Mixing Technology

Leaflet no. MR 1365-11-en

EIRICH Intensive Mixer Type R

- economic efficiency
- reliability
- low maintenance

The Pioneer in Material Processing

EIRICH

agglomerating · batching · coating · cooling · conveying · deaerating · defibrating · disagglomerating · dispersing · dissolving · drying · emulsifying · evacuating · fine grinding granulating · heating · impregnating · mixing · moistening · pelletizing · plasticizing · reacting · suspending · stripping · slurrying · waterproofing · weighing · measuring · controlling

The advantages of an innovative system

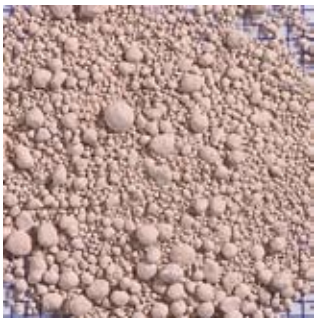
EIRICH intensive mixers of the Type R Series were developed for the most diverse jobs in the processing of raw materials, mechanical mixtures and compounds. Variable setting of machine components and the energy range ensures a high degree of efficiency.

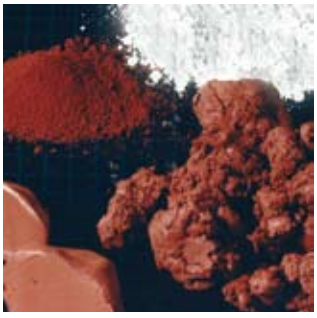
Three components determine the characteristics of these mixers:

1. **An inclined, rotating mixing pan**
2. **A rotating mixing tool**
3. **An adjustable multi-purpose wall-bottom scraper**

The advantages resulting for the user are considerable:

- **Optimum homogenization of the process material**
- **Shortest mixing times**
- **Little wear**
- **Low-maintenance design**
- **Excellent, constant quality of process material (permanently)**
- **Continuous or batchwise mode of operation**



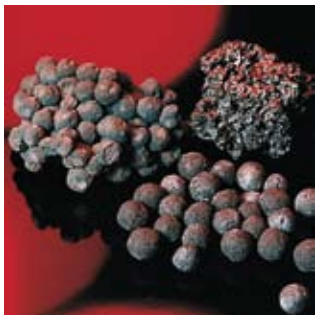


The spectrum of applications covered by EIRICH intensive mixers is as varied as the range of industrial processing operations in the fields of production and environmental protection.

Conventional EIRICH mixers are used for mixing under atmospheric pressure whereas EVACTHERM® mixers are used for mixing under vacuum and/ or for combining complex preparation processes. Processing steps can be performed either singly or in combinations in one machine.

They include:

mixing, reacting, dispersing, dissolving, slurrying, plasticizing, deaerating, fiberizing, solubilizing, agglomerating, disagglomerating, pelletizing, granulating, kneading, moistening, drying, heating, cooling, stripping, impregnating, coating, waterproofing.



The mixer configuration of the future

EIRICH Type R intensive mixers can be set up for either counter-current or cross-current operation. This design provides optimum performance in both batch and continuous operation, using state-of-the-art processing technology to meet today's special production requirements.

The Type R mixer's excellent processing efficiency is guaranteed by

- a rotating mixing pan that continually transports the material to the rotating mixing tool, inducing counter-flowing currents of material with a high velocity differential.
- an inclined rotating mixing pan, which together with a stationary multi-purpose wall-bottom scraper produces high vertical flow rates.
- a multi-purpose wall-bottom scraper designed to prevent residue accumulations on the walls and bottom surface of the mixing pan and to accelerate material discharge at the end of the mixing cycle.

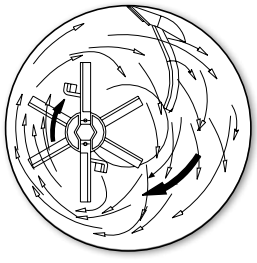


Fig. 4.1:
Flow pattern of the cross-current principle

Fig. 4.2:
Flow pattern of the counter-current principle

Fig. 4.3: Current of material

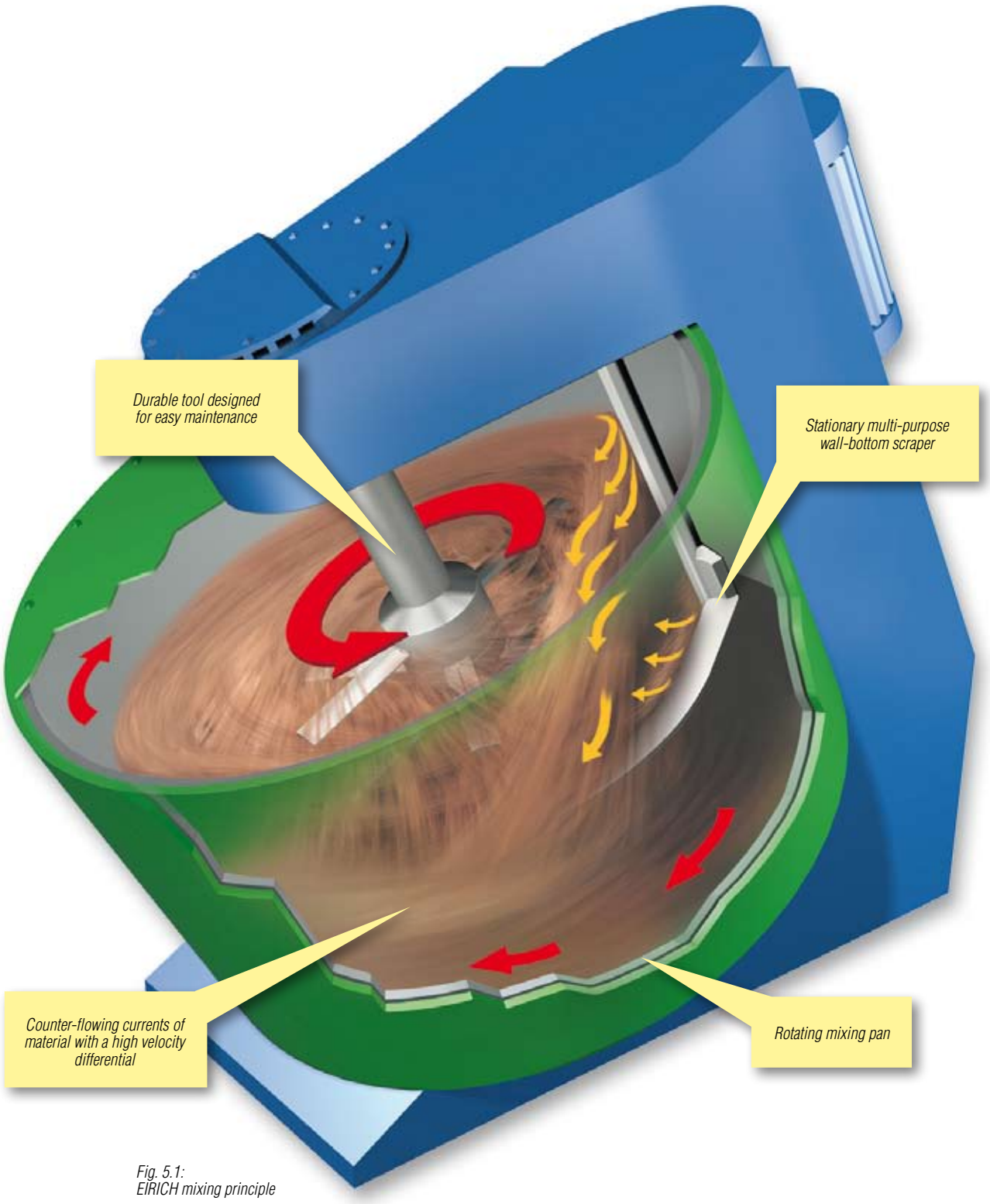


Fig. 5.1:
EIRICH mixing principle

The design features

With EIRICH Type R intensive mixers it is possible to work under atmospheric pressure and under vacuum over a wide range of temperature. The mixers are subject to minimum wear and they require minimum maintenance.

- The rotating mixing pan is enclosed by a static case.
- The seals of the moving parts do not come into contact with the process material.
- The mixing chamber is easy to reach. Access to the pan varies according to its size.

EVACTHERM®

Mixers in vacuum-tight design for the combination of several process steps.

At the moment, the series comprises mixers with load capacities ranging from 1-5 liters (e. g. for the laboratory) to 7,000 litres.

Drives

Power requirement, speed and the type of power transmission are chosen in accordance with the particular application:

- Friction wheels or gear rim for the mixing pan.
- Standard motor with V-belt, and/ or gear unit or geared motor for the rotating mixing tool.

Motors

Matched to the local conditions.

Mixing pan

Bottom, cover and side walls with smooth finished surfaces for easy cleaning.

Mixing tool

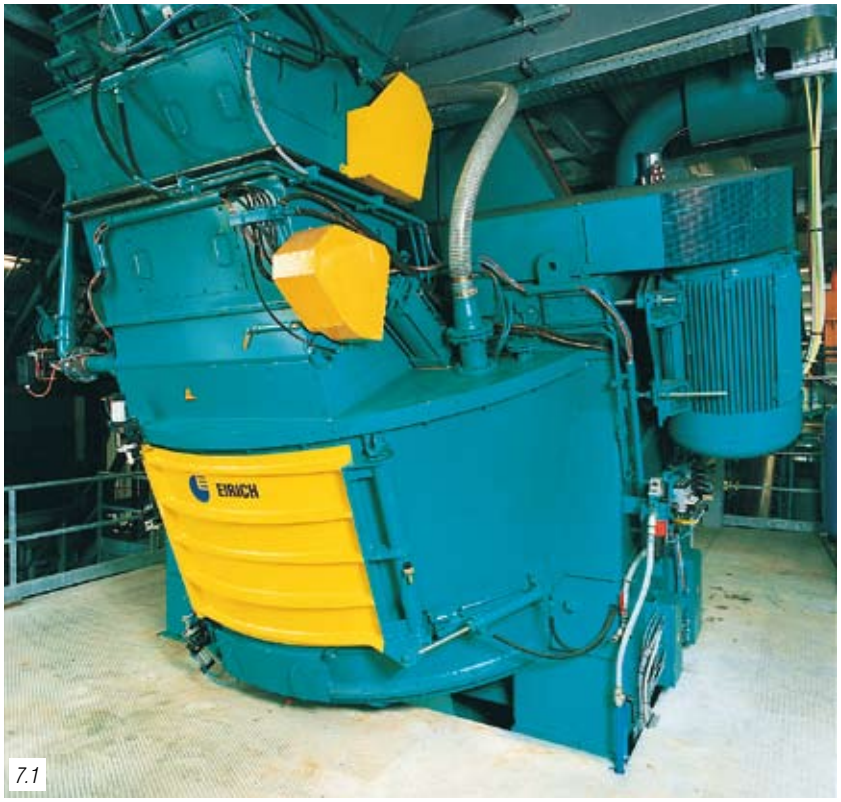
Rugged and minimum-maintenance design. Easy replacement of mixing blades. The shape and the number of mixing blades are adapted to the process material.

Feeding and discharge

Individually designed according to the product parameters and the conditions of installation.

Cover and mixing tools are raised by motors. The mixing pan can be removed.	**R01** **R02 R02E RV02E R02VAC**
Cover and mixing tool are swiveled up and open hydraulically	**R05T** **R08W R08VAC** **R09W R09T** **R12W RV12W**
The mixing pan can be tilted	**R05T R09T**
Access through large inspection doors	**R08 R09 RV11VAC R12 RV12** **R15 RV15 RV15VAC** **R16 RV16** **R19 RV19 RV19VAC RV23VAC** **R24 RV24 RV29VAC** **RV32 RV32VAC**

Fig. 7.1: EVACTHERM® mixer RV32VAC
Fig. 7.2: Cross section of an EVACTHERM® mixer
Fig. 7.3: Mixer type R12 with maintenance hood on guide rail
Fig. 7.4: Quick-acting closure
Fig. 7.5: Friction wheel drive
Fig. 7.6: Easy access through large inspection doors
Fig. 7.7: Mixer type R02VAC



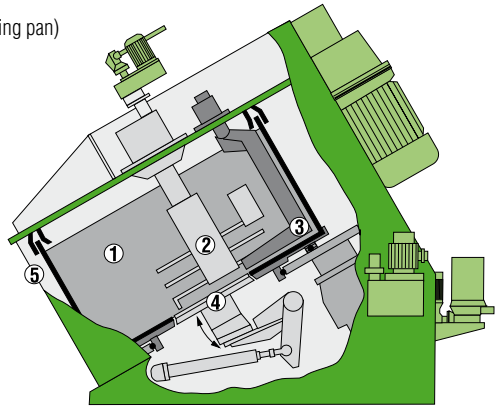
7.1

7.4

7.5

7.6

1 = mixing chamber (rotating mixing pan)
2 = mixing tool
3 = multi-purpose tool
4 = discharge opening
5 = stationary, vacuum-tight case



7.2

7.3

7.7

The range of high-performance types

Fig. 8.1:
R01 with raised mixing tool

Fig. 8.2:
R09T with raised mixing tool

Fig. 8.3:
R12 with open maintenance hood

Type[1]	Capacity [2]		Working principle		Operating modes	
	liters	kg max.	batch	continuous	standard atmosphere	under vacuum
R01 [3] [7]	5 [8]	10	■		■	
R02 [3] [7]	3-5	8	■		■	
R02E [3] [7]	3-5	10	■		■	
RV02E [3] [7]	8-10	12	■		■	
R02VAC [3]	3-5	8	■		■	■
R05T [4] [5] [7]	40	65	■		■	
R08 [7]	75	120	■	■	■	
R08W [5]	75	120	■		■	
R08VAC [5]	75	120	■		■	■
R09 [7]	150	240	■	■	■	
R09W [5]	150	240	■		■	
R09T [4] [5] [7]	150	240	■		■	
RV11VAC	375	600	■		■	■
R12 [6]	250	400	■	■	■	
RV12 [6]	400	650	■	■	■	
R12W [5] [6]	250	400	■		■	
RV12W [5]	400	650	■		■	
R15 [7]	500	800	■	■	■	
RV15 [7]	750	1200	■	■	■	
RV15VAC	750	1200	■		■	■
R16	600	960	■	■	■	
RV16	900	1440	■	■	■	
R19 [7]	1125	1800	■	■	■	
RV19 [7]	1500	2400	■	■	■	
RV19VAC	1500	2400	■		■	■
RV23VAC	3000	4800	■		■	■
R24 [7]	2250	3600	■	■	■	
RV24 [7]	3000	4800	■	■	■	
RV29VAC	5250	8400	■		■	■
RV32	7000	11200	■	■	■	
RV32VAC	7000	11200	■		■	■

1) All types can be designed to operate at temperatures up to 170 °C. Higher temperatures of individual mix components are possible during addition.

2) Product-specific

3) Pan can be removed

4) Mixing pan can be tilted

5) Cover and tool can be raised by motor

6) Configurable with induction heating up to 250 °C

7) Induction heating upon request

8) Capacity of 1 liter upon request

Individual accessories for specific

You can also select from among a range of proven supplementary components for your system. These accessories let you optimize your technology with special machine components and extensive automation.

Protection against wear

The materials and coatings used to manufacture those components that come into contact with abrasive substances are specifcally selected for each individual application.

The standard EIRICH range lets you choose from among a number of proven materials for inhibiting wear:

- High quality steels as base material
- Bonded rubber seals and special synthetics
- Seals made of PTFE, Viton, etc.
- Armor coatings
- Hard metal plating
- Stainless steel
- Non-ferrous metals
- Ceramic tiles

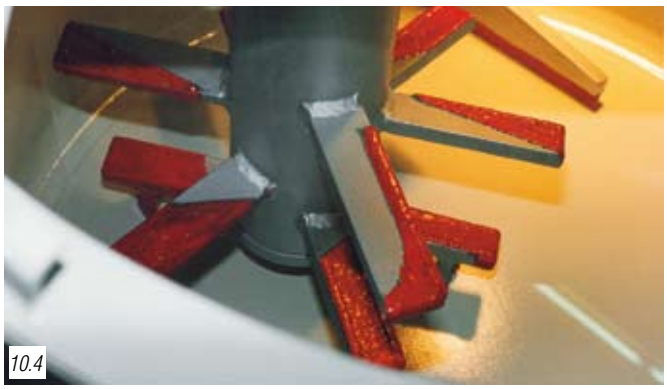


Fig. 10.1: Carbide tipped mixing blades
Fig. 10.2: Ceramic tile lining on all surfaces
Fig. 10.3: Mixing pan with rubber covering
Fig. 10.4: Mixing blades with armoring

applications

11.1

11.2

11.3

Automation

Open and closed-loop control is based on reliable systems for monitoring the parameters of mix quality and machine technology. You can benefit from the experience that EIRICH has gathered in designing countless solutions for special applications - experience that pays off in the form of thoroughly reliable systems.

- Level monitoring based on ultrasonic sensors, motor performance, electro-mechanical sensors and force monitors
- Temperature sensors
- Moisture sensors
- Residual water extraction systems
- Mixing pan cleaning equipment (dry and wet)
- Discharge aids, speed monitors for the pan and the mixing tool
- Central lubrication system
- Tooth flanks spray unit

Fig. 11.1: Retractable moisture sensor
Fig. 11.2: Automatic central lubrication
Fig. 11.3: Wet cleaning

Customized peripherals for every mixer

Special systems are also available for incorporating the EIRICH intensive mixer into the larger production process. These systems are precisely matched to machine size in order to provide optimum performance and ensure complete utilization of the mixer's full potential.

- Formulas must be strictly observed if product quality is to be maintained

This means that all of the components have to be added in precisely the right sequence and quantities.

- The product should display maximum consistency when it leaves the mixing pan on its way to subsequent processing operations

EIRICH offers a complete range of products for storing, transporting, weighing, metering and controlling the entire process.

- Storage containers for granular substances or for fluids
- Conveyors based on belt, screw, and pneumatic technology, also skip hoists
- Electromechanical scales
- Feeding units featuring electropneumatic control systems
- Measuring devices, open and closed-loop control and process data technology, including self-regulating CIM-compatible systems

Fig. 12.1:
Building and silos of a plant for adhesive mortar

Fig. 13.1: Scale assembly
Fig. 13.2: Additive storage and feeding
Fig. 13.3: Mixer with infeed by elevator
Fig. 13.4: Control room with CAQ system

Investment without risk

Fig. 14.1: Material analysis at the EIRICH Test Center

Fig. 14.2: Mixing reactor Type R08VAC in the pilot plant, shown with the cover and mixing tools raised

Machinery and equipment are available to test actual material response characteristics under a wide range of processing conditions. The effective capacities are designed for accurate simulation to ensure trouble-free full-scale operation. We can also provide units for materials that require explosion protection or need to be processed under vacuum.

A very special feature: We can supply a fully automated control system capable of maintaining optimum process conditions – automatically. The system can also record the trials for graphic display. These features reduce both the effort and the risk involved in designing your production facilities.

From advice to production
Everything from one source

EIRICH offers you a comprehensive range of services. These start with the initial consultations and trials, and extend to include system design, measurement and control technology, transport, assembly and training. We can even help you when you start production. Our Customer Service ensures reliable access to spare parts, around the globe. Modern, computer-assisted procedures help us find the most economical solution for you.

Fig. 15.1: Complete plant for concrete

Fig. 15.2: Complate plant for dry mortar

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 145 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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