



# E-SPHERES® Hollow Ceramic Microspheres

## TECHNICAL DATA

### APPLICATION: CEMENTITIOUS PRODUCTS

**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 industry to formulate advanced cementitious products such as light weight mortars, self-levelling compounds, cast concrete and plaster products among many others. E-SPHERES® improve value and performance of products by enhancing physical characteristics, density reduction, improved rheological performance, increased thermal and fire rating properties and reduced shrinkage. Typical applications include:

- Light weight repair mortars
- Light weight wall/floor panels & blocks
- Polymer concrete
- Thermal insulation panels
- GRC- Glass reinforced concrete products
- Light weight sprayable insulating coatings
- Tile grouts and roof pointing compounds
- Fire-rated cladding
- Self-levelling compounds
- Light weight hydraulic concrete
- Light weight cast concrete products e.g. tables, statuary, pots
- Light weight plaster products e.g. ceiling roses, decorative cornices

These are only examples of possible applications.

#### ADVANTAGES

Density and weight reduction  
 Reduced shrinkage  
 Improved rheology/flow properties  
 Improved acoustic properties  
 Fire rating performance  
 Thermal insulating  
 Reduced slump/sag

#### VALUE IN USE

thanks to volume displacement by low density filling material  
 as a result of its non-absorbent properties and dimensional stability  
 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 low thermal conductivity and ceramic configuration  
 thanks to super lightweight compared to other type of aggregates

#### Cost Saving and value added throughout the life cycle of the end products

Transport costs		by producing a lighter final product
Packaging costs		less expensive packaging materials needed for lighter products
Application costs		ease of handling finished product and application/installation

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

Silicon Dioxide SiO <sub>2</sub> (Silica)	55 – 60%	Iron Oxide Fe <sub>2</sub> O <sub>3</sub> (Hematite)	0.4 – 0.5%
Aluminium Oxide Al <sub>2</sub> O <sub>3</sub> (Alumina)	36 – 40%	Titanium Dioxide TiO <sub>2</sub> (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 compounds of both types: dry and wet form, provide major benefits and add value through enhanced performance of cementitious materials, 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, non toxic. E-SPHERES® are compatible with both waterborne and solvent based binder systems and resins. For more about formulating information or suggested starting point, please contact EnviroSpheres.

**OTHER BENEFITS:** Include improved mixing, moulding and pressing (packing) processes, as well as potential reduction of pigmenting materials thanks to E-SPHERES® SL Series white colour.

**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.