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Abstract Formulary

Presentation type: **Oral** ✔ **Poster** ☐

Title: Aerobel: manufacturer of innovative insulation technologies via vertical integration

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Institution (Presenter): Aerobel BV

ABSTRACT (Space limited to 2200 characters)

Aerobel is a Belgian scale-up that offers innovative insulation products and solutions for energy conservation and climate change mitigations. All products are developed and manufactured via a vertical integration system starting from waste streams or abundant natural resources which are then transformed into high performance insulation materials. At the moment, Aerobel produces silica aerogel, the Aerobinder, and expanded polystyrene (EPS) beads, while systems such as the Aeromix and aerogel composites are part of the know-how and developed for customers. The Aeromix is the world's best in-situ applied EPS-based flooring insulation system consisting of mostly EPS beads (virgin or recycled), the Aerobinder, and a small amount of cement. The Aerobinder, a gel-like biobased binder, gives the Aeromix its thermomechanical properties, i.e. a thermal conductivity of 35-37 mW/m-K and compression strength of 110 kPa. A modified version of this system is currently under development containing no cement and having even better properties, i.e. 28-32 mW/m-K and 150 kPa, respectively. Further, Aerobel owns a first-of-its-kind patented technology to manufacture hydrophobic silica aerogel via a circular production process, requiring less process steps, raw materials, and energy. Silica from waste sources or abundant natural resources is converted into a specially designed precursor system that will be transformed into a hydrophobic mesoporous silica network. As a result, tedious washing and chemical intensive hydrophobization steps are avoided. No expensive precursors, such as the traditional silicon alkoxides (e.g. TMOS, TEOS, MTMS, etc.) or organosilanes (e.g. TMCS, HMDSO, HMDZ, etc.) are used in this protocol. Lastly, a low-energy drying step carefully extracts the liquid phase from the gel giving aerogel powder and granules. The thermal conductivity of Aerobel's aerogel is 16-18 mW/m-K. This process is currently in scale-up and the targeted production capacity of 30 000 m3 is aimed to be achieved by 2026. The high cost efficiency of this process allows the implementation of the aerogel even in price sensitive construction applications, a fast growing market for aerogel.