

Product portfolio
Rail & Bus

Material Solutions | Shaping ideas.



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HÜBNER Group
Mobility. Materials. Photonics.
united by passion.

Since the beginning in 1946 when Kurt Hübner founded the company, HÜBNER has been shaped by a spirit of enterprise, inventiveness and innovation. Today it continues to be this same passion for new solutions that drives the company and its employees. Again and again over the years, new concepts for new products and new markets have been developed and implemented.

It is on this basis that HÜBNER has become the company that it is today: A comprehensive system supplier for transportation technology and the worldwide leader for gangway systems (Mobility), a well-recognized specialist for sophisticated elastomer solutions and products, insulation and composite materials (Material Solutions), as well as an up-and-coming company in the field of laser, terahertz and high frequency technologies (Photonics).

Today the HÜBNER Group consists of more than 30 different companies and has more than 3,300 employees around the world. And HÜBNER products continue to stand out with their high-quality workmanship, their superior convenience and their distinctive durability. This high level of quality is to be found in all of the Group's business sectors and throughout the entire product range.

This all comes together in our company slogan:
Mobility. Materials. Photonics. | united by passion.





Material Solutions | Shaping ideas.

The HÜBNER business segment Material Solutions is the specialist for sophisticated solutions and products made of elastomers, insulation materials and composite materials (FRP). With a clear focus on innovative, technologically challenging products for the mobility sector (Rail & Bus Business Unit) as well as for high-growth markets such as the oil industry, aerospace and healthcare (Industry Business Unit), Material Solutions has sharpened its image and its range of products and services.

The latest examples of the HÜBNER Group's innovative strength and capability in the Material Solutions segment include new functional seals for oil and gas extraction, modern hygiene applications such as a

vacuum-sealed soap dispenser made of plastic and silicone, and intelligent door safety systems with integrated sensors for public transport applications. In addition, Material Solutions is the main supplier of the HÜBNER Mobility business segment, providing products and solutions that conform with the demanding fire-safety requirements specified by EN standards for the transportation sector.

HÜBNER possesses extensive knowledge and valuable expertise in the fields of material compounding, processing and combining. And no wonder: Already at the time of its founding, Kurt Hübner laid the foundation for today's worldwide HÜBNER Group with his optimized material solutions for rubber products.



Moving into the future

A terrific team: Buses, trains and the name HÜBNER have been joined together for decades. Wherever people are traveling by public transport, whether in local systems or between cities, HÜBNER products are there providing key functionality – connecting, sealing, cushioning or protecting as required.

The GWU Group has been part of HÜBNER since the beginning of 2019. With this acquisition, the HÜBNER business segment Material Solutions has been substantially strengthened. Material Solutions now brings together a wide range of HÜBNER solutions and products made of elastomers, fiber reinforced plastic and composite materials – for use in the bus and train industries as well as for applications in the oil and gas market, the aerospace industry and the hygiene field.

It's a merger with a strong industrial logic behind it: While HÜBNER is the leading company in the area of elastomer sealing systems for doors and windows for railway vehicles, GWU has established a similarly dominant position in the bus industry. Together the two com-

panies are now the leaders in the area of door sealing and safety systems for the whole public mobility sector. This is a position that HÜBNER already occupies in the area of gangway systems for buses and trains in its Mobility business segment.

At 13 locations around the world, more than 1,000 employees in HÜBNER's Material Solutions business segment are working on solutions for customers. In the area of bus and rail applications, production focal points are rubber sealing systems for doors, hatches and windows in buses, trains and special vehicles. Finger protection profiles are specially developed and produced for different applications directly in accordance with customer wishes. With door profiles for touchless passenger protection or with LED light strips for better guidance of passengers, HÜBNER and GWU are moving forward with exciting new innovations for the bus and rail industry.



Elastomer solutions Protection & **sealing**

Rubber and silicone products protect, absorb, seal and insulate – whether as delicate precision components or as seals weighing as much as several kilograms. For decades, HÜBNER has been successfully processing rubber for the complete range of applications in bus and train construction. HÜBNER experts have approximately 600 different compound formulas at their disposal as they develop customized rubber-based solutions. The company's offerings range from consultation, to design, to production – from the prototype to regular serial production. Through the acquisition of the GWU Group in 2019, HÜBNER has now significantly extended its expertise in the area of door safety and sealing systems.

Rubber & silicone molded parts and seals

HÜBNER is specialized in providing high-quality molded parts and profile seals. These in-house developed components can cover the full range of special requirements. These products are oil, heat and UV resistant and can be provided in virtually any color, shape or configuration. For applications requiring special levels of elasticity and resistance to cold and heat or particular electrical insulation properties, high-quality EPDM synthetic rubber or silicone can serve as a good basic material.

Joining rubber and metal

Using high-performance metal pretreatment techniques, HÜBNER provides strong and stable connections of rubber with steel, aluminum, brass and other metals. These products play a central role in buses and trains – for example as bracket elements, stops, rails, buffers and discs.

Rubber profiles and frames

We develop rubber sealing systems for the doors, hatches and windows in buses and railway vehicles. Our range of solutions includes not only form-fitting rubber profiles but also complete aluminum portals. For such requirements, we develop rubber profile cross sections in close cooperation with our customers that are precisely customized for specific applications.

In addition, we have extensive know-how and expertise in the gluing procedures for complicated corner configurations, as may be required, for example, with the rubber seals for windscreen applications. Making use of plastic injection molding technologies, we can produce round or peaked rubber corners in any angle configuration. Vulcanization of customized parts is also part of our range of rubber production solutions.

Rubber profiles are available featuring punched-out and cut-out sections, molded-on parts, shape-molded corners and preheated radial connections. The product range includes window sealing systems and frames, hatch seals, door and flap seals, suspension elements as well as elastic bearings to absorb harmful or disruptive vibrations. For corners that are subject to especially hard wear through shearing effects for example, HÜBNER produces rubber frames with injection-molded corners. With this special production technique it is also possible to connect hollow chamber profiles and profiles of differing diameters with each other.



GWU

Rubber | Isolation | Fibreglass | a HÜBNER Group company

Door-closing systems that think ahead

Passenger protection in buses and trains

Hazardous situations when entering and exiting public transport vehicles

Traditional door systems in buses and trains usually cannot react adequately to spontaneous situations. Life-threatening situations can arise in connection with doors in bus and railway vehicles that are not equipped with safety mechanisms:

- Passengers can be caught in the closing system and subjected to great stress
- Children can panic if they are caught in closing doors
- Persons and objects getting caught in door systems can result in accidents and injuries

Intelligent door systems ensure safety

A main focus of GWU is the production of innovative finger protection profile and rubber sealing systems which make passengers safer when using buses or trains. Finger protection profiles with electric contract strips prevent people or objects from getting caught in closing doors. An innovative new rubber profile even functions on a touchless basis. With this system a light curtain detects when persons or objects are present in the closing area of the door. In addition, GWU has developed a door profile with LED light strips. It uses signaling colors to show passengers when it is safe to enter and leave the vehicle.

The result: Incidents when persons or objects get caught in the door no longer occur – for optimal safety in passenger transport.

Safety retrofitting in the entry area of buses and trains

Finger protection profiles with integrated safety contact strips

Our rubber profiles with safety contact strips offer a retrofitting safety solution for inward-swinging and outward-swing doors, folding and sliding doors and sliding plug doors for buses and trains. These solutions are specially customized for your specific application needs.

Finger protection profiles with light curtain functionality for touchless protection

Our newly developed LEXI light curtain system is a module for passenger safety. The system detects when persons are entering the vehicle and prevents the doors from closing. In contrast to all other systems, LEXI is directly integrated in the finger protection profile of the door. Through a combination of parallel and crossed infrared beams, the light curtain system monitors the entry area of the vehicle. When a person or object disrupts just one of these light beams, a switching pulse is generated that causes the door to open or remain open. Persons and objects in the risk area are actively detected. The system prevents collisions with the door and keeps people or objects from being accidentally dragged along by the vehicle as well as the serious injuries that can result from such incidents.

Finger protection profiles with integrated LED lighting in signal colors (FEDRA)

LED signal lights integrated in finger protection profiles now make it possible to guide passengers entering and exiting buses and trains through the use of different colors. As with a traffic light, passengers can quickly see where doors on a bus or train are available for entry (green), whether the door is about to close (blinking red) or whether the bus or train is already departing (red). The doors can also be equipped with a corresponding audio signal. It also can be indicated if someone is momentarily blocking a light barrier and preventing the doors from closing (blinking yellow). The LED strips can be programmed and controlled as required, giving operators numerous setting possibilities. Retrofitting is possible for all types of doors.

Contact strips for step treads

The product range also includes contact strips for step treads – when stepped on a switching pulse is generated that directly causes the door to open or stay open.

www.gummi-welz.com



Quick-change window systems

Damage caused by vandalism is a growing problem. Scratched window panes, broken glass or graffiti degrade the interior and exterior appearance of many vehicles. To facilitate quick reaction times and repair of such damages, HÜBNER offers quick-change window systems to its customers.

Increased profitability

Vehicle downtime in the workshop to replace windows causes annual losses running into millions. The repair of glue-based window systems is very time-intensive. Quick-change window systems, by contrast, shorten such downtimes substantially. This reduces maintenance costs and increases availability, thus increasing vehicle profitability.

Complete solutions from a single source

With complete system solutions from HÜBNER, damaged window panes can be exchanged quickly and simply whether in urban, regional or long-distance rail systems.

System solutions are available for:

- Windscreens
- Hopper windows
- Fixed windows
- Sliding windows
- Driver side windows
- Destination display windows
- Door glazing
- Side-hung windows
- Emergency exit windows

System benefits

HÜBNER quick-change window systems offer many benefits:

- No lengthy workshop downtimes
- Significant savings per window replacement
- High vehicle availability
- Minimized product life-cycle costs
- Simple replacement of panes from outside the vehicle
- No disassembly of interior fixtures necessary
- No cumbersome cutting out of glued seams
- Minimal replacement times
- Appealing design

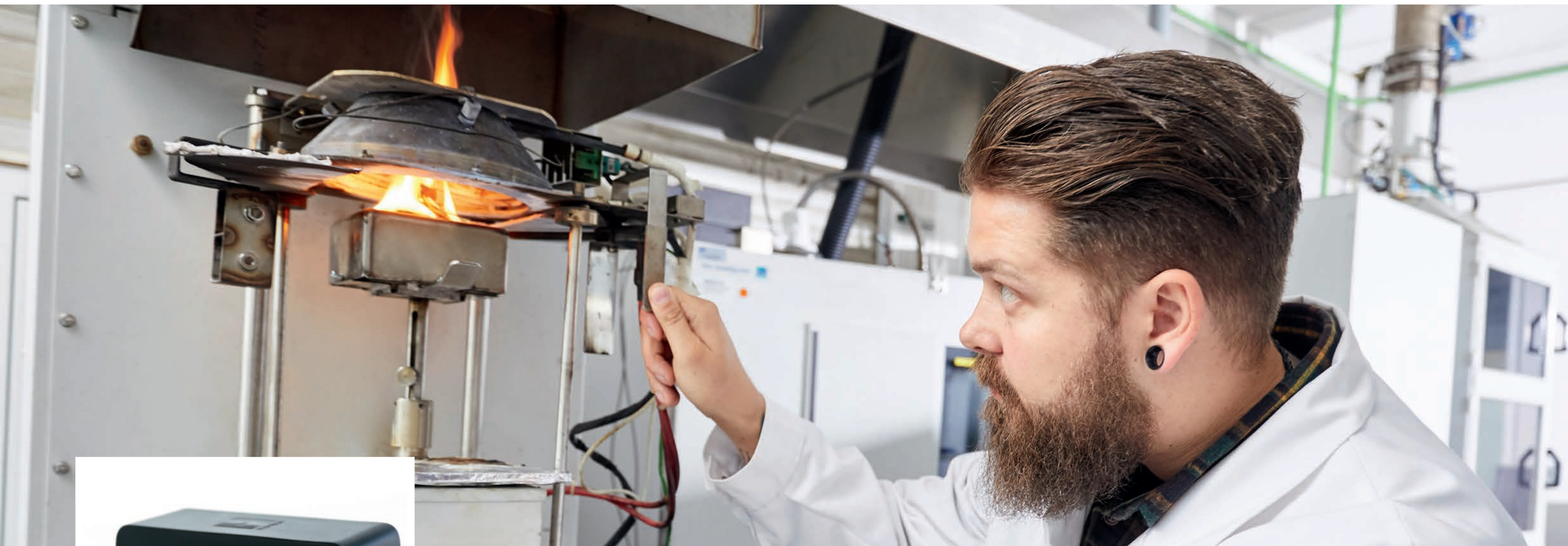


Once an idea – Today, the standard

Again and again, HÜBNER has been a driving force for technological progress – moving from an idea to a product ready for the market. From the beginning, the family-owned company has been committed to the innovative strength and outstanding quality in its products and concepts

The HÜBNER Group is active around the world and is working continually to develop new products and solutions with its cross-industry know-how – always in close proximity to customers and their needs – so as to set new standards for the future.





First-rate fire safety

Fire protection is essential for rail safety. Continually increasing passenger numbers and new regulations that prescribe enhanced fire safety standards for railway vehicles are increasing the need for modern safety features for railway vehicles. Protection of passengers and train personnel in the event of a fire is always the top priority.

Fire-retardant functional components

Under the brand name HFP, HÜBNER provides fire-retardant functional components to the railway industry made of its own polyurethane compounds. In addition to their fire-retardant characteristics,

the flexibility of these materials is particularly noteworthy. These components can be engineered and molded for all requirements.

Flexible for individual solutions

HÜBNER has more than 50 years of experience in handling polyurethane materials. This experience flows into each new product design project we undertake. Even atypical design ideas can be realized in accordance with the desired requirements.



Passive pedestrian protection

Decades of experience

As traffic volume increases, so too does the risk of accidents – particularly close to tram stops and crossings. The HÜBNER Group has more than 30 years of experience in the production of tram front ends made of polyurethane (PUR) foam. With this expertise it is possible to combine passive pedestrian protection with modern vehicle design to best effect.

Polyurethane tram front ends

The 3P (People Protection Products) Front End Systems for trams made of flexible polyurethane foam provide optimal protection for both pedestrians and the vehicle in the event of a collision. HÜBNER is also the first manufacturer worldwide to offer the tram vehicle front ends in a form that fulfills the specifications of the new fire safety standard EN 45545 that applies throughout Europe. This standard specifies the requirements for materials and components in rail vehicles in connection

with characteristics such as flammability and fire behavior. The front ends are distinguished by being at once highly robust and at the same time remarkably flexible. What does that mean in practice? In the event of a collision, HÜBNER's specially developed material deforms on impact and then in a short time returns to its original contour once again.

Outstanding test values, TÜV audit inspection

The Head Injury Criterion (HIC) test used in the automotive industry demonstrates the excellent protective effects of the HÜBNER components. The test shows that the special PUR bumper systems can reduce the degree of personal injury by absorbing the impact energy in a collision. The HIC value (Head Injury Criterion) measures the impact energy exerted on the human body. Values up to 850 typically result in good chances of survival with minimal or no injuries at all, while values over 1,300 typically result in serious injuries. In tests conducted by the

testing agency TÜV Süd, the current PUR front bumpers from HÜBNER recorded impressive results with a HIC value of 600 to 650. For comparison: Conventional tram paneling elements have a value well over 1,300.

Economical modernization

Long years of use also make themselves apparent in the look of tram vehicles. If trams are still delivering good service, however, and the technical features are only outdated in their appearance, then there is another possibility besides the cost-intensive procurement of new vehicles. An economical alternative developed by HÜBNER is the installation of new bumper elements with pedestrian protection – available also for older tram models. A practical side effect: Vehicles that have taken on an outdated appearance shine again with a fresh new design. In addition, the bumper elements can provide space for other technical upgrades such as modern headlight systems.





Fiber reinforced plastic – FRP

For high-stress applications in bus and railway vehicles

The economical fiber composite FRP (fiber reinforced plastic) can be used for many applications and is characterized by a high degree of strength and stability. Its non-susceptibility to corrosion is also a significant benefit for use in the mobility sector.

Prototype production, model and mold making

We can provide product development, prototype and sample construction, mold and model making as well as the production and assembly of ready-to-install components. We are able to produce complex component configurations and shapes in accordance with individual customer requirements. Also available as part of our comprehensive service is the production of spare parts as well as the repair of defective products of other manufacturers.

Areas of application for buses and trains

We supply both German and international railway vehicle and bus manufacturers with high quality paneling systems made of fiber reinforced plastic. FRP components are used in roof constructions in hybrid and CNG buses as well as for vehicle front and rear ends.

Our interior paneling elements made of FRP are also used, for example, in the locomotive cabs of the Deutsche Bahn's ICE 4 trains. For this new prestige order, the FRP blanks are initially produced in a manual laminating process. In the completion of the units, various other metal parts, rubber profiles and insulation elements are added together with connecting pieces made of metal, rubber or insulation material. During the subsequent assembly of the components, heating elements, passenger counting sensors and light sensors are premounted.

Certified quality

For quality and process control, all of the production steps as well as all of the basic materials used are fully documented. We also work with a fully integrated quality management system that is certified in accordance with ISO 9001:2015. In addition, we are certified in accordance with the environmental management system ISO 14001:2015 through extensive ecological and sustainability measures.

The changeover from the existing fire safety standard DIN 5510 to the EN 45545 standard has raised the requirements for fire safety characteristics enormously throughout Europe. The raw materials that we use fulfill these standards up to the designated Hazard Level 3, which meets the highest safety requirements.

Insulating materials and sound absorption

Technical solutions for noise reduction in buses and trains

Reducing noise emissions for greater travel comfort: Plastocell offers innovative products for insulation and sound absorption in buses and trains. For more than 30 years, the company – now part of the HÜBNER Group – has developed solutions across many industries for sound insulation and thermal protection. With this wide experience, Plastocell brings extensive expertise to the production and processing of various materials.

Solutions for buses

The rear end of the vehicle is a critical area for thermal emissions. Here a combined system made of MS polymer, heavy-duty film and the company's own polyester fleece Plastobond protects against noise and heat emissions. In the engine compartment, the flexible foam Plastotect serves to protect the passenger area of the vehicle against heat. At the same time, insulation in the engine compartment also reduces noise emissions. Plastocell also supplies special insulating elements for the service cover, floor coverings, the ceiling and the side panels in buses. Highly flame-resistant heat and sound insulation, for example, can also provide comfortable temperatures and a low noise level in the driver's cockpit.

Solutions for trains

Plastocell products give rail passengers excellent protection against the noise emissions generated by the train chassis and wind resistance, and at the same time help to provide comfortable interior temperatures. The thermoplastic sound insulation film Plastoform is used in the floor and wall areas of trains and serves to insulate against airborne noise while also absorbing structure-borne noise. Vibrations and oscillations are thus effectively diminished. The high density of the material makes for a particularly good reduction of rail-related noise, giving passengers the peace and quiet of a stress-free travel experience.

Highest quality and safety

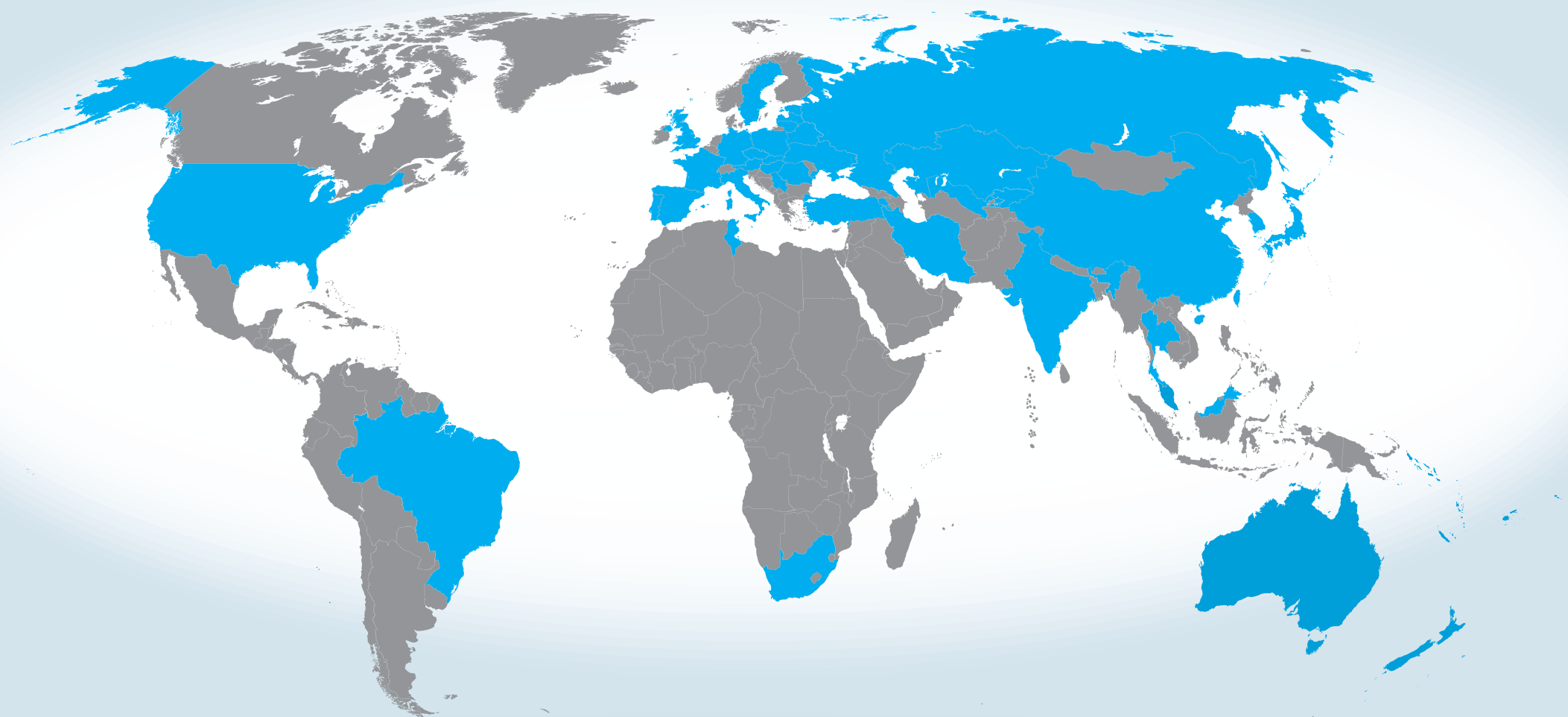
For all of the company's products, Plastocell delivers individual components that are optimally matched to one another and that meet all applicable fire-safety regulations for public transport – which are becoming increasingly strict. Highest quality and safety standards are always a top priority. With their advantageous fire behavior characteristics, the complete range of Plastocell materials are ideal for fulfilling all relevant fire protection regulations in passenger areas. In addition, they are tested in accordance with all required standards and are subject to ongoing official quality control certification (TÜV).

www.plastocell.de



MAKING NOISE QUIETER[®]
Plastocell
a HÜBNER Group company





The company **HÜBNER** worldwide

Think globally, act locally: HÜBNER is there where its customers are – because close contact helps us to understand business partners better and to provide better support. Individual wishes and requirements can be determined quickly and then put into effect and implemented without delay. Customers thus have direct benefits from our strong local presence.

In addition to the company headquarters in Kassel, Germany in the heart of Europe, HÜBNER has built up more than 30 locations around the world in the preceding years and decades. The company now has major plants in Hungary, Poland, the USA, China, Russia and Brazil. This network of company-owned locations is supported by sales partners and trade representatives in more than 30 additional countries.

And the company's offering to customers does not end with the delivery of the products. The HÜBNER Group is also continually expanding its service structures – in personnel and in the technical facilities that are provided. To be on hand ready to provide support as quickly as possible – in locations around the world.

www.hubner-group.com/en/worldwide

1group with more than 30 locations	sales partners & representatives in more than 30 countries	approx. 3,300 employees
	founded in 1946 approx. 1,000 patents worldwide	

www.hubner-group.com



HÜBNER GmbH & Co. KG

Heinrich-Hertz-Straße 2
34123 Kassel

Tel. +49 561 998-0
Fax +49 561 998-1515

info@hubner-group.com
www.hubner-group.com