

## Impact Testing



### Universal Impact Testing - ASTM D2794

As coatings (such as paint, varnish, conversion coatings, and related coating products) are subjected to impact damage during their manufacturing and useful life, this test method for impact resistance has been found to be useful in predicting coating resistance to impact. ASTM D 2794 provides a procedure for rapidly deforming by impact a coating film and its substrate and for evaluating the effect of such a deformation.

The organic coatings under test are applied to four or more suitable thin metal panels. After the coatings have cured, a standard weight is dropped a distance to strike an indenter that deforms the coating and the substrate. The indentation can be either an intrusion or an extrusion. By gradually increasing the distance the weight drops, generally 1 inch (25 mm) at a time, the point at which failure usually occurs can be determined.

Films generally fail by cracking (see bottom photo), which is made more visible by the use of a magnifier, by the application of a copper sulfate ( $\text{CuSO}_4$ ) solution on steel, by the use of a pin hole detector, or by a tape pull test to determine the amount of coating removed.

Once visible cracks have been identified, the test is repeated five times at that level, as well as five times above and below that level. Of course, these confirmation tests are conducted in a random order so successive tests are not conducted at the same height or on the same panel.

Reference: ASTM D2794

Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation

(Impact) Related ASTM standards include:

ASTM D1186 - Test Methods for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base.

ASTM D609 - Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings, and Related Coating Products;

ASTM D823 - Practice for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels.

