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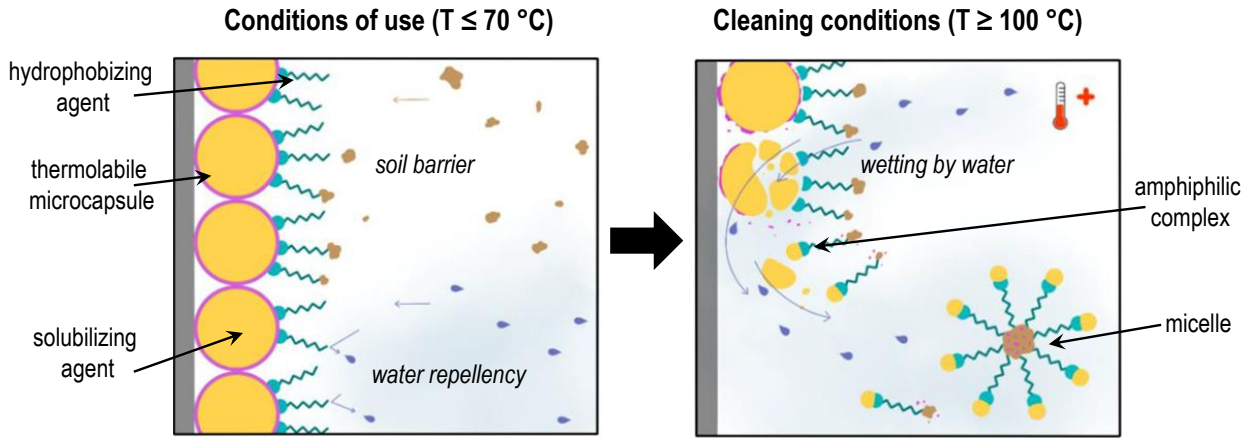
Thermosolubilizable hydrophobic systems based on renewable raw materials (IGF 01F22794N)

Regular facade cleaning is essential for maintaining the value of a property. However, with the means currently available, cleaning porous facade materials (e.g. plaster) in particular is only possible with a high expenditure of personnel and time. This applies especially to composite thermal insulation systems (ETICS), which usually have to be coated with a water-repellent coating to prevent moisture-induced mold and fungal growth. The hydrophobization does not prevent the ETICS from becoming dirty. However, the removal of dirt from ETICS is made extremely difficult in the cleaning process due to the very low wettability of the hydrophobized surface by water.

With the aim of enabling efficient cleaning of ETICS, hydrophobic systems were developed from renewable raw materials whose water solubility is controlled by temperature (thermosolubilizable hydrophobic systems). Unlike conventional systems, the thermosolubilizable hydrophobization system is not permanently bound to the facade material, but can be removed in a controlled manner during the cleaning process (e.g. low-pressure process with water, T ≥ 100 °C) together with adhering soil. Thermosolubilizable hydrophobic systems are based on specially developed thermolabile microcapsules that adhere to the ETICS and serve to bind hydrophobizing agents (mono fatty acids). The hydrophobicity of coated ETICS is achieved by aligning the alkyl chains of the hydrophobizing agents to the air interface. Under cleaning conditions, the microcapsules lose their integrity due to heat exposure and disintegrate, releasing solubilizing agents. The aligned structure of the hydrophobic alkyl chains on the facade surface is broken down, allowing the ETICS to be wetted with water. The solubilizing agents form amphiphilic complexes with the hydrophobizing agents previously bound to the microcapsules, which micellarize soil and capsule residues, thereby dissolving the hydrophobic system in water. Following cleaning, the thermosolubilizable hydrophobic system is reapplied in two stages (e.g. spray application) as an aqueous dispersion.

The research report is available on request from the wfk - Cleaning Technology Institute.



Schematic representation of thermosolubilizable hydrophobic systems under application and cleaning conditions

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