

WEEK 7

Solar radiation

Solar radiation is radiant energy emitted by the sun from a nuclear fusion reaction that creates electromagnetic energy. The spectrum of solar radiation is close to that of a black body with a temperature of about 5800 K. About half of the radiation is in the visible short-wave part of the electromagnetic spectrum. The other half is mostly in the near-infrared part, with some in the ultraviolet part of the spectrum. The solar radiation we receive on the Earth is attenuated both in spectral distribution and in total irradiance because of dispersion and absorption phenomena.

The solar radiation reaching the Earth's surface can be divided into two types of solar radiation: Direct beam solar radiation and diffuse solar radiation.

As sunlight passes through the atmosphere, some of it enters the surface of the Earth direct and undisturbed - the so-called beam solar radiation. Beam solar radiation throws sharp shadows and can be focused. Another component of sunlight is the diffuse solar radiation, on its way through the atmosphere it is absorbed, scattered, or reflected by dust, water vapor, clouds, pollutants, etc. Diffuse solar radiation does not throw sharp shadows and cannot be focused.

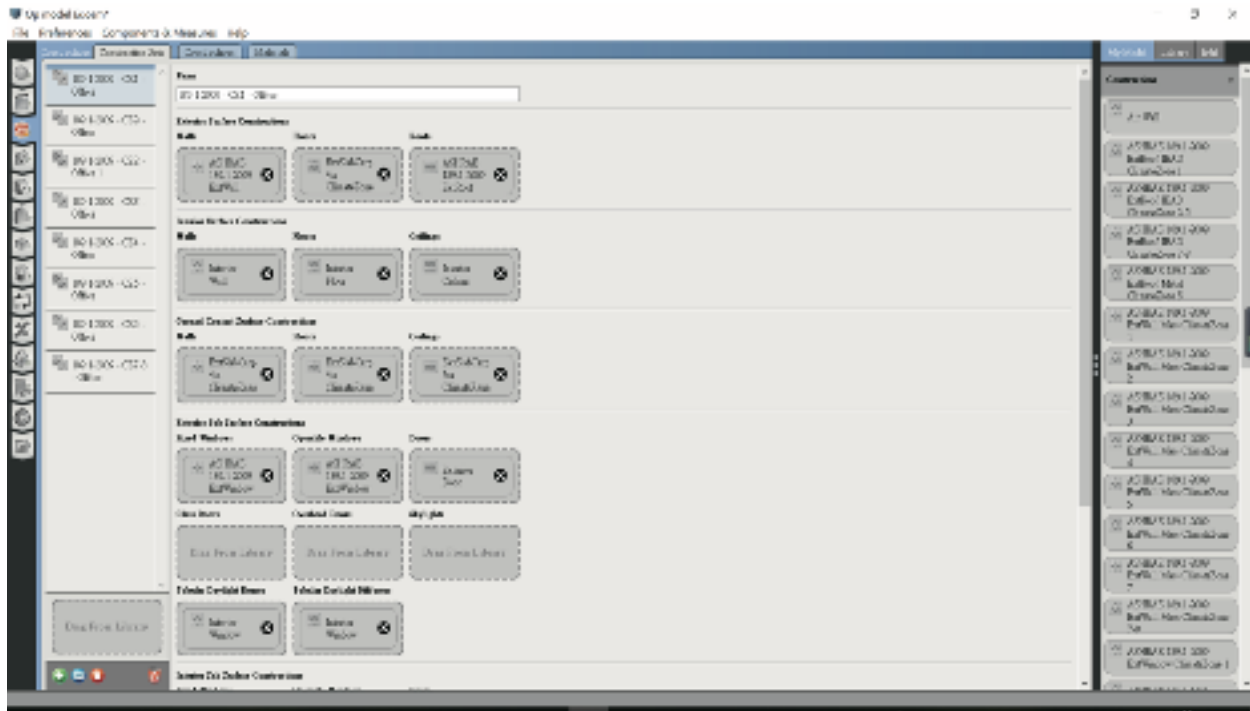
The sum of the diffuse and direct beam solar radiation is called global solar radiation.

Solar radiation absorption is due to some atmospheric components, especially ozone, water and carbon dioxide. Stratospheric ozone absorbs almost all the ultraviolet component of the solar radiation for wavelength less than 0.29 μm , water vapor has important absorption bands in the infrared field, centered at 1.0, 1.4, and 1.8 μm . Over 2.5 μm the atmosphere becomes practically opaque to solar radiation for the strong absorption due to water and carbon dioxide.

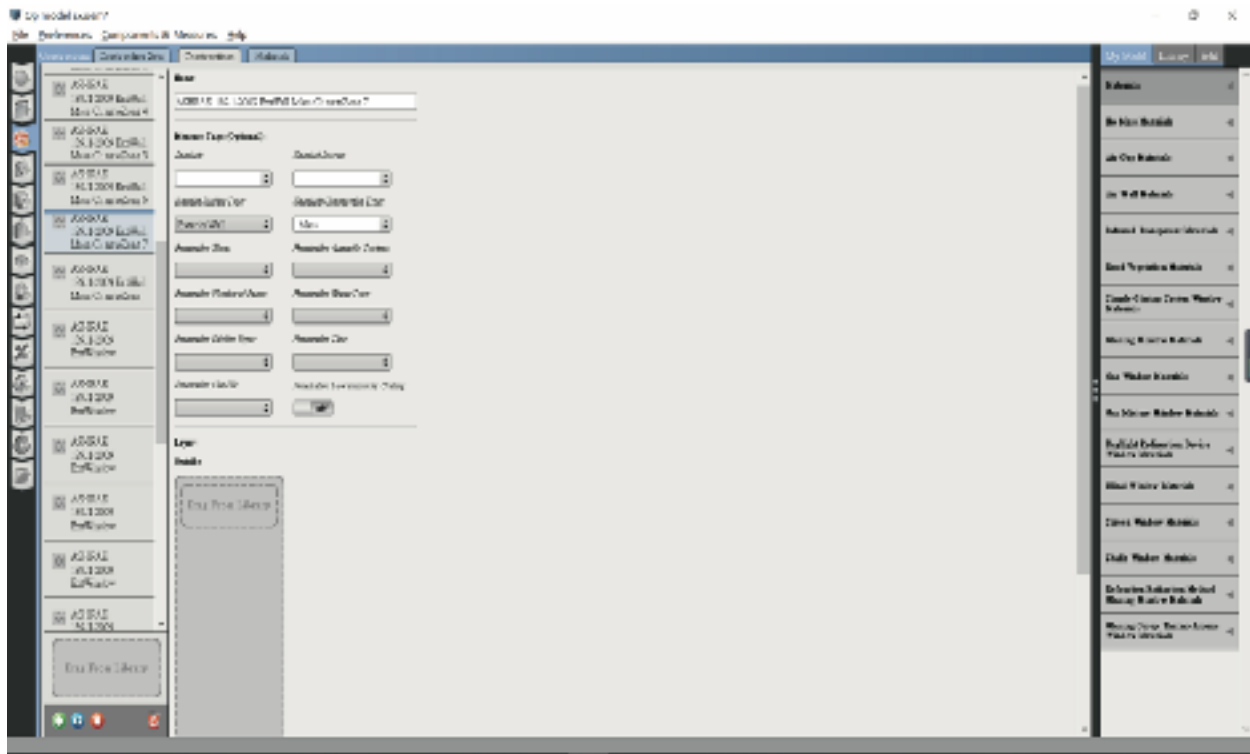
Solar radiation depends on:

1. position of the sun
2. the weather condition
3. the site altitude of the sea level
4. length of the day

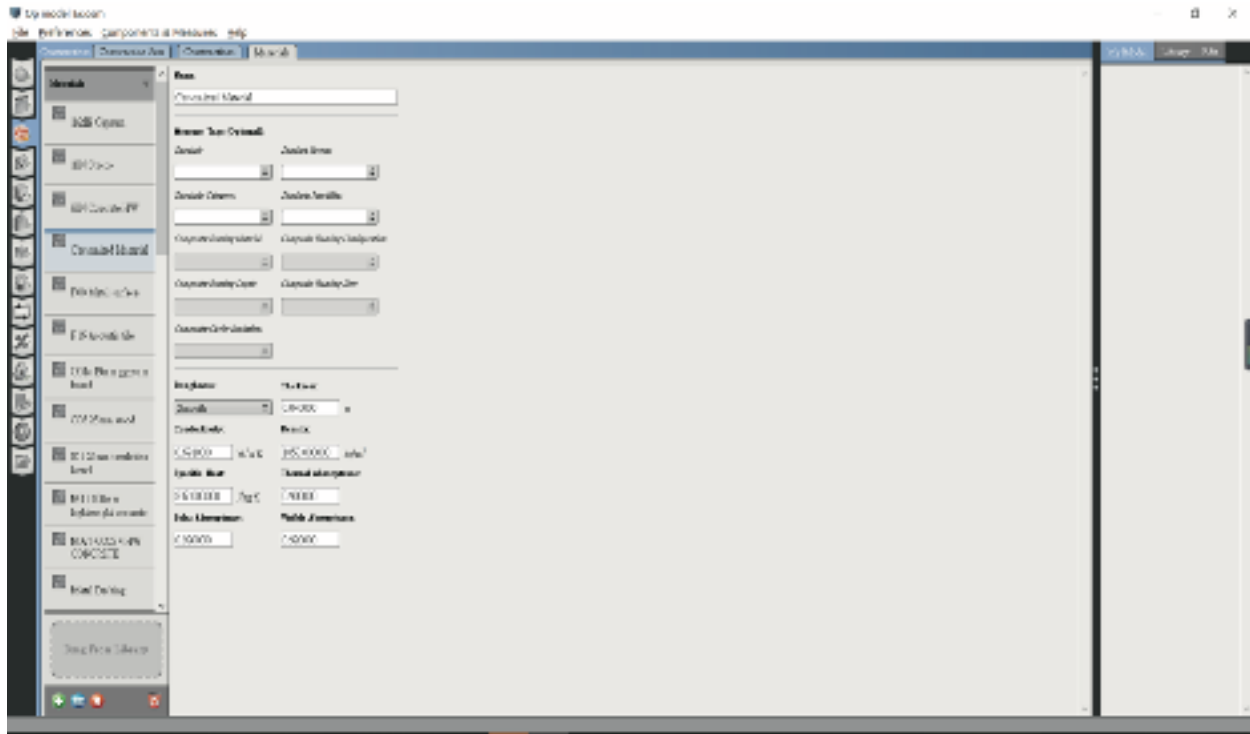
1. create the wall in construction sets, copy and change the name and factors.



2. customizing the type of the wall and choose the materials, from outside to inside.



3. go to materials tab and customizing the materials.



4. finally we put our new wall with new materials into the construction.

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