



Standard Terminology Relating to Solar Energy Conversion¹

This standard is issued under the fixed designation E 772; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

absorber—that part of a solar collector whose primary function is to absorb radiant energy and transform it into another form of energy.

NOTE 1—A thermal absorber usually possesses a solid surface through which energy is transmitted by thermal conduction to the transfer fluid; however, the transfer fluid itself can be the absorber in the case of an optically transparent container and a “black liquid”. A photovoltaic absorber converts part of the incident solar flux into electrical energy, and part to thermal energy.

absorptance, α —the ratio of the absorbed radiant or luminous flux to the incident flux. (Practice E 491, for Solar Simulation for Thermal Balance Testing of Spacecraft²). See **radiometric properties and quantities**.

absorption—the process by which incident radiant energy is transformed into another form of energy by interaction with matter.

air handling unit—a device used for distributing conditioned air supply to a room, space, or area.

air mass, **AM**—the ratio of the mass of atmosphere in the actual observer-sun path to the mass that would exist if the observer was at sea level, at standard barometric pressure, and the sun was directly overhead.

NOTE 2—(Sometimes called air mass ratio.) Air mass varies with the zenith angle of the sun and the local barometric pressure, which changes with altitude. For sun zenith angle, Z , of 62° or less and local atmospheric pressure, P , where P_o is standard atmospheric pressure, $AM \approx \sec Z (P/P_o)$.

albedo—the use of the term *albedo* is discouraged in favor of the preferred term, **reflectance**.

altazimuthal mount—a supporting device that facilitates tracking of the sun and allows rotation about horizontal and vertical axes. It can be used to aim equipment such as heliostats, concentrating collectors, exposure specimens, or radiometers.

angle of incidence—the angle between a ray and the normal to the plane on which it is incident. (The plane of incidence

may be the aperture plane, the collector, or any other plane of interest.)

angle of reflection—the angle between the direction of propagation of a reflected ray and the normal to the surface at the point of reflection.

angle of refraction—the angle between the direction of propagation of a refracted ray and the normal to the interface at the point of refraction.

aperture area—see **area**, **aperture**.

apparent solar time, **apt**—the hours of the day as computed from the position of the sun using the equation of time. (See *ASHRAE Handbook of Applications*, 1982, Chapter 57.)

area, **absorber**—the total uninsulated heat transfer surface area of the absorber, including unirradiated as well as irradiated portions.

area, **aperture**—of a flat plate collector, (1) the maximum projected area of a solar collector through which the unconcentrated solar radiant energy may be admitted to the absorber. (2) *effective aperture area*—the area as defined above projected normal to the sun’s rays and corrected for any shading. Units: square metres (m^2) [square feet (ft^2)].

area, **collector panel**—the total area of the panel assembly (with its containing box, if present), projected on the aperture plane.

area, **gross aperture**—of a *concentrating collector*, the maximum projected area through which the unconcentrated solar radiant energy is admitted, including any area of the reflector or refractor shaded by the receiver and its supports, and including gaps between reflector segments within a collector module.

area, **gross collector**—the maximum area of the complete collector module, including integral mounting means, projected on the aperture plane.

area, **net aperture**—of a *concentrating collector*, the maximum projected area through which the unconcentrated solar radiant energy is admitted, excluding any area of the reflector or refractor shaded by the receiver and its supports, and excluding gaps between reflector segments within a collector module.

auxiliary energy subsystem—in solar energy applications, equipment using nonsolar energy sources to supplement or backup the output provided by a solar energy system.

beam, **radiant energy**—a collection of rays confined to a specific path.

¹ These definitions are under the jurisdiction of ASTM Committee E44 on Solar, Geothermal, and Other Alternative Energy Sources and are the direct responsibility of Subcommittee E44.09 on Photovoltaic Electric Power Conversion.

Current edition approved Feb. 27, 1987. Published April 1987. Originally published as E 772 – 80. Last previous edition E 772 – 84.

² *Annual Book of ASTM Standards*, Vol. 15.03.