To ensure that solar cells, modules, and panels efficiently convert sunlight to electrical output, solar designers and manufacturers use solar simulators. Solar simulators can be continuous or pulsed—continuous provides steady illumination to mimic natural sunlight while pulsed simulators use a flash approach to accomplish the same thing in less time with less heat.

Solar simulators are classified as A, B, or C according to their ability to meet IEC and ASTM standards. These standards measure three essential characteristics: spectral match, spatial uniformity and temporal stability. A solar simulator meeting Class A specifications in all three categories is a Class A (sometimes called Class AAA) simulator.

Spectroradiometers from Spectral Evolution with NIST-traceable calibration like the SR-3501 and SR-1901 can provide accurate classification for spectral matching of continuous solar simulators while the SR-1901PT can provide accurate classification for pulsed simulators.