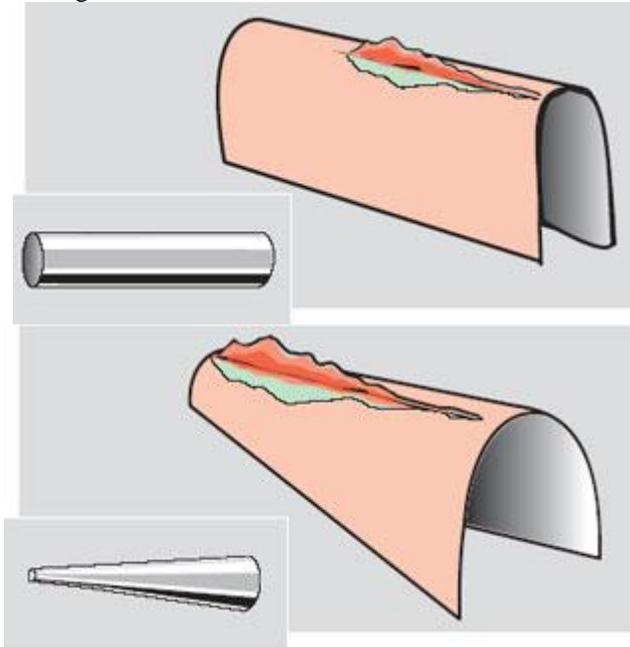


In practice, three different empirical test procedures are used to assess the resistance of coatings and allied products to cracking and/or detachment from the substrate under different conditions of deformation.

Bend Test

Bending lacquered sheet metal over a defined radius allows an indication of the elongation and adhesion of a paint film due to bending stress. The DIN EN ISO 1519 standard only permits the use of cylindrical mandrels.

The ASTM D 522 and the DIN EN ISO 6860 standards describe the test method by means of a conical or cylindrical mandrel. The use of a conical mandrel bending tester enables testing of a large variety of bending radii at the same time.



Impact Test - "Falling-weight Test"

The impact tester has gained wide acceptance in testing the impact resistance of many types of coatings and substrates.

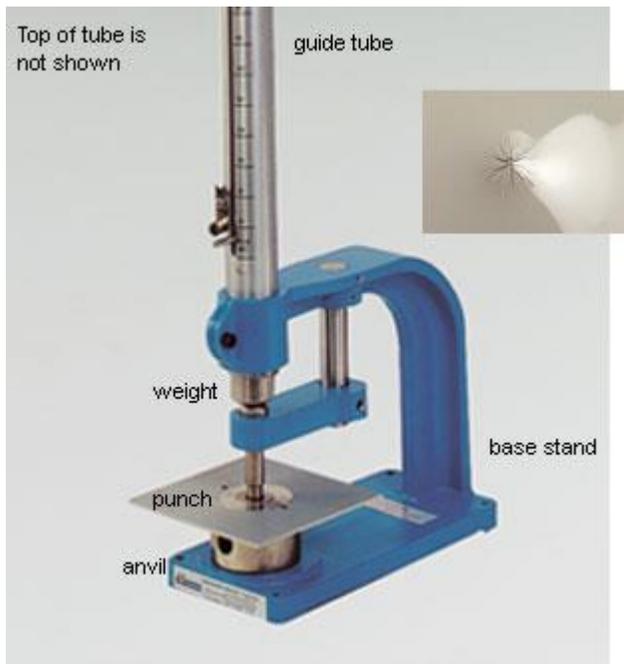
International standards describe a method for evaluating impact resistance of a coating to cracking and peeling from a substrate when it is subjected to a deformation caused by a falling weight, dropped under standard conditions yielding rapid deformation.

Impact Tester

- Consists of a solid base with a guide tube support
- The guide tube has a slot to direct a weight that slides inside the guide tube
- A collar fits on the tube that helps the user slide the weight up to the accurate height
- Graduations are marked along the slot to facilitate readings

Procedure

- Place sample under the punch
- Lift the weight to desired height on guide tube and let it drop
- View the damage of the sample visually or with low powered magnification
- Adjust the height and weight of the impacter to determine exact point of failure or establish pass/fail specifications



Cupping Test

The impact force is calculated using the following equation:

$$\text{Falling Height} \times \text{Weight} = \text{Impact Force}$$

in	lbs	in-lb
m	kg	mkg

Note: The coated or uncoated side of the panel can be tested to simulate either indentation or bulging. A die having a hardened and polished surface and a sample holder with a retaining ring are the heart of a cupping tester. The indenter that contracts the test panel is of hardened polished steel and forms a hemisphere of 8 in (20 mm) diameter. The maximum cupping depth is approx. 14 mm. The test process is observed through a microscope or magnifying glass. When evaluating the test results, it must be carefully assessed when the coating system starts cracking. More information [1](#) [2](#)

