

# Processing technology for refractory materials

economical  
proven  
reliable



# EIRICH processing technology – proven in the refractory industry worldwide.

## **For many decades now, EIRICH has been offering cutting-edge technologies for the preparation of refractory compounds.**

Intelligent and future-oriented concepts of process design are needed for final products to meet today's new quality requirements. EIRICH joins the customer in optimizing his process and supplies all he needs – from mixing, feeding and control technology to complete production lines – all from a single source.

### **Mixing technology**

The machine range is flexible enough to meet all aspects of refractory material preparation, whether dry or press-moist.

### **Granulating technology**

Granulating mixers for defined grain sizes (mixing and granulating in just one single unit – the EIRICH intensive mixer)

### **Feeding, weighing and conveying**

All components are fed in exact accordance with the mix composition by automatic systems which are coordinated with the properties of the raw materials and additives on the one hand and with the conveying, loading and handling systems on the other.

### **Control and process control technology**

Monitoring and optimization of the entire production sequence, including formula management by the batch controller.

Teleservice and Condition Monitoring for remote fault diagnostics and proactive maintenance.

### **Process engineering**

Each application is tested and optimized in its process parameters at the EIRICH test center. Trial production runs can be conducted on site with hired machines.

### **Systems engineering**

The results of the process engineering tests are used as basis for designing stand-alone machines and complete lines. In drawing up the concepts, due allowance is made for further factors such as the production range, capacity, degree of automation, labor safety and environmental protection.

### **Services**

Training of operating and maintenance personnel. Plant assembly/installation, commissioning and reliable supply of spare parts worldwide.

**EIRICH technologies are being used successfully by companies all over the world in the preparation of high-quality refractory products.**

## **EIRICH has special experiences in the following product areas:**

### **Shaped products**

- press bodies for all types of brick; also as hot mixes
- compounds for light refractory bricks
- granules for isostatic pressed products

### **Unshaped products**

- dense vibrating, casting, tamping and gunning mixes
- heat insulating compounds
- mortar and filler cement
- dry mixes

### **Prefabricated components**

#### **Special materials**

- mixes and granules for oxide ceramic and non-oxide ceramic materials
- mixes for ceramic fiber materials



# Your product is never better than the mix!

**Products have to meet higher and higher requirements and closer and closer tolerance limits. Under these conditions, the slogan “Your product is never better than your mix!” underlines more than ever how important the mixing unit is for the results of the production process.**

Poorly mixed raw materials lead to products which lack the required properties and display an inconsistent standard of quality.

With EIRICH intensive mixers you are assured of quality and reproducibility within close limits. Powerful technology plus the know-how gained from decades of partnership with the refractory industry add up to an exceptional level of operational reliability for the user.

## **Design features:**

- rugged construction, suitable for hard and abrasive materials
- service-friendly thanks to:
  - automatic lubrication
  - good access to easy-to-replace wear components
- seals on moving parts do not come into contact with the mix
- no drives in the mixing zone

## **Advantages:**

- optimal, constant mix quality
- efficient use of energy
- economical due to short mixing cycles resulting in high throughput rates
- flexible and adaptable to raw material consistency and processing objectives
- a demixing effect is avoided
- high self-cleaning effect

## **Important for the preparation of refractory concrete**

In comparison to planetary mixers with an EIRICH intensive mixer you normally need less water.

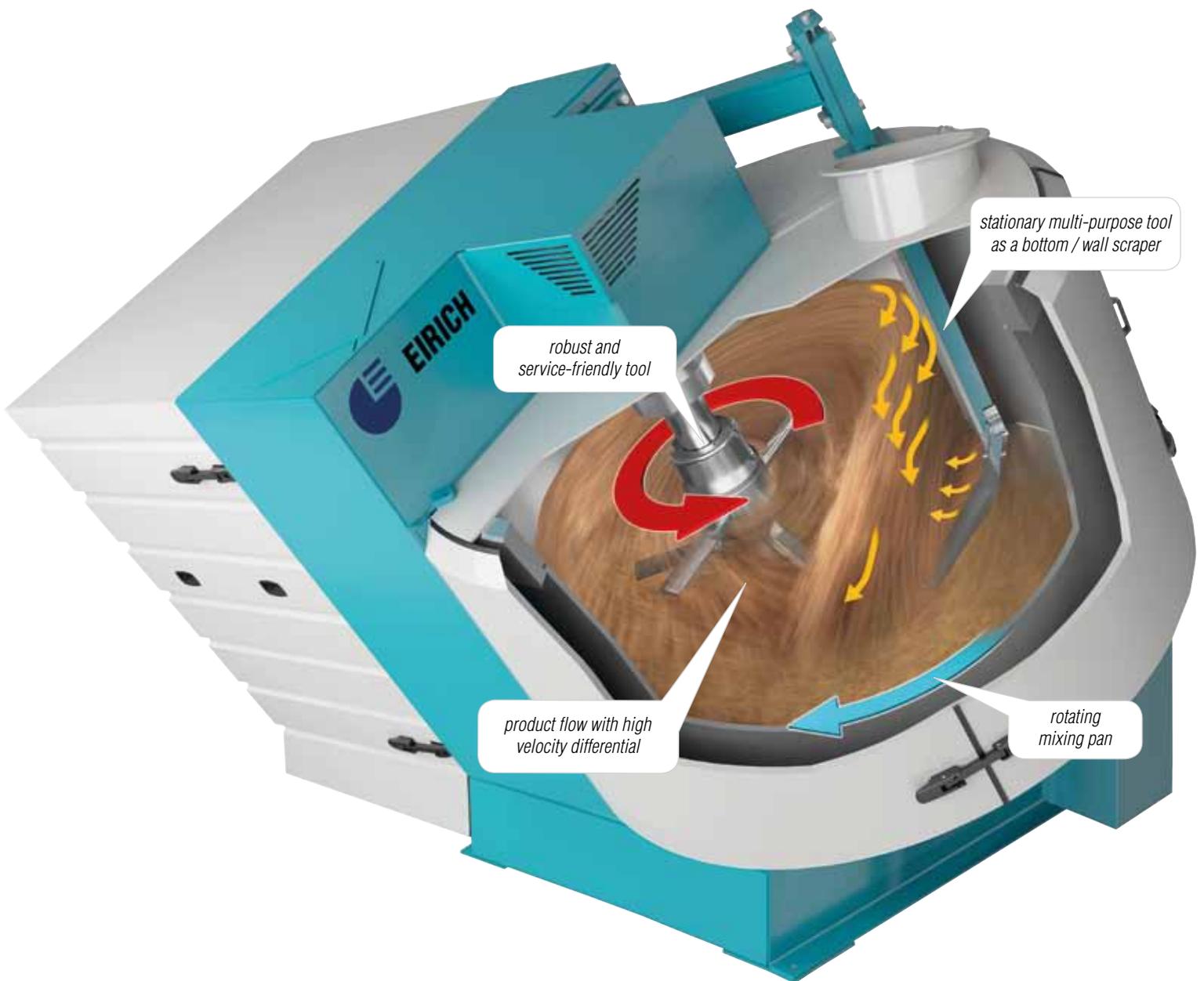
### **Consequence:**

The open porosity (which is decisive later on regarding wear) decreases distinctly. Sometimes it is possible to replace fired functional products.

## **Important, especially during dry mixing**

With other mixer types there is a risk of heavy components collecting in the outer region of the mixing zone and of undesirable classifying effects on components with various densities and grain sizes. Using an EIRICH intensive mixer type R with an inclined mixing pan reliably eliminates segregation problems, even when processing components show extreme differences in material properties and quantity.





## Globally unique EIRICH mixing principle

**Rotating mixing pan**  
for material transport

**Mixing tool with variable speed** for mixing, pelletizing, kneading and many basic operations more

**The effect:**

The separation between material transport and mixing process allows the speed of the mixing tool and thus the power input into the mix to be varied within wide limits

# Tailor-made mixing technology for every application

Mixer sizes from 1 liter to 12,000 liters capacity are available for applications at normal pressure and under vacuum.

The refractory industry mainly uses mixers with capacities of 500 to 1,500 liters. The experience gathered from projects completed all over the world can be drawn on to select the right mixer and to design the optimal mixing tools for the respective task.

Mixers of the R series with an inclined mixing pan have proven particularly successful for most mixing jobs. Mixers of the D series with horizontal mixing pan are used for selected applications or for replacing existing machines. Both mixer types are equally notable for their flexibility in adapting to different applications. EIRICH intensive mixers can also be equipped with additional features such as a heating system.

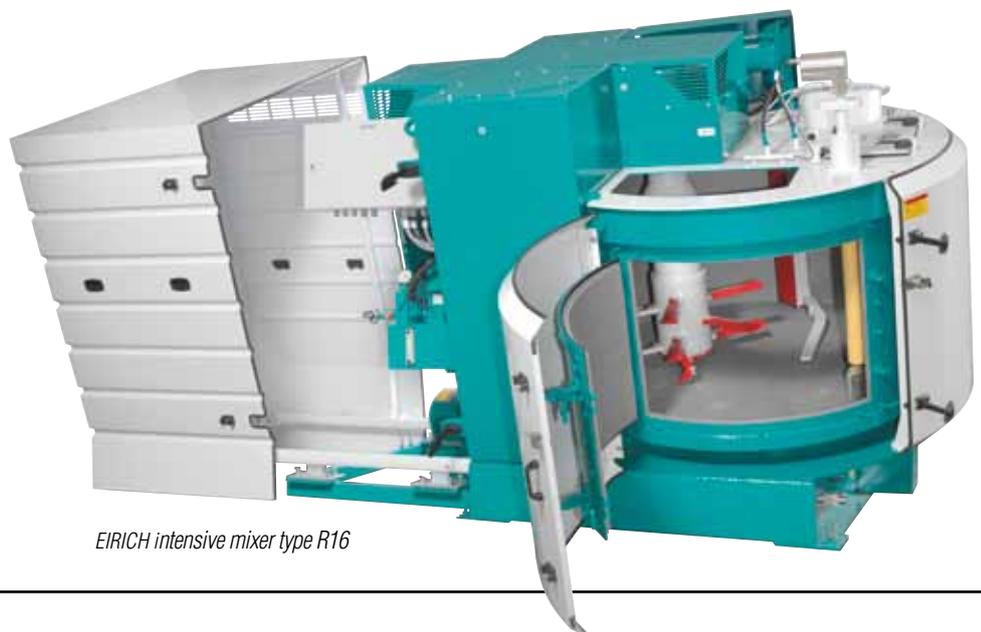
Versatility is assured by the possibility of combining various mixer components and features:

- direction of rotation of the mixing tool for counter-current or co-current material flow
- speed of rotation of the mixing tool
- geometry of the mixing tools such as star rotors, pin rotors, etc.
- mixing pan driven by a friction wheel or gear rim
- Mixing tool optionally driven by standard motor and V-belts, geared motor (both of them also frequency-controlled) or by energy-efficient synchronous motor with high torque
- mixing tools protected from wear by an armored coating or carbide plates
- mixing pan protected from wear by high-grade steel, stainless steel, rubber or plastic lining or ceramic tiles

EIRICH guarantees the reliable supply of spare parts for decades to come.



*EIRICH laboratory mixer R01*



*EIRICH intensive mixer type R16*



*EIRICH mixer type R  
with 1,500 liters  
effective volume*

*EIRICH mixer type D  
with 1,500 liters  
effective volume*



*2 EIRICH intensive  
mixers type R each  
with 250 liters  
effective volume*



*Preparation plant for refractory concrete with EIRICH intensive mixer type RV15 with a capacity of 750 liters*

# Preparation of solvent-based systems under ex-protection

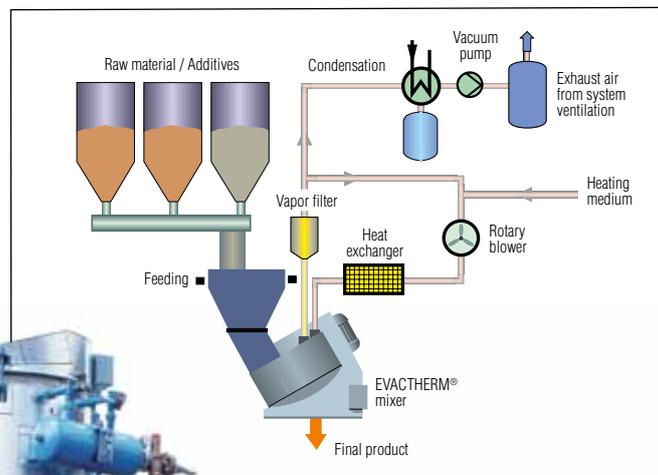
Resin bonded refractory products are often manufactured with solvents, which because of their inflammability and potential danger for man and environment require special process equipment.

The EVACTHERM® system – an EIRICH development – takes all the necessary precautions for the processing of solvents because it works in a closed circuit and can be operated under inert gas. The heart of this system is an EVACTHERM® mixer which combines in ideal fashion all the positive features of the EIRICH intensive mixer with those of vacuum technology.

Product characteristics can be selectively influenced within wide limits by controlled circuits of cold or hot nitrogen or solvent vapor.

According to requirements, EVACTHERM® systems can be used for the defined re-drying of solvent-wet compounds or for the production of compressible granules from slurries – something that is often impossible with other methods. Plants equipped with this technology have been operating for many years already and have successful tracked records in the preparation of, for example, bodies for high-performance ceramics and solvent-based mixes.

EVACTHERM® systems are available at the EIRICH test center in Hardheim for test purposes and for the development and optimization of products. Mixer capacities of 3 or 5 and 75 liters enable a reliable scale-up for the planned production machine.



*A complete EVACTHERM® system in modular design*



*Diagram of a typical EVACTHERM® drying system*

# Complete solutions from one source – the result of interface-free planning and implementation!

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

## Test centers

EIRICH test centers can be found on various continents. Experienced engineers and process technicians join forces with the user in optimizing specific process steps and devising a basis for the optimal performance of new applications with untried formulas.

## Engineering

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

## Systems engineering

The machines and equipment developed and built by EIRICH itself but also products from efficient and experienced partners are used to turn the engineering into reality.

These include:

- raw material handling
- feeding, weighing
- mixing, granulating
- finished product handling
- engineering (steel structure, building and system infrastructure)

## Control and process control

Standardized systems with hardware and software developed by EIRICH itself are used for the control of stand-alone machines and for the process control of complete preparation plants. The range of products and services covers new installations as well as the modernization or extension of existing machines and plants. All components are exactly configured, i.e. tailor-made, to the user's needs – from the conventional keyboard control system and special batch controllers with formula management.

## Control and process control systems from EIRICH ensure

- easy connectivity to existing systems
- high operational reliability and availability with optimal operating conditions of the machines and equipment
- easy formula management
- reliable inventory of the materials used
- future-proof process design

## Installation and commissioning

An experienced service team is available for installation and commissioning. Local partners assist us, and the customer's personnel are instructed in the course of the work.

## Training

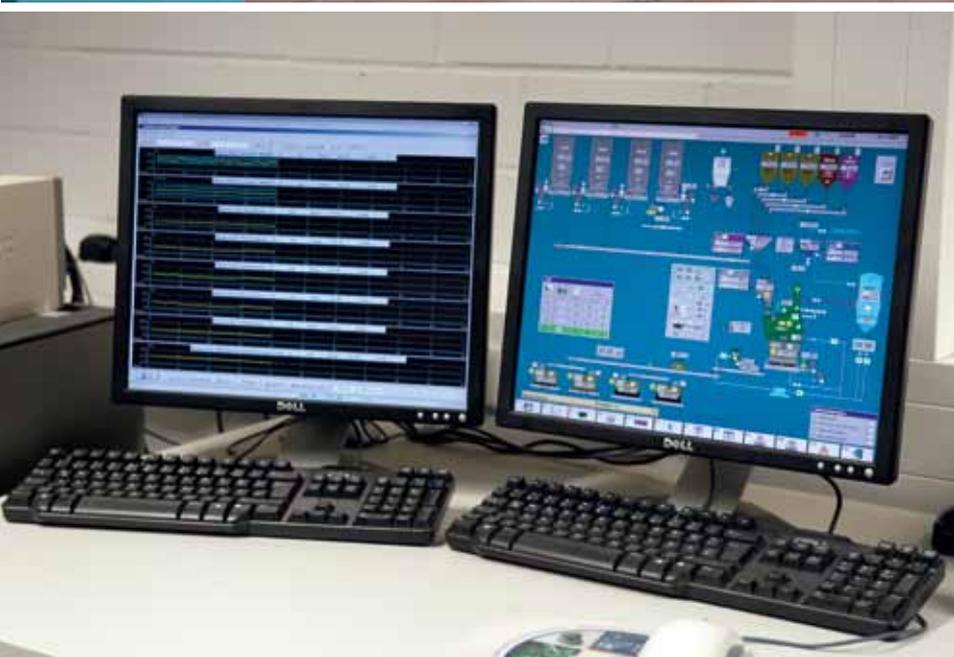
Training for your operating and maintenance team is provided by expert instructors to ensure that you get the most out of your investment over the long term. It includes instructions concerning the system's operation, safety regulations, process optimization, maintenance intervals and repair work.

## Customer service

EIRICH After Sales Service is your guarantee of expertise, high availability and comprehensive support. It includes the dependable delivery of original spare parts worldwide, prompt reaction to servicing needs, the fast repair of machines and system components, and expert advice if the process requirements should change. A particularly efficient option is remote diagnosis by data link (teleservice), which provides quick and cost-saving support if trouble occurs during operation. Software packages for condition monitoring and maintenance round off the service offering.

## Working with EIRICH has its advantages – use them!

*From the control system, batching system and single mixer to the complete system – everything from one source – from EIRICH*



## Industrial Mixing and Fine Grinding Technology

### Tradition and innovation since 1863

EIRICH stands worldwide for a comprehensive range of products and services in the field of preparation technology. Its particular focus is on mixing and fine grinding technology, with know-how developed over 150 years of close cooperation with industrial users, universities and research institutions.

Pursuing a corporate philosophy of operating internationally and thereby ensuring close proximity to every customer, the EIRICH Group has secured its place in all the key economic regions of the world.

The focus is on innovative technology for machinery and systems engineering designed to offer solutions for high-standard preparation tasks from a single source.

Applications and process technology with own test centers, a high vertical range of production and comprehensive after-sales service provide the ideal basis for the development of modern and economical processes for a multitude of industries.

**Building materials – Ceramics – Glass – Carbon paste – Battery paste  
Friction linings – Metallurgy – Foundries – Environmental protection**

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