

The Pull-Off Adhesion Series

1. An Introduction to Pull-Off Adhesion on Coated Substrates

When a coating is applied in the wrong climatic conditions, or to a poorly prepared surface; there is a much greater chance that the coating will blister, delaminate or simply not stick to the substrate.

To test how well a coating adheres to a surface, adhesion testers are used.

There are essentially 3 coating adhesion test methods available to the coating inspector:

- cross hatch; such as the Elcometer 107 or 1542, where a cutter with 6 or 11 blades is used to cut two sets of lines at right angles - the resultant debris is removed using either adhesive tape, a brush, or compressed air, and the results determined by the use of tables;
- push off adhesion testers; such as the Elcometer 108 and 508, have a pin which goes through the centre of a dolly that has been glued to the coated substrate, and pushes it off the coating, with the force recorded - ideal for convex and concave surfaces;
- and the most commonly used method, the pull-off adhesion test, where a dolly is adhered to the coated substrate, pulled off, and the resultant force recorded.

[Elcometer Pull-Off Adhesion Testers]

Elcometer offer three different pull-off adhesion testers. The original Elcometer 106, which is a hand operated mechanical gauge. The hydraulic Elcometer 506, with a separate, low height actuator and range of skirts for thick and thin substrates. And finally the Elcometer 510, which is similar in operation to the Elcometer 506 but, rather than manually, automatically applies the increasing force at a predefined and uniform rate, storing all of the results into memory by the simple press of a button.

[The Pull-Off Adhesion Test Method]

All pull-off adhesion testers follow the same principle. A properly prepared dolly, or pull stub, is glued to the prepared coating, and, once the glue has fully cured, the dolly is pulled off - perpendicularly (or 90 degrees) from the surface. The resultant tensile pull-off force, together with the dolly diameter, and the conditions of the dolly, are all recorded.

This video is part of a series on pull-off adhesion testing. Click on any one of the titles on-screen to watch another video in the series.

For more information and training on the pull-off adhesion method, or Elcometer's range of pull-off adhesion testers, visit our website.