MAKE DATA MATTER.

PV Module Product Qualification Program (PQP)

Independent testing that drives market acceptance for manufacturers and builds buyer confidence

PQP Benefits

- **Be Recognized in Our Scorecard.** Eligible results from each PQP are included in PVEL's PV Module Reliability Scorecard. It is downloaded thousands of times by buyers around the world.
- **Obtain Data to Respond to RFPs.** Gain access to the necessary PVEL PQP reliability and performance data to easily and quickly reply to module purchasing RFPs.
- **Reach New Buyers and Markets.** PVEL shares your test reports with the global module purchasing community via our online portal (with manufacturer's approval).
- **Enhance BNEF Tier 1 Visibility.** All Bloomberg NEF Tier 1 module manufacturers participating in our PQP are differentiated with an asterisk*.

Who We Are

PVEL is the leading independent lab of the downstream solar industry. Our bankability testing and data-driven reports connect manufacturers with a global network of PV equipment buyers and investors that represent over 30 GW of annual buying power.

What are PQPs?

We launched our flagship PVEL Product Qualification Programs (PQPs) in 2012 with two goals in mind:

1. To supply PV equipment buyers and power plant investors with independent, consistent reliability and performance data to support implementation of an effective supplier management process.
2. To provide independent recognition to module manufacturers who outpace their competitors in product quality and durability.

Our PQP links module manufacturers to over 400 developers, investors and installers that use our data. From mechanical stress to backsheet durability to LeTID, our PV Module PQP addresses the industry's top reliability and performance concerns for a wide range of technologies.

We continually improve our test Program so that it addresses the evolving technology roadmaps of manufacturers, building buyer and investor confidence in PV modules so they can make informed procurement decisions. To date, we have tested over 360 Bills of Materials (BOMs) from more than 50 module manufacturers.

Factory Witness and Module Test Sequence

Every product tested in our PQP begins with a factory witness, where BOMs of the tested products are identified and each manufacturing step is thoroughly documented – from the opening of raw materials packages through every step of the production process to wrapping the completed pallet in tamper-proof tape.

Once BOMs arrive at our laboratories after factory witness, they are tested in the same way, using consistently calibrated equipment and in consistent laboratory environments. Module testing begins with intake characterization, followed by light soaking for light-induced degradation (LID), and then another round of post-light soaking characterization.

Then a series of reliability and performance testing takes place, including:

- Thermal cycling
- Damp heat
- Backsheet durability
- Mechanical stress
- Potential-induced degradation (PID)
- Light and elevated temperature induced degradation (LeTID) sensitivity
- PAN file creation
- IAM coefficient measurement
- Field exposure (grid-connected outdoor testing)

The PQP test sequences evolve annually based on feedback from PVEL's Downstream Partners, upstream manufacturers, research institutes, independent engineers and the industry's collective understanding of module failure modes and test mechanisms.

Why PQP Matters

Each test sequence in our PQP replaces assumptions about PV module performance with empirical data that can help PV module buyers optimize revenue and energy yield models. Our reports give buyers the technical due diligence insights they need to make informed procurement decisions.

PQP Reporting

A range of comprehensive reports are generated as part of the PQP, keeping participants up to date on the progress and findings of the testing. All PQP reports can be made available on PVEL's online portal when approved by the manufacturer.

To find out more about how to participate, contact:
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For more information about PVEL's PV Module Qualification Program, go to pvel.com/pqps

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