3 Types of Radiation

Ksenia Knyazkina

EPW data include 3 types of solar radiation: Direct Normal Radiation, Diffuse Horizontal Radiation, and Global Horizontal Radiation.

Direct radiation is a solar radiation traveling on a straight line from the sun down to the surface of the earth. Thus, the Direct Normal Radiation is the amount of solar radiation received by a surface that is always held perpendicular to the rays that come in a straight line from the direction of the sun at its current position in the sky. These normal surfaces receive maximum amount of radiation. DNR is extremely important for example for placing solar power systems, calculating thermal gains of the building, and orientation.

Diffuse radiation, on the other hand, describes the sunlight that has been scattered by the cloud coverage, molecules, and particles in the atmosphere but still travelled down to the Earth. Diffuse Horizontal Radiation is an amount scattered radiation received by the horizontal surface. While direct radiation has a definite direction the diffuse radiation is just going any which way. And hence diffuse radiation is generally equally distributed throughout the sky, the most diffuse radiation is gathered by horizontal surfaces.

Global Horizontal Radiation is a total amount of both direct and scattered solar radiation received by the horizontal surface.

All three measures are given in Wh/m2.