

### Description of the result

mRefCem is a processed cement industry based refractory waste with strong dielectric properties. It serves as a sustainable functional filler for insulating composites, construction products, and coatings. The material passport provides chemical, structural, thermal, and dielectric data, ensuring suitability for non-refractory industrial applications.



mRefCem



Funded by  
the European Union



### Problem addressed



Refractory waste often lacks end-markets due to absence of property data and reliable processing routes. The mRefCem passport fills this gap by offering complete performance mapping and enabling replacement of virgin mineral fillers in construction, polymer, and insulation industries.



### Main features & benefits

The mRefCem material passport enables valorisation of cement industry based refractory waste streams exhibiting dielectric behaviour. Comprehensive characterisation identified MgO, spinel phases, and lossy dielectric properties (dielectric constant ~102). With advanced milling ( $<10 \mu\text{m}$ ), AI-assisted optimisation, and silane surface treatment, mRefCem was proven compatible with thermoplastic and thermosetting polymers, coatings, and dielectric systems. It creates new reuse pathways for typically landfilled fractions.

## Contact & Further Information

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Consortium:





### Target users /stakeholders

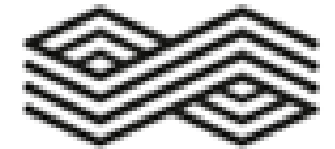
Construction material developers, polymer composite and coating manufacturers, dielectric material formulators, recyclers, researchers, and circular economy innovators.



### Who is leading the development?



cpi



RHI MAGNESITA



### Exploitation potential

Applications in dielectric composites, construction materials (cements, mortars), insulating coatings, and sustainable filler markets. Reduces use of virgin fillers (e.g., talc, silica) while enabling circular use of refractory waste.



### Technical facts

Particle size:  $D_{50} < 10 \mu\text{m}$

Dielectric constant:  $\sim 102$  (lossy dielectric)

Thermal conductivity:  $0.2\text{--}0.6 \text{ W/mK}$

Compatible with epoxy, HDPE, PP, coatings (after silane treatment)

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