

testing equipment for quality management

SURFACE TESTING

Measuring and
Testing Equipment for
Coatings Technology

Sheet metal testing



Surface testing



Corrosion testing



Materials testing



ERICHSEN -

The absolute reliability of your test results is our top priority. All our research, planning, development, construction and production is geared to achieving this objective – not only in the past, but today and in the future.



Björn Erichsen
Björn Erichsen

1910

1920

1930

1940

1950

1910

It was probably true Viking spirit and the urge for discovery that impelled the engineer A.M. Erichsen from Porsgrunn/Norway to settle and set up business in Berlin-Reinickendorf. His first invention, a water-cooled ingot mould which to this day constitutes one of the most frequently used casting processes for semi-finished products in the foundry industry, enabled him to secure the financial position of his company. A.M. Erichsen's next invention – the cupping test – was just as significant. This was the very first test method for determining the quality grade of sheet and strip metal.

This test procedure was initially patented, but has since been adopted by all industrial countries within the framework of the International Standards Organisation (ISO). Just as temperatures are measured throughout the world in Celsius or Fahrenheit, the standard for sheet metal quality is the ERICHSEN deep-drawing index.

1928

A.M. Erichsen set up his first small factory in Teltow near Berlin. Research and experiments led to many further inventions.

1930

the German State Chemico-Technical Institute successfully applied the ERICHSEN deep-drawing method to measure the elasticity and adhesive properties of paints and lacquers. The results were so convincing that the procedure has since been adopted by the paint industry all over the world.

1932

the inventive Norseman A.M. Erichsen introduced tools for cupping test dies to the market, without which the batch production of deep-drawn parts made of sheet metal would hardly have been possible. Numerous innovations and improvements followed. A.M. Erichsen not only possessed a forward-looking inventive urge, he was also talented in commercial matters and soon enjoyed international renown. Satisfied customers were evidence of the quality of his products.



the name means commitment.

As the world's leading manufacturer of well-known and proven testing machines and instruments for the coatings industry, we ensure that our experience and knowledge is incorporated into the development of our products.

This results in perfect and innovative high quality products with excellent long term stability which only needs a minimum of maintenance. These products meet global requirements on testing tech-

nology and exceed international demands on accuracy. The ERICHSEN Reference Class is our answer to the control of measuring and test equipment described in the QM standards. All test instruments of the REFERENCE CLASS are supplied with a Manufacturer's Certificate M (in accordance with DIN 55 350, part 18)! Product identification ensures traceability.

The characteristics concerning the quality are determined by means of high precision

measuring instruments calibrated with the help of measuring equipment calibrated and certified by DKD. This guarantees the supply of a precision measuring instrument in compliance with highest demands. An incoming inspection is no longer necessary – which means a reduction in costs for your company.

We are also in a position, upon request, to calibrate and certify your ERICHSEN test instruments already in use.

We would be delighted to welcome you in our showrooms, where we can convince you of our competence. Please consult us in all aspects concerning your testing problems – especially in the event of customised solutions. We will be glad to pass on our experience and our knowledge!



1960 1970 1980 1990 2000 2016

1949 1975 1998 2016

Following the turmoils of the war and the loss of his company, A.M. Erichsen resolved to start up again in the west of Germany. His best partner – his son, Dr.-Ing. Per F. Erichsen – had studied mechanical engineering in Hanover, graduated at the Metallurgical Institute of the Technical High School in Aachen, and did his doctorate at the Coal Research Institute of Dortmund. Establishing the new company proved difficult – without machines, tools, or construction drawings – in a factory kitchen of the ironworks in Sundwig. Ideas and determination were the order of the day – initially the parts were made externally and assembled by themselves. The modern factory we operate today is located not far away.

Björn Erichsen joined the company after completing his technical and business management studies at the Polytechnic in Munich and at the George Washington University in the U.S.A.. After taking over from his father – who entered well-earned retirement from the active management of the business in 1977 and died in 1988 – he is now the third generation to lead this company which has long since gained international renown. Under his management the range of instruments has been expanded, primarily by the addition of modern, non-destructive measuring devices for surface engineering applications.

The decision was made to incorporate tensile and pressure testing machines, hydraulic and electronic load and pressure cells, as well as calibration equipment with extreme measuring accuracy into the production programme – reverting to the field of mechanical metrology earlier controlled by the company. Support was provided by a group of competent former employees from ERICHSEN Wuppertal whose knowledge and experience in conjunction with great insight into the latest in the field of hardware and software has resulted in a wide range of modern products.

In the course of 100 years the extensive Erichsen product range has been built up based on the technical fields of metrology and test engineering. ERICHSEN pays stringent attention that their machines and equipment comply both with the testing regulations of national and international standards and with the acceptance terms of the industrial sector. These provide the basis for global understanding between the manufacturer and the user wherever the quality of raw materials, semi-finished and finished products is concerned. Design precision, perfect function and absolute fulfilment of purpose: these attributes have top priority at ERICHSEN.



Deep Drawing Tests.

Testing machines and instruments for physical and optical tests on all kinds of surfaces. Dependable tests ensure efficient production.



ERICHSEN-Cupping Test and Deep Drawing Cup Test

The following two test methods represent the point of origin of our company and provide only a minimum insight into the wide variety of physical and optical test methods that can be carried out using our testing instruments. As one of the few existing manufacturers of the German testing machine industry, we gladly respond to our customers special requests.

One of the best-known test methods for coated sheet metal world-wide – patented as early as 1913 by the founder of our company – is the ERICHSEN Cupping Test. To conduct this test, a coated sheet metal panel is clamped between blank holder and drawing die and then dented (cupped) with a hardened spherical punch. In this procedure the coating is subject to an increasing elongation and bending stress until first cracks appear. The displacement of the spherical punch in mm is known as the Erichsen cupping value “IE”, the measure for the ductility of the coating and for its adhesion

assessment. The forming of cracks during the ERICHSEN Cupping Test is observed visually with the eye or preferably with a microscope. This simple, but useful test method is frequently used in the incoming inspection.

The ERICHSEN Deep Drawing Cup Test is a practice-orientated ductility test for stamping lacquers and similar coatings under intensified conditions. For this test method, a blank is cut - in one operation - from a sheet metal coated by the stamping lacquer to be tested and drawn abruptly to a cylindrical or square standard cup. The Deep Drawing Cup Test subjects the



Specimen Preparation. Coating Tests.

The following pages contain brief descriptions of our products intended for the solution of a variety of testing problems in the lacquer and coatings industry (for different raw materials as well as for lacquers, paints and coatings before and after application). In addition, this catalogue gives a survey of testing instruments suitable for testing purposes related to fields of application, dealing with the quality of surfaces or with the subject of coating/substrate (e. g. printing inks, adhesives, plastics, paper etc.). This completes our range of testing instruments.

To facilitate the search for the test instrument complying with your requirements, the products have been grouped thematically and according to their application. These groups are numerically classified in the following Table of Contents. Additionally, you will find a Key Word Index with lateral connections from test property to product group.

The most important standards to which the test instruments mentioned in this catalogue can be related, are listed in the Standard Index on page 07. This list will help to find the

appropriate testing instrument to enable the user to carry out tests in accordance with a specific standard.

We will, of course, gladly assist you with our advice, our wide experience and our competence in finding solutions for your particular testing problems. Your requirements will be dealt with individually and confidentially. As manufacturer, with the use of our own research and development laboratory, special types of serial instruments and individual solutions, are part of our daily routine. The professional exper-

tise of our product specialists guarantees the realisation of your quality demands as a result of the best possible attendance.

You will, upon request, immediately receive detailed technical information. For this purpose, please make use of our fax form at the back of this catalogue, or contact personally:

Tel. +49 (0) 23 72-96 83-0

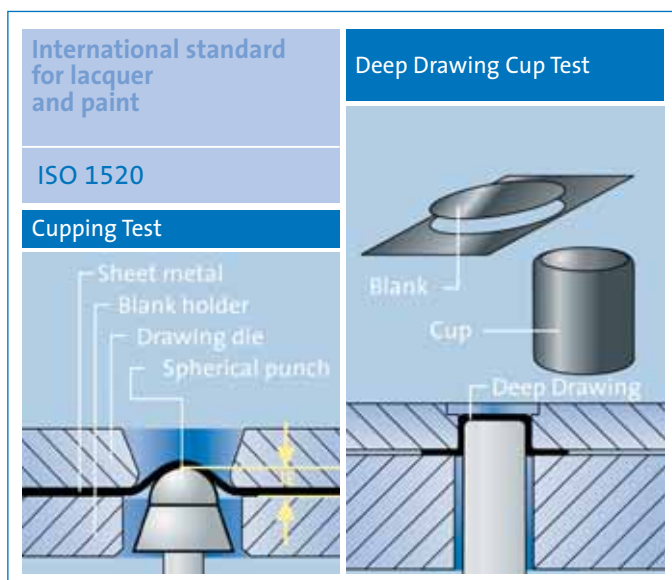
Fax. +49 (0) 23 72-64 30

info@erichsen.de

www.erichsen.de

The ERICHSEN-production range:

Machines for testing the forming properties of coating materials | Viscometers and consistency measuring instruments | Density measuring devices | Equipment for determining the electrical properties of paints | Devices for ascertaining grain size and pigment dispersion | Instruments for determining opacity | Devices for producing films of defined thickness | Instruments for testing drying properties | Film thickness gauges | Flexibility testers | Adhesion testers | Instruments for testing adhesives | Impact resistance testers | Hardness testers | Abrasion resistance and scrubability testers | Instruments for conducting chalking tests | Gloss measuring devices | Densimeters | Equipment for corrosion and weathering tests | Film applicators for printing ink | Special testing instruments | Torque measuring equipment | Calibrating equipment | Force and pressure gauges | Tensile and pressure testing machines | Deep Drawing test | Equipment for specimen preparation | Sheet metal marking



coating on the specimen to the same stresses which would be encountered in the practice by deep drawing with blank holder force, i. e. the coating must follow the compression, elongation and bending of the substrate material under considerable pressure. The cylindrical standard cup is drawn from a blank of 64 mm dia. using a standard drawing punch of 33 mm dia. This allows comparative tests between manufacturers and users of stamping lacquers.

To intensify the test and to numerically determine the remaining deformation abilities of the coating, a bead can be for-

med in the wall of the drawn cup. Tinning factories as well as the coil coating industry often prefer square standard cups with an edge length of 40 mm or 70 mm for quality comparisons of their products.

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ERICHSEN quality.

Our REFERENCE CLASS Seal:



All test instruments of the REFERENCE CLASS are supplied with a Manufacturer's Certificate M (in accordance with DIN 55 350, part 18)! Product identification ensures traceability.

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(D): Draft / (W): withdrawn

Model 200

Group 1

Lacquer and Paint Testing Machine EN ISO, ISO

Mechanical testing machine for ERICHSEN Cupping Test on painted or plastic coated sheet metal specimens up to 1.25 mm thick.



Model 202 EM

Group 1

Lacquer and Paint Testing Machine EN ISO, ISO

This simple to operate Lacquer and Paint Testing Machine is used for rapid and accurate measurement of the elongation and adhesion properties of protective paints and other coatings of all types using the ERICHSEN CUPPING TEST.

The cupping speed is infinitely variable from 2 mm/min to 60 mm/min. On Model 202 EM the sheet metal specimen is clamped automatically. Due to the laterally opening of the cylinder also larger sheet metal panels can be accommodated in the test head.

At option:
Microscopes for observing the test procedure.



Model 227

Group 1

Bead Test Instrument

For numerical evaluation of the quality of stamping lacquers and plastic coatings on cylindrical standard cups.

Accuracy up to 20 µm.



Model 212

Group 1

Cupping and Deep-drawing Cup Test Machine EN ISO, ISO, ASTM

Intended for the ERICHSEN Cupping Test and for the Deep Drawing Cup Test. Electro-hydraulic drive, variable drawing speed as well as a blanking press integrated into the test head allow the manufacturing of a

cup (blanking, drawing and ejection) in one operation. The sheet thickness to be tested depends on the quality of the material and on the required test method.

Blanking force: 200 kN
Drawing force: 120 kN



Model 242-Basic

Group 1

Cupping and Deep-drawing Cup Test Machine EN ISO, ISO, ASTM

Especially intended for coil coatings, this machine is suitable for the ERICHSEN Cupping Test as well as for the Deep Drawing Cup Test producing cylindrical and square cups. To intensify the material stressing it is possible to conduct a first and second re-drawing operation. Blanking, drawing and ejection of the cup is carried out in one operation. The sheet thickness to be tested depends on the quality of the material and on the required test method.

Blanking force: 265 kN
Drawing force: 200 kN



Model 243

Group 2

Flow Cup DIN, EN ISO, ISO, ASTM

Flow Cups conforming to international standards. Optional accessories: adjustable tripod and thermostatically controlled jacket to ensure reproducible results; thermometer and digital stop watch with calibration certificate.



**CUPTIMER 243 T****Group 2****Flow Time Measuring Instrument
DIN, EN ISO, ISO, ASTM**

Objective determination of flow time for viscosity measurements using standardized flow cups. Including temperature bath and adapter rings for the different flow cups. Automatic measuring sequence with optical detection of the efflux stream of sample. Flow times up to 200 s can be read from the LCD with an accuracy of 0.01 s.

**Model 301****Group 2****Visco Test Blade
acc. to Rossmann**

A simple reliable instrument for checking the required brushing or spraying consistency of coating materials. Invaluable for users of paint. Serves also as stirrer for thinning down small quantities.

**Model 321 and 322****Group 2****Dip Flow Cup DIN - Model 321
Dip Flow Cup (EN) ISO - Model 322**

Well-known, handy instrument for quick and convenient establishment of viscosity, directly from the container, by simply dipping in and measuring run out time. Internal dimensions in accordance with DIN 53 211 (Modell 321) and (EN) ISO 2431 (Model 322), respectively.

**Model 343****Group 2****Zahn Flow Cup
ASTM**

Simple dip flow cup used particularly in the U.S.A.. 5 cups available for different viscosity ranges.

**Model 419****Group 2****Levelling Test Blade and Sag Tester
EN ISO, ISO, ASTM**

Film applicator frame with gaps arranged in pairs and with steps of increasing depth, separated and at equal pitches.

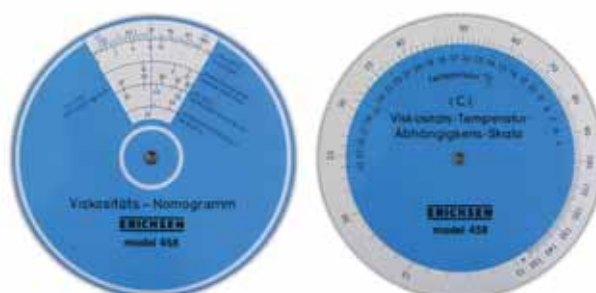
ASTM Version
Combined instrument for levelling and sag testing acc. to ASTM D 2801 (withdrawn) ASTM D 4400.

DIN Version
Sag testing applicator acc. to DIN 55 677 (withdrawn) (EN) ISO 16862.

**Model 458****Group 2****Viscosity Nomogramme and
Viscosity Temperature Comparative Dial**

For rapid conversion between different viscosity units (ASTM seconds, DIN seconds, cSt, Engler degrees,

Krebs-Stormer units, Gardner-Holdt units) at defined temperatures (temperature-dependent viscosity scale).



VISCOFLO® 460 FC

Group 2

Software DIN, EN ISO, ISO, ASTM

Software for rapid conversion between viscosity and efflux time, for use with standardised flow cups. Converts between dynamic and kinematic viscosity. Clearly arranged graphics, easy to use.



RED DEVIL 392

Group 2

Paint Shaker EN ISO, ISO

A world-wide well known machine for grinding, dispersing, mixing – three concepts related to important processes in the

manufacture of paints and lacquers. The RED DEVIL has several decisive advantages: A perfected shaking system with 3-way orbital mixing action achieves optimal dispersing results whilst at the same time ensuring shortest cycles. The operating method of the RED DEVIL is so convincing that it is prescribed by DIN EN ISO for standardizing the dispersing behaviour of pigments.



DISSOLVER 492 I/DISSOLVER 492 III

Group 2

Laboratory-dissolver

The **DISSOLVER 492 I** is a precisely controlled laboratory high speed stirrer. It is suitable to produce colloidal suspensions with very fine solid particles integrated by high speed into fluid, as well as mixing and dispersing of mill feed material within common paint/lacquer matters (Here are clusters of powder-type components disintegrated by shearing force during the dispersing procedure, to cover in ideal case their primary particles with the fluid phase.). A low-noise drive system with continuous adjustable speed as well as high-tech PID electronics to ensure a constant speed even when viscosity - and due to this also the shear rate - changes, are already included in the delivery specification. The **DISSOLVER 492 I** has primary been created for vessel

volume ranges of 0,25 up to 2 liters, and can be operated with a steplessly variable speed of up to 10.000 min⁻¹.

The **DISSOLVER 492 III** equates in function, construction and application/ usage in principle DISSOLVER 492 I, but for a higher vessel volume range of 0,2 up to 8 liters, and can be operated with a steplessly variable speed of up to 12.000 min⁻¹.



Model 290

Group 3

Pycnometer EN ISO, ISO, ASTM

To measure the density of coating materials and similar liquids. Robust and light weight design, made of black anodized aluminium, or alternatively, stainless steel. Available for 50 or 100 ml capacity, also with official calibration certificate.

natively, stainless steel. Available for 50 or 100 ml capacity, also with official calibration certificate.



Model 475

Group 3

Density Ball EN ISO, ISO

For rapid determination of density of liquids. A sphere of volume 100 or 10 ml is immersed in a beaker the contents of which have been previously weighed. The increase in liquid level given in grams (g) corresponds with 100 or 10 x the value of the density. The equipment is easily cleaned after use.



**Model 515****Group 4****Paint Resistance Measuring Instrument**

To measure electrical resistance of paints in the range from 0–20 MΩ. Specially suited to establish characteristics of dipping paints and monitoring spray paints for electrostatic processes. Portable measuring system. Display of measuring value after defined measuring time. Easy to clean dip-in measuring probe with annular gap.

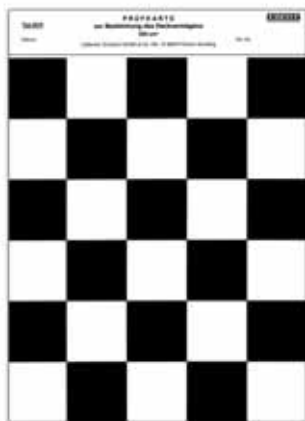
**Model 232****Group 6****Grindometer acc. to Hegman EN ISO, ISO, ASTM, NF**

A robust instrument for gauging the degree of fineness of grind of liquid dispersions of pigments in the range 0–15/25/50/100 μm. The substance is filled into the wedge-

shaped grooves and drawn down with a blade. Rippling occurs at the point where pigments particles are bigger than the depth of the groove measured in μm.

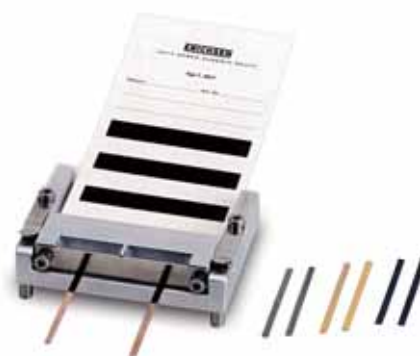
**Model 451****Group 7****Contrast Charts ASTM**

24 test card versions available, in different sizes, patterns and colourings, including special penetration cards for watery systems.

**Model 238****Group 8****Duplex or Triplex Film Applicator acc. to Biddle**

To produce 2 or 3 parallel paint films on test cards under identical and reproducible application conditions. Paint specimens produced for visual

comparison or to build up a colour tone collection. Standard film thicknesses 100/150/200/250 μm.

**APPLICATOR acc. to Bird / BAKER APPLICATOR 286****Group 8****Film Applicator according to BIRD, Model 284**

Special film applicator with 4 gap heights and film widths of 50/75/100/150 mm. Standard gap heights are 50/100/150/200 μm. Instrument made of corrosion-resistant steel.

**Film Applicator BAKER APPLICATOR 286**

Special film applicator with 4 gap heights and film widths of 60/75/100 mm. Standard gap heights are 30/60/90/120 μm. Instrument made of corrosion-resistant steel.

**Model 288****Group 8****Film Applicator System Wasag**

Duplex film applicator for film widths 80/120/180/230 mm. Made of corrosion resistant steel. The two gaps can be chosen as desired from the range 15–2000 μm.



Model 334

Group 8

Centrifugal Film Applicator

To produce specimen panels with an evenly applied paint film of defined thickness. Variable speed from 100–2500 min⁻¹.



Model 358

Group 8

Spiral Film Applicator

Well proven film applicator for any kind of film forming liquid. Particularly suitable for applying films to flexible substrates. Available for

film widths 80/150/220 mm and wet film thicknesses between 10 and 200 µm. Made of stainless steel.



Model 360

Group 8

Quadruple Film Applicator

An inexpensive special film applicator with 4 heights of gaps for widths of film 13/40/60/90 mm. Standard gap heights 30/60/90/120 µm. Also

available for other wet film thicknesses in the range from 15–2000 µm. Model 360 is made of corrosion-resistant steel.



UNICOATER 409

Group 8

Film Applicator ASTM

Motor-driven film applicator for the application of coatings of an even and defined thickness onto glass plates, contrast charts, foils, etc.. Equipped with a multi-functional applicator support appropriate for most of the normally used applicators (spiral film applicators, gap applicators of various

dimensions). Adjustable speed up to 99 mm/s. Maximum application area approx. 330 mm x 345 mm. To be used optionally with glass plate, vacuum suction plate or flexible application substrates.



MULTICATOR 411

Group 8

Film Applicator

A film applicator with variable gap height. Clearance adjustable in the range 0–1000 µm by means of a

micrometer screw (accuracy 1 µm). Available for film widths 80/150/220 mm.



Model 421

Group 8

Staggered-Gap Film Applicator acc. to Krause

Produces 6 or 10 Film stripes of graded Thicknesses in one operation. Film thickness range: 10–500 µm. Suitable for assessing paint

properties in relation to film thickness: opacity, color strength, drying properties etc.



**AUTOSPRAY 481****Group 8****Test Panel Spraying Applicator Type APL 1.2**

This modern and inexpensive spray applicator for test panels has been designed for reproducible application of coating substances onto various substrates. It is easy to operate and can also be used in hazardous areas. The control unit of the AUTOSPRAY allows not only the use of fixed programmed spraying parameters such as step sizes, horizontal stroke speeds, number of spraying strokes and ventilation time, but also permits to adapt to practically all conceivable requirements of coating technology by altering the settings. The AUTOSPRAY 481 is pre-fitted to enable the use of one or two automatic flow cup spray guns. Optionally a material conveyor unit as well as a "cross-path" programme can be supplied.

**COATMASTER 510****Group 8****Film Applicator ASTM**

A combined application- and testing machine, attached with a foil key pad. Especially within the constant precisely defined as well as reproducible application of coating materials it leaves nothing for contingency. It fulfills two essential basic functions - The use for high precision applications and for the determination of

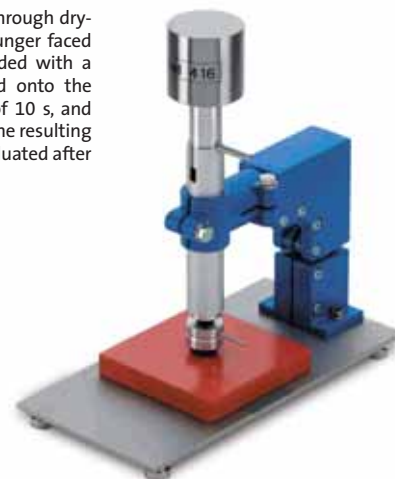
coating materials' drying time characteristics (acc. to DIN 530150 and in comparison to each other)- plus an additional function: The use of the ERICHSEN Hardness Rods 318 and 318 S as well of the Mar Testing rod 435 and the Adhesion- and Scratch-testing Rod 435 S.

**Model 415****Group 9****Drying Time Tester
DIN, EN ISO, ISO**

A simple plunger type press for measuring degree of dryness in accordance with DIN 53 150 in the range from 2 to 7. A glass tube Ballotini dispenser to measure degree of dryness 1 is available as accessory.

**Model 416****Group 9****Through-Dry Tester
EN ISO, ISO**

For testing the degree of through drying of a coating. A test plunger faced with nylon fabric and loaded with a defined weight is lowered onto the test surface for a period of 10 s, and then turned through 90°. The resulting effect on the coating is evaluated after lifting the test plunger.

**Model 432****Group 9****Gradient-oven
EN ISO**

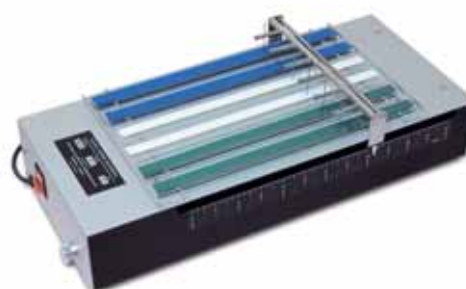
The Gradient-oven, Model 432, is a testing instrument for the assessment of the baking and drying behaviour of paint and powder coatings, resins, plastic materials and similar. The production process can be simulated by programming heat-up speed,

baking temperature, and time. The very good repeatability of measurements allows a remarkably accurate determination of the present limiting values. Depending on the gradient-oven type coatings can be tested with temperatures up to 320 °C.

**Model 504****Group 9****Drying Time Recorder**

Motorised instrument for automatic recording of drying process of paints and similar coating materials. 6 tests

can be performed in parallel. Running time selector for 6, 12 or 24 hours for different drying times.




Model 233
Group 10

Dry Film Thickness Gauge acc. to Rossmann EN ISO, ISO, ASTM

The difference in level between substrate and film surface is gauged by the contact point of the dial indicator.


Measuring range 0-1000 μm in 5 μm divisions.



Model 234
Group 10

Wet Film Thickness Gauge DIN, EN ISO, ISO, ASTM

A hardened and ground double wheel with an eccentric cam in the centre is rolled over a newly applied film. The wetting line on the centre cam is read on a scale as wet film thickness. Total measuring range: 1500 μm , available in 8 different sub-ranges.




Model 296
Group 10

Wet and Dry Film Thickness Gauge acc. to Rossmann EN ISO, ISO, ASTM

Same principle of measurement as Model 233.

For measurements on wet films the contact point is raised by means of a knurled screw and then lowered until it touches the surface of the wet film.



Model 333
Group 10

Wet Film Thickness Gauge acc. to Rossmann EN ISO, ISO, ASTM

Simple operating instrument. The stainless steel „comb“ with tooth lengths varying by equal amounts is applied perpendicular to the wet film and the film thickness can be read on the last tooth that made contact with the wet coating. 3 versions with measuring ranges 120/600/1200 μm .

Model 333 S
Large version acc. to BAST for road marking paint.



Model 433
Group 10

Wet Film Thickness Gauge EN ISO, ISO, ASTM

One instrument only for 4 measuring ranges: 5-100 μm , 100-500 μm , 300-700 μm , 700-1500 μm .

This comb-shaped instrument, made of stainless steel, stands for high accuracy.




Paint Inspection Gauge P.I.G. 455
Group 10

Coating Thickness Gauge DIN, EN ISO, ISO, AS, ASTM

A successful instrument using the standardised wedge cut method. Indispensable for film thickness measurement on any substrate. In the case of multi layer coatings complete and individual layer thickness can be measured.

Measuring ranges:
200/500/1000/2000 μm

Also for adhesion tests in accordance with AS 1580 (method 408.1).



**Model 497****Group 10****Foil Thickness Gauge
EN ISO, ISO**

To measure the thickness of foils, cards, paper, with and without coating. Indispensable for scrubbing resistance tests on Leneta foils and for colour and opacity measurements on contrast cards.

Measuring range:
1000 µm, accuracy 1 µm

**PAINTBORER 518 MC****Group 10****Coating Thickness Gauge
DIN, EN ISO, ISO, ASTM**

For film thickness measurements using the wedge cut technique. Combines the advantages of P.I.G. 455 with greater ease of operation: a conical bore of defined angle is made in the coating. Measuring microscope, easily and accurately focused over the cut out. Minimum specimen damage allows a large number of test points.

Specimen table for extremely small specimens (dia. 10 mm) available as accessory. Due to the mobility of the microscope into two directional axes (turned by 90° from one another) with the possibility of turning the scale, the PAINT BORER 518 MC is especially suitable for the evaluation of elliptical holes that arise with curved specimens.

**PAINTBORER 518 USB****Group 10****Coating Thickness Gauge
DIN, EN ISO, ISO, ASTM**

For measuring the thickness of organic coatings on all substrate using the wedge cut principle; with high-resolution digital microscope (50x magnification, 2 million pixels CMOS image

sensor) for digitally assisted visual detection/collection of circular or elliptical holes directly on the object as well as documentation, for connection to PC/Laptop/WINDOWS-Tablet.

**LAYERCHECK 750 USB****Group 10****Coating Thickness Gauge
EN, EN ISO, ISO, ASTM**

The small, universally applicable thickness gauge, used for non-destructive, fast and precise coating thickness measurements. The LAYERCHECK 750 USB FN provides the magnetic induction principle as well as the eddy-current method. Due to this, it is available in two versions: LAYERCHECK 750 USB F for all non-magnetic coatings on steel (0–3000 µm). LAYERCHECK 750 USB FN for all non-magnetic coatings on steel (0–2000 µm) and all insulating coatings on non-ferrous metals. Both versions are equipped with statistics function, illuminated display, USB Interface, Standard-/ 1-Point-/ and 2-Point-Calibration. Software as free download.

At option: calibration certificate.

**PAINTXPLORER 548****Group 10****Thickness Gauge
DIN, EN ISO, ISO, ASTM**

In accordance with the standardized wedge cut method in which the specimen is cut at a defined angle. It has been developed to extend the range of the application of the PAINT BORER 518 S, especially targeting sensitive drillings, especially into rigid/brittle materials. It is possible that, already at minor eccentric irregular running of the drill used or of its centre axle, such materials can be subject to breaking off of the cutting edges including chipping off. To minimize these limitations the PAINTXPLORER 548, a convenient table top unit, is equipped with an improved rotating/sliding high precision axle-bearing device. It is a laboratory equipment, either be held in hand or used in connection with the measuring stand that is included in the scope of supply.


At option: A "50 x" Measuring Microscope, with illumination.

**PenTest****Group 10****Coating Thickness Gauge
EN, EN ISO, ISO, ASTM**

Inexpensive instrument using the magnetic pull-off method for rapid non-destructive measurement of non-magnetic layers on steel. Measuring result held mechanically. No electrical supply required.

Measuring range: 25–700 µm





SmarTest	Group 10
Coating Thickness Gauge DIN EN ISO, ASTM	
<p>SmarTest is an intelligent wireless sensor for non-destructive coating thickness measurement and relays sensor data via Bluetooth to your tablet, smart phone or to the coating thickness gauge MiniTest 745. The SmarTest app shows the current measuring values, the statistical</p>	<p>evaluation and helps store control and calibration of the sensor. There is an option of the metric (μm, mm) and imperial (mils) formats for display and processing of measuring values. Storage and transfer / download of measuring values is done in the CSV format.</p>
	

MikroTest 5, 6	Group 10
Coating Thickness Gauge EN, EN ISO, ISO, ASTM	
<p>For non-magnetic coatings on steel using the non-destructive magnetic pull-off technique. No electrical current required. Measuring result held mechanically. With unique automatic measuring system for reproducible results, even under extreme measuring conditions.</p>	<p>Mikrotest 5 and 6: 9 analog versions for a total measuring range $1\ \mu\text{m}$ - 20 mm, also for electro-plated nickel layers on various base materials.</p>
	

MiniTest 725, 735, 745	Group 10
Coating Thickness Gauge EN, EN ISO, ISO, ASTM	
<p>New generation of portable coating thickness gauges with a completely new, modern signal processing (SIDSP). For non-destructive, highly reproducible measurement of non-magnetic coatings on steel (F) and</p>	<p>insulating coatings on nonferrous metals (N). Also available as combined version (FN). Supplied with an internal probe, a cable probe or with the possibility of an interchangeable internal/external probe.</p>
	

MiniTest 3100	Group 10
Coating Thickness Gauge EN, EN ISO, ISO, ASTM	
<p>Up-to-date technology in a handy precision instrument. Alphanumeric LCD, touch pad keyboard, micro-processor controlled calibration and measuring sequence, statistic module, bidirectional interface. Designed</p>	<p>for use with 20 different probes (F, N, FN, CN). Total measuring range $1\ \mu\text{m}$ to 100 mm. Other features: Automatic hold and battery switch off. Storage of up to 10.000 measuring data.</p>
	

GalvanoTest	Group 10
Coating Thickness Gauge EN ISO, ISO, ASTM	
<p>To measure metallic single or multi layer coatings on a metallic base by electrochemical removal. Particularly suitable for galvanic coatings. Total measuring range: 0.5–75 μm.</p>	<p>Special electrolytes for more than 70 combinations of coating and base material. Minimum measuring area: 0.25 mm². Interface RS 232 C for printer or PC.</p>
	

QuintSonic 7	Group 10
Ultrasonic Coating Thickness Gauge ASTM	
<p>Ultrasonic Coating Thickness Gauge for up to 5 layers measured in one single measuring action. For layers of paint, lacquer and plastic on plastic, metal, wood, glass and ceramic.</p>	
<p>Measuring ranges: 10 μm...356 μm, 890 μm, 1900 μm, 3900 μm, 7500 μm (at 2375 m/s Sonic Velocity in all layers) Resolution: 0,1 μm. With graphic Display (160 x 160 Pixel Backlight LCD) showing the results. Interfaces: IrDA® 1.0, USB and RS 232.</p>	

**LayerScan 590****Group 10****Coating Thickness Gauge**

Touchless & Non-destructive Coating Thickness Gauge, acc. to the principle of Thermic Layer Examination. The surface of the coating layer to be measured is heated by flashing light. The recorded gradient of temporally reflected heat energy allows some essential conclusions regarding the coating material's thickness, adhe-

sion and characteristics. The method is suitable for dry as well as also for wet coatings. Due to this, several different coating materials in combination with various substrates can be measured in a comfortable as well as precise manner. Also an Online/Inline application is possible.

**Model 266 S****Group 11****Cylindrical Mandrel Bending Tester
EN, EN ISO, ISO, ASTM**

Lever-type instrument for testing the flexibility and the adhesive properties of coatings when these are subjected to bending stresses. With 14 easy changeable mandrels (diameter 2 – 32 mm). Testing with the cylindrical mandrel bending tester

determines the greatest cylinder diameter at which a coating will show cracking or flaking subsequent to bending. Model 266 S allows the testing of samples up to a width of 100 mm.

**Model 312****Group 11****Conical Mandrel Bending Tester
EN, EN ISO, ISO, ASTM**

To establish the limiting extension of coating materials on sheet metal specimens by bending around a conical mandrel (1/8" - 1 1/2" or 3 mm - 38 mm dia.). From the diameter of the mandrel at the point where the crack starts, the maximum relative extension of the coating can be cal-

culated. With rapid clamping device for faster operation.

**Original TABER® STIFFNESS TESTER 362****Group 11****Bendability Measuring Instrument
ISO, ASTM, JIS, TAPPI**

Precision instrument for measuring bendability in accordance with standards for flexible materials (metal and plastic foils, cardboard, paper etc., max. thickness 3 mm). Outstanding measuring accuracy (up to 0.1 %) achieved with motori-

sed measuring process. Analogue and digital versions available, with accessories covering a total measuring range of 0.01-10.000 Stiffness Units.

**Model 295****Group 12****Folding Rulers/SCROLLRULER
EN, EN ISO, ISO, ASTM**

These folding rulers feature for each possible of the concerning required cutting distance the right ruler thickness, without necessity to add them by single 1 mm steps. The Folding Ruler

for Mod. 295/XII is especially even for the cutting distance for tests acc. to Daimler-Benz, also attached with rulers of 1,5 mm thickness. The Folding Ruler for Mod. 295/XIII allows by its

innovative design with ball type top handle, a comfortable as well as fatigue-proof performance. All Folding Rulers are also separately available!

The SCROLLRULER 295/XV is a universal ruler for cross hatch cuts, where the desired cutting distances (6 x 1 mm, 6 x 2 mm, 6 x 3 mm, 11 x 1 mm, 11 x 1.5 mm) can be adjusted very easily as well as comfortable, simply by turning a thumb wheel.



Folding Ruler for Model 295/III: with 10 swivel-mounted rulers of 1 mm thickness /each.



Folding Ruler for Model 295/XII: with 10 of each swivel-mounted rulers of 1 mm and 1,5 mm thickness.



Folding Ruler for Model 295/XIII: with 5 of each swivel-mounted rulers of 1 mm, 2 mm and 3 mm thickness.



SCROLLRULER 295/XV: universal cross cut ruler, adjusted by turning a thumb wheel.

Model 295 I

Group 12

Multi-Cross Cutter EN, EN ISO, ISO, ASTM

Well established, manually guided tool for cross hatch cutting tests. For the application of 6 parallel cuts with a cutting distance of 1 mm between them, for adhesion tests at layers with a thickness of up to

60 µm. Further types with other standard-according cutting distances, for testing the adhesion of layers with higher thicknesses, are also available from the standard delivery range.



Model 295 IX

Group 12

Multi-Cross Cutter EN, EN ISO, ISO, ASTM

Advanced version for manually guided cross hatch cutting tests. For the application of 6 parallel cuts with a cutting distance of 1 mm, for adhesion tests at layers with a thickness of up to 60 µm. To simplify the performance, Mod. IX (as well as also X and XI) has a free turnable axle between handle and head. The axle promotes a more homogeneous spread of the applied scratch force over the full range of cutting width and enables due to this a lower user-depen-

dence of the evaluated results. Many users value the use of this Mod. quite fatigue-less and due to this also more comfortable! By simple turning the unit's interlock ring, the connection between handle and cutter can be locked stiff, if desired. Further types with other standard-according cutting distances, for testing the adhesion of layers with higher thicknesses, are also available from the standard delivery range.



Model 295 XIV

Group 12

Multi-Cross Cutter EN, EN ISO, ISO, ASTM

Due to numerous enquiries of users, now, by Mod. 295/XIV a variously usable single blade instrument for the application of free cuts on curved surfaces is available. It consists of a single cutting tool additionally

covered with an extremely hard layer, mounted in an adaptor block, with holder. A flexible steel ruler, suitable for several of the "curved" applications, is already included in the delivery specification.



VarioCut 404

Group 12

Cross Hatch Cutter EN, EN ISO, ISO, ASTM

Multifunctional applicable tool in the cross-cut test of coatings as well as for standard compliant defined preparation of corrosion tests.

Optionally, the user has a total of five different adapters with various tools available:

Clamping chuck adapter
to attach test tools

Adapter block "Sikkens"
to attach Sikkens tools

Adapter block 45°
to attach test tips

Cross cutter adapter
to attach multi cross cutters

Chuck adapter (rolling)
to attach model 318



Model 525

Group 12

Adhesion Test Apparatus ASTM

To measure adhesion of coatings in accordance with ASTM D 4541 by pulling off stuck on dolly. Robust unit requiring no electrical supply and therefore particularly suited to

application in the field. Complete test case with necessary accessories. 3 versions for measuring ranges 5/10/25 N/mm².



Model 525-B

Group 12

Adhesion Test Apparatus

Special pull off test instrument version for concrete surfaces with 50 mm diameter dollies and measuring range up to 4.5 N/mm².



**Model 304****Group 13****Variable Impact Tester
EN, EN ISO, ISO, ASTM, NF**

ERICHSEN impact tester for testing the strength, formability and ductility of coatings and substrates and the adhesion of coatings. Three versions are available:

Model 304 ASTM
(ASTM D 2794);

Model 304 ISO-1
(ISO 6272-1 – direct impact test)

Model 304 ISO-2
(ISO 6272-2 – indirect impact test)

Optionally, with the corresponding retrofit kit, each model 304 can be converted to a different version.

**Model 305****Group 13****Impact Tester acc. to Wegner
DIN, EN, EN ISO, DIN ISO, ISO**

Portable and handy instrument especially designed for tests on enamel in accordance with DIN EN ISO 4532. Enables the user to carry out tests on site.

Optional accessory: Special support for testing plastic surfaces.

**Model 471****Group 13****Bend and Impact Tester
IVLV**

The performance of a coated sheet metal panel, previously formed to a U-shape when it is deformed by conical bar in a sudden blow can be examined.

**MULTI GRIT TESTER 508 VDA****Group 13****Stone Hammer Blow Testing Instrument acc. to VDA
EN ISO, ISO, Peugeot-Citroen, Renault, VDA**

Originally developed in reconciliation with the Association of Car Manufacturers (VDA), it is an even currently still valid "Stone Hammer Blow Tester" which meets the prescriptions of national as well as international standards. The shoot procedure acc. to VDA acts with defined sharp edged Steel Shot accelerated by compressed air in an

shoot/impact angle of 54°. With furthermore, it is possible to equip the MULTI GRIT TESTER 508 VDA within a few minutes with the conversion kit (offered as an accessory) for carrying out tests in accordance with the specifications of Peugeot-Citroën (vertical impact).

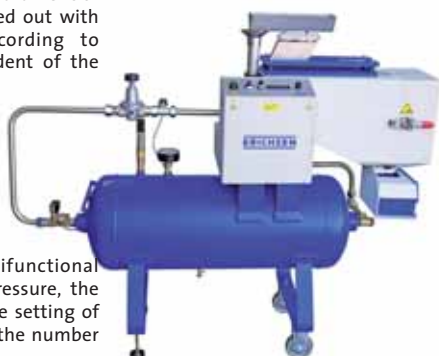
**MULTI GRIT TESTER 508 SAE****Group 13****SAE Stone Hammer Blow Testing Instrument
ASTM, SAE, GM, VOLVO**

The MULTI GRIT TESTER 508 SAE features a good repeatability and reproducibility of the test results.

of tests conducted (total/ temporary) can be read off alternatively.

It is equipped with an adjustable impact angle. The bombardment of the test panels is carried out with determinate grit (according to ASTM D 3170). Dependent of the specifications of further standards other shot materials can be used.

The shot is entered automatically using an adjustable vibratory feed. On a multifunctional display the working pressure, the duration of the test, the setting of the vibratory feed and the number

**RIMpact****Group 13****Impact Cabinet for Stone Chipping Simulation at Wheel Rims**

Impact Cabinet for Stone Chipping Simulation at Wheel Rims; an accessory for Multi Grit Tester 508 SAE. Enables the user to test complete rims i.e. in principle also several other specimen, which up to now – due to their big sizes – would have to be previously segmented by cutting them. The Wheel Rim to be tested is turnably fixed, so each single spoke can be tested differently by choice with varying combinations of Shot Gravel, Shoot Cycles, Shot Gravel quantities, Shoot Periods and Shoot Pressures. So, the user is free to use it in

accordance to the current standards' stipulations he has to follow as well as for individually tailored tests.



Scratch Test Station 450

Group 14

Scratch Test Station acc. to BMW/ERICHSEN BMW

Versatile instrument for the execution of scratch resistance tests on lacquered and plastic surfaces. Supplied with a servomotor-driven X-Y specimen table and a universal tool holding fixture with vertical linear guide and pneumatic tool feed motion. The Scratch Test Station is operated by means of a

touch-screen control panel. Adjustable are the test speed of the movements in the x and y direction, respectively, the scratch length in x or y direction respectively, the selection of the required scratch pattern (linear/curved/plane) as well as the preselection of the number of the test cycles.



Model 263

Group 14

Indentation Hardness Tester acc. to Buchholz EN, EN ISO, ISO

A steel block with an inserted impression body is applied onto the test surface and produces a pressure mark, the length of which is measured with a microscope. The

impression hardness in accordance with Buchholz is established from the length of the impression, using the standard table.



TriForcePencil 293

Group 14

Scratch Hardness Tester EN, ISO, EN ISO

Pencils of increasing hardness are pushed across the surface of the coating at a defined angle and under a defined load. The film hardness is established by the two hardness grades between which there is a limiting effect of surface marking and indentation into the surface. The advanced ERICHSEN TriForcePencil 293 is (due to several enquiries especially also from the Asian market) equipped with three test loads (5 N/7,5 N/10 N) instead of usually only one (7,5 N). The weight block of the TriForcePencil 293 is equipped with three pencil guides,

which apply by the principle of leverage the appropriate test load on the pencil tip, according to their positioning. Setting the correct height or the defined projection of the pencil out of the weight block, is ensured by rotating an adjusting screw with distance tip.



LINEARTESTER 249

Group 14

Scratch Hardness Tester EN, EN ISO, ISO

To establish the ability of a surfaces to resist damage by scratching, also for several other tests: Scribe/Scratch tests, To and fro-cycle abrasion tests, Crockmeter tests, MEK tests, tests determining the resistance against solvents in general or wipe test, respectively. The required scratching force in the range of 0.5 to 40 N is set by moving the weight along the

reciprocating beam, making use of a setting scale. When testing insulating coatings on conducting substrates, an electric recognition of the through-scratching offers an additional security for setting the scratching force. There are three fixed as well as one freely programmable test speeds available. A wide program of available test tools is tailored to cover a lot of testing requirements.



Model 456 USB

Group 25

USB Microscope

High-resolution digital microscope to be connected with PC/Laptop: 2 million pixels CMOS image sensor, integrated light (adjustable), video function, live view, direct image capture directly from the object, shootings with microscopic precision, scalable precision measurement.

The scope of supply includes: Camera with USB cable, 1 tube stand for 20x magnification, 1 tube stand for 40x/200x magnification, 1 swivel-type special stand, software CD, instructions.



Model 299/300

Group 14

Pendulum Damping Tester EN ISO, ISO, ASTM

Damping of the oscillations of a pendulum resting on the coating material in accordance with the standards. Two pendulum versions

with automatic adjustment: in accordance with Koenig and Persoz. In addition, two different measuring modules: basic version with manual pendulum excursion and automatic version. Measuring values are shown on the digital display of the control terminal.





Model 318/318 S

Group 14

Hardness Test Pencil

The Hardness Test Pencil 318 is a well tried and extremely useful scratch hardness tester in the form of a pocket instrument. Also suitable for tests on curved surfaces. For a convenient operation on surfaces that are highly sensitive to scratches the Hardness Test Pencil 318 S

is equipped with a rolling head so that only the test tip used can leave a scratch on the test surface. Supplied with a carbide ball tip of 0.75 mm dia.; optionally 0.5 mm or 1.0 mm dia. Test load 0 - 20 N divided into 3 measuring ranges using 3 spiral springs.



SCRATCH HARDNESS TESTER 413

Group 14

Scratch Hardness Tester
DIN, EN, ISO

Compact rotary table instrument for determination of the scratch hardness and scratch resistance of lacquered, glass or plastic surfaces (especially HPDL coatings). If proceeding in the appropriate manner, it is also possible to test small parts

of different geometries. Four interchangeable diamond or carbide test tools with defined test geometries are available. Including two weights movable on the graduated load arm, load range 0.01 to 1 N and 0.1 to 10 N.



SCRATCH HARDNESS TESTER 430 P

Group 14

Scratch Hardness Tester
EN, EN ISO, ISO, ASTM

Multifunctional machine for testings against mechanical influences: Cross Hatch Cutting Test, Scratch Resistance, Writing Effect. Adjustment of the test/scratch force (up to 50 N) manually (Mod. 430 PI) or electromotive (Mod. 430 PII) by pressing key buttons. 9 preset cutting patterns in accordance to the common standards as well 1 free adjustable cutting pattern. 2 speeds and 2 cutting path lengths, to be combined user-defined free. With quick clamping device for the specimen to be tested and optically indication for through cutting of insulating layers on

metallic substrates. The only world-wide established machine for testing the scratching resistance of "leather type structured" plastics materials for car interiors. Due to this already successfully established at a lot of well-known nameable car manufacturers as well as at a lot of their suppliers.



Model 435

Group 14

Mar Tester acc. to Oesterle

The pocket instrument model 435 serves to determine the scratch resistance of lacquered and plastic surfaces. The test body (plastic, copper

or steel disc) is applied with a preset force and drawn across the test surface. Spring force 0 - 20 N, divided into 3 measuring ranges.



Model 435 S

Group 14

Adhesion and Scratch Resistance Tester

When using Model 435 S, the direction of the test movement is rotated by 90° so that the adhesion of coloured markings (e. g. of the dials of speedometers) can be tested by "lateral slipping". It is particularly

suitable for testing the scratch resistance of surfaces against "blunt" effects where the application of the Hardness Test Pencil, Model 318/318 S has turned out to be too aggressive.



Original TABER® ABRASER 352

Group 15

Abrasion Test Instrument
DIN, EN, EN ISO, ISO, ASTM

Internationally established abrasion test instrument. Standardised tests for plastics, decorative coatings, paints etc.. Suitable for abrasion simulation of all types by applying appropriate abrading wheels and the use of a wide range of accessories. Also available as dual version for simultaneous testing of two specimens.



Original TABER® LINEAR ABRASER 364

Group 15

Abrasion Test Instrument

Instrument for testing the abrasion resistance as well as the scratch hardness of finished products of any size or shape. The free-floated test head of the Linear Abraser follows the contours of every sample. Therefore particularly suitable for testing shaped plastic parts, automotive components, printed graphics, optical products, rub-

ber, leather and textiles. Equipped with TABER®'s famous abrasives or with a universal attachment for customised test means. Optional attachments convert the Linear Abraser to a Scratch Tester or a Crockmeter.



Model 494 MC

Group 15

Washability and Scrub Resistance Tester

Robust instrument for standard tests of washability and scrubability as well as cleanability of emulsion

paints and similar coating materials. Available accessories: standard brushes, PVC foils, dosing pump.



Model 241

Group 16

Chalking Rate Tester acc. to Kempf DIN

Damp photographic paper is pressed by a rubber pad under defined force onto the film surface in accordance with DIN 53 159. Evaluation of chalking mark by comparison with sample scale.



PICOGLOSS 560 MC-X

Group 17

Gloss Meter

The PICOGLOSS 560 MC-X actually belongs to the smallest portable gloss meters available. It is smaller than a PC mouse and therefore particularly suitable for use in situ. The universal 60° measuring geometry and the automatic change-over of mirror-gloss make this instrument suitable for a wide range of applications. The PICOGLOSS

560 MC-X features an automatic calibration as well as an extremely long-life LED as light source and a USB interface and integrated statistic function. The instrument is operated by a round cell, the capacity of which is sufficient for at least 10.000 measurements. Measuring ranges: 0-150 or 150-1000 gloss units.



PICOGLOSS 560 MC-XS

Group 17

Gloss Meter

The PICOGLOSS 560 MC-XS is, as well as the PICOGLOSS 560 MC, one of the smallest Glossmeters ever. The main difference to the 560 MC is the remarkable small aperture of the 560 MC-XS (round, with a diameter

of 3 mm), which has been developed due to numerous enquiries from potential users (up to now, mainly from the Automotive matter). It enables now the gloss measurement even on small parts.



PICOGLOSS 562 MC

Group 17

Gloss Meter

The two-angle gloss meter with the measuring geometries 20°/60° is one of the smallest portable gloss measuring instruments which have ever been designed. The measuring geometries 20°/60° and the automatic change-over of mirror-gloss meet the requirements of the mostly used

gloss ranges i. e. high and medium gloss. The PICOGLOSS 562 MC is provided with an automatic calibration as well as extremely long-life LEDs as light sources and a USB interface. The instrument is operated by two round cells the capacity of which is sufficient for at least 10,000 measurements.

Measuring ranges 20° mode:
0 - 150 and 150 - 1999 GU, respectively.

Measuring ranges 60° mode:
0 - 150 and 150 - 1000 GU, respectively



**PICOGLOSS 503****Group 17****Gloss Meter
DIN, EN ISO, ISO, ASTM**

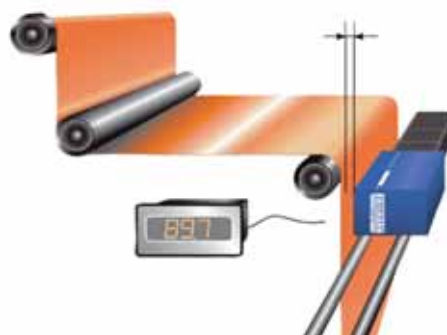
A compact portable battery-operated gloss meter in SMD-Technics with high accuracy and three measuring geometries of 20°, 60° and 85°. In case of e.g. high gloss metallic or chromium-plated surfaces the instrument switches over automatically to mirror gloss measurement. The integrated USB (Mini)

as well as Bluetooth® interfaces enable the data transmission to a PC. Additionally, also the power supply can be provided through the integrated USB (Mini) interface, by a PC. A Data Analysis Software is already part of the delivery specification.

**GLOSSMASTERONLINE 507****Group 17****Gloss Meter Facilities
DIN, EN ISO, ISO, ASTM**

Consisting of measuring head and supply and display unit for non-contact gloss measurement on the process line. 10 mm measuring distance. Built-in calibration standard and

dust protected versions on request. An electrically controlled traversing device carrying the measuring head can also be supplied.

**SPEKTROMASTER 565****Group 18****Color and Gloss Unit
DIN, EN ISO, ISO, ASTM**

The overall appearance of a product is influenced by color and gloss. A sample of the same color but higher gloss level is visually perceived darker and more saturated than a low gloss sample. In order to get a uniform appearance, both attributes need to be controlled. The Spectrometers of the very most other suppliers are only able to measure the color value. In comparison with this, the SPEKTROMASTER 565 is able to measure color and gloss both simultaneously! Thus, the cause of a mismatch can be clearly defined in any situation.

color (geometry 45/0) and gloss (geometry 60°).

- SPEKTROMASTER 565-D, for simultaneous measurement of color (geometry 8/d) - (Ullbricht'sche Kugel) - and gloss (geometry 60°).



Two different versions are available:

- SPEKTROMASTER 565-45, for simultaneous measurement of

MATCHMASTER 425 MC**Group 18****Colour Comparison Cabinet
DIN, EN, EN ISO, ISO, ASTM**

Microprocessor controlled colour comparison cabinet. Automatic operation based on manually preset programme sequences. 3 types of illuminants: A, D65 and TL84. Facility for adding UV light to clarify response to the fluorescent effect.

Control panel with foil pad keyboard and LCD. Display of operating hours and number of switching cycles for each light source.

Accessories: Pivoting specimen table, light diffusor.

**MATCHMASTER 425 MC II****Group 18****Colour Comparison Cabinet
DIN, EN, EN ISO, ISO, ASTM**

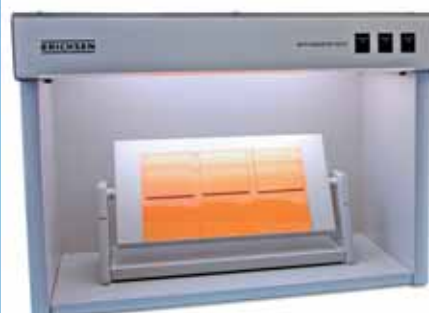
The Standard Light Cabinet MATCHMASTER 425 MC II is a colour comparison instrument with five different light sources (D65, TL84, A, TL83, UV) for perfect assessment and comparison of colour under various light types. A light diffuser provides a uniform distribution of light. Upon request light types can be exchanged, e.g. CWF (cool white fluorescent). A Calibration Certificate (light quality) is included in the scope of supply. An electronic light automatism enables a programmable automatic change of light sources in connection with adjustable

times of illumination. The user can programme a sequence of the individual light types (up to 10 changes) in any desired order.

**MATCHMASTER 425 III****Group 18****Colour Comparison Cabinet
DIN, EN, EN ISO, ISO, ASTM**

The standard light cabinets MATCHMASTER 425 III and 425 IV are colour comparison instruments with three light types. There are three standard light types available: D65, A and TL84. It is possible to switch over automatically or manually between

these three standard light sources at arbitrary time intervals in any desired order. Each cabinet comes with a Test Certificate (light quality). Both bench models consist of metal sheets lacquered conforming to standards and can be assembled without any tool within some minutes. The colour comparison cabinets are open at the front side. A control panel with illuminated toggle switches - the symbols of the three light sources are shown above - provides an easy operation of the instrument.



MATCHMASTER 425 IV

Group 18

Colour Comparison Cabinet DIN, EN, EN ISO, ISO, ASTM

The standard light cabinets MATCHMASTER 425 III and 425 IV are colour comparison instruments with three light types. There are three standard light types available: D65, A and TL84. It is possible to switch over

automatically or manually between these three standard light sources at arbitrary time intervals in any desired order. Each cabinet comes with a Test Certificate (light quality). Both bench models consist of metal sheets lacquered conforming to standards and can be assembled without any tool within some minutes. The colour comparison cabinets are open at the front side. A control panel with illuminated toggle switches - the symbols of the three light sources are shown above - provides an easy operation of the instrument.



TINT TESTER 527

Group 19

Brightness Measuring Instrument DIN, EN, EN ISO, ISO, ASTM

Special laboratory version for dark paste type test layers, with 4 1/2 digit LED display and special measuring head. In addition to tinting strength measurement in accordance with

ASTM D 3265/2745 also for standard brightness measurements. Can be equipped with BCD/RS 232/analogue output.

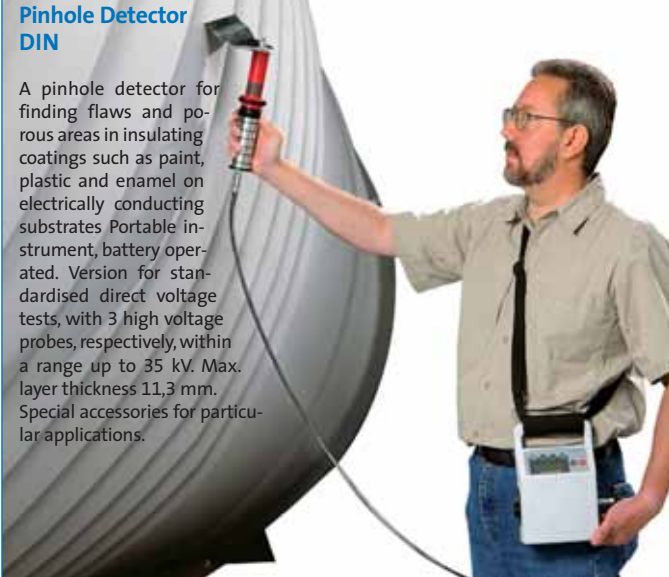


PoroTest 7

Group 20

Pinhole Detector DIN

A pinhole detector for finding flaws and porous areas in insulating coatings such as paint, plastic and enamel on electrically conducting substrates. Portable instrument, battery operated. Version for standardised direct voltage tests, with 3 high voltage probes, respectively, within a range up to 35 kV. Max. layer thickness 11,3 mm. Special accessories for particular applications.



Model 426

Group 21

Scratching Tool acc. to van Laar EN ISO, ISO

A practical instrument with tungsten carbide tip 0.5 mm in diameter. The instrument is used for standardised scratching of corrosion test samples.



SCRATCHMARKER 427

Group 21

Scratching Tool EN ISO, ISO

Portable instrument to apply defined scratches through coatings on specimen panels used for corrosion tests. Compact construction for

fatigue-free operation. Scratch tool with van Laar geometry. Defined adjustment of the depth of the scratch in increments of 25 µm.



HANDCUTTER 428

Group 21

Scratching Tool acc. to Clemen EN ISO, ISO

A practical instrument with tungsten carbide tip acc. to Clemen. The instrument is used for standardised scratching of corrosion test samples. A test tip acc. to van Laar is additionally available.



**SOLVENTCHECKER 434****Group 21****Corrosion Test Instrument**

Simple and practical instrument for testing paints and plastics for their resistance to chemicals under static conditions giving results simultaneously for the effects of liquids and vapours as well as in the threshold area. 4 tests can be performed in parallel.

**Model 463****Group 21****Scratch Stylus acc. to Sikkens EN ISO, ISO**

This hand operated instrument complete with carbide cutting tip provides a convenient means of scoring a 1 mm (optional 0.3, 0.5 mm or 2 mm) wide rectangular track in a surface coating - for corrosion tests.

**SOLARBOX 522/522 RH****Group 21****Light Exposure Test Apparatus EN ISO, ISO, ASTM, UNI**

Compact instrument to determine the resistance to exposure to sun light using a Xenon high pressure lamp (1.5 kW or 2.5 kW). Adjustable level of irradiance, uniform illumination by special mirror system, exchangeable filters for variable UV fraction. Four versions available:

- SOLARBOX 522/1500, 522/3000
- SOLARBOX 522/1500e, 522/3000e (each without and with microprocessor controls)

Light Exposure Test Apparatus - SOLARBOX 522/1500e RH - SOLARBOX 522/3000e RH are extended versions of Model 522/1500e and 522/3000e with additional control/monitoring of relative humidity in the test chamber during the test.

Optional: Programmable flooding system for periodic wetting of specimens.

**Machu-Test-Bath 530****Group 21****Machu-Test-Bath QUALICOAT**

Test instrument for the execution of a short-term corrosion test which lasts over a period of 48 hours. This test is used to obtain the QUALICOAT labels (quality community for industrial coating). The cross-cut of the coating is applied with Mod. 463, Sikkens scratching tool.

**Bac Ford-Bath 531****Group 21****Bac Ford-Bath AFNOR, EN ISO, Renault, PSA**

Immersion-Test to determine the resistance of a coating to the immersion in deionised water thermostated to 40 °C +/- 1 °C. The test plates are immersed under an angle of 15° during several days.

**HYGROTHERM 519 / 519 FA/SA****Group 21****Humidity Cabinet DIN, EN, EN ISO, ISO, ASTM**

Fully automatic corrosion test apparatus for standardised tests in condensation water climate with and without SO₂ addition, using a programmable logic control (PLC) for the automatic sequence, i.e. control of heating, acid feeding and draining, filling and draining of the bottom trough water tank as well as evacuation and replacement of air (manual operation also possible). Test chamber volume 300 l. Model 519 SA equipped with a semi-automatic control system, i.e. acid draining, evacuation and replacement of air as well as the control of the heating system are executed automatically.



HYGROTHERM 529

Group 21

Humidity Cabinet EN, EN ISO, ISO, ASTM

For tests of bulky parts in condensation water climate (without addition of gas), e. g. in accordance with (EN) ISO 6270-2, this instrument with a test chamber capacity of 1000 l or

2000 l is available. The instrument consists of a control unit and a separate test chamber in rectangular design.



Bandal Wheel 532/I Bandal Wheel 532/II

Group 21

Accelerated Weathering Instrument ISO, NF

Photo-ageing instrument for acceleration of natural weathering - for "dry" (532/I) and "wet" (532/II) cycles.

In a compact and light form, the Bandal Wheel integrates all the necessary characteristics of a real equipment for accelerated weathering. All used materials and components, are specially chosen for extreme reliability.



Cathodic Delaminator, Model 602

Group 21

Corrosion Quick Test

Used for rapid checking of product quality and frequently quality control of coated metals. The apparatus consists of a control unit and a temperature control vessel (immersion container) with 8 test receptacles and circulator. Each test vessel has its own constant current source. So you can use up to 8 specimen for testing, independently of each other.

The cathodic delamination allows the determination of infiltration of the coating in the damaged area and erroneous pretreatments can be made visible (formation of bubbles during pinholes, scratches or stone impact).



Model 606-Basic

Group 21

Corrosion Test Apparatus for Salt Spray and Condensation Tests DIN, EN, EN ISO, ISO, ASTM, BS, DEF, ECCA, JIS, NF, SIS

The compact Corrosion Testing Instrument, Model 606-Basic, to perform salt spray and condensation tests, is made of impact resistant, ecofriendly polypropylene material and is delivered in a rectangular design. It consists of a test chamber, available either of 400 l or 1000 l

capacity, with a built-in control unit and built-in storage tank for the spray solution as well as the necessary control instruments. A dosing pump serves for an infinitely variable adjustment to achieve optimum consumption of spray solution.



Model 606

Group 21

Corrosion Test Apparatus for Salt Spray Tests EN, EN ISO, ISO, ASTM

To carry out the mostly required salt spray tests and condensation water tests in accordance with the current standards. Corrosion test apparatus with circular or rectangular chamber of plastic construction system.

Corrosion testing equipment consisting of regulation unit including salt-solution-reservoir with operator friendly controls and up to 2 individual test chambers selectable with volumes of 400 l, 1000 l and/or 2000 l. Special dimensions upon request.



Model 608

Group 21

Corrosion Test Apparatus for Alternating Tests EN, EN ISO, ISO, ASTM, VDA, VW

For testing with cycles of changing corrosive effects in accordance with e.g. VDA 621-415. Basic concept, design details and dimensions as for Model 606 consisting of a regulation unit including salt-solution-reservoir and up to 2 individual test chambers

With touch screen, for the display of the present projected and the actual states and for the input of the test conditions selectable with volumes of 400 l, 1000 l and /or 2000 l. The control and adjustment of the test instrument is effected by a Siemens S7-200 PLC (programmable logic controller).



**CORROTHERM 610/610 E****Group 21****Corrosion Test Instrument
EN, EN ISO, ISO, ASTM, VDA, VW**

To carry out the mostly required fog tests and condensation water tests in accordance with the current standards. The test instruments CORROTHERM 610/610 E are available with two different chamber capacities each (400 l or 1000 l). The version 610 is

equipped with a key control for test selection. The more sophisticated CORROTHERM 610 E is provided with a micro controller offering the possibility of programming individual test sequences. All relevant test parameters are displayed on a multiline LCD.

**Corrosion Test Unit 618****Group 21****Corrosion Test Instrument
EN, EN ISO, ISO, ASTM**

Besides the usual applications such as salt spray test and cyclic corrosion tests, the specimens can be stored and tested in an atmosphere with controlled humidity.

Constant settings, as well as rising and falling ramps for temperature and humidity can be programmed quickly and easily using a display with "Touch" function.

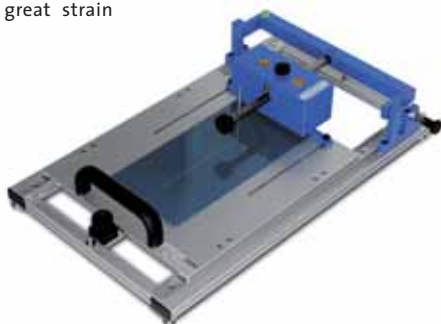
The Model 618 is ideal for using fast ramps for temperatures or rel. humidity or for slowly increasing/decreasing over several hours.

An additional air conditioner allows the operator to carry out low-temperature cycles down to -40 °C.

**CORROCUTTER 639****Group 21****Test Panel Scratcher
EN ISO, ISO**

Comfortable, manual instrument for fatigue-free application of defined scratches on coated specimen panels intended for corrosion tests. Provided for use of scratching tools in accordance with Clemen, van Laar and Sikkens frequently used in practice. Avoids the great strain

usually put to fingers and wrists when scratching specimen in large series. Using adequate scratch templates available as accessories, it is possible to apply 90° cross scratches as well as 60°/120° St. Andrew's cross scratches.

**GTH 1170****Digital Quick-response Thermometer**

Quick response measurements on surfaces, in liquids, air/gases etc.. Incl. Surface Probe GOF 400 VE.

High precision, low power consumption, min-/max-value memory, hold function, auto-off function, down to -25°C ambient temperature, °C and °F, offset/scale

**GTH 175/PT****Digital Precision Pocket
Thermometer**

High-precision measurements in liquids, core measurements (using insertion probe), for air/gases or as reference device for calibrating other, more expensive systems! Battery operation, complete with probe.

**GLF 100****Conductivity Measuring Device**

All-purpose conductivity measuring device with electrode, adjustable.

Main field of application:

- Water,
- Waste Water,
- Chemical Solutions



GFTH 95

Hygro-/Thermometer

Quick-response humidity and temperature measurements in EDP rooms, museums, galleries, churches, office complexes, workshops, storage rooms, swimming-baths, private buildings, greenhouses, for refrigeration engineering, air conditioning, for building sites/technology, for inspectors or rendering of expert opinions etc..



GMI 15

Digital Indicator for Moisture in Wood and Buildings

Device for high-speed determination of moisture in buildings, contracting work etc. The GMI 15 allows detection of moisture in wood down to a depth of approx. 3 cm and in concrete or wash floor down to a depth of approx. 4 cm. Detection of moisture behind ceramic tiles and/or various wall or floor coverings. To check moisture simply place device on the surface to be measured - no injection into the measuring object required.



GMH 3431

Digital Precision Conductivity Measuring Device

Including conductivity measuring cell, double display for conductivity and temperature; display of resistance, salinity or TDS; automatic temperature compensation, serial interface; battery and d.c. operation.



GMH 3350

Humidity, Temperature and Flow Rate Measuring Device

Double display of humidity and temperature. Incl. Humidity- and Temperature Probe, TFS 0100 E. Compact probe for humidity and temperature measuring resp. flow rate measuring (probe exchange without re-calibration). Calculation of dew point temperature, dew point distance and enthalpy. Additional NiCr-Ni-socket for surface measurement. Min-/Max value memory, Hold function. Serial interface, device can be connected to bus system (up to 5 devices can be connected to one PC interface). Battery/d.c. operation, 2 integrated logger functions. Optical and acoustic min-/max- alarm. Real-time clock with day, month and year.



GMH 3531

pH-/Redox-/Temperature Measuring Device

Double display for pH or redox and temperature. Incl. Additional Set GMH 55 ES and Redox Electrode GE 105 BNC. Redox mode allows for automatic conversion to a hydrogen system. Automatic or manual temperature compensation. Automatic buffer detection. Automatic detection of measuring value stability. rH-measurements. Min/Max value memory, Hold function. Evaluation of probe quality. Battery and d.c. operation. Serial interface, device can be connected to bus system (up to 5 devices can be connected to one PC interface). Device can be used as thermometer, too.



GMH 3851

Digital Material-Moisture Measuring Device with Data Logger

This instrument is indispensable for the documentation of material state by quality assurance systems. Incl. Wood Moisture Measuring Set 38 HF. By means of the integrated data logger there can be recorded up to 10000 measuring values and processed on demand. Additionally there can be 4 material curves individually programmed by the user to data acquired by reference measurements with dry ovens or CM-method. This instrument finally makes the usage of paper correction tables and so on obsolete.









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- Stretch Draw Test
- Deep Draw Test
- Specimen Preparation
- Sheet Metal Marking

Surface testing



- Formability of Coating Material
- Viscosity and Consistency
- Density
- Electrical Properties of Paints
- Grain Size and Pigment Dispersion
- Opacity and Hiding Power
- Film Application
- Drying
- Film Thickness
- Flexibility
- Adhesion
- Impact Resistance
- Hardness
- Abrasion Resistance and Scrubbability
- Chalking
- Gloss
- Colorimetry
- Brightness
- Porosity
- Print Coat Instruments
- Special Test Instruments

Corrosion testing



- Specimen Preparation
- Condensation Water and Salt Spray Test
- Cyclic Corrosion Test
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