THINKING OF TOMORROW

Engineered Lightweight Fillers:
A Sustainable and Multifunctional Solution Revolutionizing the Paints Industry

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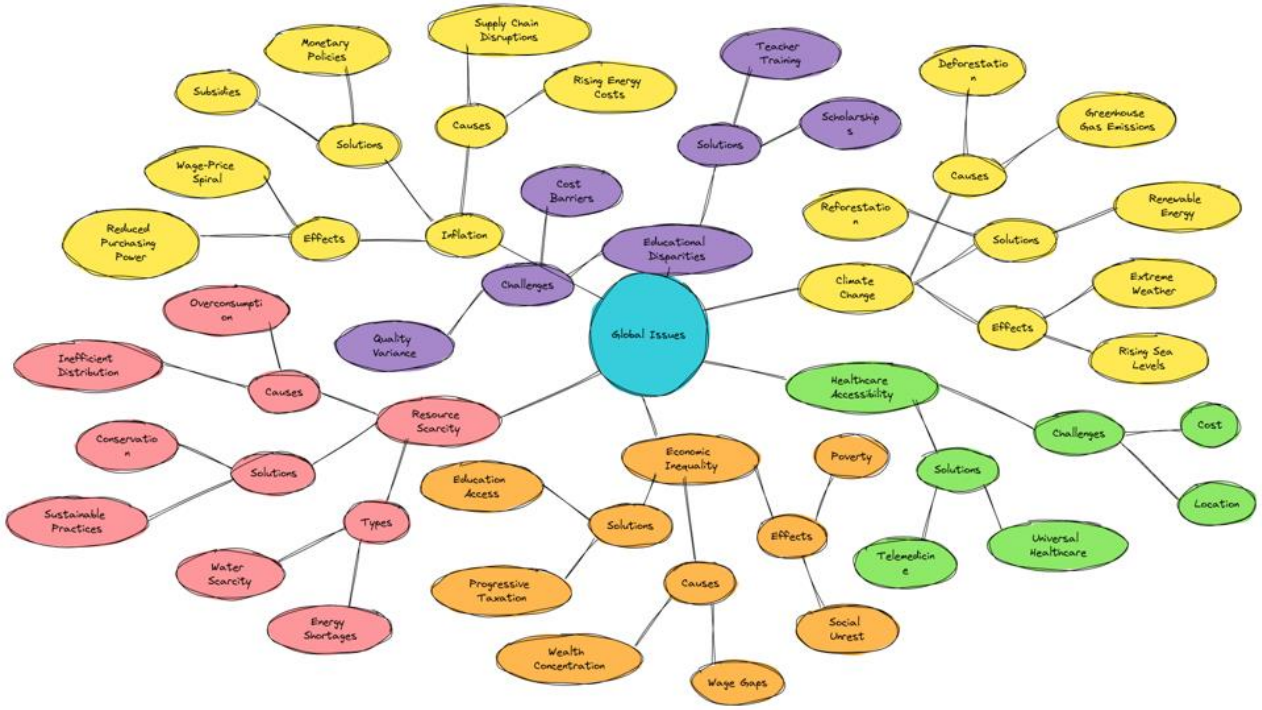
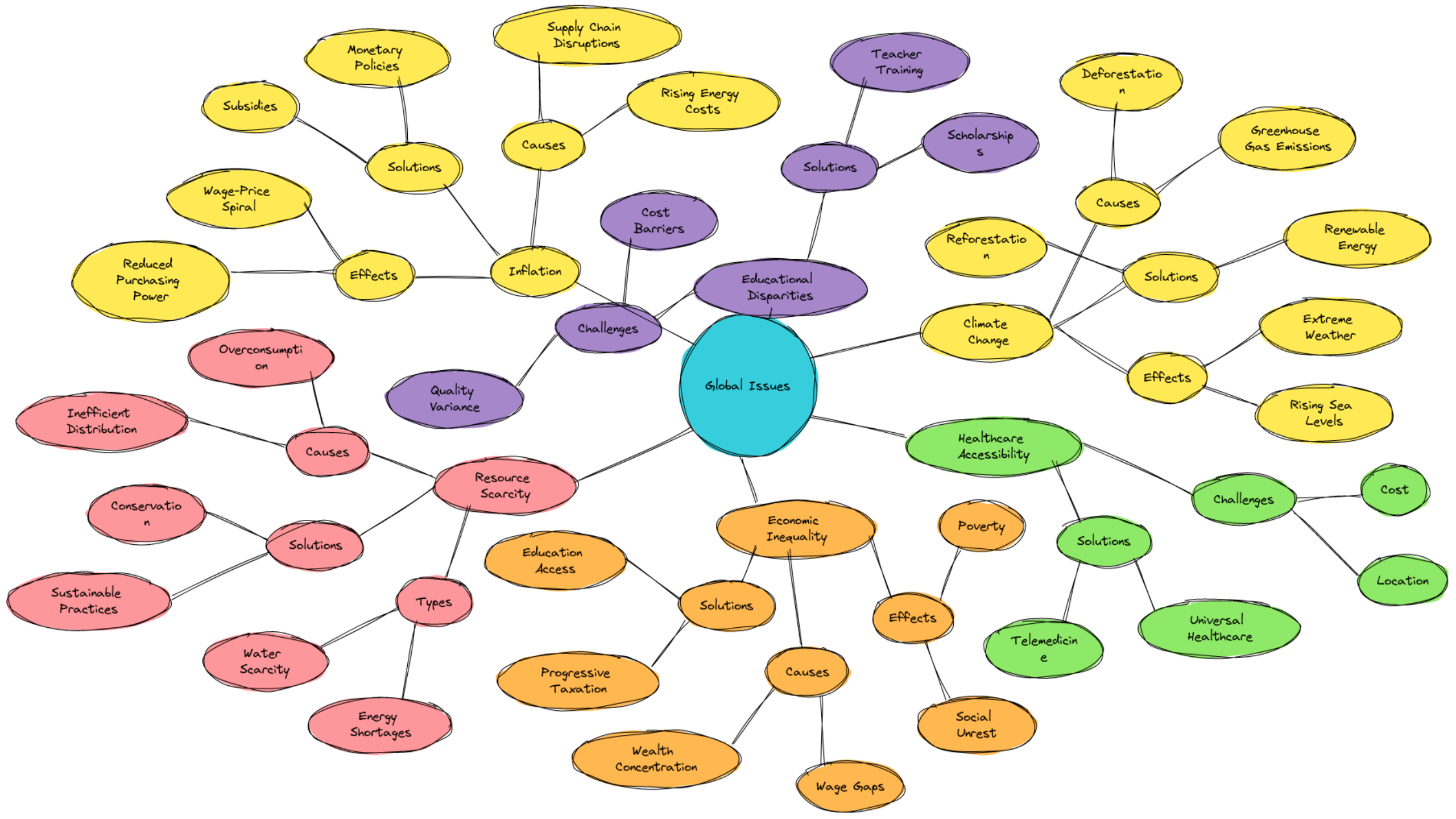
Omya International - Switzerland

Societal Challenges & Sustainable Development Goals

- **Climate Change:** Addressing global warming and its consequences.
- **Healthcare Accessibility:** Ensuring that everyone has access to affordable and effective healthcare services.
- **Economic Inequality:** Reducing disparities in wealth and income, within and between countries.
- **Educational Disparities:** Closing gaps in access to quality education caused by e.g., geography, socioeconomic status.
- **Resource Scarcity:** Dealing with the limitations of critical resources like fresh water, arable land, and certain minerals.




Global Issues
Inflation
Causes
Supply Chain Disruptions
Rising Energy Costs
Solutions
Monetary Policies
Subsidies
Effects
Wage-Price Spiral
Reduced Purchasing Power
Challenges
Cost Barriers
Educational Disparities
Quality Variance
Solutions
Teacher Training
Scholarships
Climate Change
Causes
Deforestation
Greenhouse Gas Emissions
Solutions
Reforestation
Renewable Energy
Effects
Extreme Weather
Rising Sea Levels
Resource Scarcity
Causes
Overconsumption
Inefficient Distribution
Types
Water Scarcity
Energy Shortages
Solutions
Conservation
Sustainable Practices
Economic Inequality
Causes
Wealth Concentration
Wage Gaps
Solutions
Education Access
Progressive Taxation
Effects
Poverty
Social Unrest
Healthcare Accessibility
Challenges
Cost
Location
Solutions
Telemedicine
Universal Healthcare

Urban Heat Island (UHI): How to Adapt or Avoid?

- Urban areas are steadily warmer than natural surroundings, a phenomenon called the Urban Heat Island effect.
- UHI intensity depends on e.g., city size, greenery, building density, and ventilation.
- Key mitigation: green spaces, efficient A/C (?), and cool surface design.

Ögçe H, Erdem Kaya M. Urban heat island phenomenon in Istanbul: A comprehensive analysis of land use/land cover and local climate zone effect. Indoor and Built Environment. 2024;33(8):1447-1470.

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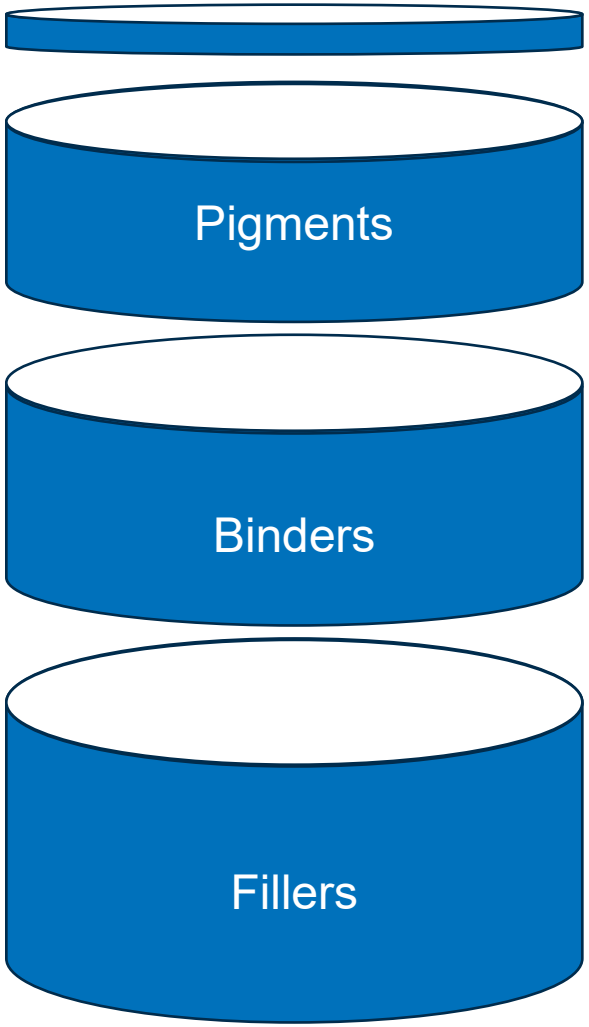
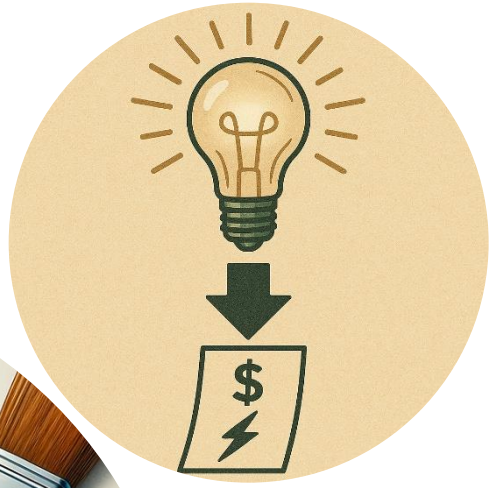
Build a Better Future: Contribution of Paint Industrials

- **Eco and Health-Friendly Formulations:** Employ non-toxic materials and compositions that minimize environmental impact while enhancing *user comfort and reducing health risks for workers.*
- **Energy Efficiency:** Develop paints that lower energy and water use in production and beyond.
- **Recycling Management:** Use recycled materials and establish programs like container recycling.
- **Community Engagement:** Partner with local producers on projects that promote regional and societal benefits.

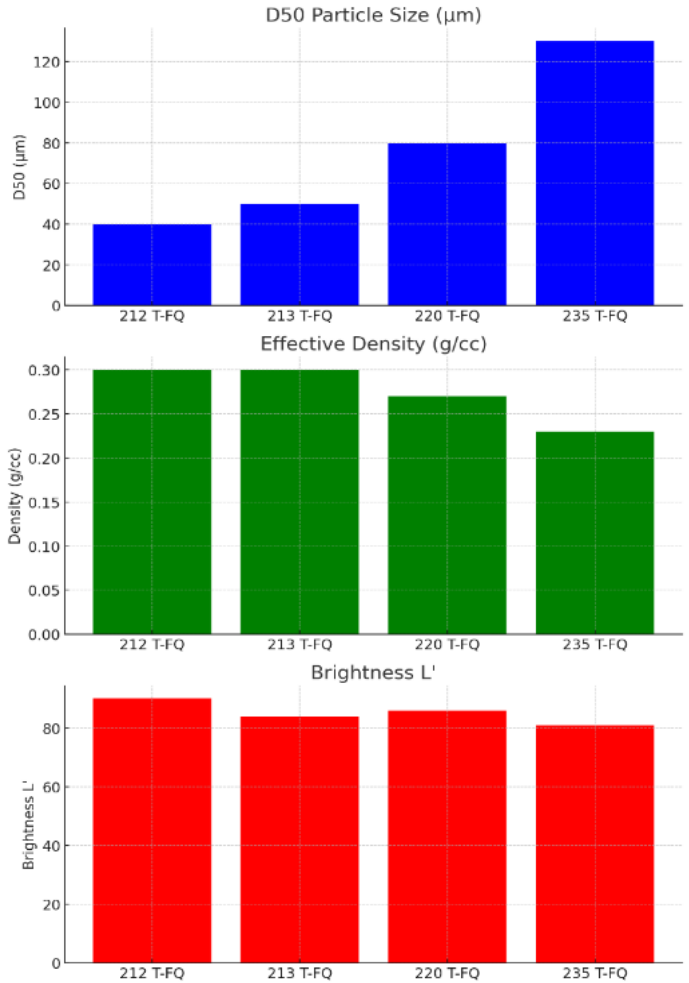
Where to Start?



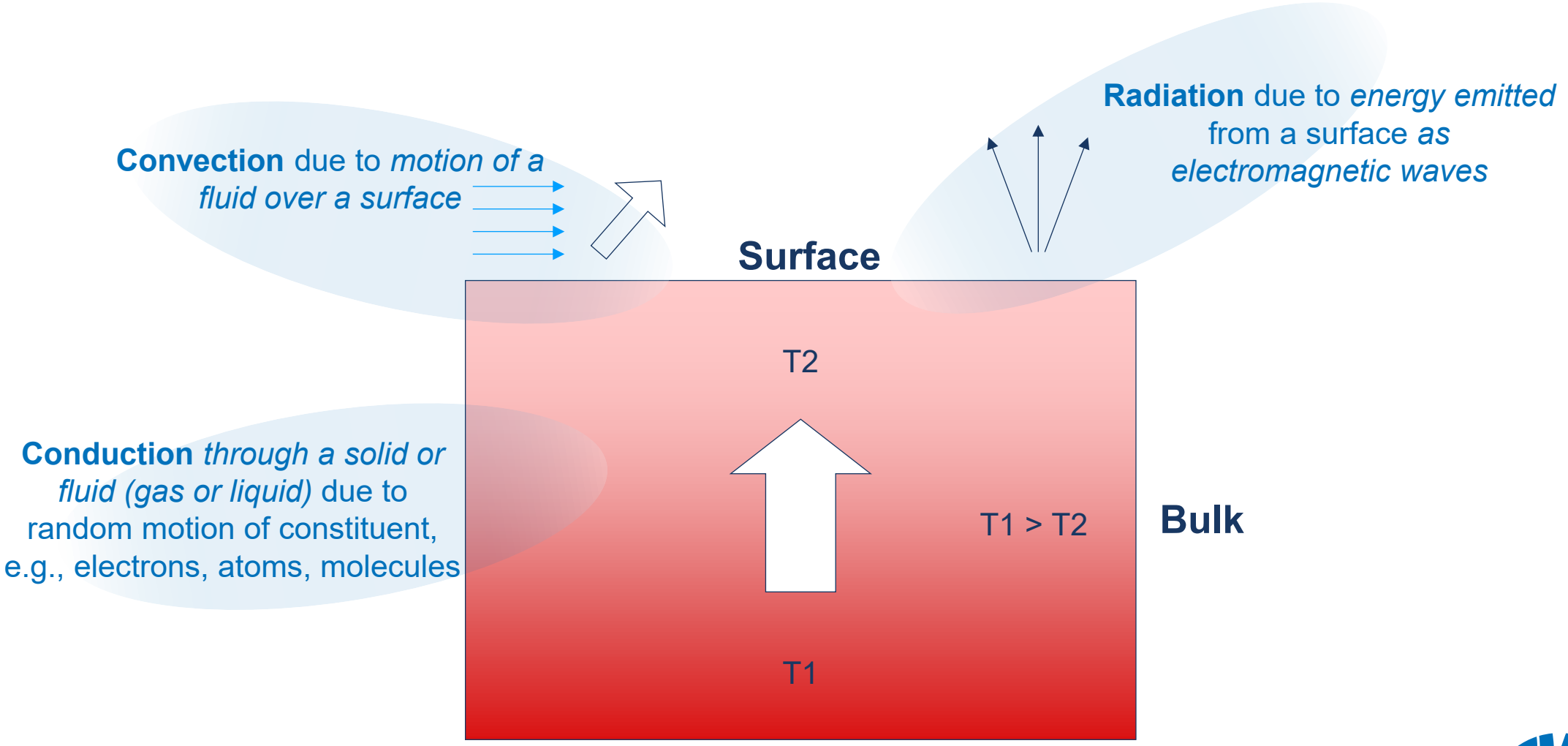


Illustrations generated via AI

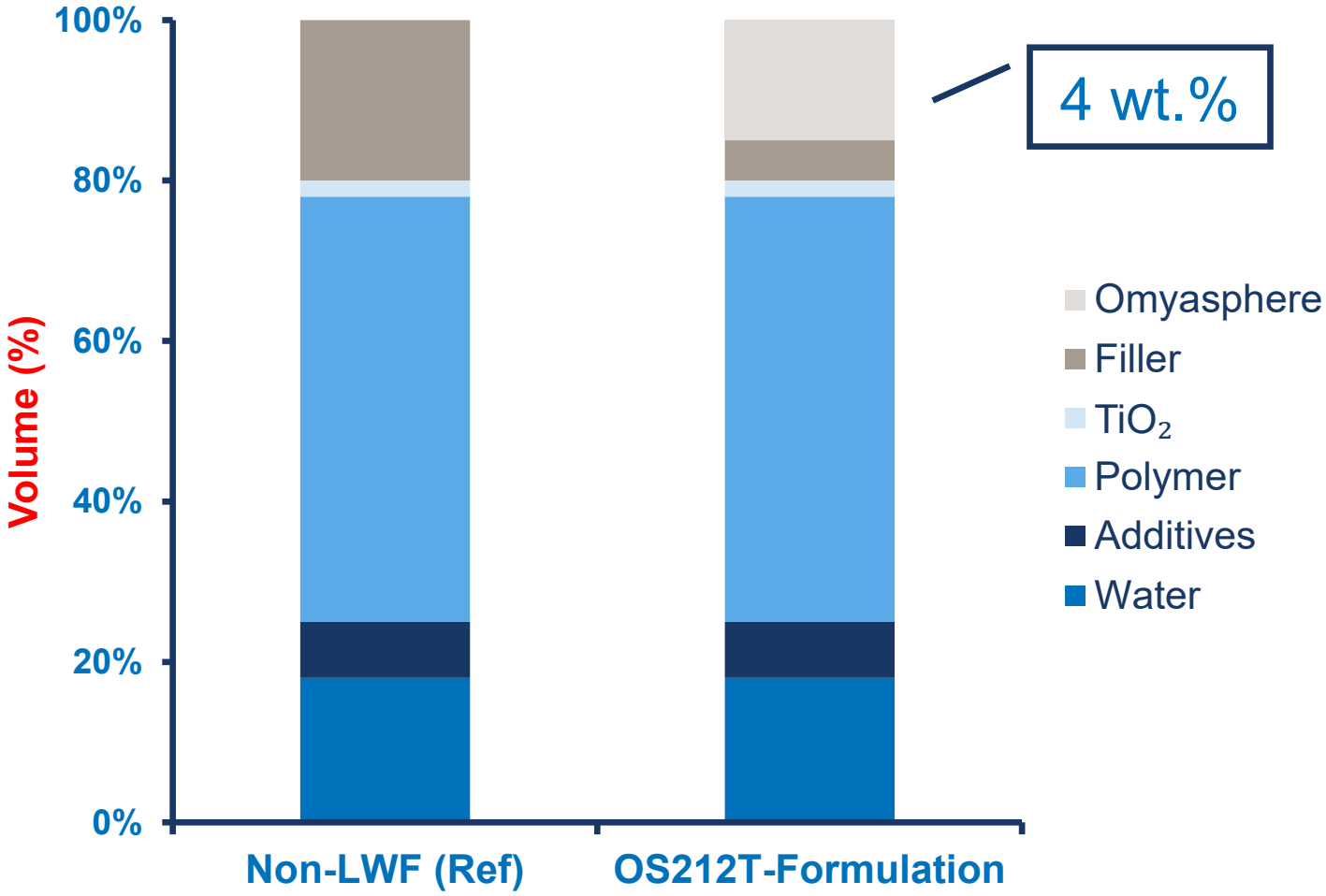
Omyasphere Family of Engineered Light Weight Fillers: 200 Series

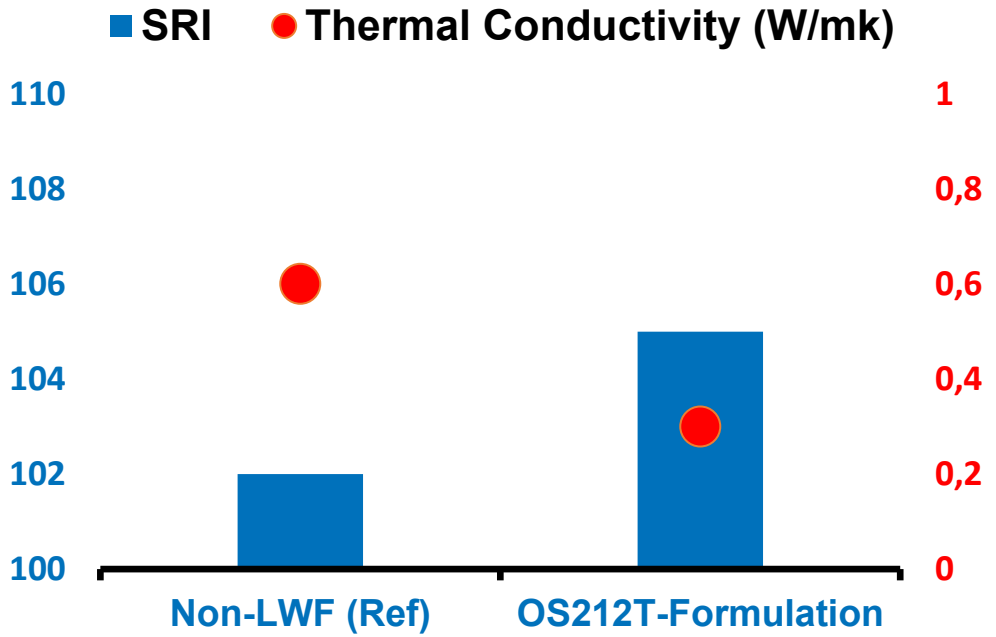


Modes of Heat Transfer

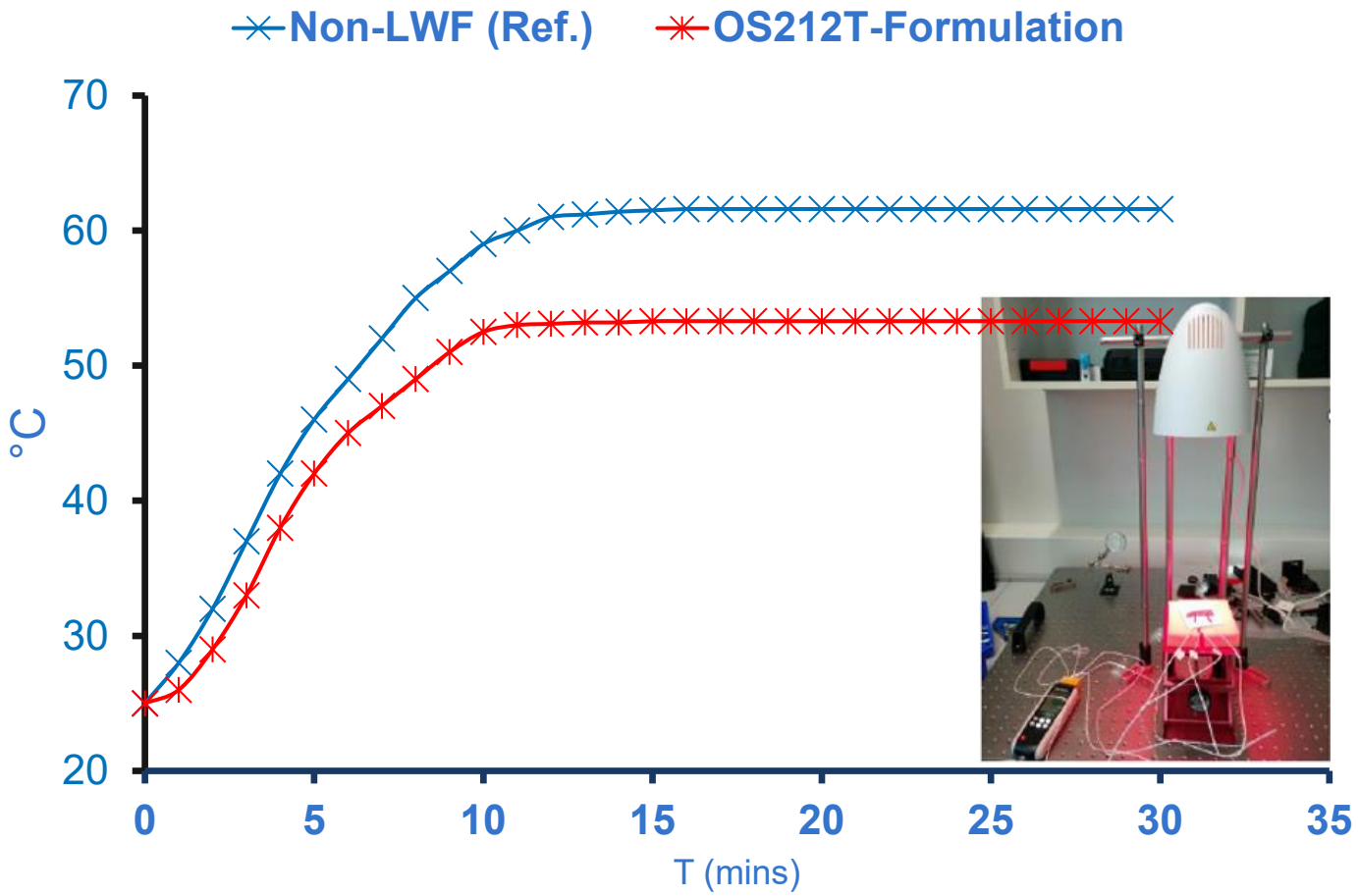


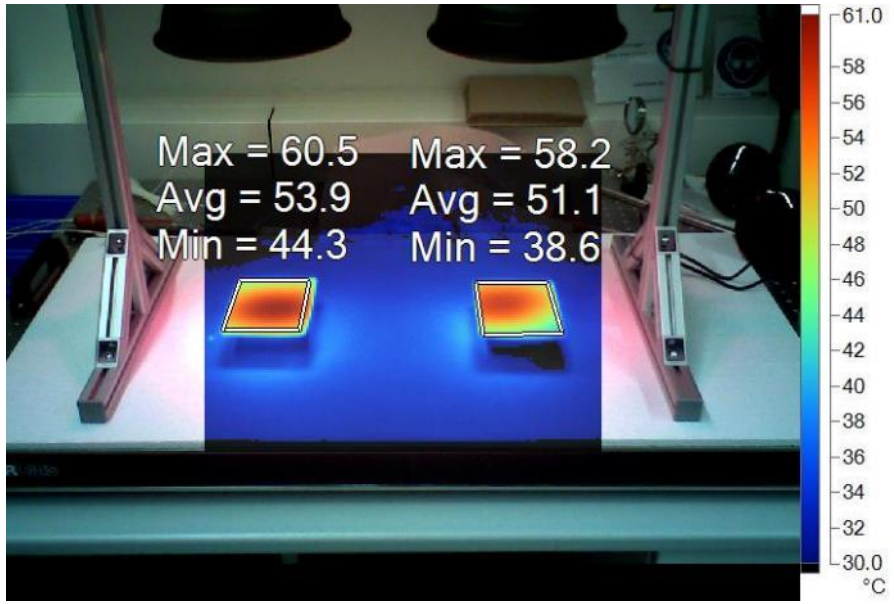
Case Study: A Solar Reflective Paint using Omyasphere 212T





Case Study: A Solar Reflective Paint using Omyasphere 212T





Non-LWF (Ref.) OS212T-Formulation

Let’s Simply Use A/C Systems … ?

- Raising indoor temperatures from 18°C to 22°C can reduce cooling energy use by up to 30%.
- Each 1°C increase saves ca. 6-8% in A/C energy consumption (i.e., economies).
- In Türkiye, where electricity relies on fossil fuels, this leads to significant CO_2 emission reductions - *especially in areas with high UHI intensity, where cooling demand is greatest (i.e., Closed cycle).*
- Raising A/C temperatures improves efficiency, reduces energy cost and carbon emissions.

Omyasphere 200 and Beyond …

- **OS200:** D50 of 40-130 µm, effective density of 0.3-0.4 g/cc, mid level brightness and compressive strength.

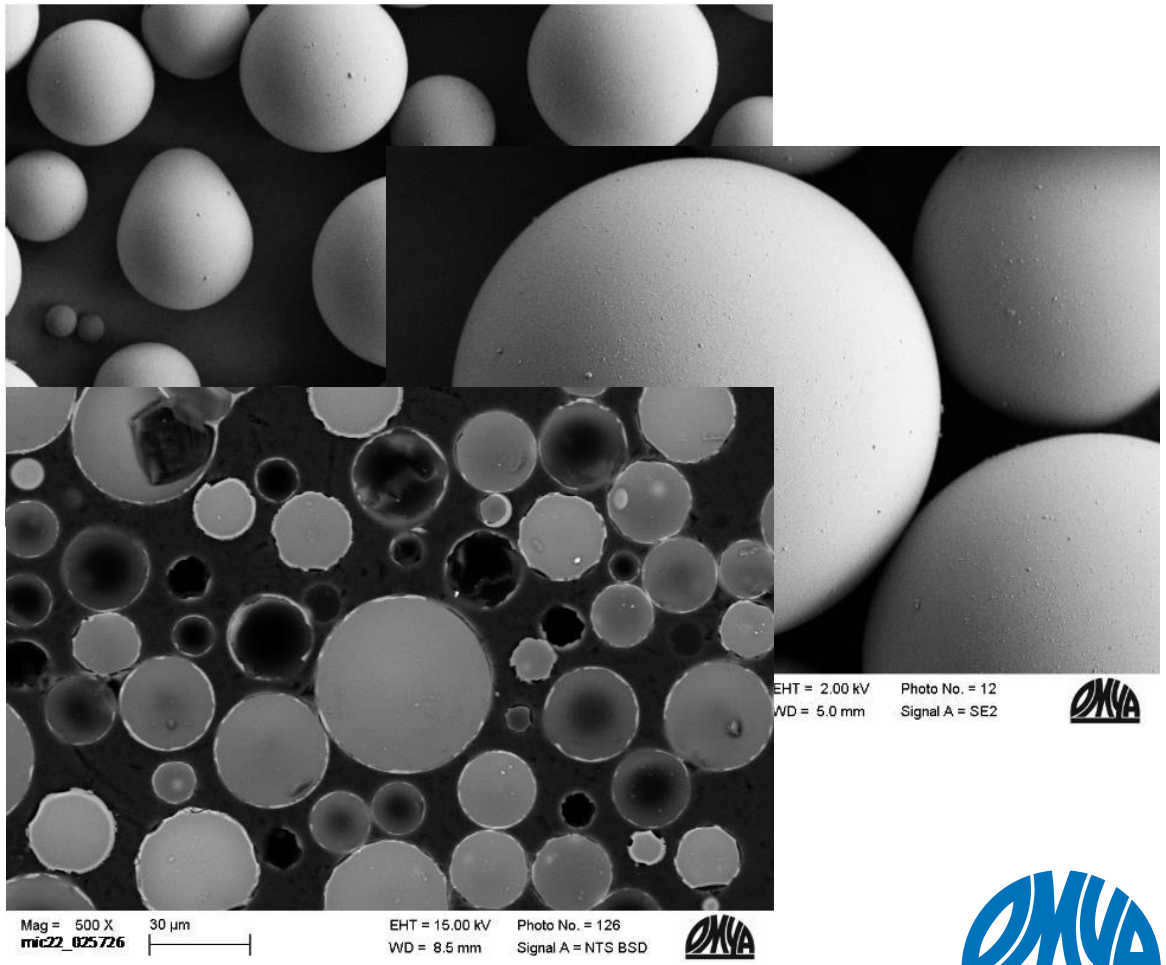
- **OS900:** D50 16-85 µm, effective density of 0.15-0.5 g/cc, high level brightness and compressive strength.

Main applications	Omyasphere 200 series	Omyasphere 900 series
Building Refurbishment & Finishing		
Spackles / Joint Compounds / Joint Fillers / Putties	●●	○
Acrylic Plasters	●●	○
Gypsum Joint Filler / Mortars / Renders / ETICS	●●	
Ceramic Tile Adhesives	●●	
Self Levelling Underlayment / Tile Grouts		
Panels & Boards	○	
Concrete		
LW Concrete / Infra LW Concrete / 3D printing	○	
Paints & Coatings		
Thermal Insulating Paints	○	●●
Deco Paints		●●
Roofing & Flooring		
Elastomeric Roof Coating / Cool Roof	●●	●●
Waterproofing Asphalt Membranes / Sealers	●●	
Adhesives & Sealants		
PU / SMP / Silicone		●●
Acrylic / Epoxy	○	●●

●● First choice ○ Second choice

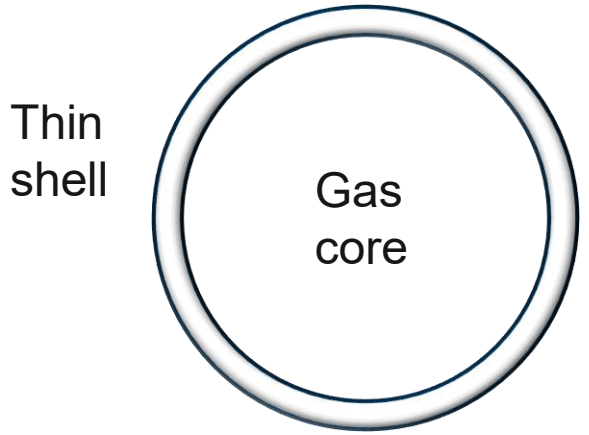
What is Omyasphere 900?

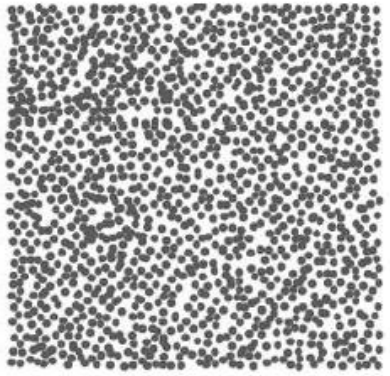
- Omyasphere 900 series are hollow glass microspheres, derived from soda lime borosilicate glass.
- Materials are chemically inert and water-resistant.
- Spherical and hermetic, they have low density, high compressive strength and high brightness.

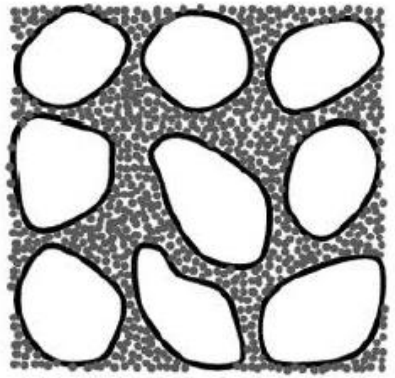


How Omyasphere Improves Thermal Insulation?

- $\lambda_{Total} = \lambda_{Conduction} + \lambda_{Convection} + \lambda_{Radiation}$
- Conduction: heat transfer through shell material.
- Convection: gas movement within the hollow core.
- Radiation: reduced by scattering within and between particles.







Key Takeaways

Upgrading a P&C formulation with Omyasphere yields:

- A **high** SRI and a **low** of thermal conductivity (i.e., **high** thermal insulation): Use less energy to cool residential areas.
- If a coating thickness (or compressive strength) is important OS 920, 922 and 938S are recommended. If not, OS 212T, 220T are suitable. *Cost/Performance ratio is to be considered.*
- Addressing our societal and environmental challenges require a multifaceted approach, as there is no one-size-fits-all solution!

About Omya

Omya is a leading global producer of essential minerals and a worldwide distributor of specialty materials.

160 plants in **50** countries

9,000 employees

Privately owned

Headquartered in Switzerland

CHF **4 billion** turnover

THINKING OF TOMORROW

Solving customer challenges today and into the future

Horizon 3 **Future challenges**

Working now to be ready for what tomorrow may bring

Horizon 2 **Development programs**

A global innovation pipeline for market applications

Horizon 1 **Technical support**

Responding to immediate customer needs

325
patent families

3
innovation hubs

6
pilot plants

100+
scientists

17
dedicated laboratories

Thank you for your kind attention!