

Corrosive façade cladding

Low Voltage Pinhole Detector

Case study > LD8100

Situation

For a new commercial building, the architect opted for aluminium façade cladding powder coated with an organic coating in a predetermined RAL colour.

The powder coating company carried out this assignment and the façade cladding was applied to the building by a third company.

Reason for investigation

Corrosion formed in the façade cladding relatively soon after delivery

The question

What caused corrosion on the façade cladding

The recommendation

The recommendation is to use a so-called Pinhole detector (also called a holiday detector) to determine whether cavities (craters) are present in the coating or coating system. Due to their capillary effect, these cavities act as a sort of bridge that allows moisture to penetrate under the coating layer. This can lead to corrosion. Holiday detection only works when the coating system is non-conductive and the substrate is conductive. The façade cladding in question meets this requirement.

Pinhole detectors come in high voltage and low voltage. Low-voltage pinhole detectors are preferred because these measurements are non-invasive. The condition is that the total layer thickness is less than 500 µm. The coating layer of this façade cladding meets this requirement.

For zones where moisture loads are higher than C2, the layer must be completely sealed. The completed building is located in a C2 zone. The C-zone distribution indicates the corrosion class. For buildings, this is determined by atmospheric conditions. In the Netherlands, salty sea air is the most important atmospheric load.

The device

TQC Sheen low-voltage pinhole detector

The test

The TQC Sheen low-voltage pinhole detector is used to assess whether the lacquer layer is sufficiently sealed. For this purpose, we measure the difference in electrical potential with a wet sponge at 9 Volts. Based on vibrations and/or an acoustic signal, the device indicates any defects in the coating system.

The test result

Particularly on the rounded edges, the coating layer proved to be insufficiently sealed, resulting in insufficient corrosion protection.

The solution

With the new cladding, the holiday test was carried out using the pinhole detector before the plates were fitted to the building. This ensured already during fitting on site that the coating layer of each sheet was completely watertight.

If the powder coating company is aware of the corrosion class to which the cladding will be exposed in future orders, the coating layer can be adjusted accordingly.