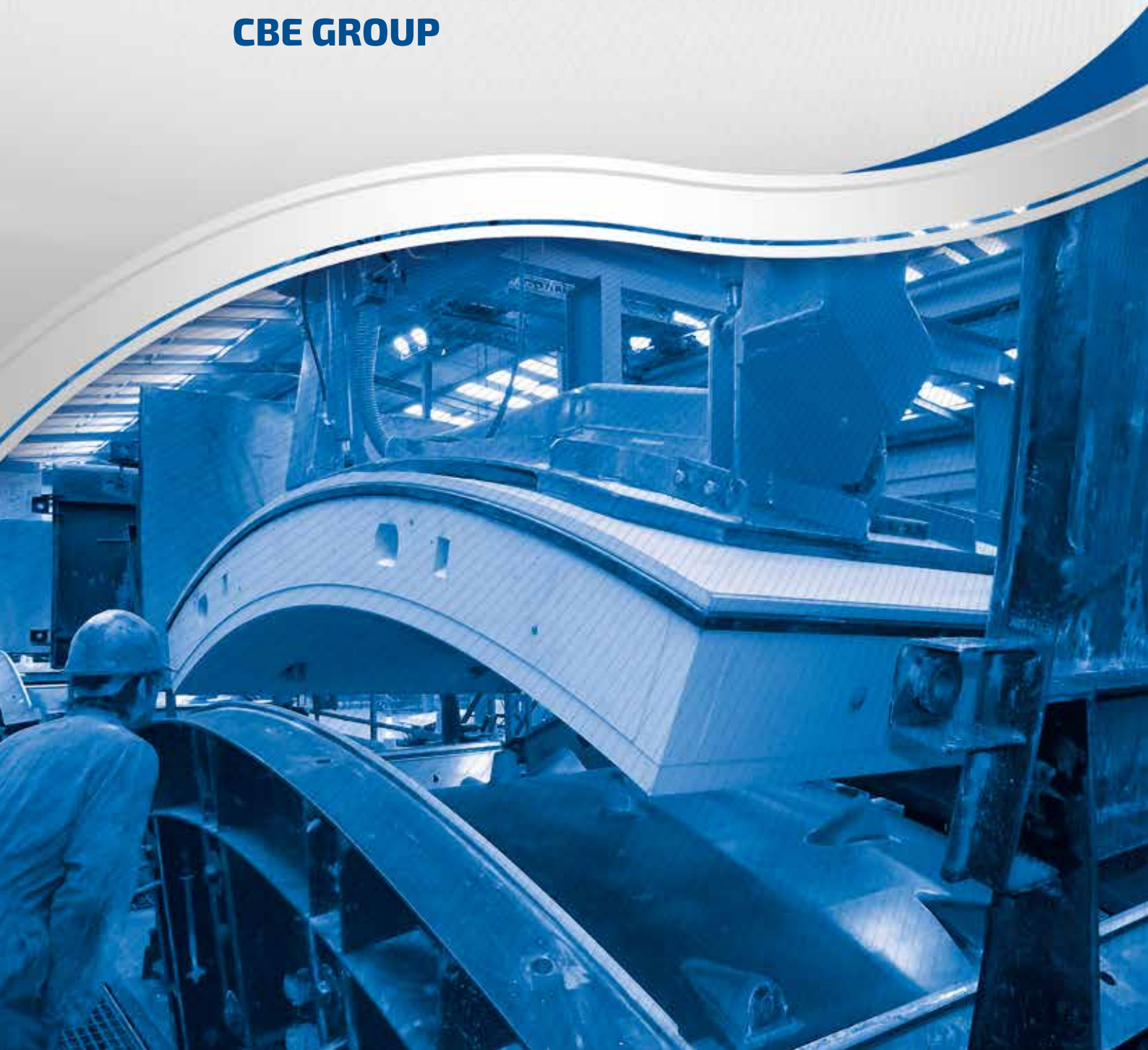




Precast solutions
for **tunnelling**

—
CBE GROUP



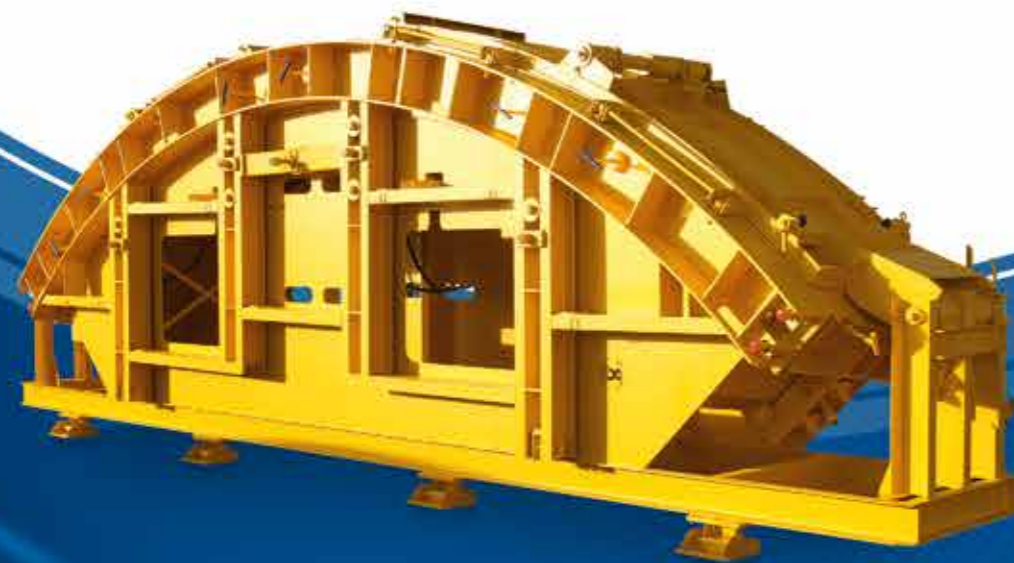
A leading international company

CBE GROUP IS A FRENCH INDUSTRIAL COMPANY, SPECIALIZED IN THE ENGINEERING AND THE MANUFACTURING OF METAL MOULDS AND INDUSTRIAL PLANTS FOR THE PRODUCTION OF TUNNEL CONCRETE SEGMENTS.



The company started off with the Channel Tunnel back in 1987, leading the way in the production of state-of-the-art moulds and visionary automated plants to optimize segment production.

CBE Group has a **unique know-how on the tunnel market**, based on years of experience regarding all possible tunnel configurations. **The company masters the entire production process**, from the design of the project to the set up of the plants. The company's main production site is located in the Loire Valley, one hour away from Paris.



Ever since its creation, **CBE Group has strived to grow on the international market**. A promising lead in the tunnel business, China started off with a few projects and **a production site was soon launched in 2009, in Yangling.**

2009 - 2016

92 projects in China

120+ projects on the Asian continent

4,200 moulds

CBE Group's Chinese subsidiary now operates on the entire Asian continent.

CBE GROUP WORLDWIDE

22,500 moulds produced since 1987

51 countries

480 projects worldwide, among which

170 carousels

10,000 sqm of production facilities

3 production sites

230 employees



Advanced products

MOULDS Engineering custom-made products



CBE Group has successfully taken part in the development of **segment moulds for tunnels of all dimensions**: 1 to 17 m diameter, 18 to 60 cm thickness, 3 to 17 tons.

CBE Group offers **custom-made segment moulds**, with the slightest detail taken into account in order to produce the best-fitting mould. Contact elements between the segments are made with an accuracy of 2 to 3/10th of a millimeter.



CBE Group's expertise is based on its ability to **design a long-lasting mould which will produce a high quality segment**. Each mould is designed to produce at least 1,500 segments.



- Specific moulds for each tunnelling project
- Tunnels for subways, trains, roads, water, cables, etc.
- Segments adaptable to all TBMs
- Horizontal and vertical moulds
- Pneumatic or electrical vibration



CAROUSELS Producing more efficiently with automated plants

CBE Group has used its unique experience in the production of segments to offer clients **turnkey production environments (stationary or automated)**, designed to produce a constant and sufficient quantity of segments.

CBE Group guarantees with its automated carousels a **significant productivity gain** of about 30 to 40% compared to a stationary configuration, with less staff needed and more segments produced.



- Improved overall quality of segment
- Optimization of production area
- 24/7 service
- Curing time independent of climate and always constant
- Improved acoustic insulation



A unique expertise

RESEARCH & DEVELOPMENT Improving productivity and efficiency

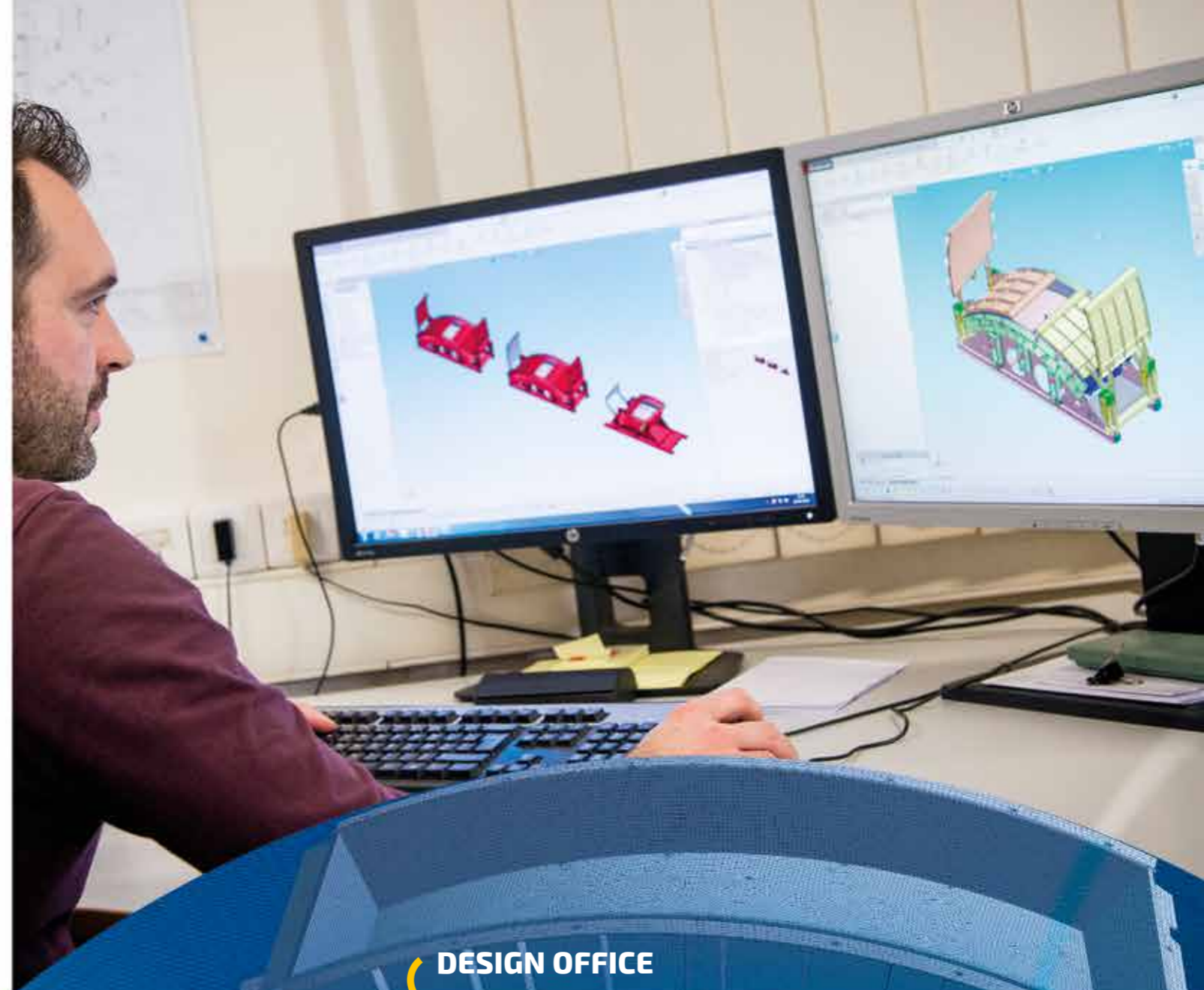
The Research & Development department aims at permanently improving the mechanical design of moulds and the equipment for precast facilities, through **an important investment in manpower and in the study and construction of prototypes.**

The department is at the origin of innovations now used globally by the tunnel industry: self-compacting concrete moulds, modular carousel plants or anchored gaskets.

Constantly **improving existing products and coming up with innovating solutions for clients** is essential to CBE Group. Key research topics also include:

- Better cost efficiency
- Work conditions for staff (noise reduction, simpler handling procedures)
- Sustainable development (reducing energy and raw material consumption)

The Research & Development team is fully integrated to the production process and works closely with other departments to achieve its aims.



DESIGN OFFICE Anticipating the clients' needs

The Design Office is at the launch stage of the project. During this important pre-design stage and **in continuous interaction with the clients**, CBE Group defines their needs, checks on the technical elements that are provided and completes the design.

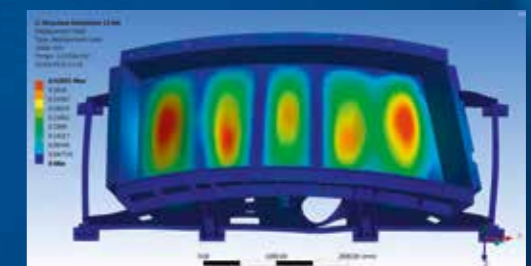
An essential phase which:

- Anticipates the product's behaviour under tremendous vibrations using calculation software,
- Provides cost-effective mould production, easier casting and demoulding,
- Allows the dimensioning of the precast plant workspace with the best possible layout.

Because of the time spent on this phase, CBE Group is able to guarantee the production of **an equipment which is completely adapted to the clients' needs**, calculated to offer longevity and reliability.



All projects are designed using the most adapted 3D software





PRODUCTION

Respecting the highest manufacturing standards

CBE Group controls the entire manufacturing process of its products, ensuring a sustained level of quality. While keeping in mind the respect of contract terms, the company offers **high reactivity on demand and very competitive delivery time**. First moulds can be delivered 3 months after the concrete design drawings have been handed over to the client.



Machining & laser cutting

Creating each part of the mould requires special attention and precision, using dedicated tools:

- 5 axis milling machines, 8m tables
- Automated high-speed machining centre
- Large laser-cutting capacity



Assembly

Large production increases can be met owing to the company's strong production capacity.

- Assembly of 50 moulds simultaneously
- Average of 1,500 moulds produced per year
- Certified welding procedures by highly-skilled operators



Finishing & control

Products require an extremely accurate level of geometry precision, particularly for segment moulds. Parts are measured in 3 dimensions with an accuracy of a 10th of a millimeter.

- High-accuracy control tools (3D laser tracker/photometric system)
- Supply of quality plans
- Monitoring of control tests
- ISO 9001 certification

CUSTOMER SERVICE

Helping clients succeed



With factory sites all over the world, and projects lasting up to a few years, clients need to be sure that they will be accompanied all the way, from the start to the finish of the project.

CBE Group's Customer Service focuses on keeping constant contact with its clients to make sure that everything goes smoothly. Present at each stage of the project, **qualified technicians provide support and assistance whenever needed**.

Their missions take several forms:

- Installation of equipment on production site by a dedicated technical team,
- Training of production site operators,
- Assistance (onsite and remote),
- Going worldwide, with specialized operators helping with technical support,
- Supplying spare parts.



40 Customer Service interventions to assist clients in 2016



International projects

480 projects in 51 countries





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