

Paint Test Equipment

Hydraulic Adhesion Tester Data Sheet





Hydraulic Adhesion Tester

The Hydraulic Adhesion Tester is one of the most accurate and versatile adhesion testers currently available. It measures the adhesion bond strength of applied coatings with ease, and precision.

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.

Adhesion values are recorded by a pressure gauge giving a 1:1 pressure reading. This is made possible as the net surface area of the Dolly is equal to the surface area of the hydraulic piston bore. Pressure reacted by the Dolly is the same as the pressure in the bore and is transmitted directly to the pressure gauge. The maximum value achieved at pull-off is recorded by a reset needle that is easily read on the large scale of the pressure gauge.

Connection to the stainless steel Dolly is easily made with a snap-on connector. The pressure gauge is swivel-mounted allowing testing in any position. This is significant as coating breakdown invariably starts at positions that were difficult to reach during surface preparation and application.

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 25mm (1") and internal diameters as small as 150mm (6") can be tested.

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. If necessary, the Dolly can be left in place for testing during service as part of a planned maintenance programme.

Calibration Certificate with traceability to UKAS (for the Adhesion Tester) and PAT Certificate (for the Heated Dolly Remover) are an optional extra. The Certificate is supplied in a paper format and is available online through the Calibration Portal (under Browse Categories) on this website. The Calibration Portal will list all your equipment that is calibrated by Paint Test Equipment, showing the renewal dates and allowing Calibration Certificates to be viewed at any time.

Supplied in a Industrial Foam-Filled Carrying Case with 5 Flat Dollies, Adhesive and Heated Dolly Remover, Dolly Cleaning Tool and Dolly Plug.

Complies with International Standards

ISO 16276-1	ASTM D 4541
ISO 4624	NF T30-606

Hydraulic Adhesion Tester Specifications

Part No	Head Type	Operating Range PSI	Operating Range MPa	Accuracy	Cal Cert Part No	PAT Cert Part No
X1003	Standard	0-2600	0-18	±1%FSD	NX001	NXP01
X1004	Right Angle	0-2600	0-18	±1%FSD	NX001	NXP01

Hydraulic Adhesion Tester Accessories

Part No	Product	Pipe Size Metric	Pipe Size Imperial	Use with HATE Model	Information
XA201	Concave Dolly	51mm	2"	X1003 / X1004	For external pipe testing.
XA202	Concave Dolly	76mm	3"	X1003 / X1004	Select the closest sized dolly for your diameter of pipe.
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	
XA215	Convex Dolly	152mm	6"	X1004	For internal pipe testing.
XA216	Convex Dolly	203mm	8"	X1004	Select the closest sized dolly for your diameter of pipe.
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	
XS101	Flat Dolly			X1003 / X1004	For flat substrate testing.
XS102	Spare Adhesive				For bonding the Dolly to the coating.
XS103	Dolly Plug				Use in Dolly when applying Adhesive.

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.

Taking Measurements

Roughen the surface of the dolly using a fine-grade emery paper and remove any residue or dust. Check that no adhesive has been left in the dolly hole by trial fitting a plastic plug.

Clean the dolly surface and test area with a degreasant.

Insert the plastic plug into the dolly until the tip protrudes from the surface. Carefully apply a thin coat of adhesive to the surface of the dolly (try not to get any adhesive on the plastic plug).

Press the dolly onto the surface using thumb pressure for approximately 10 seconds and then remove the plastic plug. If you are testing a pipe using curved dollies, ensure that the aligning mark is lined up with the longitudinal axis of the pipe. Do not twist the dolly as this could introduce air bubbles. Allow the adhesive to dry for approximately 15 minutes.

Connect the HATE to the dolly by pulling back the snap-on ring, pushing the head and releasing the snap-on ring. Ensure the HATE is held so that the rubber hose is straight.

To pressurise the HATE, turn the handle clockwise. To decrease the pressure, turn anticlockwise. Set the red needle to zero before pressurising.

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. The pressure is recorded from the red needle.

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 we suggest that a two-pack epoxy adhesive should be used.

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 drill bit.

Care

Always store the HATE with a dolly fitted to the head. This will prevent any damage to the pin.

Do not hold the HATE under pressure for longer than is Required.

Routine Maintenance

If the HATE is not used on a regular basis, you will need to pressurise once a month to 2500psi, then immediately release the pressure. This will ensure that the seals are kept working to their maximum potential.

Always pressurise with the dolly fitted.

CE

About us

Paint Test Equipment are manufacturers of a comprehensive range of specialist instruments for the Industrial Coatings and Finishings Industries and have been supplying instruments to customers worldwide for over 25 years.

During this time Paint Test Equipment have established a reputation for manufacturing quality instruments to the highest specification, to meet the demanding requirements of the Industrial Painting Industry.

Recalibration

Paint Test Equipment can service and recalibrate all applicable products that we supply.

We recommend that the equipment is returned on a 12-monthly basis to Paint Test Equipment for service and recalibration.

Calibration Certificates will have traceability to UKAS or BAM. The Certificate is supplied in a paper format and is available online through the Calibration Portal (under Browse Categories) on our website. The Calibration Portal will list all your equipment that is calibrated by Paint Test Equipment, showing the renewal dates and allowing Calibration Certificates to be viewed at any time.

www.paint-test-equipment.com

Paint Test Equipment

3 & 4 The Courtyard
Greenfield Farm Estate
Congleton, Cheshire
CW12 4TR, England
Tel: +44 (0) 1260 275614
Fax: +44 (0) 1260 299231
E-mail: sales@paint-test-equipment.co.uk

Distributor