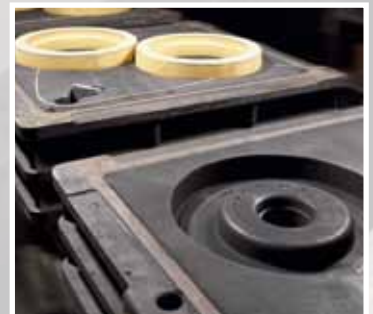
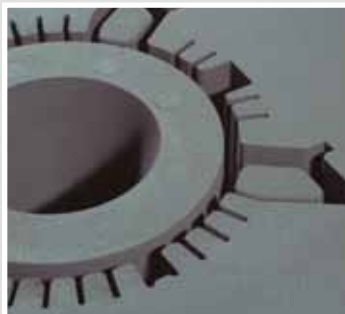


Machines & systems for molding sand preparation

- Reproducible sand quality
- Tailored solutions
- High cost-effectiveness



The Pioneer in Material Processing



EIRICH – partner for the foundry industry

Users in the foundry industry know that to get the most out of their state-of-the-art molding lines, the molding sand has to consistently meet very stringent quality criteria. The name EIRICH stands for top class quality.

EIRICH specializes in systems for processing bentonite-bonded molding sand, and for many years the company has maintained a close working relationship with foundries, moldmakers and research organizations. More than 1,500 EIRICH sand preparation systems worldwide process sand for gray iron, steel and aluminum casting lines from all major manufacturers, delivering leading-edge quality, throughput and efficiency.

EIRICH molding sand technology also leads the way in throughput performance

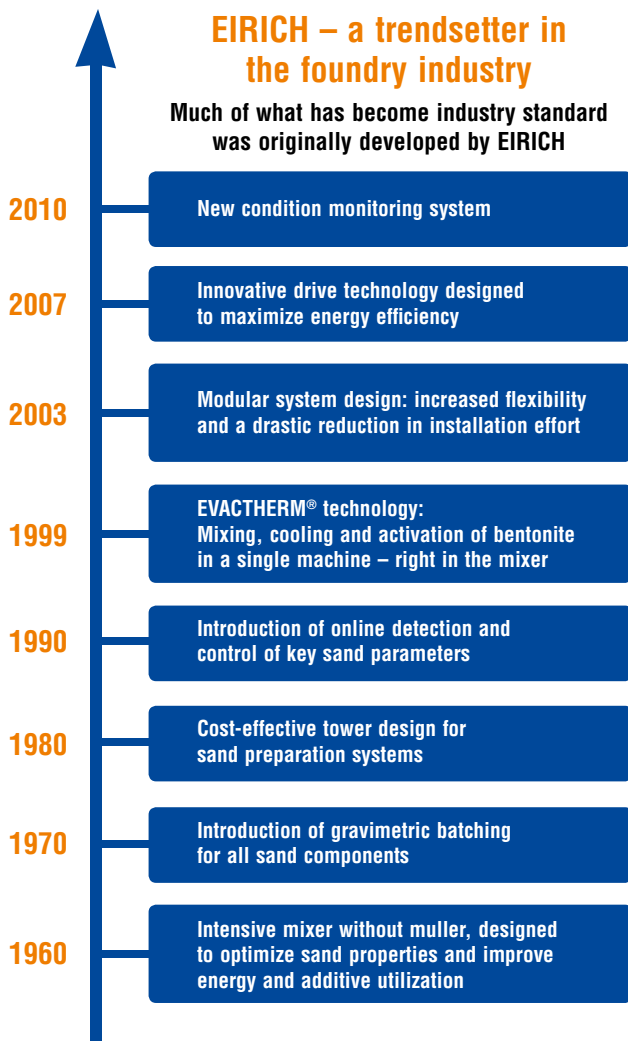
EIRICH has delivered a large number of conventional and EVACTHERM® systems which can process up to 500 metric tons of finished sand per hour, demonstrating the company's worldwide leadership in the molding sand preparation market. EIRICH has in-depth expertise, extensive experience and a thorough understanding of each step in the sand processing loop, making the company a partner which foundries can depend on for their new construction, retrofit and modernization projects.

The EIRICH portfolio – everything from a single source

- Molding sand mixers including a complete range of peripheral equipment
- Conventional sand processing systems and EVACTHERM® technology for any throughput capacity
- Automation and control systems developed and produced in house
- Installation and commissioning
- Training for operating and maintenance staff
- Tailored service solutions ranging from the dependable supply of genuine spare parts to condition monitoring and remote service systems
- Technology for eco-friendly handling and safe transportation of foundry dust

EIRICH – a trendsetter in the foundry industry

Much of what has become industry standard was originally developed by EIRICH





- Georg Fischer
- Daimler AG
- Buderus Guss
- BBT Thermotechnik
- Ohm & Häner
- Scheeff
- Trompeter Guss
- Ortrander Eisenhütte
- Karlshütte
- Fritz Winter
- MAT Foundries Europe
- Heunisch Guss
- Brano A.S.
- Uralwagon Zavod
- Kamaz
- Fagor Ederlan
- Componenta Gruppe
- Atik Metal
- Ferro Döküm
- Fonderie de Niederbronn
- Kuhn
- Weslin Autóipari
- Atlantis Diesel
- FAW Foundry
- Weichai Power
- China Metal
- New Wai San
- Chery Automotive
- Dongfeng Motor
- Hangzhou Automotive
- Lioho
- Hyundai
- Sakthi Automotive
- Toyota
- Nissan
- Wescast
- Cifunsa
- Rassini Frenos
- Tupy Fundições

EIRICH molding sand quality ...

State-of-the-art compacting technology for sand molds can make a significant contribution to casting efficiency provided that the molding sand consistently meets stringent quality criteria.

The essential quality criteria for molding sand are:

- Exact compliance with compactability specifications
- Excellent flowability
- Uniform strength
- Optimal gas permeability

The current tendency to increase the number of return cycles during the production process results in a higher thermal load factor, creating an additional set of criteria.

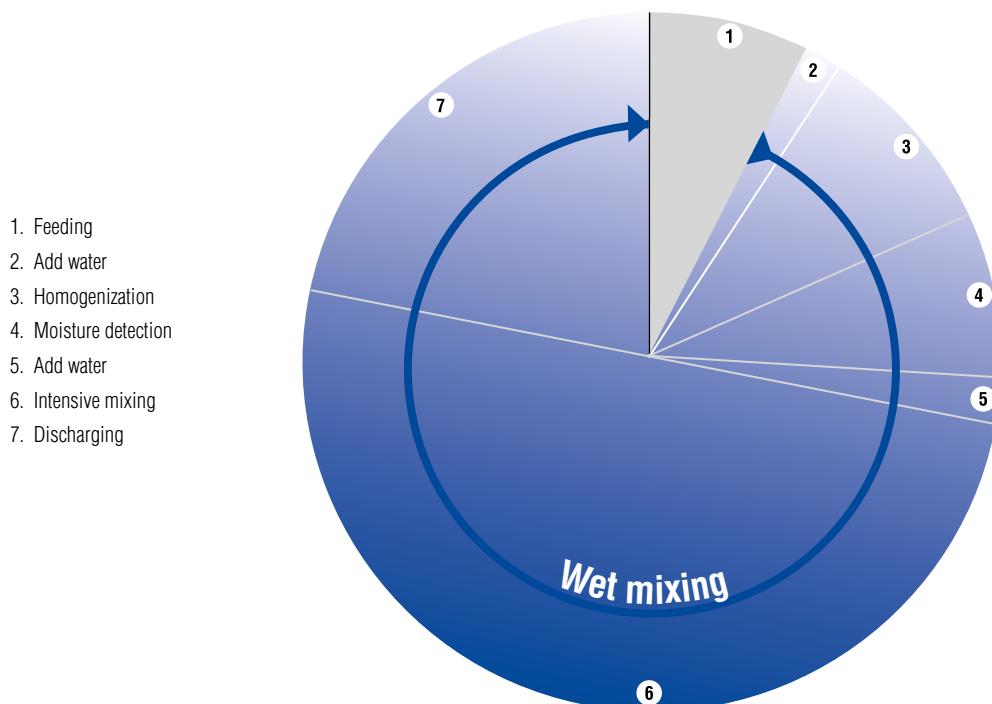
The EIRICH mixing system is ideally suited to meet this requirements profile:

- Perfect homogenization of return sand, new sand and additives
- Fast, complete distribution of the water which is added to the mix
- Sufficient duration of the wet mixing phases
- The bentonite is completely activated and forms a uniform coating on the grains of sand

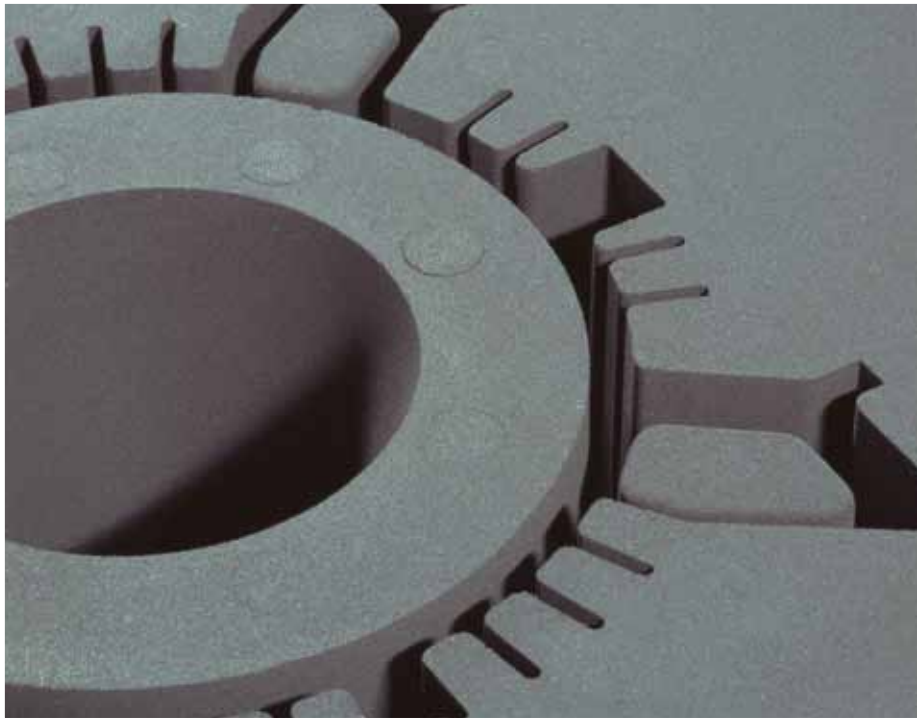
The EIRICH mixing system with its unique advantages produces top quality sand with excellent reproducibility.

The duration of the wet mixing process has a crucial influence on sand quality.

Example: Cycle time at 26 batches/hour. Wet mixing time approx. 80 % of total time.



... when only the best is good enough



The advantages of the truly unique EIRICH mixing system

A molding sand mixer based on the unique EIRICH mixing process is the core element in any sand preparation process.

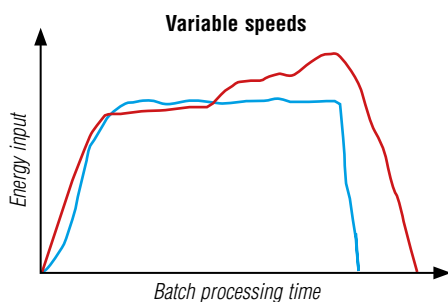
Three components define the EIRICH molding sand mixer:

- The **rotating mixing pan** continually moves the mix into the path of the revolving mixing tool. Because material transport and mixing action are separate, maximum energy can be applied to the molding sand.
- The extremely low-wearing **rotating mixing tools** ensure the ideal mix intensity and energy transfer.
- The **multi-purpose tool** acts as a bottom / wall scraper, providing additional agitation action. It prevents caking in the mixing pan and facilitates discharge when the mixing cycle is complete.

No other mixing system can offer a similar combination of features. The EIRICH solution generates highly effective mixing action and produces the best possible molding sand, batch after batch.

EIRICH molding sand mixers are service-friendly, low-wearing and energy-efficient:

- Large openings in the mixing pan provide easy maintenance access
- All of the major assemblies (drives and gear units) are located outside the mixing pan
- Wearing parts are easy to replace
- A fully loaded mixer can easily be restarted
- Using a frequency inverter for motor control permits the energy input to be adjusted variably over the whole mixing cycle and thus batch processing times to be further shortened, molding sand properties to be influenced specifically and it also offers the potential for energy savings.



A specific motor control (blue line) ensures a uniform nominal load, faster discharge and less energy consumption

*Material flow in the EIRICH intensive mixer
Rotating mixing tool and bottom/wall scraper
Large maintenance doors provide easy access to the machine interior*





Stationary multi-purpose wall-bottom scraper

Durable tool designed for easy maintenance

Counter-flowing currents of material with a high velocity differential

Rotating mixing pan



A full range of molding sand mixers

Conventional sand preparation

Hourly output approx. t/h ²⁾	Hourly output m ³ /h ¹⁾	Batch size/ liters	Drive power (kW) rotor/mixing pan	Type of mixer
1.65-1.75	1.95	75	5.5 / 1.5	R08
3.3-3.5	3.9	150	11 / 3	R09
5.5-5.8	6.5	250	22 / 5.5	R12
8.8-9.3	10.4	400	37 / 7.5	RV12
13.3-14	15.6	600	37 / 7.5	R16
20-21	23.4	900	45 / 9.2	RV16
24.6-26	29	1,125	75 / 15	R19
33-35	39	1,500	90 / 18.5	RV19
50-53	58.5	2,250	110 / 2x15	R24
66-70	78	3,000	132 / 2x22	RV24
88-94	104	4,000	160 / 30	R28-41
110-117	130	5,000	200 / 2x22	R28-51
133-140	156	6,000	200+160 / 2x22	R33-61
155-164	182	7,000	250+160 / 2x30	R33-71

¹⁾ 26 batches/h

²⁾ prepared sand bulk density 0.85-0.9 t/m³

EVACTHERM[®] sand preparation

Hourly output approx. t/h ⁴⁾	Hourly output m ³ /h ³⁾	Batch size/ liters	Drive power (kW) rotor/mixing pan	Type of mixer
7-7.5	8.4	350	45 / 7.5	RV11VAC
15-16	18	750	55 / 9.2	RV15VAC
31-32.5	36	1,500	90 / 22	RV19VAC
61-65	72	3,000	160 / 2x22	RV23VAC
102-108	120	5,000	2x160 / 2x22	R32VAC
143-151	168	7,000	2x200 / 2x30	RV32VAC

³⁾ 24 batches/h

⁴⁾ prepared sand bulk density 0.85-0.9 t/m³

*EIRICH molding sand mixer
for aluminum casting line*



Molding sand preparation systems – complete solutions from EIRICH

EIRICH has more than seventy years of systems engineering experience.

The portfolio covers the entire process chain including material handling, pre-treatment, return sand storage, sand preparation and transfer to the molding line. EIRICH is the partner of choice when you are looking for a solution tailored to your needs regardless of whether you are putting in a completely new system or are modernizing / optimizing your existing equipment.

The EIRICH portfolio covers all aspects of systems engineering: Consultancy, engineering, installation, commissioning and service – the key basic advantages of this approach are a reduction in organizational effort, assemblies that are well matched and the possibility of obtaining an availability guarantee for the entire system. EIRICH takes responsibility for system sizing, engineering and project execution in close consultation with the mold makers.

EIRICH – the right partner for every piece of equipment in a sand preparation system:

- Molding sand mixer – the core element
- Scale cluster for return sand, new sand, additives and water
- Control modules for optimal sand quality management
- Moisture probe for moisture level correction
- QualiMaster AT1 tester for online sand quality verification and control
- Table feeder for demand-driven material flow downstream from the mixer
- Material handling and storage equipment
- Return sand conditioning equipment (screens, cooling, ferrous and non-ferrous material removal)
- Dust extraction filters
- Steelwork / building work

Scale cluster with water scale
Control modules
Moisture probe
QualiMaster AT1 sand tester





Complete system with mixer and table feeder



Modular design in systems engineering: The fast track to production

Very early on, EIRICH recognized that modular design was the best way forward in sand preparation system design, and it is fully committed to that approach.

All of the subsystems are mounted, assembled and tested on individual platforms. The system can be quickly installed at the customer site, avoiding extensive downtime and interruption while installation work is in progress. The cabling and pipe-work is pre-installed on all of the units which can be quickly attached to each other using plug-in connectors and fittings. The control unit switch gear is mounted on the mixer platform. The system can be operated from a different location in the foundry.

Version A

The mixer, control unit switchgear and scales are delivered on platforms. The rest of the equipment and the steelwork are provided locally.

Version B

The entire sand preparation system is mounted on individual platforms. EIRICH or the customer can provide the supporting steelwork. There is no limit to mixer size.

Version C

The modules are supplied complete with front enclosure. All of the units including the silos, etc. are installed in containers. The container walls act as the front enclosure. The walls can be made of insulated sandwich or panel elements. The customer can select the color.





C

The EVACTHERM® process: An excellent solution that delivers outstanding efficiency and quality

What you want is the best possible sand quality. In practice, variation right at the start of the process often makes this difficult to achieve. Material variability, e.g. differences in temperature distribution or the iron/sand ratio of return sand, is one factor that makes things more difficult, and ambient climatic conditions (air temperature and relative humidity) also vary.

EIRICH has developed a truly unique process. Like no other, EVACTHERM® guarantees consistent, reproducible molding sand quality despite the variability which is present at the start of the process.

Originally developed as a cost-effective cooling solution, the process has been specifically adapted to molding sand preparation applications. Today, it is the solution of choice wherever there is a need for outstanding efficiency and quality.

What sets the EVACTHERM® process apart:

- It exploits the advantages of molding sand preparation under vacuum to the maximum.
- It replaces three process steps (cooling, mixing and bentonite activation) with a single step which takes place inside the EVACTHERM® mixer. Cooling and bentonite activation are part of the mixing process.

Users of EVACTHERM® systems worldwide can confirm that the system offers the following advantages:

- A significant improvement in practically all of the molding sand quality parameters
- Exact adherence to molding sand quality criteria regardless of ambient air temperature and relative humidity
- Drastic reduction in the volume of exhaust air, resulting in reduced accumulation of filter dust and lower disposal costs
- Substantially lower additive consumption as a result of moisture reduction and less saltification
- Lower emissions, reduced environmental impact of the molding sand preparation process
- Improved surface properties of the castings, reduced conditioning effort
- Reduced reject rate

The EVACTHERM® process is particularly efficient when sand throughput rates are high and multiple mixers are used, because the mixers can share the peripheral cooling equipment.

Allow us to put together a detailed efficiency assessment which shows how you can cut additive and energy consumption and reduce dust extraction air volumes.

*EVACTHERM® molding sand
mixer for aluminum casting line*

The EVACTHERM® principle

The EVACTHERM® principle exploits the fact that the boiling point of water depends on ambient pressure:

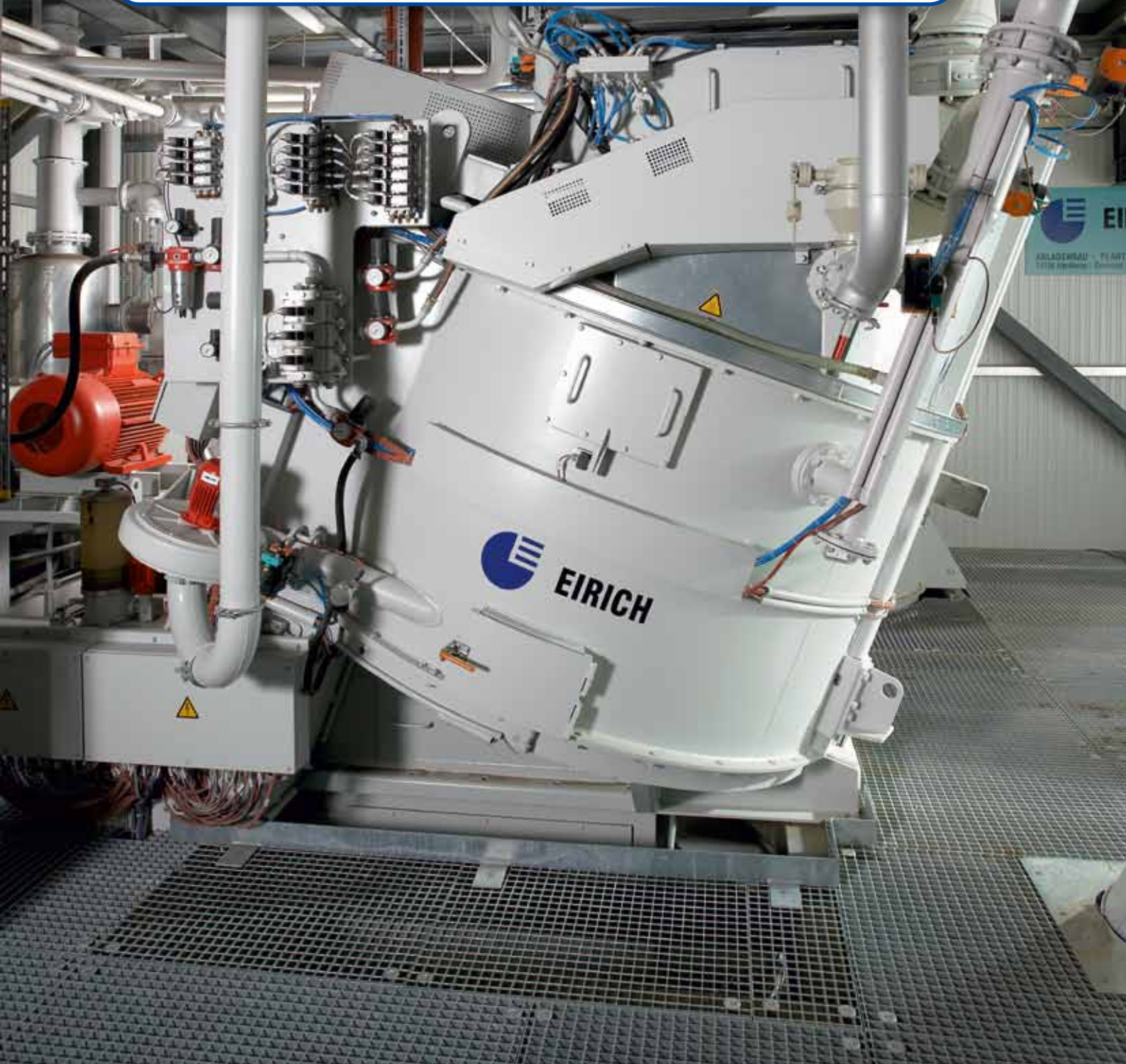
- Water boils at 100°C under atmospheric conditions
- At 70 mbar ambient pressure, the boiling point is around 40°C

The temperature and moisture of the sand can be fixed exactly if processing takes place under vacuum and the pressure inside the mixer is accurately controlled. With vacuum cooling, water vaporization extracts heat during the mixing process. The intensive mixer becomes a mixer-cooler in a single machine.

The system automatically determines how much water to add based on the following criteria:

- The return sand is cooled to a final temperature of around 40°C.
- The moisture level of the mix is increased until the desired level for the prepared sand is reached.

The water that vaporizes while the return sand is cooling is condensed and used for the next batch. A heat exchanger removes heat from the process flow.



Automation and control systems – assured quality, increased productivity

Faster, more flexibility, greater efficiency – standing still is not an option in the foundry industry.

In the competitive global marketplace, companies need to stay one step ahead. You need more than state-of-the-art production facilities and a high level of automation to succeed in today's environment. To ensure maximum efficiency, every step along the value-add chain must play its part in a well-coordinated process flow.

To meet this need, EIRICH has developed a seamless data integration strategy which integrates all production and engineering flows at all levels into a networked environment. A full set of process, product and quality information is available anywhere anytime, resulting in optimized process flows, enhanced quality levels and improved logistics performance.

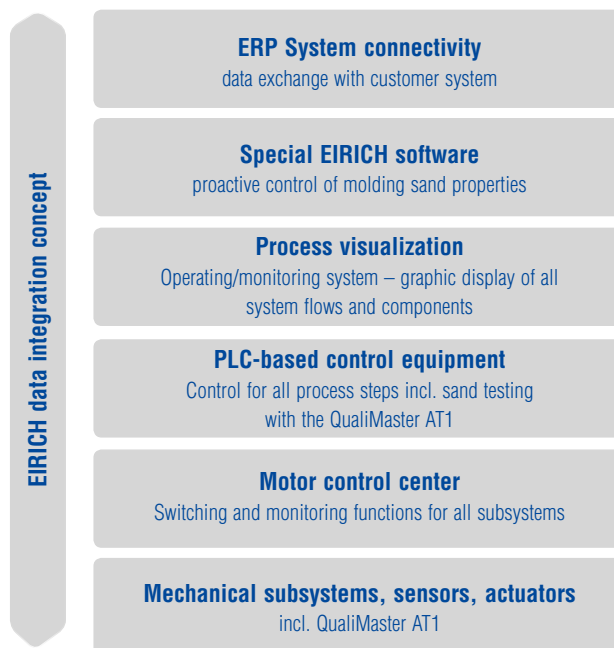
Particularly the parameters which influence the quality of the prepared sand and consequently the quality of your castings must be closely monitored and controlled. Compactability and shear strength are at the top of the list. Proactive process management with the aid of the EIRICH control modules keeps the actual state of these parameters within tight tolerances.

The main features of the EIRICH control strategy:

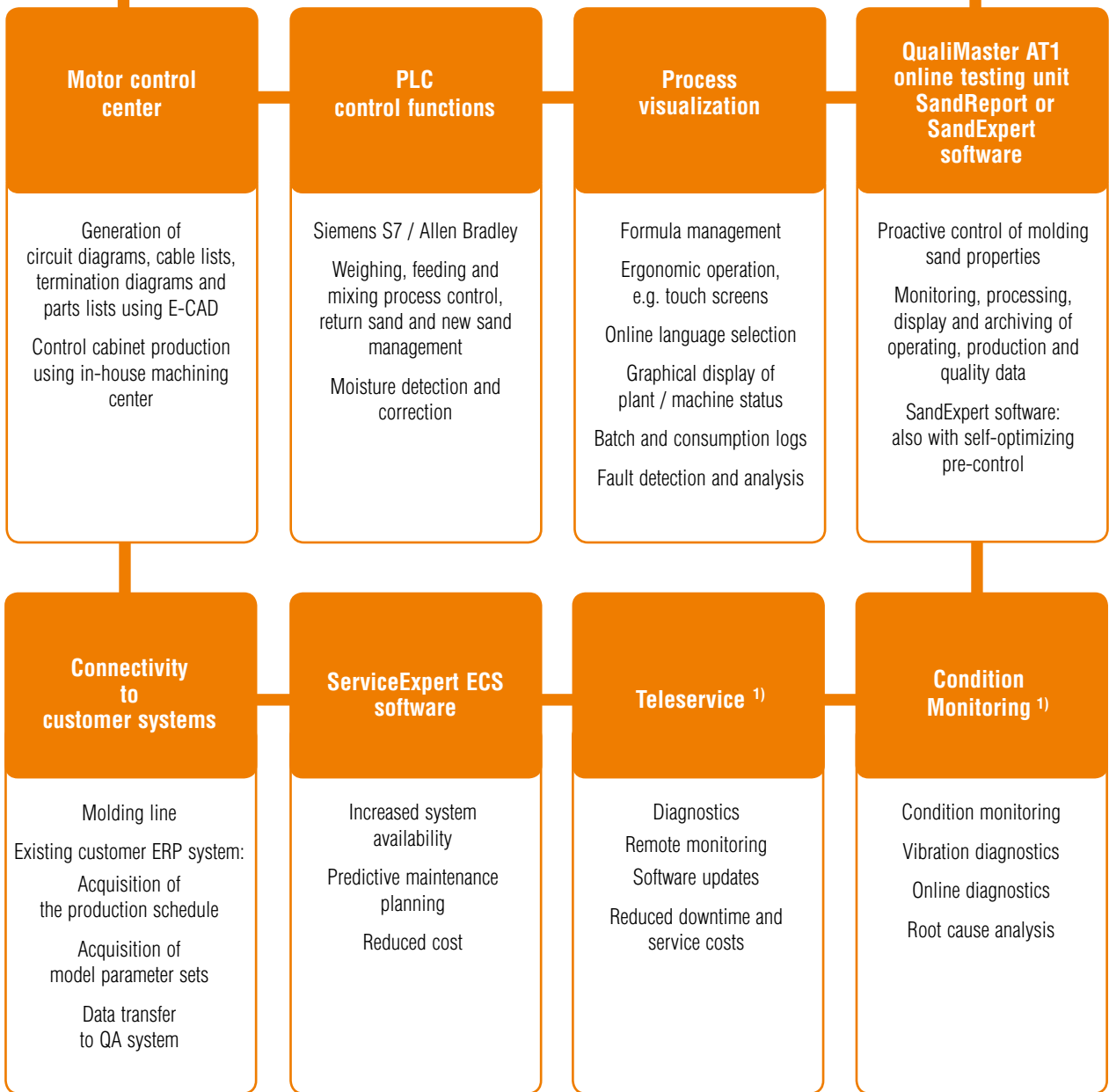
- Proactive management and control of molding sand properties, ideally using the QualiMaster AT1 online sand tester in combination with SandReport and SandExpert software. SandExpert features an additional self-optimizing pre-control function. Recommendations for the addition of water and additives are generated based on a mold parameter file.
- Monitoring of all key parameters and actual values using SandReport and SandExpert data acquisition and display functions; deviations and the need for corrective action are immediately flagged.
- Continuous logging and archiving of all relevant operating, production and quality data.

The full set of EIRICH control modules supports optimal management of sand quality and provides the appropriate process documentation. The end result is maximum system productivity and a substantial improvement in casting quality.

The EIRICH control solution offers seamless integration at all stages of the process:



Control modules for the foundry industry



¹⁾ ideally in combination with a service agreement



Computer-based instrumentation and control

Process visualization – detailed display of system states and process data

QualiMaster AT1 tester to verify sand quality

EIRICH services – maximum confidence across the board

Consulting

The highly experienced EIRICH project team is available to clarify any issues relating to molding sand preparation for your new or existing system. After you share your ideas, needs and preferences with us, we sit down with you to define the performance profile for the planned system and look at some of the possible options.

Basic and detailed engineering

Based on all of the available information and the defined performance profile, we submit a specific project proposal to you. Keeping the number of interfaces to a minimum enhances project efficiency. You also have the assurance that what we deliver complies with a quality standard which is recognized worldwide.

Installation and commissioning

A team of highly trained specialists is available to carry out the installation including all of the preparation work. Local partners assist us, and we also provide direction to the customer team which is involved in the project.

Training

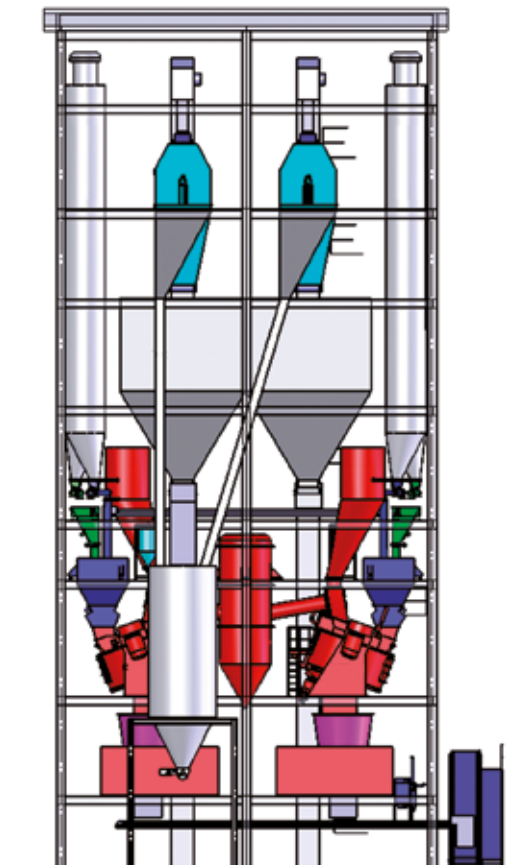
Training for your operating and maintenance team provided by expert instructors ensures that you get the most out of your investment over the long term. Training can be held at EIRICH and / or on-site during the installation and commissioning phase. Besides a basic technical introduction, the training agenda includes system operation, safety information, process optimization, maintenance intervals and repair activities.

After Sales 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. Remote diagnosis via a data link is particularly efficient, guaranteeing fast, low-cost support when problems occur. We can also provide Condition Monitoring and maintenance software packages.

Worldwide service network

We have a presence wherever our customers need us. We provide fast, highly effective on-site service from a network of worldwide locations.



*Diagram of a dual
EVACTHERM® system
with shared vacuum
peripherals*

*Dual EVACTHERM® system with
shared vacuum peripherals*



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 plant 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 bodies – Battery pastes
Friction linings – Metallurgy – Foundries – Environmental protection**

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