet and the associated SDS before using the products.

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