

KD-INFO

Edition 2023

Obituary Prof. Volker Deutsch
SONATEST Phased Array Flaw Detectors
Career at KARL DEUTSCH



DEUTROMETER
Measurement of Magnetic
Field Strength, UV and White Light

KARL DEUTSCH

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Cover image:
Comfortable UV and white light measurement
with the DEUTROMETER

Editorial

Dear customers, partners and friends!

The new year began sadly: On January 13th, 2023, my father, Prof. Dr.-Ing. Volker Deutsch, passed away exactly one month after his 90th birthday. Until the end, he participated in all developments of the KARL DEUTSCH company.

The war in Ukraine and the still difficult procurement situation pose great challenges for our development and service department: Most recently, this included the costly investment in chips and the corresponding increase in inventory level to speed up the delivery of the ECHOGRAPH series. Delays cannot always be avoided, for which we ask our customers for their understanding. In addition to adapting production to the new standard for ultrasonic testing equipment, it is important to meet our customers' demand that even 20-year-old flaw detectors should also comply with this standard. Thus, the replacement of components in existing products is just as important as the development of new devices – in the case of the new DEUTROMETER (see page 6), this has been achieved!

Ms. Lea Lutterbeck has been strengthening our HR department as a recruiter since the beginning of the year: despite the tight labour market, she is winning excellent employees for us. She has also already set up a new career website for KARL DEUTSCH (see page 22).

The company and the division management was significantly renewed. Dr. Michael Lach maintains the continuity of the management team that has existed since 2001 – hopefully he will continue to work for us forever! But also in the field of UT probes, the course for succession has been set for years, so that the most valuable asset – the know-how of the employees – remains in-house.

The good order backlog lets us remain optimistic! Stay with us, yours,

Dr. (USA) Wolfram A. Karl Deutsch



Dr.-Ing. Michael Maaß (Sales Director), **Dipl.-Ing. Dietger Schäle** (CEO),
Dr. (USA) Wolfram A. Karl Deutsch (President) and **Dipl.-Kaufm. (FH) Sascha Rosenbaum** (CFO), f.l.t.r.

In Memoriam – Prof. Dr.-Ing. Volker Karl Friedrich Deutsch



The company KARL DEUTSCH Prüf- und Messgerätebau grieves its long-time owner and managing director. On January 13th, 2023, Prof. Dr.-Ing. Volker Deutsch passed away at the ripe old age of 90.

The family of Volker Deutsch's father and company founder Karl Deutsch comes from Wittenberge at the river Elbe. Among other things, Ing. Karl Deutsch worked professionally in Aerzen, and so Volker Deutsch was born in the nearby town of Hameln on December 13th, 1932. In Posen (now Poznan, Poland), Karl Deutsch managed a mechanical engineering company until 1944. Posen had to be left in a hurry when the Russian army was just around the corner. Each family member was allowed to take one piece of luggage, and they managed to get seats on the last train. Volker Deutsch has only seen one of his schoolmates again. After many stages of flight, the family of six became stranded in Wuppertal. Being the eldest child, Volker Deutsch quickly had to take responsibility. Refugees were not always warmly welcomed in Wuppertal – neither at school nor at the tennis club, where the

“Wuppertal moneyed aristocracy” looked down at the refugees. During this time, Volker Deutsch developed enormous ambition and the will to succeed.

Karl Deutsch started his own business in 1949 and non-destructive testing soon became the focus of the product range. In 1951, the first ultrasonic flaw detector was developed. Shortly afterwards, the young company presented

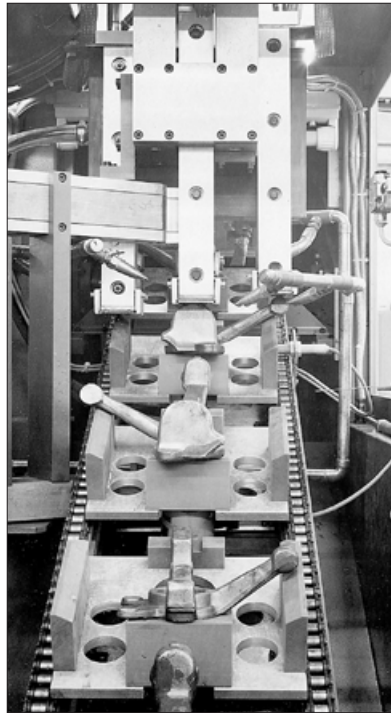
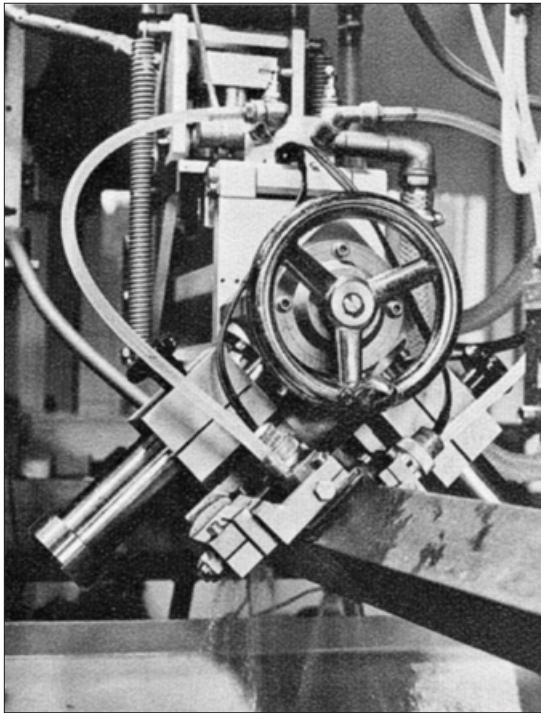
the first magnetic particle testing system. Thus, the KARL DEUTSCH company did pioneering work in NDT – in good company with the companies FOERSTER, KRAUTKRÄMER, SEIFERT and TIEDE.

From 1953, Volker Deutsch studied mechanical engineering at the RWTH Aachen. After graduating, he moved to Hanover, where he received his doctorate at the Institute for Materials Science under Prof. Alexander Matting in 1961. During this time, he worked for the MPA Federal Materials Testing Institute. He gathered a wide range of practical knowledge on all NDT methods during these years. He also helped to organize the first courses for the German NDT Society DGZfP outside Berlin.

After Volker Deutsch joined the company, it experienced high growth rates. Company founder Karl Deutsch was only active as a



Volker Deutsch as a test engineer (top) with an early ECHOGRAPH ultrasonic testing instrument during his time as a doctoral student in Hanover



Start with special machine construction in the 60s: Ultrasonic testing system for billets (left) and magnetic particle testing system for steering knuckles (right)

consultant, but he advised his son not to deal only with the successful magnetic particle testing and to turn away from ultrasonic testing. The reason he gave was “that it is better to stand on two pillars”. This proved to be a good decision – even if competing against the market leader KRAUTKRÄMER (also founded in 1949) was not always easy. In the mid-1960s, KARL DEUTSCH started building special machines – at that time still with external partners for mechanics. In 1967, 35 employees moved into the newly built Works 1 in Wuppertal, which already had to be extended by an annex in 1972.

There were also many changes in his private life: In 1964 he got engaged in Carinthia (Austria) and, in 1965, married his wife Heidi in her hometown Vienna. In 1967, 1969 and 1972 the children Wolfram, Elke and Olaf were born.

Karl Deutsch died unexpectedly in 1974 and did not live to see the erection of Works 2 in 1978, which now accommo-

dates the company’s testing system production. Volker Deutsch travelled the world and met customers and trading partners. He was a sociable person, and therefore many of them became friends. At Christmas parties, it was important for him to have spoken to really all the employees during the event. At every NDT conference he was a valued discussion partner. In Wuppertal, NDT courses were offered,

which not infrequently ended in the cellar bar at home. At the University of Dortmund, he enthusiastically lectured on NDT and was appointed professor at the age of 50.

Foreign sales were and are an important pillar of the company. As early as the 1970s, Volker Deutsch, together with sales director Helmut Cost, travelled to China – as the first entrepreneur from Wuppertal. Subsidiary offices were founded in Sweden and Italy. Unfortunately, other commitments, e.g. in the USA, were less successful. It takes luck to find the right partners. This was achieved perfectly in China with Mr. Zhengxin Zhang, who managed the extremely successful office in Beijing for 25 years. At that time, around 100 employees worked at KARL DEUTSCH in Wuppertal.

There are ups and downs in running a company. After the political changes in 1989, turnover in Eastern Europe collapsed. However, Volker Deutsch always focused on the well-being of the employees and the retention of skilled workers. Employee fluctuation was (and still is) a foreign word at KARL DEUTSCH. The product mix of portables, sensors, crack detection equipment, testing systems and many innovative products were a guarantee for success.



Dr.-Ing. Volker Deutsch joining the KARL DEUTSCH company, shot with his parents in 1961



Dr. (USA) Wolfram A. Karl Deutsch joined the company in 1998

Volker Deutsch was an impressive leader, but he was also (perhaps exactly for that reason) able to share responsibility and gave his staff the chance to grow. For example, he let his sales engineer Hans-Jürgen Andersen negotiate even large contracts independently: In 1993, an expensive KARL DEUTSCH ultrasonic testing system for rails was sold to THYSEN in the German town of Duisburg. The testing system developed by Dr. Peter Möller provided good service until the plant was shut down in 2013 (today the system operates in Iran). In the mid-1990s, he appointed CTO Dr. Michael Platte and CFO Hans-Willi Krümmel as co-managing directors in order to better share responsibility and to secure the transition to the next family generation.

In 1998, Dr. Wolfram Deutsch joined the company after studying in Hanover, Germany, and obtaining his doctorate in Chicago. Volker Deutsch proudly presented his successor and said at the end of the year 2000: “40 years VD are enough!”. He had often experienced that senior and junior bosses were at odds with each other. He wanted to prevent that at all costs! To everyone’s surprise, he consistently withdrew from the daily business in 2001 and transferred the company to his son Wolfram. He was also pleased when also son Olaf joined the family business: Olaf Deutsch has been living and working in Beijing since 1999 and

has been strengthening the Chinese sales and service office since 2005.

In the following years, he wrote many books: Technical books on non-destructive testing (including the 10-volume series “Compact and

Comprehensible” on most NDT testing methods as well as extensive books on ultrasonic and magnetic particle testing), funny books “Zerstörungsfreies Schmunzeln” (Non-destructive smiling), “Ein Prüfer...” (An Inspector...) and two crime novels. Due to a polyneuropathy, Volker Deutsch’s walking ability became increasingly poor. For the last time in 2005, he attended the DGZfP conference in Rostock and gave his last lecture at an event in Wuppertal. In spring 2008, he celebrated his 75th birthday on a grand scale in the magnificent Wuppertal Stadthalle. Numerous friends, colleagues and employees of the

company gladly accepted his invitation. The German NDT society DGZfP honoured the jubilarian on this memorable evening. Prof. Dr.-Ing. Volker Deutsch had given countless lectures at DGZfP events, was a long-standing member of the DGZfP advisory board and holder of the DGZfP badge of honour.

Volker Deutsch was a family person and happily married for more than 50 years. Two of his three children live in his immediate vicinity in Wuppertal. His daughter Dr. iur. Elke Herbsthofer, in addition to her work in a law firm, runs the Wuppertal Castell publishing house, which published his many books. He was an enthusiastic grandfather to seven grandchildren. His last book with jokes from grandpa for his grandchildren remained unfinished. It got the working title “Kennze Den?” (D’ya know this one?). He lived to see his 90th birthday in December 2022, being cared for by his wife Heidi Deutsch. On January 13th, 2023, Volker Deutsch peacefully passed away surrounded by his family. We will not forget him and will continue his life’s work in his spirit! **WD**



Dr. Matthias Purschke, then Managing Director of the DGZfP, congratulates Prof. Volker Deutsch on his 75th birthday in the Wuppertal Stadthalle. On the left in the picture is Mrs. Heidi Deutsch.

DEUTROMETER – Now also for measuring UV and white light



To control the viewing conditions, the DEUTROMETER together with the DEUTROLIGHT sensor simultaneously provides the measured values for the residual daylight and the UV intensity.

The DEUTROMETER makes it easy and convenient to measure magnetic field strength and monitor limit values. With a special probe, it is now also possible to measure UV and white light.

For magnetic particle testing and penetrant testing, the viewing conditions must be monitored. In order to prove compliance with the standard DIN EN ISO 3059:2013-03, two separate measuring gauges were required previously. The new UV and white light sensor from KARL DEUTSCH replaces the functionality of both measuring gauges and expands the DEUTROMETER field strength meter by the possibility of simultaneous UV intensity and lux illuminance measure-

ment. A minimum illuminance of 500 lx (in special cases 1000 lx) is usually required for standard-compliant test with the dye penetrant method or non-fluorescent magnetic particles. For the fluorescent method, limit values are specified for standard-compliant viewing conditions, both for the maximum permitted white light illuminance (≤ 20 lx) and for the minimum required UV-A intensity (≥ 10 W/m²). The DEUTROLIGHT sensor for combined UV and white light measurement is the op-

timal tool for the inspector. The sensor meets the requirements of protection class IP65, i.e. complete protection against contact, dust-tightness and protection against water jets (nozzle) from any angle. The use is very simple: Plug in the sensor, switch on and measure. The sensor is positioned onto the test piece.

The DEUTROMETER is now available in three different versions:

- **DEUTROMETER** (order no.: 3873.001)
Field Strength Meter
- **DEUTROMETER LIGHT** (order no.: 3873.002)
UV- and White Light Meter
- **DEUTROMETER UNIVERSAL** (order no.: 3873.003)
UV-, White Light and Field Strength Meter

The DEUTROMETER then simultaneously displays the intensity of the UV irradiation and the white light illuminance. The result of the lux illuminance measurement is not influenced by the UV radiation, so that a measurement (as required by ISO 3059) is possible even when the UV lamp is switched on. The sensor is traceable to the PTB (Physikalisch-Technische Bundesanstalt, Braunschweig, a German federal authority). It comes calibrated, can be recalibrated and is supplied with a factory calibration certificate. Excellent long-term stability is achieved by using selected sensor materials. **Sib/KS**



The DEUTROMETER is also the perfect tool for checking the illumination conditions during penetrant testing.



DEUTROMETER supplied in a compact and sturdy carrying case (example picture)



UV and white light sensor with translucent diffuser through which the light reaches the measuring unit in the sensor



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Products » Magnetic Particle
Testing » Accessories »
Field Strength Meter

Forty ECHOGRAPH 1095 and respective probes shipped to the DGZfP

The German Society for Non-Destructive Testing DGZfP is the leading provider of NDT training in Germany and is operating training centres in Berlin, Dortmund, Hamburg, Magdeburg, Munich and Wittenberge. A new location has just opened in the beautiful city of Dresden.

More than 60 employees of DGZfP Ausbildung und Training GmbH as well as approx. 30 employees in the mother organisation DGZfP e.V. enable professional support for "NDT students" in a variety of industrial sectors such as metal, railway, automotive and aerospace.

DGZfP used more than 50 ECHOGRAPH 1090 flaw detectors. Most of these have now been replaced by the next generation ECHOGRAPH 1095. During train-



ing, the devices are hardly subject to wear and tear. However, the successor unit ECHOGRAPH 1095 offers some new functions that are interesting for trainees, e.g. DGS flaw evaluation also with TR probes and monitoring of the backwall echo drop with a third monitor gate.

In the UT training courses, students can also compare the ECHOGRAPH with de-

vices from other manufacturers. Especially UT newcomers appreciate the clear text menus and the simple operating concept. Therefore, the configuration of the ECHOGRAPH 1095 is always done quickly. With the help of our YouTube training videos, you can see for yourself.

The managing director of DGZfP Ausbildung und Training GmbH, Dr. Ralf Holstein, was very satisfied with KARL DEUTSCH's delivery capability and adherence to delivery dates, especially in times when electronic chips are difficult to obtain. **WD**

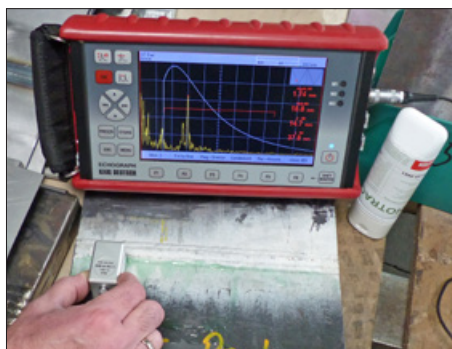


www.karldeutsch.de »
Products » Ultrasonic Flaw
Detectors » ECHOGRAPH 1095

ECHOGRAPH 1095: Zentrallabor Leipzig uses KARL DEUTSCH equipment

Since its foundation in 1992, Zentrallabor Leipzig has been a provider of testing services for all common NDT methods. As an accredited testing laboratory, additional mechanical-technological, metallographic and chemical tests can be carried out on a wide range of metallic materials. Zentrallabor Leipzig thus offers a complete service for all matters relating to materials testing – the highest quality from a single source.

When procuring new ultrasonic testing equipment by the end of 2021, the management opted for the ECHOGRAPH 1095 flaw detector in DGS/DAC/TCG version from KARL DEUTSCH. In the meantime, four instruments are successfully in use.



The well-experienced inspectors particularly appreciate the large, easy-to-read colour display, the plain text menu navigation and the freely assignable function keys. In addition to foundries and forges, the most important customers of Zentrallabor Leipzig include companies from the automotive, apparatus and mechanical engineering sectors as well as steel construction and railway engineering. KARL DEUTSCH wishes much success in testing with the ECHOGRAPH 1095 and is looking forward to a further good and long-term cooperation with Zentrallabor Leipzig. **MR**



www.karldeutsch.de »
Products » Ultrasonic Flaw
Detectors » ECHOGRAPH 1095

KARL DEUTSCH at the TÜV Austria customer day

After several postponements due to COVID, the long announced customer day could finally take place at the TÜV Austria office in Kerpen.

Around 30 visitors from a wide range of industrial sectors accepted the invitation. They were able to see innovative NDT methods on site and educate themselves further with a programme of lectures. Various information booths showed current NDT trends.



Numerous registrations for the customer day

Reinhold Engels and Stefan Kierspel from KARL DEUTSCH were also on site exhibiting some up-to-date testing equipment. In addition to a live demo, Stefan Kierspel also gave a lecture on advanced ultrasonic imaging with phased arrays.



Stefan Kierspel during his lecture on ultrasonic imaging with phased arrays

With meals and beverages provided, there was also the opportunity to exchange views on the challenges ahead and to network. The TÜV Austria Group is active in Germany with

approx. 100 employees at six locations. **Ki**

ECHOGRAPH delayline probes for special applications

Delayline probes are used to avoid interference with the transmitter pulse during manual wall thickness measurement. Three types of probes in the frequency range from 2 to 20 MHz are the standard choice for the ECHOMETER.

For special applications such as the measurement of multi-layer plastic tanks or composite components made of GRP and CFRP, broadband probes with high sensi-

tivity and good resolution are required. For this task, a highly damped 2 MHz straight-beam probe with \varnothing 10 mm composite was developed (left image). The exchangeable delay line made of a high-performance plastic with good sound conductivity has a contact surface diameter of only 16 mm and a length of 20 mm. This results in an enlarged thickness range for measuring these components.

A high-frequency probe is necessary for measuring the thickness of thin metal layers. Thus, a 20 MHz crystal with \varnothing 4 mm was built into a special housing, allowing the use of a delay line of only 6 mm diameter. Handling is just as easy as with the standard probe, as the housing is of convenient size. At the same time, the resolution has been signifi-

cantly improved when operating with the ECHOMETER 1077 wall thickness gauge. **Lh/Sj**



Size comparison of the two new probes



www.karldeutsch.de »
Products » UT Probes

UT, MT and PT equipment for the new zfp Akademie GmbH in Duisburg

There is a new provider for NDT training: The zfp Akademie GmbH in the German town of Duisburg.

The driving force behind this project was Resit Akman, who is also the managing director of the service inspection company mtl Werkstoffprüfung GmbH with 60 employees.

Experienced employees who are well-known to the NDT community, such as Ralf Luckei (management) and Dirk Riegel (lecturer), were recruited. The business model is exceptional and is intended to address the lack of qualified personnel in Germany. For this reason, the courses are also offered in many languages such as Arabic, English, Russian, Turkish and Ukrainian.

A Turkish certification body and the TÜV Rheinland Akademie GmbH were found as partners. Thus, zfp Akademie offers the necessary flexibility.

New and large premises were set up in Duisburg. For the launch, KARL DEUTSCH was asked to supply the UT, MT and PT equipment. Six ultrasonic sets based on ECHOGRAPH 1095, a DEUTROFLUX MT testing system, mobile MT units, UV LED lamps, six PT test stations and all accessories were delivered at the beginning of 2023.



Reinhold Engels and Dr. Wolfram Deutsch visited the zfp Akademie after the delivery and were warmly welcomed with a Turkish lunch. **WD**



You can find the website of zfp Akademie GmbH at www.zfp-akademie.de

DIN EN ISO 22232-1: New standard for ECHOGRAPH ultrasonic testing equipment

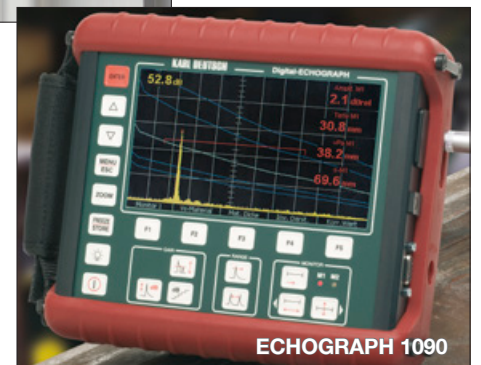
In 2021, the standard DIN EN 12668-1 (Characterisation and verification of ultrasonic equipment) applicable to portable ultrasonic equipment was withdrawn and replaced by the new standard DIN EN ISO 22232-1.

Since then, all new ECHOGRAPH 1095 ultrasonic flaw detectors have been delivered with certificates in accordance with the new standard. For periodic inspections of older ECHOGRAPH instruments such as the 1090, it should be noted that many measurement methods for inspection of the devices have been changed in the new standard. The test criterion for the receiver amplifier has been tightened in the new standard. Due to this, a new calibration of the ultrasonic receiver is often necessary for the ECHOGRAPH 1090 model. The ad-



ditional calibration would make more sense. At the customer's request, it is still possible to issue a certificate according to the old (no longer valid) standard DIN EN 12668-1. **KS**

ditional calibration is only necessary for the initial test according to DIN EN ISO 22232-1, and thus the moderate costs for the adjustment only occur once. If an exchange of the main board is necessary, it will be discussed with the customer whether this should be done or whether a device exchange to a new, modern ECHOGRAPH 1095 with an attractive ex-



Service and certification for KARL DEUTSCH mobile testing and measuring equipment

KARL DEUTSCH equipment for non-destructive materials testing is developed and manufactured with much passion for detail so we are able to offer our customers the best solution for their testing tasks. However, when delivering a device to the customer, our job does not end there.

Our application laboratory (alab@karl-deutsch.de) and our service division (service@karldeutsch.de) are available as competent contact partners for application-related questions, problems in handling the devices and in the event of repairs.

The standards for ultrasonic testing equipment are compulsory for us as a manufacturer: Ultrasonic testing equipment should be inspected before delivery, in regular intervals of twelve months and after repairs.

For conventional ultrasonic test equipment, the new standard DIN EN ISO 22232-1 was released in September 2021. In addition to standardised documentation, it requires a type test (Group 1 tests). In addition, each individual instrument must be tested (Group 2 tests).

Within the scope of this inspection, all essential properties of the transmitter pulse and the receiver circuitry are measured.



Production and commissioning of ECHOGRAPH 1095 flaw detectors



Manufacture, repair and certification of the DEUTROMETER and LEPTOSKOP series and the RMG 4015 crack depth gauge

Our customers thus have the certainty that their instruments also meet all relevant technical requirements.

However, carrying out the check is very demanding. For example, in addition to high-quality electronic equipment, the standard requires the measurement of at least 24 characteristic values of the transmitter pulse. Even more extensive are the measurements to check the receiver characteristics. For each available filter setting, typically 150 – 200 individual measurements are recorded.

At KARL DEUTSCH, we have implemented the standard requirements in our PEAT automated testing setup. PEAT remotely controls the unit to be tested as well as high-quality measuring instruments, and records all measured values required in the Group 2 tests. Our well-trained staff carries out all other testing tasks, e.g. checking the physical condition and external appearance of the equipment as well as checking other equipment features and accessories. Minor

damage is repaired directly and without further notice. In addition, the units are provided with the latest operating software.

So far, we have been able to implement the PEAT automated testing procedure for the following ECHOGRAPH units: ECHOGRAPH 1090, ECHOGRAPH 1095 and ECHOGRAPH 1170. **Bu**

SONATEST phased array flaw detectors

In April 2023, a new phase for mobile phased array flaw detectors begins at KARL DEUTSCH. A new agreement on exclusive distribution for Germany has been signed with the Anglo-French company SONATEST. At the CONTROL trade fair in Stuttgart in May 2023, the PRISMA and VEO instruments were on display for the first time at the KARL DEUTSCH booth.

KARL DEUTSCH's start into the phased array technology was a funded project with the BAM research institute in 2007. Afterwards, the French company M2M had been our exclusive partner for all applications of the phased array technology since 2009. This applied to system modules as well as to mobile testing equipment, which has conquered the market since 2014 on the base of the innovative TFM technology. KARL DEUTSCH was also a shareholder (35 %) of M2M from 2009 to 2018. In 2018, the majority shareholder TECNATOM (core business: nuclear testing services) from Spain sold its shares to the Canadian company EDDYFI. KARL DEUTSCH then also sold its shares to

EDDYFI - now a 100 % owner of M2M. The contract for the exclusive distribution of M2M's PAUT instruments in Germany and Austria was discontinued by EDDYFI at the beginning of 2023.

After a comprehensive market analysis, old contacts were re-established. The Husarek and Deutsch families can look back on many years of cooperation. Vladimir Husarek's (1922 – 2016) company SOFRANEL was KARL DEUTSCH's exclusive distributor in France from 1973 to 1984. In 2011, his son Pierre Husarek bought into the English company SONATEST.

Pierre Husarek and Wolfram Deutsch know each other well through many joint conferences and trade fairs. The three family-owned companies SOFRANEL,



Prof. Dr. Volker Deutsch and Vladimir Husarek (f.i.t.r.)

SONATEST and KARL DEUTSCH share a similar way of thinking and working. Although they naturally compete in the field of conventional flaw detectors, the now agreed cooperation for PAUT equipment for Germany is beneficial for both sides.

SONATEST has two PAUT flaw detectors in its portfolio: The PRISMA is available in two hardware versions (16/16 or 16/64). The extremely powerful VEO3 with TFMi technology features a 32/128-channel hardware and the unique TFMi technology.

The TFM technology has become widely accepted in the field of mobile PAUT, although defect sizing is still carried out by following traditional standards (e.g. DGS/DAC).

TFM technology generates high-resolution B-scans and allows precise characterisation of reflectors. With the VEO3, up to six inspection functions can be displayed simultaneously and up to four inspection functions can be superimposed (TFMi™). Thus, the inspection results of different focusings or wave modes are evaluated together.

TFMi™ is unique in the market for PAUT testing instruments! KARL DEUTSCH is happy to demonstrate this new feature. **WD**

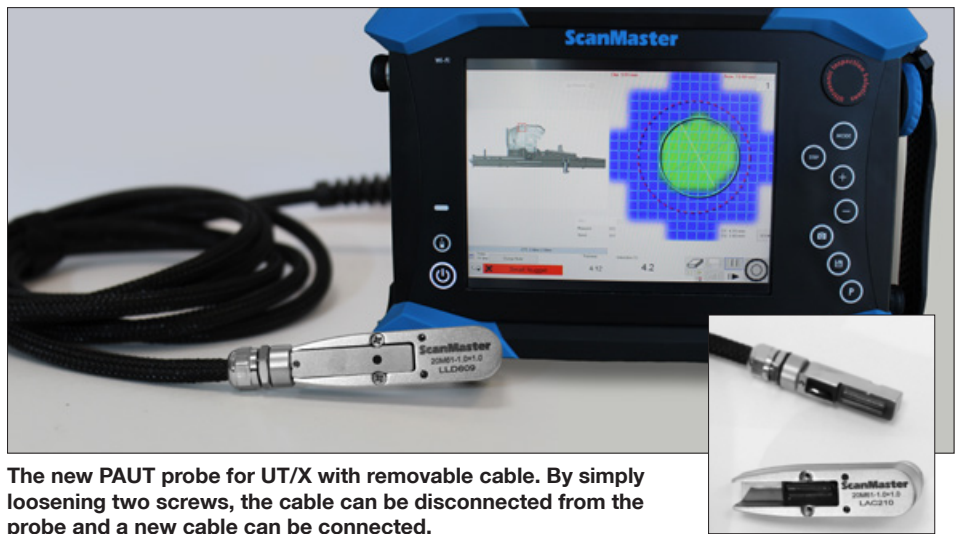


ScanMaster UT/X: Probes with replaceable cable

The state of the art of spot weld testing with phased arrays use a 61-element matrix probe. So far, a defective cable meant that the entire probe had to be discarded.

So far, the large number of cable connections required previously made it impossible to set-up a plug-in connection between cable and probe in a manageable size. Now, an innovative new plug-in connection makes exactly that possible - a defective cable no longer necessarily means the loss of the probe. By simply loosening two screws, the defective cable can be replaced, which means a cost saving of 90% compared to replacing the complete probe.

Currently, the new connector is only available for the Ø9 mm probe, but will



The new PAUT probe for UT/X with removable cable. By simply loosening two screws, the cable can be disconnected from the probe and a new cable can be connected.

soon be offered for the Ø16 mm version as well. **Ki**



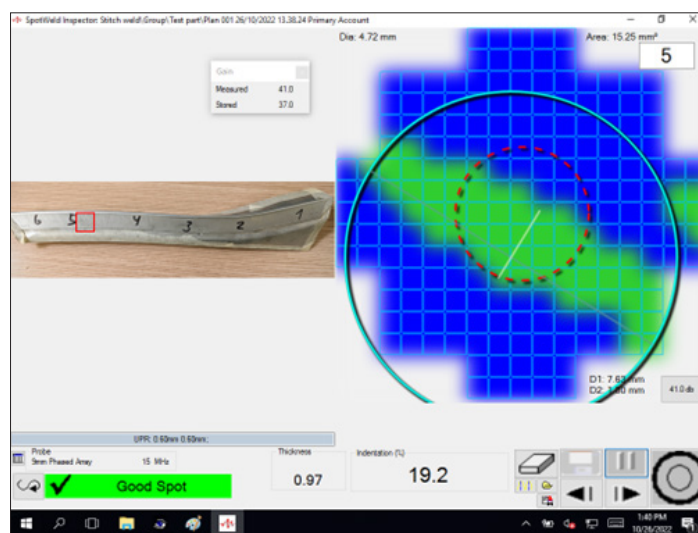
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Products » Spot Weld Testing »
ScanMaster UT/X

ScanMaster UT/X: “Arplas Weld” testing

In addition to the most widespread resistance spot welding, there are numerous other methods for making joints in car body construction. These joints are produced by stamping, soldering, gluing or other methods.

There are also special seam types within the scope of resistance welding that require modified testing algorithms with respect to established testing with ultrasound.

Weld seams produced with the so-called “Arplas Method” are becoming increasingly popular. These seams are characterised by a lower indentation depth and are almost invisible when painted. However, they are not round but elongated, and the inner structure is different from “normal” spot welds. A special algorithm



Visualisation and evaluation of an “Arplas” weld. The weld seam is not only visualised, but also measured.

in the UT/X phased array system now makes it possible to display this type of weld seam and automatically measures



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Products » Spot Weld Testing »
ScanMaster UT/X

the relevant parameters.

As with “conventional” spot welds, an automatic evaluation of the weld is carried out. **Ki**

A look behind the scenes – design of testing machines at KARL DEUTSCH

The mechanical engineering department at KARL DEUTSCH develops and designs state-of-the-art testing machines, mostly for the metal-producing and metal-processing industry. Metal plants and suppliers to the automotive industry, such as forges and foundries, as well as manufacturers of ball bearings are important customers. Safety relevant parts for railways and aerospace are also examined with NDT.

We developed an immersion tank testing system (ECHOGRAPH TTPS) for a renowned German customer. In a kick-off meeting, the following goals were set for the design:

- Test parts: Aluminium billets with diameters from Ø140 mm to Ø700 mm
- Length: 500 mm to 2000 mm
- Straightness deviation of the billets: max. 1 mm/m
- Inspection task: 100 % volume inspection with short inspection time
- Rotational and linear speed can be adjusted separately with high precision
- Movements are synchronised to enable gapless helical ultrasonic inspection
- Adherence to time and cost schedule

After defining the tasks, the focus was on developing the best solution for our client. The search for ideas required creativity and innovative thinking. In this phase, the team thought about the immersion tank, the horizontal support and the positioning of the rotating rollers. Within the team, solutions were quickly presented. This resulted in many ideas and approaches that now had to be evaluated in the decision-making process.

An effective design has a large influence on the costs. This initial phase is therefore



Dipl.-Ing. Omar Bouroum, Head of Construction at KARL DEUTSCH

extremely important. Before different versions are evaluated, the corresponding evaluation criteria must be established, compared and weighted. Once a concept for the immersion tank had been agreed upon, the detailing phase began. The status was discussed at regular intervals with

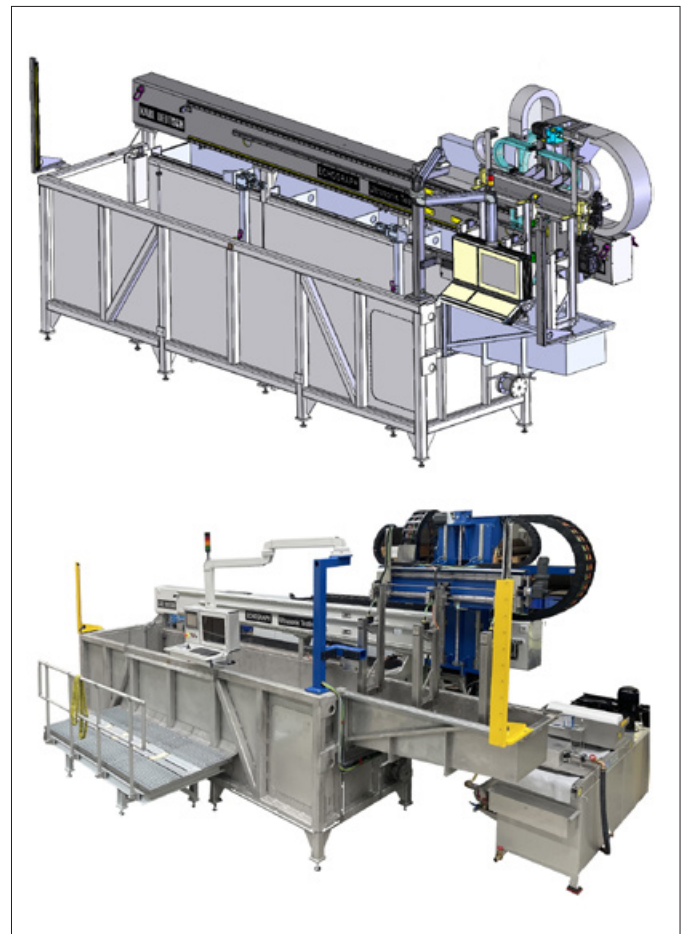
the project manager, the in-house production division and the customer. This ensured that all wishes could still be taken into account during the design phase.

After the individual parts, assemblies and drawings including parts lists were created and handed over to the work planning department, the project went into the next phase.

For the design team, however, the work is not over at this point of the project. Our designers are always available for queries, whether for our suppliers, for the produc-

tion or for the service engineers during commissioning.

For us, the job is only finished when the system is running successfully and the customer is satisfied. **Bou**



The two pictures show the system as a 3D model in the design process (above) and as a fully assembled system.

DEUTROFLUX: New MT systems for SCHMIEDAG after the flood



Shocking dimension of the flood: The normally tranquil river Volme cannot accommodate the masses of water and flooded bridges and surrounding buildings.

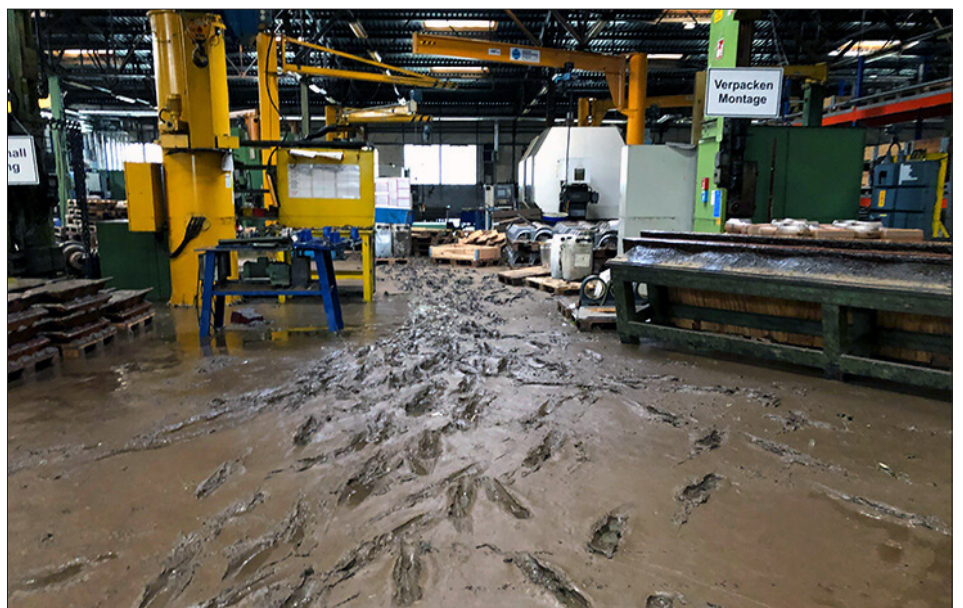
On July 14th, 2021, heavy rain that lasted into the night triggered a flood in the German provinces of North Rhine-Westphalia and Rhineland-Palatinate. Up to 150 litres of rain poured down in a few hours, causing streams and rivers to overflow their banks. As a result, more than 180 people died in the Eifel region and the Ahr valley. In addition, billions of euros worth of property damage was caused.

The Hagen region with its high industrial density was also severely affected. Here it was mainly the riverbed of the Volme that could not accommodate the masses of water. Surrounding areas were flooded. Many traditional industrial plants in Hagen are located directly at the waterfront, as water power was used as a source of energy in the past.

Our longtime customer SCHMIEDAG, a part of the GMH Group, was severely affected. It has a tradition of almost 200 years. Dramatic scenes took place on the factory premises during the night of

July 15th. The Volme river flows right through the middle of the factory premises and divides the company into two areas connected by a river bridge. In the afternoon of July 14th, the water was already rising directly beneath the bridge. The level continued to rise rapidly. When the Volme river overflowed its banks, plant manager Detlef

Müller halted production and had the factory premises evacuated. But he and 16 other employees did not make it off the site in time. The main escape route to the neighbouring road through a railway tunnel was full of water. It was already clear by then: All the staff vehicles in the factory car park were lost. When the level of the water



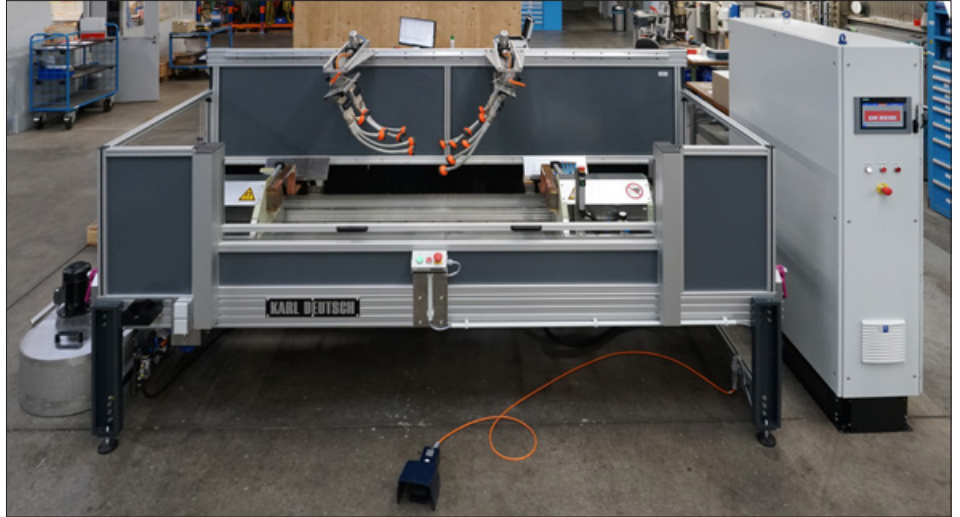
Mud-covered factory hall immediately after the flood receded



After the clean-up, normality has returned

was more than 30 cm high on the factory premises, Detlef Müller told all those trapped to climb onto one of the staff offices. From here, they could have used a ladder to reach the roof of the hall for further escape. 17 people then spent the night in this place. Evacuation by boat had become impossible due to the rapidly flowing water masses, the already advanced darkness and the unpredictable flotsam, which was also piling up in front of the bridges. At the peak of the water level, the factory halls were 1.9 m below water level. It was only in the morning that the Schmiedag team was freed by inflatable boats of the German Armed Forces.

When the water receded, the extent of the destruction became apparent. All the machines on the site, which are used to produce components for large engines, special vehicles, mining and other special applications, were covered in foul-smelling river mud. The electrical installations were destroyed. The seven MT machines in production and the final inspection were also beyond saving.



General view of the MT machine DEUTROFLUX DTA 1500 UK

The big clean-up began and plans were made to resume production. Fortunately, other production facilities of the GMH Group could be used for a transitional period. The motivated team, both in the group and at the Hagen site, contributed a lot to the fact that production at Schmiedag could be restarted relatively soon. As an interim solution, it was also fortunate that some KARL DEUTSCH MT machines could be borrowed or even purchased from other companies. This enabled the company to adapt its MT machines to the current products and to plan new equipment.

KARL DEUTSCH then received an order for three more MT machines last year, all with special features for Schmiedag's comparatively large forged products. The last and at the same time biggest of the special machines ordered has meanwhile been delivered. The DEUTROFLUX DTA 1500 UK machine with particularly powerful magnetisation was designed for testing various components, mainly from the large engine and railway sector. The current can reach 8000 A. Enlarged and stronger coils and likewise enlarged yoke cross-sections ensure strong longitudinal fields.



Input mask of the MEMORY CONNECT PLC software

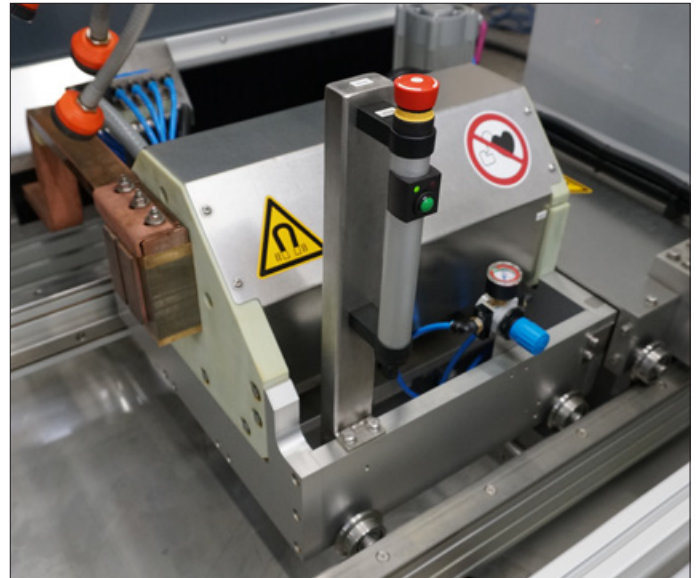
The machine was also equipped with the MEMORY CONNECT PLC software. Test parameters and test sequences can be configured and stored via a touch screen. The test current and field flow are controlled and monitored during magnetisation. The test results can be saved with all relevant data for each order and test part and stored in the SCHMIEDAG network.

The machine can be used flexibly for direct clamping of various components. The right-hand contact carriage is pneumatically unlocked with the touch of a button and can be moved to adjust the clamping length. A highly universal spraying device with many adjustment options was designed. Suitable workpiece carriers have been provided for some components. A splash guard is raised at the front during the test.

Ring-shaped components up to 800 mm in diameter can also be tested. In this case, testing is carried out via combined auxiliary flow. This means that the components are

completely magnetised pole- and contact-free via a magnetising mandrel. Due to the pole-free magnetic field induction and homogeneous distribution of the magnetic fields, this is a very advantageous method for all ring-shaped components. Large magnetic fields are required for the large components.

With the delivery of the last machine from this order, the SCHMIEDAG machinery pool is now almost complete. Fortunately, in the meantime KARL DEUTSCH has even received another order for an MT machine, and the next projects are already under discussion. A major topic is the respective automation. For this reason, in all projects



To be unlocked at the push of a button: The right contact carriage of the clamping can be moved.

SCHMIEDAG has ensured that an exchange of communication with a robot can also be easily realised at a later date. A DEUTROFLUX UWE 600 with workpiece ejector and mobile operating panel on the control cabinet was designed accordingly.

KARL DEUTSCH wishes the entire SCHMIEDAG team lots of success. We were impressed by the courageous, consistent and highly committed way in which the company was rebuilt at the Hagen site after such a challenge. **KS**



DEUTROFLUX UWE 600 with workpiece ejector and mobile control panel



www.karldeutsch.de » Products » Magnetic Particle Crack Detection » Systems for Magnetic Particle Crack Testing

ECHOGRAPH RPTS: Testing of aluminium bars at the IMPOL company in Slovenia

The IMPOL company in Slovenia is a leading supplier of aluminium products. It employs about 1000 people and produces more than 170 different alloys. Semi-finished and high-quality finished products for demanding customers, e.g. from the automotive and aviation industries, are manufactured at several locations.

The testing system was designed for bar diameters from 60 mm to 180 mm and lengths from 2700 mm to 8000 mm. During the inspection, the bars are rotated at circumferential speeds of up to 1 m/s. A compact multi-probe with a total test

track of 80 mm contains eight straight-beam probes for core defect detection. Eight additional angle-beam probes for clockwise scanning and eight angle-beam probes for CCW scanning detect surface defects. The detectable defect size strongly depends on the surface quality and the material structure, i.e. the aluminium alloy to be tested. Typically, 0.7 mm FBH can be detected for bar diameters up to 80 mm. At the maximum diameter of 180 mm, 1.2 mm FBH can be achieved.

The testing system was delivered in 2022 and subsequently put into operation.

IMPOL plant manager Tadej Lozinsek and KARL DEUTSCH service engineer Eduard Komenda worked closely together to ensure a smooth installation phase. The best possible test sensitivities for the various aluminium alloys and short untested ends of 30 mm were achieved.

Loading and unloading of the bars with a gantry crane was part of the scope of supply of the German company UNTERSCHÜTZ. A combined loading/unloading time of 3 s and a helical inspection time of 46 s for the smallest bars and 138 s for the largest bars result in a throughput of 23 to 59 bars per hour.



ECHOGRAPH RPTS system for testing aluminium bars before shipment at KARL DEUTSCH in Wuppertal



Squirter coupling for high testing sensitivity, quick changeover and long service life of the probes

The stainless steel tray of the ultrasonic testing system collects all the excess coupling water and keeps the floor dry.

This rotating bar testing system is already KARL DEUTSCH's second system at IMPOL. Since 2016, smaller aluminium bars with a maximum diameter of 90 mm have been tested in linear motion and high testing speeds of up to 2 m/s with an ECHOGRAPH HRPS testing system.

satisfied with KARL DEUTSCH's project management. Therefore, a KD-CHECK penetrant testing system for aluminium forgings could be the next step in our cooperation. **WD**



Control panel for UT and PLC settings

Polona Turnsek from the IMPOL purchasing department was again

satisfied with KARL DEUTSCH's project management. Therefore, a KD-CHECK penetrant testing system for aluminium forgings could be the next step in our cooperation. **WD**



www.karldeutsch.de » Products » Ultrasonic Testing Systems » ECHOGRAPH ALPT/RPTS

KD-CHECK-SYSTEM: PT testing system for ceramic rings

A fully automatic PT system for fluorescent penetrant testing of ceramic rings was implemented for a major German customer. A reliable reproducibility of the adjustable parameters as well as the testability of a large spectrum of parts were of great importance.

The pre-cleaned components are placed on specially coated workpiece holders for testing, which prevent damage to the surface. At the same time, the carry-over of testing liquids is significantly reduced by optimised dripping, which considerably lowers the costs of consumables. After dipping and dripping, a two-stage washing process takes place: first by oscillating dipping in water, then by spraying in a washing chamber. All parameters such as test cycles and washing times can be stored individually for each component via the PLC. In addition to the temperature and pressure of the wash water, fill levels are also measured so that all important test parameters are monitored.

Prior to the final developer application, the parts still have to be dried. The drying oven is also equipped with an automatic transport system and a position monitoring system for the workpiece holders.



KD-CHECK MEMORY: Mobile panel for entering and monitoring test parameters



Fully automatic PT system - this image shows a pre-acceptance setup at KARL DEUTSCH

After drying, self-development follows, i.e. the test is performed without developer.

At the end of the line, the workpiece holders are pulled onto modular transport trolleys, which can be attached to the output station, and then pushed to the respective viewing station.



Output station with light barrier and trolley

This ensures convenient handling of the workpiece holders and components for the inspectors. With the trolley, the newly loaded workpiece holders can then be fed into the testing system.

This system design can be adapted and configured for a wide range of components. If you are interested in such a test-

ing system, our experienced staff will be happy to assist you. **Rb**



www.karldeutsch.de »
Products » Penetrant Testing »
Testing Stations and Systems

FLUXA HRS: Water-based magnetic particle concentrate

FLUXA HRS is a water-based magnetic particle concentrate that has been well established for many years. It is now also available as a ready-to-use in aerosol cans.



Whether for sample testing, for large components in the workshop or during outdoor operations - the inspector always has a ready-to-use test agent. Of course, in addition to the well-known magnetic particles

from our own production, which are characterised by a strong fluorescence, there is also a corrosion protection. Furthermore, a non-flammable propellant was used during the design of the new product.

This means that the cans are completely label-free

and can also be used in areas where conventional test agents with flammable propellants may not be used.

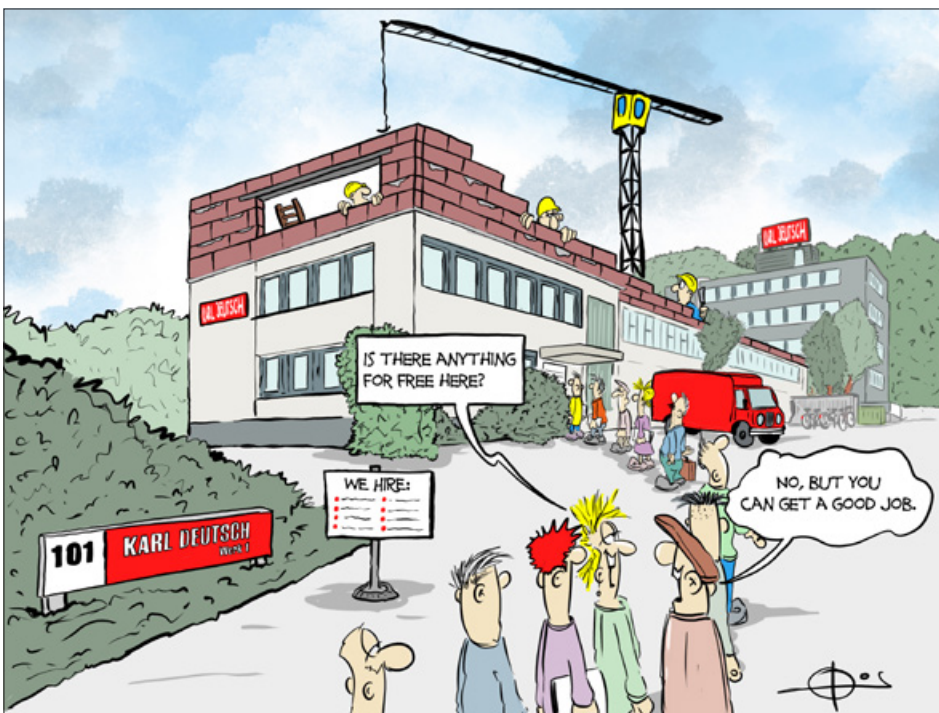
The test agent complies with many common standards and specifications, such as DIN EN ISO 9934-2, SAE AMS 3044, ASTM E 1444, BS 4069 and ASME-CODE Sec. V Art. 7.

If you have any questions about your application, please do not hesitate to contact us. **Rb**



www.karldeutsch.de »
Products » Chemical
Products » Magnetic Particle
Testing » Fluorescent » FLUXA-
Spray HRS

Cartoon



KARL DEUTSCH is getting ready for growth!

We are in need of many new professionals and are happy about new employees joining our team. They, in turn, need workplaces, and so we are currently planning an expansion of the Works 1 premises. **LL, Kr**

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www.marcus-gottfried.com

Career at KARL DEUTSCH

KARL DEUTSCH

Stellenangebote Job-Level **KARL DEUTSCH** Berufen Kontakt

UNSERE ARBEITSKULTUR

Unsere MitarbeiterInnen sind unser wichtigstes Kapital. Bei KARL DEUTSCH liegt uns daher die Zufriedenheit unserer MitarbeiterInnen sehr am Herzen. Wir fördern ein harmonisches Arbeitsklima, achten auf den Arbeitsort, sondern auch außerhalb des Büros. Gemeinsame Unternehmungen wie Bowling- und Hobbymöglichkeiten mit der ganzen Familie sowie die Teilnahme an Sportveranstaltungen wie dem Schachstadelauf stärken unser Team und schaffen ein positives Arbeitsklima. Wir glauben daran, dass eine gute Work-Life-Balance ein wichtiger Faktor für die Zufriedenheit und den Erfolg ist.

KARL DEUTSCH

Stellenangebote Job-Level **KARL DEUTSCH** Berufen Kontakt

Alle / TechnikerIngenieur / Berufsaufsteiger / Metallbearbeitung / Schicht/Person / Studenten

ONLINE-BEWERBUNG

Rechnen Sie Ihre Bewerbung über das folgende Formular aus:

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Nachname*

Mitarbeiter-ID*

E-Mail-Adresse*

Telefon*

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Lebenslauf*

Zugangskarte

Wir freuen uns auf Ihre Bewerbung!

Wir werden Fragen zu der ausgeschriebenen Stelle oder zur Bewerbung* gerne beantworten. Sie sind gerne!

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 E-Mail: +49 202 640 828 20
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Hierher Ziehen & fallen lassen
 100% Daten automatisch

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All products from KARL DEUTSCH are developed and manufactured in Wuppertal, Germany. We are constantly looking for mostly technical, high-level personnel. Since more than 50 % of our products are exported, many international colleagues already work for KARL DEUTSCH, either at the headquarters in Wuppertal or at our international subsidiaries.

We are happy to receive your application, especially if you have a strong background in engineering or NDT! Please send your application to career@karldeutsch.de.

You can find the current vacancies via our careers portal:



www.karldeutsch.de »
 Karriere

Employee News

Dr. Michael Maaß has now been Head of Sales at KARL DEUTSCH since June 2022. Since then, he has been able to restructure the division and to strengthen his team. There has been a massive increase in foreign sales staff in particular. Stefan Klein, who has been working for KD in field sales since 1999, supports Dr. Maaß in his new position as a Deputy Sales Director. Jörn Bolten, who had been Deputy Division Manager at KARL DEUTSCH since 2019, was recently appointed Division Manager for Ultrasonic Testing Systems. Under his leadership, some of the company's largest orders have already been executed successfully. LL



Dipl.-Phys.-Ing. Stefan Klein has been the Deputy Sales Director since January 2023.



Dipl.-Ing. (FH) Jörn Bolten has been the Division Manager for UT Systems since January 2023.



In the last few months, we have had the pleasure of welcoming many new employees. Welcome to KARL DEUTSCH!

Front row from left: Titus Peltsch (Sales in the South of Germany), Anton Sevryukov (International Sales), Julia Timmer (Shipping / Goods Reception), Alexander Hoheisel (Sales / Focus PAUT & Aerospace), Bubacarr Drammeh (System Production), Omar Bouroum (Head of Construction), Lea Lutterbeck (Recruiting), Katharina Bosse (Head of Accounting), Alexandr Tripel (System Production)
 Second row from left: Dr. Wolfram Deutsch (President), Danila Kabanov (International Sales), Nihat Yilmaz (Construction), Dirk Schmidt (Production Planning), Sabrina Büthke (Sales Processing), Oliver Medic (Deputy Head of System Production), Ulrich Hallberg (System Production)
 Third row from left: Krystian Rostkowski (International Sales), Sedat Dogan (Shipping / Goods Reception), Wilhelm Kraft (Production Planning), Adrian Helm (Sales in the West of Germany), Marc Sowa (Head of Portables Production)

Events and Trade Fairs



16 – 19 October 2023
31st testXpo
ZwickRoell GmbH & Co. KG
August-Nagel-Straße 11
89079 Ulm, Germany



23 – 26 May 2024
36th Control
International Trade Fair for
Quality Assurance
Stuttgart, Germany



24 – 27 September 2024
InnoTrans – Trade Show
for Railway Sector
Berlin, Germany



17 – 19 October 2023
50th National Conference
on Non-Destructive Testing
Kotobrzeg, Poland



27 – 31 May 2024
20th WCNDT
World Conference on
Non-Destructive Testing
Songdo Convensia
Incheon, Korea



22 – 24 October 2024
IZB – International
Suppliers Fair
Wolfsburg, Germany



15 – 19 April 2024
TUBE
International Trade Show
for the Tube Industries
Duesseldorf, Germany



The subjects of our lectures given at trade fairs and conferences and other current dates can be found on our homepage:
www.karldeutsch.de » **News & Dates** » **Dates**

About KARL DEUTSCH

KARL DEUTSCH

Pruef- und Messgeraetebau GmbH + Co KG

The privately owned company KARL DEUTSCH was founded in 1949 and develops and produces instruments for non-destructive material testing. Portable instruments, stationary testing systems, sensors and crack detection liquids are produced by 130 motivated employees in two works in Wuppertal. Additional 20 employees in international offices and a worldwide network of dealers support the export business which accounts for more than 50 % of the turnover.

Characterised by continuous innovation and product reliability, the trade marks

ECHOGRAPH,
ECHOMETER,
DEUTROFLUX,

LEPTOSKOP, FLUXA, KD-CHECK and **RMG** are well-recognised. Our customers are metal producing and processing industries, e. g. steel works, automotive companies and bearing manufacturers. Typical test tasks are ultrasonic weld



Main offices and manufacturing site for portables, sensors and chemicals (Works 1)



Offices and manufacturing site for testing systems (Works 2)

testing, detection of shrink holes in castings, crack detection in forgings with magnetic particles and dye penetrants, safety components for railway and aerospace as well as the wall and coating thickness measurement.

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