



Rain Erosion Testing | ASTM G73-10

INVEST IN THE MOST EFFECTIVE COATING



During its lifetime, a wind turbine blade is subject to continual wear - exposed to sunlight and a constant collision with raindrops, dust particles, hailstones, insects, etc. Strong resistance to this highly corrosive exposure is crucial for the protective surface of the blade, particularly the highly exposed leading edge.

Choosing the right surface is essential to maximise lifespan, fulfill guarantees and control costs.

Superior testing

Turbines are installed in so many different environments, it is impossible to simulate all of them. One of the essential tests for the leading edge is the ASTM G73-10 whirling arm rain erosion test. This test is especially designed to reveal the durability of the protective layer on the leading edge.

Typical test procedure

PolyTech supplies GFRP profiles for rain erosion testing. The profiles are coated by the customer with leading edge protection material. The specimens are shipped to PolyTech for rain erosion testing.

The specimens are mounted in the rain erosion test setup. The specimens are accelerated up to a speed defined by the customer (typically 160 m/s at the tip). When the defined speed is reached, the nozzles simulate a droplet size of 1-2 mm and a rainfall intensity of 30-35 mm/h for an interval specified by the customer.

The test is interrupted at 30-minute intervals, or per customer instructions, to document the erosion process by acquiring images of the leading edge.

POLYTECH TEST CENTER ADVANTAGES

- ✓ Accredited according to ISO 17025
- ✓ Highly qualified staff
- ✓ Able to combine different test methods inhouse
- ✓ Able to adapt new standards
- ✓ For combined test, an individual test plan is produced

**More information on
PolyTech Test Center:
Phone +45 75 10 10 26
E-mail: info@poly-tech.dk**

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Beyond the idea



The test cycle including images and data from the test setup is compiled in a Test Report, which is sent to the customer.

The standard test parameters

- Rain (mm/h): 30-35
- Droplet size (mm): 1-2
- Temperature (C°): 20-25

The customer specified test parameters

- Velocity/tip speed
- Image interval
- Test duration

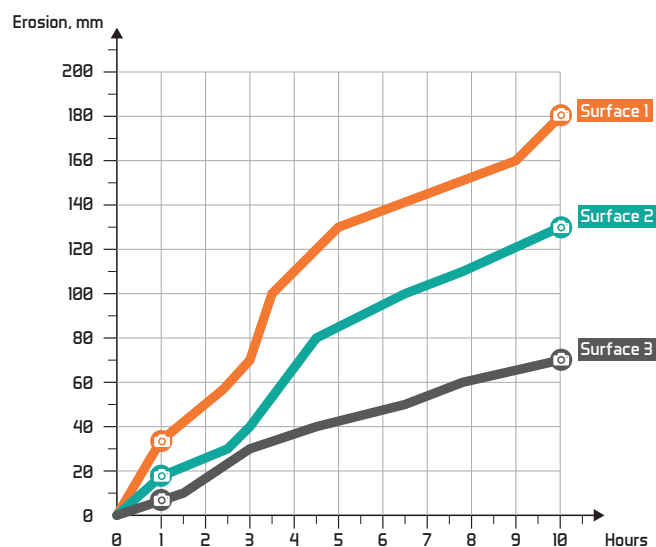
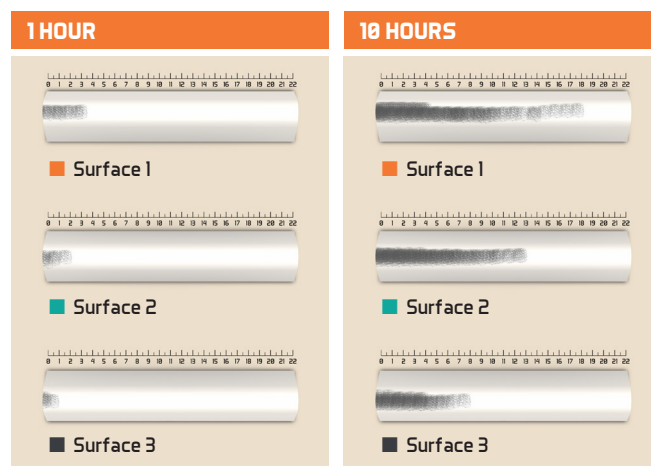
As specified by the standard, a reference test is carried out every four weeks to ensure the quality of the test.

Complies with ASTM International G73-10 test standard

PolyTech Test Center conducts tests according to the ASTM G73-10 standard, the only recognised industry standard at the moment. This test is widely accepted as the most suitable for evaluating the erosive properties of materials applied to the leading edge of wind turbine blades.

Suggested evaluation of test results

One way to evaluate the images obtained from the rain erosion test is by converting them to a graph that shows the evolution of the erosion. The images can be analyzed by measuring the erosion progress [mm] at each interval. The erosion progress is plotted as a function of testing hours. Hence, the surface with the lowest slope has the highest rain erosion resistance.



Independent third party testing



PolyTech Test Center is accredited by DANAK according to ISO 17025 and acts as an impartial third party test institute.