

## Improvement of Emissivity Measurements on Reflective Insulation Materials

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Thermal insulation products with low emissivity surfaces can be used in association with airspaces to constitute insulation systems with thermal resistances higher than those of the insulation products themselves. An intercomparison of techniques for measuring total hemispherical emissivity of reflective foils was organized by a standardization working group in the EU; integrating sphere techniques and commercial emissometers were involved in the comparison. The results were very scattered from 0.02 to 0.08 on the same foil. The discrepancies are not yet explained; likely explanations are the sensitivity of measurement techniques to angular diffusion of foils and the type of reference samples used for calibration. A group of four National Metrology Institutes (LNE, Aalto, DTU, PTB), two institutes involved in certification of insulation materials (IG, FIW), two research laboratories (ZAE, IPK), one manufacturer of low emissivity insulation products (ACTIS), and the manufacturer of TIR 100 emissometers are collaborating in a three-year project for improving the measurements of total hemispherical emissivity of reflective foils. The sensitivity of integrating spheres to the angular distribution of reflection of samples has been analysed as well as the influence of using specular or diffusing reference samples. The angular diffusion at reflection and the specularity of different reflective foils have been analysed experimentally in order to define the ideal types of reference sample that should be used to avoid errors in measurements. The metrological characterization of the INGLAS emissometer TIR100-2 has begun. The global structure and objectives of the project will be presented as well as the main results obtained during the first year of the project.

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