

Concept of black body

- A black body is an ideal body that absorbs all incident energy and reflect or transmit none.
- Snow and ice or white paper are quite bright to the eye but are nearly radiations black with an absorptivity of 0.97-0.98
- No actual body is perfectly black, the concept of black body is an idealisation with which the radiation characteristics of real bodies can be conveniently compared.
- Black body is regarded as a perfect absorber of incident radiation. as well as a perfect emitter.
- Radiation passing through the hole into cavity is repeatedly absorbed and reflected at the cavity walls until it is all absorbed

Laws of Radiation

Stefan Boltzmann law

The total radiant heat power emitted from a surface is proportional to the fourth power of

its absolute temperature

Intensity of radiation

- The radiation emitted in any direction is defined in terms of radiation intensity
- The radiation intensity of a surface is defined as the rate of heat flux emitted by it per unit projected area normal to the direction of radiation per unit solid angle.

$$I_b = \int_0^{\infty} I_{b\lambda} d\lambda$$

I_b is used to characterize the amount of energy emitted over the entire wavelength spectrum from $\lambda=0$ to ∞ in a beam.

$I_{b\lambda}$ - radiation in an interval $d\lambda$