

testing equipment for quality management

**MATERIALS TESTING**

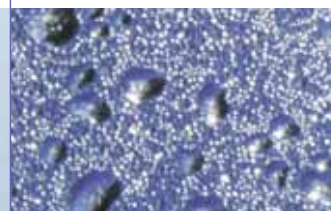
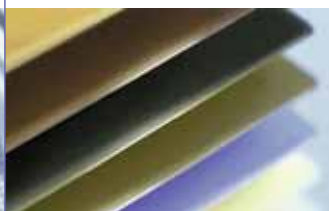
Tensile and Pressure  
Testing Machines  
Measuring Devices  
Display Devices

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



1900                      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 Organization (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 Chemicotechnical 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, 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.

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 show-rooms, where we can convince you of our competence. Please con-

sult 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

1949

*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.*

1975

*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.*

1998

*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.*

2006

*In the course of almost 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.*

## Measuring Facilities. Ten



ERICHSEN measuring instruments for stationary and mobile measurements enable an easy and cost-effective determination of mechanical quantities.





## History and Compression Tests, Special Applications

The assessment and comparison of materials derive already from the prehistoric era. In this way the primitive man succeeded in getting the spear running through the body of the deer, and the ploughshare being helpful to cultivate the soil. The stone axe had to be harder than the wood to be cut, and the chisel more resistant than the stone to be hewed.

Leonardo da Vinci, the artist, inventor and scientist of genius of the 15th century, manufactured among others a simple tensile testing instrument for wires

- an early forerunner of modern universal testing machines. In the course of the last centuries the branch "material testing" gained more and more in importance.

The comparative assessment of different materials has developed to a high-tech science - the modern, mechanical material testing. Today this makes it possible to stress in a defined manner kinds of materials or components and to measure and evaluate exactly and reproducibly the resulting forces. Using perfected mechanical

testing instruments and systems as well as an ultra-modern mensuration and control techniques, the ERICHSEN testing machines not only comply with the today's requirements, but they are already provided to a high degree for future applications, too.

On the following pages you will find short descriptions of our products for material testing. The determination of the physical quantities is effected by mobile, easy-to-handle measuring instruments or by

stationary test facilities. Our testing instruments meet all standards currently used in the industry and laboratories (DIN, EN, ISO).

Detailed technical information will be sent immediately upon demand.

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## 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



UNI MAT® 050 / UNI MAT® PLUS 050



Tensile and Pressure Testing Machine

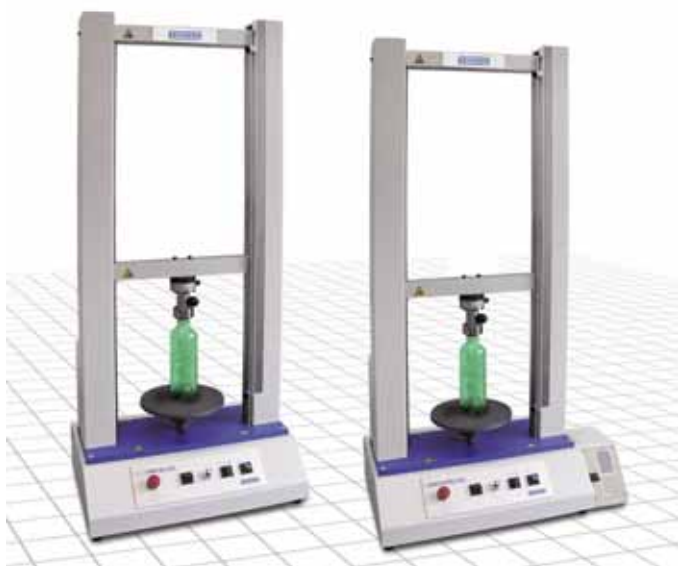
The UNIMAT® 050 is a high-quality, cost-effective and place saving testing machine for forces up to 2 kN. It is portable, easy to handle and is provided with a 1-column load frame. Due to the low weight and the small base this modular system can be placed on any laboratory table without any problem. In spite of the small size and low weight the 1-column testing machine is extremely powerful.

testing of paper, textiles, foamed materials and springs to tests of components. The UNIMAT® 050 is particularly suitable for in-process control and incoming inspection, for demonstration and instruction purposes at schools, and it is a dependable test equipment in quality assurance systems.

The UNIMAT® 050 is designed for mechanical tests carried out with low forces. It is used in a wide field of applications ranging from testing plastics and elastomer as well as

The UNIMAT® PLUS 050 corresponds to the standard version of the testing machine, but it is equipped with an integrated multi-measuring system PHYSIMETER® 906 MC-E. Thus force-displacement and speed control as well as cycle tests can be effected.

UNI MAT® 052 / UNI MAT® PLUS 052



Tensile and Pressure Testing Machine

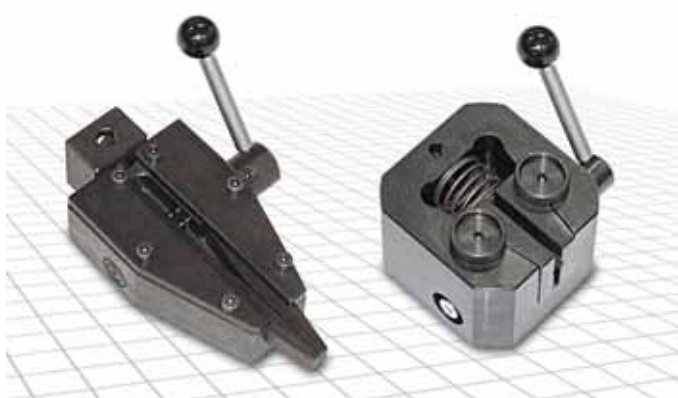
The UNIMAT® 052 is an easy-to-handle, high-quality testing machine with a 2-column load frame and a rugged and long-life industrial drive. The UNIMAT® 052 has been developed to meet the demand for a budget-priced testing machine for routine work and standard applications in quality assurance.

of joining and pressing processes on precise mechanical components as well as peak pressure tests on rewinding tubes and pipe sections. In the packaging and foodstuff industry for example the stackability of plastic containers and cardboard articles is tested; snaps are tested by opening and closing forces, tin lids by pull-off tests, plastic foils and tubing by tearing and parting tests as well as carrying handles by tear-off tests.

Such applications are more and more frequently found in functional tests of components and in standard material tests. A clear advantage of this machine for the customer is its particular easy and compact operation. In the "functional testing of components" there is a variety of applications: Representative are the tests of plug contacts and spring-finger connectors in the electrical industry, the checking

The UNIMAT® PLUS 052 corresponds to the standard version of the testing machine, but, in addition, it is equipped with an integrated multi-measuring system PHYSIMETER® 906 MC-E. Thus force-displacement and speed control as well as cycle tests can be effected.

Mechanical Grips



Mechanical Grips

ERICHSEN offers a great variety of mechanical grips for testing a great number of materials and shapes of specimens. The grips fit easily to all ERICHSEN testing machines because of the simple plug-in system. Furthermore, it is possible to install smaller grips or test tools into larger

grips by means of a fitting, so that it is not necessary to remove the grips which are often heavier. ERICHSEN grips cover a force range up to 5 kN. A wide choice of jaws ensuring a safe fixing of most different materials, is available.

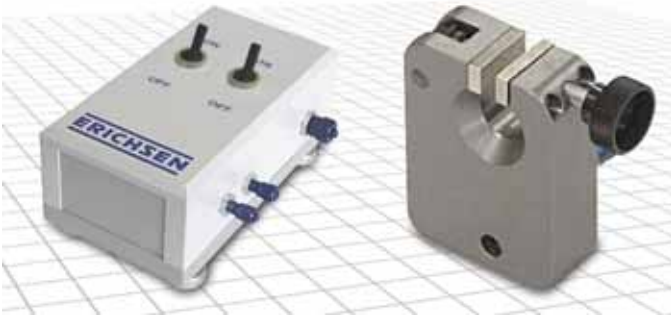


Pneumatic Grips

Pneumatic Grips

ERICHSEN offers a great variety of pneumatic grips for testing a great number of materials and shapes of specimens. The grips fit easily to all ERICHSEN testing machines because of the simple plug-in system. Furthermore, it is possible to install smaller grips or test tools into larger

grips by means of a fitting, so that it is not necessary to remove the grips which are often heavier. ERICHSEN grips cover a force range up to 5 kN. A wide choice of jaws ensuring a safe fixing of most different materials, is available.



Universal Measuring Device

Universal Measuring Device

The Universal Measuring Device in connection with the PHYSIMETER® 906 MC-E is the ideal Measuring system to measure various physical quantities like force, displacement, torque and rotation angle simultane-

ously. By virtue of the modular design of the instrument a short-term assembly as well as a retrofitting for special measuring tasks are possible.



Special Measuring Device

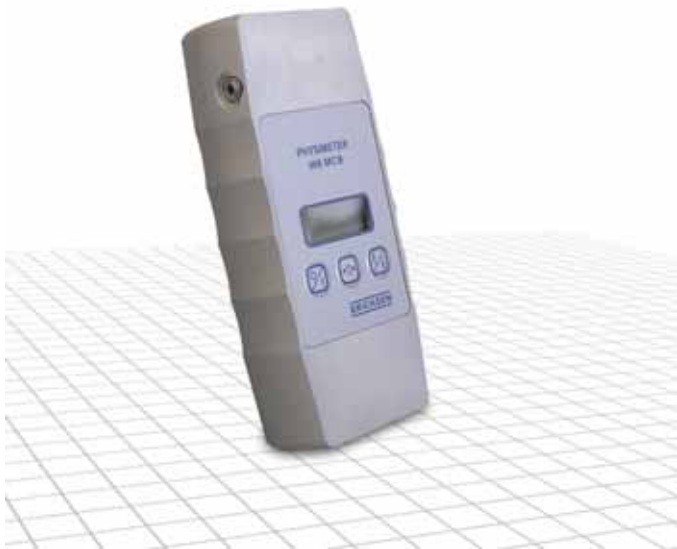
Special Measuring Device

Some measuring tasks cannot be realized using the standard measuring devices. However, multiple experience in the field of metrology

enables us to offer special solutions for our customers (e.g. the semi-automatic measuring device for screw-type caps).



PHYSI METER® 906 MC-B



Measuring System

The measuring system PHYSIMETER® 906 MC-B has been designed for the determination of the mechanical parameters force or torque on the basis of wire strain gauges. The instrument can be supplied with an integrated or an external sensor. For the power supply a block battery of 9 V is required (standard article) or alternatively a plug-in power pack (option). For easy handling the instrument is provided with the functions On/Off, reset and indication of peak value (upper and lower measuring value). In the standard version of the instrument the load introduction

takes place at the bottom. Upon request, the load introduction can also be effected on the top of the instrument. The ergonomically designed housing, made of anodised, high-strength aluminium, is provided with threaded bores at the front side so that an unproblematic connection to the ERICHSEN testing machines is guaranteed - as it was also ensured when using the preceding models of the tensile and pressure testing instruments.

The instrument is perfectly suitable for mobile as well as for stationary applications.

PHYSI METER® 906 MC-S/E



Multi-Measuring System

The PHYSIMETER® 906 MC-S/E is a universal multi measuring system that, due to its versatility and its modular construction meets all relevant demands of technical measurements. The core of this system is a fully-fledged PC in the size of a credit card. For the first time, integration of different complex technologies in connection with an intelligent system architecture results in an efficient measuring system with intuitive operation. High quality and a clean design underlines the consequent concentration on perfect functionality and ergonomics. Designed as a mobile

system the PHYSIMETER® 906 MC-S/E is equipped with four channels for simultaneous data-recording of physical values such as force, stroke, pressure as well as the number of revolutions, torque or rotational angles. The versatile amplifier allows the connection of strain gauges, inductive stroke sensors, digital and analogue signals. The connected sensors are automatically identified and can be changed during operation. The strong aluminium housing plus optional force sensor enables the unit to be integrated in a stationary measuring system and is suitable for a load of 1kN.

Model 975 AP



Display Instrument

The display instrument, model 975 AP, has been designed for convenient measurement and display of forces in connection with ERICHSEN force transducers on wire strain gauge basis. It is suitable for applications in all areas where forces need to be measured without bother and within the shortest possible time. Ease of operation makes the display instrument useful for a wide range of measurements. The measuring and display electronics are provided for mains operation and installed in a

sturdy housing. The LED digital display on the front panel is easily identifiable even from a distance. By way of a 7-pole socket located on the rear of the box, the force transducer can be easily disconnected from the display instrument. A peak value memory is included in the standard version of model 975 AP. Minimum and maximum readings can be fetched by means of key operation. Measured values can be compared with a given specification to make a go/no-go statement.



Model 980 AP

**Display Instrument**



The display instrument, model 980 AP, has been designed for convenient measurement and display of forces in connection with ERICHSEN force transducers on wire strain gauge basis. It is suitable for applications in all areas where forces need to be measured without bother and within the shortest possible time. Ease of operation makes the display instrument useful for a wide range of measurements. The measuring and display electronics are provided for

mains operation and installed in a sturdy housing. The LED digital display on the front panel is easily identifiable even from a distance. By way of a 7-pole socket located on the rear of the box, the force transducer can be easily disconnected from the display instrument. A peak value memory is included in the standard version of model 980 AP. Minimum and maximum readings can be fetched by means of key operation.

Model 922

**Electric Load Cells**



Electric load cells from ERICHSEN reflect state of the art sensor technology. At the same time they are easy to handle and capable of meeting a wide range of customer requirements. These force transducers are applicable wherever tensile and pressure forces need to be measured with a high degree of accuracy, e. g. in material testing, in reference measuring systems as well as in the

field of research and development. In addition, these force transducers are also suitable for industrial purposes in the fields of automation, controlling of press-in processes and in joining technology. An extensive accessories programme is available. A connection to the Measuring and Display Instruments 975 AP and 980 AP as well as to the PHYSIMETER® 906 MC-B/S/E is also possible.

Model 830/833/844

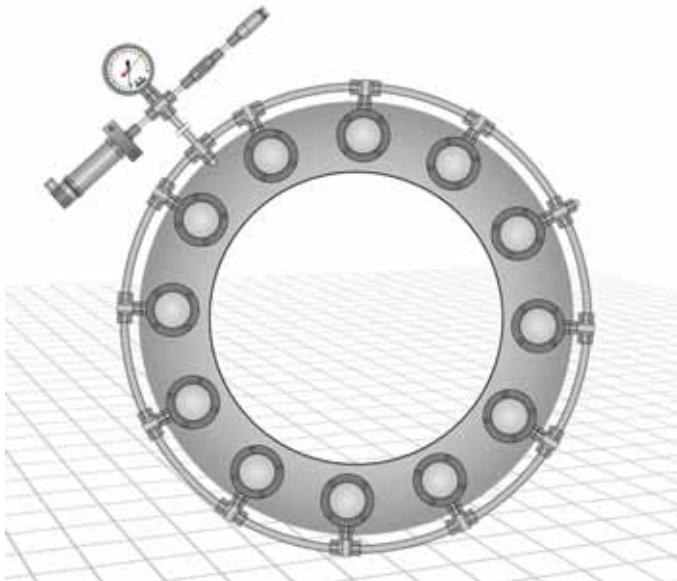
**Hydraulic Load Cells**



ERICHSEN hydraulic load cells provide a simple and economical method of measuring forces. The technique is based on the hydraulic transmission of forces which act on the piston of the force transducer. This hydraulic pressure is immediately indicated on a display unit with a scale in Newton. Load cells are ideal for maintenance and adjustment work as well as for the use in plants, machines

and systems of all kinds. Their compact dimensions make these instruments extremely versatile. By using the appropriate accessories the measured value can also be shown on a remote display. A transmission of the measured data to the PHYSIMETER® 906 MC-B/S/E by means of a pressure transducer is also possible.

Shearing Force Measuring System (electric/hydraulic)



Shearing Force Measuring System

The protection of shaftings from overload is ensured and monitored by means of the ERICHSEN shearing force measuring systems (with hydraulic or electric sensors). The arising tensile and pressure forces are measured and integrated in the control processes. Systems with a nominal force of 4.8 MN have already been realized.

Standard Machines / Control Machines / Calibration Machines



Measurement Principles

Standard Machines and Calibration Machines

Direct loading

To achieve maximum precision in expressing the physical quantity force it is necessary to use exactly defined masses. The force is applied by coupling successively masses to the device under test.

Hydraulic amplification

Direct loading is not economical when dealing with very large forces. In this case the force generated by the masses is applied to the primary measurement cylinder of a hydraulic system; at a second cylinder with a different piston diameter this force is amplified to exert greater force in a second machine frame.

Calibration Machines with Comparative Measurement

Comparison measurements can also be made when dealing with calibration machines where ultimate accuracy is not required. In this case load cells with known response characteristics are mounted in a particularly stiff machine frame, whereby a comparison is made with the response of the load cell being tested. The load is applied with an electric motor under microprocessor control, the force being transferred via recirculating ball spindles.

Measurement Ranges

Standard Machines and Calibration Machines

Direct loading

Used for measurement values between 10 N and 500 kN, start with zero and rising in steps of 10%, a 10% overload step is available on request, with a relative measurement uncertainty  $\leq 2 \cdot 10^{-5}$ .

Hydraulic amplification

Used for measurement values depending on the direct loading machine required and on the amplification ratio(s) selected at 10 : 1, 20 : 1, 50 : 1, 100 : 1 and so on, up to about 1000 : 1. Between 100 kN and 10 MN with a relative measurement uncertainty  $\leq 7 \cdot 10^{-5}$  to  $\leq 1 \cdot 10^{-4}$ .

Calibration Machines with Comparative Measurement

Here all measurement ranges are possible within the spectrum of the reference load cells available, from about 50 N to about 500 kN with a relative measurement uncertainty  $\leq 5 \cdot 10^{-4}$ .

Application

Standard Machines

Force standard machines for use by government institutes and agencies to express national scales for the physical quantity force.

Control Machines

Force control machines for testing bureaus and other official agencies, calibration offices and members of official calibration services.

Calibration Machines

Calibration machines for manufacturers of weighing cells, load cells and torque transducers used both in manufacturing and for quality control purposes

Fully automatic control and evaluation in accordance with internationally recognized standards such as DIN EN ISO 7500-1, EN 10002-3, ISO 376, NF 03-510, BS 1610, Part 2, ASTM 74-81, OIML IR 60/IR 76.



# Our solutions in testing technology for you.

ERICHSEN is your capable partner for all questions concerning modern testing techniques. We are in the position to develop and fulfil your special measuring and testing requirements to secure your demands for a high level of quality in manufacturing. Convince yourself of our competence.

Please request the condensed catalogue or individual brochures of the product group you are interested in, or visit our website: [www.erichsen.de](http://www.erichsen.de)

**Service:** In our quality control department we produce Manufacturer's Test Certificates and Calibration Certificates for most of our products.

Recalibration of equipment already supplied is available at any time.

Furthermore, our service technicians can visit you in order to check and calibrate your equipment in situ.

## Sheet metal testing



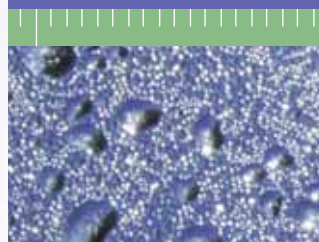
- Cupping Test
- Specimen Preparation
- Sheet Metal Marking

## 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
- Weathering Test

## Materials testing



- Load Cells
- Tension and Compression Testing Machines
- Torque Measuring Devices
- Calibration Devices

# ERICHSEN

## ERICHSEN world wide.

We are represented in the following countries:

Argentina	Liechtenstein
Australia	Luxembourg
Austria	Malaysia
Belgium	Mexico
Brazil	Netherlands
Bulgaria	New Zealand
Burma	Norway
Cambodia	Pakistan
Canada	Peru
Chile	Philippines
China	Poland
Czech Republic	Portugal
Denmark	Rumania
Egypt	Singapore
England	Slovakia
France	South Africa
Greece	Spain
Hong Kong	Sweden
Hungary	Switzerland
Iceland	Taiwan
India	Thailand
Indonesia	Turkey
Iran	Uruguay
Israel	U.S.A.
Italy	Vietnam
Japan	
Korea	
Laos	
Lebanon	



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