



E-SPHERES® Hollow Ceramic Microspheres

TECHNICAL DATA

APPLICATION: HIGH PERFORMANCE & ANTI-SLIP COATINGS

DESCRIPTION: Advanced functional additive and reinforcing filler with spherical hollow structure and ceramic composition. Its main characteristics are lightness, high compressive strength, thermal resistance (high melting point), chemically unreactive or inert and unique off-white colour.

APPLICATION: E-SPHERES® Hollow Ceramic Microspheres (HCM) are widely utilised in the coatings industry, to formulate advanced non-slip flooring top coats, such as clear or transparent coatings as well as pigmented materials dedicated to a number of substrates and applications. E-SPHERES® improve value and performance of surface coatings by enhancing physical characteristics, density reduction, improved rheological performance, increased thermal and fire rating properties and non-slip attributes. Typical applications include:

- Waterborne 1K and 2K timber top coats
- Solvent based 1K and 2K wood products
- Acrylic emulsions and concrete sealers
- Kitchen benchtop coatings
- Epoxy self-levelling flooring systems
- Polyurethane coatings (pigmented and clear)
- Industrial protective and floor coatings

These are only examples of possible applications.

ADVANTAGES

Density and weight reduction
 Enhanced anti-slip attributes
 Improved rheology/flow properties
 Improved acoustic properties
 Fire rating performance
 Improved wear (abrasion) resistance
 Colour and gloss retention
 Easy Cleaning
 Cost reduction

VALUE IN USE

thanks to volume displacement by low density filling material microspheres rise to the surface due to its density relative to the binder act as miniature bearings due to its smooth surface and spherical geometry owing to its capacity to absorb sound and vibration within the binder matrix due to its non-combustible nature and high temperature melting point resulting from hardness and ceramic composition microspheres are kept coated in resin unlike other randomly shaped additives non-slip, yet smooth surface compared to other non-slip aggregates. by partially replacing volume of high cost resins with inexpensive ceramic filler

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

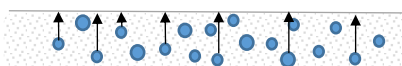
Silicon Dioxide SiO ₂ (Silica)	55 – 60%	Iron Oxide Fe ₂ O ₃ (Hematite)	0.4 – 0.5%
Aluminium Oxide Al ₂ O ₃ (Alumina)	36 – 40%	Titanium Dioxide TiO ₂ (Rutile)	1.4 – 1.6%

E-SPHERES® HCM can be described as aluminosilicate microspheres

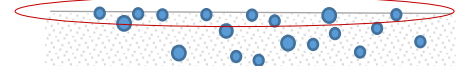
1. Mix of binder and microspheres



2. Microspheres rise to the surface



3. Anti-slip surface



Binder's typical density 1.1 to 1.4 g/cc, E-SPHERES® density 0.7 g/cc, therefore a percentage of the mixed microspheres rise to the surface creating micro-texture resulting in the anti-slip effect. When microspheres reach the surface remain coated due to the surface tension.



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 anti-slip coatings, provide major benefits and add value through enhanced performance of flooring top coats beyond non-slip properties, but durability, easy cleaning feature and other mechanical and chemical attributes, enabling manufacturers to further improve existing products and assisting to develop new ones.

E-SPHERES® are not classified as dangerous goods - they are non combustible, non flammable, non reactive, non corrosive, non toxic. E-SPHERES® are compatible with waterborne, solvent based, acrylic, polyurethane, epoxy and phenolic 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.