

Emissivity characterization of different stainless steel textiles in the infrared range.

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Abstract

We investigated, both experimentally and theoretically, the infrared emissivity of a set of stainless steel textiles, prepared using different type of fabrics. Infrared emission of the textiles was characterized in the mid-infrared range by observing their temperature evolution under heating regime with a focal plane array (FPA) infrared camera. Standard test method for measuring and compensating emissivity using infrared imaging radiometers as well as a reference surface of known higher emissivity was applied to the set of metallic textiles. The obtained experimental results allowed to retrieve the infrared emissivity at different applied temperatures. The measured data were interpreted by means of Plank's theory of black-body radiation. Finally, the investigated textiles composed of stainless steel yarns differ by the type of fabrics, while all appear to be suitable for thermal shielding applications.