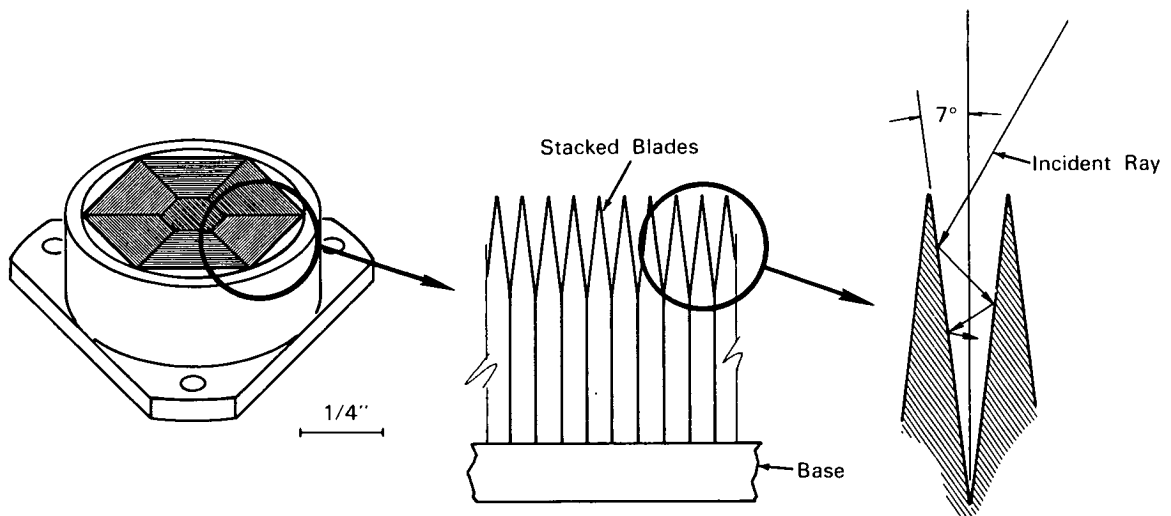


NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the NASA space program.

Reference Black Body is Compact, Convenient to Use



The problem: To construct a compact device that would serve as a reference black body (i.e., one which completely absorbs all radiant heat falling on its surface) over a wide range of incident angles. For the intended experimental purposes, it was not convenient to use the classical hollow sphere as a black body. Also, it is difficult to realize quantitative black-body behavior in normally used black coatings, especially when the radiation strikes the surface at grazing angles. Serrated surfaces which have been used as black bodies may require difficult machining operations in special applications.

The solution: Stacked razor blades with a deposit of a black oxide on the surfaces or notches between the upper edges of the blades.

How it's done: A special clamping fixture is used for stacking and soldering the blades. Another fixture is used to hold the work for electrical discharge machining.

The resulting compact device provides a deep-notched black body surface that is large compared to the overall size of the device. Radiant energy incident on any notch is almost completely absorbed because of the multiple reflections within the small apex angle. Any variation in absorptivity of an individual notch has a small effect on the overall absorptivity of the device.

Notes:

1. This device may be useful as a reference black body in laboratory radiation measurements and quality control of thermal processes.

(continued overleaf)

2. The stability of the device at high temperatures has not been ascertained.

of this innovation. No patent action is contemplated.

Patent status: NASA encourages commercial use

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