



Smart into the future.  
For sure.

Test it. Heat it. Cool it.



# Smaller, faster, higher performance – the electronics of tomorrow.

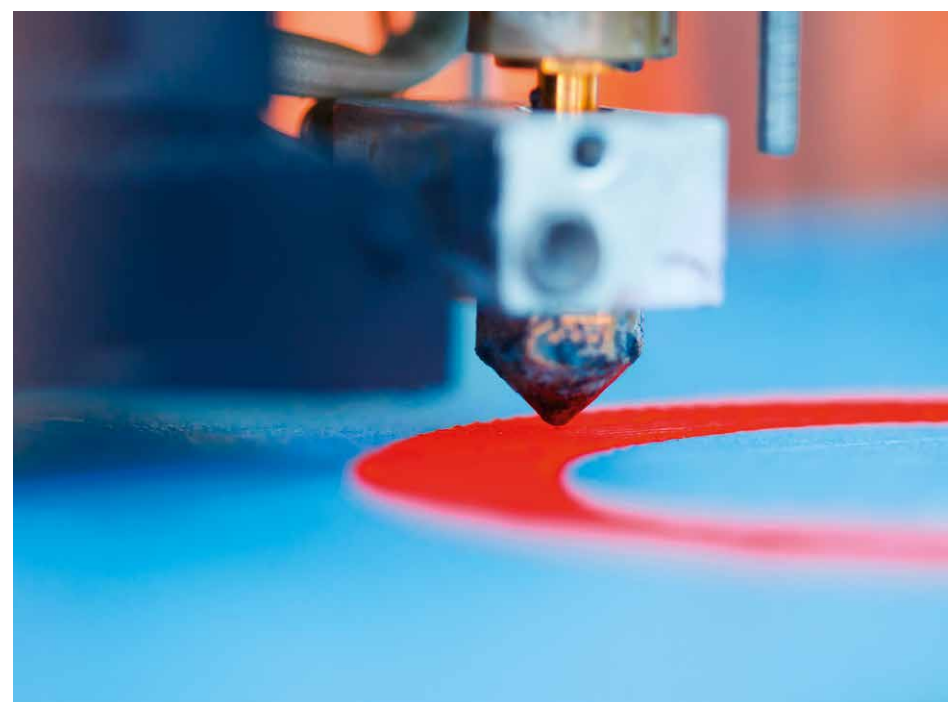
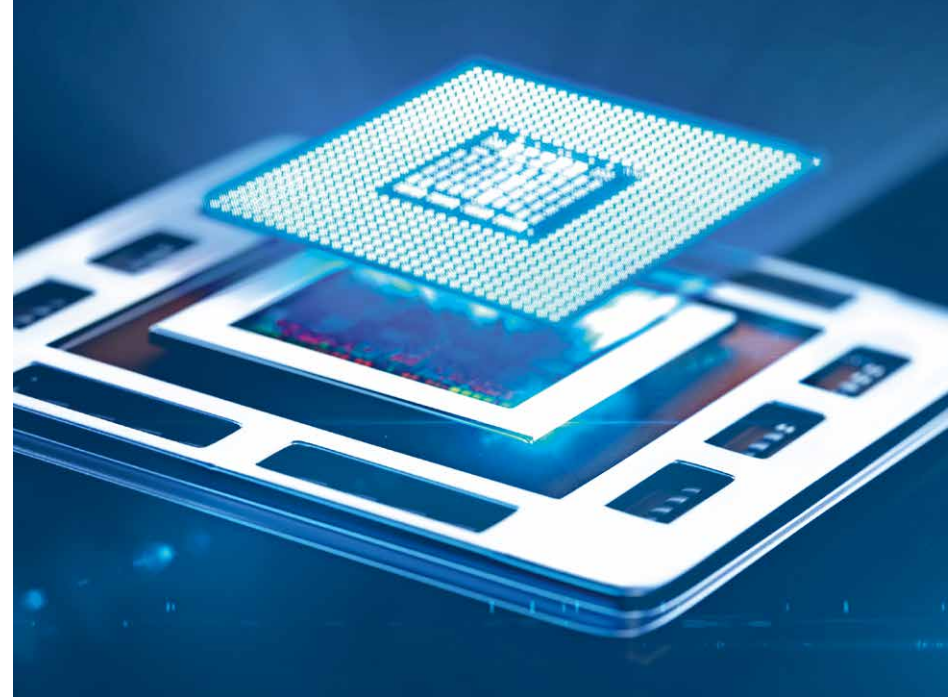
Securely into the future – with **weisstechnik®**.

**The future is digital: visions such as the Internet of Things, cars as supercomputers, eye-tracking, wearables, and 3D printing are gradually becoming reality. These developments are based on electronic components such as sensors, opto-electronic components, processors, and connectors.**

The increasingly extensive recording and processing of data are only possible with the interaction of these electronic components. With such advancements, we can use a smartphone to operate a washing machine which has been loaded by a robot. Or we can have a car pick up the children from school without our presence, for that matter.

Regardless of whether Augmented Reality Glasses or Virtual Reality Goggles dominate the market in the future – the more extensively the virtual world interacts with our real world, the greater will be the demands for reliable electronic components.

Individual components as well as integrated systems must operate safely at all times under all conditions: with fluctuations in climate or temperature or in extremely hot, cold, wet, or dusty environments. These requirements can only be met by components and systems produced under optimum conditions according with state-of-the-art technology which have proven their durability and reliability in corresponding tests.



Weiss Technik companies are amongst the most innovative and significant developers and manufacturers of systems in the field of environmental simulation, temperature processes and air conditioning. We have developed solutions specially for the electronics industry that meet the highest demands. To ensure that components excel in all applications, from electronic toys up to satellite control.

## **Test it. Environmental Simulation**

As one of the pioneers of testing and environmental simulation, we offer customised test systems for your industry for the simulation of extreme temperatures, drastic temperature changes, vibrations, and damp and dusty environments. These can be combined with our standard range of systems for weathering and corrosion tests under all climatic conditions, anywhere in the world.

## **Heat it. Industrial Heating Technology**

Our subsidiary Vötsch Industrietechnik complements our product range in the area of heat treatment systems and technology. We develop, plan and produce reliable heating systems of the highest quality. This helps us realise tailor-made solutions for you, e.g. for drying coatings or cross-linking plastic sheaths for sensors.

## **Cool it. Climate Control Technology**

Complex manufacturing processes and operating conditions require the best possible climatic conditions. In addition to clean rooms and containment systems to protect people, products and the environment, we also offer air conditioning systems for optimal temperature control of IT equipment and operating units. As one of the leading providers of climate control technology, our experts will guide you from the planning to the implementation of your projects.

## Speeding up processes.

**weisstechnik® - and you can bring your product to market faster.**

We love extremes, reproducible results, energy-efficient processes, and excellent service. This is why we offer exactly that.

### Software

For 100% traceability and higher quality. Integrate your test systems into an intelligent factory. SIMPATI® makes it possible!

### Heating technology

For research and production. So that your drying and heat treatment processes take even less time.

Industry 4.0

Production

Equipment

Testing

### Climate control

For your production facilities and server room cooling. To maintain your computing power, even when things get hot.

### Environmental simulation

For development and quality assurance. So that the interaction of individual components functions properly in the complete system and processes and components can be optimised.

## Heat up your processes.

**Low failure rates for profitable results - with vötschtechnik®.**

The Heating Technology division of our subsidiary Vötsch Industrietechnik offers a wide range of production systems for the electronics industry. From chips to switches, for clean room heating, drying, or vacuum ovens - with us, the focus is on your product.

### Your benefits:

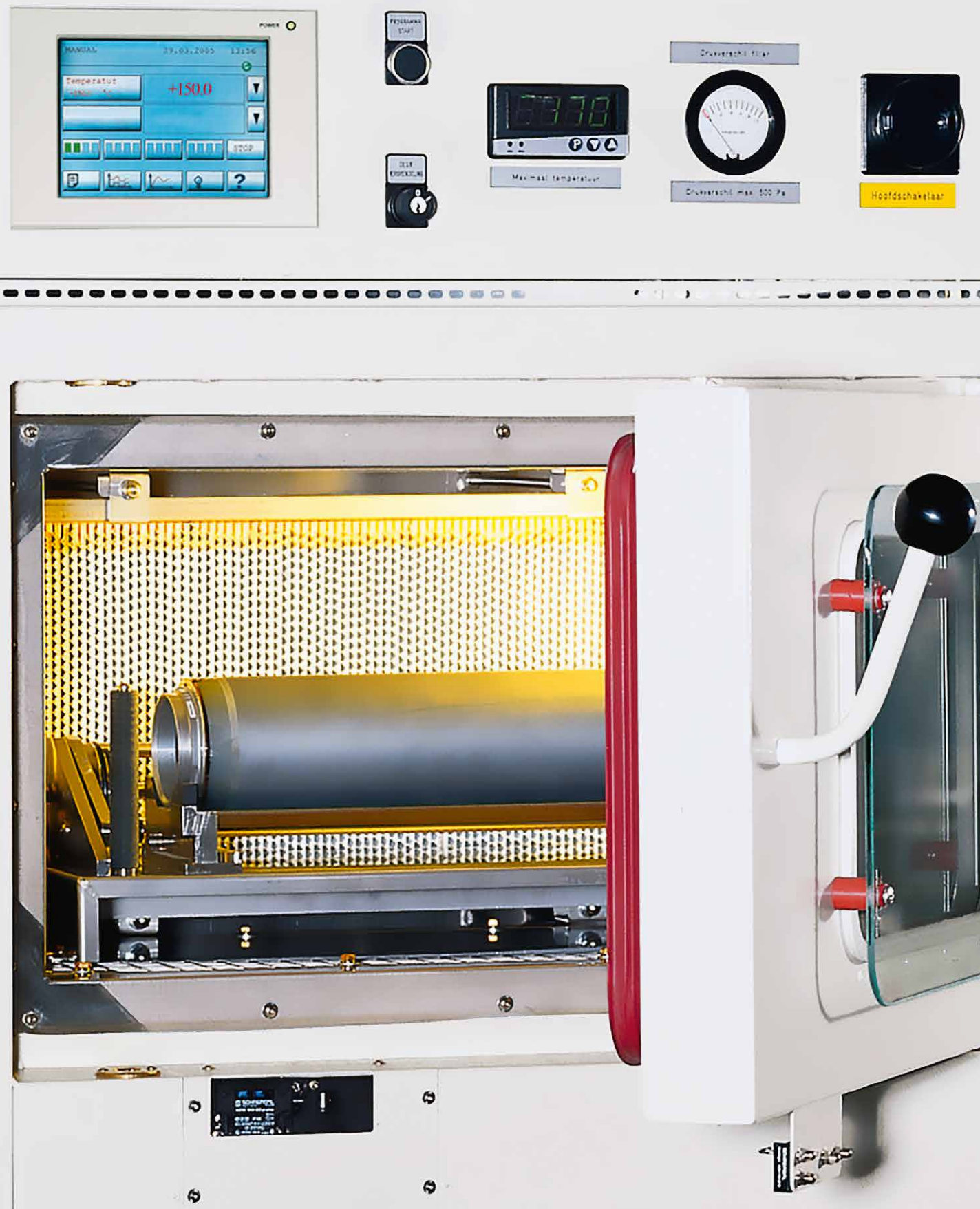
- Short process times thanks to rapid heating and cooling
- Constant product quality due to homogeneous temperature distribution in the workspace
- Reproducibility through the use of components with consistently high quality
- 100% traceability through networked control systems
- Systems which are optimally tailored to the production processes through the development of customised solutions

For materials with a high proportion of solvents or inflammable materials, we have developed drying ovens with special protective devices - to keep you safe. Of course, we also supply our systems in versions suitable for clean rooms - for ultimate precision electronic components.

### Heat treatment of wafers in a nitrogen atmosphere

#### Special features:

- Clean room Class 5 according to DIN EN ISO 14644 in the working area and the workroom
- Adjustable inert gas supply
- Automatic or manually operated lifting doors



## Your perfect heating technology.

**Fast and energy-efficient production processes.**

### Clean room heating and drying ovens

Manufacturing under clean conditions improves the quality standard in research, development, and production. Heating and drying processes, for example in the production of integrated circuits under high purity conditions, are a prerequisite for low failure rates and profitable results. VTF series clean room heating and drying ovens have been developed in close cooperation with leading companies in the semiconductor industry. This has resulted in products which meet highest requirements for clean room technology.

VTF series clean room heating and drying ovens are available in six sizes, with workspace volumes between 60 and 3,125 litres and nominal temperatures of 250 °C, 300 °C, and 350 °C. These are suitable for heat treatment under clean room conditions (clean room Class ISO 5 working areas according to DIN EN ISO 14644-1). Further highlights are homogeneous room temperature distribution across the entire temperature range, shorter process cycle times due to short recovery times, and solutions for integration into automated production lines, which are also available as clean room versions.

### Basic equipment

- Stainless steel (1.4301) workspace in clean room version
- SIMPAC® control and regulation system
- High-efficiency particulate air (HEPA) filter for filtering circulating and fresh air
- Differential filter pressure display
- Filter test connections



### Clean room heating and drying oven VTF 60/35/35-200 °C\*

- Nominal temperature: 200 °C
- Heating power: 12 kW
- Clean room Class: 100
- High temperature uniformity:  $\pm 1$  K

\* Selected device type - other types on request, please contact us.

# Your professional hot-rods.

The right solution for every application.

## Continuous oven systems

Each **vötschtechnik**® continuous oven systems is tailored to the particular application process and is therefore a unique item. It can be equally used to temper plastics or cure adhesives on electrical components and is especially suitable for heat treatment in automated production lines. Whether chains, hinge strips or roller conveyors, vertical or horizontal airflow - from conveyor systems to cooling: we have the perfect solution for your process.



### Continuous oven VDU 120/20/240-200 °C\*

- Dimensions: Width: 1.64 m, height: 1.9 m, length: 5.7 m
- Nominal temperature: 200 °C
- Heating power: 40 kW

## Heating and drying ovens

VTU series heating and drying ovens are available in seven sizes with extensive accessories, e.g., charging trolleys, temperature controllers, etc. They can be used universally for heating and drying processes in production and research. Due to the extensive options, accessories, and modification possibilities, these devices can be optimally matched to meet your requirements.



### Heating and drying oven VTL 100/150\*

- Test space volume: 1.5 m<sup>3</sup>
- Nominal temperature: 250 °C
- Heating power: 27 kW

## Vacuum heating and drying ovens

VVT series vacuum heating and drying ovens are used wherever gentle drying of heat-sensitive materials, light and small products, or components with complex geometries is required. The vacuum enables a reduced boiling point and increased drying speed; the extremely low residual oxygen content prevents oxidation processes.



### Vacuum heating and drying oven VVT 65/50\*

- Test space volume: 260 l
- Nominal temperature: 200 °C
- Heating power: 3 kW

# Tested speed sensors – nothing else is used in automatic gearboxes.

## Intelligent process integration at Bosch.

The environment for sensors in automatic gearboxes is harsh: large temperature fluctuations and oil which aggressively attacks surfaces. Bosch now uses ovens from Vötsch Industrietechnik to cross-link the thermosetting plastic housings of speed sensors and then subject them to an extensive stress test. The ovens are integrated into fully automated production lines. The rotation sensors are integrated into the 9G-TRONIC automatic gearboxes of a leading German car manufacturer.

### The oven

The **vötsch**technik® heating and activation oven consists of two chambers. In one of the chambers, there is a constant temperature during the process. The second chamber has two temperature zones, with greatly differing temperatures. The sensors are passed from one temperature zone to the other.

The oven is equipped with a separate controller and is integrated into a fully automated production line. The production line uses industrial robots to place the sensors in the oven. The oven doors, four for each chamber, are pneumatically powered, and opening and closing is requested with an input/output signal.



Wolfgang Paasch, Production Project Manager at Robert Bosch Fahrzeugelektrik Eisenach GmbH summarises the integration into the production line: “**vötsch**technik® ovens are ideal for processing our small sensors in large packaging units and therefore only require a small amount of space. The ovens are notable for their robustness, reliability, and once-a-year maintenance. Cooperation during the various projects was good and constructive and deadlines were always met. A second oven is planned to increase capacity.”

### The process

The robot places the sensors, which are plugged onto carrier plates, directly into the hot left-hand chamber of the oven. The thermosetting plastic, the packaging of the sensors, if you will, is cross-linked at high temperatures. Cross-linking creates the finished structure of the plastic. This process takes several hours, during which the temperature of the oven is held stable.

Sensors which have already gone through this process are moved into the cooler of the two temperature zones in the right-hand chamber. The repeated transfer from one temperature zone to the other is triggered by the production line control system and is carried out automatically by the oven. The rapid change in temperature, from hot to cold or from cold to hot, simulates the thermal stresses on the sensor in the gearbox. The sensors are therefore being subjected to a stress test under extreme conditions.

A function test is carried out once the heat treatment is complete. Only sensors which have passed this test are installed in the gearboxes.

### The sensors

Three speed sensors are installed in automatic gearboxes: one measures the engine speed, a second measures the speed of a ring gear in the gearbox, and a third measures the speed at the output of the gearbox. The vehicle control unit receives the data from the sensors to decide when to shift gears.





## Simulate the future. Now.

**weisstechnik® - so your product passes the test of daily use in the future.**

Our lives are becoming increasingly dominated by electronics: be it smartphones, tablets, Game Boys, navigation systems, or intelligent household appliances, in every toy there is a chip, a battery, a switch. From sensors in cars to LED lights for minimally invasive surgery - we need to, and must be able to rely on the quality and function of all components under all conditions. Every day, everywhere, and in every weather.

To ensure this and to exclude possible weaknesses and thus expensive warranty claims right from the outset, we have developed test cabinets and chambers which can be used to simulate a wide variety of environmental influences under accelerated conditions. Whether hot or cold, damp or dry, dusty or wet, at rest or in motion - our test systems cover virtually all eventualities. This not only ensures safety, it also saves time and costs.

Generations of **weisstechnik®** test cabinets and chambers have been successfully used for many years in research, development, production, and quality assurance. With their wide variety of options, even series-production devices, fulfil many specific requirements with ease. In addition, our teams of experts develop special chambers on request, which are perfectly matched to your technical requirements.

# Pass your stress test.

Test spontaneous temperature changes - so that nothing can shock you.

## Temperature shock test chambers

Environmental conditions have a great effect on the functionality and reliability of electronic components, devices, and systems. These products are subjected to a large number of shock-like temperature changes, allowing latent weaknesses to be detected as quickly as possible. This provokes early failures, so that faults can be detected at an early stage of production and the life expectancy of the samples can be predicted.

With the **weisstechnik** TS temperature shock test chamber, extremely rapid temperature changes ranging from -80 °C to +220 °C can be implemented. The test chamber consists of two independently controlled chambers, one hot and one cold chamber. These are positioned on top of each other. The specimens are placed in a lifting cage and rapidly transferred between hot and cold to achieve a temperature shock. The temperature levels and the number of cycles determine the severity of the test.

## Basic equipment

- Stainless steel (1.4301) test space
- Volume compensation system for continuous operation for more than 1,000 cycles without defrosting
- All-round securing of the entry port
- Green Mode®



## Temperature shock test chamber TS 120\*

- Lifting cage volume: 120 l
- Load capacity of lifting cage: 50 kg
- Transfer time: <10 sec
- Temperature range: Hot chamber from +50 °C to +220 °C, cold chamber from -80 °C to +70 °C

\* Selected device type - you can find further types in the product brochure TS Temperature Shock Test Chambers, please contact us.

# Your border crossers.

Test to the limit - only if the individual parts pass the test, the entire system will work.



## Assembly test chamber

The WT 550/60 assembly test chamber is designed to carry out constant temperature tests, temperature fluctuation tests, and function tests on materials, individual components, and finished products. With a test space volume of 550 litres and a floor space of only 1.3 m<sup>2</sup>, the chamber is an absolute space miracle and the ideal space-saving solution for development, the laboratory, or production.

### Assembly test chamber WT 550/60\*

- Test space volume: 550 l
- Temperature range: -60 °C to +100 °C
- Heating rate: 4.5 K/min
- Cooling rate: 3.3 K/min



## Tensile test chamber

Environmental conditions during production, storage, transport, and use have an effect on the function and service life of products. Tensile tests must be carried out in specified climatic conditions to ensure the quality of materials. With our tensile test climatic chamber you can determine the behaviour of materials under realistic conditions.

### Tensile test chamber ETE/EKE\*

- Test space volume: from 30 l to 1000 l
- Temperature range: from -30 °C (-60 °C) to +180 °C



## Dust test chamber

Dust tests are mainly performed to test the functioning of electronic components under extreme environmental conditions. The dust is filled into the hopper below the test space. The formation of dust within the test space is effected by injecting compressed air through four special nozzles. Due to the intensive air movement, the dust is blown into the upper test space and swirled around.

### Dust test chamber ST 1000\*

- Test space volume: 900 l
- Testing according to SAE J575 (June 1992)



## Splash water test chamber

With the splash water test chamber, reproducible spray and splash water tests can be performed according to DIN VDE 0470 T1 or EN 60529 and for protection code testing (IP Code) according to IPX3 and IPX4. This test determines the protection class of housings against ingress of water.

### Splash water test chamber SWT 200/400\*

- For testing water protection, IPX3, and IPX4
- According to DIN EN 60529 (September 2000)

## Under the sea.

### Safe underwater pipelines for Oceaneering.

A network of supply lines is spread across the Earth's oceans to supply the world with oil and gas. These lines must be extremely reliable and durable. For this reason, cables and pipes are often made of steel or copper. To ensure that the materials which are used meet the stringent requirements, they are subjected to an endurance test in test chambers from Weiss Umwelttechnik.

Two of these chambers are located at Oceaneering, one of the world's leading manufacturers of undersea cable and piping systems. To identify the materials best suited for use in the depths of the ocean, the company carries out extensive material research and testing. The materials used must be able to withstand the low temperatures and high pressure prevailing under the sea for up to 35 years.

Tests enable the company to predict the behaviour of these materials at various temperatures to ensure that the cables withstand the conditions in a deep-sea environment. In the case of oil and gas pipelines, premature material fatigue can have disastrous effects on the environment and must be excluded at all costs.

In one of the material tests, cables and pipes are subjected to the combined stress of temperature and tension. The test samples are stretched and simultaneously cooled or heated in the **weisstechnik®** temperature test chamber. The most important temperature for this test is +4 °C, as water reaches its greatest density at this temperature. To provoke more rapid material fatigue and, therefore, to make reliable predictions about the durability of the material, the components are also heated up to 90 °C.

The test results are stored in a database, which allows the company to expand its knowledge about the various materials. Also, the material needs to be tested only once by this method, which reduces time and costs for the development of new solutions.



# Your stress makers.

Details are decisive - so you can stay relaxed.



## Environmental stress screening (ESS) test chamber

Today's competitive market demands highly reliable products. During the ESS test, products are subjected to a precisely specified stress situation in order to detect faults in components and circuit boards at an early stage.

### Climatic test chamber WKS3 480/70/15\*

- Test space volume: 480 l
- Temperature range: from -70 °C to +180 °C
- Heating rate: 15 K/min
- Cooling rate: 16 K/min



## Lithium-ion test chamber

Lithium-ion batteries are the most important source of energy for many electronic devices. Particularly in the consumer segment, they must work perfectly, regardless of wind or weather. With **weisstechnik®** lithium-ion test chambers, you can perform temperature tests, climatic tests, vibration tests, and temperature shock tests, and, if necessary, supplement these with additional safety components according to EUCAR Hazard Levels 0-7.

### Lithium-ion test chamber\*

- Individually selectable test space volume
- Extensive safety equipment: CO<sub>2</sub> cooling and inerting, H<sub>2</sub> concentration measurement, CO and CO<sub>2</sub> concentration measurement, safety temperature limiter, electromechanical door lock



## EMC test chamber

Electromagnetic influences may cause malfunctions in electrical devices and systems. Measurement of the electromagnetic compatibility of a system and the development of suitable protective measures for the reduction or suppression of electromagnetic interference are subject of many research projects. For this, we have developed special test chambers.

### EMC test chamber VT 4021 EMC\*

- Test space volume: 200 l
- Temperature range: -35 °C to +100 °C
- Shielding effectiveness (SE):  
Medium frequency (30 MHz to 1 GHz) <dB 40-70
- High frequency average (1-3 GHz) <dB 40
- Nominal output: 1.5 kW



## Vibration test chamber

With the WT3-V and WK3-V series test systems, you are in a position to simulate the mechanical and thermal/ climatic stresses on components and devices. A total of 36 test systems in three sizes, in temperature ranges between -40 °C or -70 ° to +180 °C, and temperature change rates of 5 K/min, 10 K/min, and 15 K/min, with and without air conditioning, represent the variety of our vibration test systems.

### Vibration test chamber WK3-2200/70/15/V\*

- Test space volume: from 600 l to 2200 l
- Temperature range: from -70 °C to +180 °C
- Humidity range: from 10% to 95% RH
- Movability (as shown in picture): optional

# Safe journeys with Connected Car.

Material stress tests in the high-tech test laboratory make it possible.

"Connected Car" solutions have now become a central economic factor in the European car industry, explains IT consulting firm Pierre Audoin Consultants (PAC) in a current study. One of the pioneers in this market is MD Elektronik GmbH, whose data transfer solutions are now integrated into over 170 models of more than 25 well-known car manufacturers. These products are jointly created in cooperation with the car manufacturers and are thoroughly tested with regard to their quality and suitability for day-to-day use in an ultra-modern, in-house laboratory before they go into large-scale series production for years of use in practice.

The MD test laboratory located in the company headquarters in Waldkraiburg, east of Munich, was largely equipped with technology from Vötsch Industrietechnik, which supplied the special temperature, climate, and vibration test chambers; a salt spray chamber; shock test chambers; an iced-water shock chamber; and systems to simulate sunlight and dry corrosion. With this special equipment, MD Elektronik

can carry out sophisticated material and high-frequency analyses, mechanical and electrical tests, measurements with high-speed cameras, and computer tomography imaging as well as various "material stress tests". For these, special environmental conditions such as extreme temperatures or high voltages are simulated in order to test and ensure the quality of MD products, i.e. their performance and durability.

The test laboratory has now been enhanced with a **vötschtechnik®** air/water temperature shock chamber. Test samples placed in a metal lifting cage from a test chamber are immersed into a water bath to e.g. test the waterproofness of plug connectors can be tested. The OEM (Original Equipment Manufacturer) develops special test methods for stresses, which in some cases may be extreme. In this version, pre-assembled cables are repeatedly subjected to a rapid change from a hot chamber at 120 °C to a salt-water immersion bath at 0 °C. The temperature

gradients which occur and the associated thermomechanical stresses on the test samples are enormous. One example is a scenario in which vehicle wiring in the floor pan, which has been heated by the engine, is subjected to ice-cold drenching with salt water in winter. In the past, it was only possible to implement these special test requirements manually. With the new air/water temperature shock test chamber, the test is now automated and reproducible, even for large numbers of samples.

"As an internal test laboratory, we qualify not only products according to customer specifications. We also conduct product assurance, tests in the course of development, fundamental examinations, lifetime simulations, and analyses of defective components. All of this ensures the quality of our products and reinforces our position as a competent development partner for the automotive industry," explains Dr. Alexander Haas, Head of the MD Elektronik GmbH test laboratory.

Product qualification is always an interaction between assessment tests (e.g. measurement of high-frequency transfer function) and stress tests (e.g. temperature shock storage), so that changes in specific performance parameters can be evaluated under special operating conditions and types of ageing. The MD test laboratory tests and qualifies almost exclusively products from the automotive sector. On the one hand these are transfer systems for high-frequency analogue and digital signals – plug connectors, cables, and power components. Recently there has been an increasing number of active electronic components from the infotainment sector, as this market segment is continually growing in the motor vehicle industry. For this reason, the facilities in the test laboratory are continuously being enhanced. Dr. Haas gives an outlook for the future: "At present we are increasingly working to exploit new test technologies which result from new product strategies and fields of activity. For example, we will soon be intensively involved in measurements for electromagnetic compatibility (EMC)."





## Individually planned. Expertly implemented.

**weisstechnik® - experts for decades  
in the field of climate control.**

### **Ideal climate for your applications**

Purity, temperature, humidity, pressure, and their permitted variation tolerances are indispensable conditions for sophisticated development, production and test processes.

The use of process climate control makes it possible to set the required narrow limits and control these precisely in both space and time.

In addition, people, the environment, or the product itself must be protected against contamination in various processes. These core areas require significantly more complex control than other process stages.

### **Standard products and individual solutions**

With its wide ranging product portfolio, Weiss Klimatechnik offers systems for every application, from complete clean rooms and measuring rooms, to process climate control systems and individual workbenches, to special air conditioning systems for data centres. Customised solutions are our strength.

### **Compact, universal, and reliable**

From precision air conditioning units to mini environments, our components and systems impress with their compact design combined with innovative technology. We provide you with comprehensive support right from the start - from planning to acceptance measurements and instruction of your employees. Through our service network we ensure constant availability of our systems and installations.

# Your unerring quality assurance.

Controlled process environment for pure production and precise products.

## Clean room air conditioning systems and equipment

With our ultraclean® line of products, we offer our customers a technology in which the emphasis is on the cleanliness of the room. Depending on requirements, the solution is equipped with partial or full air conditioning functions, i.e., cooling, heating, and humidity control. With our system solutions we ensure compliance with national and international clean room standards such as VDI 2081 and DIN EN ISO 14644.

The spectrum of expertise ranges from simple machine housings to laminar flow systems and complex clean room systems. Together with you, we plan and build according to your wishes and requirements.

### Clean room air conditioning systems and equipment\*

Mini environment ultraclean® with high precision climate control for micro-electronic inspection tools

- Temperature stability:  $\pm 0.05$  K
- Humidity stability:  $\pm 1\%$  rel. humidity
- Clean room Class 2 according to DIN EN ISO 14644



## Measuring room

Measuring rooms are central components for quality assurance during production. The greater the reliability of the measurement, the lower the reject rate. This is particularly important for the narrow manufacturing tolerances of sensitive electronic components.

One major factor for the uncertainty of measurements are the environmental conditions, primarily the temperature. Weiss Klimatechnik plans and produces individually tailored measuring rooms in accordance with the requirements of VDI/VDE 2627. These reduce measurement uncertainty by suppressing the influences of temperature, through e.g. the prevention of draughts or direct light, the enclosure of the measuring device, and thermal insulation of the measuring room.



### Measuring room\*

- Floor space: 112 m<sup>2</sup>
- Clear room height: 3.50 m
- Air supply: TMS (Turbulent Mixed Flow) via swirl diffusers



# Your protection for people and the environment.

Efficient solutions for your safe workplaces.

## Safety workplaces

Progress in systems engineering places increasing demands on the protection of products and the protection from emissions for the people who work with the products. Workplaces and stations in which hazards could occur must fulfil functionally and economically critical conditions.

The WIBOject® and the WIBObarrier® system are the basic principles of our safety workplaces. Specially formed air outlets, known as ejectors, create a curtain of pure air, which safely separates the work area from the surrounding area. The WIBOject® system provides optimum protection for employees and the room. Dust or gases which are released by the product are caught by the ejector air and removed by the extractor in the rear wall. The WIBObarrier® system is used if pure product protection or protection of the product and persons is required. The vertical WIBObarrier® air curtain operates according to the 3-zone principle and protects the product from external immissions. This achieves a reliable Class 5 clean room zone according to DIN EN ISO 14644-1 in the work area.

### WIBObarrier® BAKVO 120/97\*

Clean room line for production of electronic switching elements

- HEPA filtering of intake and exhaust air
- Air volume: Air intake 1,000 m³/h, exhaust 1,400 m³/h
- Clean room Class ISO 8

### WIBObarrier® BAPVO 120/87\*

Safety workplace for coating and vapour deposition on electronic components

- HEPA filtering of intake air
- Air volume: Air intake 1,000 m³/h
- Special equipment: sliding front window
- Clean room Class ISO 7

# Your flexibility for higher efficiency.

Intelligent climate control for your data centre.

## IT Climate Control

An absolute innovation in the area of IT climate control: CoolW@II® turns the entire technology room into a refrigerator and makes it possible to achieve extremely high cooling performance with low energy consumption. The technology is built into the walls saving space in the server room. Say goodbye to climate control chambers!

### IT Climate Control CoolW@II® 300.4 CW\*

- Air volume: 30000 m³/h
- Cooling output: 150 kW at 10/15 °C water and 30 °C recirculation

## The most important benefits of CoolW@II® at a glance:

- Most energy-efficient water-cooled climate control system for data centres
- Highly useful cooling output with a small installation area
- Modular system design with coordinated individual elements
- Can be freely adjusted to every room's infrastructure
- Maintenance-friendly walk-in system



By the way: our latest product, the innovative air conditioner deltaclima® mini DC won second place in the Deutscher Rechenzentrumspreis 2015.



## Industry 4.0 – networking is a catalyst for innovation.

Exploit your potential with **weisstechnik®**.

With the increasing requirements for the use of electronic components, the need for 100 % quality control is also increasing. Quality control must be integrated into the process, enable comprehensive traceability, and facilitate immediate intervention in case of deviations. The production flow must continue without hindrance by the tests so that delivery times can be met and products are available any time and any place in a globalised world. For this reason, individual solutions, as they are now commonly used in research and development laboratories, will become a model of the past in tomorrow's quality control.

In cooperation with leading process automation manufacturers, we have developed a special measuring software and continue to develop it further: SIMPATI® performs and documents the test process, interlinks up to 99 systems, which can be remotely monitored and controlled with SIMPATI® Web via Internet browser from anywhere in the world. Visualisation of the test process through real-time monitoring by camera: SIMPATI® TimeLabs® and SIMPATI® TimeLabs® Infrared enable precise tracking of changes during the testing process with simultaneous correlation of the measurement values.

In addition to automatic loading and unloading of test samples by robots and conveyor technology, SIMPATI® plays an important role in the integration of environmental simulation chambers into the production process. 100 % traceability of the process data enables complete evidence of quality – chip by chip.

## Smart integration with SIMPATI®.

Future-proof use of test systems in intelligent factories.



### Networking

The SIMPATI® control software enables the optimal integration of test equipment for environmental tests into smart production processes.

- Networking with different test systems
- Control of up to 99 systems, including additional measuring devices

### Process control

Control of test systems becomes simpler and saves time. Integrated monitoring routines increase the reliability of system operation. The extent and frequency can be individually specified.

- Easy control of test sequences
- Easy creation of test programs with the program editor
- Clear management of programs for production sequences and tests
- Management and administration of various users and user groups
- Convenient configuration of outgoing e-mails in case of events
- Clear specification and display of future events with the planner

### Evaluation and documentation

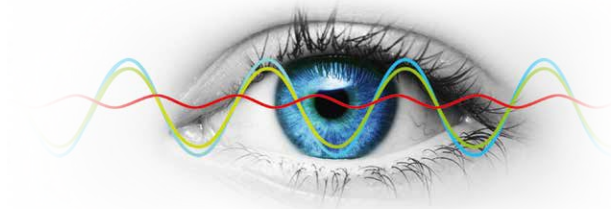
Evaluation and documentation of test sequences as well as the inclusion of your special measurement data guarantee and improve the quality standard.

- Save measurement data
- Record irregularities and malfunctions during the test sequence
- Print out measurement data in graphic form
- Export measurement data to other programs for evaluation
- Calculate the gradients of process parameters and times for changes to process parameters
- Display evaluations as illustrative graphs

Did you know? Equipment with infrared sensors for non-contact measurements can be available on request. To help you keep the test sample intact and accelerate the process.

## A picture is worth a 1000 measurements.

The SIMPATI® TimeLabs® visual documentation system.



In addition to and in correlation with the recording of conventional measurement data, digital camera images are generated at regular intervals with a special software and saved in a common archive folder. The combined evaluation of the measurement data and the images creates new and valuable knowledge. And more so, when a special event has occurred.

### SIMPATI® TimeLabs

- Parallel documentation of images and measurement data
- Up to six cameras in HD quality
- Individual choice of cameras, be it industrial or notebook cameras, endoscopes, microscopes, webcams, or thermal imaging cameras

### SIMPATI® TimeLabs documents:

#### Electronics

- Malfunctions
- Responses of LED/LCD displays

#### Mechanics/movement

- Fan stoppages
- Throttle control
- Valve control

#### Condensation

- Surface precipitation
- Moisture build-up

#### Corrosion

- Progress of processes

#### Fluid level

- Changes of fluid level

#### Behaviour of materials

- Deformation

# Industry 4.0 – forward into the future.

## Mitsubishi uses robots for climatic testing.

Almost everyone has tracked a parcel on the Internet. Via a link, it is possible to find out where a parcel is from anywhere and in real time – in the dispatch department, in the packing station, or already in the post van. How does this work? Are there other applications for this system? The key to these questions is Industry 4.0.

The term “Industry 4.0” refers to the fourth industrial revolution, which is characterised by the systematic increase in the flexibility of products and production processes. This involves large-scale networking of machine and plant construction, automation technology, and IT. One feature includes the further development and use of

modern automation, information and communications technologies, which will open up new possibilities for users in production and logistics.

The basis for Industry 4.0 is the availability of relevant information in real time – just like tracking a parcel. Industry 4.0 describes the networking of product systems and products on the basis of cyber-physical systems in the Internet of Things. Advantages include greater flexibility, optimised processes, and cost savings. The concept of the Internet of Things implies the virtual representation of physical objects (“things”) in a structure similar to the Internet. This creates a link between humans, objects,

and systems, with which dynamic, real-time, and self-organising inter-company value creation networks are developed. If a special spare part is produced somewhere, its status, availability, and location can be tracked from the other side of the world.

Information which can be called up can be made available by means of RFID or QR codes, for example. This information is recorded and made available by a central system, so that it can be accessed regardless of the location. This is also how parcel tracking operates on the Internet.

In a unique project, the cooperation partners Weiss Umwelttechnik, the VDE Institute, and Mitsubishi utilise the advantages of Industry 4.0. The project is an automated test station for testing components in a climate-controlled environment. The application example at the Productronica 2015 trade fair demonstrates the advantages of a symbiosis of robotics (Mitsubishi robot system) and climatic testing equipment (Weiss Umwelttechnik).

Data are transferred to the robotic system using a barcode scanner. The **weisstechnik®** SIMPATI® software records the scanned data, including, for example, the name of the employee, loading or unloading of the climatic chamber, and the number of test samples. The correct program for each previously scanned product is saved in a database and is selected automatically. The time stamps and measurement data are recorded during the process and are made available in an overview. Hence the information in the database can then be accessed from anywhere, even at a later time. Information is stored about which program has been, or will be run, when the product was inserted into or removed from the chamber, by whom this was done, and whether there were any error messages. In this way, test processes are optimised and the testing and evaluation quality is increased.

The use of a robot perfects this system and assists testing in future mass production. Scanning and loading or removal of the test samples is carried out fully automatically, but works just as well manually. Employees operate the climatic chambers or the heating systems with the aid of a barcode scanner. The SIMPATI® software then records the data and generates a report on the progress of the test. Any other employee can then access the information in the database from any department by means of a browser – again, it’s just like tracking a parcel.



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Vötsch Industrietechnik, a subsidiary of Weiss Umwelttechnik, offers a wide product portfolio in the field of heating technology. With an experienced team of engineers and designers, we develop, plan and produce high-quality and reliable heating technology systems for virtually any field of application. Products include heating/drying ovens, clean room drying ovens, hot-air sterilisers, microwave systems and industrial ovens. The portfolio reaches from technologically sophisticated standard versions to customised solutions for individual production operations.

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