PosiTest® CH

Cross Hatch Adhesion Tester

Instruction Manual | Manual de instrucciones
Bedienungsanleitung | Notice d'instruction

DeFelsko®
The Measure of Quality

Introduction

The **PosiTest *CH Cross Hatch Adhesion Tester*** determines a coating's ability to resist separation from a substrate. The test is performed by cutting a lattice pattern in the coating, applying a piece of pressure-sensitive tape over the coating, and removing it swiftly to determine how much coating is removed from the surface. The test results are compared to the descriptions and pictures shown in **Classification of Adhesion Test Results** (pg. 5 and 8). Select the closest classification and record the results.

PosiTest *CH Adhesion Test Kits* can be used to test in accordance with ISO 2409/16276-2, ASTM D3359, and other international standards for cross hatch adhesion testing.

NOTE: These instructions provide brief summaries of procedures used to perform a Cross Hatch Adhesion Test. Consult and follow the applicable Standard prior to testing.

Preparation

Preparing the Test Sample:

This test is primarily performed on coated test panels, but may be performed on other coated substrates if required.

For hard panels, the minimum thickness shall be 0.25 mm (0.01"). For relatively soft panels such as wood, the minimum thickness shall be 10 mm (0.4").

The area under test should be free from blemishes and other surface imperfections. The test area should be large enough to perform 3 separate tests, with at least 5 mm (0.2 in) of space between tests and the edges of the panel.

Condition the panels immediately prior to testing at a temperature of 23 ± 2° C and a relative humidity of (50 ± 5)% for a minimum of 16 hours (Required for laboratory testing in accordance with ISO 2409).

To accurately determine the correct cutting blade, measure the sample's dry film thickness using a coating thickness gage such as the PosiTector *6000*, PosiTector *200*, or PosiTest *DFT*.

Preparing the PosiTest *CH Cross Hatch Tester*:

The cutting blade should be inspected before each use for signs of wear or damage.

If the cutting edge is damaged or dulled, a new cutting edge should be used. Each **PosiTest *CH Adhesion Tester Blade*** features 4 cutting edges, 2 on each side.

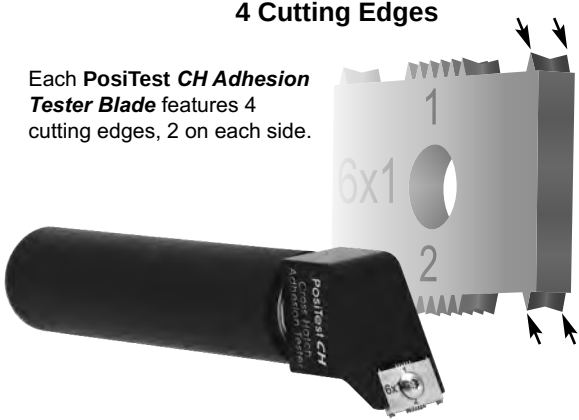
NOTE: If all 4 cutting edges have been damaged or dulled, the blade should be replaced.

To install, rotate, or replace the blade follow these steps:

1. Remove the hex screw from the tool head using the included 3/32" hex wrench.
2. To install a new blade, align the hole in the blade with the hole in the tool head. To replace a cutting edge-carefully remove the current blade and rotate or flip to another cutting edge on the same blade, or replace with a new blade.
3. Insert the hex screw through the hole in the blade and turn clockwise, using the included hex wrench, until the blade is secured.

4 Cutting Edges

Each **PosiTest *CH Adhesion Tester Blade*** features 4 cutting edges, 2 on each side.



Testing in Accordance with ISO 2409:

1. Use the table below to select the appropriate cutting tool based on the thickness of the coating to be tested.

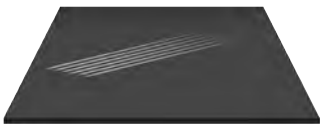
Coating Thickness		**Specified Cutting Tool** (Spacing/# of Cuts)	**PosiTest *CH Cross Hatch Adhesion Tester Kit***	**Replacement Blades**
µm	mils			
0 - 60	0 - 2.3	1 mm / 6 Teeth*	CHKITISO6X1	CHBLADE6X1
61 - 120	2.4 - 4.7	2 mm / 6 Teeth	CHKITISO6X2	CHBLADE6X2
121 - 250	4.7 - 9.8	3 mm / 6 Teeth	CHKITISO6X3	CHBLADE6X3

* For soft substrates (e.g. wood and plaster), use 2mm / 6 Teeth for coating thicknesses between 0 - 120 µm (0 - 4.7 mils)

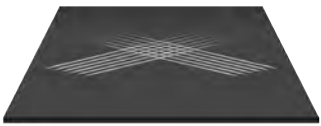
2. Inspect the tool to ensure that the cutting edge of the blade is not damaged or dulled. If the blade is not in suitable condition, follow the steps in **Preparing the PosiTest *CH*** (pg. 2).

3. With the test panel on a rigid, flat surface, place the **PosiTest *CH*** on the coated surface with the blade perpendicular to the coating, and pull the tool across the surface to create a mark or scratch significantly longer than the width of the cutting tool.

4. Repeat step 3, producing another set of cuts at a 90° angle to the first set of cuts, creating a lattice pattern on the surface.



Step 3



Step 4

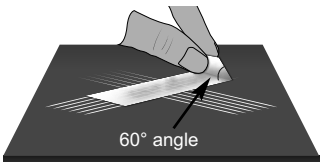
NOTE: All cuts shall mark or scratch the substrate or the test is considered invalid and should be repeated on a fresh test panel.

5. As agreed among the interested parties, use one of the following methods to remove loose paint from the lattice cut:

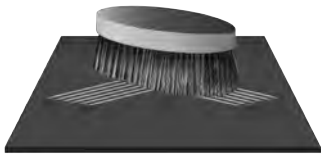
a. Apply a piece of pressure-sensitive adhesive tape over the center of the lattice cut in a direction parallel to one set of cuts, and firmly rub the tape with a fingertip or fingernail. The applied adhesive tape should fully cover the center of the lattice cut. Within 5 minutes, remove the tape by taking the free end and pulling it off the surface at a 60° angle with a smooth motion, taking 0.5 – 1 second.

Within 5 minutes, remove the tape by taking the free end and pulling it off the surface at a 60° angle with a smooth motion, taking 0.5 – 1 second.

b. Use the included brush to gently remove debris from the surface.



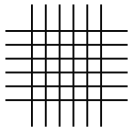
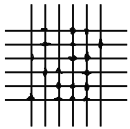
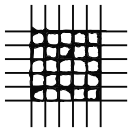
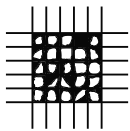
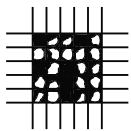
Step 5a



Step 5b

6. Visually inspect the cut area, optionally using the included 3x Magnifier, and classify the results according to the description and illustrations in ***ISO 2409 Classification of Adhesion Test Results Chart*** (pg 5).

ISO 2409
CLASSIFICATION OF ADHESION TEST RESULTS

ISO Classification	Percent Area Removed	Description	Surface of Cross-Cut Area from which Flaking has occurred for Six Parallel Cuts and Adhesion Range by %
0	0% None	The edges of the cuts are completely smooth; none of the squares of the lattice is detached.	
1	Less than 5%	Small flakes of the coating are detached at intersections; less than 5% of the area is affected.	
2	5 – 15%	Small flakes of the coating are detached along edges and at intersections of cuts. The area affected is 5 to 15% of the lattice.	
3	15 – 35%	The coating has flaked along the edges and on parts of the squares. The area affected is 15 to 35% of the lattice.	
4	35 – 65%	The coating has flaked along the edges of cuts in large ribbons and whole squares have detached. The area affected is 35 to 65% of the lattice.	
5	Greater than 65%	Flaking and detachment worse than Classification 4.	

Testing in Accordance with ASTM D3359:

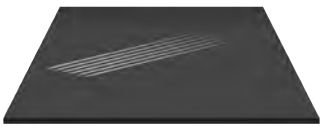
1. Use the table below to select the appropriate cutting tool based on the thickness of the coating to be tested.

Coating Thickness		**Specified Cutting Tool** (Spacing/# of Cuts)	**PosiTest *CH Cross Hatch Adhesion Tester Kit***	**Replacement Blades**
µm	mils			
0 - 50	0 - 2	1 mm / 11 Teeth	CHKITASTM11X1	CHBLADE11X1
50 - 125	2 - 5	2 mm / 6 Teeth	CHKITASTM6X2	CHBLADE6X2

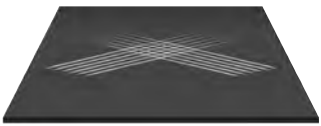
2. Inspect the tool to ensure that the cutting edge of the blade is not damaged or dulled. If the blade is not in suitable condition, follow the steps in **Preparing the PosiTest *CH*** (pg. 2).

3. With the test panel on a rigid, flat surface, place the **PosiTest *CH*** on the coated surface with the blade perpendicular to the coating, and pull the tool across the surface to create a mark or scratch approximately 20 mm (¾ in) long. After cutting, lightly brush the surface with the included brush to remove any detached flakes of coating.

4. Repeat step 3, producing another set of cuts at a 90° angle to the first set of cuts, creating a lattice pattern on the surface.



Step 3



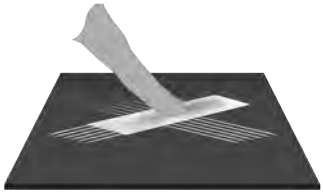
Step 4

NOTE: All cuts shall mark or scratch the substrate or the test is considered invalid and should be repeated on a fresh test panel.

5. Carefully cut a piece of pressure-sensitive tape, approximately 75 mm (3 in) long, from the roll.

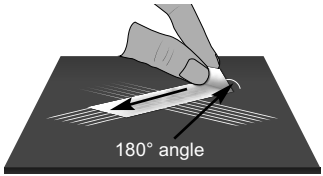
NOTE: At the beginning of each work day, remove two complete turns of tape from the roll and discard.

6. Place a piece of pressure-sensitive tape over the center of the lattice cut and smooth the tape in place by finger. Firmly rub the surface using a pressure application device, or a suitable alternative, such as a rubber eraser or rubber roller.



Step 6

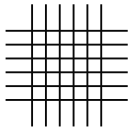
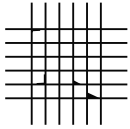
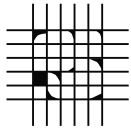
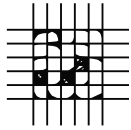
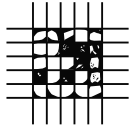
7. Remove the tape by holding the free end and quickly pulling it back over itself at a degree as close to 180° as possible. All tests should be completed within 90 +/- 30s of cutting the lattice.



Step 7

8. Visually inspect the cut area, optionally using the included 10x Magnifier, and classify according to the description and illustrations in ***ASTM D3359 Classification of Adhesion Test Results Chart*** (pg. 8).

ASTM D3359 (Method B)
CLASSIFICATION OF ADHESION TEST RESULTS

ASTM Classification	Percent Area Removed	Description	Surface of Cross-Cut Area from which Flaking has occurred for Six Parallel Cuts and Adhesion Range by %
5B	0% None	The edges of the cuts are completely smooth; none of the squares of the lattice is detached.	
4B	Less than 5%	Small flakes of the coating are detached at intersections; less than 5% of the area is affected.	
3B	5 – 15%	Small flakes of the coating are detached along edges and at intersections of cuts. The area affected is 5 to 15% of the lattice.	
2B	15 – 35%	The coating has flaked along the edges and on parts of the squares. The area affected is 15 to 35% of the lattice.	
1B	35 – 65%	The coating has flaked along the edges of cuts in large ribbons and whole squares have detached. The area affected is 35 to 65% of the lattice.	
0B	Greater than 65%	Flaking and detachment worse than Classification 1B.