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Recent NASA/GSFC Cryogenic Measurements of the Total Hemispheric Emissivity of Black Surface Preparations

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High-emissivity (black) surfaces are commonly used on deep-space radiators and thermal radiation absorbers in test chambers. Since 2011 NASA Goddard Space Flight Center has been measuring the total hemispheric emissivity of such surfaces from room temperature down to 20 Kelvin using a test apparatus that fits inside a small laboratory cryostat. We report the latest data from these measurements, including Chemglaze Z307 paint, Black Kapton™, and a configuration of painted aluminum honeycomb that was not previously tested. We also present the results of studies of batch-to-batch reproducibility in Ball Infrared Black™ and painted aluminum honeycomb. This work was performed to support the development and testing of the James Webb Space Telescope.

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