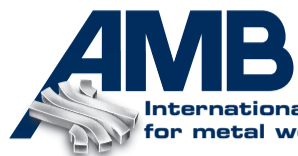


TECHNICAL HIGHLIGHTS



International exhibition
for metal working

13.-17.09.2022
Messe Stuttgart
Germany



INTERNATIONAL

AMB EDITION



#economical #innovative #flexible

SHAPING THE FUTURE OF MANUFACTURING



**Dear Business Partners
and Friends of GROB,**

We are pleased to be able to be present when AMB finally opens its doors again after a four-year break. This trade fair remains one of the most important events in the machine tool industry for GROB. Despite digital marketing and new forms of communication on social media channels, the industry's leading trade fairs are still the anchors of GROB's strategy, since they perfectly complement digital platforms and create a forum for open and globally interconnected thinking.

And it is not only marketing with its new forms of modern communication that has evolved greatly in the world of machining. Due to the transformation of the drivetrain, the direct components and many other components associated with the lightweight construction of cars have completely changed and are manufactured both in component plants by the automotive industry and by the supplier industry. GROB reacted to this development early on and developed the F-series with new machining processes, mainly for machining large-volume frame and structural components for automotive bodies. Whereas three years ago over 80 percent of all G-modules built at GROB were delivered to OEMs, today 50 percent of G-modules are sold to the automotive supplier industry. This development has had an enormous impact on practically all business divisions of GROB. Without standardization, we would not have been able to meet the requirements for fast offers with extremely short, practically halved delivery times.

In addition, the decrease in the volumes of internal combustion engines and the relocation of the machining of new electromobility components to the automotive supplier market consistently requires new technologies and products. This is why GROB's product range has grown steadily. It currently comprises four series with 20 different machining centers and ranges from 4- and 5-axis universal machining centers to system machines with our classic G-modules and the F-series, and to machines and systems for electromobility.

GROB has continued to round off its product range in the area of automation solutions. We offer automation solutions with part clamping on pallets and highly flexible automation with robot loading, gripper changes for parts, and other types of handling. Additive manufacturing is new for GROB. It premiered during our In-House Exhibition 2022 with the brand new GMP300 Liquid Metal Printing System. Other AMB highlights include several exhibits on electromobility and the areas GROB-NET⁴Industry, GROB Service, and Customer Training.

Visit us at Booth B11 in Hall 10 and see for yourself. We will be happy to inform you in depth about the new orientation and strategy of our company. At GROB, we are convinced that we have set the course for the future and that we have future-proofed our global company with its plants and branches.

**Your Grob Family and the Management Board of
GROB-WERKE GmbH & Co. KG**

GROB AT THE AMB 2022

BIG EXHIBITION COMEBACK

DISCOVER OUR TRADE FAIR HIGHLIGHTS

Following the motto "BIG EXHIBITION COMEBACK", GROB is looking forward to finally being back live at the AMB in Stuttgart. GROB has made good use of the time and intensively prepared the restart. GROB is going to present its extensive product portfolio on over 5,000 square feet in **Paul Horn Hall 10, Booth B11**: From the small G150 5-axis machining center with robot cell to the G440 4-axis machining center with rotary pallet storage system and the large G520F machining center for frame structure and chassis parts, GROB will present its expertise in milling and automation technology from September 13 to 17, 2022.

GROB will again demonstrate its unique machine concept for 4-axis and 5-axis machining centers offering nearly unlimited possibilities for milling and turning parts made of a wide variety of materials. Whether it be aerospace, mechanical engineering, die and mold industries, automotive sector, or medical technology: GROB machining centers are optimized to meet the diverse requirements of various industries.

Although the focus of the AMB exhibition is on machining, numerous other highlights and new technologies will again be presented at GROB's exhibition stand. This includes the new GMP300 Liquid Metal Printing Machine, with which GROB offers its customers for the first time a manufacturing system for the production of near net-shape parts using additive manufacturing processes.



PARTNER STANDS AND AMB TREND LOUNGE

During its seventh AMB in a row, GROB will not only present its own stand this year, but will also demonstrate its know-how at two partner stands and in the AMB Trend Lounge. Visitors can find the G350 5-axis milling machine, where a demo component will be processed live, at YG-1 Deutschland GmbH in Hall 3, Booth B30. In Hall 1, Booth C10 | B10, Ingersoll Werkzeuge GmbH will exhibit a horizontal four-disk tool magazine from GROB, which is perfectly suited for quick tool changes as well as loading and unloading of machining centers during machining.

In the AMB Trend Lounge in the ICS Foyer, GROB will present the focus topics additive manufacturing and digitalization. On September 13, GROB presenter Dr.-Ing. Martin Otter will give a keynote presentation on the topic of *GROB Liquid Metal Printing – Economical production of near-net-shape components*. On September 16, GROB Product Sales Manager Mr. Emil Nigl will give the presentation *Digitalization Solutions Made by GROB – From Maintenance to the Tool Cycle*.

Come and be inspired – we look forward to meeting you!

INVESTMENT WITH FORESIGHT

GROB GROUP ON GROWTH COURSE

The challenges posed by the transformation in drive technology from combustion engines to electric motors and the highly dynamic nature of global markets require GROB not only to constantly develop new technical solutions, but also to make additional investments in land and buildings. For this reason, GROB invested over 46 million euros in the development of new technologies and the expansion of its worldwide locations in the past financial year. Current flagship projects include the construction of a new plant in India and the expansion of the plant in China. Once inaugurated, GROB Group will comprise a total of six production plants and 14 service and sales branches.

After its completion, the new plant in India near the metropolis of Bangalore will replace the current GROB branch in Hyderabad. We expect it to carry out the first turnkey projects and retrofits in the coming year. With an investment volume of 6 million euros and an area of over 50,000 square feet, the site is initially designed for 300 jobs. The construction of the second, 17-million-euro GROB plant in China was successfully completed this September. Universal machining centers are manufactured

and turnkey production lines are assembled on around 270,000 square feet, right next to the existing location in Dalian. This allows customers to directly receive GROB's latest technologies locally optimally serving the Chinese market. GROB also established a new branch in Thailand at the beginning of the year. Following South Korea, India, Vietnam, Japan, and the two Chinese subsidiaries in Beijing and Shanghai, GROB Thailand is the seventh Asian subsidiary of the GROB Group. It strengthens sales and after-sales service in Southeast Asia with six employees.

Not only are land and buildings multiplying, but we are also heavily investing in new developments: In order to secure its technological advantage, GROB focuses in particular on the expansion of the electromobility division and on new and further developments in battery and fuel cell technology. At the same time, GROB has strengthened its position as market leader in the traditional system and universal machining center business by investing in the new GROB 4-axis machine series and in machining centers for frame structure and chassis parts.



FROM ALLGÄU TO THE WORLD

Sustained investment occurs also at GROB's headquarters in Mindelheim: With the construction of a new 174,000-square-foot hall, GROB-WERKE is doing justice to the successful development of the electromobility division. Since August of this year, e-mobility systems have been assembled in our new Hall 14A. The number of GROB-WERKE employees is also growing. In Mindelheim alone, more than 5,000 people work for GROB – and the location keeps expanding!

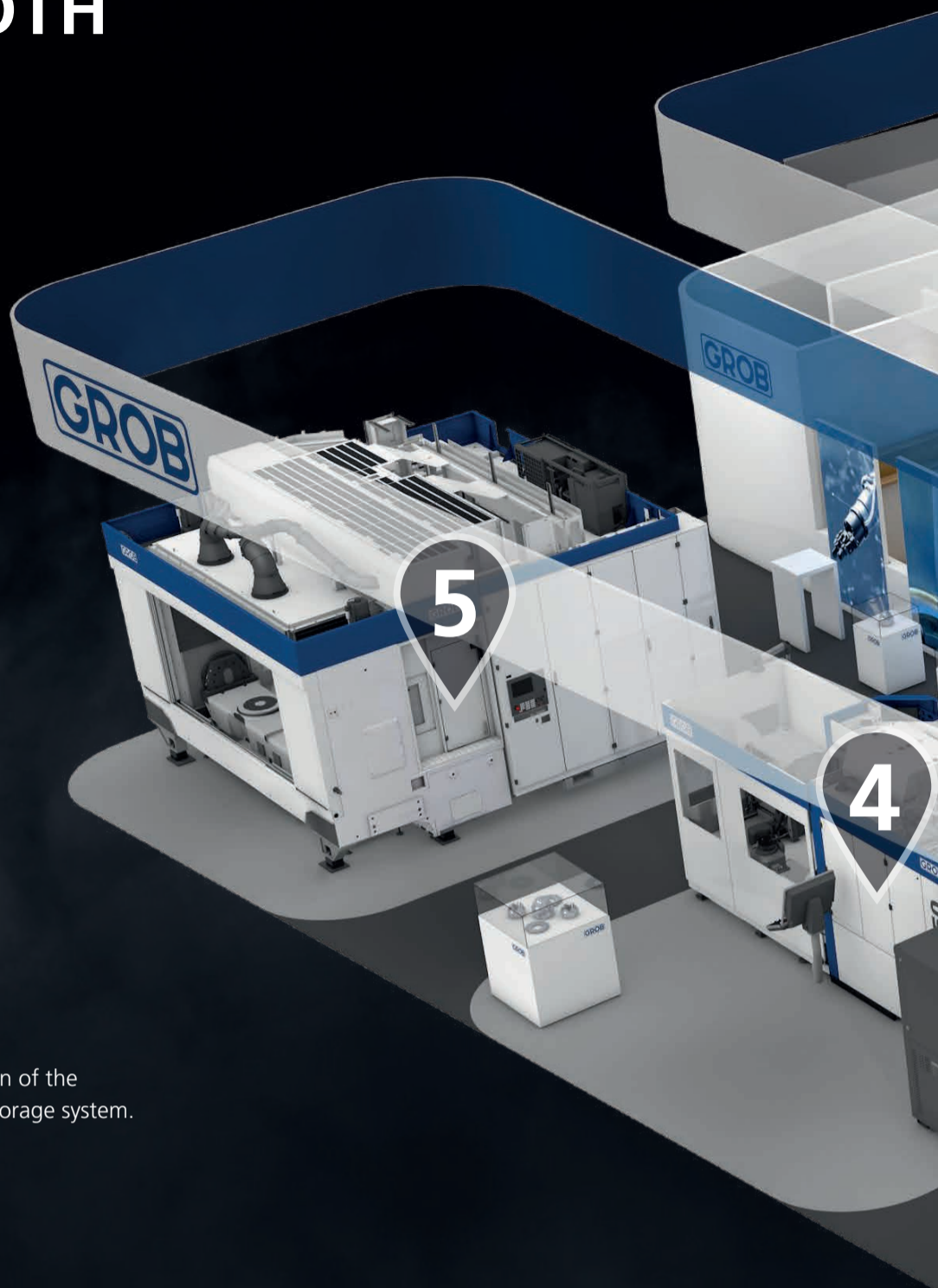
OVERVIEW OF GROB'S BOOTH

HALL 10 | BOOTH B11

Decades of experience meet innovative technologies:

To mark the 20th anniversary of the AMB, GROB will present groundbreaking solutions for the production of the future at its trade fair stand. Discover our latest developments from the world of machining and automation, find out about our digitalization products and our services, and learn how to master the challenges of modern production with GROB as a partner.

The seventh participation with the AMB continues GROB's long tradition of trade fairs: Already in 2008, when GROB-WERKE took part in the AMB for the first time, it presented the first generation of the 5-axis universal machining center G350. Eight years later, the second generation of the GROB universal machining center series was presented. Today, GROB counts among the big players in the field of 4-axis and 5-axis machining centers with automation. What is more, we are a market leader for machines and systems for the electric drive train.



1

G440 UNIVERSAL MACHINING CENTER WITH ROTARY PALLET STORAGE SYSTEM (PSS-R)

Continuous operation of the entire system including performance demonstration of the G440 4-axis milling machine in combination with the PSS-R1800 rotary pallet storage system.

2

GROB SERVICE



Interactive presentation of the GROB's extensive service portfolio and GROB's training concepts.

3

GROB-NET⁴INDUSTRY

Presentation of GROB-NET⁴Industry software and digitalization solutions for machining and – NEW – for electromobility.

4

G150 UNIVERSAL MACHINING CENTER WITH ROBOT CELL (GRC)

Machining of a clip applying forceps of the medical industry on the G150 5-axis milling machine in conjunction with the GRC-R12 robot cell.

5

G520F MACHINING CENTER FOR FRAME STRUCTURE AND CHASSIS PARTS

Machining of a rear carrier of the automotive sector in simulated machining on the G520F double-spindle 5-axis milling machine of GROB's F-series.

6

WALK OF FAME: GROB CENTERS OF EXCELLENCE

Exhibition of industry-specific components of the GROB Centers of Excellence for the areas of aerospace, medical technology, mechanical engineering, die and mold industries, energy technology, automotive, and automation.

7

GROB GMP300 LIQUID METAL PRINTING MACHINE

Production of a demonstration component with a powderless manufacturing process on the GMP300 Liquid Metal Printing Machine from the additive manufacturing sector.

NEW



GROB ELECTROMOBILITY



8

Presentation of GROB's comprehensive portfolio in electromobility and presentation of the machines and systems for the production of the complete drivetrain for fully electric vehicles. Exhibition of a battery module.

VEHICLE SUBSTRUCTURE MODEL

HIGHLIGHT

9

Demonstration on GROB's comprehensive expertise in the areas of machining and e-mobility based on a vehicle substructure with a total of 23 components produced with GROB systems.

GROB EXHIBITION HIGHLIGHTS

FOR THE PRODUCTION OF THE FUTURE

ELECTROMOBILITY

A Full-Service Provider in Electromobility

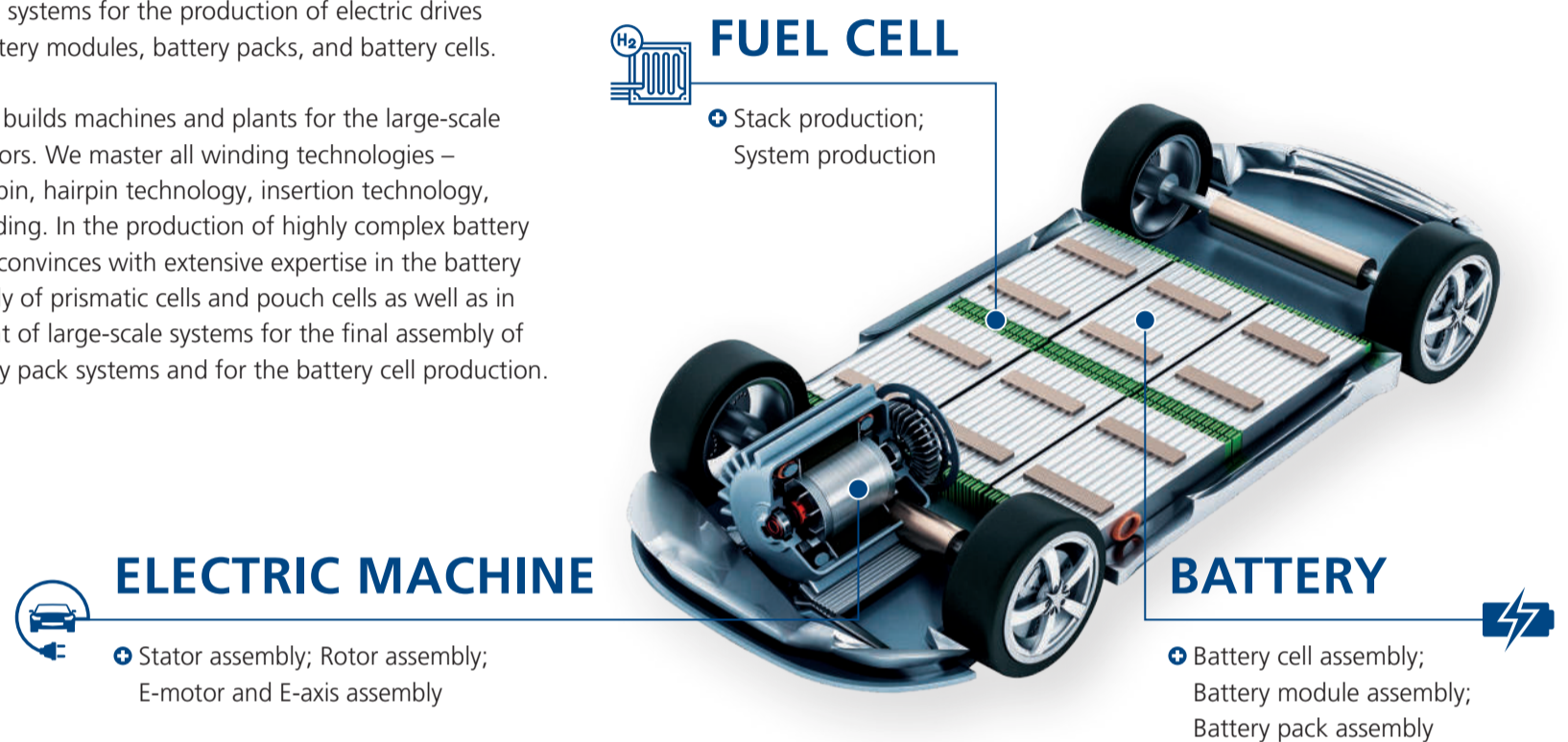
GROB offers you an integrated concept for tomorrow's components through its modular, flexible and scalable solutions. Our machines and systems cover the complete drivetrain of fully electric vehicles. GROB's product range includes four essential technologies that allow to produce solutions for the international automotive industry: Machines and systems for the production of electric drives as well as assembly systems for battery modules, battery packs, and battery cells.

In the area of electric drives, GROB builds machines and plants for the large-scale series production of stators and rotors. We master all winding technologies – continuous hairpin, hairpin technology, insertion technology, and needle winding. In the production of highly complex battery systems, GROB convinces with extensive expertise in the battery module assembly of prismatic cells and pouch cells as well as in the development of large-scale systems for the final assembly of complete battery pack systems and for the battery cell production.



At the same time, GROB is continuing to invest in the development of fuel cell technology to be able to offer manufacturing systems for series production in a timely manner.

At AMB, GROB demonstrates its electromobility portfolio with the model of a vehicle substructure with a total of five e-mobility components manufactured on GROB systems, such as stators, rotors, and battery cells.



ADDITIVE MANUFACTURING

Liquid Metal Printing – GMP300

GROB's new GMP300 Liquid Metal Printing (LMP) Machine offers our customers a system for the fast and safe production of near net-shape parts using additive manufacturing processes for the first time. The powder-free production process utilized in this machine is efficient and cost-conscious and allows maximum flexibility in individual and small series production. In contrast to the commonly used powder bed process, GROB's proprietary solution utilizes wire as the starting material. This eliminates the disadvantages of many metalworking additive manufacturing processes and offers a number of convincing advantages: Material costs are reduced, the hazard potential is lowered by the elimination of powder handling, and additional work steps, such as component de-powdering and powder sifting and processing are completely eliminated. Furthermore, GROB's LMP process is a micro-casting process and not a welding process, causing little to no thermal warping.

The GMP300 is equipped with 3-axis kinematics and maximum axis speed of 30 m/min. The inert atmosphere in the machine protects the component from oxidation and guarantees consistently good material quality. At the AMB, the GMP 300 will be introduced to industry specialists at this international mechanical engineering trade fair followed by a live manufacturing presentation of a demo component.



TECHNICAL DATA GMP300:



- + Construction volume [mm³]: 300 x 300 x 300
- + Positioning accuracy [mm]: 0.015
- + Var. droplet diameter min./max. [mm]: 0.4/0.7
- + Calculated max. build-up rate [cm³/h]: 320 (500 Hz at 700 µm droplet diameter)
- + Building panel heating max. [°C]: 650

F-SERIES

The Machine Concept for all Important E-Mobility Components

High machine dynamics, optimum chip transport and compact design: GROB's F-series machines offer the right solution for machining next generation parts. In addition to the production of frame structure and chassis parts, the focus is on the processing of lightweight components for electric drives. The flexible and precise 5-axis concept guarantees automotive industry customers an efficient production of stator, transmission and battery housings. The machine variants of the F-series are the perfect foundation for your automated production and can be set up stand-alone or in combination, automated or interlinked. Two types of part loading can always be selected: Either top loading via a GROB linear gantry, or front loading via a GROB pallet changing system, a swiveling or sliding changer, a robot or manually by an employee.

At the AMB, GROB will be presenting the G520F, a two-spindle machine for the parallel machining of two parts. The G520F is one of the largest machines that GROB has ever presented at a trade fair and demonstrates the synchronous production of two rear carriers in simulated machining.



Subframe



Giga-Casting



Side rail



Battery tray



KEY FACTS G520F:

- ⊕ 5-axis working area up to 1,500 mm
- ⊕ Excellent dynamics in this machine size with the usual stability
- ⊕ Maximum energy efficiency

4-AXIS MACHINING CENTERS

One Concept for many Industries

The expansion of its product range by the 4-axis machine series enables GROB to meet the ever-increasing demands of the target markets outside the 5-axis market. Whether aerospace, mechanical engineering, die and mold industries, automotive or energy technology – 4-axis machining centers are the ideal solution for efficient machining projects and are suitable for almost every material. Their modular design and huge variety of options allow the G440, G640, and G840 machine versions to be configured according to specific customer requirements and they are characterized by a unique axis arrangement, high loading weight as well as high feed forces and accelerations of the main axes. With GROB's proprietary automation solutions,

such as the rotary pallet storage system (PSS-R), the machines can be expanded to create a flexible production cell that offers an ideal entry to automated, highly efficient production.

At the AMB, GROB will show the G440 4-axis universal machining center in combination with a PSS-R1800 rotary pallet storage system offering space for 10 or 15 pallets on three levels.



TECHNICAL DATA G440:



- ⊕ Working travels in X-/Y-/Z'-axis [mm]: 800/800/800
- ⊕ Speeds [max.] in X-/Y-/Z'-axis [m/min]: 70/60/60
- ⊕ Interference diameter [mm]: 800
- ⊕ Pallet size [mm]: 500x500

GROB WORLDWIDE



NORTH AMERICA

Bluffton, Ohio, USA
 Detroit, Michigan, USA
 Querétaro, Mexico

SOUTH AMERICA

São Paulo, Brazil

EUROPE

Mindelheim, Germany
 Pianezza, Italy
 Birmingham, Great Britain
 Hengelo, Netherlands
 Senlis, France
 Baar, Switzerland
 Poznań, Poland
 Győr, Hungary

ASIA

Dalian, China
 Beijing, China
 Shanghai, China
 Yokohama, Japan
 Suwon, South Korea
 Haiphong, Vietnam
 Bangkok, Thailand
 Hyderabad, India

PRODUCTION PLANTS



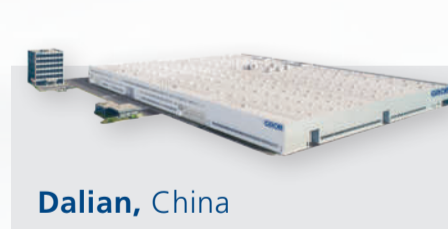
Mindelheim, Germany



São Paulo, Brazil



Bluffton, USA



Dalian, China



Pianezza, Italy



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IMPRINT – GROB INTERNATIONAL – AMB EDITION

PUBLISHER
 GROB-WERKE GmbH & Co. KG, Mindelheim
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 MARKETING, Telephone +49 8261 996-0,
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DESIGN AND IMPLEMENTATION
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PHOTOS
 GROB-WERKE GmbH & Co. KG, Mindelheim;
 Christian Schneider Photography;
 Marc Tillmann emtyVISION;
 Ulrich Wagner; Shutterstock Inc.

TRANSLATION
 Glossa Group GmbH

PRINT
 Holzer Druck und Medien
 Druckerei und Zeitungsverlag GmbH + CO. KG, Weiler im Allgäu