

UQESH Polyurethane vs Epoxy

Compiled test summary — source: UQESH internal product testing

1. VOC Content and Environmental Impact

Traditional epoxy often contains organic solvents: solvent-free variants 60–80 g/L VOC, solvent-based variants 500–600+ g/L VOC, with a noticeable odour during application. UQESH's waterborne polyurethane system uses water as the dispersion medium instead of solvents: 2–10 g/L VOC, completely odourless. The binder is based on renewable castor oil instead of petroleum-based raw materials.

2. Flexural Strength – Three-Point Bend Test

Method: the test specimen is loaded symmetrically from three points until the breaking load is measured. Result: UQESH waterborne polyurethane > 15 MPa flexural strength, high toughness, low cracking tendency. Epoxy (reference) $\approx$ 6 MPa flexural strength, poorer toughness, significantly higher cracking risk.

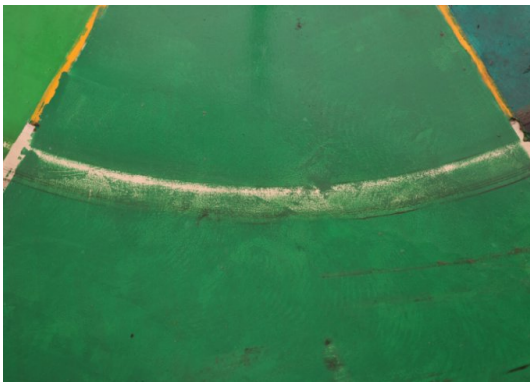
3. Resistance to Ground Moisture

UQESH's system achieves a bond strength to concrete above 2.0 MPa – higher than the concrete substrate's own strength. Typical epoxy often falls below 1.0 MPa, with failure at the interlayer boundary. The higher bond strength means the UQESH system better withstands ground moisture rising from below, without blistering or delamination.

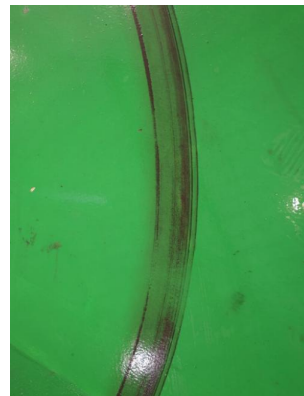
4. Wear Test Under Heavy Forklift Traffic

Test method: electric forklift, 3 tonnes total weight, one lap every 1.5 minutes, 10 hours of operation per day, 80 days – a total of 32,000 passes on each test surface.

Conclusion: the wear resistance of the two-component waterborne polyurethane system (UQESH) is significantly higher than that of epoxy.



Epoxy: clearly abraded wear track



UQESH polyurethane: minimal wear track

5. Impact Resistance – Steel Ball Drop Test

Test method: a 1 kg steel ball is dropped from a defined height onto a concrete substrate meeting the test conditions.

UQESH (PF 1.5 mm + TAP 750): 70 drops from 1 metre and 10 drops from 2 metres – without a single crack or sign of damage.

A commonly used epoxy system on the market: cracks and sustains damage after just 3 drops from 1 metre, and after only 1 drop from 2 metres.



Epoxy: cracks after 3 drops from 1 m



UQESH: 70 drops from 1 m / 10 drops from 2 m, no damage

See the full, detailed comparison with all test videos at www.uqesh.eu/polyuretangelv-vs-epoxigolv.html