

## **Photovoltaics: Testing and Certification**

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Photovoltaic (PV) industry is growing at an explosive rate with more than 250 manufacturers around the world. To reduce the cost and to improve the quality and reliability of PV modules, the manufacturers are constantly changing the design of the modules. Over the past twenty years, the design quality of the PV modules has been significantly improved and the confidence on module reliability has been built as evidenced by the commercial warranties as long as 25 years. In order to sell the PV modules in various countries, the modules need to be tested and certified according to various national and international standards. The PV test standards could be generally classified as performance standards, qualification standards and safety standards. This presentation provides an overview on the testing and certification requirements of PV modules. This presentation will cover various aspects of testing and certification including: similarities and differences between test standards; differences between performance, qualification and safety standards; test failures; influence of ambient conditions on the module performance; and reliability issues.