

Q.CELLS
YIELD SECURITY

- ✓ ANTI PID TECHNOLOGY (APT)
- ✓ HOT-SPOT PROTECT (HSP)
- ✓ TRACEABLE QUALITY (TRA.Q™)



HANWHA Q.CELLS QUALITY

QUALITY TESTED · MODULES

The safest test standard for your investment

Hanwha Q.CELLS is the first solar module manufacturer to participate in the **Quality Tested** program of the German independent certification authority VDE. Quality Tested by VDE considerably expands the well-known module tests of IEC 61215 and IEC 61730, in terms of the **approval certification**, the **quality controls** during the production process and the **frequency of the testing cycle**. Unlike any other quality program, Quality Tested by VDE ensures the continuously high safety and quality of our modules over the long term.

QUALITY TESTED MEANS

The best modules on the market with independently confirmed:

- High reliability
- Optimized durability
- Low degradation
- Continuous line monitoring.

THE ADVANTAGES FOR YOU ARE:

- **Reliable system performance** thanks to comprehensive approval certification.
- **High yields over the long run** thanks to additional safety tests.
- **Increased investment security** thanks to testing repeated quarterly.
- **Increased bankability** thanks to independent certification by an internationally recognized testing and certification authority.



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TOUGHER REQUIREMENTS TO GAIN VDE APPROVAL

- Double thermal cycling test in acc. with IEC (400 cycles)
- 1.5-fold damp heat test in acc. with IEC (1,500 hours)
- Twice the amount of tested modules per test string
- Twice the amount of junction box tests
- Additional dynamic load test following UV treatment
- Allowed performance loss after VDE testing is at most 5% (instead of 8% in acc. with IEC)

Longer testing cycles and the low acceptable performance loss threshold of 5% make Quality Tested by VDE the most comprehensive testing program for solar modules.

STRICTER QUALITY CONTROLS IN PRODUCTION

- 100% electroluminescence test following lamination
- Wet leakage test on 1% of all modules
- Daily test of grounding behavior
- Daily reverse-current carrying capacity test

The additional tests protect against the risk of module damage and system failures thanks to high production consistency.

UNIQUE IN THE PV INDUSTRY: REPEATED TESTS

- Quarterly testing for the accuracy of the power data on the module via remeasurement
- Quarterly recurrence of testing cycles on 20 modules from running production
- Quarterly climatic testing on 4 modules from running production

Continuous testing guarantees the production of solar modules of the highest quality – every time and at all production sites.

Visit www.vde.com for further information on the Quality Tested program for solar modules.



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