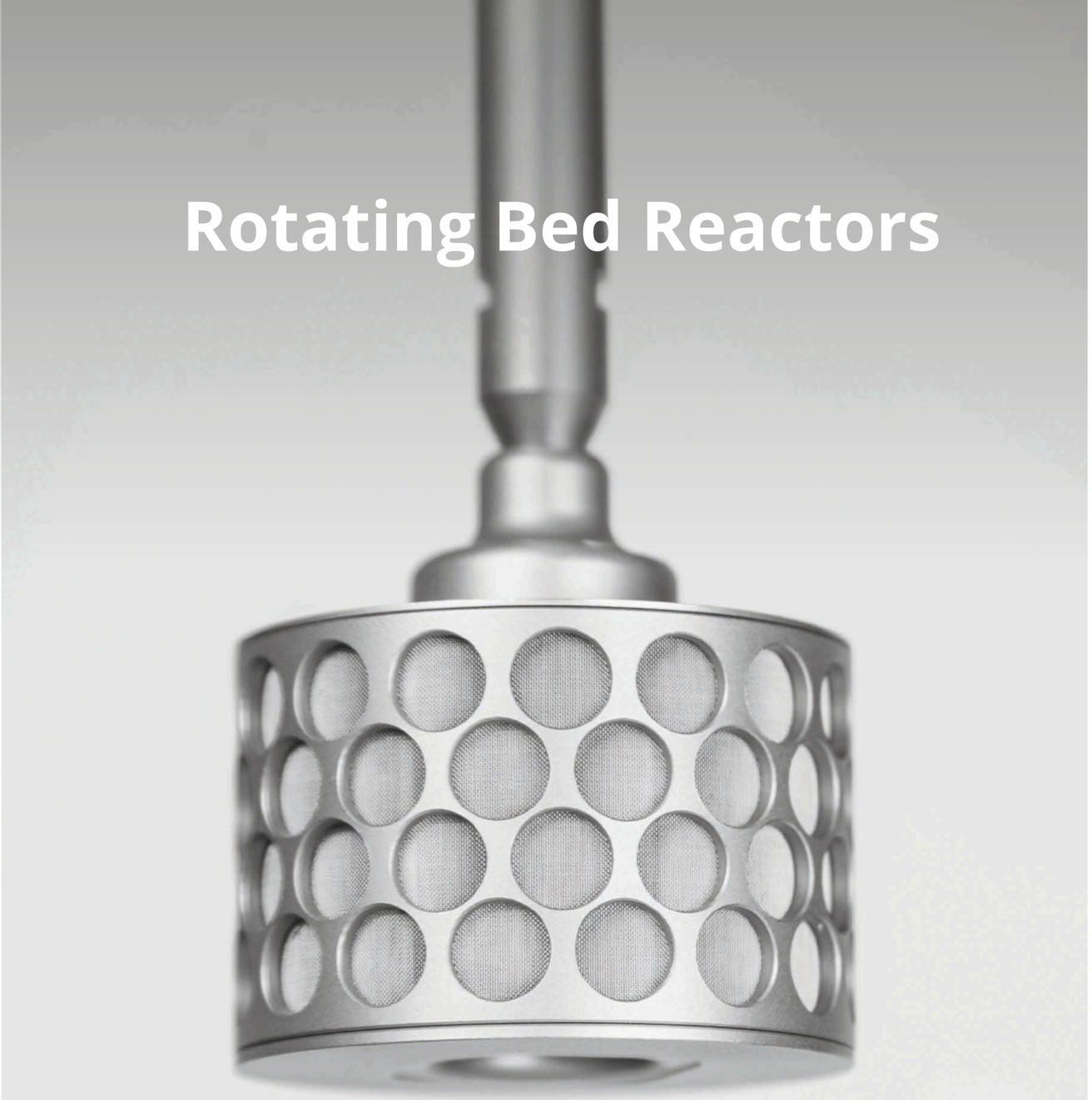
Rotating Bed Reactors



SPINCHEM®

√ Short reaction time
Due to fast mass transfer

√ Simple to scale
Due to its smart design

√ Long catalyst lifetime
Due to protected solid phase

√ No filtration required
Due to contained solid phase

√ Perfect for screening
Due to quick catalyst exchange

The SpinChem® Rotating Bed Reactor (RBR) contains the solid phase between a pair of filters.

It rapidly aspirates the reaction solution from the vessel, percolates it through the solid phase, and quickly returns it to the vessel.

By the design of the RBR and vessel, the mixing and convective transport are maximized. The resulting **efficient mass transfer** minimizes **reaction time and boosts product yields** even with liquids that are immiscible or of high viscosity, or for reactions demanding distribution of dissolved gases.

With an RBR, you can eliminate slow reaction kinetics caused by poor mass transfer between your solution and the solid phase.

The SpinChem® RBR design is flexible and can be used for **heterogeneous reactions with numerous types of solid phases**, including:

- immobilized enzymes,
- encapsulated cells,
- ion-exchanger re-sins, or a
- ctivated carbon.

This typically results in faster processes, higher yields, or reduced consumption of reagents, depending on the process.

In addition, the RBR **extends the lifetime of the solid phase** by minimizing mechanical damage (attrition), while also making it easier to separate and recycle them.

The RBR **concept is fully scalable** from laboratory to production, thus providing more efficient reaction development as well as improved production economy.

Find out more about SpinChem technology

Rotating Bed Reactor Technology

Intro

Key benefits

- Deliver consistent results from lab to industrial scale
- Reduces material consumption by protecting fragile beads and particles from mechanical damage
- Accelerate development timelines with SpinChem's superior mass transfer
- Lower OPEX with efficient recycling and minimal or no filtration steps

Common challenges in solid–liquid operations

- Mass transfer limitations in heterogeneous and multi-phase systems
- Particle attrition, fines generation, and filter clogging
- Scale-up gaps between screening, pilot, and production
- Complex work-ups and frequent offline filtration

The SpinChem RBR addresses these challenges by design, which is why it is a completely innovative approach to reactions and processes.

It prevents solid phase grinding, enhances mass transfer across different viscosities, enables efficient multi-cycle use, and simplifies downstream processing by eliminating filtration in many applications.

Learn more

Industries served

- **Pharmaceuticals and API:** Synthesis of APIs by means of transition metal catalysis, biocatalysis, or hydrogenation and associated downstream processing such as metal scavenging.

Read more: Pharma applications

- **Food and Beverage:** Processing of ingredients and finished products including decolorization, contaminant removal, and molecular modifications.

Read more: Food & Beverage

- **Flavour and Fragrance**: Focus on product synthesis, purification, or extraction from natural sources, mostly plants

Read more: Flavour and fragrance

- **Industrial Liquid Remediation:** Industrial wastewater treatment and contaminant removal in cleantech, nuclear and PFAS industries

Read more: Industrial Liquid Remediation

Proven Scale-up

Scalable reactions from laboratory to factory

The SpinChem® technology is fully scalable, enabling a seamless transition from laboratory to production scale.

This adaptability makes it suitable for diverse industry sizes and needs, providing a seamless scalability path from small-scale lab experiments to full-scale industrial processes.

The scalability allows processing volumes ranging from 5 mL to 100,000 L with standard RBR models—and even larger volumes, up to thousands of cubic meters, with the ProRBR.

Read a Scale-up case study

Refer to the website for more information:

- RBR design and scale-up
- Mass transfer revolutionized - overview
- Technology explainer
- Applications library

Start your research fast

Complete starter kit S2

Get started quickly with biocatalysis experiments using this kit for 120–300 mL volumes. The kit includes everything you need: an RBR S2, reaction vessel V2, lid, seal, hose connectors, shaft guide, holder, stand, and motor.

Complete starter kit S3

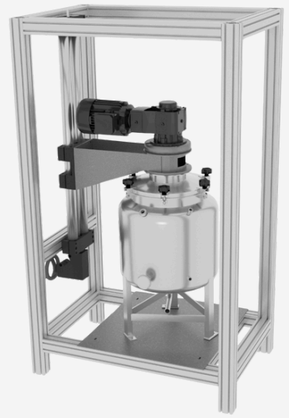
The quickest way to your rotating bed reactor experiments up and running. The all-inclusive kit allows processing of 250–1,500 mL volumes. Includes RBR S3, reaction vessel V3, lid, seal, hose connectors, shaft guide, holder, stand, and motor.

Pilot batch production

ProRBR complete kit

The ProRBR Complete kit is a plug and play system used for pilot and industrial scale. The system can be used with a variety of vessels thanks to its modular design, with typical liquid volumes ranging between 50-1000 L. The electrically controlled lift and motor make the system easy to use for a single operator.

Complete S5



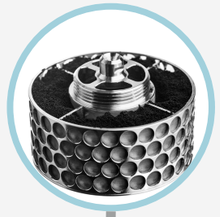
Get started with pilot testing or production in 120 L of liquid, with the RBR S5 installed in a jacketed stainless steel vessel. The lifting aid raises the rotating bed reactor for service operations, such as solid-phase replacement or cleaning.

MiniRBR

>5 mL

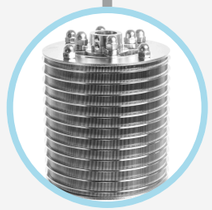
RBR S2

100 mL



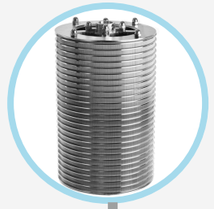
RBR S3

1 L



RBR S4

10 L



RBR S5

100 L

ProRBR

100 - >1000m^3

Order Rotating Bed Reactors at spinchem.com

Order Starter Kits at spinchem.com