



www.insize.com



**THD-PF34
IMPACT TESTER
OPERATION MANUAL**

PLEASE SCAN QR CODE TO
WATCH THE OPERATION
VIDEO OF PRODUCTS.



VIDEO



INTRODUCTION

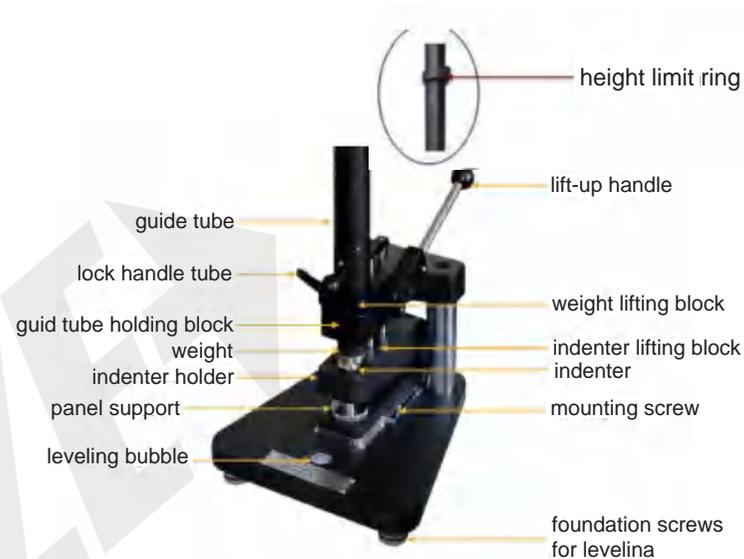
THD-PF34 is used to test the impact resistant performance when the coating such as paints, varnish and other relative coating get impact and deformed under the standard conditions.

This instrument conforms to ISO 6272-2: 2002 Paints and varnishes Rapid-deformation (impact resistance) tests--Part 2:Falling-weight test, small-area indenter, ASTM D 2794 and other relative requirements.

PRINCIPLE

The coating under test is applied to suitable thin metal panels. After the coatings have cured, a standard weight is dropped a distance so as to strike an indenter that deforms the coating and the substrate. The test can be carried out with the coated side of the panel facing upwards (i.e. towards the falling weight and indenter) or downwards (i.e. away from the weight and indenter). By gradually increasing the distance the weight drops, the point at which failure occurs can be determined. Films generally fail by cracking, which is made more visible by the use of a magnifier or, on steel, by the application of a copper sulfate solution.

DESCRIPTION



Guide tube: black alumina, of 1.2m; with notch of graduation.

Guide tube holding block: with a big hole which can hold and fix the guide tube.

Lock handle for tube: after putting the tube into the holding block, tightly lock up the tube.

Height limit ring: black nylon ring, when making test, slip it into the tube and move up and down to adjust the falling height, then fix it on the tube with the screw.

Indenter holder: pull forward the indenter holder to put the indenter and panel support to their positions.

Lift-up handle: pull forward the lift-up handle can lift up the weight and indenter to fix or change the test panel.

Weight lifting block & Indenter lifting block: controlled by the lift-up handle; used to lift up the weight and indenter.

Mounting screw: during testing, fasten the support fixing screw to fixed the position of panel support; loosen the screw when the indenter and/or panel support is needed to be changed.

Foundation screws for leveling: 3 pcs in total, for regulating the level of the impact tester.

Leveling bubble: to check whether the impact tester is level.

Ø12.7mm & Ø15.9mm Indenter: made of stainless; 2 indenters with different head diameter to meet different requirement.

Panel support A: stainless, inter radius is 16.3mm

Weight: stainless cylinder, with plastic handle, 3 in total, which is 300g, 1000g and 2lb.

Additional weight: stainless cylinder, there's screw on one side, it can fix on the main hammer to increase the weight; one is 1000g and the other is 2lb.

PROCEDURE

1. Test panel

a) Substrate

The substrate shall be metal, conforming to the requirements of ISO 1514.

The panels shall be planar, free from distortion and at least 0.25 mm thick. The dimensions shall be such as to allow the test to be carried out at at least five different positions not less than 40 mm from each other and not less than 20 mm from the edge of the panel.

Measure the thickness to the nearest 0.01 mm.

b) Coatings

Prepare 4 test panels in accordance with ISO 1514 at least and then coat it by the method specified by the manufacturer of the product or system under test to give the dry-film thickness specified by the manufacturer, or coat it by a method agreed upon between the interested parties to give a dry-film thickness agreed upon between the interested parties.

c) Drying

Dry (or stove) and age (if applicable) each coated test panel for the time, and under the conditions, specified by the manufacturer of the product or system under test, or as agreed between the interested parties.

d) Thickness of coating

Determine the thickness, in micrometers, of the dried coating by one of the procedures specified in ISO 2808. Make the measurements at, or as near as possible to, the positions at which the test is to be carried out.

Use only test panels for which the film thickness values do not differ from the specified or agreed film thickness by more than 10%.

2. Installation

a) Mount the apparatus on a level firm surface, and then adjust the 3 leveling foundation screws until it is in level position.

b) Loosen the Lock handle for tube, then put the tube into the Guide tube holding block and make its guiding groove face to the leveling bubble.

Note: don't fix the tube now.

c) Choose the suitable Indenter and its relevant Panel support, pull out the Indenter holder, and put the indenter and panel support to their positions (as shown below). Push the Indenter holder to its original position, and then tighten the mounting screw.



d) Choose a suitable weight (or with the additional weight) according to different requirements and install it from the top of the tube, then install the height limit ring in the same way (the height limit ring is above the weight).

e) Pull the handle forward to lift up the indenter and put the panel on the panel support. Then push the handle backward to the original position to ensure the panel and indenter is contacting. Adjust the guide tube up and down to ensure the top of the weight handle is at the zero mark of tube (see the following picture)

After placing the test panel, the top of the weight handle is at the zero mark



f) Lock up the swing-handle to fix the tube and take out the test panel.

g) If it is necessary to change to a different punch and die holder during the test, loosen the guide locking screws, lift the main drop weight and pull the guide block outward. Then reinstall the punch and die holder according to step c.

3. Test

a) General

Before testing, condition the coated panels at a temperature of $(23 \pm 2)^{\circ}\text{C}$ and a relative humidity of $(50 \pm 5)\%$ (or at another temperature and humidity, agreed between the interested parties, from those specified in ISO 3270) for a minimum period of 16 h. Begin the test procedure as soon as possible after conditioning, but in any case complete it not later than 30 min after removal of the test panels from conditioning.

Carry out the test at $(23 \pm 2)^{\circ}\text{C}$ or at another temperature, agreed between the interested parties, from those specified in ISO 3270. State the test temperature at which the test was carried out in the test report.

Measure the relative humidity during the test and state it in the test report.

b) Classification test (to determine the minimum drop height which will cause cracking or peeling)

b.1 Adjust the height limit ring make its below edge align at the specified height where it is expected that no failure will occur.

b.2 Pull the handle forward to lift up the indenter, place the test panel on the panel support with the coated face up or down, and be sure the panel is flat against the panel support. Push the handle backward to make the indenter contact with the top surface of the panel.

b.3 Raise the weight to the height limit ring then release it so that drops on the indenter.

b.4 Remove the test panel from the apparatus and observe the impact area for cracks in the coating. If no cracks are evident, repeat the procedure at a greater height, increasing 25 mm a time. Once visible cracks and/or peeling are observed, continue as follows. Release the appropriate weight and allow it to fall on to the test panel five times at different positions from each of the following heights:

- ① the height where cracks and/or peeling were first observed;
- ② 25 mm below this height.

Note: Test in a random fashion, taking care that not all impacts from one height are made in succession on one

b.5 Choose one of the following methods to check the cracking and peeling condition of the impact areas:

- ① Use a viewing lens.
- ② Hold a white flannel-type cloth saturated with acidified copper sulfate solution (5.1) on the impacted areas for at least 15 min. Remove the cloth and examine both the test areas and the cloth for evidence of copper deposition or iron-rust staining, respectively.

NOTE: The copper sulfate solution will not perform properly on zinc-phosphate-treated metal unless the conversion coating cracks.

c) Check the cracking and peeling condition with pinhole detector: connect the earth terminal with the bare substrate, then plug in the instrument.

Moisten the spongy probe with water, then put it on the impact area and slowly move, it will alarm if there's crazing or peeling.

For each height, tabulate the number of times the coating passed or failed. The height at which the results change from mainly passing to mainly failing is the impact failure end point of the test.

NOTICES

1. If the deepest depressed point deviates from the center of impact area, please contact with the manufacture to calibrate.
2. If need to change a different weight and indenter, please pull forward the handle to lift up the weight, and then loosen the mounting screws to pull out the indenter supporting block, and re-install the apparatus according to c.
3. Regularly check the surface of the hemispheroid, replace it in time if it gets deformed, rust, broken or other failures.
4. After finishing test, dismantle all the weights, indenters and panel supports, clean them and put it back to the box. Smear some preservative oil if not use it for a long time.