Economic and sustainable concrete production

The Liebherr Solution

LIEBHERR
Agenda

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- Liebherr – a family-run business
- Structure of the Liebherr group
- Concrete Technology Division

02

- How does Liebherr face the challenge for economic and sustainable quality concrete production?
- Which challenges are there?
- Liebherr as a full-service provider and companion through the PLC

03

- What is already done & developed
- ETM
- New generation of mixing plants
- The construction site of the future – Liebherr digital solutions
“My life has made me realise that if you are determined to do a good job and fulfil different customer requirements to the best of your abilities, you can also achieve goals that at first seemed almost unimaginable.”

Dr.-Ing. h. c. Hans Liebherr
Founder of the Liebherr Group
Liebherr Group

Factsheet: Group overview (2022)

1949
Founded by Hans Liebherr in Kirchdorf an der Iller, Germany

Parent company
Liebherr-International AG based in Bulle, Switzerland

13
Product segments

51,321
Employees

12,589
Turnover in € mio

40
Production sites

>140
Companies

Liebherr is a family-run technology company

Liebherr Group

19.09.2023
The Liebherr Solution: Economic and sustainable concrete production
A 100% independent family business
Liebherr Group

A future-facing company

Pioneering

Leader in R&D

Trend-setting

Average annual investment of > € 700 million
Responsible leadership

Long-term success
Sustainable development
Stability
Reliability
In organisational terms, Liebherr is a technology company that is divided into independently operating divisions.

Each of the 13 product segments is divided into manufacturing, sales and service companies, which are managed and operated by their divisional parent companies.
Concrete technology division

Liebherr is a full-service provider of concrete technology, with a global presence. We provide the right solution for any challenge, ensuring that our customers can efficiently produce and transport high-quality concrete.

2022:
- Turnover of €253 million
- 1,833 employees
- €11 million in investment
Production facilities worldwide

Germany

China

Brazil

Thailand

Saudi-Arabia

Bulgaria
02 How does Liebherr face the challenge for economic and sustainable quality concrete production?

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Concrete Technology
Which challenges are there?

01 Climate neutrality in the EU till 2050
   → Cement production & combustion engines cause lots of CO₂

02 Finite availability of source materials
   → Mainly aggregates are finite

03 Rising energy costs
   → It gets more and more expensive to produce concrete

04 Concrete recipes get more complex
   → Challenging production of concrete and concrete placement
02 How does Liebherr face the challenge for economic and sustainable quality concrete production?

Liebherr as a full-service provider and companion through the PLC

We help our customers to find the right beton recipe. Therefore we use our three step process:

**Simulation**
Understand relationships
Generate knowledge

**Laboratory**
Recognize trends
Work on solutions

**Application**
Validate experiments

**SUCCESS**
Innovation for Customer Value

DEM - Discrete Element Method
CFD - Computational Fluid Dynamics
The right products for the right recipe: Aggregate storage

Different types of storage, for different challenges
Up to 16 different aggregates (e.g. recycled aggregates) with a volume up to over 1000 m³ can be stored
The right products for the right recipe

Cement storage
- Liebherr provides storage and feeding solutions for all needed kinds of:
  - Cement
  - Microsilica
  - Fly ash
  - Steel- & polypropylene-fibres
  - Additives (liquid & powder)

Only the latest environment-protection technology is used:
- Extremely efficient dust filters
- Leckage protections
- Noise reduced motors
- Noise reduced gearboxes
- Use of frequency converters for less energy consumption
02 How does Liebherr face the challenge for economic and sustainable quality concrete production?

The right products for the right recipe: “Heart” and “Brain”
# The Liebherr Solution: Economic and sustainable concrete production

## 02 How does Liebherr face the challenge for economic and sustainable quality concrete production?

### 01 Two powerful electric motors and the frequency converters ensure variable speeds for highest flexibility and efficiency

### 02 Patented agitator configuration *NEW* for the best homogenization results in shortest time → Perfect penetration of the mixing material

### 03 Proven ring-channel: → The material cannot flow away

### 04 Best accessibility of the mixer thanks to the well-thought arrangement of the powertrain underneath the mixer → No drives on the top side and therefore optimum accessibility

### 05 Controlled discharge flow thanks to the variable adjustable opening angle (max. 91°) of the closure → Cylinder with an intelligent measuring system

### 06 Up to 3 discharge gates ensures shortest discharge time

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**Image**: Diagram of the Ring-pan mixer RIV with labeled features:

1. **1st Feature**
2. **2nd Feature**
3. **3rd Feature**
4. **4th Feature**
5. **5th Feature**
6. **6th Feature**

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**Image Credit**: The Liebherr Solution: Economic and sustainable concrete production

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**Date**: 19.09.2023
Discharge gates of the mixing trough

Highlights:
- Short discharge times/ short mixing times also among special concretes
- Up to 3 discharge gates for the maximum of flexibility
- Loading of several delivery points is possible, e.g. truck mixer, bucket transport system, cleaning/recycling operations
- Discharge gates can be opened in multi-stage → Optimum discharge to the different transportation systems

Discharge gate for concrete testing (samples)
- Simple concrete testing discharge for the running production control
- Up to 3 discharge gates

Generous mixer gates and testing discharge gate
02 How does Liebherr face the challenge for economic and sustainable quality concrete production?

The right products for the right recipe: “Brain” → Litronic MPS III

- **Convenient operation**
  - Operation of the control system via minimum 2 monitors possible
    - Monitor 1: Master data management (material data, screening line, articles, recipes, customers, vehicles, etc.)
    - Monitor 2: Visualization of the process flow (fill levels of the silos, progress of the dosage, progress of the mixing procedure, display of the consistency, manual operation, etc.)

- **Extensive functionalities enable the efficient operation**
  - Extensive statistical tools for the commercial planning
    - Construction phase statistics, consumption per type of material, production per customer/ site/ type of concrete etc.
    - Analysis tool for monitoring and setting of the dosing accuracy
    - On the safe side with maximum material saving (set dosing accuracy to 1%, enter threshold per recipe → compliance of the standard)

- **Individual configuration**
  - Adjustments for the most different applications → e.g., ready-mixed concrete facilities, prefabricated facilities, dam projects, exceptional mixing plants
02 How does Liebherr face the challenge for economic and sustainable quality concrete production?

The right products for the right recipe: Liebherr recycling systems
03 What is already done & developed

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Concrete Technology
03 What is already done & developed

Hybrid truck mixer - ETM

- Operation of the mixing drum with an electric motor
- Automatic charging of the battery while driving via the diesel engine
- Massive emission reduction on the construction site
New generation of mixing plants

A wide range of innovative drive enables the ideal solution for the CO$_2$-optimized construction site, depending on the required application.

- **Faster assembly**
  Concrete production after shorter time

- **Easy Transport**
  Transport by low-loader (max. 3 m width)

- **High output**
  With Liebherr ring-pan & twinshaft mixers

- **Intelligent mixing process**
  FC control for process optimisation

- **High dosing accuracy**
  under $\pm 0.5\%$
  Savings up to 7.5 kg cement per 1 m$^3$

- **Energy efficiency**
  No high power peaks & 30% energy saving possible

- **Best cleanliness**
  Optimum cleaning with LiClean cleaning solutions

- **Litronic MPS III Control**
  Easy concrete production with modern tools for analysis and networking
With our products, technologies and digital solutions, we are already shaping the construction sites and mines of tomorrow. In our construction site of the future, machines work with pioneering drives, low noise and emissions, as well as digitally connected and always close to the needs of our customers.
Contact Data

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Thank you.
Questions?