



Rotating Bed Reactor

S2 Starter Kit
Assembly Guide &
Operating Instructions

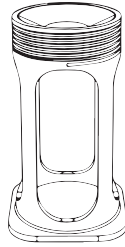


Index

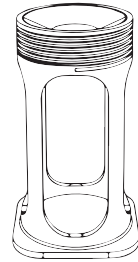
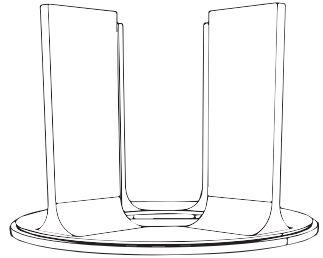
1.	Rotating Bed Reactor	no. 1-13	p. 3-7
	a) Inner filter replacement	no. 4-5	p. 4
	b) Outer filter replacement	no. 6-7	p. 5
	c) Filling and cartridge installation	no. 10	p. 6
2.	Laboratory Stand	no. 14-18	p. 8-12
	a) Stand base	no. 14-15	p. 8-9
	b) Stand shaft and connectors	no. 16-17	p. 10-11
	c) Complete assembly	no. 18	p. 12
3.	Reaction Vessel	no. 19-29	p. 13-18
	a) Vessel holder	no. 19-22	p. 13-14
	b) Vessel body	no. 20	p. 13
	c) Seal ring	no. 23	p. 15
	d) Shaft guide	no. 24-25	p. 15-16
	e) Vessel lid	no. 26-29	p. 16-18
4.	Overhead Stirrer Motor	no. 30	p. 18
5.	Complete Assembly	no. 31	p. 19
6.	Filling and Emptying Reaction Vessel		p. 20-21
7.	Temperature Control, Pressure and Vacuum		p. 22-23
8.	Filter Maintenance and Partricle Size		p. 24-25
9.	Product Specifications		p. 26-27

Rotating Bed Reactor

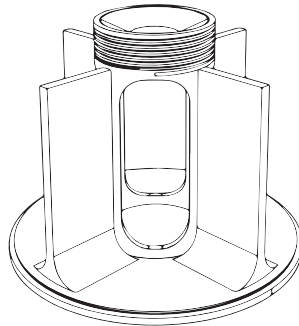
- 1** Place centre piece on flat surface



- 2** Fit bottom plate onto centre piece

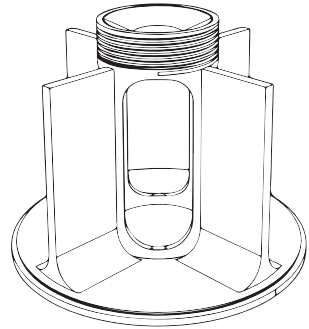


- 3** Twist to fit



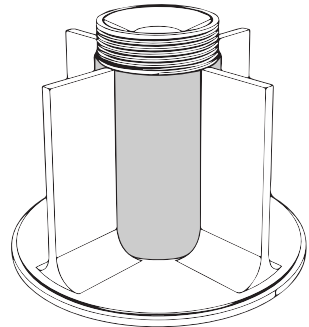
4

Mount filter onto centre piece
When using cartridges, skip steps 4-7, since no filters are needed

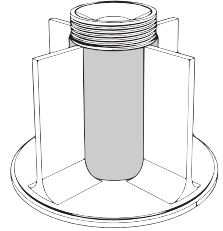
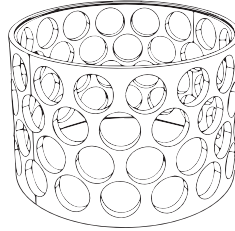
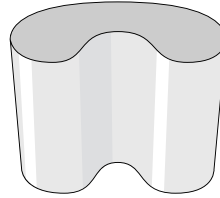


5

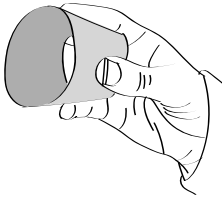
Make sure filter fits tight to bottom
Complete seal of filter cannot be guaranteed



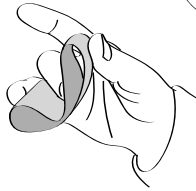
- 6** | **Fit filter inside outer ring**
Fold gently according to 6.1 & 6.2



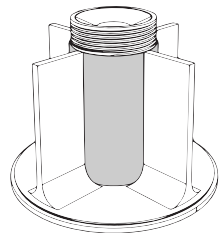
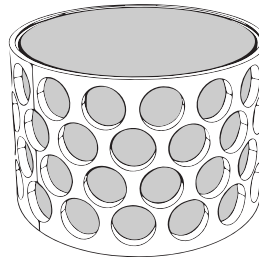
6.1



6.2

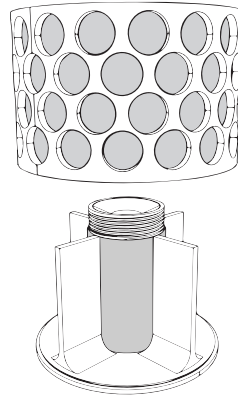


- 7** | **Ensure filter fits evenly**
Easiest when ring is on flat surface

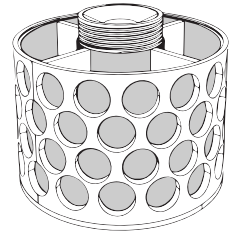


Inspect filters regularly and replace at any sign of damage

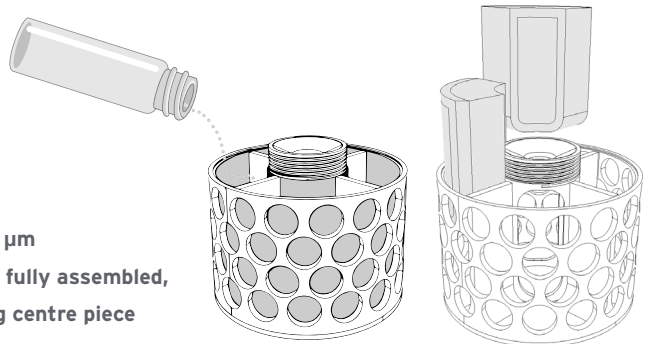
- 8** | Mount outer ring onto bottom plate



- 9** | Gently press until it clicks



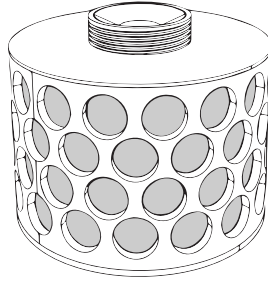
- 10** | Fill reactor compartments or insert cartridges



Particle size $>100\ \mu\text{m}$
Before the RBR is fully assembled,
only lift by holding centre piece

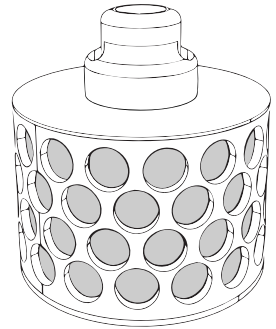
11

Mount lid



12

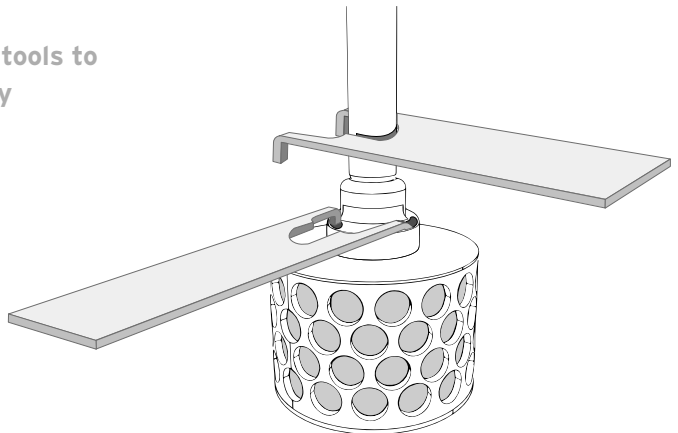
Attach nut



13

Attach shaft

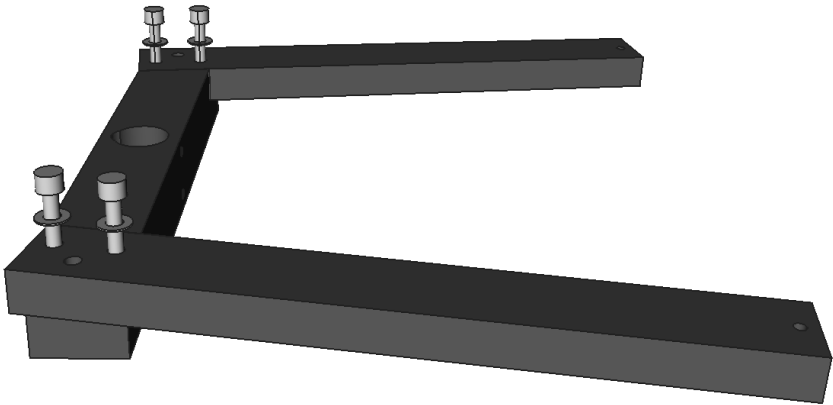
Use supplied tools to
tighten gently



14

Assemble stand base

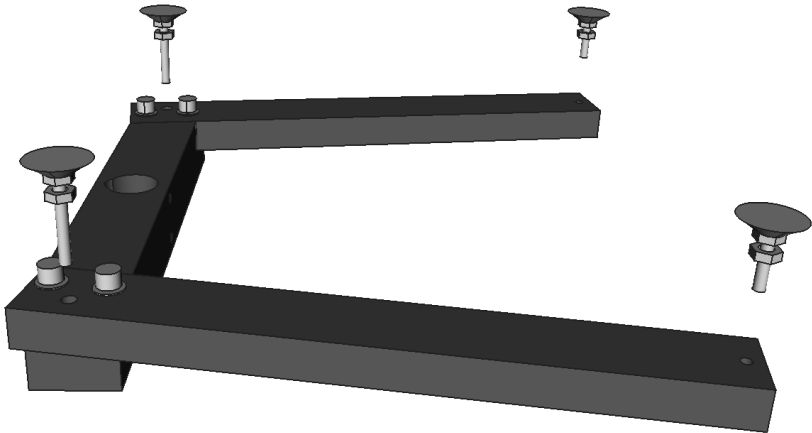
Attach side base parts to middle base part using the 4 hexagonal screws and the 4 washers. Tighten to ensure stability



15

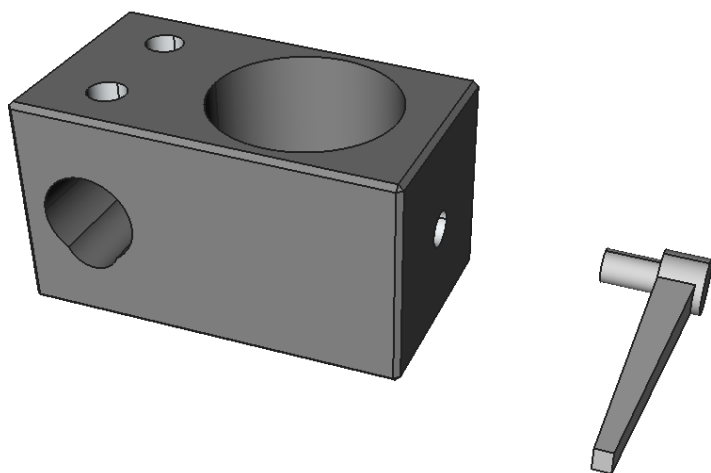
Assemble stand base

Attach the 2 long stand bolts at side with middle base part, and the 2 short stand bolts at the opposite side of base. Adjust height of stand bolts by use of screw-nuts. Tighten to ensure stability



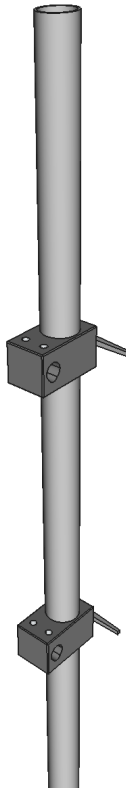
16

Attach screw handles to cross connectors



17

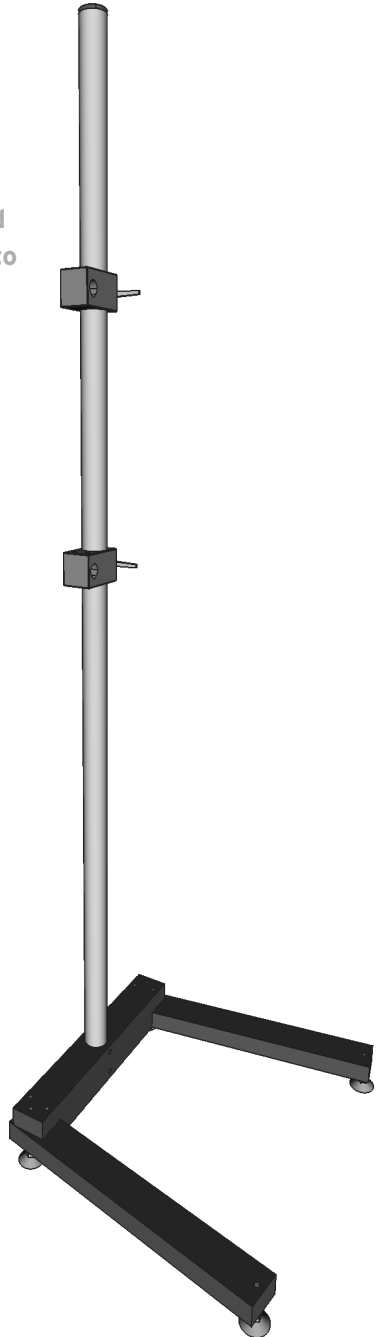
Insert vertical tube into hole in stand base
Remove plastic stop at end of vertical tube.
Secure cross connectors in place using handles. Re-insert plastic stop at end of tube



18

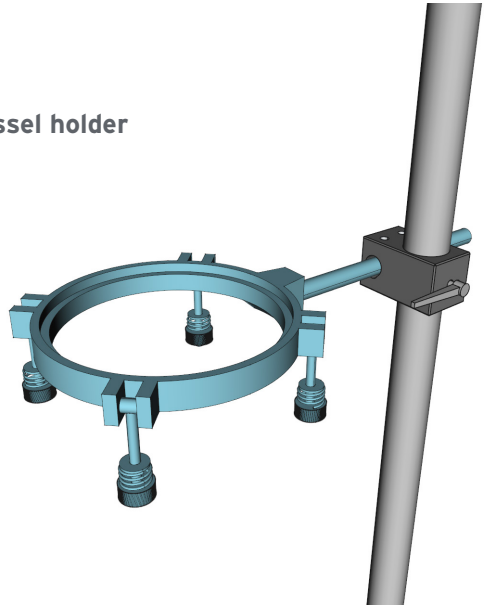
Assemble reactor stand

Secure tube to base with two screws using hex key. Adjust height of stand bolts by use of screw-nuts. Tighten to ensure stability



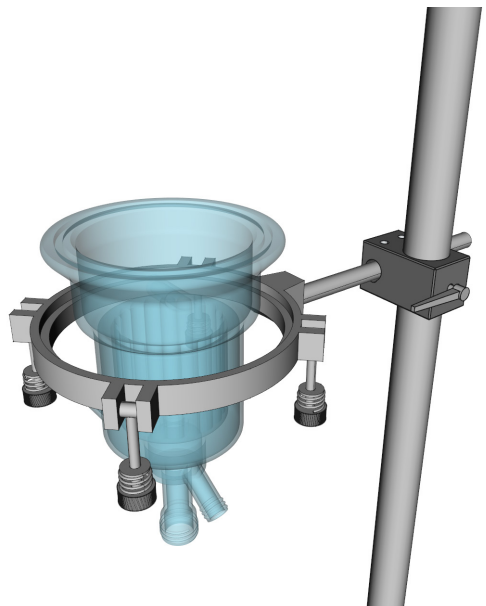
19

Fix bottom piece of vessel holder onto stand

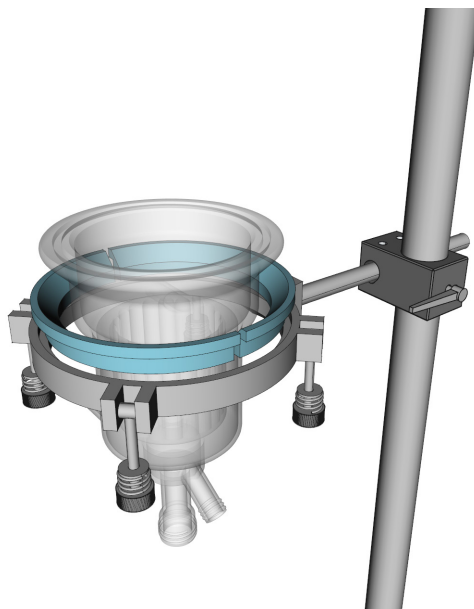


20

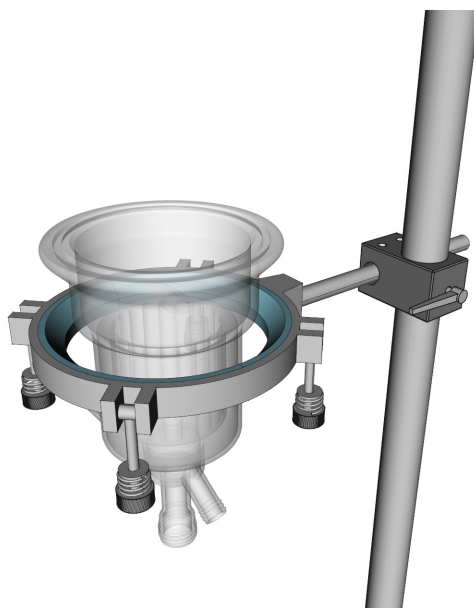
Place vessel in holder



- 21** | Position bottom inserts into holder

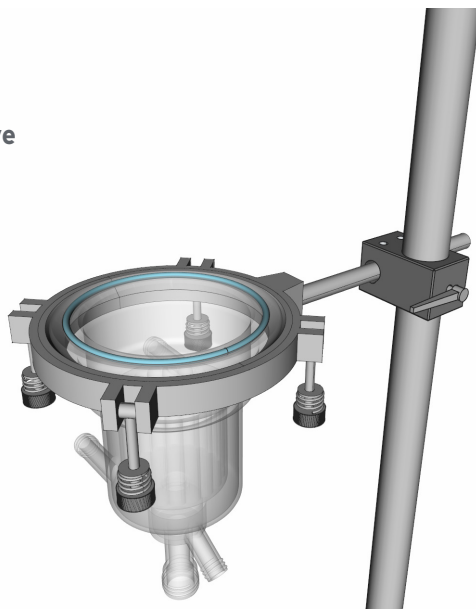


- 22** | Gently snap into place



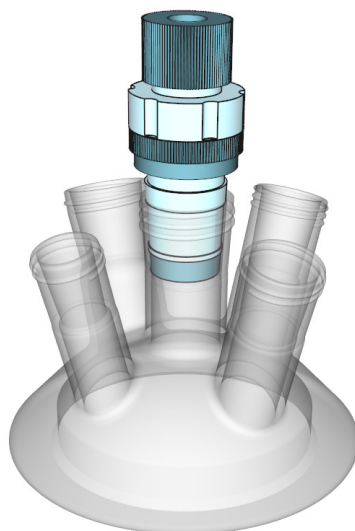
23

Place seal ring in groove



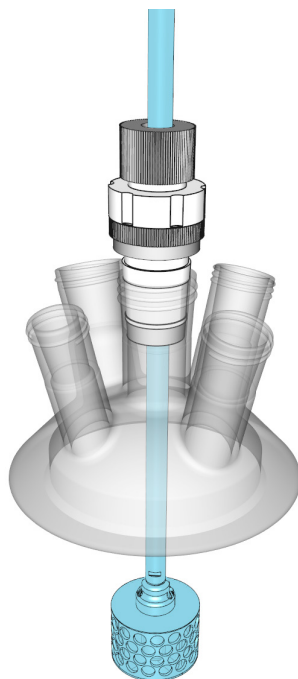
24

Place shaft guide in lid



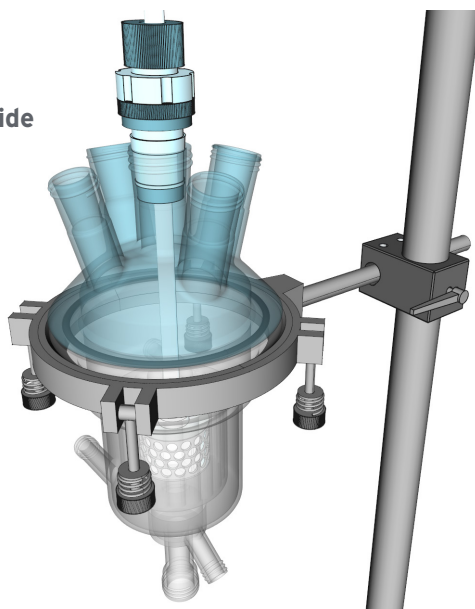
25

Pass RBR shaft through lid and shaft guide



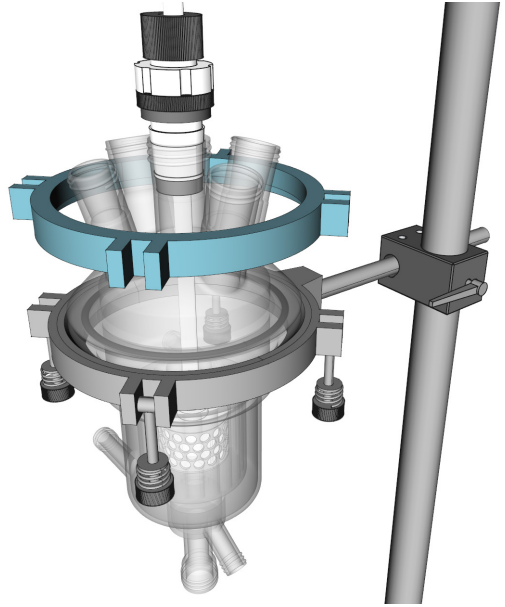
26

Place lid with shaft guide and RBR onto vessel



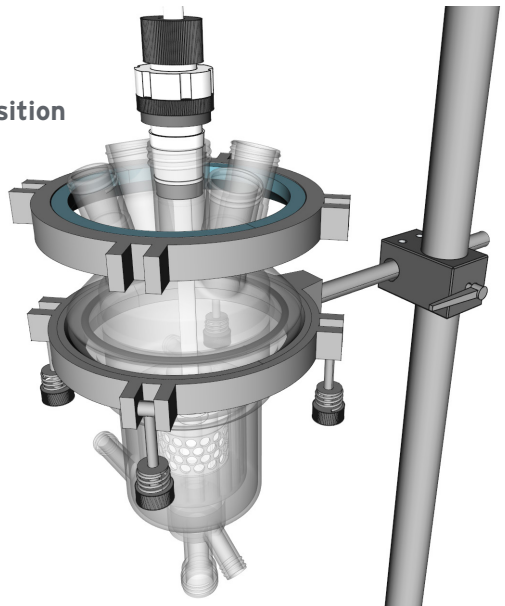
27

Place top piece of holder over lid



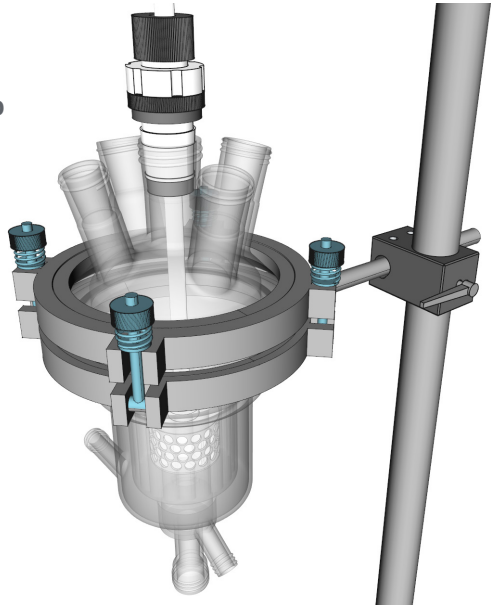
28

Place top inserts in position



29

Tighten bolts while top holder rests on lid

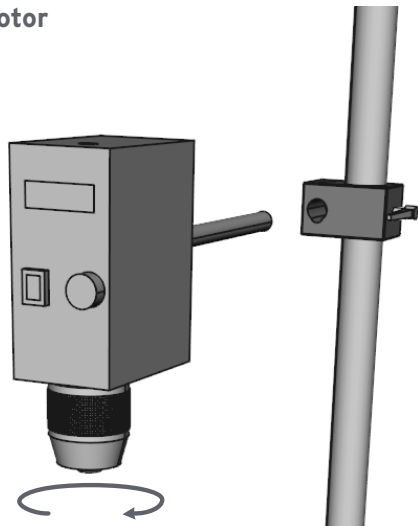


30

Attach overhead stirrer motor

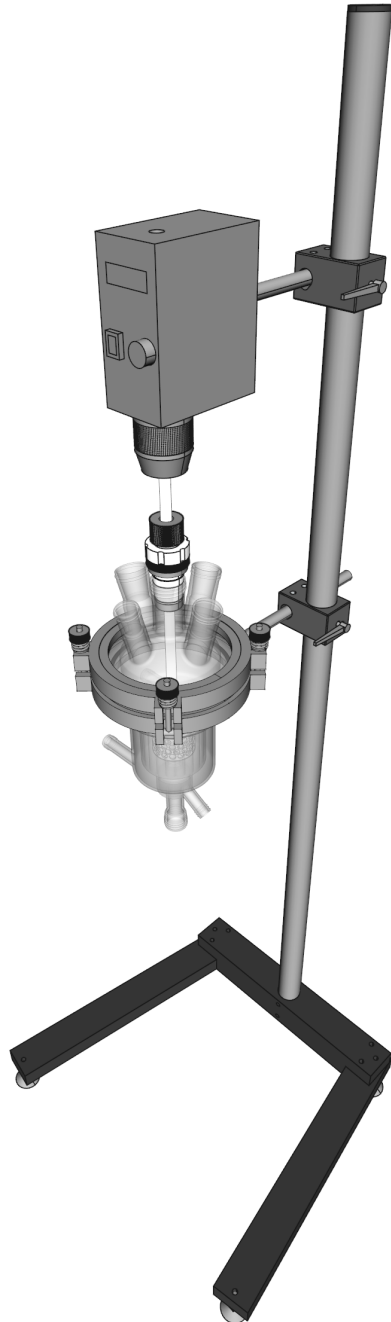


Ensure clockwise rotation
Speed 300-1000 rpm

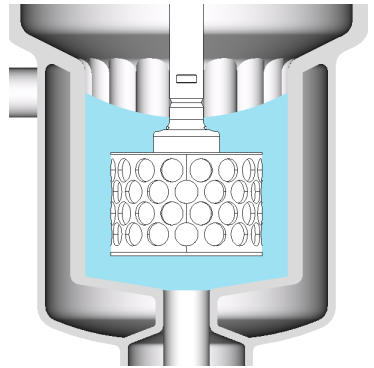
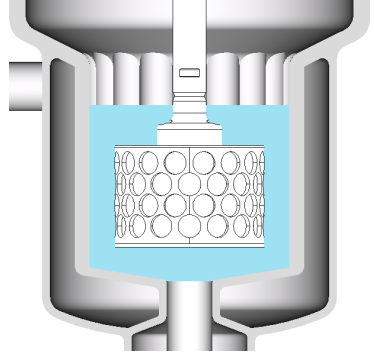


31

Assembly completed



- **Ensure the drain valve is closed**
- **Fill reaction vessel with your reaction solution (120-300 mL)**
- **Position RBR below the surface with at least 5 mm clearance from the bottom of the vessel**
- **Start overhead motor, ensure clockwise rotation and keep speed at 300-1000 rpm**
- **Ensure that the RBR is positioned below the surface while rotating and that air is not drawn into the RBR**



Maximum 500 rpm continuously
when shaft guide is used

Emptying Reaction Vessel

- Place collection vessel under drain or connect tubing to drain using the supplied GL18 connector

- Open drain valve by turning it clockwise

- Spin RBR dry (optional)

- Rinse vessel (optional)

- Ensure that no particles are trapped in the drain

- Close drain valve by turning it anti-clockwise

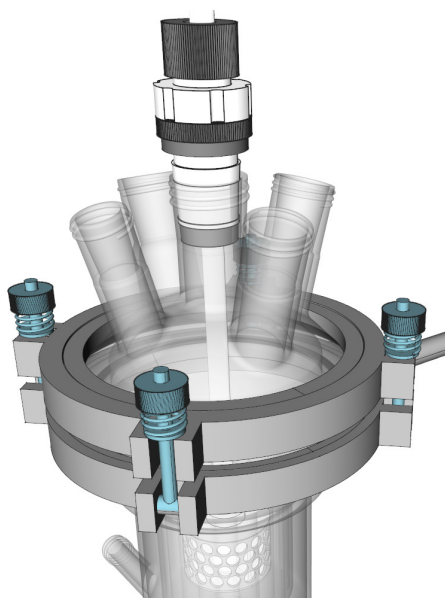


Closing drain valve with particles in drain might damage vessel

- **Connect your constant temperature liquid circulator unit to the vessel jacket**
- **Use supplied GL18 hose connectors (up to +230°C)**
- **Secure the circulator tubing to the connector barbs using hose clamps, wire or other suitable means**



- With the SpinChem® seal ring, vessel holder and shaft guide limited pressure can be maintained within the vessel
- Achievable vacuum 10 mbar with shaft guide



Never exceed 0.5 bar relative pressure within the reaction vessel

- **Replace RBR filters at first sign of damage**
- **Slide the inner filter carefully onto the center piece**
- **Fold the outer filter gently and place within the outer ring**
- **Consult assembly instructions for details**



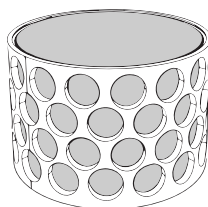
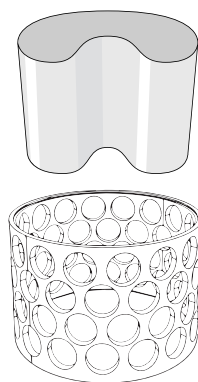
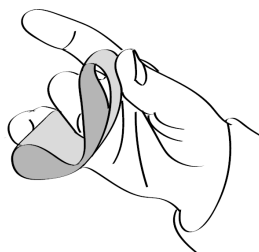
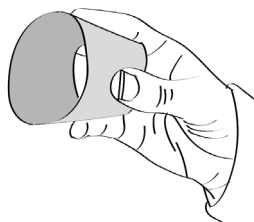
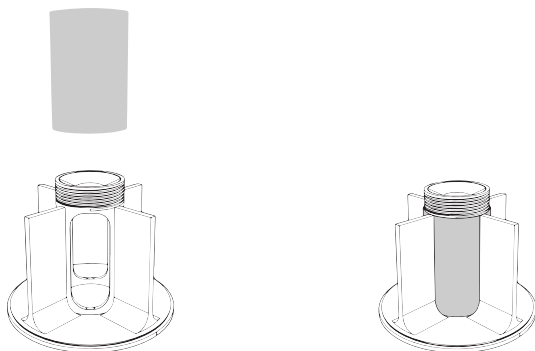
Particle size must be above 100 μm .

Inspect filters and replace at first sign of damage

Particle size guide

Mesh	μm	Mesh	μm	Mesh	μm	Mesh	μm
18	1000	40	420	80	177	200	74
20	841	45	354	100	149	230	63
25	707	50	297	120	125	270	53
30	595	60	250	140	105	325	44
35	500	70	210	170	88	400	37

Note that all stated particle sizes have a distribution, meaning that a batch with an average size of 100 μm will contain particles both bigger and smaller than this. For example, a batch with a particle size of 100 μm , and a distribution of $\pm 10\%$, will contain particles ranging from 90 μm to 110 μm in size. Particle sizes can be normally distributed, but frequently are not, thus making the median (or D50) the more relevant number. If D50 is 100 μm , then 50% of the particles in that batch will be smaller than 100 μm , and 50% will be bigger.



SpinChem® RBR S2

1221-001

SpinChem® rotating bed reactor in electro-polished stainless steel, for vessel volumes of 100-500 mL.



Properties

Material:	Stainless steel (SS316L/EN2348)
Diameter:	45 mm
Height:	30 mm
Weight:	317 g (85 g without shaft)
Shaft length:	380 mm
Shaft diameter:	10 mm
Volume:	28 mL
Filter porosity:	104 µm

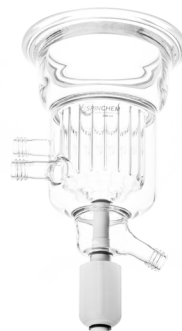
Operational conditions

Rotational direction:	Clockwise
Rotational speed:	300-1000 rpm
	NB: Maximum 500 rpm continuously when shaft guide is used!

SpinChem® Vessel V2

2221-001

**SpinChem® flower-baffled jacketed reaction vessel
DN100 with bottom drain, 200 mL.**



Properties

Material:	Borosilicate glass
Diameter:	140 mm
Height:	250 mm
Weight:	763 g
Flange:	DN100
Hose connection:	GL18
Lid height:	110 mm (155 mm with shaft guide)
Lid weight:	549 g
Lid necks:	5 ea; straight B24, angled B34, B29, B24, B19

Operational conditions

Pressure:	0-0.5 bar above atmospheric
Vacuum:	10 mbar with shaft guide
Temperature:	-70 to +230°C
Liquid volume:	120-300 mL*

*Determined with water at 20°C and a fully packed RBR S3 rotating at 500 rpm



SpinChem AB • Tvistevägen 48
SE-90736 • Umeå • Sweden
+46 (0)90 192 501 • info@spinchem.com
www.spinchem.com