REESE

EXPERTS FOR HEAT TREATMENT.

The Management Board (from the left):
Norbert Schremb, Weimar
Dipl.-Ing. Ulrich Reese, Chemnitz
Dipl.-Ing. Joachim Reese, Brackenheim
Dipl.-Ing. Gerhard Reese, Bochum

KNOWLEDGE FROM EXPERIENCE.
WE MASTER THE TECHNOLOGY.

Precision technology needs heat treatment. The cost effectiveness and quality assurance of production can be safeguarded as early as the design phase, with the choice of right materials and suitable heat treatment methods.

For over 65 years, HÄRTEREI REESE has been a leading force in the development and application of heat treatment methods for steels and other metal materials, maintaining its excellent market position on the strength of its extensive expertise. This was set in motion at the time when the company was still being run by its founder, Dr.-Ing. Helmut Reese, who provided the key scientific ideas and laid the cornerstone for a corporate culture geared to innovation.

Today, HÄRTEREI REESE can provide a comprehensive range of materials technologies at all four of its sites. By exchanging findings and experience with universities and research centres and refining its own methods and procedures on site, our specialised company has become the focus of high demand in its field – also on the international level.

Supported by its experience, know-whow, and state of the art plant technology, HÄRTEREI REESE understands how to hallmark heat treatment as an indispensable success factor in production and to convert its high quality and high precision products into market advantages for its customers.

For this reason, a great many partners consult with Reese before they select the materials for their applications, and have never failed to trust our expertise for many years.


WHEN HIGH MATERIAL TOUGHNESS
AND TENSILE STRENGTH ARE NEEDED.

HARDENING AND TEMPERING.

When a steel in the austenitic phase (i.e. at temperatures over 723 °C) is suddenly cooled, the austenite transforms into martensite, a structure characterised by great hardness.

Tempering gives back the steel a certain toughness. The steel is tempered at temperatures as high as 700 °C for the optimal values of all mechanical properties.

This is particularly important for workpieces that are subjected to dynamic stress and therefore must exhibit high toughness.

Hardening and tempering at REESE:

- In a controlled furnace atmosphere
- Max workpiece dimensions Ø 5,000 x 5,000 mm

[Precision components prior to heat treatment.]


HIGH SURFACE HARDNESS
COMBINED WITH HIGH
TOUGHNESS AND STRENGTH
IN THE CORE.

CASE HARDENING.

This thermochemical process is designed to enrich the workpiece with carbon. The method applied at HÄRTEREI REESE is based on gas carburisation, which can be very easily regulated and allows precise specifications for subsequent hardening profiles. After carburisation, the components are hardened and then stress relieved in a tempering process. Besides their high surface hardnesses (up to 850 HV) and resistance to wear, the heat treated workpieces also exhibit high fatigue strengths. Specific time and temperature variations during the carburising, hardening, and stress relief processes serve to optimise the material properties and minimise the changes to geometry caused by these processes' special batching techniques.

[Chamber furnace for smaller components.]

HÄRTEREI REESE operates highly automated universal chamber furnace lines that can case harden, carbonitride, and temper components for large scale series production. The furnaces are charged and discharged automatically, hence all key process parameters can be regulated and documented to a high precision.

Into a new dimension:

HÄRTEREI REESE operates the largest state-of-the-art shaft furnace for inert gas hardening in Europe

- For parts up to 5,000 mm in diameter
- Ideal for the construction of large scale plant, e.g. wind turbine generators, offshore installations, or shipbuilding

SURFACE HARDENING.

[Selective surface hardening of a workpiece.]

Inductive, flame, or laser heating raises the temperature on the workpiece's targeted zones that are then quenched once they reach the required hardening level. Surface hardening of large workpieces demands high qualification levels and great experience. Both are found in the highly trained employees at HÄRTEREI REESE. Many years of experience have culminated in optimised processes and component based solutions for both flame and inductive hardening. A high level of reproducibility can be obtained with the targeted definition of machine parameters. Hence, in many cases, surface hardening presents itself as a technical and economical alternative to conventional case hardening. The installations allow surface hardening on workpieces up to 16 t in weight and 10 m in length. Induction coils are available for many standard workpieces, accelerating greatly the fulfilment of these orders.

Surface hardening at REESE:

- Inductive and flame hardening on shafts, axles, etc., up to max Ø 1,000 x 10,000 mm
- Spin hardening up to Ø 1,250 mm
- Hardening on individual teeth of gear wheels up to Ø 5,500 mm
- Laser hardening up to 1,500 x 600 x 800 mm

SOPHISTICATED COMPONENTS WITH COMPLEX GEOMETRIES ARE HEAT TREATED TO OPTIMAL EFFECT.


IDEAL FOR COMPONENTS HIGHLY SUSCEPTIBLE TO DISTORTION.

VACUUM HARDENING.

Hardening in the vacuum furnace is ideal for precision and mould components and all kinds of tools highly susceptible to distortion. The workpieces are quenched in a stream of nitrogen under a pressure of max 20 bar. Oxidation is suppressed in vacuum, so the workpieces retain their bright surfaces.

HÄRTEREI REESE uses process controlled vacuum furnaces that allow high precision temperature regulation and are also ideal for hardening low alloy steels. This technology of ours has earned the trust of renowned tool builders and automotive parts suppliers.

Vacuum hardening at REESE:

- Temperature up to 1,300 °C
- Max workpiece dimensions 800 x 800 x 1,200 mm, 900 x 1,200 x 1,100 mm, 1,800 x 1,000 x 1,000 mm.

[Vacuum furnace line.]

THIS METHOD ENHANCES FATIGUE STRENGTH, WEAR RESISTANCE, AND CORROSION RESISTANCE.

NITRIDING.

Nitriding is used to enrich the surface layer of ferrous materials with nitrogen or – in the case of nitrocarburising – with nitrogen or carbon. This enhances not only the hardness, but also the wear resistance, fatigue strength, and corrosion resistance. Also the antifriction properties are improved. Moreover, there is no transformation of austenite to martensite, so the workpiece retains its geometry to a large extent. This process generally achieves hardness depths of up to 0.8 mm. Following a development by Dr.-Ing. Helmut Reese ("Profundinieren"), nitriding hardness depths in excess of 1.0 mm are now possible on certain materials. With its low distortion properties, nitriding can be used in many cases in lieu of case or surface hardening – provided that suitable steels are used. Nitriding steels are listed in DIN 17211 and EN 10085.

Nitriding at REESE:

- Plasma, gas, and vacuum; passivation (corrosion protection)
- Max workpiece dimensions Ø 2,500 x 3,400 mm, Ø 2,000 x 4,500 mm.

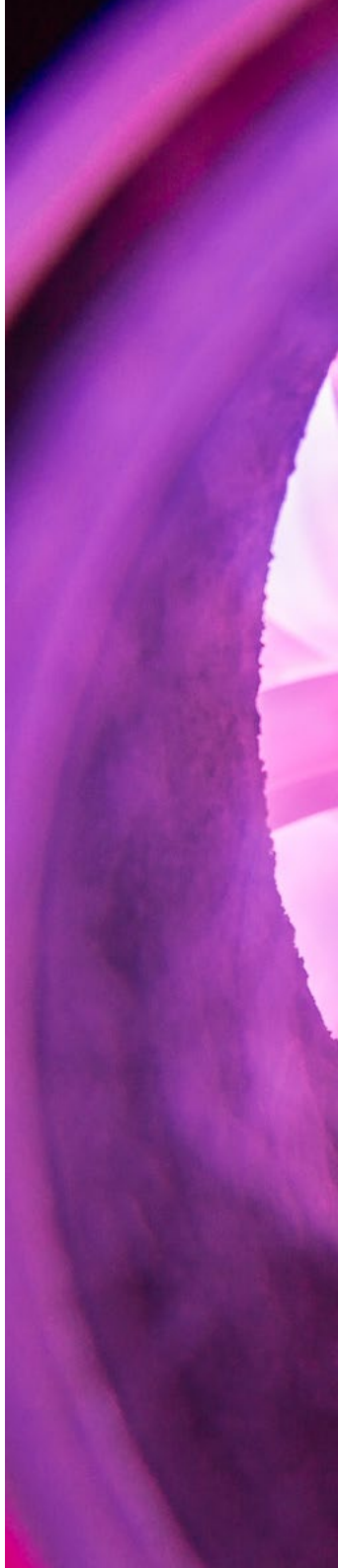
[Nitriding of smaller batch sizes.]

PLASMA NITRIDING.

Initial attempts to nitride steel parts with a powerful glow discharge in a low pressure nitrogen atmosphere were made as early as 1930. This hardening process “bombards” the workpieces with ionised gases – a method that has remained unchanged to the present day.

Yet it wasn’t until the introduction of microprocessors that nitriding could be controlled precisely in the so called “fourth state of matter”, i.e. plasma.

Plasma nitriding is used to build up special layers and is characterised by a high level of reproducibility and short process times. This method is the preferred choice for sliding and rolling component pairs like pistons and gear wheels as well as other parts that must exhibit particular resistance to wear. HÄRTEREI REESE operates installations that generate plasma pulses for nitriding extremely large workpieces with very little distortion.



THE PREFERRED METHOD FOR SLIDING AND ROLLING COMPONENT PAIRS LIKE PISTONS OR GEAR WHEELS.

STRAIGHTENING. ANNEALING. SURFACE TREATMENT.

STRAIGHTENING

[Straightening of large workpieces.]

Straightening at REESE:

- Precision pressing
- Max pressure 800 t
- Max workpiece length 10,000 mm

Distortion and changes to geometry are unavoidable in heat treatment. Nevertheless, HÄRTEREI REESE offers its customers a wide range of methods, including e.g. plasma nitriding, gas nitriding, nitrocarburising, vacuum hardening, etc., that reduce this hardening distortion to a minimum. These also include the knowhow needed to determine and counteract changes of this kind – and hence eliminate extensive rework. Straightening has also therefore evolved into a particularly important service. Our precision presses can generate forces up to 8000 kN for straightening both small workpieces and large components up to 10 m in length within a precision of ±0.1 mm.

ANNEALING

Annealing at REESE:

- In a controlled atmosphere
- Temperature up to 1,050 °C
- Max workpiece dimensions
  Ø 5,000 x 5,000 mm

Annealing methods are applied for enhancing the strength and machining properties of metal materials and relieving internal stress in the workpiece or component. HÄRTEREI REESE provides all of the customary annealing methods. Besides normalisation, diffusion annealing, stress relief annealing, recrystallisation annealing, and annealing for specific microstructures, these also include ferritising, pearlitising, and special annealing on cast components.

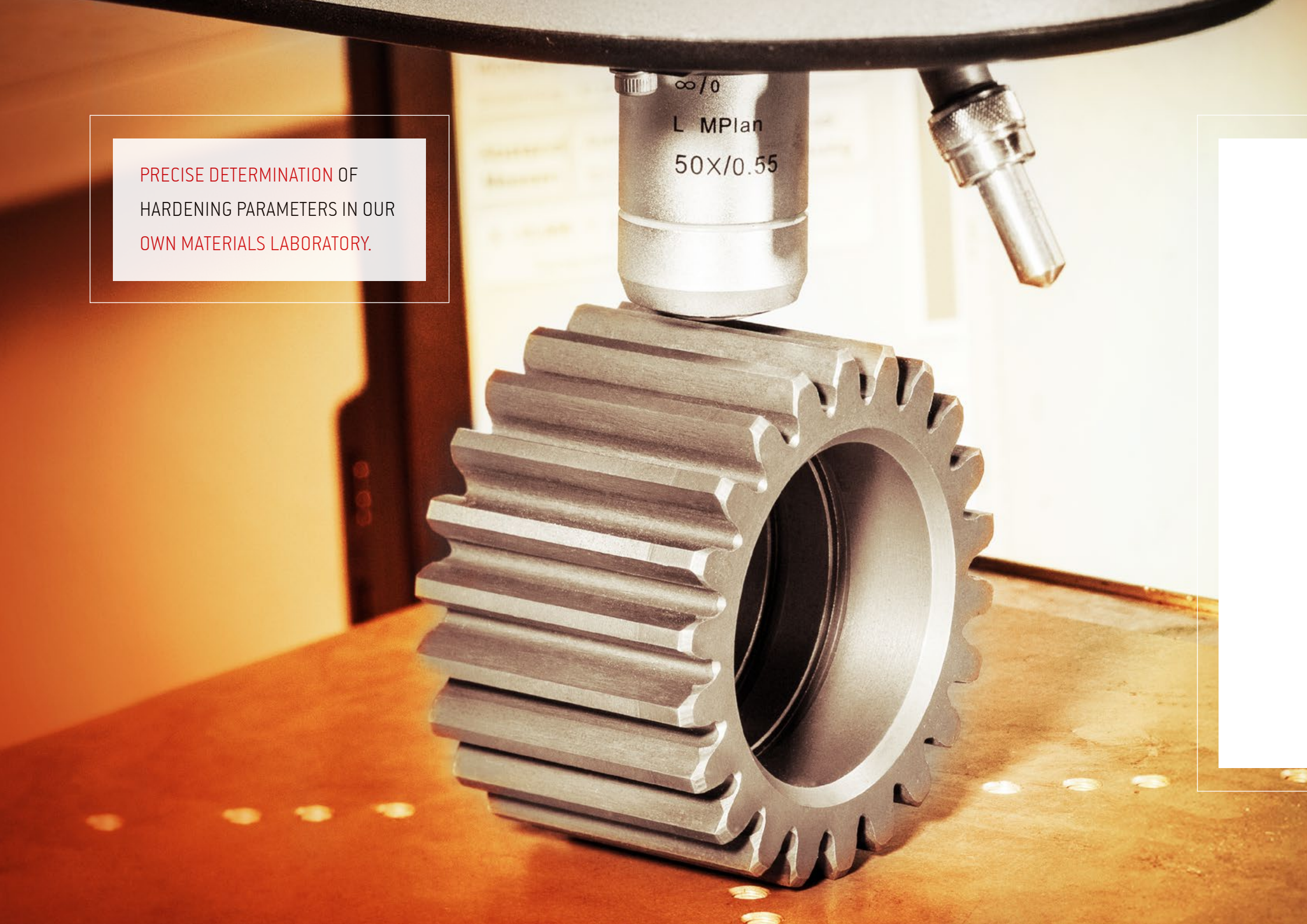
SURFACE TREATMENT

Surface treatment at REESE:

- Blast cleaning:
  Max dimensions
  Ø 2,500 x 2,500 mm
- Browing, oxidation,
  aftertreatment

The customer can choose from a wide range for the surface quality he wants for his workpieces – including blast cleaning, browning, Blackrapid®, oxidation, etc. This range of services also extends to steam degreasing for cleaning components and to the phases following heat treatment, e.g. hot shrink fitting.

[Components after browning and oxidation surface treatment.]



PRECISE DETERMINATION OF HARDENING PARAMETERS IN OUR OWN MATERIALS LABORATORY.

TESTED AND CONFIRMED.
WE SAFEGUARD THE HIGHEST QUALITY.

Heat treatment is a process that has a decisive influence on the quality of a component. Accordingly, the precise determination of the hardening parameters, the exact steering of each process, and the documentation of the hardening results – also customised – are all crucial factors for our services. Our state-of-the-art metallography laboratory is fitted with operator-independent, semi- and fully automated grinding equipment, and fully automated hardness testers. The standard programme includes safety tests on components and damage analyses, as well as analyses of surfaces that are difficult to access.

Following the certification of its quality, environmental, and energy management system under the current DIN EN ISO standards, all HÄRTEREI REESE sites are now geared to a consistently high quality level. This high quality standard not only applies to the entire heat treatment process, but it begins as soon as the customer receives our binding advice for his particular applications. In terms of total quality management, HÄRTEREI REESE is endeavouring to raise its quality levels on a continuous basis on the strength of innovation, permanent optimisation, and continued training.

Both, our employees and the Management Board, see themselves equally responsible for these objectives.

OUR KEY SECTORS

- AUTOMOTIVE INDUSTRY
- COMMERCIAL VEHICLES
- AEROSPACE
- SHIPBUILDING
- MACHINE AND PLANT BUILDING
- TOOL BUILDING
- WIND POWER
- MINING
- OFFSHORE TECHNOLOGY

ONSITE PRESENCE.
WHEREVER YOU NEED US.

At each of its four sites in the centres of German machine building, HÄRTEREI REESE offers services geared to solutions, close to the market and to customers. As a result, all companies in the Group benefit from the synergies created by close cooperation, knowledge and technology transfer, and specialisation.

REESE customers can use the entire range of methods provided by this universal hardening plant whenever they need them. This package is completed with shipping services that HÄRTEREI REESE offers at all of its sites.

FOUR SITES – ONE POLICY

- Owner operated family enterprise
- HÄRTEREI REESE BOCHUM – Founded in 1948 and strengthened successively by HÄRTEREI REESE BRACKENHEIM (1988), HÄRTEREI REESE CHEMNITZ (1991), HÄRTEREI REESE WEIMAR (1992)
- Custom design and production advice from engineers and technicians
- 240 fully trained and experienced employees
- Large investments in plant, control, and measuring technology

  e.g. REESE Bochum – the largest state-of-the-art insert gas hardening plant in Europe

  e.g. REESE BRACKENHEIM – new hardening technology centre on 5,000 m² of production area
- Universal hardening plant with over 170 facilities
- Field based research activities in close cooperation with universities and research institutes
- Logistics concepts tailored to individual needs

IN FUTURE TOO.
WE BEAR THE RESPONSIBILITY.

THE HUMAN FACTOR.

Our most important capital lies in the knowledge and experience of our employees. Maintaining, developing, and communicating this enjoys top priority. Knowledge transfer is therefore an integral constituent of our policy, whether through training or further training courses or at information events, which are also open to our customers. Not only that, we are also committed to the next generation of engineers by cooperating with nearby research centres and universities. With a high training rate at all sites, we moreover create the foundation for our company's future, taking pleasure in the interest we arouse in young persons for materials technology and its possibilities.

THE SOCIETY FACTOR.

As a family enterprise, we are committed to our sites through our work in associations, at schools, and for local politics: our contribution to society in our direct environment.

THE ENVIRONMENT FACTOR.

HÄRTEREI REESE values environmentally compatible, sustainable production. For instance, the Bochum site was the first German hardening plant to pass the environmental audit – back in 1999.

When the new plant was being built in Brackenheim in 2014, this opportunity was taken to design the building facilities and industrial installations for compliance with the latest energy performance standards, e.g. with extensive heat recovery measures.

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Details here –
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a personal contact!