

Paint Test Equipment

Digital Adhesion Tester



Adhesion

Digital Adhesion Tester



Information

ISO 4624: Paints and varnishes. Pull-off test for adhesion.

ISO 16276-1: Corrosion protection of steel structures by protective paint systems. Assessment of, and acceptance criteria for, the adhesion/cohesion (fracture strength) of a coating. Part 1: Pull-off testing.

The Adhesion Tester will measure the adhesion bond strength of applied coatings with ease and precision.

Fitted with a GE Druck DPI 104 digital pressure gauge. Models are available with an Intrinsically safe GE Druck DPI 104-IS digital pressure gauge (ATEX and IECEx approval).

The adhesion is measured by the tensile pull on a Dolly glued to the coating surface. The force is applied through the centre of the Dolly by a hydraulically loaded pin. This ensures an exactly central point-loading of the force.

Ensures effective quality control with a non-destructive capability. To allow the specification minimum to be proven, the dolly can be removed using the heated dolly remover supplied.

The Calibration Certificate with traceability to UKAS is an optional extra. The Certificate is supplied as hard copy and is available online through the Calibration Management Cloud (under Calibration) on our website.

Supplied in an industrial foam-filled Carrying Case with 5 Flat Dollies, Adhesive, Heated Dolly Remover, Dolly Cleaning Tool and Dolly Plug.

Adhesion Tester



The Right Angle version of the Adhesion Tester enables the user to test the adhesion of coatings inside pipes with a minimum diameter of 150mm (6").

Adhesion Tester Specifications

Part No	Head Type	Intrinsically safe Pressure Gauge	Operating Range MPa	Operating Range psi	Accuracy	Cal Cert Part No
X3001	Standard		0–20	0–3000	0.05%FS	NX001
X3002	Right Angle		0–20	0–3000	0.05%FS	NX001
X3003	Standard	ATEX / IECEx	0–20	0–3000	0.05%FS	NX001
X3004	Right Angle	ATEX / IECEx	0–20	0–3000	0.05%FS	NX001
XS101	Spare Flat Dolly					
XS102	Spare Turbo Fuse Adhesive					
XS103	Dolly Plug (pack of 5)					

Adhesion Tester Accessories

The Adhesion Tester can test both external and internal surfaces of pipes. Because the load reacts internally within the dolly, curved surfaces of pipes can be easily tested.

To obtain a uniform tensile load, curved dollies machined to match the diameter under test need to be used. External diameters as small as 51mm (2") and internal diameters as small as 152mm (6") can be tested.

Convex Dollies on Next Page



Adhesion Concave Dollies

Part No	Product	Pipe Size Metric	Pipe Size Imperial	Use with Model
XA201	Concave Dolly	51mm	2"	X1003 / X1004
XA202	Concave Dolly	76mm	3"	X1003 / X1004
XA203	Concave Dolly	102mm	4"	X1003 / X1004
XA204	Concave Dolly	152mm	6"	X1003 / X1004
XA205	Concave Dolly	203mm	8"	X1003 / X1004
XA206	Concave Dolly	254mm	10"	X1003 / X1004
XA207	Concave Dolly	305mm	12"	X1003 / X1004
XA208	Concave Dolly	356mm	14"	X1003 / X1004
XA209	Concave Dolly	406mm	16"	X1003 / X1004
XA210	Concave Dolly	457mm	18"	X1003 / X1004
XA211	Concave Dolly	508mm	20"	X1003 / X1004
XA212	Concave Dolly	610mm	24"	X1003 / X1004
XA213	Concave Dolly	762mm	30"	X1003 / X1004
XA214	Concave Dolly	914mm	36"	X1003 / X1004

Adhesion Tester Accessories



Adhesion Convex Dollies

Part No	Product	SPipe Size Metric	Pipe Size Imperial	Use with Model
XA215	Convex Dolly	152mm	6"	X1004
XA216	Convex Dolly	203mm	8"	X1004
XA217	Convex Dolly	254mm	10"	X1004
XA218	Convex Dolly	305mm	12"	X1004
XA219	Convex Dolly	356mm	14"	X1004
XA220	Convex Dolly	406mm	16"	X1004
XA221	Convex Dolly	457mm	18"	X1004
XA222	Convex Dolly	508mm	20"	X1003 / X1004
XA223	Convex Dolly	610mm	24"	X1003 / X1004
XA224	Convex Dolly	762mm	30"	X1003 / X1004
XA225	Convex Dolly	914mm	36"	X1003 / X1004

Adhesion Tester Operation

Safety



When using the cyanoacrylate Adhesive – ensure the work area is well ventilated, wear gloves and do not let any Adhesive come into contact with your skin.

When using the Dolly Remover – do not touch the elements or heads after switching on. Allow approximately 15 minutes for the elements and heads to cool to ambient temperature after switching off.

Information

Prior to testing, a recently applied coating shall be dried/cured in accordance with the manufacturer's recommendations.

In the absence of manufacturer's recommendations, the coating should be dried/cured for at least 10 days.

Pull-off tests are destructive test methods. Repair work will be necessary when they are used on coated structures. To avoid damage to the coated structure, test panels can be used.

The cyanoacrylate Adhesive should not be used with thermoplastic, non-convertible paint systems due to chemical reactions that could affect adhesion results. These paint systems include cellulose, vinyls, chlorinated rubbers and some acrylics. For these paint systems a two-pack epoxy adhesive should be used.



Adhesion Tester Operation

Taking Measurements

To reduce the likelihood of adhesive failure, abrade the face of the Dolly and the surface of the protective coating with fine emery paper.

Clean the surface of the Dolly and protective coating. The cleaning process should include thorough degreasing.

Check that no adhesive has been left in the dolly hole by trial fitting the Dolly Plug.

Insert the Dolly Plug into the Dolly until the tip protrudes from the surface. Apply the Adhesive thinly and evenly to the whole end surface of the Dolly in sufficient quantity to ensure a good bond to the protective coating. Ensure that no Adhesive is on the Plastic Plug.

Press the Dolly onto the surface using thumb pressure for approximately 10 seconds and then remove the Dolly Plug. Do not twist the dolly as this could introduce air bubbles. Allow the adhesive to dry for approximately 15 minutes.

If you are testing a pipe using curved Dollies, ensure that the aligning mark is lined up with the longitudinal axis of the pipe.

Connect the Adhesion Tester to the Dolly by pulling back the coupling socket, pushing the head and releasing the coupling. Ensure the Adhesion Tester is held so that the rubber hose is straight.

To pressurise the Adhesion Tester, turn the handle clockwise at a uniform rate, not greater than 1MPa/s. To decrease the pressure, turn anticlockwise at a uniform rate.

If the Adhesion Tester has been pressurised after switching on the last stored reading on the Pressure Gauge will have to be cleared before carrying out the test (refer to Pressure Gauge Operation, Maximum Reading paragraph).

To destructively test the coating, increase the pressure slowly until the Dolly pulls off.

To non-destructively test the coating, increase the pressure slowly until the specified minimum value has been reached – you can then decrease the pressure to zero and remove the head.

The Dolly can be removed by using the heated Dolly remover.

Press the Power on / Menu button on the Pressure Gauge to show the maximum pressure reading (refer to Pressure Gauge Operation, Maximum Reading paragraph).



Adhesion Tester Operation

General

Dolly Cleaning

After use, clean the Dolly with the Dolly Remover. A duration of 3–5 minutes per Dolly should normally be sufficient to degrade the adhesive, which can then be scraped off.

Ensure the work area is well ventilated.

The hole can be cleaned using the Dolly Cleaning Tool.

Care and Maintenance

Always store the Adhesion Tester with a Dolly fitted to the head. This will prevent any damage to the pin.

Do not hold the Adhesion Tester under pressure for longer than is required.

If the Adhesion Tester is not used on a regular basis, you will need to pressurise once a month to 15MPa, then immediately release the pressure. This will ensure that the seals are kept working to their maximum potential. Always pressurise with the Dolly fitted.



Adhesion Tester Operation

Pressure Gauge Operation



Button Functions

A: Power / Menu

B: Arrow Up / Arrow Down

C: Enter

Power

Switch on by pressing the Power / Menu button.

Switch off by holding the Power / Menu button until **OFF** appears on the display then press the Enter button.

The Pressure Gauge will automatically switch off after 20 minutes from switch on.

Maximum Reading

Press the Power on / Menu button to show the maximum pressure reading (the up arrow will show on the display). Press again to show the minimum pressure reading (the down arrow will show on the display).

When on minimum reading hold the Enter button to clear the stored readings.

Stored pressure readings are cleared automatically when the Pressure Gauge is switched off.

Set PSI

Hold the Power / Menu button until **L - - -** appears on the display.

Using the Up and Down Arrows enter **0** and press the Enter button. Repeat until **000** is shown on the display. After pressing the Enter button on the third number **units** will appear on the display. Select psi by pressing the Up and Down arrow buttons and enter by pressing the Enter button.

Repeat the above to reselect MPa.

Adhesion Tester Operation

Changing Battery

1: Ensure that the Pressure Gauge is switched off

2: Remove the display bezel using a screw driver to lever the bezel (see below).



3: Remove the battery clamp [item A].

5: Disconnect the battery connector [item B] and discard the used battery.

6: Attach the battery connector [item B] to the new battery.

7: Install the new battery and re-attach the battery clamp [item A].

7: Make sure that the o-ring [item C] is in place.

8: Push the display bezel back into position until it is fully engaged.



About Us

Paint Test Equipment is a global leader in the manufacture of specialist test equipment specifically for the industrial painting and coating industries for the protection of steel assets from corrosion, mainly in the oil, renewables and steel construction sectors. We have over 30 years experience and extensive knowledge in delivering practical solutions in supporting our customers with world class products for corrosion prevention.

Prevention of corrosion on steel is essential to extend the asset lifetime, optimise performance and minimise downtime for expensive maintenance work. Using Paint Test Equipment products ensures that industrial coatings are applied to the highest achievable quality standards of ISO compliance.

We supply small, medium and multinational companies with the full range of technologies and innovations in our unrivalled portfolio of products for our customers to grow their business and enhance profits through cost effective corrosion management equipment.

Paint Test Equipment is committed to providing proactive and innovative solutions to meet customer requirements for the highest quality, user friendly inspection equipment. Paint Test Equipment is the partner of choice.

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