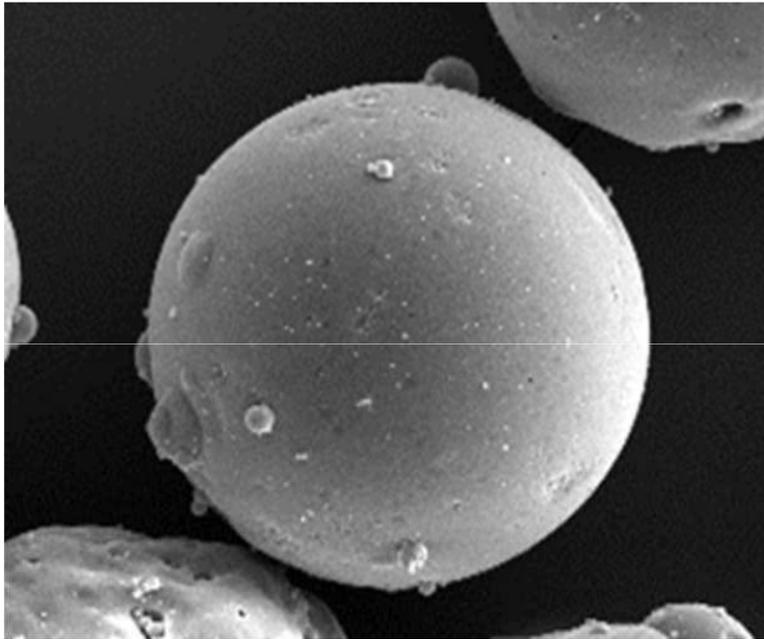




Improving IR-reflection and insulation properties of coatings

Thorsten Heyden, Omega Minerals - Paolo Rossi, Azelis Italia



SEM micrograph of THERMO-SPHERES



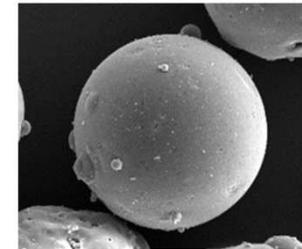
Density = 0,7

**Wall Thickness
about 1/10 particle size**

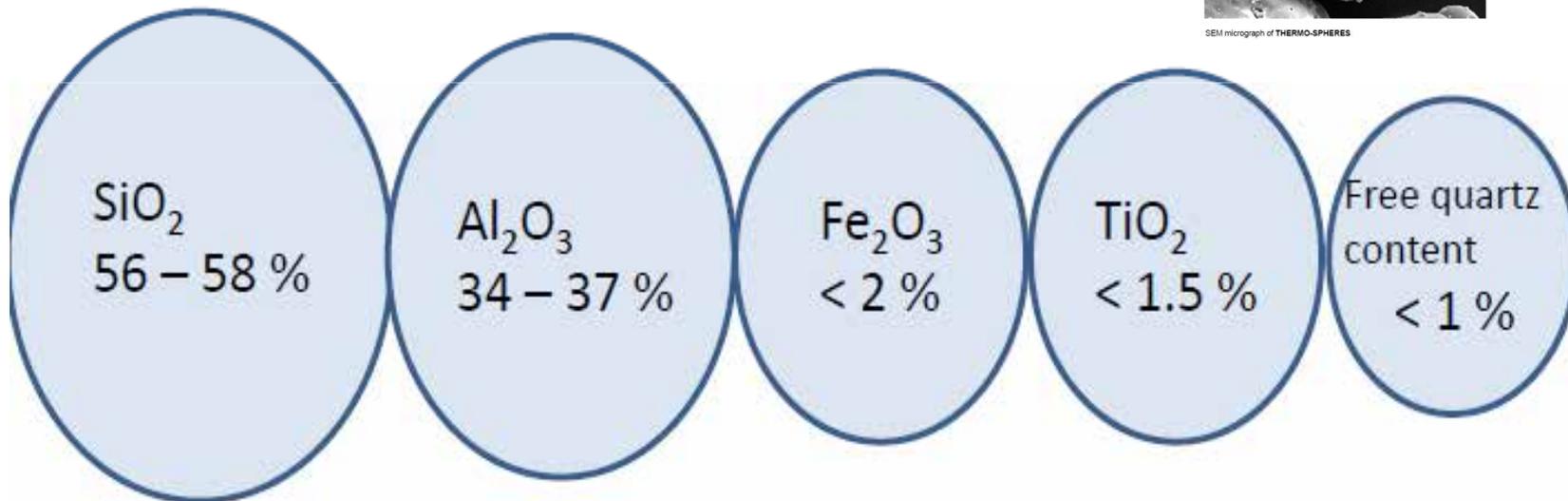
High Quality Hollow Ceramic Microspheres

- THERMO-SPHERES are manufactured from a special raw material with an high Al-silicate content
- During the processing the material is purified, dried, and separated into fractions for different market demands.
- Packing is in paper bags and big bags
- All our plants are ISO 9001:2008 certified.

CHEMICAL COMPOSITION

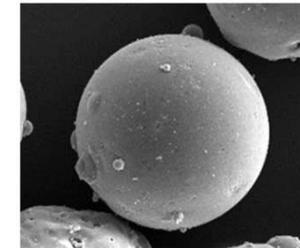


SEM micrograph of THERMO-SPHERES



 No crystalline
Silica

Physical Properties	W75	W100	W125
Colour	off-white	off-white	off-white
pH-Value	7.0 - 9.9	7.0 - 9.9	7.0 - 9.9
Melting Point (°C)	up to 1600	up to 1600	up to 1600
Hardness Mohs	5 - 6	5 - 6	5 - 6
Compression Strength (MPa)	25	25	25
Bulk Density (g/L)	350 - 450	350 - 450	350 - 450
Density (g/cm ³)	approx. 0.8	approx. 0.8	approx. 0.7
Particle Size (µm) Range	up to 75	up to 100	up to 125
Floaters (vol. %)	90 - 100	90 - 100	90 - 100



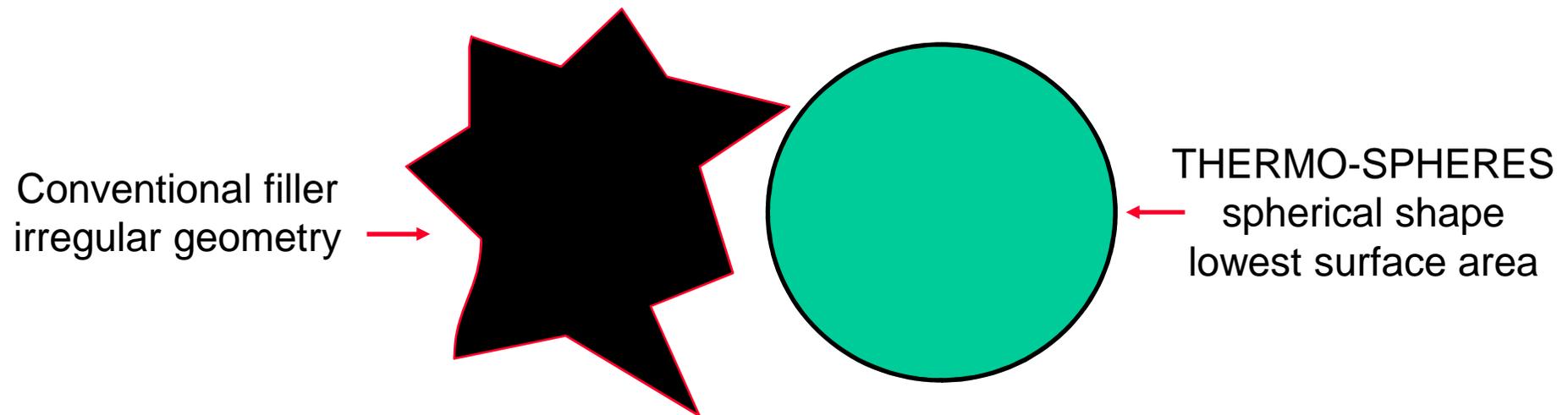
SEM micrograph of THERMO-SPHERES

New **W75**
Top-cut 75 µm

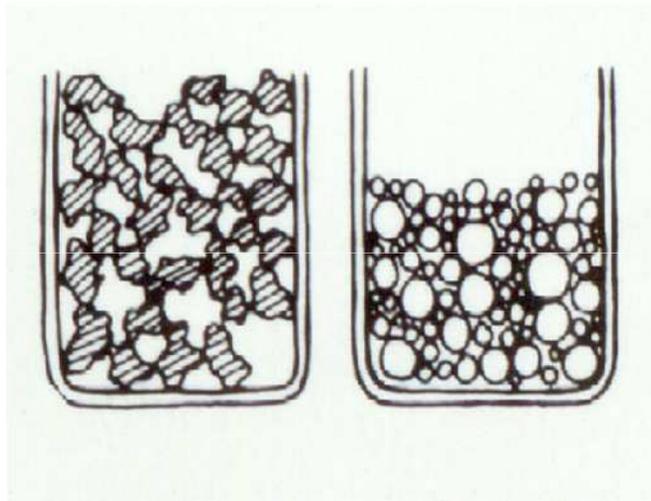
Advantage of spherical shape

Minimum Surface area!

Spheres have lowest surface / volume ration

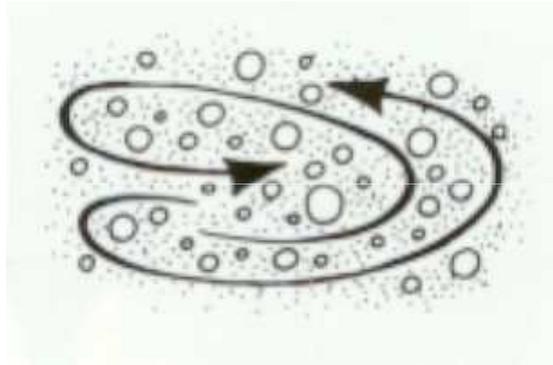


Advantage of spherical shape



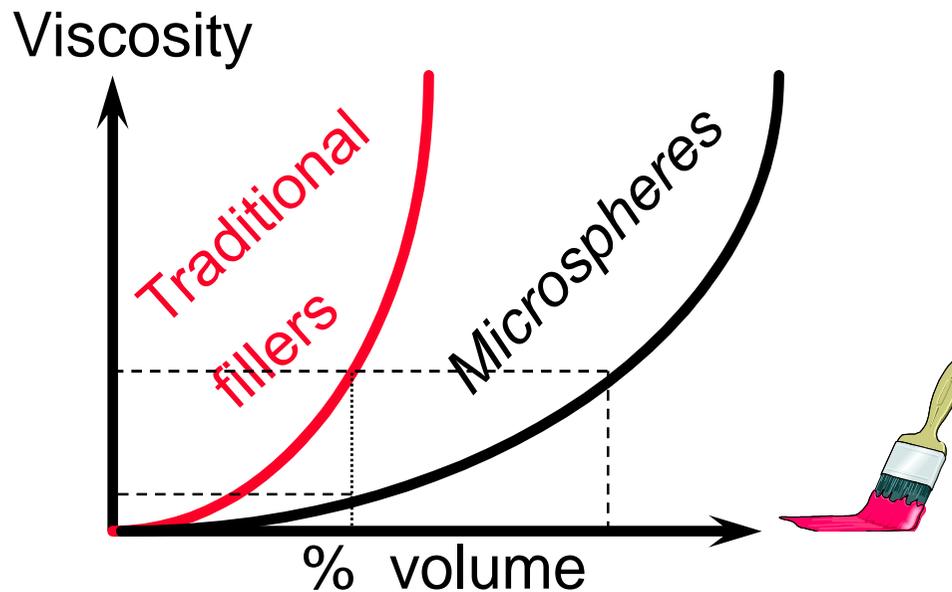
- **Lower binder demand**
- **Very High packing factor**
- **High solid - Low VOC**

Advantage of spherical shape



- **Low viscosity**
- **High fluidity**
- **Excellent disperability**

Advantage of spherical shape



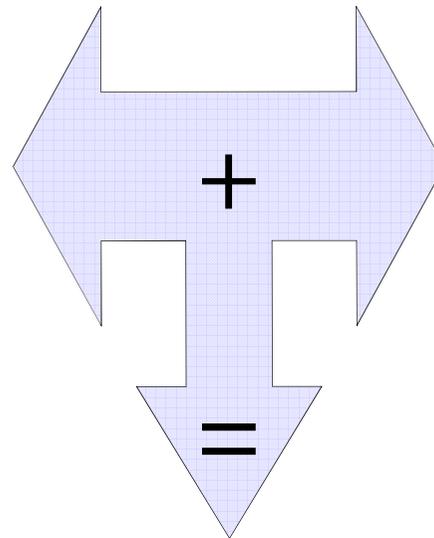
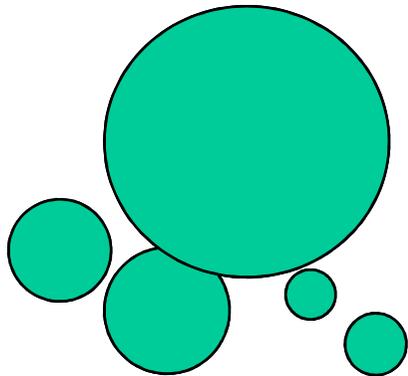
Minimum oil absorption
Minimum binder demand



Low VOC

- Low viscosity with the same solid volume*
- Higher filler loading for the same viscosity*

Advantage of spherical shape



Ceramic
Glass
PP, PU, PA
PMMA
Silicone
...

Hollow?
Full ?
Porous?

PERFORMANCE often UNIQUE
For high VALUE final applications

AZELIS Spherical Fillers

•POLYMERIC

•POLYPROPYLENE

•POLYURETANE

•FULL GLASS

•HOLLOW GLASS

•ACRYLIC

•PMMA

•SILICONE

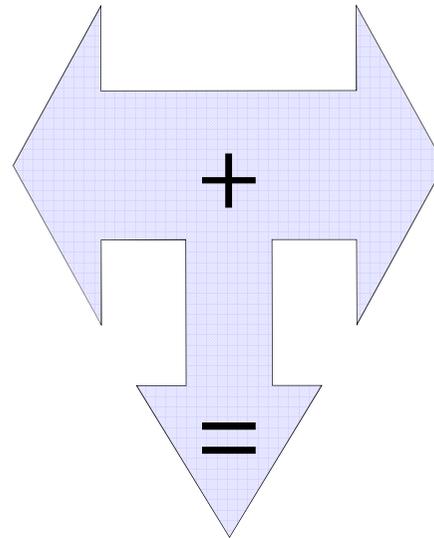
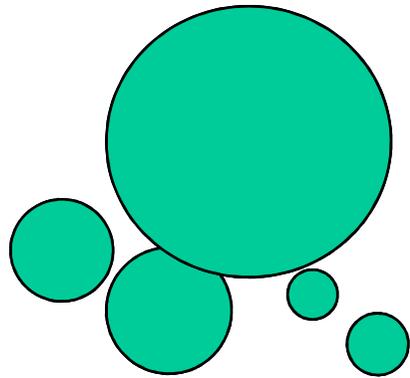
•MINERALS

•FULL CERAMIC

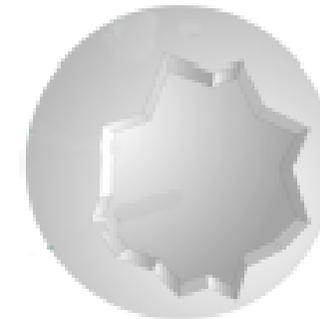
•HOLLOW CERAMIC



Advantage of spherical shape



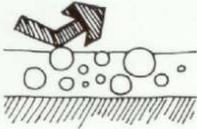
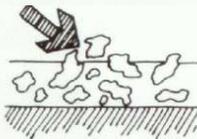
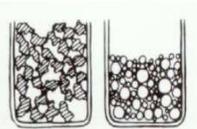
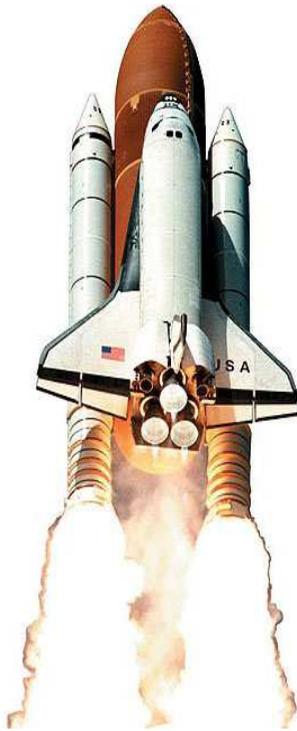
**Properties of
ceramic hollow
spheres**



THERMO- SPHERES

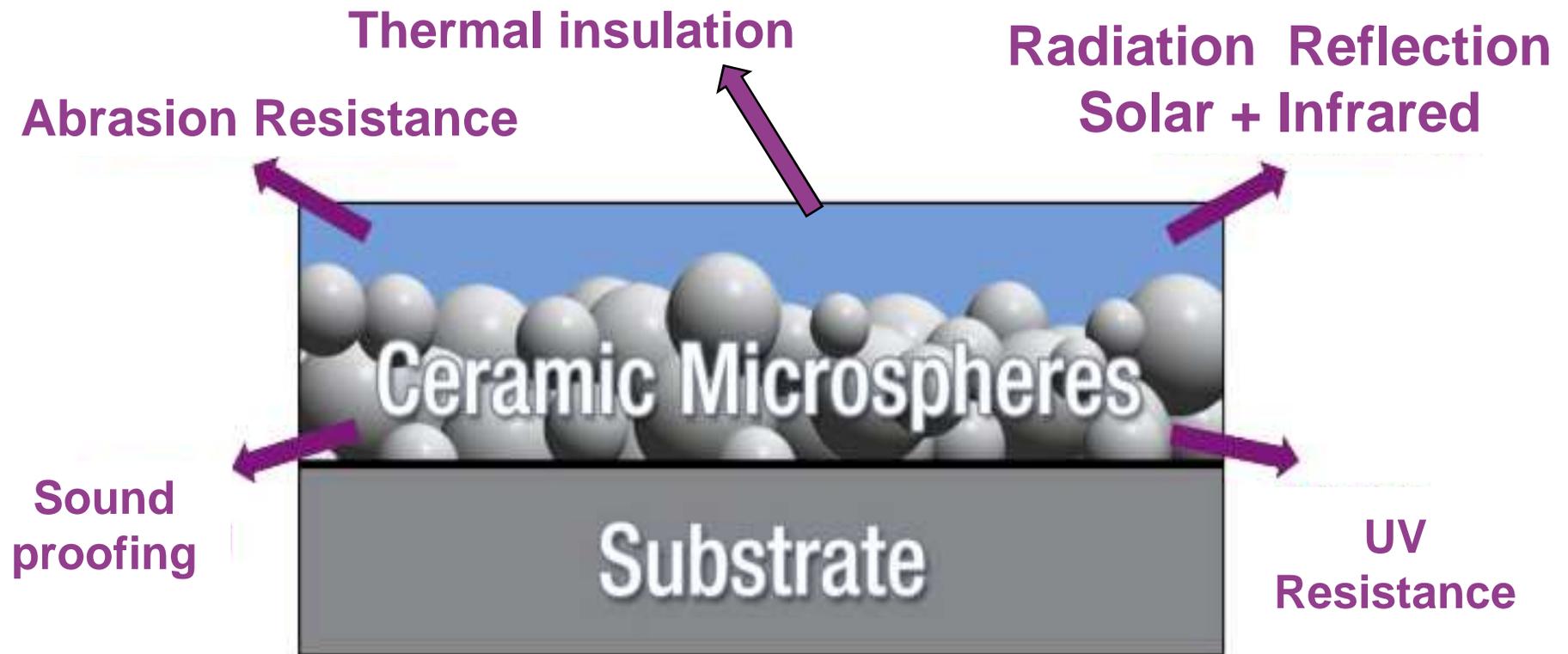
A step forward in the extender technology

Characteristics

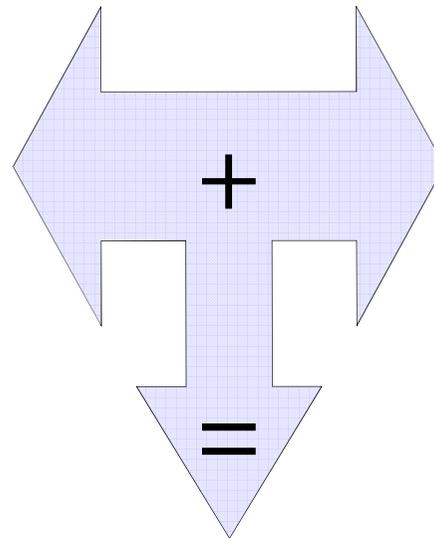
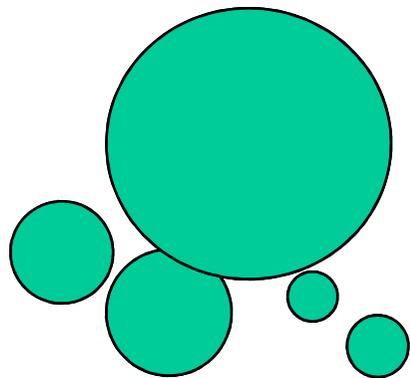


- Lightweight, insulating properties
- Smooth surface, non porous
- Low surface area, high solid
- Easy to dispersion
- Hardness, abrasion resistance
- Inert, chemical and exterior resistance
- Thermal , Corrosion resistance
- Radiation Barrier, IR-reflective

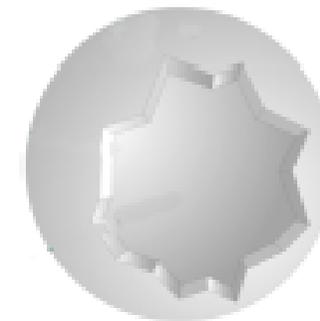
Characteristics



Advantage of spherical shape



Properties of ceramic hollow spheres



White color - Lightweight - Hardness and Chemical resistance
Thermal insulation - **IR reflective barrier** - Acoustic insulation
Thermal Resistance up to **1600 °C** - wide Dimension range

Applications

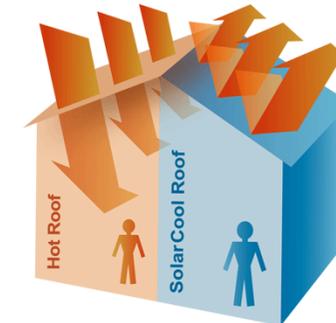
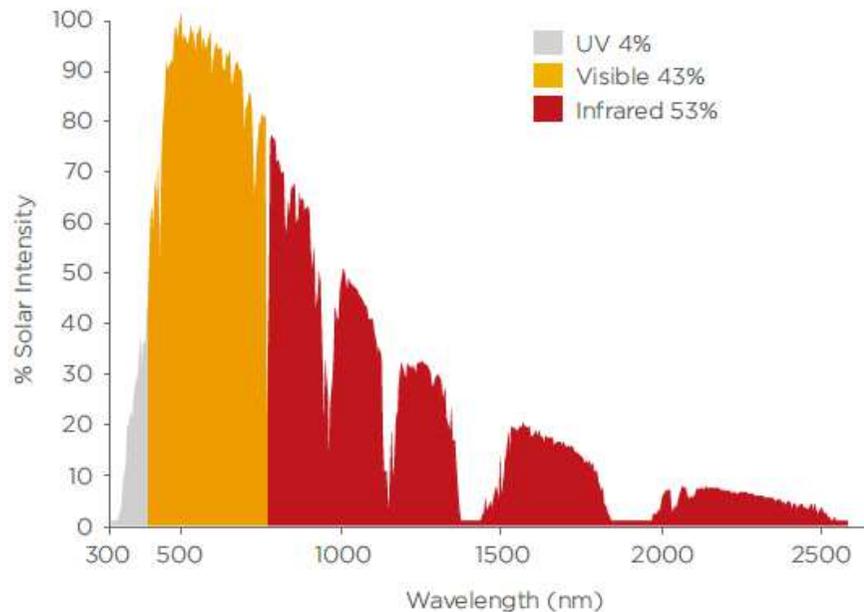
Foundary & Refractory

Products and accessories where high thermal resistance and dimension stability up to 1600 °C is very important.



Applications

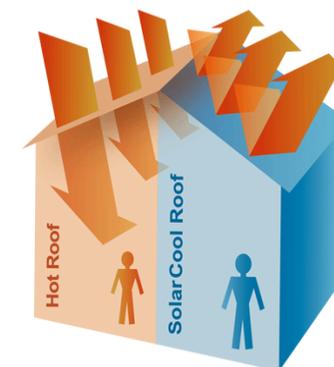
- Solar reflective paints
- Insulative coatings
- Cool-Roof coatings and Membranes



Spheres dosage : 5 - 25 % on weight

Applications

- Functional Paints and plasters
- «Comfort» paints for interior
- Soundproofing paints
- Anti-condensation paints
- Mould and algae-resistant paints for interior and exterior
- Hot surface touch protection coatings



Spheres dosage : 5 - 25 % on weight

Applications

Fireproof products

General industry and Refractory applications.



Composites

Thermal resistance up to 1600°C and very high hardness systems. Special Ceramic coatings.



Spheres dosage : 5 - 25 % on weight

Applications

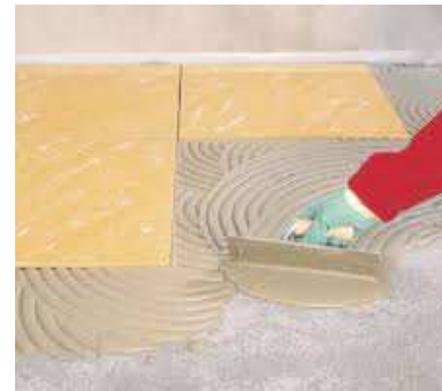
Sparkling Compounds

Concrete and polymeric, for high performance, high abrasion and detergent resistance, low shrinkage, self levelling and good flow.



Lightweight adhesives

Dry-mix and ready to use products, tile or facade adhesives, reduced thermal conductivity, reduced noise transmission



Spheres dosage : 5 - 25 % on weight

Applications

Texture paint and Coatings

Special texture and tactile effect paints for interior and exterior

Decorative

Emulsion paints , ideal for application in combination with metallic pigments



Spheres dosage : 5 - 25 % on weight

A world of special performances for innovative applications



Thank you for your interest and attention!