

# Preparation Technologies for Metallurgy

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Eirich supplies technologies for the economical preparation of raw materials, auxiliary materials and residues for recycling and disposal. The product line includes not only machinery and systems but also a full range of services covering everything from consulting to start-up.



# Tailor-made solutions – effective and trendsetting

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With locations in Germany, France, Ukraine, USA, Brazil, Japan, China, India, South Africa as well as agencies in over 50 other countries, we are always close at hand with our know-how accumulated from countless projects worldwide.

## Processes

Eirich typically uses the following processes for its tailor-made solutions:

- Mixing
- Homogenizing
- Fine grinding
- Pelletizing
- Agglomerating
- Micro granulating
- Plasticizing
- Drying

## Core applications

- Preparation of pellets and micropellets
- Sinter mix preparation
- Recycling of valuable residues like dusts, ashes, sludges, slurries
- Fine grinding
- Preparation of carbon paste for graphite electrodes, anodes, cathodes
- Coal / Coke preparation





# Machines and systems

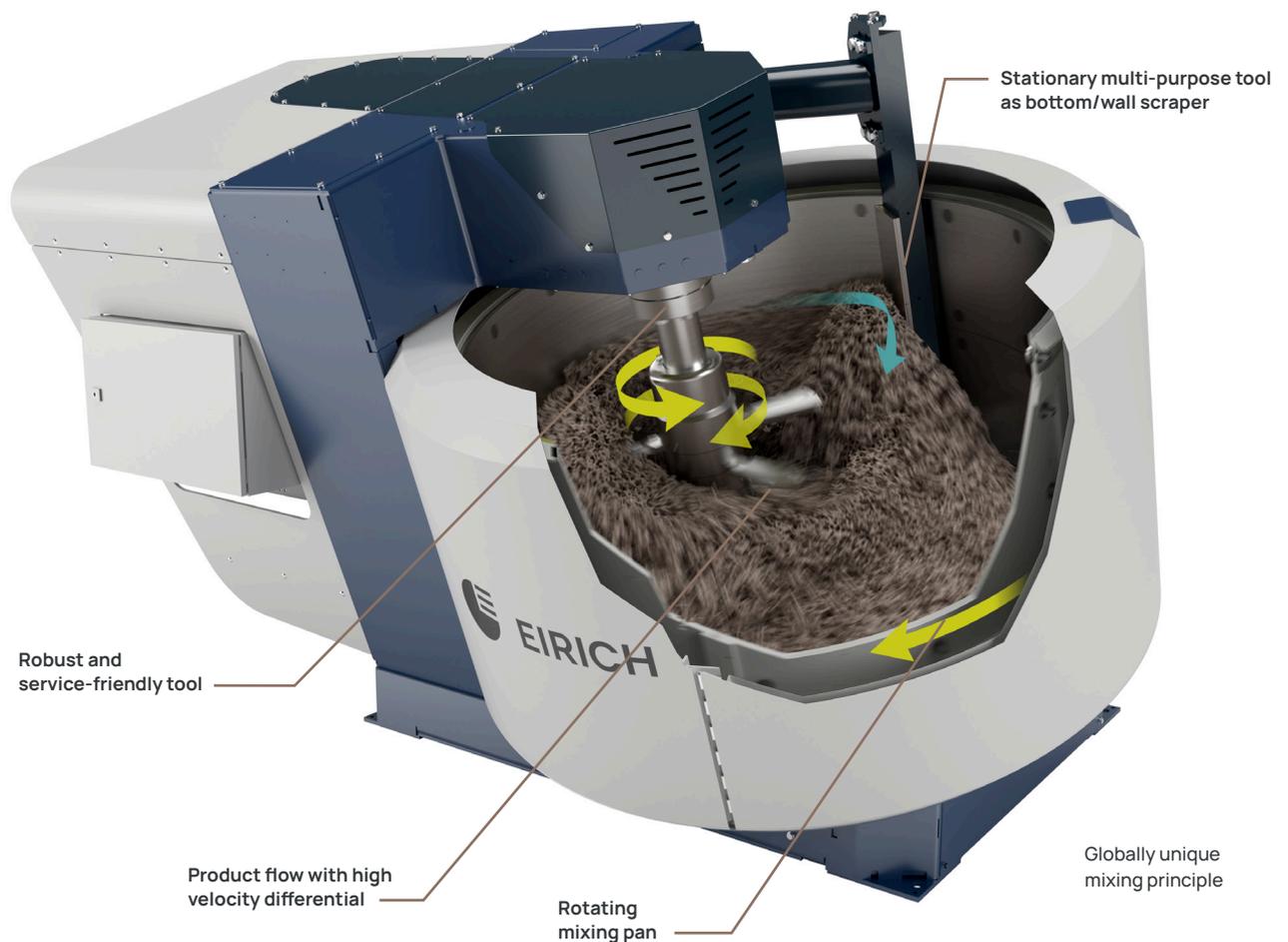
Our production range covers an extensive selection of highly reliable machines, components and complete systems for continuous and batch operations:

- Intensive mixers
- Mix pelletizers
- Pelletizing disk
- EVACTHERM® vacuum mixers and dryers
- Feeding and weighing equipment
- TowerMill vertical agitated media mills
- QualiMaster MT1

Stand-alone machines and complete preparation systems are available for capacities from approx. 15 t/h to 1,400 t/h in a single production line.

For quality assurance and/or research and development, there are laboratory mixers with working volumes from 1 liter as well as complete laboratory systems for reliable scale-ups. Measurement and control technology, from software development to complete control and computer-aided process control systems, complete the product line.

Eirich machines and systems provide:



- High-intensity mixing
- Exceptional high availability
- Easy maintenance conditions and worldwide service



DW40 intensive mixer inside



DW40 intensive mixer for capacities up to 1,400 t/h with High Torque Drives

# Machine types

Eirich intensive mixers are characterized by their unique mixing principle and display outstanding performance and flexibility. For many years, leading producers in the metallurgy have relied on the service-proven solutions from Eirich for both continuous and batch processes.

The special characteristics of the Eirich intensive mixers are:

- a rotating mixing pan
- a stationary bottom/wall scraper
- one to four high-speed rotors in an eccentric position relative to the center of the mixing pan

## Unique mixing principle of the Eirich intensive mixer

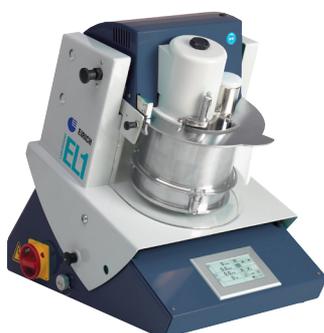
A rotating mixing pan continually conveys the materials to the rotating mixing tool. This cycle is supported by the bottom/wall scraper which deflects the mix and conveys it into the area of the rotor. The extremely effective fine mixing that takes place in the high-speed rotor is thus superimposed on the rough mixing performed by the bottom/wall scraper.

**Eirich intensive mixers are service-friendly, extremely wear-resistant and highly reliable:**

- Drives and gear units are positioned outside the mixing pan
- Wearing parts are easy to replace
- Easy access to the inside of the mixing chamber for maintenance work is guaranteed
- Even a fully loaded mixer can be restarted

## Just the right size for all performance classes

The Eirich range of mixers includes sizes from 1 to 12,000 liters, meeting user-specific requirements with great efficiency. In many cases, various applications can be performed in succession, step by step, in one and the same mixer.



1 L



500 L



Mixer type	Capacity (max.)		Mode of operation	
	Liter	Kilogram	Batch operation	Continuous
EL1	1	1,6	•	
R01	5	8,0	•	
RV01	10	16	•	
R05T	40	65	•	
R09T	150	240	•	
R12	250	400	•	•
RV12	400	650	•	•
R16	600	960	•	•
RV16	900	1,440	•	•
R19	1,125	1,800	•	•
RV19	1,500	2,400	•	•
R24	2,250	3,600	•	•
RV24	3,000	4,800	•	•
R28/40	4,000	6,400	•	•
R28/50	5,000	8,000	•	•
RV28/50	5,500	8,800	•	•
R33/60	6,000	9,600	•	•
R33/70	7,000	11,200	•	•
R33/80	8,000	12,800	•	•
DW40	12,000	19,200		•



# Preparation of pellets and micropellets with the Eirich intensive mixer

When processing material for the production of green pellets, binding agents (e.g., bentonite) and sometimes aggregates (e.g., limestone, dolomite) are added to the fine ore and mixed with it.

- High operational reliability with little maintenance
- Narrow grain size range / uniform quality
- Low wear

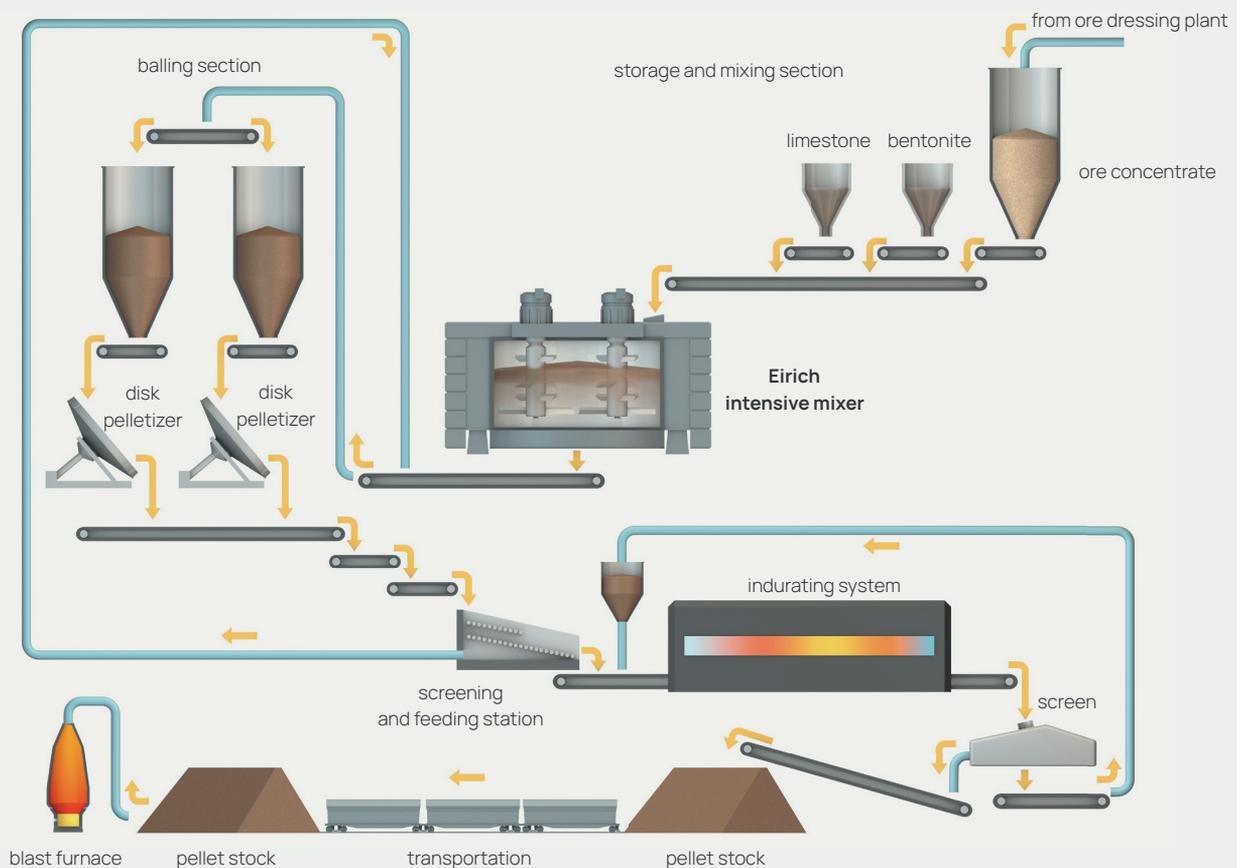
**Eirich intensive mixers perform this preparation in continuous duty with the following important advantages:**

- Low consumption of binding agents
- Reduced energy requirement
- Higher green strength of pellets with a low recycling quota
- High and constant homogeneity of material at throughput rates up to 1,400 t/h

## Smelting and direct reduction

The Eirich intensive mixer also improves the efficiency of smelting and direct reduction plants, regardless of whether a shaft furnace, rotary kiln, fluidized bed or smelting reactor is used.

For the production of sponge iron briquettes, a material mix of high and stable homogeneity is required. Eirich intensive mixers meet this requirement reliably.





System in operation at:  
LKAB, Sweden

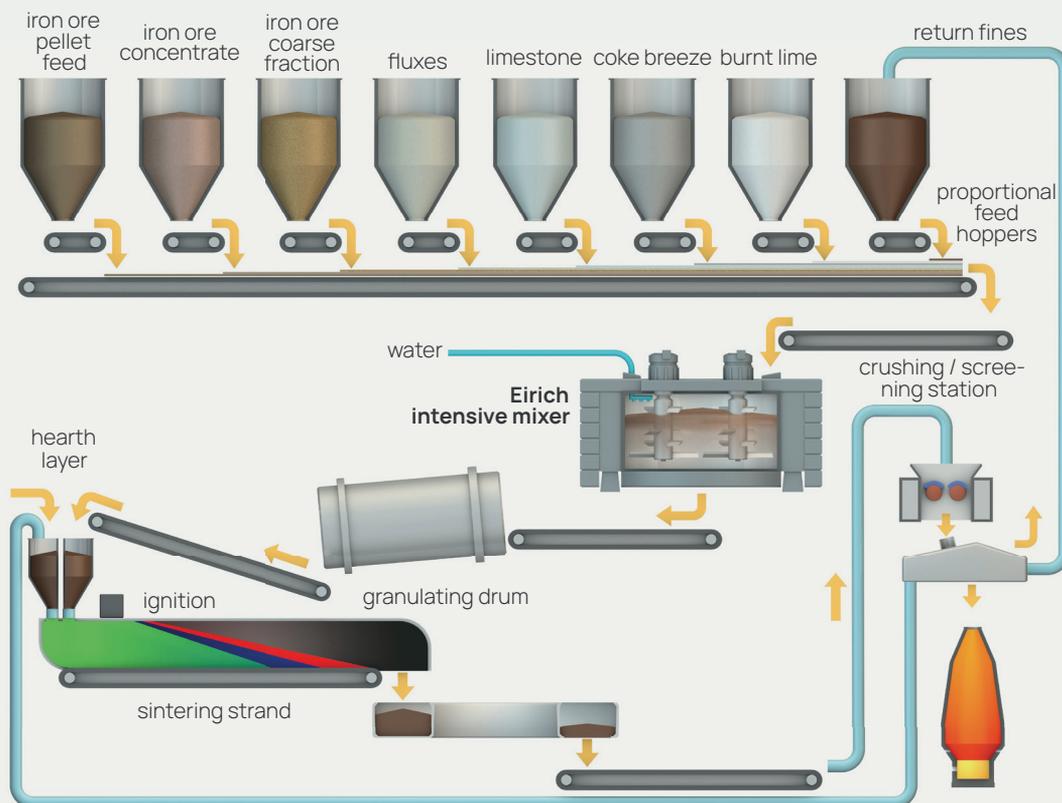
# Preparation of sinter mix with the Eirich intensive mixer

A globally observed trend is the ever-increasing proportion of fine and ultra-fine iron ores mined for use in the iron and steel industry. Existing sinter plants, however, are not capable of efficiently processing larger quantities of under-sized ore fractions. Extremely fine iron ores must normally be pelletized prior to charging into a blast

furnace. This results in higher iron production costs than agglomeration of the ore by sintering. In order to meet the sinter producers' demand for higher proportions of fine and ultra-fine iron ore in the sinter raw material mix, intensive mixing and micro-granulation is mandatory for economic sintering. Eirich, therefore, offers two alternative solutions.

## Alternative A:

Eirich intensive mixer and locally provided granulating drum  
Especially for revamping of existing sinter plants



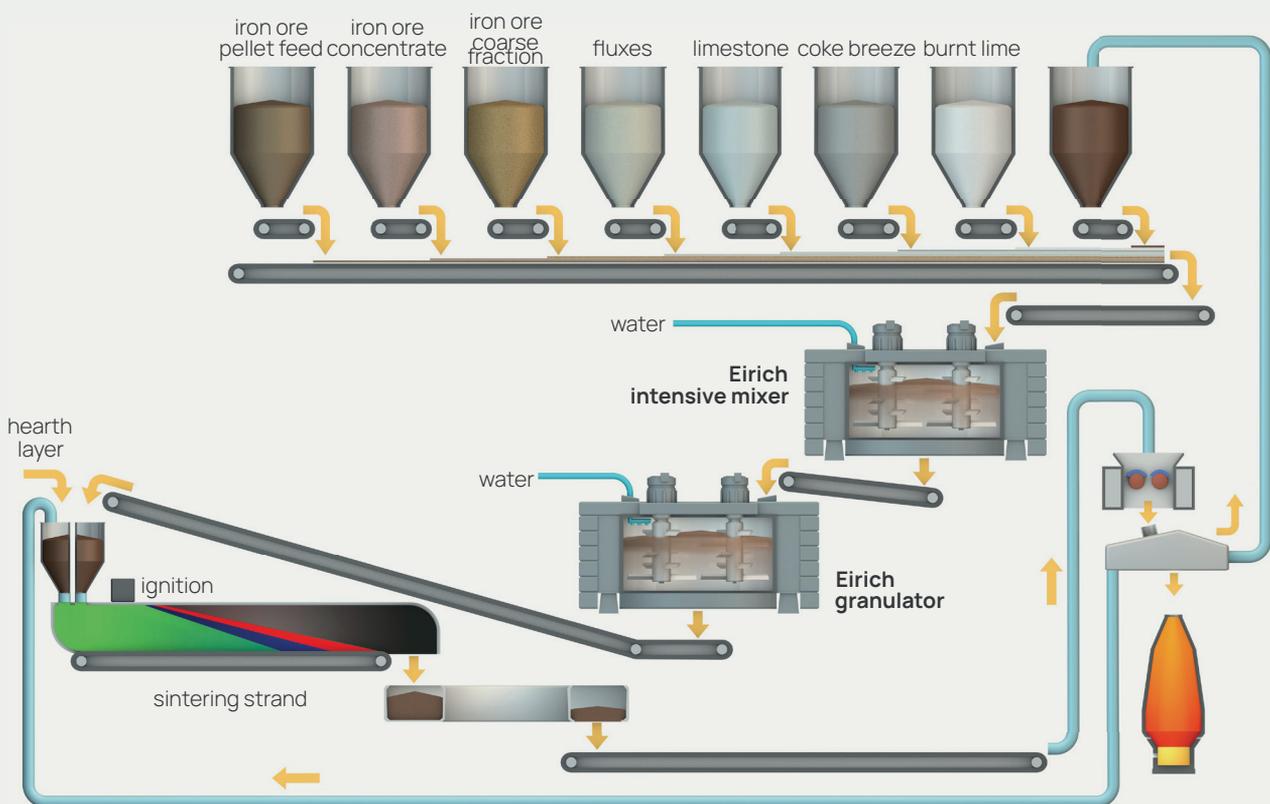
System in operation, e.g., at:  
Dragon Steel, Taiwan / ArcelorMittal, Belgium

**The benefits of both systems have been proven true in many projects and can be summarized as follows:**

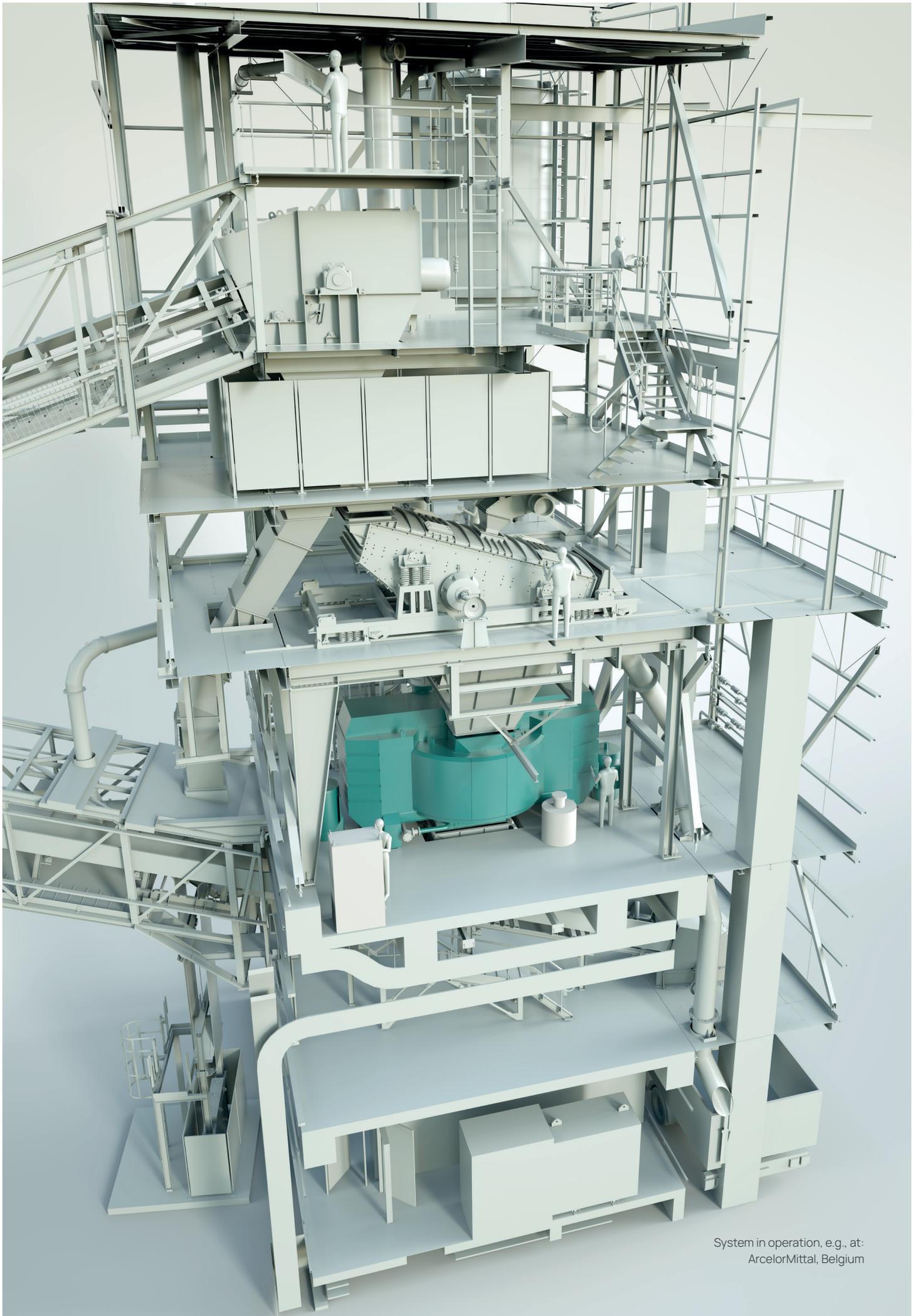
- Completely homogeneous sinter raw mix with high and even sinter bed permeability
- High productivity of the sinter plant even with high portions of fine and ultrafine iron ore
- Reduced energy consumption
- Low solid fuel consumption
- Equalized burn-through zone
- High and stable sinter quality
- Less return material
- High availability
- Throughputs up to 1,400 t/h

**Alternative B:**

Eirich intensive mixer & granulator  
Especially for greenfield projects



System in operation, e.g., at JSW, India



System in operation, e.g., at:  
ArcelorMittal, Belgium

# Eirich wear protection

Eirich has decades of experience in the development and use of wear protection solutions. You get the benefit of this know-how in several ways:

- Exceptionally long service lives are guaranteed
- Significantly reduced downtimes and maintenance times
- Eirich wear parts give you the assurance of unbeatable cost efficiency when measured over the total life cycle

Specifically for beaters, different types of wear protection are used depending on the type of stress associated with the application. The different types are each designed for the maximum service lives of the beaters and are constantly being improved as well. All of the work of applying the wear protection is carried out in house in the Eirich workshops specifically set up for the job – the best guarantee for quality and reliability.

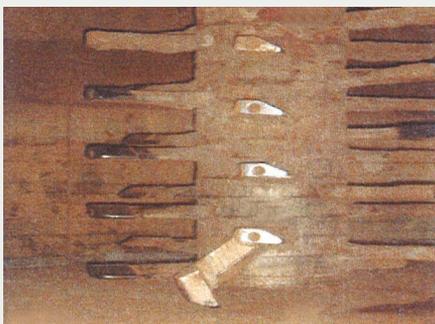
## Typical wear protection of Eirich mixers for:

### Sinter mix preparation



Tungsten carbide faced with a tungsten carbide end piece  
Production of hardfacing: hard-soldered in our own workshops

**Properties:**  
reduced life cycle costs due to the special Eirich changeover system



Interior view of an Eirich sinter mixer Rotor after 3 months of operation

### Pellet preparation

#### Standard type

4 layers of armoring  
Production of armoring: manual hardfacing in our own workshops

**Properties:**  
material blows possible; armor material and thickness can be varied



#### High-performance type

4 layers of armoring with a tungsten carbide end piece  
Production of armoring: manual hardfacing in our own workshops

**Properties:**  
reduced life cycle costs due to the special Eirich changeover system



This configuration can process more than 5 million tons of iron ore in a pellet plant without showing any noticeable wear

# Recycling of valuable residues

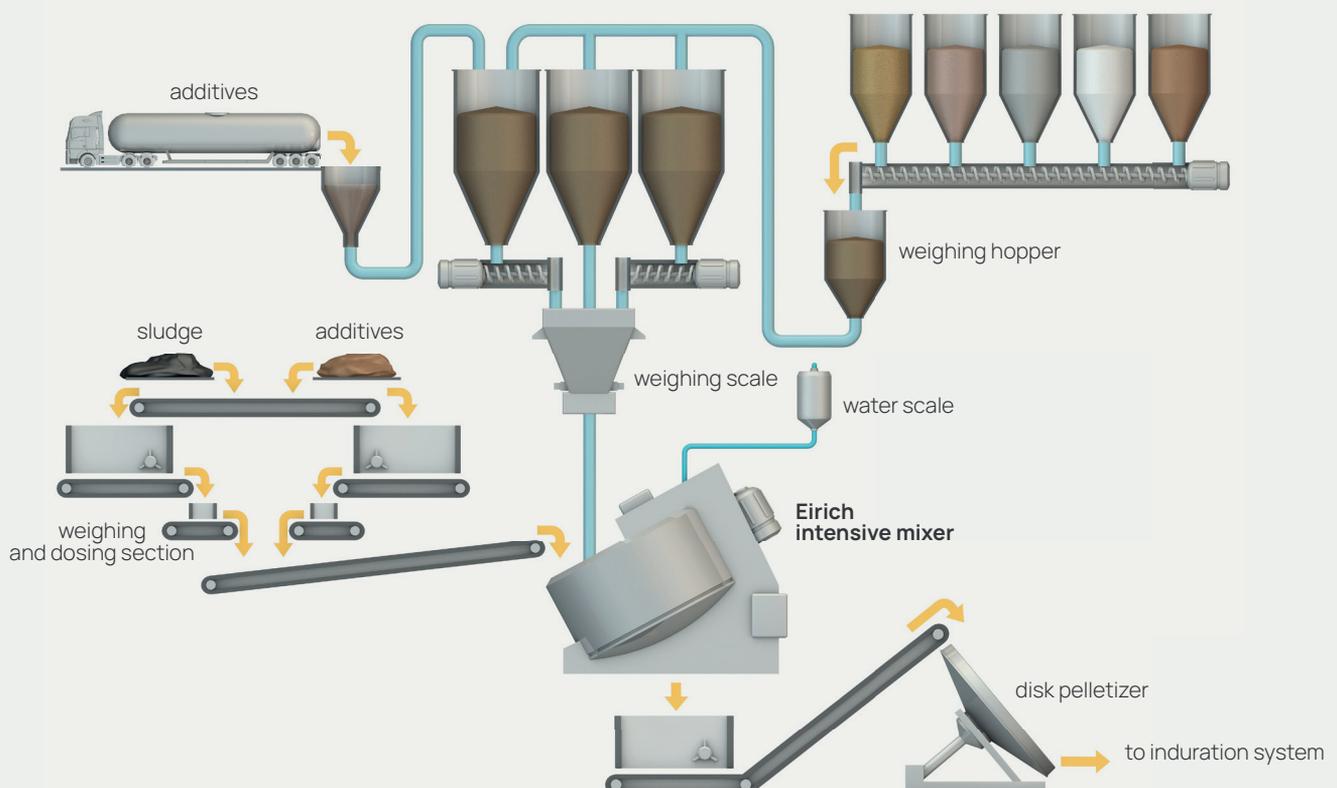
The steel industry is adopting innovative ways of recycling dusts and residues, aiming for zero waste. The common approach is to recycle them into the production line. Most of these residues are difficult to handle and have highly demanding mechanical, chemical and physical properties. An adequate material preparation determines to a large extent the outcome of the process. With the Eirich mixing system, residues like dusts and sludges from sinter plants, blast furnaces, cast shops, BOF plants and electric arc furnaces are effectively prepared.

**The Eirich intensive mixer is able to manage several processing steps one at a time:**

- Mixing
- Moistening/moisture distribution/moisture removal
- Dispersing
- Compacting
- (Pre-)granulating
- Reacting
- Cooling

**Advantages of the Eirich mixing system:**

- Excellent mixing results
- Stable properties of the intermediate product
- Flexible system that can also cope with widely varying properties of the residues
- High wear resistance
- Self-cleaning





System in operation at:  
Votorantim, Brazil

# Fine grinding

To provide an economical solution for modern ore beneficiation plants, Eirich offers the TowerMill – a proven vertical agitated media mill for energy-efficient fine grinding in the fresh feed size range from 3 mm (hard rock ores) to 10 mm (soft ores) and economical size reduction to 15 microns. With the Eirich TowerMill both energy and media consumption are reduced considerably in the ore concentration process.

## The benefits of the Eirich TowerMill at a glance:

- Energy efficiency
- High throughput
- High availability even in abrasive applications
- Reduced operating costs

## Example

**Application:** Iron ore - magnetite

**TowerMill installation:** Western Asia magnetite project

**5 units ETM-1500**

**Installed power:** 5 x 1.1 MW

**Delivery date:** 2009

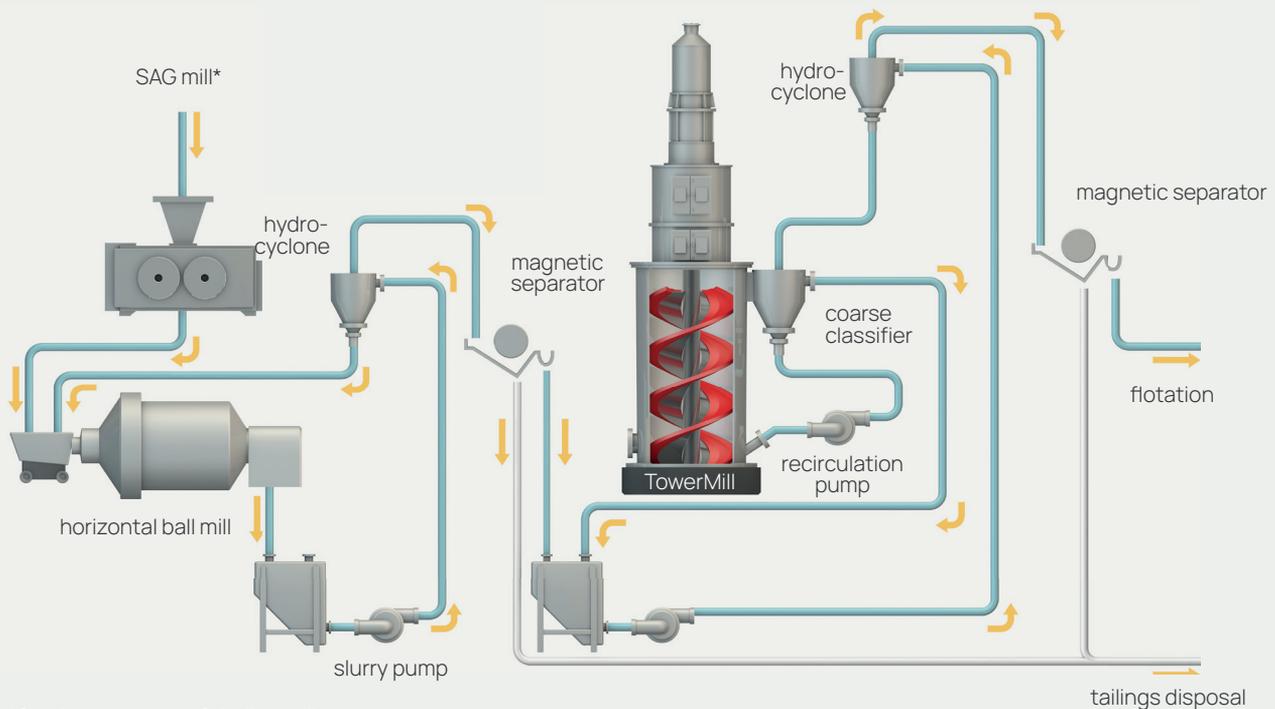
**4 units**

**Feed size:** F80 = 80 microns

**Product size:** P80 = 38 microns

**Throughput:** 130 t/h / TowerMill

**1 unit on standby**

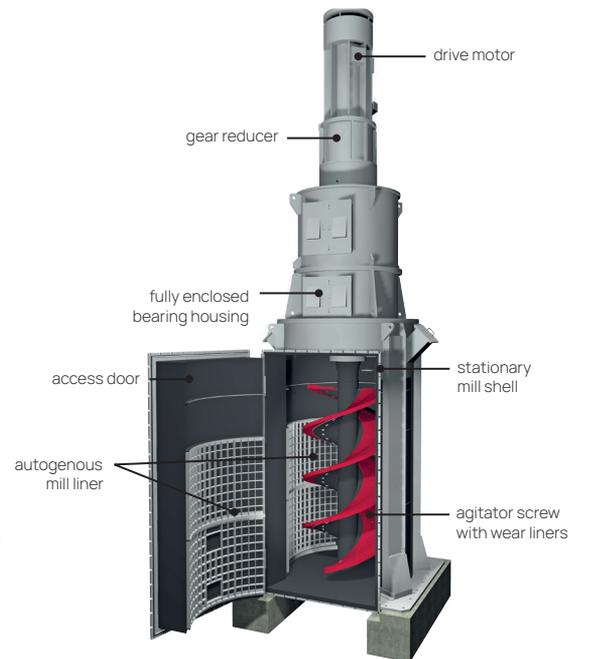
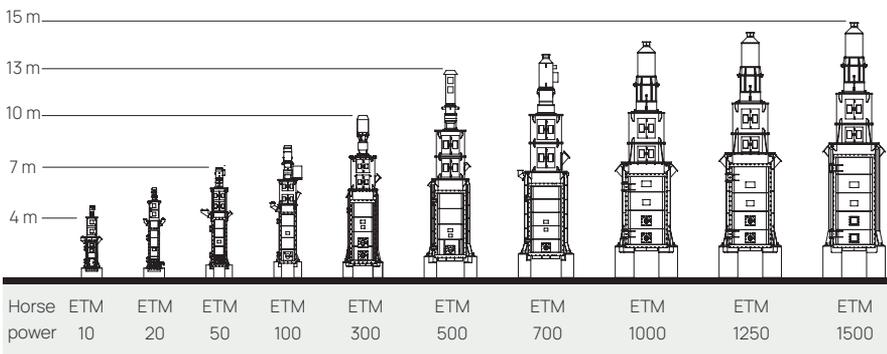


\*Semi-Autogenous Grinding mill



5 units ETM-1500  
Western Asia

**TowerMill range: For each application the size that fits**



# Eirich services – maximum confidence across the board

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Eirich offers a comprehensive range of services for the metallurgy industry worldwide: from the initial consultation to the planning and implementation of a preparation solution, reliable after-sales service and the dependable delivery of original spare parts.

## Test centers

Eirich maintains test centers on various continents. It is there that, experienced engineers and process technicians work together with the user to optimize individual process steps and develop the basis for the optimum performance of new applications with non-tested mix compositions.

## Engineering

Data collected at the Eirich test center is used as the basis for selecting the right machines and equipment.

## Systems engineering

Only machines and equipment developed and built by Eirich itself and products from efficient and experienced partners are considered in the engineering and order handling stage.

## Process control and instrumentation

Eirich develops and builds its own machine and process control systems and instrumentation for complete preparation solutions. The range covers new installations as well as the modernization or expansion of existing machines and preparation systems. All components are exactly configured for the user's needs. The results are tailor-made solutions ranging from conventional keyboard control systems to special batch controllers with formula management to the ServiceExpert software package with online documentation and the predictive maintenance planning.

## Installation and commissioning

An experienced service team is available for installation and commissioning. Local partners sup-

port us, and the customer's personnel are trained in the sequence of operations.

## Training

Training for your operating and maintenance team is provided by expert instructors to ensure that you get the most out of your investment over the long term. It includes instructions concerning the system's operation, safety regulations, process optimization, maintenance intervals and repair work.

## Customer service

Eirich after-sales service is your guarantee of expertise, high availability and comprehensive support. The portfolio includes the worldwide supply of genuine Eirich spare parts, rapid response to production stoppages and fast machine / system repairs.

Particularly beneficial options are:

- **Teleservice**

Remote diagnosis via data link. This guarantees fast and cost-effective support in the event of problems

- **Condition Monitoring**

Sensors mounted on key functional elements send data in real time to a central analysis system in order to detect component degradation before a major error occurs. This can enhance machine availability and reduce maintenance costs.

- **Maintenance software packages**

The software ServiceExpert ECD software provides easy access to technical drawings, images and photos to quickly identify even very small parts, and includes a shopping cart function. ServiceExpert ECS provides a customized, comprehensive and state-of-the-art maintenance management software solution that helps maximize machine availability.





The Eirich Group, with the Gustav Eirich machine factory as a strategic center in Hardheim, is a supplier of machines, systems and services for mixing technology, granulating/pelleting, drying and fine grinding. Our core competencies are procedures and processes for the treatment of loose materials, sludge and mud. We are a family-run company with 16 locations worldwide.

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More information at:  
[www.eirich.com](http://www.eirich.com)