

Paint Test Equipment

Catalogue 2020



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Paint Test Equipment

Coating Thickness Meter



Coating Thickness

Coating Thickness Meter



Information

The Paint Test Equipment Coating Thickness Meter will measure all coatings on metallic substrates using the magnetic induction or eddy-current principles, ensuring the correct coating thickness has been applied.

One of the most advanced portable Coating Thickness Meters on the market, incorporating all the following user functions.

Calibration. Calibrate on any blasted profile or any shape of substrate using the Calibration Foils supplied.

Calibration Memories. The calibration settings for different substrates and shapes can be stored and recalled when required.

Statistics. shows Mean, Number of Readings, Max/Min, Coefficient of Variation and Standard Deviation.

Limits. Pass and fail with audible and visual alarm.

Metric/Imperial. Select measurement units.

Batching. Measurements can be stored into batches which incorporate batch number, job number, and date and time. You can also go back to previous batches and look at the statistics and add or cancel readings.

Download. Measurements, statistics and out-of-limit readings can be downloaded to a computer either by batch number or job number into Microsoft Word or Excel.

Coating Thickness Meter

PC Download Cable

The optional PC Download Cable (CA101) enables the stored batches in the Coating Thickness Meter to be downloaded to a computer directly into Microsoft Word and Excel.

The connection is made to the download socket on the Coating Thickness Meter and the USB port on the computer.



ISO Standards

ISO 2808: Paints and varnishes. Determination of film thickness.

ISO 19840: Corrosion protection of steel structures by protective paint systems. Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces.

ISO 2360: Non-conductive coatings on non-magnetic electrically conductive basis materials. Measurement of coating thickness. Amplitude-sensitive eddy-current method.

ISO 1461: Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods.

ISO 2063: Thermal spraying. Metallic and other inorganic coatings. Zinc, aluminium and their alloys.

Coating Thickness Meter

Specification

Accuracy: ± 1 to 3%.

Resolution 0–1000 μ m/0–2000 μ m: 1 μ m (0.1mil).

Resolution 0–5.00mm: 0.01mm (0.1mil).

Resolution 0–20.0mm: 0.1mm (0.1mil).

Supply

Supplied in an industrial foam-filled Carrying Case with Probes, set of 8 Calibration Foils and Zero Disks.

The PC Download Cable shown below is available as an optional extra.

The Calibration Certificates with traceability to UKAS are an optional extra.

Ordering Information

C5001	Coating Thickness Meter. Inc CS301 Ferrous Probe 0–1000 μ m
C5002	Coating Thickness Meter. Inc CS302 Ferrous Probe 0–2000 μ m & 0–5.00mm
C5003	Coating Thickness Meter. Inc CS303 Ferrous Probe 1–20.0mm
C5004	Coating Thickness Meter. Inc CS304 Non-Ferrous Probe 0–1000 μ m
C5005	Coating Thickness Meter. Inc CS305 Non-Ferrous Probe 0–2000 μ m
C5006	Coating Thickness Meter. Inc CS301 Ferrous Probe & CS304 Non-Ferrous Probe 0–1000 μ m
C5007	Coating Thickness Meter. Inc CS302 F Probe 0–2000 μ m/0–5.00mm & CS304 N Probe 0–2000 μ m
NC101	Ferrous Probe Calibration Certificate
NC102	Non-Ferrous Probe Calibration Certificate
NC002	Calibration Foils Calibration Certificate
CA101	PC Download Cable

Coating Thickness Meter

Paint Inspection Kit

The Coating Thickness Meter is also supplied in the Paint Inspection Kit. The Paint Inspection Kit contains all the equipment for the testing of blast-cleaned steel and coating inspection using the following equipment.

Testex Tape / Testex Gauge. Surface Profile measurement of blast-cleaned steel.

Bresle Test. Measurement of salts on blast-cleaned steel.

Dust Test. Assessment of the quantity and size of dust particles on blast-cleaned steel.

Dewpoint Meter. Testing for condensation on blast-cleaned steel.

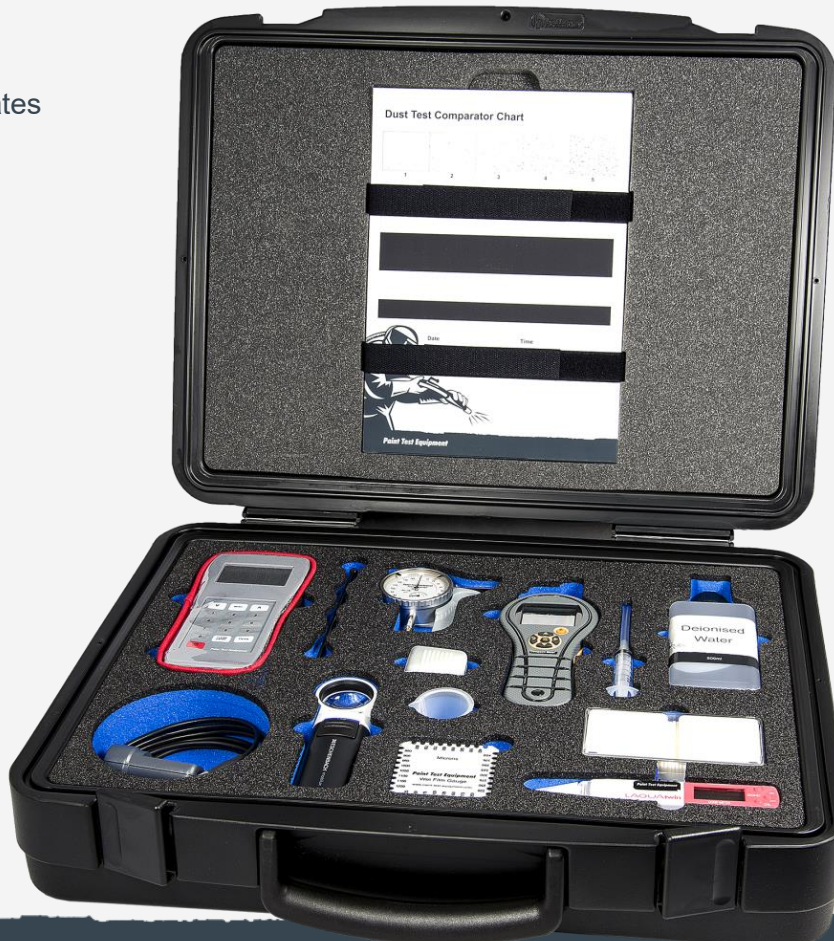
Wet Film Gauge. Wet film thickness measurement of the coating.

Coating Thickness Meter. Dry film thickness measurement of the coating.

Ordering Information

K3001 Paint Inspection Kit

NK002 Paint Inspection Kit Calibration Certificates



Coating Thickness Meter

Ferrous Probes

CS301
0–1000 μ m



Probe Diameter: 9mm (360mils).
Working Headroom: 75mm (3").
Minimum Convex Radius: 4mm (160mils).
Minimum Concave Radius: 25mm (1").
Minimum Sample Area: 4mm (160mils).

CS302
0–2000 μ m &
0–5.00mm



Probe Diameter: 15mm (600mils).
Working Headroom: 75mm (3").
Minimum Convex Radius: 10mm (400mils).
Minimum Concave Radius: 50mm (2").
Minimum Sample Area: 10mm (400mils).

CS303
1–20.0mm



Probe Diameter: 50mm (2").
Working Headroom: 150mm (6").
Minimum Convex Radius: 100mm (4").
Minimum Concave Radius: 500mm (20").
Minimum Sample Area: 100mm (4").

CA201
0–1000 μ m



Probe Diameter: 9mm (360mils).
Working Headroom: 40mm (1.5").
Minimum Convex Radius: 4mm (160mils).
Minimum Concave Radius: 25mm (1").
Minimum Sample Area: 4mm (160mils).

Coating Thickness Meter

Ferrous Probes

Ferrous Probes for use with the Coating Thickness Meter.

Ferrous Probes measure all non-ferromagnetic coatings on steel and iron.

Example: Paint on steel, galvanising on steel, metal spray on steel and chrome on steel etc.

Specification

Accuracy: ± 1 to 3%

Resolution CS301: 1 μ m (0.1mil).

Resolution CS302: 0.01mm (0.1mil).

Resolution CS303: 0.1mm (0.1mil).

The Calibration Certificate with traceability to UKAS is an optional extra.

Ordering Information

CS301	Spare Ferrous Probe 0–1000 μ m (to fit C5001 & C5006 Thickness Coating Meters)
CS302	Spare Ferrous Probe 0–2000 μ m & 0–5.00mm (to fit C5002, C5007 Coating Thickness Meters)
CS303	Spare Ferrous Probe 1–20.0mm (to fit C5003 Coating Thickness Meter)
CA201	Ferrous Probe Right Angle 0–1000 μ m (to fit C5001 & C5006 Coating Thickness Meters)
NC101	Ferrous Probe Calibration Certificate



Coating Thickness Meter

Non-Ferrous Probes

CS304
0–1000 μ m



Probe Diameter: 10mm (400mils).
Working Headroom: 75mm (3").
Minimum Convex Radius: 5mm (200mils).
Minimum Concave Radius: 25mm (1").
Minimum Sample Area: 5mm (200mils).

CS305
0–2000 μ m



Probe Diameter: 10mm (400mils).
Working Headroom: 75mm (3").
Minimum Convex Radius: 5mm (200mils).
Minimum Concave Radius: 25mm (1").
Minimum Sample Area: 5mm (200mils).

CA202
0–1000 μ m



Probe Diameter: 10mm (400mils).
Working Headroom: 40mm (1.5").
Minimum Convex Radius: 5mm (200mils).
Minimum Concave Radius: 25mm (1").
Minimum Sample Area: 5mm (200mils).

Coating Thickness Meter

Non-Ferrous Probes

Non-Ferrous Probes for use with the Coating Thickness Meter.

Non-Ferrous Probes will measure all non-conductive, non-ferromagnetic coatings on conductive non-ferrous substrates.

Example: Paint on aluminium, paint on stainless steel and anodising on aluminium etc.

Specification

Accuracy: ± 1 to 3%.

Resolution CS304, CS305 & CA202: $1\mu\text{m}$ (0.1mil).

The Calibration Certificate with traceability to UKAS is an optional extra.

Ordering Information

CS304	Spare Non-Ferrous Probe 0–1000 μm (to fit C5004 & C5006 Coating Thickness Meters)
CS305	Spare Non-Ferrous Probe 0–2000 μm (to fit C5005 & C5007 Coating Thickness Meters)
CA202	Non-Ferrous Probe Right Angle 0–1000 μm (to fit C5004 & C5006 Coating Thickness Meters)
NC102	Non-Ferrous Probe Calibration Certificate



Coating Thickness Meter

Calibration Foils

Calibration Foils for calibrating Coating Thickness Meters.

Each individual Calibration Foil is measured in the centre and the value is printed on the attached label.

All values shown are nominal values.

Foil Accuracy: $\pm 2\%$.

Supply

Supplied in packs of eight in a protective Wallet.

The Calibration Certificate with traceability to UKAS is an optional extra.

Ordering Information

F2001	Spare Calibration Foils 0–1000 μm (25, 50, 75, 125, 175, 250, 500, 750 μm)
F2002	Spare Calibration Foils 0–40mils (1, 2, 3, 5, 7, 10, 20, 30mils)
F2003	Spare Calibration Foils 0–2000 μm (50, 250, 500, 750, 1000, 1250, 1500, 2000 μm)
F2004	Spare Calibration Foils 0–80mils (2, 10, 20, 30, 40, 50, 60, 80mils)
F2005	Spare Calibration Foils 0–5.00mm (50, 250, 500, 750, 1000, 1500, 2000, 3000 μm)
F2006	Spare Calibration Foils 0–200mils (2, 10, 20, 30, 40, 60, 80, 120mils)
F2007	Spare Calibration Foils 1–20.0mm (5, 9.5, 15mm)
F2008	Spare Calibration Foils 1–800mils (200, 360, 600mils)
FV001	Calibration Foils Special Range. Select 8 values from the following: 12, 25, 37, 50, 63, 75, 100, 125, 150, 175, 190, 200, 225, 250, 275, 300, 350, 375, 500, 625, 750, 1000, 1250, 1500, 2000, 3000 μm (also available in mils on request)
NC002	Calibration Foils Calibration Certificate



Coating Thickness Meter

Zero Disk

Ferrous and Non-Ferrous Zero Disks for use with the Calibration Foils when calibrating a Coating Thickness Meter.

The Ferrous Zero Disk is used for calibrating the Ferrous Probes and the Non-Ferrous Zero Disk is used for calibrating Non-Ferrous Probes.

Ordering Information

Z1003	Spare Zero Disk Ferrous
Z1004	Spare Zero Disk Non-Ferrous
Z1005	Spare Zero Plate Ferrous (1–20mm Coating Thickness Meter)



Operation

General

Switch On/Off

To switch the Coating Thickness Meter on, press the on/off keypad for approximately 1 second. The display will show the last reading taken.

The Coating Thickness Meter will automatically switch off after approximately 5 minutes if no readings have been taken.

The instrument can also be switched off by pressing the on/off keypad again.

Connecting Probe

With the Coating Thickness Meter switched off, plug the Probe into the connector located on the bottom of the instrument. Take care to align the red dots before pushing the plug in.

On combined Ferrous and Non-Ferrous instruments the display will show Setting up Probe when the Probes are changed.

On the Non-Ferrous Probe the display will ask you to place the Probe on the Non-Ferrous Zero Disk. Hold the Probe on the Zero Disk until Zero Detected is shown.

When changing Ferrous and Non-Ferrous Probes the display will ask you to enter a job number. This will enable the readings taken with the last Probe to be stored. If you do not require the readings to be stored, press Enter.

Continued next page



Operation

General Continued

Taking Readings

Ensure that the correct Probe for the substrate is selected. If you have a combined Ferrous and Non-Ferrous Coating Thickness Meter, the display will show if a Ferrous or Non-Ferrous Probe is connected.

Place the Probe onto the surface to be measured – there will be a double beep and the reading will be displayed. This reading will be retained on the display until replaced by the next reading.

Replacing Batteries

When the batteries require replacement, Low Battery will flash on the display and the instrument will switch off.

With the instrument switched off remove the cover located on the rear of the instrument, replace the batteries with two alkaline AAA batteries, ensuring correct polarity.



Operation

Menu

All functions are accessed through a menu-driven display. To scroll through the menus use the up and down arrows and enter where indicated.

To exit from the menu, press the Menu button again and the Coating Thickness Meter will revert back to normal measurement mode.



Operation

Calibration

Calibration of the Coating Thickness Meter can be checked at any time by using the Calibration Foils and Zero Disks supplied.

Zero and Calibration

This function will work from Factory Calibration (standard calibration) or Operator Calibration (special calibration).

For the highest accuracy of measurement, the instrument has a variable calibration facility, enabling precise measurements to be obtained on virtually all substrate types.

The zero is carried out by placing the Probe onto an uncoated substrate or Zero Disk – this will set the zero value.

The calibration is carried out by placing a Calibration Foil on the same uncoated substrate or Zero Disk (select the Calibration Foil value to be just above the coating thickness value to be measured). Place the Probe on this Calibration Foil and enter the Foil value into the instrument.

When Calibrating the C5003 1–20.0mm Coating Thickness meter add a 0 when entering the Calibration Foil value when under 9.9mm. Example using a 5.0mm Foil you enter 05.0.

Factory Calibration

When selected this will reset the Coating Thickness Meter to a standard calibration.

If you are using a combined Ferrous and Non-Ferrous instrument, the calibration is only reset to the Probe fitted.

Calibration Foils are not required for this calibration.

Calibrations stored in Calibration Memories are not affected. Limits, if selected, will be cleared.



Operation

Calibration Continued

Operator Calibration

This calibration enables the operator to access a special calibration curve that has been set up under Control in the menu. This will assist in overcoming inaccuracies due to slight probe wear.

When selected, the operator can still use the other functions under Calibration.

Factory Calibration will revert the instrument back to the standard calibration.

Profile

This facility enables a special zero calibration that will assist in calibration on blast-cleaned surfaces and will also enable a top coat to be measured in a multiple-coating application – for example, if a coating of 25 microns has another coating of 50 microns applied then the profile feature will allow the operator to zero the Coating Thickness Meter on the 25 micron coat, and the instrument will measure the top coat only.

To use this facility, the operator must first select Factory Calibration.

Calibration Memories

For specific calibrations that have to be retained on a temporary basis the Coating Thickness Meter has nine calibration memories which will retain any special calibrations.

These can be recalled when required – for example, the current calibration can be stored under Calibration Memory 1, then the calibration can be changed for another job and saved under Calibration Memory 2. Then if required the first stored calibration can be recalled from Calibration Memory 1.



Operation

Clear Memory

Clears the Coating Thickness Meter memory of all batches and stored readings. Does not affect calibration values and Calibration Memories.



Operation

Statistics

At any time the appropriate statistics can be displayed on the lower line of the display. The statistics will be automatically updated when additional readings are taken.

Mean

Average of all readings.

Number Readings

Number of readings taken.

Standard Deviation

Standard Deviation of readings taken.

Coefficient of Variation

Coefficient of Variation of readings taken (SDV/ Mean)*100.

Maximum Reading

Maximum reading.

Minimum Reading

Minimum reading.

Statistics Off

Removes the displayed Statistics.



Operation

Batching

Multiple batches can be stored to a maximum of 10,000 readings.

Batch Store

Readings taken can be stored in a batch and a job number allocated (up to 6 digits). Multiple batches can be stored with a maximum of 100 readings per batch. The 100th reading taken will automatically enter into a batch and you will be asked to enter the job number.

Batch Recall

Previous batches stored can be recalled either by batch number or by job number, so that further readings can be added, statistics viewed or job number changed.

Auto Batch

A batch quantity can be allocated and the Coating Thickness Meter will automatically enter the batch and you will be asked to enter the job number when this quantity of readings has been taken (the maximum batch limit is 99 readings).

Batching On/Off

Always ensure that batching is on if you need to store readings. When you do not need to store readings switch the batching off. This will enable you to take readings above 100 without automatically being stored into a batch.

When changing Probes on combined Ferrous and Non-Ferrous instruments with batching on, your readings will automatically be entered into a batch and you will be asked to enter the job number.



Operation

Computer Download

This enables the stored batches to be downloaded to a computer directly into Microsoft Word and Excel.

Connection is made using the optional USB PC Download Cable to the download socket on the Coating Thickness Meter and the USB port on the computer. Ensure the Coating Thickness Meter is switched off when connecting the cable.

Switch the Coating Thickness Meter on and USB Connected will show on the display. Locate the PteMeter storage device on the computer and view the files.



Operation

Control

Check Bat Life

Battery Life can be accessed to check the percentage of battery life available. Low Battery will appear on the display when the batteries require replacement.

To replace, remove the cover located on the rear of the instrument. Replace with 2 alkaline AAA batteries, ensuring correct polarity.

All readings and calibrations stored in the memory will not be affected by the battery change.

Set Limits

Limits can be set to establish a high and also a low pass/fail threshold.

For out-of-limit readings an error display will be shown and the alarm will be sounded. The error amount will be shown as a percentage, which is the difference between the set high or low limit and the particular reading.

To remove Limits press Clear Entry instead of Entering numbers when setting limits.

Set Date/Time

The date and time can be set. This will be recorded with every batch stored, and appear on all batches downloaded.

Continued next page



Operation

Control Continued

Operator Calibration Set

Enables the operator to create a special calibration curve by entering 8 Calibration Foil values. This will assist in overcoming inaccuracies in the calibration due to slight probe wear.

The zero is carried out by placing the probe onto the Zero Disk – this will set the zero. The values of the 8 Calibration Foils can then be entered by placing the lowest value Calibration Foil onto the Zero Disk, place the Probe on this Calibration Foil and enter the Foil value into the instrument. Then enter the other Calibration Foils in order of value. The instrument will revert to normal measurement mode when the last Foil value has been entered.

Once set up, the calibration curve can be accessed through Operator Calibration under Calibration in the menu.

Engineers Mode

This function is for Paint Test Equipment use only.

Micron/Thou

Enables the instrument to operate either in metric or imperial measurements.

Install Name

The Coating Thickness Meter can be personalised with your company, department or operator's name. This will appear on every download and on the display when the instrument is switched on.

By entering the following Ascii codes the name can be entered:

A-65, B-66, C-67, D-68, E-69, F-70, G-71, H-72, I-73, J-74, K-75, L-76, M-77, N-78, O-79, P-80, Q-81, R-82, S-83, T-84, U-85, V-86, W-87, X-88, Y-89, Z-90.

a-97, b-98, c-99, d-100, e-101, f-102, g-103, h-104, i-105, j-106, k-107, l-108, m-109, n-110, o-111, p-112, q-113, r-114, s-115, t-116, u-117, v-118, w-119, x-120, y-121, z-122.

Space character is 32.

When Enter is pressed without a character input, then the display will exit to normal measurement mode.

Select Probe

This function is only available on instruments with the ferrous range of 0–2000µm/0–5mm. On other models this function will not be shown.

This gives the operator the option of selecting either a 0 to 2000µm measurement range with a display resolution of 1 micron, or a 0 to 5.00mm measurement range with a display resolution of 0.01mm.

Probe Speed

Select a fast or slow reading speed when the Probe is placed on the surface.

Paint Test Equipment

Wet Film Gauge



Wet Film Thickness

Wet Film Gauge



Information

ISO 2808: Paints and varnishes. Determination of film thickness.

The Wet Film Gauge ensures the quality control of the paint thickness while the coating is still wet. Applying too much coating can be expensive.

Very useful on non-metallic substrates where the coating can only be measured destructively when dry.

The Wet Film Gauge is machined in a solvent resistant plastic and can either be kept as a record for the wet film thickness taken or cleaned in solvents and reused.

The wide measurement range and high resolution of measurement ensures the gauge caters for all of the wet film measurements the user requires.

The plastic disposable Wet Film Gauges are supplied in quantities of 200 and give the industrial painter a quick and efficient test of the wet film thickness.

Manufactured in plastic, this disposable Wet Film Gauge has been designed for one-off use only, saving time on cleaning the teeth after use. They can also be left to dry and be kept as a permanent record of the paint thickness.



Wet Film Gauge

Specification

Material W4001 & W4002: Traffolyte.

Material W2008: Plastic.

Number of teeth W4001 & W4002: 32.

Number of teeth W2008: 18.

Supply

W4001 & W4002 supplied in packs of 5.

W2008 supplied in packs of 200.

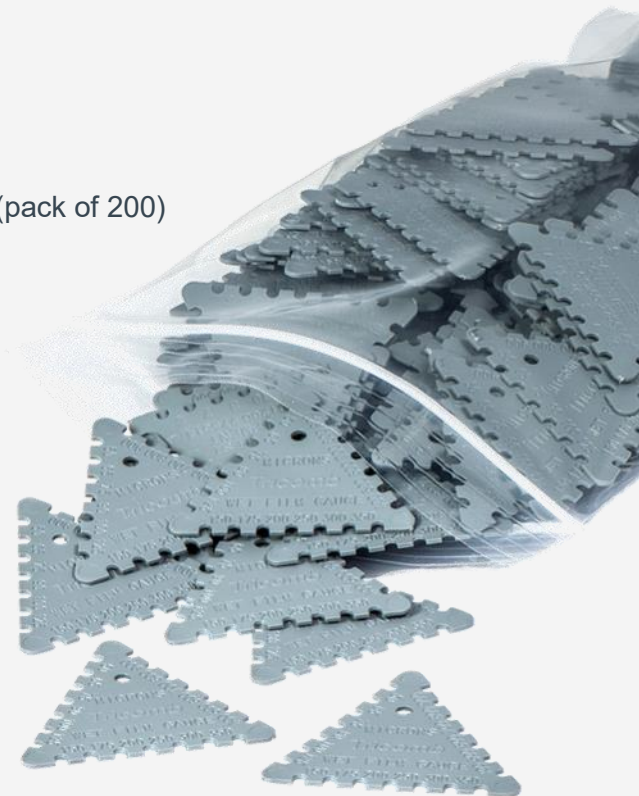
Ordering Information

W4001 Wet Film Gauge 25–1200 μ m (pack of 5)

W4002 Wet Film Gauge 50–2400 μ m (pack of 5)

NWC01 Wet Film Gauge Conformance Certificate

W2008 Tricomb Plastic Wet Film Gauge 50–900 μ m/2–36mils (pack of 200)



Wet Film Gauge

Paint Inspection Kit

The Wet Film Gauge is also supplied in the Paint Inspection Kit. The Paint Inspection Kit contains all the equipment for the testing of blast-cleaned steel and coating inspection using the following equipment.

Testex Tape / Testex Gauge. Surface Profile measurement of blast-cleaned steel.

Bresle Test. Measurement of salts on blast-cleaned steel.

Dust Test. Assessment of the quantity and size of dust particles on blast-cleaned steel.

Dewpoint Meter. Testing for condensation on blast-cleaned steel.

Wet Film Gauge. Wet film thickness measurement of the coating.

Coating Thickness Meter. Dry film thickness measurement of the coating.

Ordering Information

K3001 Paint Inspection Kit

NK002 Paint Inspection Kit Calibration Certificates



Operation

Testing

Wet film thickness measurement should be taken as soon as possible after the coating application.

Press the Wet Film Gauge onto the coated flat surface so it touches the substrate and the teeth are normal to the plane of the surface. Allow sufficient time for the coating to wet the teeth before removing the Gauge.

If the surface is curved in a single plane, the Wet film Gauge should be placed parallel to the axis of the curvature.

The coating thickness can now be observed by looking at the base of the teeth. The greatest gap reading of the tooth wetted by the coating is the wet film thickness.

The Wet Film Gauges can be cleaned with solvents. Ensure all of the coating is removed from the teeth.

Plastic Wet Film Gauges are designed for one-off use and are not suitable for cleaning with solvents.

Teeth Ranges

W4001 Wet Film Gauge

25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300, 325, 350, 375, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050, 1100, 1150, 1200µm.

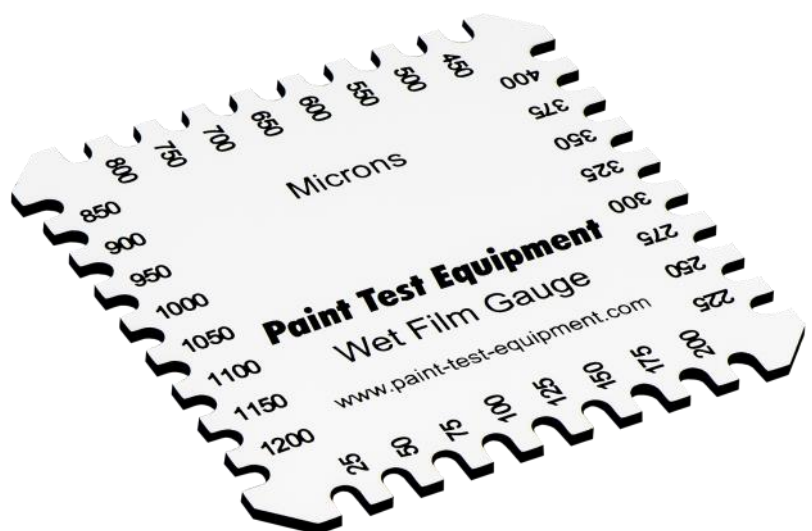
W4002 Wet Film Gauge

50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2100, 2200, 2300, 2400µm.

W2008 Plastic

50, 65, 75, 90, 100, 125, 150, 175, 200, 250, 300, 350, 400, 500, 600, 700, 800, 900µm.

2, 2.5, 3, 3.5, 4, 5, 6, 7, 8, 10, 12, 14, 16, 20, 24, 28, 32, 36mils.



Paint Test Equipment

Paint Inspection Kit



Inspection Kit

Paint Inspection Kit



Information

The Paint Inspection Kit contains all the essential equipment needed for the testing of blast-cleaned steel and coating inspection using the following equipment.

Testex Tape / Testex Gauge (ISO 8503-5).
Surface Profile measurement of blast-cleaned steel.

Bresle Test (ISO 8502-6, ISO 8502-9).
Measurement of salts on blast-cleaned steel.

Dust Test (ISO 8502-3). Assessment of the quantity and size of dust particles on blast-cleaned steel.

Dewpoint Meter (ISO 8502-4). Testing for condensation on blast-cleaned steel.

Wet Film Gauge (ISO 2808). Wet film thickness measurement of the coating.

Coating Thickness Meter (ISO 2808, ISO 19840).
Dry film thickness measurement of the coating.

Paint Inspection Kit

Supply

Testex Tape X Coarse (50 impression roll), Testex Gauge and Burnishing Tool.

Bresle Patches (pack of 35), Conductivity Meter, 500ml Deionised Water, 5ml Syringe with Needle, Calibration Solution (14ml), Conditioning Solution (14ml) and 25ml Beaker.

Dust Test Tape (60m roll), Dust Test Charts (pack of 50) and X10 Illuminated Magnifier.

Dewpoint Meter, Humidity Sensor and Surface Temperature Probe.

Wet Film Gauge (pack of 5).

Coating Thickness Meter (C5001), Ferrous Probe, set of 8 Calibration Foils and Zero Disk.

Calibration Certificates with traceability to UKAS are an optional extra.

Ordering Information

- K3001 Paint Inspection Kit
- NK002 Paint Inspection Kit Calibration Certificates



Paint Test Equipment

Holiday Detector



Porosity

Holiday Detector



Information

ISO 29601: Paints and varnishes. Corrosion protection by protective paint systems. Assessment of porosity in a dry film.

ISO 2746: Vitreous and porcelain enamels. Enamelled articles for service under highly corrosive conditions. High voltage test.

The Holiday Detector is a DC voltage Holiday Detector for detecting pinholes and flaws in insulated coatings on conductive substrates.

Where coatings have to provide an effective safeguard against corrosion, it is essential that any pinholes or flaws that will eventually lead to corrosion are detected at the earliest possible stage, preferably immediately after the coating application.

The test voltage is of high impedance, enabling safe testing, and does not damage or cause burn marks to the coating.

The Holiday Detector is a compact and lightweight instrument, which can easily be carried by the operator with the supplied Carry Bag.

Holiday Detector

Specification

Accuracy: $\pm 1\%$.

Resolution S4001: 0.01kV.

Resolution S4002 & S4003: 0.1kV.

Voltage Type: DC.

Supply

Supplied in an industrial foam-filled Carrying Case with High Voltage Probe, Band Brush, 10m Earth Cable and Carry Bag.

Calibration Certificate with traceability to UKAS is an optional extra.

Ordering Information

S4001	DC Holiday Detector 0.5–6Kv (maximum test thickness 1100 μ m) Inc High Voltage Handle
S4002	DC Holiday Detector 1–20Kv (maximum test thickness 3700 μ m) Inc High Voltage Handle
S4003	DC Holiday Detector 1–30Kv (maximum test thickness 8000 μ m) Inc High Voltage Handle
NS001	DC Holiday Detector Calibration Certificate
SS003	Spare Earth Cable 10m
SS001	Spare Band Brush
SS002	Spare High Voltage Handle



Holiday Detector

Broad Brushes

Brass-filled Brushes for the testing of coatings on large flat areas using the Holiday Detector.

All Broad Brushes come complete with the connector assembly.

Ordering Information

- | | |
|-------|-------------------------|
| SA502 | Broad Brush 200mm (8") |
| SA503 | Broad Brush 500mm (20") |



Holiday Detector

Circular Brushes

Brass-filled Circular Brushes for the testing of coatings on the internal diameter of pipes using the Holiday Detector.

All Brushes come complete with the connector assembly.

Ordering Information

SA302	Circular Brush & Assembly 2" (51mm)
SA303	Circular Brush & Assembly 3" (76mm)
SA304	Circular Brush & Assembly 4" (102mm)
SA306	Circular Brush & Assembly 6" (152mm)
SA308	Circular Brush & Assembly 8" (203mm)
SA310	Circular Brush & Assembly 10" (254mm)
SA312	Circular Brush & Assembly 12" (305mm)



Holiday Detector

Rolling Springs

Phosphor Bronze Rolling Springs for the testing of coatings on the external diameter of pipes using the Holiday Detector.

All Rolling Springs require the SA490 Rolling Spring Connector. One Rolling Spring Connector can be used on multiple Rolling Springs.

Ordering Information

SA404	Rolling Spring 4" (102mm)
SA406	Rolling Spring 6" (152mm)
SA408	Rolling Spring 8" (203mm)
SA410	Rolling Spring 10" (254mm)
SA412	Rolling Spring 12" (305mm)
SA414	Rolling Spring 14" (356mm)
SA416	Rolling Spring 16" (406mm)
SA418	Rolling Spring 18" (457mm)
SA420	Rolling Spring 20" (508mm)
SA424	Rolling Spring 24" (610mm)
SA430	Rolling Spring 30" (762mm)
SA436	Rolling Spring 36" (914mm)
SA442	Rolling Spring 42" (1067mm)
SA448	Rolling Spring 48" (1219mm)
SA490	Rolling Spring Connector



Holiday Detector

Extension Rods

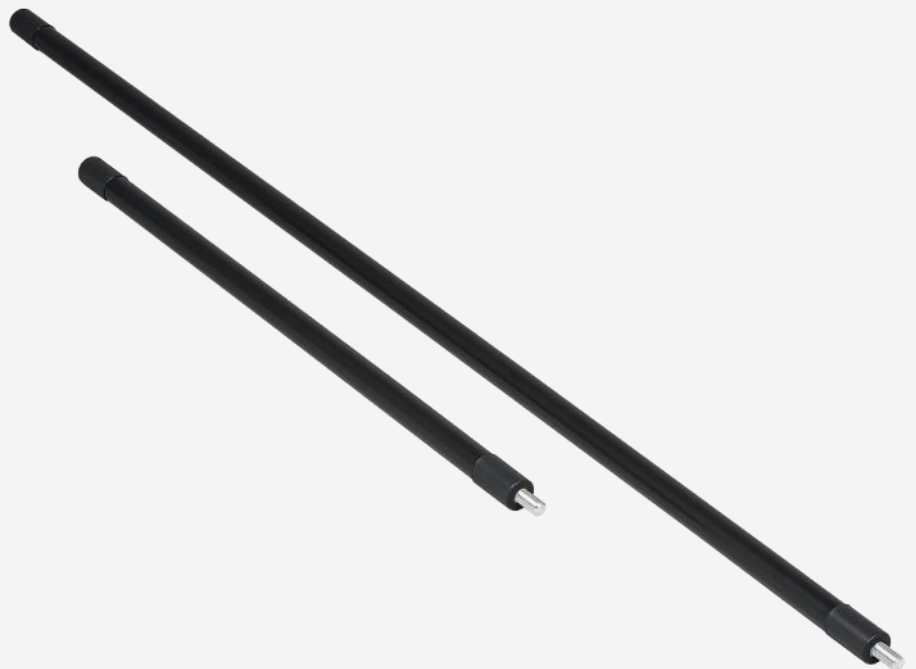
Insulated Extension Rods for extending the reach of the Brushes and Rolling Springs using the Holiday Detector.

Extension Rods can be connected together to make longer lengths when using Circular Brushes down long pipes.

Ordering Information

SA002 Extension Rod 500mm (20")

SA003 Extension Rod 1000mm (40")



Operation

Testing

If the coating has been applied recently, it should be cured in accordance with the manufacturer's instructions before testing. In the absence of manufacturer's instructions the coating should be cured for at least 10 days.

The surface of the coating should be free of oil, dirt and other contaminants before testing.

The Holiday Detector must be switched off and the multiturn voltage control turned fully anticlockwise.

Connect the plugs on the High Voltage Handle and Earth Cable to the colour coded sockets on the front and back of the instrument.

Switch the Holiday Detector on to switch position A. The green fault indicator will illuminate and there will be a low reading on the display. Press the switch on the High Voltage Handle and turn the multiturn voltage control on the instrument in a clockwise direction until the required test voltage is displayed.

The test voltage should be set in accordance with the coating manufacturer's instructions.

In the absence of manufacturer's instructions the test voltage table shows the test voltage required for the testing of the coating thickness in compliance with ISO 29601.

The Holiday Detector can be used on coatings above 300 microns in compliance with ISO 29601. The 0.5 to 6kV Holiday Detector (S4001) can be used on coatings above 100 microns.



Operation

Testing

For the majority of testing, switch position A is sufficient. However, for difficult-to-see flaws it may be necessary to select a continuous test voltage where the spark can be seen more easily, jumping across the flawed area. This can be achieved by selecting switch position B, which gives a continuous test voltage when the High Voltage Handle is pressed and will sound the alarm every time a spark occurs. The red flashing fault indicator illuminates and remains on until the High Voltage Handle switch is pressed again.

To reset the instrument, re-press the High Voltage Handle switch. This restores the test voltage so that testing can resume.

Always ensure that the High Voltage Probe is kept away from the instrument.

With the High Voltage Handle switch pressed on, place the Brush or Rolling Spring on the coating to be tested and move over the full area of the coating. If a flaw is detected a spark will jump across from the Brush or Rolling Spring through the flaw in the coating to the metal substrate, the alarm will sound, the red flashing fault indicator will illuminate and the test voltage will drop to zero.



Operation

General

Replacing Batteries

When the batteries require replacement, the red Lo Bat indicator will illuminate.

With the instrument switched off pull out the 2 drawers located on the rear of the instrument, replace with 2 lithium PP3 batteries, ensuring correct polarity.

Safety



Safety precautions must be strictly followed whilst using the Holiday Detector.

The Holiday Detector must be operated by responsible and trained personnel, who are in good health and do not suffer from any cardiac conditions.

The Holiday Detector must not be used in any area which could have a combustible or flammable atmosphere, as the test voltage can cause a spark and an explosion could occur.

The work under test must be located in a clearly defined area, with unauthorised personnel prohibited.

All items under test must have a secure connection to earth or ground.

Operation

Test Voltage Calculator

Coating Thickness	Test Voltage	Suitable Detector	Coating Thickness	Test Voltage	Suitable Detector
Up to 500µm	2.3kV	S4001/S4002/S4003	2800µm–2900µm	16.0kV	S4002/S4003
500µm–600µm	2.9kV	S4001/S4002/S4003	2900µm–3000µm	16.5kV	S4002/S4003
600µm–700µm	3.5kV	S4001/S4002/S4003	3000µm–3100µm	17.0kV	S4002/S4003
700µm–800µm	4.0kV	S4001/S4002/S4003	3100µm–3200µm	17.5kV	S4002/S4003
800µm–900µm	4.5kV	S4001/S4002/S4003	3200µm–3300µm	18.0kV	S4002/S4003
900µm–1000µm	5.0kV	S4001/S4002/S4003	3300µm–3400µm	18.5kV	S4002/S4003
1000µm–1100µm	5.5kV	S4001/S4002/S4003	3400µm–3500µm	19.0kV	S4002/S4003
1100µm–1200µm	6.5kV	S4002/S4003	3500µm–3600µm	19.5kV	S4002/S4003
1200µm–1300µm	7.0kV	S4002/S4003	3600µm–3700µm	20.0kV	S4002/S4003
1300µm–1400µm	7.5kV	S4002/S4003	3700µm–3800µm	21.0kV	S4003
1400µm–1500µm	8.0kV	S4002/S4003	3800µm–3900µm	21.5kV	S4003
1500µm–1600µm	8.5kV	S4002/S4003	3900µm–4000µm	22.0kV	S4003
1600µm–1700µm	9.0kV	S4002/S4003	4000µm–4100µm	22.5kV	S4003
1700µm–1800µm	10.0kV	S4002/S4003	4100µm–4200µm	23.0kV	S4003
1800µm–1900µm	10.5kV	S4002/S4003	4200µm–4300µm	24.0kV	S4003
1900µm–2000µm	11.0kV	S4002/S4003	4300µm–4400µm	25.0kV	S4003
2000µm–2100µm	11.7kV	S4002/S4003	4400µm–4500µm	25.8kV	S4003
2100µm–2200µm	12.4kV	S4002/S4003	4500µm–4600µm	26.4kV	S4003
2200µm–2300µm	13.0kV	S4002/S4003	4600µm–4700µm	26.8kV	S4003
2300µm–2400µm	13.5kV	S4002/S4003	4700µm–4800µm	27.4kV	S4003
2400µm–2500µm	14.0kV	S4002/S4003	4800µm–4900µm	28.0kV	S4003
2500µm–2600µm	14.5kV	S4002/S4003	4900µm–5000µm	28.5kV	S4003
2600µm–2700µm	15.0kV	S4002/S4003	4900µm–5300µm	29.0kV	S4003
2700µm–2800µm	15.5kV	S4002/S4003	5300µm–8000µm	30.0kV	S4003

Paint Test Equipment

Pinhole Detector



Porosity

Pinhole Detector



Information

ISO 29601: Paints and varnishes. Corrosion protection by protective paint systems. Assessment of porosity in a dry film.

The Pinhole Detector uses the wet sponge principle to detect through-pinholes, cracks and damaged areas on non-conductive coatings on conductive substrates. These flaws would eventually lead to corrosion and premature failure of the coating.

Operation is by a wet sponge, moistened with a wetting agent, being moved over the coating. The wetting agent penetrates any pinhole and makes a conductive path through to the substrate.

The Pinhole Detector detects this conductive path and indicates that a pinhole has been detected by sounding an audible alarm and giving a visual warning by a red flashing indicator.

The Pinhole Detector has test voltages of 9 Volts, 67.5 Volts and 90 Volts, which are easily selectable.

Pinhole Detector

Specification

Accuracy: $\pm 1\%$.

Maximum test thickness 9V: 300 μm .

Maximum test thickness 67.5V & 90V: 500 μm .

Supply

Supplied in an industrial foam-filled Carrying Case with 150mm Sponge Assembly and 5m Earth Cable.

Calibration Certificate with traceability to UKAS is an optional extra.

Ordering Information

- S3002 Pinhole Detector 9V/67.5V/90V
- NS002 Pinhole Detector Calibration Certificate
- SS004 Spare Earth Cable 5m
- SS005 Spare Sponge Assembly



Operation

Testing

Wet the Sponge with water containing a wetting agent. Squeeze the Sponge so that the excess water is removed and the Sponge does not drip.

Place the Sponge on the coating to be tested and move over the full area of the coating, ensuring a wet interface is maintained between the Sponge and the surface.

If a pinhole is detected, the water will make a conductive path through the pinhole in the coating to the metal substrate, the alarm will sound and the red flashing fault indicator will illuminate. The flaw can now be marked for repair and further testing can be resumed.

To switch the Pinhole Detector off, press the mode keypad until the selectable voltages indicators are not illuminated.

If the coating has been applied recently, it should be cured in accordance with the manufacturer's instructions before testing. In the absence of manufacturer's instructions the coating should be cured for at least 10 days.

The surface of the coating should be free of oil, dirt and other contaminants before testing.

Connect the plugs on the Pinhole Detector Handle and Earth Cable to the colour-coded sockets on the base of the instrument.

Connect the Earth Cable to the base metal of the item under test. It is essential that the base metal of the item being tested is also connected to a true earth.

Switch the Pinhole Detector on and select the test voltage of 9V, 67.5V or 90V using the mode keypad. The test voltage should normally be 90V. A test voltage of 9V can be used for coatings with a mean thickness of up to 300µm.

General

Replacing Battery

When the battery requires replacement, the red Lo Bat indicator will illuminate.

With the instrument switched off remove the cover located on the rear of the instrument, replace with an alkaline PP3 battery, ensuring correct polarity.

Operation

Safety



Safety precautions must be strictly adhered to whilst using the Pinhole Detector.

The Pinhole Detector must not be used in any area which could have a combustible or flammable atmosphere, as the test voltage can cause a spark and an explosion could occur.

All items under test must have a secure connection to earth or ground.



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.

Digital Adhesion Tester

Specification

Pressure Gauge accuracy: 0.05%FS.

Intrinsically Safe Gauge classification: ATEX /
IECEX.

Supply

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

The Calibration Certificate with traceability to UKAS is an optional extra.

Ordering Information

X3001	Digital Adhesion Tester (Standard) 0–20MPa (0–3000psi)
X3002	Digital Adhesion Tester (Right angle) 0–20MPa (0–3000psi)
X3003	Digital Adhesion Tester (Standard) 0–20MPa (0–3000psi) Intrinsically Safe Gauge
X3004	Digital Adhesion Tester (Right angle) 0–20MPa (0–3000psi) Intrinsically Safe Gauge
NX001	Adhesion Tester Calibration Certificate
XS101	Spare Flat Dolly
XS102	Spare Turbo Fuse Adhesive
XS103	Spare Dolly Plug (pack of 5)



Digital Adhesion Tester

Concave Dollies

The Adhesion Tester can test external 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, Concave Dollies machined to match the diameter under test need to be used. External diameters as small as 51mm (2").

Ordering Information

XA201	Concave Dolly 2" (51mm)
XA202	Concave Dolly 3" (76mm)
XA203	Concave Dolly 4" (102mm)
XA204	Concave Dolly 6" (152mm)
XA205	Concave Dolly 8" (203mm)
XA206	Concave Dolly 10" (254mm)
XA207	Concave Dolly 12" (305mm)
XA208	Concave Dolly 14" (356mm)
XA209	Concave Dolly 16" (406mm)
XA210	Concave Dolly 18" (457mm)
XA211	Concave Dolly 20" (508mm)
XA212	Concave Dolly 24" (610mm)
XA213	Concave Dolly 30" (762mm)
XA214	Concave Dolly 36" (914mm)



Digital Adhesion Tester

Convex Dollies

The Adhesion Tester can test 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, Concave Dollies machined to match the diameter under test need to be used. Internal diameters as small as 152mm (6") can be tested.

Ordering Information

XA215	Convex Dolly 6" (152mm)
XA216	Convex Dolly 8" (203mm)
XA217	Convex Dolly 10" (254mm)
XA218	Convex Dolly 12" (305mm)
XA219	Convex Dolly 14" (356mm)
XA220	Convex Dolly 16" (406mm)
XA221	Convex Dolly 18" (457mm)
XA222	Convex Dolly 20" (508mm)
XA223	Convex Dolly 24" (610mm)
XA224	Convex Dolly 30" (762mm)
XA225	Convex Dolly 36" (914mm)



Operation

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.



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").

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).



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.

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.



Operation

Pressure Gauge Operation

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.

Button Functions

A: Power / Menu

B: Arrow Up / Arrow Down

C: Enter



Operation

Changing Battery

When the battery requires replacement, low battery indicator will show on the display.

With the Pressure Gauge switched off remove the display bezel using a screw driver to lever the bezel (see picture below).

Remove the battery clamp, replace with a PP3 alkaline battery ensuring correct polarity and re-attach the battery clamp

Make sure that the o-ring is in place and push the display bezel back into position until it is fully engaged.



Paint Test Equipment

Adhesion Tester



Adhesion

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 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.

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.

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.

Adhesion Tester

Specification

Pressure Gauge resolution: psi 20, Mpa 0.2.

Accuracy: $\pm 1\%$ FSD.

Supply

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

The Calibration Certificate with traceability to UKAS is an optional extra.

Ordering Information

- | | |
|-------|--|
| X1003 | Analogue Adhesion Tester (Standard) 0–3500psi (0–25MPa) |
| X1004 | Analogue Adhesion Tester (Right angle) 0–3500psi (0–25MPa) |
| NX001 | Adhesion Tester Calibration Certificate |
| XS101 | Spare Flat Dolly |
| XS102 | Spare Turbo Fuse Adhesive |
| XS103 | Spare Dolly Plug (pack of 5) |



Adhesion Tester

Concave Dollies

The Adhesion Tester can test external 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, Concave Dollies machined to match the diameter under test need to be used. External diameters as small as 51mm (2").

Ordering Information

XA201	Concave Dolly 2" (51mm)
XA202	Concave Dolly 3" (76mm)
XA203	Concave Dolly 4" (102mm)
XA204	Concave Dolly 6" (152mm)
XA205	Concave Dolly 8" (203mm)
XA206	Concave Dolly 10" (254mm)
XA207	Concave Dolly 12" (305mm)
XA208	Concave Dolly 14" (356mm)
XA209	Concave Dolly 16" (406mm)
XA210	Concave Dolly 18" (457mm)
XA211	Concave Dolly 20" (508mm)
XA212	Concave Dolly 24" (610mm)
XA213	Concave Dolly 30" (762mm)
XA214	Concave Dolly 36" (914mm)



Adhesion Tester

Convex Dollies

The Adhesion Tester can test 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, Concave Dollies machined to match the diameter under test need to be used. Internal diameters as small as 152mm (6") can be tested.

Ordering Information

XA215	Convex Dolly 6" (152mm)
XA216	Convex Dolly 8" (203mm)
XA217	Convex Dolly 10" (254mm)
XA218	Convex Dolly 12" (305mm)
XA219	Convex Dolly 14" (356mm)
XA220	Convex Dolly 16" (406mm)
XA221	Convex Dolly 18" (457mm)
XA222	Convex Dolly 20" (508mm)
XA223	Convex Dolly 24" (610mm)
XA224	Convex Dolly 30" (762mm)
XA225	Convex Dolly 36" (914mm)



Operation

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.



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").

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. 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.



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 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.

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.



Paint Test Equipment

Cross Hatch Cutter



Adhesion

Cross Hatch Cutter



Information

ISO 2409: Paints and varnishes. Cross-cut test.

ISO 16276-2: Corrosion protection of steel structures by protective paint systems. Assessment of, and acceptance criteria for, the adhesion/cohesion (fracture strength) of a coating. Part 2: Cross-cut testing and X-cut testing.

The Cross Hatch Cutter is a multi-blade cutting tool which enables an assessment to be made of the adhesion resistance of coatings to separation from substrates when a right-angled lattice pattern is cut into the coating and penetrates through to the substrate.

The coating thickness determines the Cutter size used.

The 1mm Cutter is suitable for coatings under 60 microns.

The 2mm Cutter is suitable for coatings over 60 microns.

Multiple coatings can be tested for the assessment of the resistance to separation of individual layers of the coating from each other.

The hardened tool steel cutting blades are precision-ground with 6 cutting sides, so that when one cutting side becomes blunt there are a further 5 cutting sides to use.

The Adhesion Test Tape has an adhesive strength of 9.5N per 25mm width and is transparent to ensure correct adhesion to the coating.

Cross Hatch Cutter

Specification

Number of cutting edges: 6.

Coating Thickness: Under 60µm (2.4mils) use 1mm Cutter, over 60µm (2.4mils) use 2mm Cutter.

Supply

Supplied in an industrial foam-filled Carrying Case with Adhesion Test Tape 25mm and a x3 Illuminated Magnifier.

Ordering Information

- | | |
|-------|--|
| X2001 | Cross Hatch Cutter 1mm (40mils) Blade. Includes Adhesion Test Tape & Magnifier |
| X2002 | Cross Hatch Cutter 2mm (80mils) Blade. Includes Adhesion Test Tape & Magnifier |
| XS001 | Spare Cutter Head 1mm (40mils) |
| XS002 | Spare Cutter Head 2mm (80mils) |
| XA001 | Spare Adhesion Test Tape 25mm (1"). 60m Roll |
| NXC01 | Cross Hatch Cutter Conformance Certificate |
| NXC03 | Adhesion Test Tape Conformance Certificate |



Operation

Cutting

Select the correct Cross Hatch Cutter for the required coating thickness.

Hold the Cross Hatch Cutter so the blade is normal to the test surface. With uniform pressure draw the cutting edge across the coating at a uniform cutting rate. All cuts should penetrate to the substrate.

Repeat this operation making further parallel cuts, crossing the original cuts at 90° so that a lattice pattern is formed.

The Cutter Head will make 8 cuts in the surface: the 2 fine cuts each side are to steady the Cutter Head, and the 6 cuts in the centre create the lattice pattern that is the test area.

Coating Removal

Brush the test area lightly several times along the diagonals of the lattice pattern with a soft brush.

At the beginning of each series of tests, remove and discard the first three turns of the Adhesion Test Tape from the roll.

Remove a piece of Tape about 75mm long. Holding the Tape only at the ends, press the freshly exposed Tape onto the lattice pattern in a direction parallel to one set of cuts and smooth into place over the lattice pattern and 20mm beyond. To ensure good contact with the coating, rub the Tape firmly with a finger. The colour of the coating seen through the tape is a useful indication of overall contact.

Within 5 minutes of applying the Tape, remove by pulling the free end steadily within 1 second at an angle as close as possible to 60°.

For powder coatings or coatings made up of more than one layer it is recommended that the Tape application and removal is carried out at least once in each direction of the lattice pattern.

The Adhesion Test Tape can be kept as a permanent record for the inspection carried out by attaching to a sheet of transparent film.

Carefully examine the cut area of the coating using the x3 Illuminated Magnifier.



Operation

Evaluation

Carefully examine the cut area of the coating using the x3 Illuminated Magnifier.

Classify the cut area according to the Classification Guide on the following page. If possible rotate the area under test so that the viewing and lighting of the test area is not confined to one direction. It can be useful to examine the Tape in a similar manner.

The Classification Guide is given as an approximate information guide only (refer to the appropriate International Standard for the precise classification).

General

Changing Cutter Head

The Cutting Head has 6 cutting edges. When one edge becomes blunt simply remove the Cutter Head by removing the retaining screw, and turn the Cutter Head around until the second new unused cutter edge is selected.

Replacement Cutter Heads are available.

Tape Shelf Life

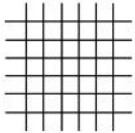
Do not expose the Adhesion Test Tape to any extremes of temperature or daylight. We would recommend that the Tape is used within a 12- month period from date of purchase.



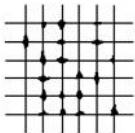
Operation

Classification Guide

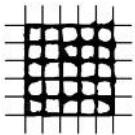
The first three steps of the Classification Guide are satisfactory for general purposes and are to be used when a general pass/fail is required.



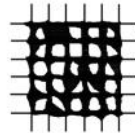
0. The edges of the cuts are completely smooth; none of the squares of the lattice is detached.



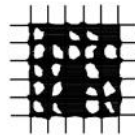
1. Detachment of small flakes of the coating at the intersections of the cuts. A cross-cut area not greater than 5% is affected.



2. The coating has flaked along the edges and at the intersections of the cuts. A cross-cut area greater than 5% but not greater than 15% is affected.



3. The coating has flaked along the edges of the cuts partly or wholly in large ribbons, and it has flaked partly or wholly on different parts of the squares. A cross-cut area greater than 15%, but not greater than 35% is affected.



4. The coating has flaked along the edges of the cuts in large ribbons and some squares have detached partly or wholly. A cross-cut area greater than 35% but not greater than 65% is affected.

5. Any greater degree of flaking that cannot even be classified by classification 4.

The first three steps of the Classification Guide are satisfactory for general purposes and are to be used when a general pass/fail is required.

Paint Test Equipment

Testex Tape



Surface Roughness

Testex Tape



Information

ISO 8503-5: Preparation of steel substrates before application of paints and related products. Surface roughness characteristics of blast-cleaned steel substrates. Part 5: Replica tape method for the determination of the surface profile.

A unique replica technique and a snap gauge enable accurate, blast-cleaned surface profile measurements. Testex Tape makes surface replicas easy to obtain and produces average maximum peak-to-valley readings that ensure optimum blasting effectiveness. Replicas can be retained for future needs.

The Testex Gauge is used to measure the Testex Tape replica and determine the average maximum peak-to-valley height of the blasted profile.

Testex Tape

Specification

Testex Gauge accuracy: $\pm 1\%$ FSD.

Supply

The Testex Gauge is supplied in an industrial foam-filled Carrying Case with Testex Tape X Coarse, Testex Tape Coarse and a Burnishing Tool.

The Testex Gauge Calibration Certificate with traceability to UKAS is an optional extra.

Ordering Information

R1001	Testex Tape Coarse (50 impressions) 20–64 μ m (0.8–2.5mils)
R1002	Testex Tape X Coarse (50 impressions) 40–115 μ m (1.5–4.5mils)
R1004	Testex Gauge. Includes Testex TapeS Coarse & X Coarse
NR001	Testex Gauge Calibration Certificate
NRC02	Testex Tape Conformance Certificate
RS001	Spare Burnishing Tools (pack of 10)



Testex Tape

Paint Inspection Kit

The Testex Tape and Testex Gauge are also supplied in the Paint Inspection Kit. The Paint Inspection Kit contains all the equipment for the testing of blast-cleaned steel and coating inspection using the following equipment.

Testex Tape / Testex Gauge. Surface Profile measurement of blast-cleaned steel.

Bresle Test. Measurement of salts on blast-cleaned steel.

Dust Test. Assessment of the quantity and size of dust particles on blast-cleaned steel.

Dewpoint Meter. Testing for condensation on blast-cleaned steel.

Wet Film Gauge. Wet film thickness measurement of the coating.

Coating Thickness Meter. Dry film thickness measurement of the coating.

Ordering Information

K3001 Paint Inspection Kit

NK002 Paint Inspection Kit Calibration Certificates



Operation

Principle

The replica film in the Testex Tape consists of a layer of crushable plastic microfilm coated onto a polyester substrate of a highly uniform thickness 50µm (2mil). When compressed against a hard surface, the Microfoam collapses to about 25% of its original thickness.

During compression the foam acquires an impression of the surface against which it is burnished. The highest peaks on the test surface displace the fully compressed foam and come to rest against the polyester substrate. The deepest valleys on the test surface create the highest peaks on the replica.

This method measures an average maximum peak-to-valley profile. The anvils of the Testex Gauge flatten the replica profile slightly so that the reading equates to an average maximum value (this is not the same as mathematical average).

Testex Gauge measurements of Testex Tape give Rz results, which is the average maximum peak-to-valley height of the profile. This is the form of measurement most commonly used by the painting and coating industries.

In some applications, Ra results are used, which are the arithmetic average roughness.

In most cases Rz has a value approximately 4 times Ra for a given surface.



Operation

Taking Measurements

Locate a representative area of the surface for measurement and select the appropriate grade of Testex Tape based on your target profile (Coarse or X Coarse). For 20 to 64µm (0.8 to 2.5mil) profiles use Coarse grade. For 38 to 115µm (1.5 to 4.5mil) profiles use X Coarse grade.

Prepare the Testex Gauge by cleaning the anvils and adjusting the dial to read zero on the red scale, the red scale is the thickness of the polyester substrate. The red scale automatically subtracts the thickness of the polyester substrate from all subsequent readings. Always ensure rust paper is placed between the anvils when the Testex Gauge is not in use.

Remove a single piece of Testex Tape from its release paper. The replica material is the square, white plastic film in the centre. A bulls eye circle of paper should remain behind on the release paper (this is not used in the measurement).

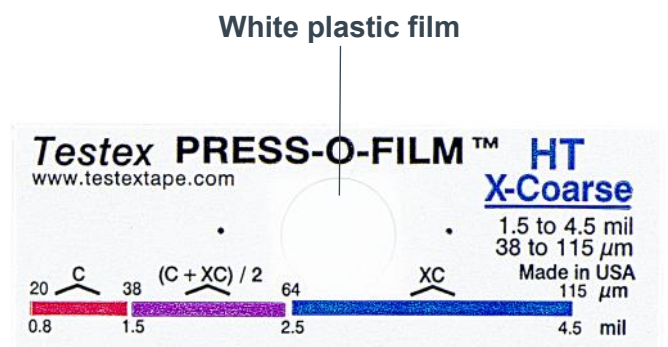
Apply the Testex Tape to the blast-cleaned surface and rub the Burnishing Tool over the replica film in the centre of the tape, using firm pressure. The circular cut-out will become darker as the surface is replicated. Make sure that the entire circular area has darkened uniformly.

Remove the Testex Tape from the surface and place the replica between the anvils of the Testex Gauge, making sure that it is centred properly. Release the Testex Gauge anvil gently onto the replica and measure the profile. The gauge reading is the average maximum peak-to-valley height of the blast-cleaned surface.

Testex Tape is able to produce accurate replicas on surface temperatures of -10 to +65°C.

If a measurement with either Coarse or X Coarse grade is between 38 to 64µm (1.5 to 2.5mil) take a second reading with the other grade of tape and average the reading.

A graphic illustrating the ranges over which averaging should and should not be applied appears on each piece of tape.



Operation

General

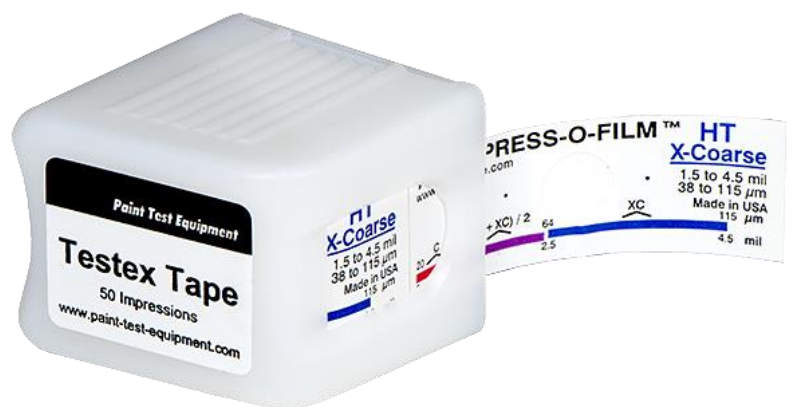
Sources of Error

One source of error is the presence of particles of dirt on either the replica or the Testex Gauge. Reasonable care should be taken to keep the Gauge anvils free of dirt.

Another is a poor burnishing technique, including incomplete compression of the test film.

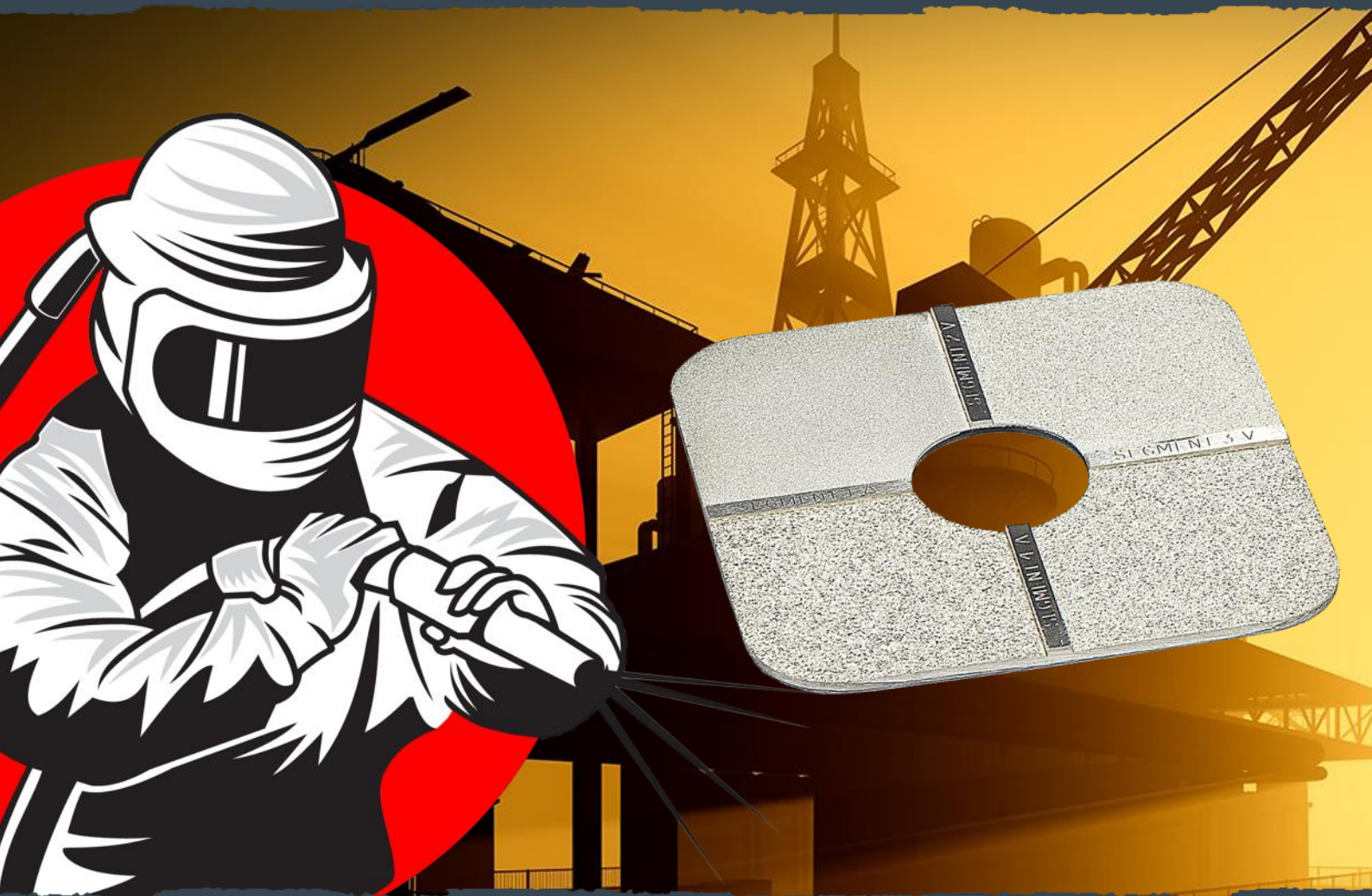
Shelf Life

The replica film on the Testex Tape has no expiry date. The only degeneration is the adhesive on the Tape if exposed to extremes of temperature. We would recommend that the Tape is used within a 12-month period from date of purchase.



Paint Test Equipment

Roughness Comparator



Surface Roughness

Roughness Comparator



Information

ISO 8503-1: Preparation of steel substrates before application of paints and related products. Surface roughness characteristics of blast-cleaned steel substrates. Part 1: Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces.

ISO 8503-2: Preparation of steel substrates before application of paints and related products. Surface roughness characteristics of blast-cleaned steel substrates. Part 2: Method for the grading of surface profile of abrasive blast-cleaned steel. Comparator procedure.

A precision nickel Comparator plate for grit and shot-blast surface roughness comparison measurement.

When steel has been blast-cleaned, the surface consists of random irregularities with peaks and valleys that are not easily characterised. Because of this random nature, experts have recommended that the profile should be identified as either angular (where grit abrasives have been used) or dimpled (where shot abrasives have been used) and that they should be graded as fine, medium or coarse with each grade being defined by limits specified in ISO 8503.

Roughness Comparator

Specification

Profile Segment 1: Grit 25µm. Shot 25µm.

Profile Segment 2: Grit 60µm. Shot 40µm.

Profile Segment 3: Grit 100µm. Shot 70µm.

Profile Segment 4: Grit 150µm. Shot 100µm.

Supply

The Roughness Comparator is supplied in a protective Wallet.

A X5 Illuminated Magnifier for viewing the Comparator is available as an optional extra.

Ordering Information

R2006	Roughness Comparator Grit
R2007	Roughness Comparator Shot
RA001	Illuminated Magnifier X5. Includes Carrying Case
NRC01	Roughness Comparator Conformance Certificate



Operation

Evaluation

Remove all loose dirt and debris from the test surface.

Select the appropriate surface profile reference Comparator. The Grit Comparator is for comparing profiles after blast-cleaning with grit abrasives, and the Shot Comparator is for comparing profiles after blast-cleaning with shot abrasives.

Place the selected Comparator against an area of the test surface. Compare in turn the test surface with the four segments of the Comparator, using the Illuminated Magnifier if necessary. If the Illuminated Magnifier is used, place it so that the test surface is viewed simultaneously with a segment of the Comparator.

Assess the profiles on the Comparator that are nearest to the profile of the test surface and determine its grade from the following:

Fine-grade profiles equal to segment 1 and up to but excluding segment 2

Medium-grade profiles equal to segment 2 and up to but excluding segment 3.

Coarse-grade profiles equal to segment 3 and up to but excluding segment 4.

If any profile is assessed as below the lower limit for the fine grading, assess this grading as finer than fine.

If any profile is assessed as greater than the upper limit for the coarse grading, assess this grading as coarser than coarse.

If visual assessment proves difficult, tactile assessment may provide a useful guide. It is possible to assess the closest grading by passing the back of a fingernail or a wooden stylus held between thumb and forefinger over the test surface and segments on the Comparator alternately.



Operation

Practical Advice

The Roughness Comparator method is applicable to steel surfaces that have been blast-cleaned to grades Sa 2½ and Sa 3 when the surface under test shows an overall blast-cleaned appearance.

It is applicable to surfaces that have been cleaned with either metallic or non-metallic abrasives.

When a mixture of shot and grit abrasives are used to blast-clean a substrate, the Grit Surface Roughness Comparator should be used.

Care

Never place the Comparator face down on a rough surface. Keep the Comparator in the protective Wallet provided when not in use.

If the Comparator becomes tarnished, wash with a Dilute detergent solution and soft brush and dry with soft tissue.



Paint Test Equipment

Bresle Test



Surface Cleanliness

Bresle Test



Information

ISO 8502-6: Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Part 6: Extraction of soluble contaminants for analysis. The Bresle method.

ISO 8502-9: Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Part 9: Field method for the conductometric determination of water-soluble salts.

The Bresle Test will measure water-soluble salts and corrosion products on blast-cleaned steel. These compounds are almost colourless and are localized at the lowest point of the rust pits.

If they are not removed prior to painting, chemical reactions can result in blister formation and accumulations of rust that destroy the adhesion between the substrate and the applied protective coating.

Bresle Test

Specification

- Conductivity Meter Accuracy: ± 2 .
- Conductivity Meter range: 0–1999 μ S/cm.
- Conductivity Meter resolution: 1 μ S/cm.

Supply

Supplied in an industrial foam-filled Carrying Case with Bresle Patches (pack of 35), Conductivity Meter, 500ml Deionised Water 500ml, 5ml Syringe with Needle, Calibration Solution (14ml) Conditioning Solution (14ml) and 25ml Beaker.

The Conductivity Meter Calibration Certificate with traceability to UKAS is an optional extra.

Ordering Information

- P2005 Bresle Test. Includes 35 Bresle Patches
- PS002 **NEW** Bresle Patches (pack of 35)
- PS003 Spare Deionised Water (500ml)
- PS004 Spare Syringes with Needles (pack of 10)
- PS005 Spare Conductivity Meter Calibration Solution (14ml)
- PS006 Spare 25ml Beakers (pack of 5)
- PS007 Spare Conductivity Meter Sensor Measurement Head
- PS008 Spare Conductivity Meter Conditioning Solution (14ml)
- NP001 Conductivity Meter Calibration Certificate
- NPC01 Conductivity Meter Calibration Solution Conformance Certificate
- NPC04 Bresle Patches Conformance Certificate



Bresle Test

Paint Inspection Kit

The Bresle Test is also supplied in the Paint Inspection Kit. The Paint Inspection Kit contains all the equipment for the testing of blast-cleaned steel and coating inspection using the following equipment.

Testex Tape / Testex Gauge. Surface Profile measurement of blast-cleaned steel.

Bresle Test. Measurement of salts on blast-cleaned steel.

Dust Test. Assessment of the quantity and size of dust particles on blast-cleaned steel.

Dewpoint Meter. Testing for condensation on blast-cleaned steel.

Wet Film Gauge. Wet film thickness measurement of the coating.

Coating Thickness Meter. Dry film thickness measurement of the coating.

Ordering Information

K3001 Paint Inspection Kit

NK002 Paint Inspection Kit Calibration Certificates



Operation

Conditioning Procedure

For first use on a new Conductivity Meter, condition the measuring electrode with 3 to 4 droplets of the Conditioning Solution, ensuring that the Solution is in both sections of the electrode with no air bubbles and allow to sit for approximately 10 minutes, then the measuring electrode should be rinsed using the syringe with Deionised Water and shaken dry.

If the measuring electrode has not been used for a long period of time, or if the electrode has been left extremely dry, then use this moistening procedure.

Conductivity Meter Cal

Place 3 to 4 droplets of the 1413 μ S/cm Conductivity Solution into the measuring electrode, ensuring that the solution is in both sections of the electrode with no air bubbles. Check the displayed reading which is shown when the smiley face comes on and if this is not 1413 μ S/cm then calibrate as follows:

Press the Cal button, the CAL indicator and a smiley face will flash – the Conductivity Meter will now auto calibrate. When the CAL indicator and smiley face stop flashing the calibration is complete and the instrument will revert to normal measurement mode.

When you have finished calibrating the Conductivity Meter, the measuring electrode should be rinsed using the syringe with Deionised Water and shaken dry.



Operation

Taking Measurements

Pour approximately 10ml of Deionised Water into the Beaker.

Completely fill the Syringe with the Deionised Water from the Beaker, and then empty the Syringe back into the Beaker.

Using the Syringe, withdraw approximately 1ml of Deionised Water from the Beaker and place 3 to 4 droplets into the measuring electrode on the Conductivity Meter, ensuring that the Deionised Water is in both sections of the electrode with no air bubbles.

Record the conductivity of the Deionised water displayed by the Meter when the smiley face appears.

Take a Bresle Patch and remove the protective paper and the punched-out center foam. Ensure that you only hold the corner of the Patch away from the adhesive near the test chamber when the protective paper is removed.

The adhesive on the Patch is more adherent in warmer temperatures and this can cause the protective paper stick more. If this is the case remove the backing paper by push the punched-out centre foam from the elastomer side. The centre foam will push off the backing paper when pressure is applied.

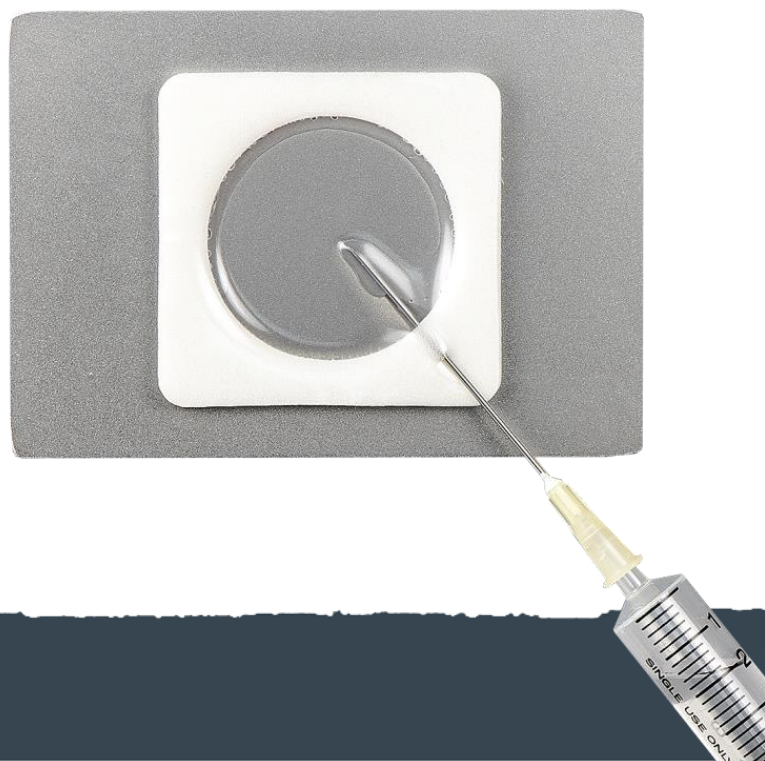
Press the adhesive side of the patch against the test surface by running the flat of your finger across from one side of the Patch in such a way that the air in the test chamber is pushed out and the minimum amount of air is trapped. The elastomer on the Patch should concave inwards and touch the steel in the center of the test

Fill the Syringe with 2.5ml of Deionised Water from the Beaker and insert the Syringe needle at an angle of about 30° to the test surface near the outer edge of the Patch so it passes through the adhesive foam body and into the circular test chamber.

Inject the Syringe contents ensuring that it wets the entire test surface, then without removing the Syringe needle from the Patch, suck the contents of the Patch back into the Syringe. Repeat until at least 10 injection–sucking cycles have been completed.

At the end of the 10th cycle retrieve the contaminated water from the Patch with the Syringe and place 3 to 4 droplets into the measuring electrode on the Conductivity Meter, ensuring that the Deionised Water is in both sections of the electrode with no air bubbles.

Record the conductivity of the contaminated water displayed by the Meter when the smiley face appears.



Operation

Results

Subtract the initial Deionised Water conductivity reading from the contaminated water conductivity reading. The results are shown in $\mu\text{S}/\text{cm}$.

The Conductivity Meter measurements are shown in $\mu\text{S}/\text{cm}$ and no conversion is required for measurements in mg/m^2 .

For measurements $\mu\text{g}/\text{cm}^2$ add a decimal point in front of the last digit so $100\mu\text{S}/\text{cm}$ will be $10.0\mu\text{g}/\text{cm}^2$ or use the conversion table on the following page.

The conversions listed are based on a test area of 1250mm^2 and using a 2.5ml volume of water. Expression of results are based on section 7 of ISO 8502-9.

Example. The Deionised Water measurement taken is $4\mu\text{S}/\text{cm}$. The contaminated water measurement taken is $54\mu\text{S}/\text{cm}$. The difference is therefore $50\mu\text{S}/\text{cm}$ which is equivalent to $50\text{mg}/\text{m}^2$ or $5.0\mu\text{g}/\text{cm}^2$.

The Deionised Water temperature can be measured by pressing the MEAS button when the water is in the Conductivity Meter measuring electrode. Press the MEAS button again for normal conductivity measurement mode.

General

Care

When you have finished using the Conductivity Meter, the measuring electrode should be rinsed using the syringe with Deionised Water and shaken dry. Then place a small amount of Deionised Water in the measuring electrode and replace the sensor cap.

Also ensure the Syringe is cleaned to remove any contamination.

Patch Shelf Life

The only degeneration on the Bresle Patches is the adhesive if exposed to extremes of temperature.

It is recommended that the Patches are used within a 12-month period from date of purchase.

Replacing Batteries

When the batteries on the Conductivity Meter require replacement, low battery indicator will show on the display.

With the instrument switched off slide the Sensor while lifting the catch located on the rear of the instrument, replace with 2 lithium CR-2032 batteries, ensuring correct polarity.



Operation

Testing Abrasives

ISO 11127-6: Preparation of steel substrates before application of paints and related products. Test methods for non-metallic blast-cleaning abrasives. Part 6: Determination of water-soluble contaminants by conductivity measurement.

The Bresle Test can also be used for testing non-metallic abrasives for water-soluble salts and corrosion products.

Record the conductivity of the Deionised Water using the same procedure under the section Taking Measurements.

Place 100gm of abrasive into a flask and add 100ml of the Deionized Water that you have recorded the conductivity of. Shake for 5 minutes and allow to stand for 1 hour. If the liquid does not clear, filter by any suitable method.

Using the Syringe, withdraw approximately 1ml of contaminated water from the flask and place 3 to 4 droplets into the measuring electrode on the Conductivity Meter, ensuring that the contaminated water is in both sections of the electrode with no air bubbles.

Record the conductivity of the contaminated water displayed by the Meter when the smiley face appears.

Subtract the initial Deionized Water conductivity reading from the contaminated water conductivity reading. Record the results as shown in $\mu\text{S}/\text{cm}$.

Safety



The needles on the Syringes in the Bresle Test are blunt. Care must still be taken when carrying out the test.

When using the Syringes ensure the work area is well lit, be aware of people around you and assess any hazards. Ensure the protective cap is placed over the needle after use.

If the Calibration Solution comes into contact with exposed skin, wash with water. If the Solution comes into contact with eyes, rinse the eye Immediately and seek medical advice.



Paint Test Equipment

Potassium Ferricyanide Papers



Surface Cleanliness

Potassium Ferricyanide Papers



Information

The Potassium Ferricyanide Papers enables detection of any water-soluble iron salts that form at the bottom of rust pits after blast-cleaning. If these salts are present, they rapidly induce corrosion.

The test involves the reaction of soluble ferrous iron salts with potassium ferricyanide to form ferric hexacyanoferrate, which is commonly known as prussian blue. The relatively high tinting strength of prussian blue enables the reaction to be used as a very sensitive test on ferrous irons.

Simply spray a film of deionised water on an area of the blast-cleaned steel. The Potassium Ferricyanide Paper is then held against the surface for approximately 10 seconds. Any soluble iron salts present are drawn out of the rust pits by capillary action and react with the potassium ferricyanide to form blue spots. The presence of blue spots on the Potassium Ferricyanide Paper indicates that the surface should be re-blasted.

Supplied in packs of 100 Potassium Ferricyanide Papers.

Potassium Ferricyanide Papers

Specification

Paper Diameter: 90mm.

Supply

Supplied in packs of 100 Potassium Ferricyanide Papers.

Ordering Information

PS102 Potassium Ferricyanide Test Papers (pack of 100).

NPC07 Potassium Ferricyanide Test Papers Conformance Certificate



Operation

Testing

Spray a fine mist of deionized water droplets onto a small area of the blast-cleaned surface.

Allow the deionized water droplets to evaporate and at the moment that they have disappeared but the surface is just perceptibly wet, apply the Potassium Ferricyanide Paper and press onto the surface for 2 to 5 seconds.

If soluble salts remain, these will be drawn by capillary action into the Potassium Ferricyanide Paper and will react and give a prussian blue dot effect on the Potassium Ferricyanide Paper corresponding to the contaminated pits on the blast-cleaned steel.

It is important that the wetting of the surface has to be completed to the correct degree in order to dissolve the salts. Too little deionized water and this will not be achieved. Too much deionized water and there will be an overall blue colouration over the Potassium Ferricyanide Paper.

Shelf Life

Do not expose the Potassium Ferricyanide Papers to any extremes of temperature and ensure that they are retained in their light protective pouch.

We would recommend that the Potassium Ferricyanide Papers are used within a 6-month period from date of purchase.

Safety



The Potassium Ferricyanide Papers consist of 90mm diameter cellulose filter papers, impregnated with a low concentration of potassium ferricyanide.

May produce toxic fumes on burning.

Wear Plastic Gloves when handling the Test Papers.

After using the Potassium Ferricyanide Papers, wash hands with soap and water.

Paint Test Equipment

Dust Test



Surface Cleanliness

Dust Test



Information

ISO 8502-3: Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Part 3: Assessment of dust on steel surfaces prepared for painting. Pressure-sensitive tape method.

Assess the quantity and size of dust particles on steel surfaces prepared for painting. Dust particles on blast-cleaned steel surfaces may reduce the adhesion of applied coatings, and by absorbing moisture may promote the corrosion of the steel surface.

Accumulation of dust particles occurs more naturally on horizontal surfaces, the interior of pipes and in structural cavities. Inspection should be carried out to ensure that such areas are adequately cleaned and free from dust particles before painting.

The Dust Test Comparator Chart shows 5 classifications of dust particles and 4 sections of contrasting backgrounds where the Tape can be applied. All details necessary to identify the surface tested can be written on the Chart.

Dust Test

Specification

Tape adhesion strength: 190nN/metre.

Tape width: 25mm (1”).

Tape length: 60 metres.

Supply

Supplied in an industrial foam-filled Carrying Case with Dust Test Tape (60m roll), Dust Test Charts (pack of 50) and X10 Illuminated Magnifier.

Ordering Information

P4001 Dust Test. Includes Dust Test Tape & Dust Test Charts (pack of 50)

PS201 Spare Dust Test Tape 25mm (1”). 60m Roll

PS202 Spare Dust Test Comparator Charts (pack 50)

NPC05 Dust Test Tape Conformance Certificate

NPC06 Dust Test Comparator Charts Conformance Certificate



Dust Test

Paint Inspection Kit

The Dust Test is also supplied in the Paint Inspection Kit. The Paint Inspection Kit contains all the equipment for the testing of blast-cleaned steel and coating inspection using the following equipment.

Testex Tape / Testex Gauge. Surface Profile measurement of blast-cleaned steel.

Bresle Test. Measurement of salts on blast-cleaned steel.

Dust Test. Assessment of the quantity and size of dust particles on blast-cleaned steel.

Dewpoint Meter. Testing for condensation on blast-cleaned steel.

Wet Film Gauge. Wet film thickness measurement of the coating.

Coating Thickness Meter. Dry film thickness measurement of the coating.

Ordering Information

K3001 Paint Inspection Kit

NK002 Paint Inspection Kit Calibration Certificates



Operation

Application

At the beginning of each series of tests, remove and discard the first three turns of the Dust Test Tape from the roll.

Remove a piece of Tape about 250mm long. Holding the Tape only at the ends, press approximately 200mm of the freshly exposed Tape onto the blast-cleaned surface.

Place your thumb across one end of the Tape and move the thumb along the Tape whilst maintaining a firm pressure and constant speed along the Tape. Carry out this procedure three times in each direction.

Remove the Tape from the blast-cleaned surface and place it on the Dust Test Comparator Chart in a section which contrasts to the colour of the dust (adhere the Tape with thumb pressure). Excess Tape can be folded around the back of the chart or cut off.

Assessment

Assess the quantity and size of dust particles on the Tape by visually comparing an area of the Tape with equivalent-sized areas of the pictorial references shown on the Chart. Record the rating corresponding to the reference that is the closest match.

It is not unusual after carrying out the test to find that the Tape displays an overall discolouration, usually reddish-brown or black, sometimes with the presence of discrete visible particles, depending on the abrasive used.

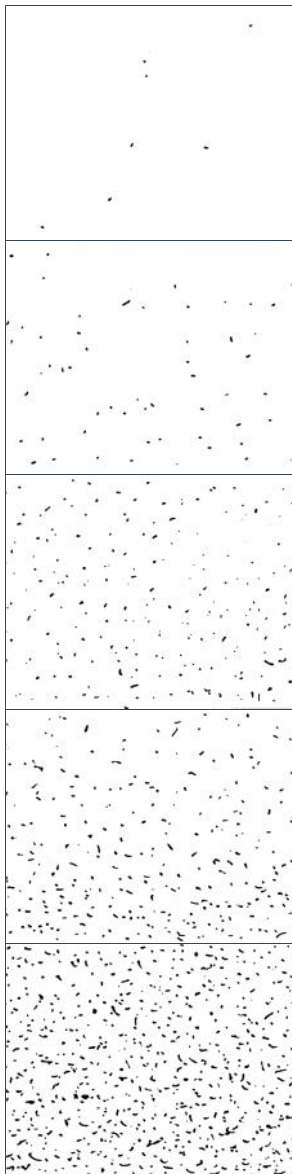
The discolouration is caused by microscopic dust particles from the blast-cleaned surface (particles less than 50µm) that can cause low paint adhesion.

Report any overall discolouration as quantity rating 5, size class 1.



Operation

Dust Particle Size Classes



1. Particles not visible under X10 magnification.

2. Particles visible under X10 magnification but not with normal or corrected vision (usually particles less than 50µm in diameter).

3. Particles just visible with normal or corrected vision (usually particles between 50µm and 100µm in diameter).

4. Particles between 0.5mm and 2.5mm in diameter.

5. Particles larger than 2.5mm in diameter.

Report

Record on the Dust Test Chart the following information:

All details necessary to identify the surface tested, with reference to specific features (ledges, beams, web or flange faces) and attitude of the test area (vertical, horizontal).

The dust particle quantity rating and dust particle size class.

Date and, if applicable, the time of each test.

The Dust Test Chart can be kept as a permanent record for the inspection carried out.

Operation

General

Practical Advice

The Dust Test is suitable for the assessment of dust particles retained after blast-cleaning on rust grades A, B and C.

Because of the limited elasticity of the Tape, it is not possible to penetrate into the deep pits present on blast-cleaned steel rust grade D.

Tape Shelf Life

Do not expose the Adhesion Test Tape to any extremes of temperature or daylight.

We would recommend that the Tape is used within a 12-month period from date of purchase.



Paint Test Equipment

Dewpoint Meter



Surface Cleanliness

Dewpoint Meter



Information

ISO 8502-4: Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Part 4: Guidance on the estimation of the probability of condensation prior to paint application.

The Dewpoint Meter enables testing for the estimation of the probability of condensation on a surface to be painted and establishing whether conditions are suitable for painting or not.

The steel surface temperature generally should be at least 3°C above the dew point when paints are applied. Below this temperature the Dewpoint Meter will sound an alarm and the display colour will change to warn you that the surface conditions are not suitable too paint.

Measurements of relative humidity, dew point, air temperature are shown. Surface temperature and surface temperature proximity to dew point are shown when using the surface temperature sensor.

Interchangeable Humidity Sensor and Surface Temperature Probe allow the user to replace damaged or out-of-calibration-date Sensor and Probe.

Dewpoint Meter

Specification

Accuracy %rh: 10–90% $\pm 2\%$. 0–10/90–100% $\pm 3\%$.

Accuracy Temp: $\pm 1\%$.

Resolution %rh: 0.1%.

Resolution Temp: 0.1°C (0.2°F).

Supply

Supplied in an industrial foam-filled Carrying Case with a Humidity Sensor and Surface Temperature Probe.

The Calibration Certificates with traceability to UKAS are an optional extra.

Ordering Information

H4001	Dewpoint Meter 1–100%rh/-10 to 70°C (14–160°F). Inc Humidity Sensor & Surface Temp Probe
HS301	Spare Humidity Sensor 0–100%rh/-10 to 70°C (14 to 160°F)
HS302	Spare Surface Temperature Probe -20 to 80°C (-4 to 176°F)
NH101	Humidity Sensor Calibration Certificate
NH102	Surface Temperature Probe Calibration Certificate
HA001	PC Download Cable



Dewpoint Meter

Paint Inspection Kit

The Dewpoint Meter is also supplied in the Paint Inspection Kit. The Paint Inspection Kit contains all the equipment for the testing of blast-cleaned steel and coating inspection using the following equipment.

Testex Tape / Testex Gauge. Surface Profile measurement of blast-cleaned steel.

Bresle Test. Measurement of salts on blast-cleaned steel.

Dust Test. Assessment of the quantity and size of dust particles on blast-cleaned steel.

Dewpoint Meter. Testing for condensation on blast-cleaned steel.

Wet Film Gauge. Wet film thickness measurement of the coating.

Coating Thickness Meter. Dry film thickness measurement of the coating.

Ordering Information

K3001 Paint Inspection Kit

NK002 Paint Inspection Kit Calibration Certificates



Operation

General

Switch On/Off

Switch the Dewpoint Meter on by pressing the On button. To switch off, press and hold the button until the display shows DEVICE IS SWITCHING OFF. Alternatively, the instrument will switch itself off after a period that the Auto Off is set to under the Setting Menu Functions.

Infra Red Thermometer

The Dewpoint Meter has a built in infra red thermometer for measuring surface temperature.

Remove the rubber cap from the infra red sensor and point at the substrate. Press the infra red temperature button (IRT) and the Surface Temperature Difference (difference between surface temperature and dewpoint), Surface Temperature and Air Dewpoint measurements will show on the display.

If you press the infra red temperature button (IRT) twice the laser sight will activate.

The infra red thermometer is not suitable for measuring on reflective substrates. This includes blast-cleaned steel. For blast-cleaned steel use the Surface Temperature Probe.

Pause Readings

Measurements on the display can be paused by pressing the right arrow button.

Practical Advice

When using the Dewpoint Meter it is good practice to monitor the display for temperature stability.

The Humidity Sensor should be given sufficient time to equilibrate with the environment to be measured. The larger the initial temperature difference between the Sensor and the environment to be measured, the more time temperature equilibration requires to provide a valid measurement.

Replacing Battery

When the battery requires replacement, low battery indicator will show one bar and flash

With the instrument switched off remove the screw then the cover located on the rear of the Instrument, replace with an alkaline PP3 battery, ensuring correct polarity.



Operation

Menu

All functions are accessed through a menu-driven display by pressing the left button. To scroll through the menus use the up and down arrow buttons and enter by briefly pressing the on button.

To exit from the menu, press the left Menu button again and the Dewpoint Meter will revert back to normal measurement mode.



Operation

Hygrometer

The Hygrometer Menu Function shows the Relative Humidity and Air Temperature on the display.



Operation

Psychometrics

Dew Point

Dew Point, Relative Humidity and Air Temperature are shown on the display.

Grams Per Kilogram

Grams Per Kilogram, Relative Humidity and Air Temperature are shown on the display.

Enthalpy

Enthalpy, Relative Humidity and Air Temperature are shown on the display.

Vapour Pressure

Vapour Pressure, Relative Humidity and Air Temperature are shown on the display.

Custom

This Menu Function will allow you to display the customised measurements.



Operation

Surface Temperature

When the Dewpoint Meter is used in conjunction with the Surface Temperature Probe you can ensure that there is no moisture on the blast-cleaned steel before painting.

When the surface Probe is placed on the steel substrate the Surface Temperature Difference measurement must be over 3°C to ensure that there is no moisture on the steel before painting.

If the Surface Temperature Difference measurement is under 3°C the green background will change to amber, flash and sound an alarm as a warning not to paint. If the Surface Temperature Difference measurement falls below 0°C the amber background will change to red.

The Surface Temperature Difference is also referred to as a delta T reading in some specifications.

The Surface Temperature can also be measured using the infra red thermometer built into the instrument.

Remove the rubber cap from the infra red sensor and point at the substrate. Press the infra red temperature button (IRT) and the measurements will show on the display.

Plug the Surface Temperature Probe into the socket on the side of the Dewpoint Meter.

The display will show the Surface Temperature Difference (difference between surface temperature and dewpoint), Surface Temperature and Air Dewpoint.

If you press the infra red temperature button (IRT) twice the laser sight will activate.

The infra red thermometer is not suitable for measuring on reflective substrates. This includes blast-cleaned steel.

Plug the Surface Temperature Probe into the socket on the side of the Dewpoint Meter.

The display will show the Surface Temperature Difference (difference between surface temperature and dewpoint), Surface Temperature and Air Dewpoint.

If you press the infra red temperature button (IRT) twice the laser sight will activate.

The infra red thermometer is not suitable for measuring on reflective substrates. This includes blast-cleaned steel.



Operation

Settings

Language

Language options of English, Norwegian, French, German, Swedish, Spanish, Italian and Dutch can be selected by using the up and down arrows. When selected press the On button to save.

Units

Metric or imperial measurements can be selected by using the up and down arrows. When selected press the On button to save.

Custom

Customise the display with up to four different measurement types by using the up and down arrows. When selected press the On button to save. When Custom is selected under the Psychometrics Menu Function the display will show the selected measurement types.

Date and Time

Set the Date and Time so when readings are stored for download to a PC the downloaded readings will show the date and time.

Select the Date by using the up and down arrows to change numbers and the side arrows to move through the numbers, then press the On button and the display will allow you to set the Time using the same arrow buttons. When selected press the On button to save.

Auto Off

Select the number of minutes for the instrument to automatically switch off by using the up and down arrows. When selected press the On button to save.

Auto Off

Select the number of minutes for the instrument to automatically switch off by using the up and down arrows. When selected press the On button to save.

Continued next page



Operation

Settings Continued

Brightness

Select the display brightness by using the up and down Arrows. When selected press the On button to save.

Buzzer

Select the buzzer to be on or off. When selected press the On button to save.

Calibration

This function is for Paint Test Equipment use only.

Logging

The logging will allow you to set a logging period and a job number so that measurements can be stored for PC download.

Select the Start and Stop by using the up and down arrows to change numbers and the side arrows to move through the numbers, then press the On button and the display will allow you to set the Log Interval and Job Number using the same arrow buttons. When selected press the On button to save.

The memory can be cleared from all measurements by selecting Clear Data using the up and down arrows. When selected press the On button to clear.

USB Connection

Measurements can be stored in the memory by pressing the right arrow button for one second until RECORD SAVED appears.

Select File Viewer by using the up and down arrows. When selected press the On button to save. All stored measurements can be downloaded to a computer directly into Excel.

Connection is made using the optional USB PC Download Cable to the download socket on the Dewpoint Meter and the USB port on the computer. Ensure the Dewpoint Meter is switched off when connecting the cable.

Switch the Dewpoint Meter on and USB Connected will show on the display. Locate the HygroMaster storage device on the computer and view the files.

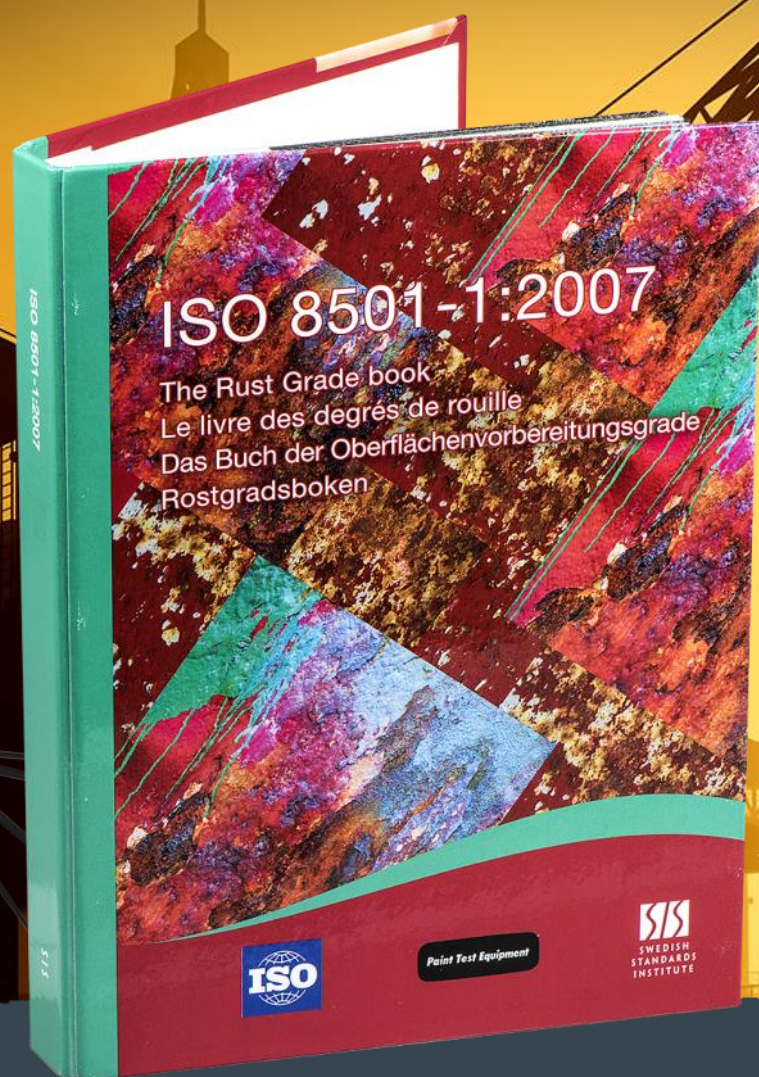
When stored readings are in Excel using the Surface Temperature Probe Function the results are shown as follows:

Measurement 1: Surface Temperature
Measurement 2: Air Dewpoint
Measurement 3: Surface Temperature Difference

The memory can be cleared from all measurements by selecting Clear Data under the Logging Menu Feature.

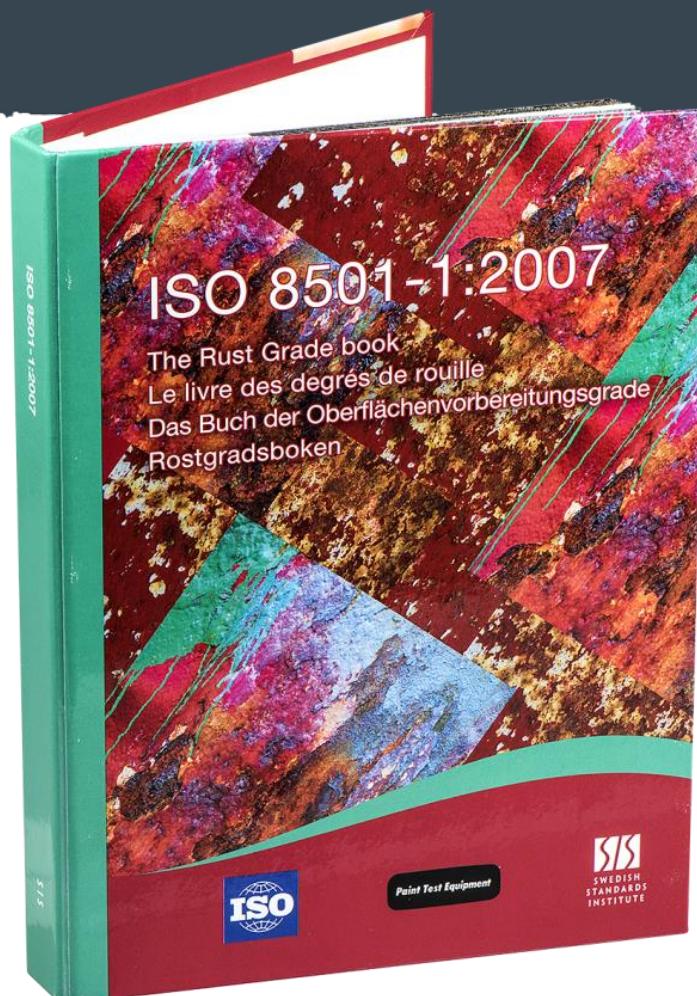
Paint Test Equipment

Rust Grade Book



Surface Cleanliness

Rust Grade Book



Information

ISO 8501-1: Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings.

The Rust Grade Book specifies a series of Rust Grades and Preparation Grades of blast-cleaned steel surfaces. The various Grades are defined by written descriptions together with photographs.

The Book identifies four levels (designated as Rust Grades) of mill scale and rust that are commonly found on surfaces of uncoated erected steel and steel held in stock. It also identifies certain degrees of visual Cleanliness (designated as Preparation Grades) after surface preparation of uncoated steel surfaces and of steel surfaces after overall removal of any previous coating.

Four Rust Grades, designated A, B, C, and D respectively are specified.

There are also fourteen Preparation Grades by blast-cleaning, indicating the degree of cleaning, together with detailed descriptions of the surface appearance to the following Sa Grades.

- Grade Sa 1. Light blast-cleaning.
- Grade Sa 2. Thorough blast-cleaning.
- Grade Sa 2½. Very thorough blast-cleaning.
- Grade Sa 3. Blast-cleaning to visually clean steel.

Rust Grade Book

Specification

Compiled by: ISO.

Edition: Second. 2007-05-01.

Translation: English, French, German & Swedish.

The Rust Grades and Preparation Grades shown are examples taken from the Rust Grade Book to show the quality of the pictures and to assist with the understanding of the book.

Ordering Information

U1007 Rust Grade Book (ISO 8501-1)

NPC08 Rust Grade Book Conformance Certificate



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.

Paint Test Equipment reserves the right to alter specifications without prior notice.
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