



**PROFESSIONAL
INDUSTRIAL EQUIPMENT
CONSUMABLES & SERVICES**

trotek test group

ABOUT US

One idea for the union of the knowledge, the industry and the quality - an idea that was turned into reality!

Our Story

Everything started in 2010. The idea was to create a trade company, but not like the standard ones. We wanted to create something different, something that is not present on the market – a symbiosis between the manufacturers of the industrial equipment, the manufacturers of the products and us – no, we are not the sellers. We are the consultants finding the optimal solutions for the customer's needs.

The Knowledge and the Team

During the years we have participated in many trainings in order to get familiar with the latest technologies and

innovations. We have participated in different conferences, scientific forums and exhibitions for industrial equipment. We have organized many seminars and demonstrations for innovative products.

And we still keep going like this - we are constantly studying the latest innovations and needs of the market!

TTG Today

TTG today consists of 6 local companies situated in Croatia (Head Quarter), Slovenia, Bulgaria, Serbia, Bosnia and Hercegovina and North Macedonia - our activities spread over the whole Balkan area and more.

Our team consists of more than 25 professionals coming from different fields – material science, metallurgical, chemistry, automatization, mechatronics, construction and electronics engineers, marketing and sales specialists.

Our partners are proven names on the market in the fields of NDT, Material Testing, Laboratory Equipment, Maintenance, Security, Defense and Forensics.

A symbiosis of consulting, sales and inspection services! That's us!

**And if somebody asks why we are doing all this the answer is very simple:
BECAUSE QUALITY MATTERS!**

Let's NEW

Don't miss to read about the latest news concerning products, partners, technologies and innovations in the field of non-destructive testing, material testing, metrology and preventive maintenance used in Aerospace, Automotive, Electronics, Pharmacy, Oil & Energy, Shipbuilding, Metallurgy & Mining, Glass, Ceramics, Composite Materials, Plastics & Polymers, Textile, Paper industry etc.



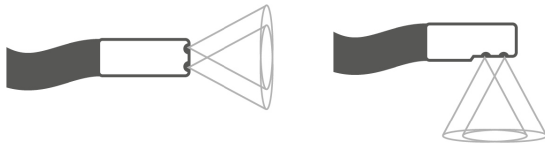
IT Concepts has released a Flexible Scope Measurement System iX3D



iX3D is a precise and modular working videoendoscope system for the execution of 2D and 3D surface inspection and measurement functionality in hard-to-reach areas.

The system offers 2 light weighted probes (0° forward view + 90° side view), each equipped with a stereo vision camera system generating 3D data. The simple and user-friendly interface and measurement software is intuitive.

Only several clicks are needed so you will get a measurement result in less than 1 minute - from the moment of starting the iX3D software you need 4 clicks for the camera settings and another 7 clicks to get your measurement result.



probe 0° forward view + probe 90° side view in one system

New Rigid Videoendoscope iXBO PRO by IT Concepts

Inspection of casting was never so easy than with the borescope ixbo pro. The device provides fast and reliable inspection with excellent video quality. The diameter of the scope is 6 mm. There are several lengths available – from 260 to 540 mm. The borescope can be connected to a standard monitor or to an iCapture imaging unit. All versions are available with direction of view 0° and 90°. With the iXBO PRO you will need only one-click for video and image documentation recordings.

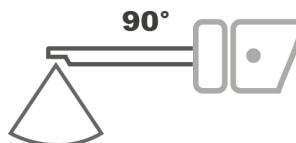


0° forward view

or

90° side view

± 180° rotatable shaft



DÜRR NDT released a new flatpanel DRC 3643 NDT especially for corrosion and erosion inspection

This extremely robust and non-glass digital detector array (DDA) was designed from the ground up for maximum portability and the harsh conditions of field radiography.

The pixel pitch is 140 μm (3.6 LP/mm) and it is having robust design with non-glass TFT sensor. DRC 3643 NDT is suitable for X-ray and gamma sources. It is equipped with an internal shielding for use up to 350 kV.

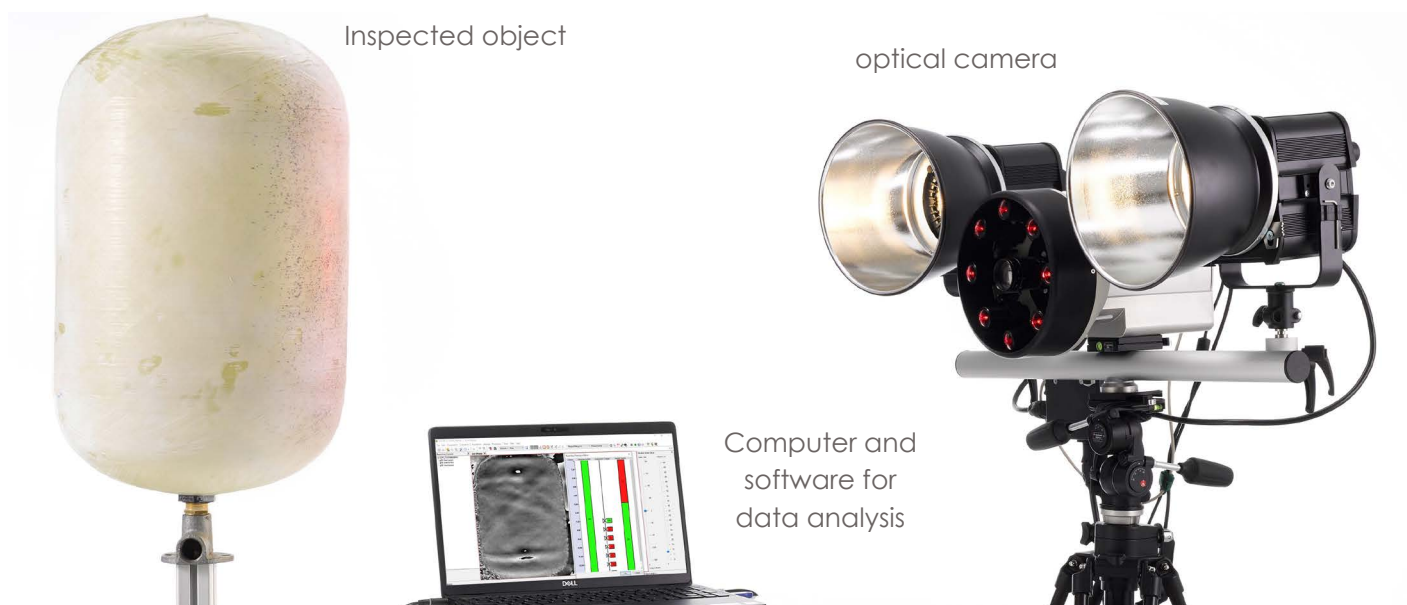
Maxwell NDT - our new partner for PECT solutions

MAXWELL NDT is a newly founded company providing electromagnetic inspection technology. The vision is to bring together expertise in electromagnetic non-destructive testing, starting with Pulsed Eddy Current Technology (PECT). PECT has been developed to detect corrosion hidden under insulation. Other applications of PECT include: Corrosion under fireproofing (CUF); Detection and sizing of flow accelerated corrosion (FAC); Inspections in the splash zone – through coatings, marine growth and corrosion product; Wall thickness monitoring and inspection through repair wraps; Defect assessment through corrosion product.

Dantec Dynamics - our new partner for Laser Shearography solutions in the field of NDT

Dantec Dynamics specializes in the development, manufacture and application support of measurement systems that acquire and analyze data of physical properties in fluids and in solid structures.

Laser Shearography is an optical, Non-Destructive Testing (NDT), surface measurement technique that works on the principle of laser-speckle shearing interferometry. Through the application of a load or excitation to an object's surface, a shearography sensor can observe surface bending in the form of an out-of-plane strain field. The measurement attained is imaged as a phase map that presents the relative difference in the two (reference/deformed) states as fringes. Local weaknesses in the structure, caused by discontinuities, are indicated as isolated fringes. Since the sensor is sensitive to laser light interference, it can detect bending within the sub-micrometer range.



Galdabini released a new version of Labtest Software

Labtest is a modern operating system offering various applications. It has been designed and updated by the Galdabini software team, paying particular attention to customer requirements. The software is divided up into specific industry sectors to simplify making a test and only showing relevant results, typical of that sector.

Some of the new software Implementations are: New simplify test method configuration; Flexure methods implementation; Results integration; New graphic zoom in analysis. Two solutions available FULL and LITE. FULL version is available for all our machines up to 50kN and over. The New LITE version is available for all machines declined in versions: "Plastic and Packaging", "Metals, Finished products and Building" and "Textile and Biomedical/Food".

Solid Mechanics DIC solutions by Dantec Dynamics



Digital Image Correlation (DIC) is a 3D full-field, non-contact optical technique to measure contour, deformation, vibration and strain on almost any material. The technique can be used with many tests including tensile, torsion, bending and combined loading for both static and dynamic applications. The DIC method can be applied from very small (micro) to large testing areas – and the results are readily comparable with FEA results or strain gauges.

QATM has released new hardness tester Qness 200 CS/CSA+ Speed – Precision- Cost Efficiency

During the development of the Qness 200 units, particular attention was paid to the following things: Maximum performance with minimum effort.

The new universal macro hardness tester Qness 200 CS, as well as the fully automated universal macro hardness tester Qness 200 CSA+ are equipped with patented swiveling downholders and automatic toolchangers, enabling the operator to choose between five different positions.

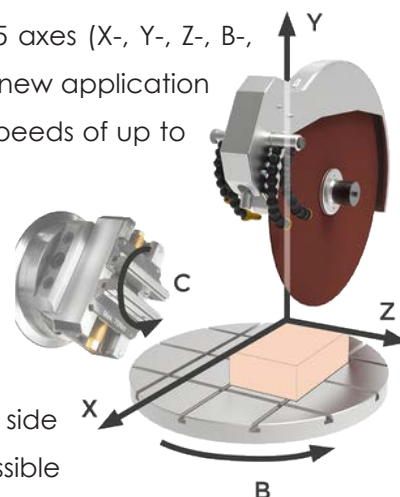


QATM released a fully automatic cutting robot with max. 5 axes

The Qcut 600 BOT cutting robot opens up new possibilities with its 5 axes (X-, Y-, Z-, B-, C-axis) and the generously sized machine table (\varnothing 600 mm) opens up new application possibilities. The automatic travel (X-axis) and cross-cut (Y-axis) reach speeds of up to 80 mm/sec thanks to its highly dynamic drives.

The rotary table (B-axis) has a swivelling range of 360° and can be modularly extended with an additional rotary axis (C-axis – swivel range of combined axes: B-axis: $\pm 200^\circ$ / C-axis 360°).

The cut-off wheel guard is guided in parallel during the chop cut to increase the cutting capacity of the cut-off wheel. The large sliding and side door, with safety lock when the cutting disc moves, ensures the best possible access to the large machine table.



1. Ergonomic control panel
Large 12.1" TFT touch display
Two joysticks for manual operation
The sliding display enables clear working
2. Optional axis of rotation: C-axis
Rotation range max. 360°
Modularly removable rotary axis
Clamping possibility can be individually extended with a chuck or other clamping devices
3. Robust machine body
With integrated recirculating cooling and automatic central lubrication
4. Large machine table
Axes can be precisely positioned and fixed vibration-free in the cutting process
Diameter: 600 mm
Load capacity: 150 kg
Travel: X/Z-axis: 550 mm
5. Side door
Swivel door for free access to the cutting chamber
Change of cutting disc via side door possible
6. Automatic cut-off wheel measurement
Dynamic adjustment of the cutting parameters for optimum results
Ideal utilization of the cutting space due to innovative transverse infeed via the swivel arm
7. Rotational B-axis
Rotation range 360°
Rotation range with combined C-axis 200°
Positioning accuracy: $\pm 0.1^\circ$



QATM released a fully an Optical analyzer for weld seam measurement

The new Qeye 800 impresses with fast, high-resolution and efficient optical analysis and measurement of specimens. Especially for standardized weld seam measurement and inspection according to DIN EN ISO 5817.

The Qeye system features innovative LED analysis area illumination. Each of the 4 illumination profiles (right, left, front, rear) can be switched on or off smoothly and individually. This now enables faster and more precise testing, without the disturbance of light influences or grinding reflections.

The optical system allows the variation of the field of view between 80 x 60 mm and 2.3 x 1.7 mm. By zooming in optically as well as digitally, a combined magnification of 35 times is achieved. This allows the user to see smallest details, while keeping the overview.



New precision cutting machine Qcut 200A by QATM

The Qcut 200 A is a compact, precision cut-off machine that offers the highest possible flexibility and use of space, with up to three automatic axes (X, Y, Z) and numerous cutting functions. Thanks to its modular design, the Qcut 200 A can be optimally equipped with numerous options and suitable clamping tools.

1. Cutting chamber flushing
Automatic cleaning of the cutting chamber

2. Large machine table
Axes can be positioned backlash-free
Easy grooves for simple mounting of QATM clamping devices
T-slots 8 mm for individual clamping devices
Max. W x H: 300 mm x 210 mm

3. Ergonomic control panel
Large 7" TFT touch display
Joystick for manual operation

4. Line laser
For exact component part positioning before cutting

5. Accessories
Clamping possibility individually expandable with turning device or further clamping devices

6. Cut-off wheel lock
Simplified cut-off wheel change via locking function
With integrated lubrication option

7. Dressing device
For sharpening diamond cutting and grinding wheels
Can be operated manually from the outside



Arun Technology released a new model LIBS Analyzer

The CALIBUS is the latest in a series of laser-induced breakdown spectrometers (LIBS) from ARUN Technology. It is the first and only CMOS-based LIBS analyser in the market to measure carbon in ferrous. The new CALIBUS is an ideal analytical solution for QA/QC, metallurgical manufacturing and machining, petrochemical industries, mining, scrap metal and recycling.

CMOS Detector

Class 3B laser device

It is equipped with a camera function so the position of the sample can be seen on the screen during testing.

Analytical results can be shown in 1 second

Wide spectrum range of 190-800nm. This range can detect more than 20 elements including C, Li, Be, B, Na, Mg, and Si.



Better resolution is achieved by three optical cells - one is specific for detecting Carbon. This feature enables to achieve greater number of elements to be detected.

5-inch colour high resolution touch screen protected with a super impact-resistant glass material.

Built in gas tank for at least 100 argon purges.

A portable argon gas cylinder is delivered in the package. It is used for topping up the argon canister up to 15 times.

Green light 3D scanner by Smarttech3D

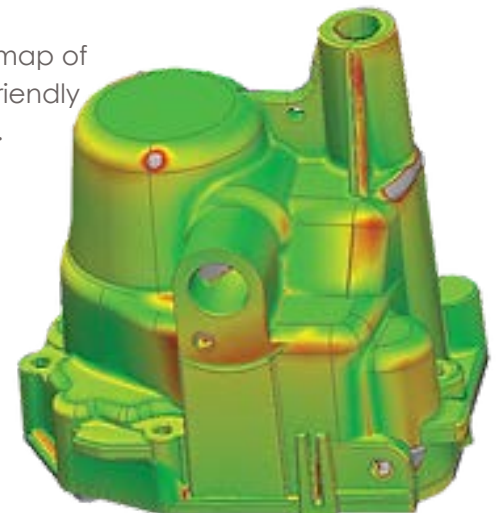
MICRON3D green stereo is ideally suited for quality control or reverse engineering applications. MICRON3D green stereo allows for easier collection of detailed data about large and small parts. It uses green LED light, which, together with filter used, reduces the impact of external lighting on the measurement. This allows to capture up to 30% better results when compared to 3D scanners using white light measurement. Two high-class monochrome detectors eliminate measurement noise, which guarantees much more accurate reproduction of the structure surface. Using LED lighting ensures maximum life expectancy and years of trouble-free operation.

Capable to compare a CAD model to the physical part, and displaying map of deviations directly on the object for visualizing its deformations. It's user friendly application that allows for full automation of the scanning process.

Two 20 MP detectors each

Top-class green light projection system

Built in round vibration sensor



Replaceable dustproof filter

Sonotec released an Acoustic Camera SONASCREEN

The new acoustic camera localizes sound sources and visualizes complex acoustic information in different colours (as an acoustic photo and video). The device extends the vision to areas the eye cannot see. This is enabled by the method called beamforming where the position of sources in wave fields, such as ultrasound fields, is determined.

8 configurable buttons
for fast control

Wide frequency range: 10 Hz to 100 kHz for the
detection of audible sound and ultrasound

Real-time acoustic
results at 100 fps for
real time results

Integrated
LED lights

Handheld device with IP54
protection (splash proof)

Integrated data
acquisition and analysis
software

72 sealed microphones
(spiral array) for use in
industrial areas

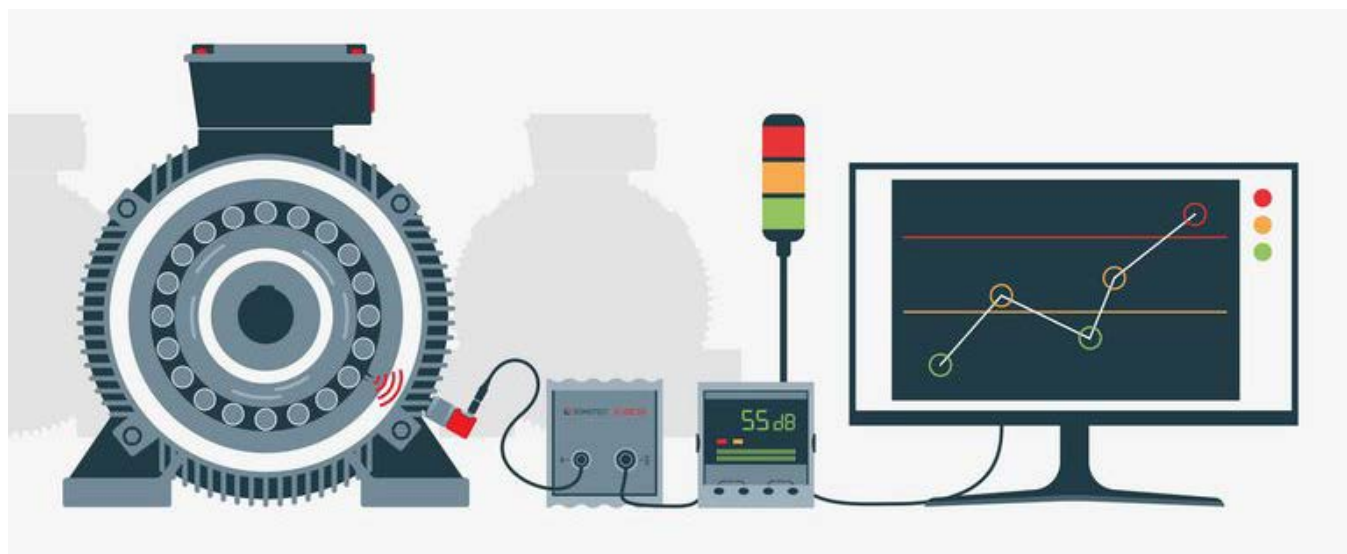
Low weight and small size



Solution for Stationary Condition Monitoring with Ultrasound by Sonotec

SONOTEC is now successfully applying its core competence - the development and production of customized ultrasonic transducers - to preventive maintenance. With the T20 ultrasonic transducer, the ultrasonic experts are launching a structure-borne (contact) sound probe for stationary condition monitoring of machines, systems, and processes. In combination with the stationary sensor box S-SB10 and a fixed installation of ultrasonic transducers at an inspection point, short-term level changes as well as long-term trend developments can be observed. Based on changes in ultrasonic levels, it is possible to make statements about the condition of the plant or process.

The main function of the S-SB10 is to convert high-sampled ultrasonic signals in a usable way for downstream, low-sampled systems. Ultrasonic signals must be sampled in the range of several hundred kilohertz (kHz). Some of the advantages are: Connection of various probes for stationary monitoring of ultrasonic levels; Online monitoring of levels and alarm triggers; Trend observations over longer periods of time; Broadband signal acquisition from 1 kHz to 100 kHz; Automatic or manual input gain, bandpass filter, alarm thresholds, averaging.



NON-DESTRUCTIVE TESTING

In an age of rapid changes, most of our customers are counting on the NDT expertise to reduce risk, increase productivity and ensure quality control and improve their own product quality. Our portfolio includes devices, consumables and accessories needed for all NDT methods – penetrant and magnetic particles testing, leak and tightness testing, ultrasonic devices (conventional, PA, TFM and TOFD), conventional and digital radiography, visual inspection, PMI analysers, laser shearography solutions etc.

products & partners information



Penetrant, Magnetic Particles and Leak Testing



Ultrasonic Testing



A Revolutionary Technique
TFM Intermode Scan (TFMi™)



Pulsed Eddy Current Technology Solutions



Videoscopes



XRF and LIBS Analyzers



X-Ray Sources



Conventional and Digital Radiography Solutions



Data Management Software for all NDT Methods



Portable Hardness Testers



Laser Shearography Applications in Aerospace
NDT: Rotor Blades



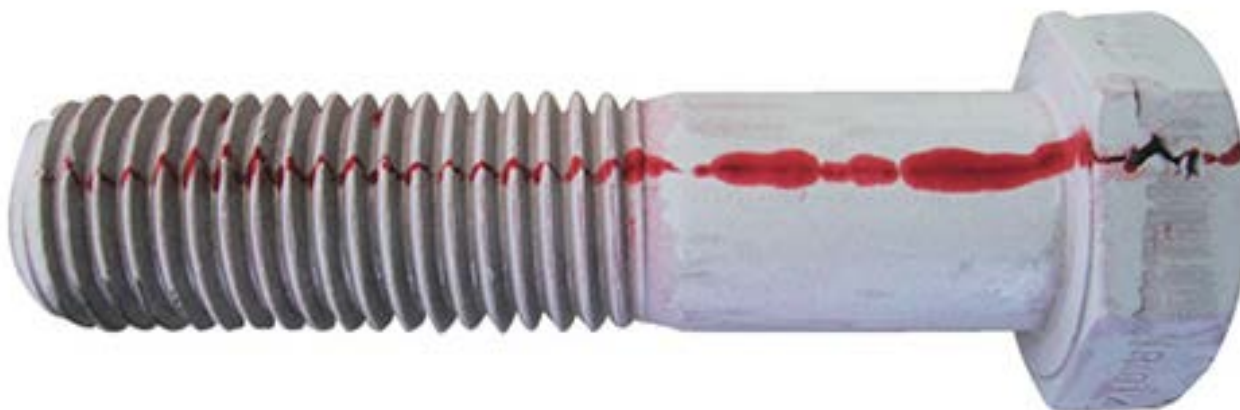
Laser Shearography Solutions

Penetrant Testing

Penetrants (PT) can easily penetrate into openings at the surface of the test specimen such as surface pores and thin cracks with widths in the micrometre range ($\geq 25 \mu\text{m}$). Depending on the applied penetrant there are different methods – Colour penetrant testing or Fluorescent penetrant testing.

Nord-Test and Standard-Chek penetrant systems are widely applied for parts testing in engineering and automobile industry, ship and boiler building, welding, etc. within a temperature range from -5°C to $+50^{\circ}\text{C}$. For testing at higher temperature (from 65°C to 180°C) the SUPER-CHEK penetrant system has been developed specially.

MET-L-CHEK penetrant systems are listed in the Qualified Products List for AMS-2644. They are used in nuclear and aerospace industry, welding, general metal working etc. in a temperature range from $+5^{\circ}\text{C}$ to $+50^{\circ}\text{C}$. For testing at higher temperature (from 52°C to 177°C) the specially developed VP-302 penetrant is used in combination with D-702 developer and R-502 cleaner. MET-L-CHEK includes a complete line of post emulsifiable and water washable fluorescent penetrants, designed to meet the requirements of nearly all applications. Products are available in steps of sensitivity from level 1 to level 4.



Leak Testing

Leak Testing is a non-destructive testing method for detection and localization of leakages in pressure and vacuum systems. The bubble test is a frequently used visual test method. The surface must be visible for this method.

Proof-Check aerosol foam-film indicator is recommended for a test medium having low surface tension, high foam-forming ability and crawl resistance. Applicable for all installations with technical gases, especially for combustible gases, as well as for nitrogen pipelines, compressed air and liquid gas systems. Considering certain safety regulations, it can be also used for testing oxygen processing systems.

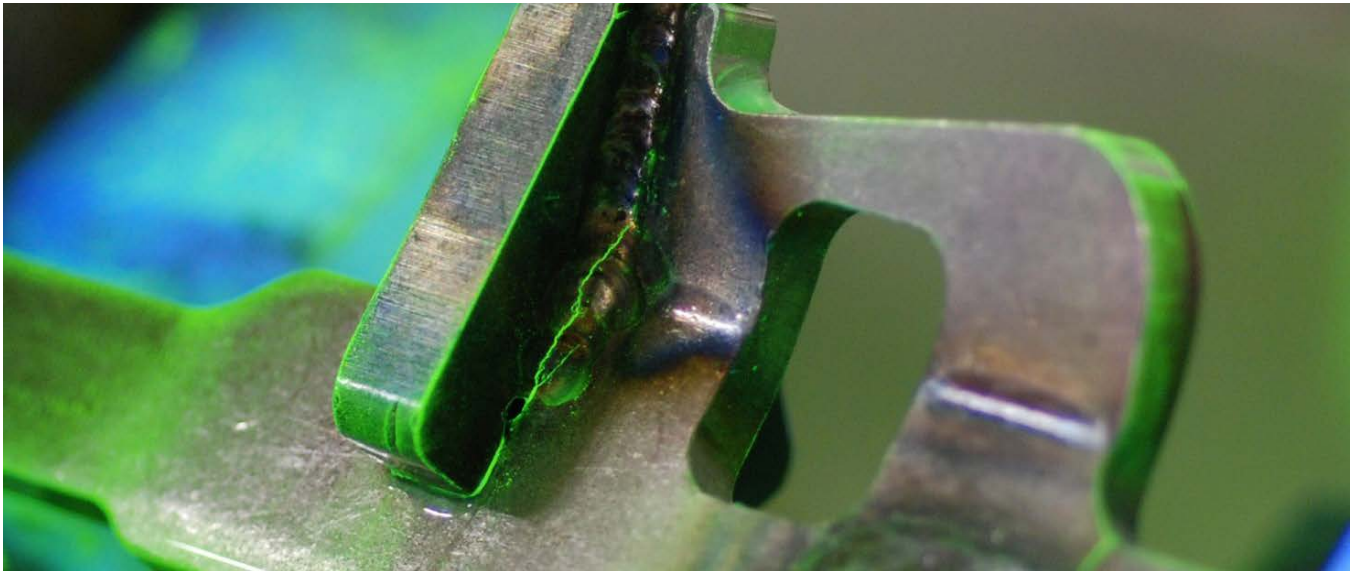
Proof-Check PLUS aerosol foam-film indicator is recommended for a test medium for leak testing with a high detection sensitivity at gas cylinders and other tanks, pipelines, solder joints, flange connections, welded joints, screw fittings, valves, armatures etc.



Magnetic Particles Testing

Magnetic particles testing (MT) is a simple but sensitive method for detection of inhomogeneities at (or close to) surfaces of ferromagnetic materials. There are different testing products (fluorescent or coloured MT) in form of dry powder, liquid concentrate, water-based or ready-to-use oil-based suspension.

The Dry Magnetic Powders excel in their high fluorescence coefficient, defined grain size distribution as well as purity and assure the indication of the finest defects. Dry Magnetic Powders (coloured media) are noted for their bright colours, defined grain size distribution and purity. Thus they serve for reliable indication, yet on dark or polished surfaces.



The liquid and dry concentrates for preparing of water-based magnetic particle suspensions contain all necessary wetting, antifoam and antirust agents. These concentrates are used also for testing of corrosion-sensitive parts.

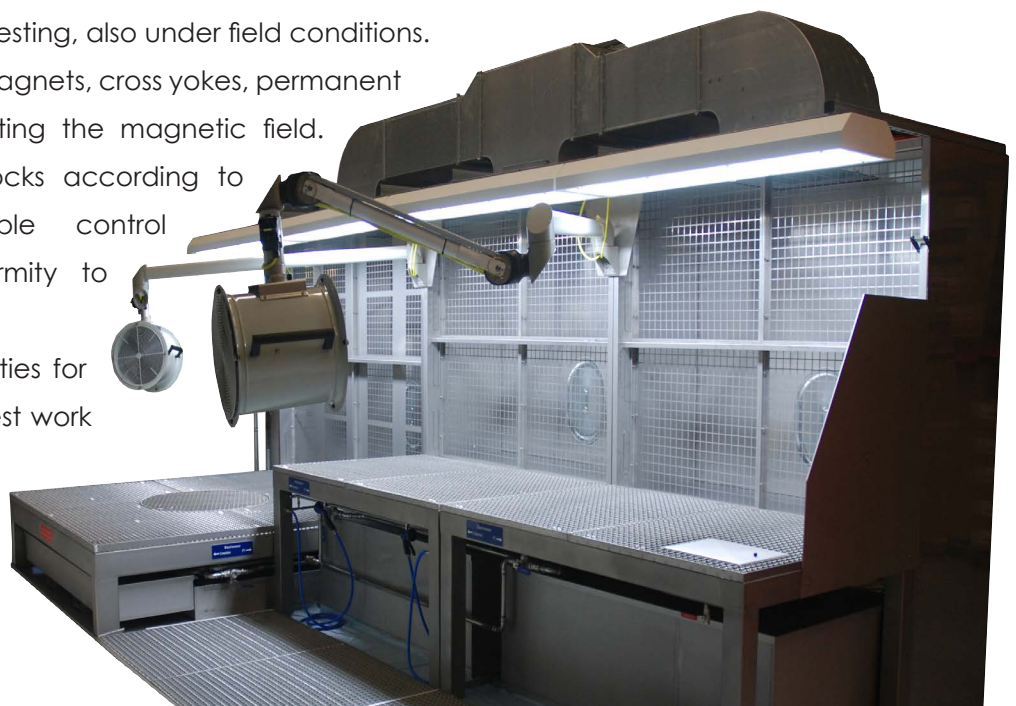
The ready-to-use suspensions are an ideal inspection material for testing at construction sites and mounting pads or for sampling inspection. The suspensions are based on colorless, odor-free, nonirritant, low-viscosity oils. The oils do not contain fluorescing components. Thus, brilliant indications at high contrast are achieved.

Furthermore, the portfolio also includes aerosol systems (V.O.C.-free) for quick, handy and efficient magnetic particle testing, also under field conditions.

Test equipment (hand yoke magnets, cross yokes, permanent magnets) are used for generating the magnetic field.

Test bodies and reference blocks according to international standards enable control of testing products in conformity to respective standards.

There are available test facilities for magnetic particle testing and test work stations for penetrant testing according to the customer's specification.



Ultrasonic Testing



The product range includes field-proven high-resolution flaw detector offering PAUT, UT, TOFD and TFM in several channel configurations. The comprehensive range of portable ultrasonic and phased array flaw detectors provide the end user with unrivalled flexibility and performance. Along with Phased Array, other complementary techniques like the Time of Flight Diffraction (TOFD) and the Total Focusing Method (TFM) are also used to provide a more detailed and comprehensive 3D representation of a defect and global integrity of a part.

The UT product range is completed by an ultrasonic thickness gauges. Thickness measurement can be performed on most common engineering materials, such as metal, plastic and glass. In addition to the test equipment there is wide range of probes, wedges and scanners.

Ultrasonic scanners use high frequency sound waves to detect flaws and anomalies in the material of the component. Where anomalies are found, the sound waves create an echo which is evaluated by specialised testing instruments. Ultrasonic inspection can be manually performed, or fully integrated solutions can be created and configured to the requirements. Ultrasonic scanners provide accurate and efficient scanning - from corrosion mapping to weld inspections.

Pulsed Eddy Current Testing

The Pulsed Eddy Current Technology has been developed to detect corrosion hidden under insulation. Other applications of PECT include: Corrosion under fireproofing (CUF); Detection and sizing of flow accelerated corrosion (FAC); Inspections in the splash zone – through coatings, marine growth and corrosion product; Wall thickness monitoring and inspection through repair wraps; Defect assessment through corrosion product.

PECT can measure through non metal, aluminium and stainless insulation covers. The inspection performance of PECT through galvanised weather sheeting depends on its properties.

The data collection is fast (two measurements per second). The data is analysed in real-time with various quality control features that assists the operator to correctly analyse the data. Colour-coded wall thickness readings are displayed on the touch screen display during data recording.



Color legend		
larger than	14.9	mm
11.2	to	14.9
9.9	to	11.2
8.7	to	9.9
less than	8.7	mm
Calibration		
Obstruction		

PECT wall thickness readings [mm]																
		Horizontal														
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
		0.0m	0.5m	1.0m	1.5m	2.0m	2.5m	3.0m	3.5m	4.0m	4.5m	5.0m	5.5m	6.0m	6.5m	
Vertical	1	2.7m	12.1	12.1	12.0	12.0	11.6	11.4	11.2	11.4	11.3	11.5	11.5	11.7	11.8	
	2	2.2m	11.7	12.1	12.0	12.2	12.4	11.9	11.3	11.3	11.2	11.2	11.3	11.4	11.7	
	3	1.7m	9.7	9.9	11.0	12.0	12.3	11.9	11.4	10.8	10.6	11.1	11.0	11.0	10.3	
	4	1.2m	9.9	10.1	10.8	11.9	12.5	12.0	11.4			10.8	11.2	11.2	10.7	
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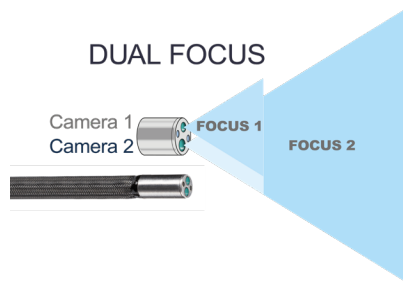
When Visual Inspection (VT) is required the most appropriate device is the endoscope. The product range we offer includes a wide variety of industrial high-quality products depending on the application (inspection of castings, weldings, pipes, engines etc.) – modular endoscopes, compact videoscopes, borescopes and fiberscopes. The compact videoscope systems create the optimal solution for your application. The modular systems offer an extensive selection of probes with different diameters and working lengths as well as camera and lighting technologies. This results in a huge range of configuration possibilities. Integrated into the cameras image sensors (AIT, Super Had CCD) are providing excellent image of the observed object.



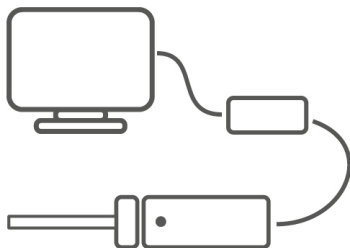
The latest innovations give the possibility to perform visual inspection in two directions simultaneously (dual view).

The Smart-Fokus function offers close and far focus by rotating the lens. The easily interchangeable lenses are screwed into the probe head (without lengthening it). This allows the working distance to be individually adjusted.

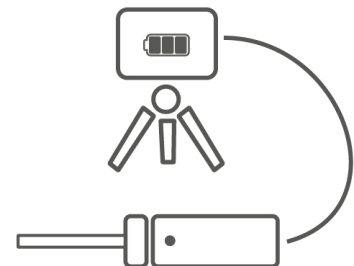
With the new PRO-SERIES, the new documentation platform forms the center of each video endoscope system. All probes can alternatively be used with a monitor for use with the ZOOM function or with a touch screen for use with the EIOS software. The software EIOS can be operated completely intuitively via the touch display. The software has various functions to optimally evaluate and archive the acquired data, as well as to forward or transfer it via USB or "wireless".



Rigid and semi flexible Borescopes are intended for fast inspections of easy to reach areas in the industrial field, combining easy handling, high image quality, a durable design and a very attractive price in a unique way.



connect to a monitor
or to an iCapture
documentation unit



Modular videoscopes:
Possibility to connect
different probes to one
documentation unit

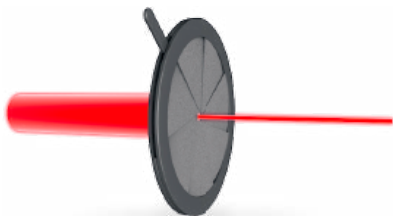


Radiography Testing

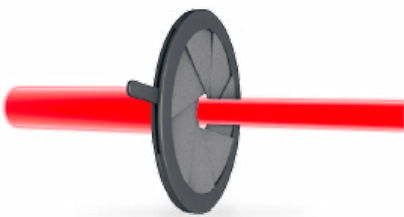
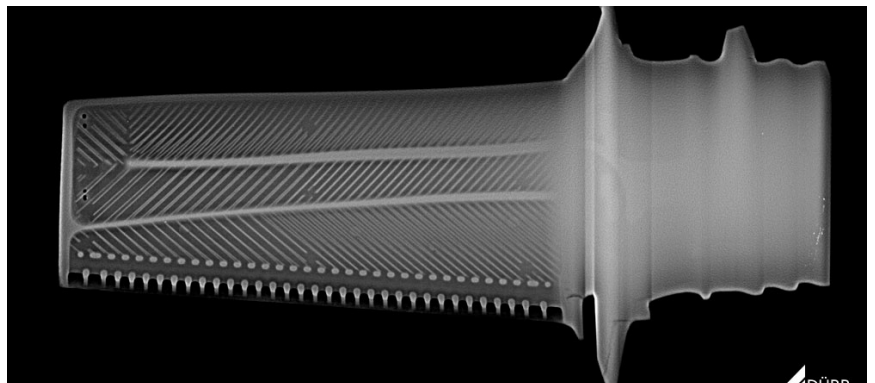
The portable systems are available in 2 configurations – computed radiography CR or direct digital radiography DR. Depending on the application the systems are including one or more of the following devices: x-ray source, DR flatpanel (direct digital radiography), CR scanner (computed radiography), computer and software, image plates etc.

Digital (Computed) Radiography

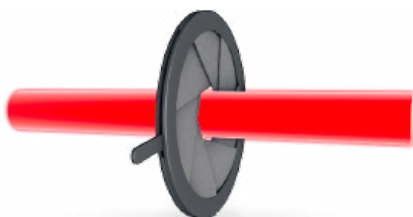
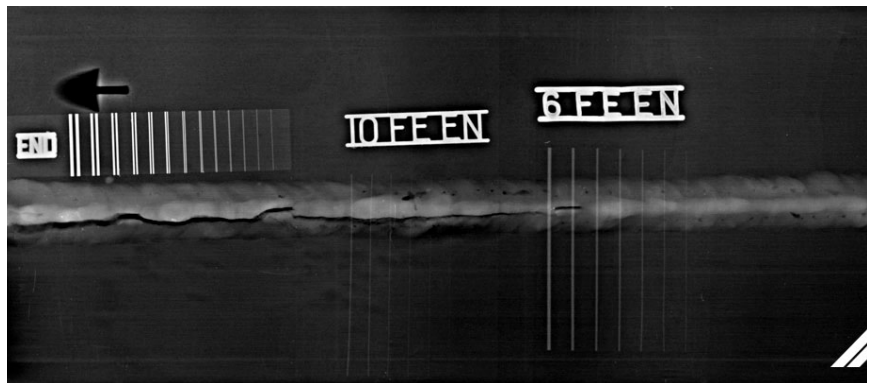
The TreFoc Technology allows to the CR scanner to be used for all NDT radiography applications - weld inspection, profile images and aerospace. With TreFoc the laser beam is adjusted perfectly to give optimal image results and the highest signal-to-noise ratio in any application. Regardless of the application – high-resolution image or low-exposure corrosion measurement – the unique TreFoc Technology give perfect image results with the best SNR every time. That scanner is the only one on the market offering 30 μm basic spatial resolution, BAM certified!



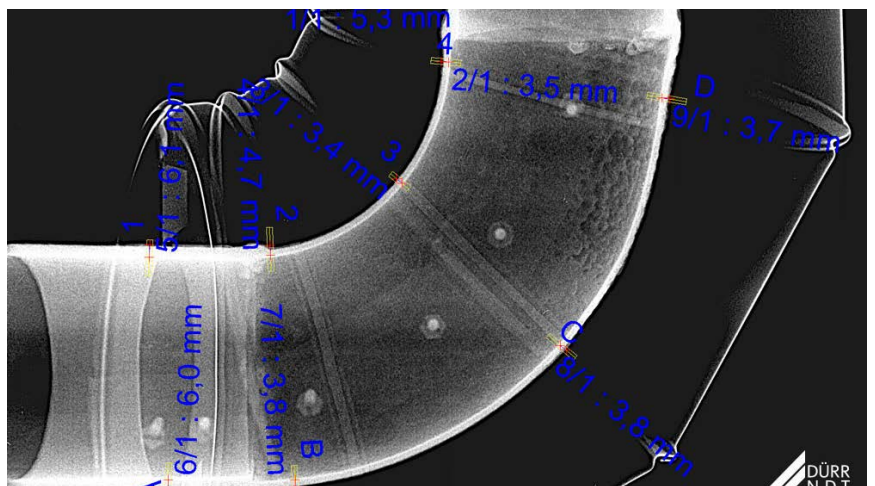
12.5 μm
Weld inspection
Aerospace
Composite materials



25 μm
Weld inspection
Metal casting
Isotope applications



50 μm
Corrosion measurements
Overview radiographs
Isotope applications



Direct Digital Radiography

Direct Digital Array (DDA) is also known as a “flat panel detector”. Depending on the application they are available with different dimensions and technical parameters.

X-Ray Sources

The source type is very important and depends on the application. We offer constant potential X-Ray generators. NDT Inspectors can rely on accurate X-ray images provided by a 0,4 mm focal spot. A communication box is allowing the flatpanel to connect to constant potential and pulsing type generators seamlessly to a Tablet or Laptop up to 50 m either wired or wireless.

Conventional Radiography

X-ray Film processors and consumables are also available for performing the conventional RT i.e. film processing. Depending on the needs the devices can be equipped with dark rooms or consumables regeneration set.

Nowadays on the market are available the so called “green” NDT x-ray chemicals. They are ensuring stunning results for industrial X-ray film processing, odorless and free of toxic and cancer-causing substances.

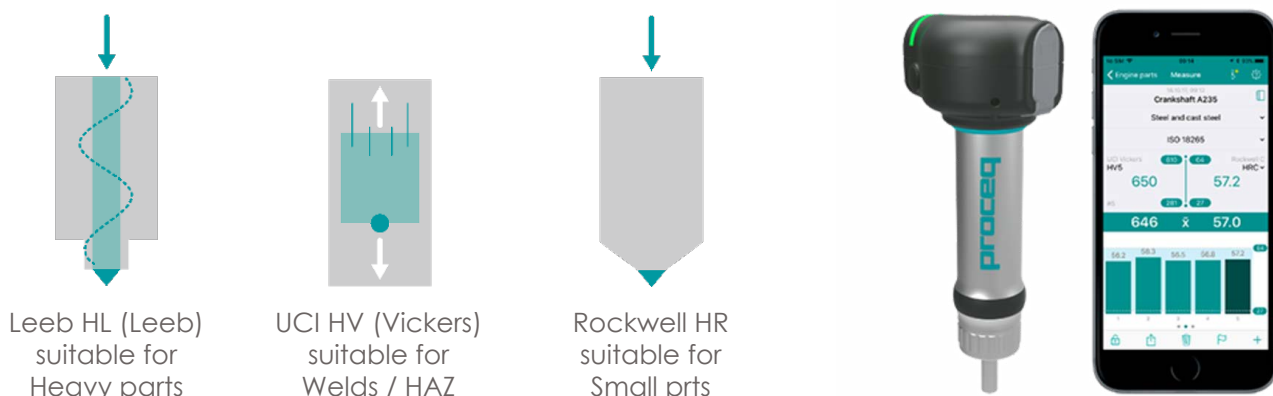
Data Management Software

DRIVE NDT is a cloud-based management software which integrates all NDT inspection methods and associated processes into a single system. With it you are able to organize and control the complete NDT job workflow including individual test reports, staff, customer and device management, and much more.

DRIVE NDT was exclusively designed for the NDT industry by NDT experts.

Portable Hardness Testers

Equotip enables portable hardness inspection of almost any object, polished parts and heat-treated surfaces. The hardness measurements are made by using the dynamic rebound testing method according to Leeb, the static Portable Rockwell hardness test and the Ultrasonic Contact Impedance (UCI) method. The rugged Swiss-made metal NDT hardness testers are designed for portable hardness testing in the lab, in the workshop, at production facilities or on site. Equotip Live is the latest innovation featuring a wireless impact device, mobile app, real-time data sharing and cloud backup.

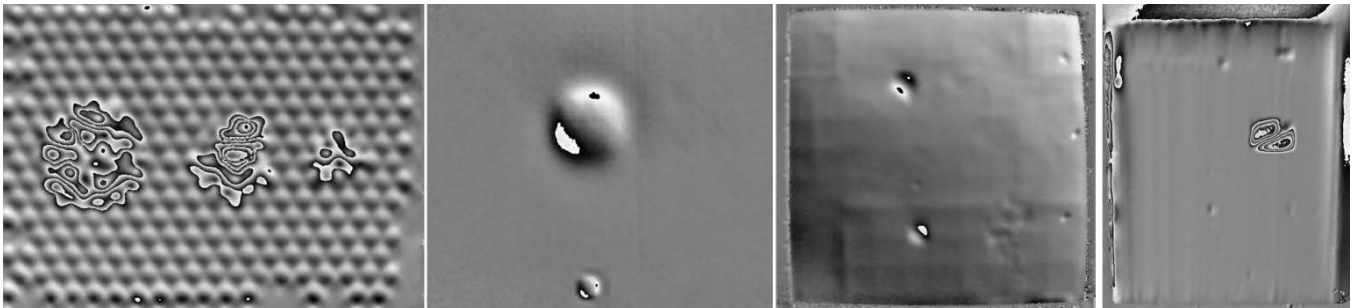


Laser Shearography Solutions

Laser Shearography is an optical, Non-Destructive Testing (NDT), surface measurement technique that works on the principle of laser-speckle shearing interferometry. Through the application of a load or excitation to an object's surface, a shearography sensor can observe surface bending in the form of an out-of-plane strain field. The measurement attained is imaged as a phase map that presents the relative difference in the two (reference/deformed) states as fringes. Local weaknesses in the structure, caused by discontinuities, are indicated as isolated fringes. Since the sensor is sensitive to laser light interference, it can detect bending within the sub-micrometer range.

Laser Shearography NDT can detect discontinuities down to 40 mm below the surface. Detection depth is dependent on the bending stiffness of the material, amount of loading, and shearing sensitivity.

Examples of applications for Laser Shearography inspection include: honeycombs & sandwiches for disbonding, cracked cores, crushed cores, node bond spits, kissing bonds, and (aluminum) corrosion between skin/core; laminates & overwraps for delaminations, ply wrinkling, fluid ingresses, and dry spots; bondings & coatings for disbonds, dry spots, and kissing bonds; compounds & ceramics for voids, cracking, and abrasions; spray foams & sealants for porosity and voids.



XRF and LIBS Analyzers

The X-Ray Fluorescent (XRF) analyzers we offer are the world's lightest, smallest, fastest, high precision device available on the market. The XRF series are a good choice for analysis in many fields; delivering rapid and accurate results right in the palm of your hand. It is the ideal solution for checking and analysing incoming materials, finished goods and in-process production parts in a non-destructive way.

The CALIBUS is the first and only CMOS-based LIBS analyser on the market. It is an ideal analytical solution for QA/QC, metallurgical manufacturing and machining, petrochemical industries, mining, scrap metal and recycling. The device has a wide spectrum range of 190nm—800nm. This range can detect more than 20 elements including C, Li, Be, B, Na, Mg, and Si. The detection speed is fast! Analytical results can be shown in 1 second and efficiency is 10-30 times improved in comparison to other available conventional portable OES spectrometers in the market. Because of the integrated CMOS technology, the LIBS is able to provide a higher precision test data.



MATERIAL TESTING

We offer a complete range of devices in the field of material testing – tabletop or floor standing universal testing machines, impact testing machines, standardised devices or customized solutions for hardness measurement, Digital Image Correlation (DIC) solutions etc.



products & partners information



Universal and Impact
Testing Machines



Software demo:
Metals testing



Software demo:
Plastics testing



Hardness Testers



Hardness Testing and
Phase Analysis



Hardness Testing
on Weld Seam



Digital Image Correlation
DIC solutions



DIC - Material Testing
applications



DIC - Fracture Mechanics
applications

Universal Testing Machines

Depending on the application we are able to offer configurations for mechanical testing machines according the international standards for most material types – plastics, metals, composites, elastomers, components, textiles, aerospace automotive and biomedical. A wide range of electromechanical materials testing machines suitable for bidirectional tests: tensile, compression, flexure, bending, cycle, constant load and many others according to International Standards or customer procedures.

We offer also a wide range of customized solutions for specific applications and in accordance with International Standards. Our expertise allows us to meet our customers' requirements by providing the best testing equipment, gauges, and accessories. All machining and assembly of testing machine frames, crossheads and major components take place in-house at the manufacturer's factory.

The software is designed by a software team and paying particular attention to customer requirements. The software is divided up into specific industry sectors to simplify making a test and only showing relevant results, typical of that sector. With pre-defined test methods, it has the ability to automatically import and export data, statistics and traceable results. Compatible with the latest and future Windows releases, it allows data exchange with management software through standardized file formats and QDAS systems.

Tests could be also performed in non-ambient temperature environment. A wide range of high-precision extensometers will meet the requirements of any known test. High technological solutions and fully robotized systems are also available.



Impact Testing Machines

Our portfolio includes a complete range of impact machines for testing resilience covers nominal energy of 300, 450, 600-750J, following both Charpy and Izod methods. A variety of specimen-preparation machines, thermostatic chambers, instrumented knives and many useful accessories for instrument set-up are available on customer request.



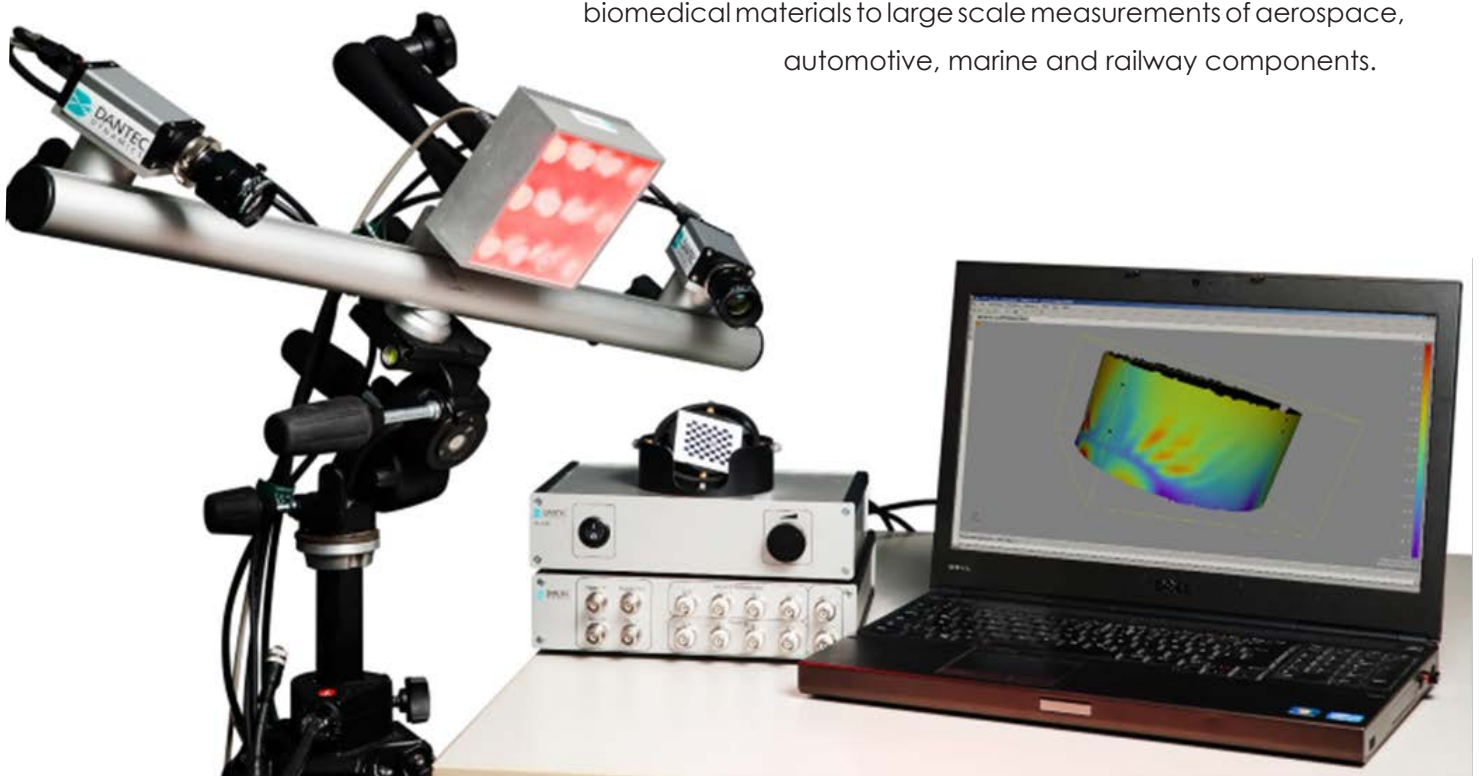
Digital Image Correlation (DIC) is a 3D full-field, non-contact optical technique to measure contour, deformation, vibration and strain on almost any material. Digital Image Correlation (DIC) is a full-field image analysis method, based on grey value digital images, that can determine the contour and the displacements of an object under load in three dimensions. The technique can be used with many tests including tensile, torsion, bending and combined loading for both static and dynamic applications.

The DIC method can be applied from very small (micro) to large testing areas – and the results are readily comparable with FEA results or strain gauges.

The features include: 3D Full-field, Real-time display of displacement and strain overlaid on live image; Real-Time Correlation with analog voltage output – evaluate, display and output data in real-time for interfacing with other equipment; Multi-camera system for up to 360 degree measurement around an object and simultaneous front and back side measurements (thinning); Measurement area < 1mm up to several square meters; Fast and easy automatic calibration procedure; Online feedback of accuracy and quality; All data with a confidence margin (error approximation); Full access to data using an open data format; Synchronous recording of analog data; Extended export to FEA software for comparisons; Different coordinate systems; High speed cameras up to 1,000,000 frames/sec.

EduDIC is a complete Digital Image Correlation (DIC) measurement system, designed as a simple and convenient educational training tool for academic courses in experimental solid mechanics. This easy-to-use system allows academic instructors to effectively present the optical measurement technique of DIC for materials testing to the engineers and scientists of tomorrow.

The Digital 3D Image Correlation System is an optical measuring device for true full-field, non-contact, three-dimensional measurement of shape, displacements and strains on components and structures made from almost any material. The system is used for determination of three-dimensional material properties in tensile, torsion, bending or combined tests. In addition, deformation and strain analysis can be applied to fatigue tests, fracture mechanics, FEA validation, and much more. Its flexible design enables a wide range of applications from microscopic investigations on microelectronic or biomedical materials to large scale measurements of aerospace, automotive, marine and railway components.



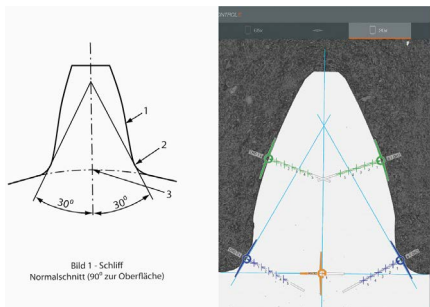
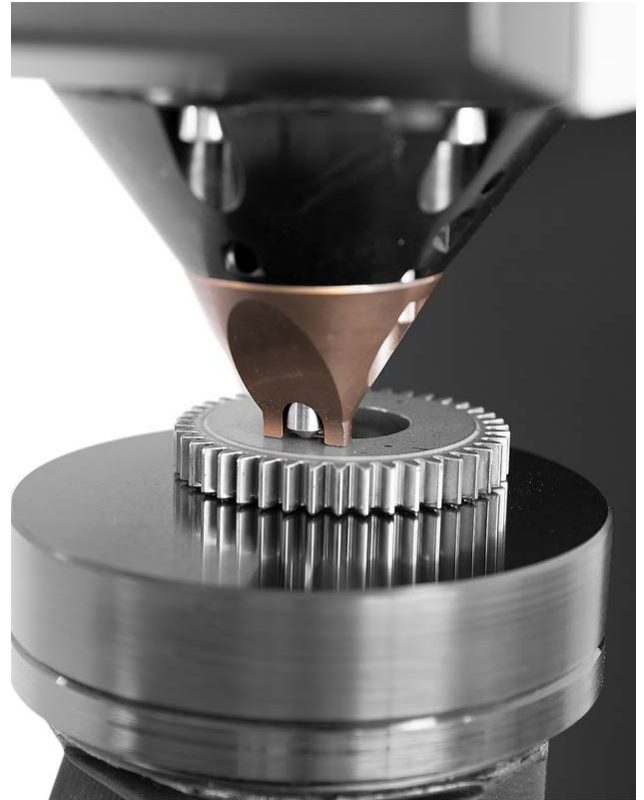
Hardness Testing

The hardness tester portfolio covers all standard test methods, such as Vickers, Brinell, Knoop & Rockwell, as well as a wide test load range. The entire hardness tester range is characterized by technological innovation, precise measuring instruments and maximum comfort due to automation and advanced interfaces. Custom made test solutions are devised by a team of specialists with expertise in automation and is subject to professional project management from start to finish.

Micro hardness testing machines cover a test load range from 0.25 g to 62.5 kg. All hardness testers are equipped with an intuitive software that allows easy operation, analysis, and documentation of results. Turrets with either 6 or 8 different test diamonds or lenses can be mounted, which makes switching between Vickers, Knoop and Brinell hardness testing very simple.

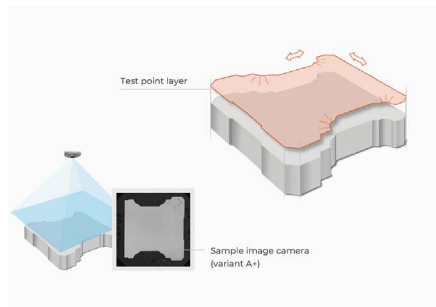
Rockwell hardness tester that we offer cover a test load range from 1 to 250 kg. They are combining sophisticated design with technical innovation. A wealth of comfort functions make operation easy, safe, and fast. Modern software and interfaces allow time-saving automation and integration of the hardness tester into any lab. Due to the large test force range, Rockwell testing can be carried out for many different materials.

The macro hardness testers cover a test load range from 0.5 g to 3000 kg. The test instruments are combining an extremely short cycle times with maximum precision.



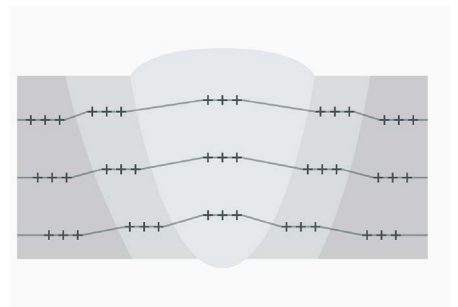
TOOTH FLANK TESTING

The A+ version enables the entire normed procedure between HV30 and HV1 to be done by one single device.



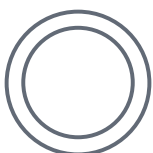
TEMPLATE FUNCTION

Ideal for repeated components. Alignment of 'test point mappings' directly on the work piece with reference lines and bench marks

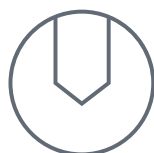


WELD SAMPLE TESTING AND ANALYSIS

Serial provision of 'Advanced Welding' functions facilitates the simple, norm-compliant (e.g. EN ISO 9015 & EN ISO 22826) integration of test mapping for Brinell / Knoop / Vickers hardness testing.



Brinell



Rockwell



Vickersl



Knoop

LABORATORY EQUIPMENT

In cooperation with the world's leading manufacturers, we provide top support in the field of material testing. We are able to equip your laboratory with complete range of devices for quality control – microscopes, sample preparation equipment for metallography and spectroscopy, optical emission spectrometers etc.

products & partners information



Optical Emission Spectrometers



Sample Preparation Equipment for Metallography and Spectroscopy



Modular Hot Mounting Press



5 Axis Automatic Cutting Cobot



Precise Cutting Machine



Easy Clamping System



Vibro Polishing Machine



Polishing and Grinding Machines



Polishing and Grinding Robot

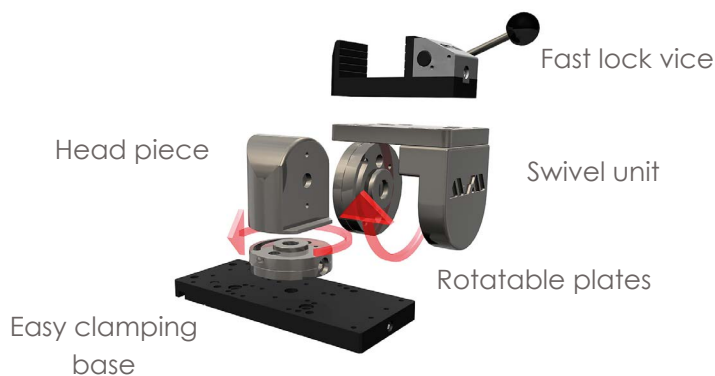
Optical Emission Spectrometers

Quality Control and Assurance are essential to making the manufacturing business successful. The optical emission spectrometers are the ideal companion for incoming material, in-process testing, independent laboratory testing and final quality inspection. Risks such as material mix-ups and machinery damage are reduced thanks to adapters which detect and analyze oddly shaped samples and small pieces and the optimizable grade library which visually displays non-compliance alloy specifications. The devices fulfil the requirement of proving fast, precise and accurate analyses for the perfect melt. The portfolio includes a complete range of analytical programs including cast irons, steels with carbon and nitrogen, and all alloying elements and their traces needed for treatment.

Metallography - Cutting machines

A wide range of cutting machines (precise and abrasive). Both types have the possibility to work with different types of cutting wheels. The combinations between the XYZ axes (manual or automatic) ensure large variety of cutting functions. The additional options (like laser alignment and side doors) and the wide variety of clamping vice ensure the coverage of any cutting process requirement.

The size and geometry of a work piece may require sectioning into smaller pieces for examination. Successful sample preparation starts with correct cutting. To avoid deformation of the sample it is necessary to extract it as gently as possible from the component to be examined. Cut-off machines, adapted to requirements such as geometry or size of the work piece, guarantee low-contact cutting. The permanent stream of coolant as well as the use of different cutting modes help to avoid thermal damages and to remove cutting debris.



The proved fast lock vices combined with the Easy-clamping modules serve as a quick clamping station for a variety of vices and extensions blocks. Changing of configured clamping vices with Easy-clamping bases is as fast as ever.

The rotatable plate is an intermediate module for angle adjustment with 15°-increments and a precision of 1/2°. The fitting head piece is easily to adapt to the clamping element by a quick holding fixture.



The mounting can be done with several methods – hot, cold and UV light mounting.

The hot mounting machines are modular or single cylinder. The modular press contains control interface and one mold assembly, where up to 3 more mold assemblies can be added. Hot mounting presses are fully hydraulic with water cooling for optimum sample mounting. Mould cylinders are available in a variety of sizes for round and rectangular mounts. The hot mounting presses feature innovative closure systems, which guarantee easy opening and closing of the mould assembly time after time.



The classic cold mounting process employs mounting materials that consist out of two or more components. Usually two to three components (liquid-powder or liquid-liquid systems) must be mixed in specific amounts. Depending on the polymer system polymerization-temperatures, pot-life and curing times deviate strongly. Mounting under vacuum is only possible with epoxy resins. Therefore, a vacuum appliance is required. Mounting with pressure is only possible with methyl-methacrylates. Methacrylates without a filler additive cure transparently under pressure.

The light-curing-based mounting of materialographic samples is done with a modern device. The samples are placed in the device which is equipped with customized, powerful LED technology. The UV transparent mounting molds are filled with the UV curing resin. The transparent sample can be removed within a very short time frame (up to 60 seconds).



Metallography - Grinding & Polishing

Grinding and polishing is the final stage in the metallographic sample preparation process and consists of several steps. Each step uses finer abrasive than the previous one, the ultimate goal being to produce a deformation-free, scratch-free and highly reflective sample surface.

The grinding and polishing process can be performed on manual, semi-automatic or fully automatic machines. There are available different options, in terms of possibilities and additional accessories, to complete the configuration of the machine suitable for your needs – working wheels with diameters from 200 up to 350 mm, dosing units for suspensions, wide range of single and central pressure adaptors.



Metallography - Electrolytic Polishing & Etching

In electrolytic polishing and etching, an electrochemical process is used to contrast phase boundaries under the light microscope. This process often saves mechanical grinding and polishing steps.

Fully automatic electrolytic polisher and etcher with intuitive touch-screen operation where the polishing and etching unit is separated from the control unit so that it may also be used in a lab fume cabinet. A scan function displays the current voltage curve of a material and provides polishing results quickly without structural changes. Handling of the polishing and etching unit was facilitated significantly by the interchangeable 1 Ltr. electrolytic tanks. Different electrolytes can be changed and easily stored with lid. The unit is cleaned with water by a washing program.



METROLOGY & MEASUREMENT

We offer metrology and measurement equipment for industry, research institutes and universities. High-resolution 2D and 3D fast measurements are enabled by our digital microscopes. 3D scanning solutions are completing the metrology product range.

products & partners information



Inverse Macroscopic for
Weld Seam Measurement
and Inspection



Inspection and
Measurement Digital
Microscopes



Artificial Intelligence
Inspection System



3D Digital Video
Microscopes



Advanced 3D Digital Video
Microscope Performance



Nano Point Scanner



3D Metrology Solutions



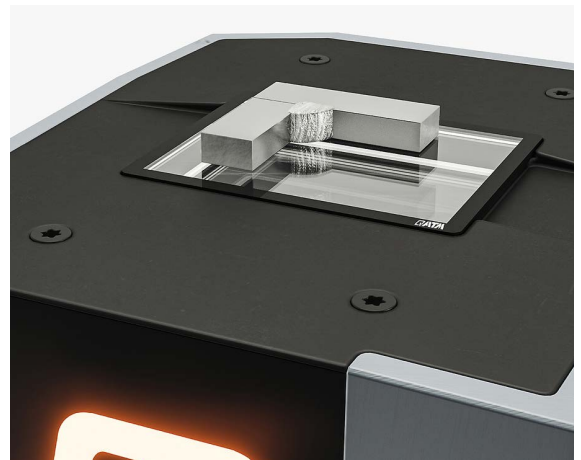
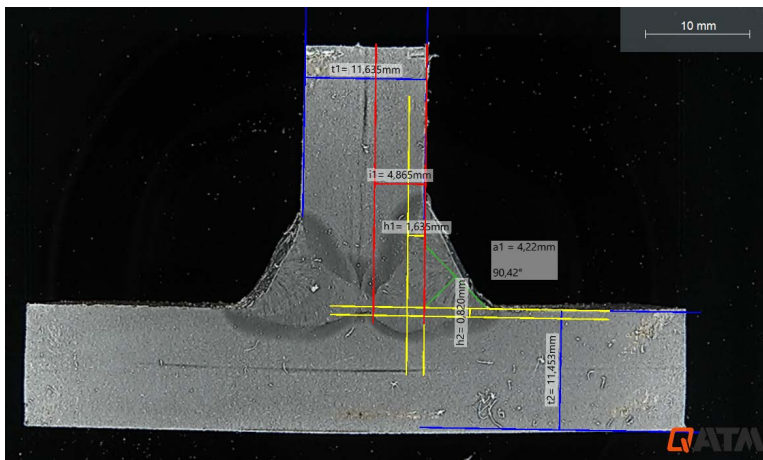
3D Scanning and Inspection
of Shiny Surface



Contactless optical
measurement systems

Inverse Macroscope

The inverse macroscope impresses with fast, high-resolution and efficient optical analysis and measurement of specimens. It is especially for standardized weld seam measurement and inspection according to DIN EN ISO 5817. Measurement tools such as A dimension, depth burn-in, evaluation limits and standard-compliant inspection report are included as standard in the proven and user-friendly Software. the devices guarantees fast, simple, precise, standardized weld inspection, and displays all irregularities. Documentation of abnormalities can be added to a measurement at any time. The use of template systems in reporting ensures unlimited precise repeatability and reliability regarding weld inspection procedures, measurement sequences and limit values. The macroscope saves time, providing detailed analysis and measurement with supreme accuracy. Robust modern industrial design. Easy replacement of the glass sample carrier. Absolutely dust-tight due to assembly in a clean room.



Digital Microscopes

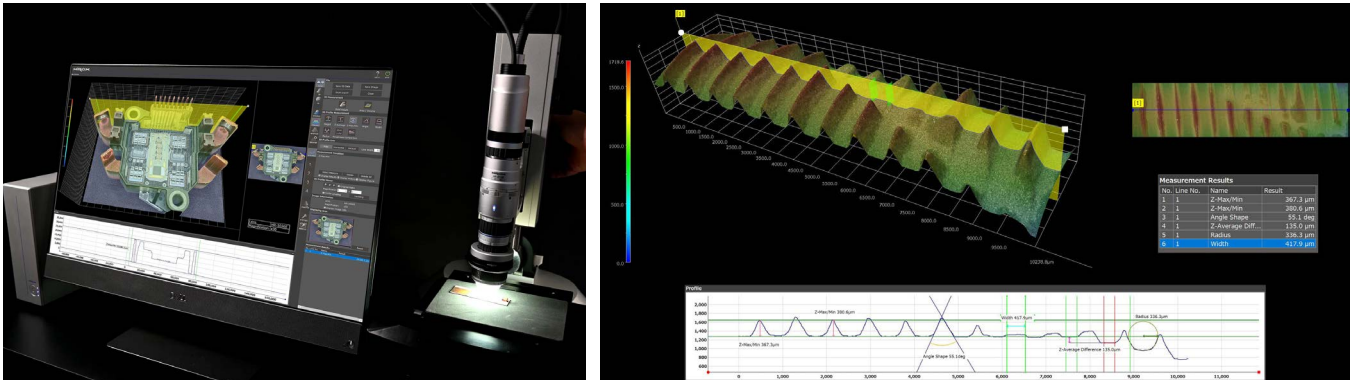
The systems are characterized with big working space up to 200 mm and of course with ergonomic design. One of the best advantages is the integrated software which avoids the expense and task of qualifying a PC. The intuitive on screen 2D software is allowing to the users simply to draw measurements, shapes and add annotations onto a live or static image and save direct to internal memory or external storage options. Additional software modules can be added depending on the end user needs – DXF Import, Image Stacking, Comparator Overlay, Comparator Side By Side etc. The inspection systems are calibrated according ISO 17025 standard i.e. there is no need to calibrate the system before performing measurements.

The AI system utilizes next generation, deep learning video analysis - Automatically identify, detect, classify, measure and count a wide range of part defects. Implementing the power of AI system will significantly increase production efficiency, eliminate human error and increase production throughput.



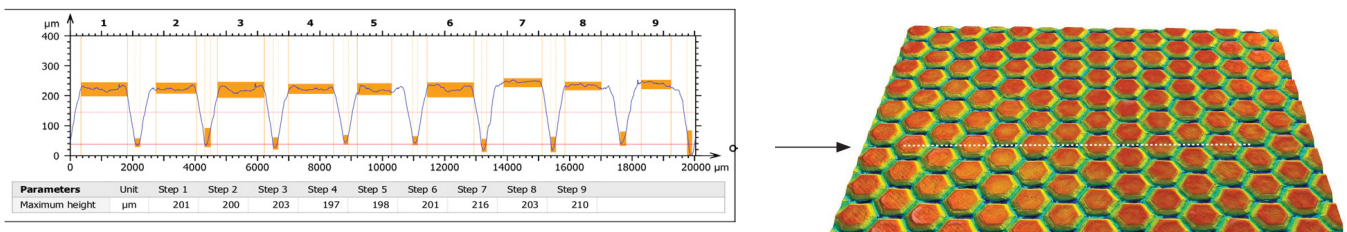
3D Digital Video Microscopy

The digital microscope is a system with a main unit, lenses attached to a camera that maximizes lens performance, optimal lighting for objects and precisely controllable stands. Depending on the application motorized or manual high-resolution zoom lenses are allowing total magnification up to 10000x. The patented motorized rotary head adapter creates a unique 360° “helicopter view” observation over an object which is discovering inaccessible details without any manipulation of the sample. Fast and accurate Z axis scanning with an integrated stepping motor creates high precision 3D Modeling data. Special designed stands and lighting options have to be added to complete the configuration according the application of the microscope.



Confocal Nano Point Scanner

The NPS (nano point scanner) is a white light confocal point sensor combined with a high-precision motorized stage. It enables submicron altitude measurement on any type of surface without any contact on the sample. By moving the sample with the high precision motorized XY stage in one axis, the NPS acquires a series of focused points at a chosen interval, creating a fast profile: the measurement of height, distance, radius, line roughness (Ra, Rz, Rt) and much more can be done within seconds! By creating a series of aligned profiles, the NPS acquires XYZ information creating a high resolution 3D surface: volume, surface roughness (Sa, Sz,...), complex shape, 3D waviness and much more can be measured – the duration of the scan is adjusted by the amount of lines, scanning speed and the dimension of the sample!



Tabletop Scanning Electron Microscope

The tabletop SEM series is focused on two essentials: Powerful Performance and User-Friendly Operation. Using the table-top compact configuration, Mini-SEM provides high-resolution, high-magnification SEM images with the ease of use. Auto-Focus, Auto-Brightness and Auto-Contrast produce an excellent image every time.

3D Scanning Solutions

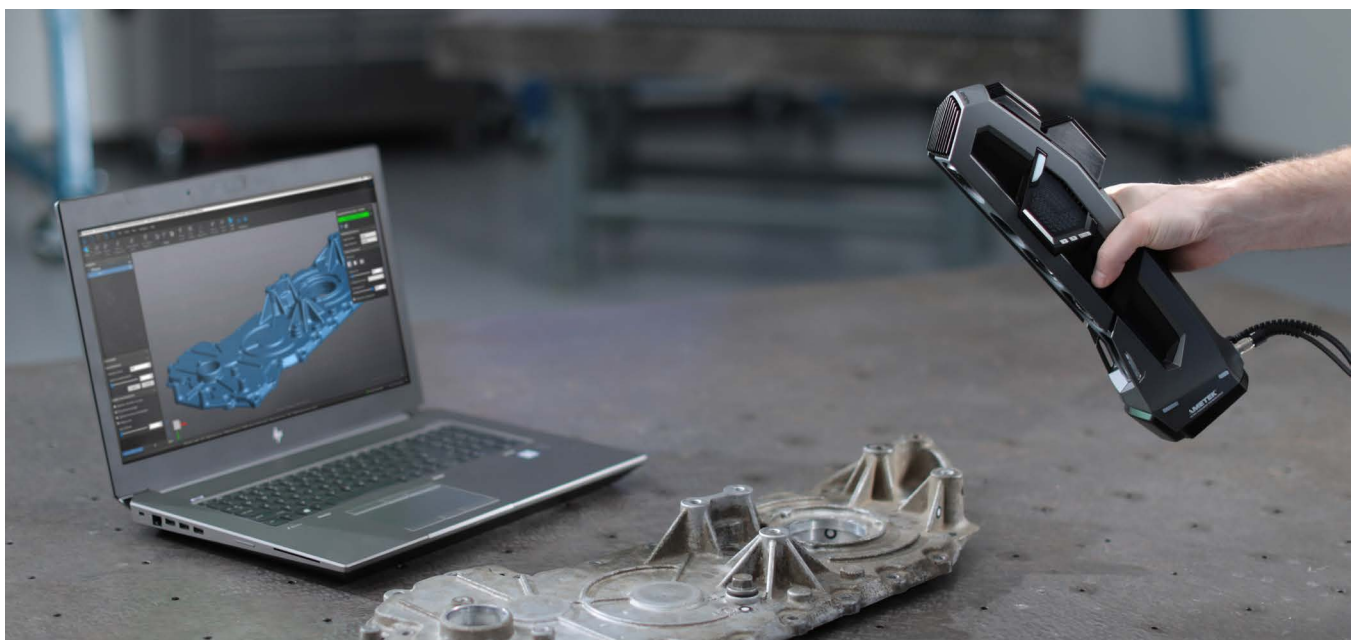
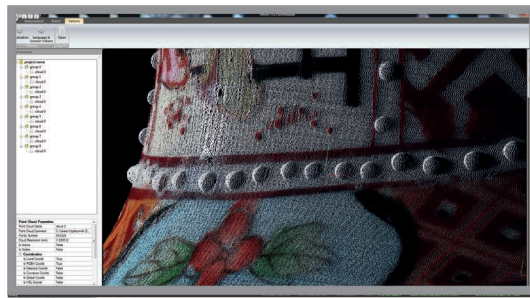
A wide range of portable and fixed 3D scanning solutions based on LED light, laser and optical technology.

Fixed 3D scanners for contactless measurement methods based on the structured LED light are allow to be obtained a realistic shape recreation with full-color reproduction. The White LED version offers precise measurement with full-color reproduction and a high resolution of 10, 18, or 24 MP – a versatile and comprehensive solution for the customers from the education, archaeology, museology, medicine, 3D printing, design, or industry sector.

The Green LED models are providing 30% better accuracy than white LED, 520 nm wavelength, special filters to reduce the impact of the external lightings, better edge sharpness representation, and automatic reduction of noises and interferences.

It is available a wide range of handheld laser 3D scanners delivering accurate, high-resolution and repeatable results what is making them especially suitable for high resolution measurements of fine details. The scanner features multiple laser crosses and an automatic mesh generation, enabling a faster workflow from the set-up to the scan and then to the file!

The 3D optical CMM scanner line-up is specifically designed for manufacturing and metrology professionals to perform highly accurate and repeatable metrology-grade measurements and 3D geometrical surface inspections. It can be paired to portable probe and the user will have a handheld optical coordinate measuring machine (PCMM) with probing capabilities. The scanner features 15 laser crosses and a high measurement rate to accelerate 3D scanning processes. There is no warm-up time, so the users can be up-and-running in less than 5 minutes.



CONDITION BASED MAINTENANCE

We are one step ahead in the field of condition base maintenance. With our devices the technical engineers are not only automatically detecting developing faults in the earliest stage, but also give a diagnostic indication on the type of fault and its severity.

products & partners information



Ultrasound detectors for Preventive maintenance



Professional Data Management and Routing Software



Leak Detection and Evaluation



Bearings Monitoring and Lubrication



Steam traps and Valves Inspection and Evaluation



Electrical Inspections



Acoustic camera



Stationary Condition Monitoring with Ultrasound



Condition Based Maintenance Solutions

Ultrasound Detectors for Preventive Maintenance

Nowadays the technology is used to reduce machine failures, increase plant availability and to save energy costs. With the multi-purpose ultrasonic testing devices many of these tasks can be carried out quickly and efficiently. The devices are finding place in compressed air, gas and vacuum systems leak detection. They reliably inspect the condition of bearings, the functioning of valves and steam traps and to detect electrical partial discharges on medium or high-voltage equipment. When simply using an ultrasonic transmitter the devices can also be used for tightness testing of cabins, hatch covers, containers and other pressureless systems.



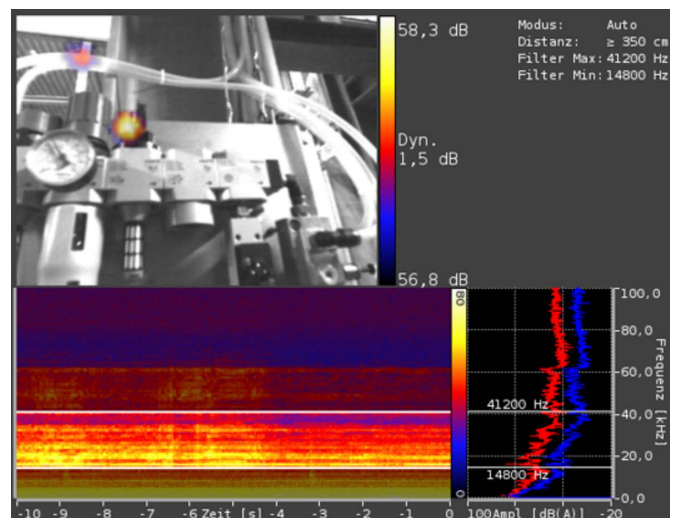
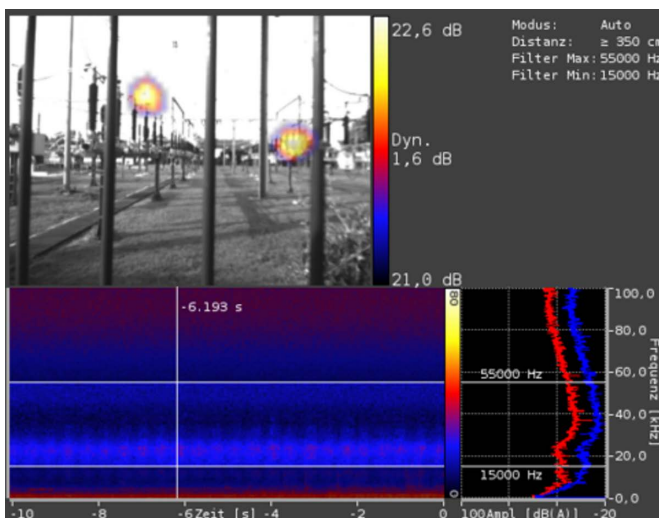
The digital ultrasonic testing device combines innovative sensors and software for preventive maintenance that can be operated intuitively and paves the way for new processes for new applications.

The Web & App software solutions are precisely tailored to your respective ultrasonic applications in preventive maintenance. The data management software is route-based data acquisition and management with mobile handheld devices and/or permanently installed sensors. It is able to trend

display, analysis and presentation of broadband ultrasonic signals at various measurement points in the plants. With its help you improve condition-based decision-making processes based on ultrasonic signals and their presentation in the dashboard. The PC software is used to store, analyze and manage the ultrasonic tests. It is the central data hub for all measurement data recorded.

Acoustic Camera

The handheld acoustic camera locates sound sources in real time and displays the results immediately on the screen. Furthermore, the camera provides audible feedback through industrial headphones. This makes ultrasound audible and visible. There are 72 sealed microphones (spiral array) for use in industrial areas. Real-time acoustic results are received at 100 fps. The wide frequency range up to 100 kHz ensures the detection of audible sound and ultrasound.



Stationary Condition Monitoring with Ultrasound

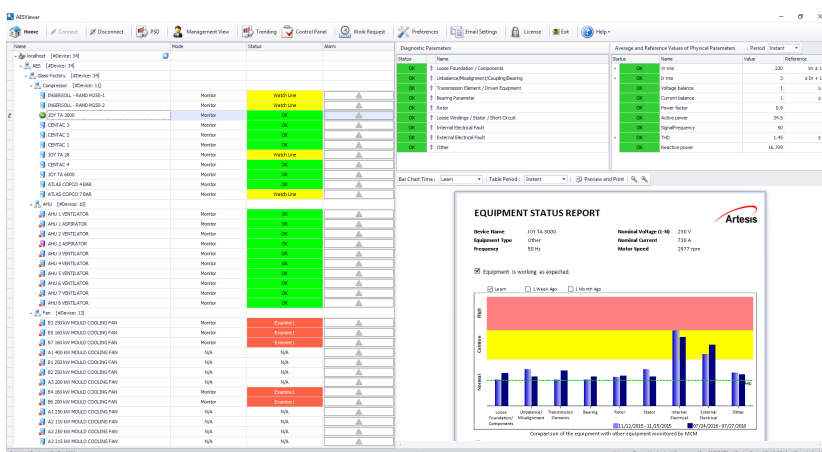
Turbulent flows of gases and liquids, e.g. in pipes or valves, can be monitored with permanently installed structure-borne sound probes (contact probes) as well as air-borne sound probes. In addition, structure-borne sound probes are also suitable for processes in which friction is responsible for the generation of ultrasound (e.g. bearing testing).

In combination with the stationary sensor box and a fixed installation of ultrasonic transducers at an inspection point, short-term level changes as well as long-term trend developments can be observed. Based on changes in ultrasonic levels, it is possible to make statements about the condition of the plant or process. For recurring measurements with recording of measurement data, the ultrasonic probe can be fixed with a magnetic base or universal magnet. For continuous monitoring or fixed mounting within a safety cover/zone, the probe is screwed on with a grub screw.



Condition Monitoring Systems

The intelligent condition monitoring products we offer include Motor Condition Monitor (MCM), and Plant Condition Monitor (PCM) instruments, and an Enterprise Server (AES) software package. The portable motor driven equipment test system automatically generates a condition assessment report indicating existing faults (both electrical and mechanical), time to failure information, recommended corrective actions, and effects of faults on energy efficiency. This instrument is capable of monitoring three phase AC motors and generators (as well as driven equipment) of all sizes and power levels to provide clear, unambiguous indications when the performance of a motor driven equipment begins to degrade. These products are used for plant monitoring, predictive maintenance, and process optimization.



Notes:



A series of horizontal dashed lines for writing notes, overlaid on a background image of a welding process. The background shows bright sparks and blue smoke, with a bright light source on the right side.

Follow us:



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NON-DESTRUCTIVE testing

MATERIAL testing

LABORATORY equipment

METROLOGY & MEASUREMENT solutions

CONDITION BASED MAINTENANCE solutions

