

How Long Will Your Solar Inverter Last?



Many solar inverters are installed outdoors and therefore need to withstand the elements of weather.

All materials and components used, whether they be inside or outside of an inverter, should not degrade under the influence of solar radiation, heat, or moisture.

Ultimately, the solar inverter must function reliably during its expected lifetime in harsh environmental conditions.

To address the durability needs of solar inverter manufacturers and their suppliers, Atlas®, a leader in weathering testing technology, has developed a comprehensive and strategic program which includes:

- Weathering testing of materials and components
- Laboratory testing of complete inverters
- Outdoor weathering testing of complete inverters
- Real-life (outdoor) performance testing of inverters

The Solar Durability Challenge – These are the Facts

- * Many inverters are installed outdoors
- * The lifetime expectancy for inverters is similar to that of PV modules – often 20 years or more
- * Testing standards mainly cover electrical safety tests; long-term durability tests are not specified
- * There is a need for a testing strategy for the long-term environmental durability of solar inverters

The Atlas Durability Solution

1

WEATHERING TESTING

of materials and components

In accordance with ISO and ASTM international weathering standards for plastics and coatings



Materials may be tested outdoors for real-time results as well as accelerated testing utilizing laboratory accelerated weathering instruments such as an Atlas Ci5000 Weather-Ometer® or outdoor accelerated testing utilizing Atlas' EMMAQUA® / EMMA®

2

LABORATORY TESTING

of complete inverters

Single-, dual-stress, and climatic tests according to relevant IEC, EN, and UL standards



Inverters may be tested using a solar array simulator



Solicit temperature / humidity related failures while operating under a solar / thermal load

3

OUTDOOR WEATHERING TESTING

of complete inverters

In benchmark climate locations: Phoenix, Arizona, and Miami, Florida



Additional niche climates such as high altitude or coastal / corrosion are also available



Tests can be performed in outdoor locations either with or without electrical load

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REAL-LIFE (OUTDOOR) PERFORMANCE TESTING

of inverters

Energy harvest and shading studies, energy loss, energy efficiency



Side by side inverter performance comparative studies



Easy and economical to combine with solution 3

- ① Atlas® Solar Test Center in Phoenix, Arizona
- ② EMMAQUA accelerated outdoor testing
- ③ Atlas' South Florida Test Service in Miami, Florida
- ④ Laboratory weathering of materials in a Ci5000 Weather-Ometer®
- ⑤ Solar environmental chamber for full component or inverter testing



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