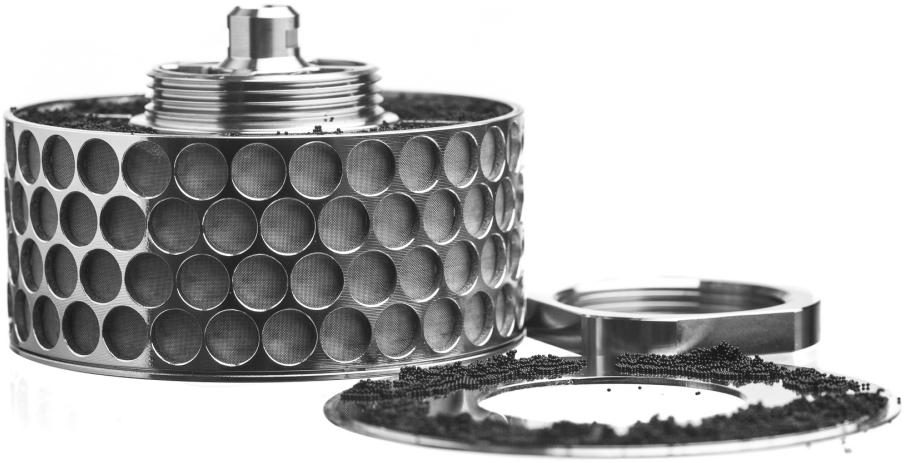
Rotating Bed Reactor

S3 Starter Kit
Assembly Guide &
Operating Instructions

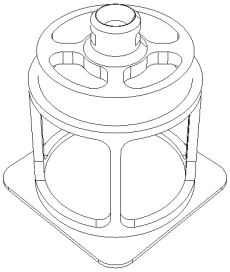


SPINCHEM®

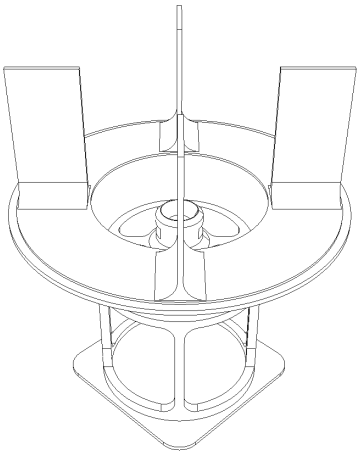
Index

1.	Rotating Bed Reactor	no. 1-18	p. 3-11
	a) Inner filter	no. 4-5	p. 4
	b) Outer filter	no. 6-7	p. 5
	c) Filling	no. 10	p. 6
2.	Laboratory Stand	no. 19-23	p. 12-16
	a) Stand base	no. 19-20	p. 12-13
	b) Stand shaft and conncectors	no. 21-22	p. 14-15
	c) Complete assembly	no. 23	p. 16
3.	Reaction Vessel	no. 24-34	p. 17-22
	a) Vessel holder	no. 24-27	p. 17-18
	b) Vessel body	no. 25	p. 17
	c) Seal ring	no. 28	p. 19
	d) Shaft guide	no. 29-30	p. 19-20
	e) Vessel lid	no. 30-34	p. 20-22
4.	Overhead Stirrer Motor	no. 35	p. 22
5.	Complete Assembly	no. 36	p. 23
6.	Filling and Emptying Reaction Vessel		p. 24-25
7.	Temperature Control, Pressure and Vacuum		p. 26-27
8.	Filter Maintenance and Partricle Size		p. 28-29
9.	Product Specifications		p. 30-31

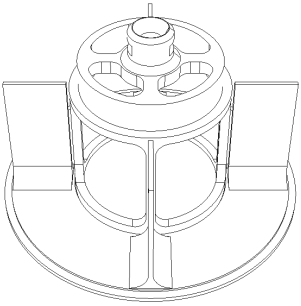
1 **Place centre piece on flat surface**



2 **Fit bottom plate onto centre piece**

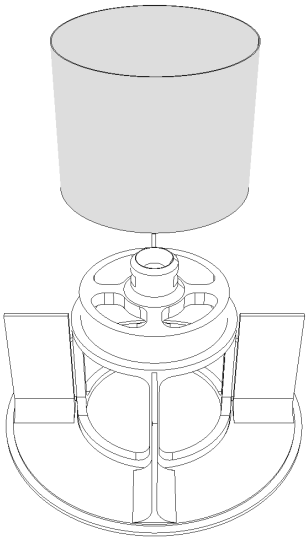


3 **Twist to fit**



4

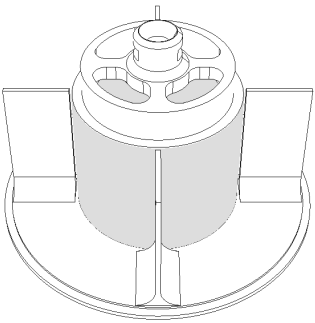
Mount filter onto centre piece



5

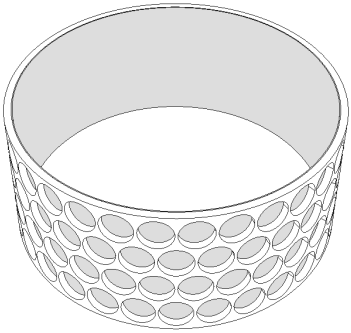
Make sure filter fits tight to bottom

Complete seal of filter cannot be guaranteed

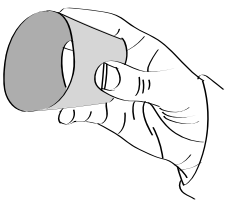


6 Fit filter inside outer ring

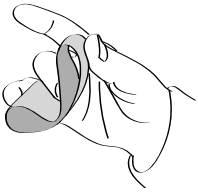
Fold gently according to 6.1 & 6.2



6.1

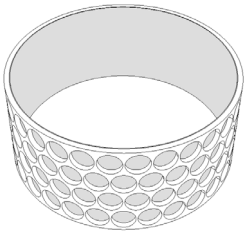


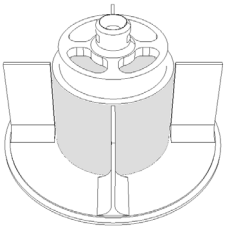
6.2



7 Ensure filter fits evenly

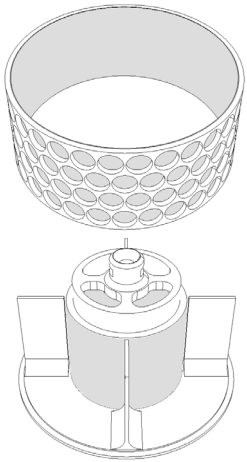
Easiest when ring is on flat surface



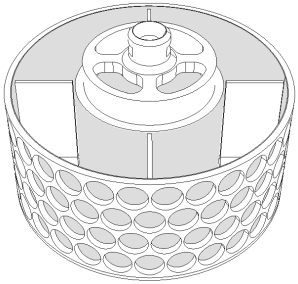


Inspect filters regularly and replace at any sign of damage

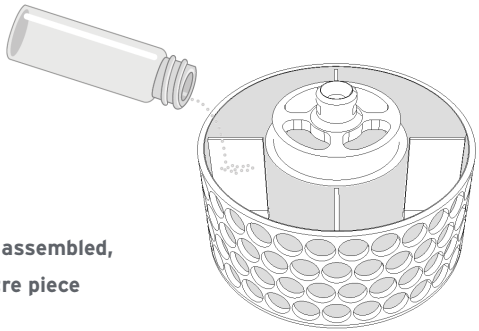
8 Mount outer ring onto bottom plate



9 Press to fit outer ring

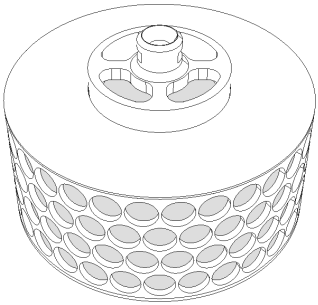


10 Fill reactor compartments

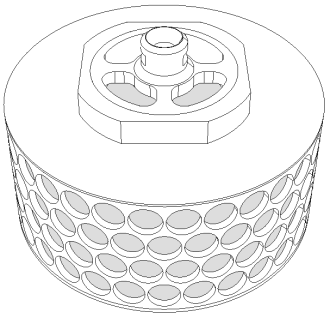


Particle size >100 µm
Before the RBR is fully assembled, only lift by holding centre piece

11 **Mount lid**

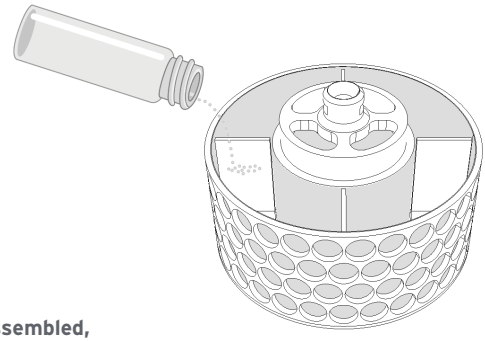


12 **Attach nut**



Steps 13-16 only apply when using a rotating bed reactor S3 Plus, and you may otherwise skip to step 17.

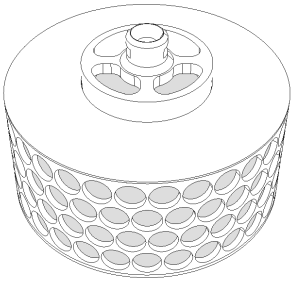
13 Fill reactor compartments of second RBR



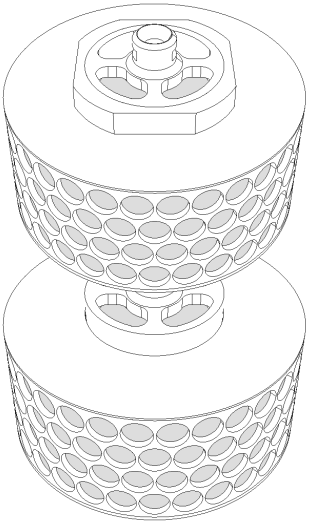
Particle size >100 µm
Before the RBR is fully assembled, only lift by holding centre piece

14 **Mount lid on second RBR**

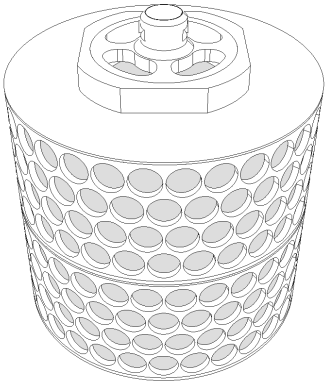
Do not attach nut



15 **Mount top RBR onto bottom RBR**

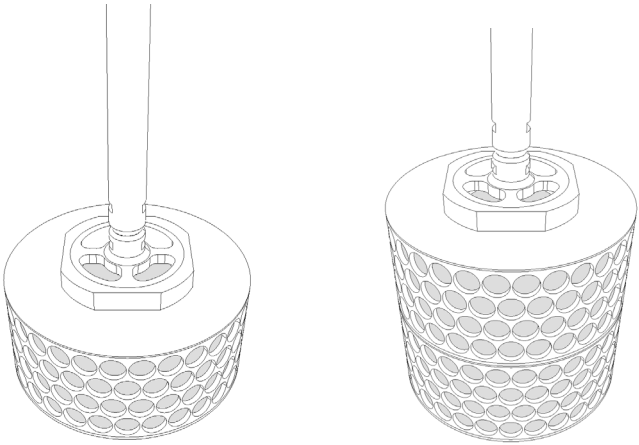


16 **Screw to attach top and bottom RBR**



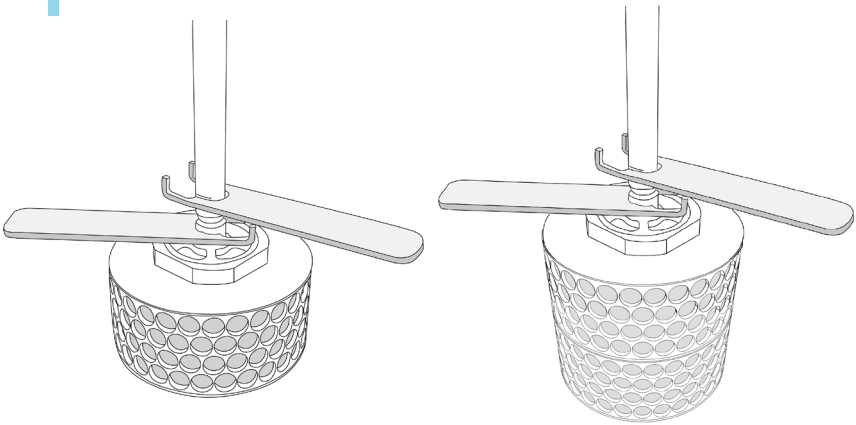
The following steps apply when using both a rotating bed reactor S3 and a rotating bed reactor S3 Plus.

17 Attach shaft



18 Secure shaft

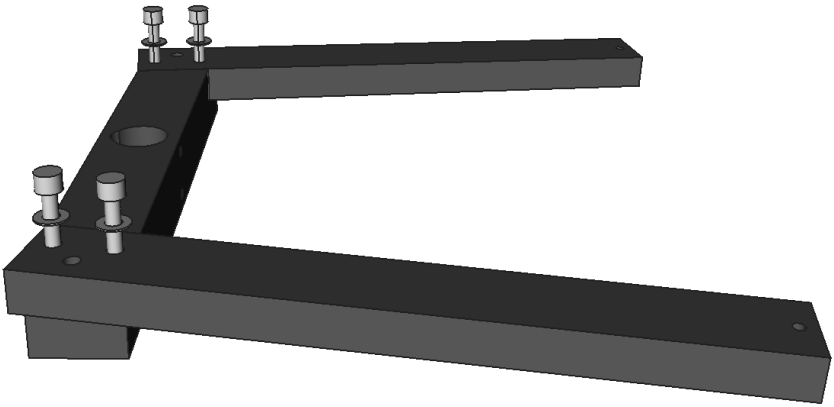
Use supplied tools to tighten gently



19

Assemle stand base

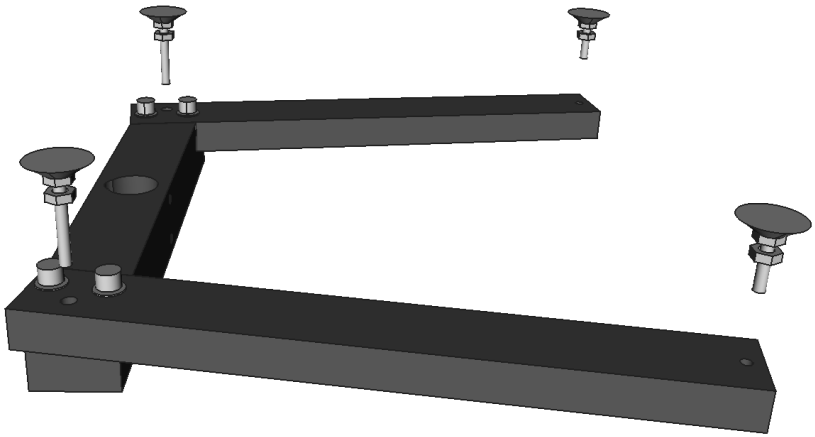
Attach side base parts to middle base part using the 4 hexagonal screws and the 4 washers. Tighten to ensure stability



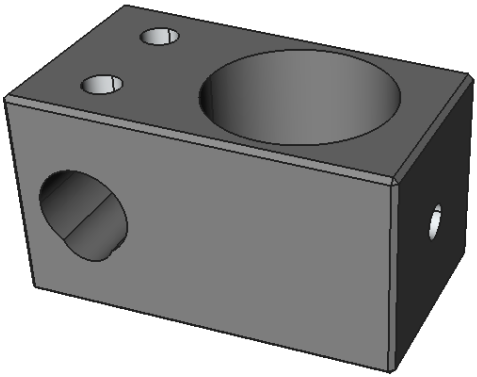
20

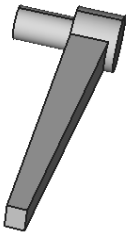
Assemle stand base

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



21 **Attach screw handles to cross connectors**

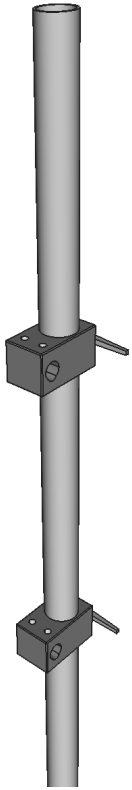




22

Insert vertical tube into hole in stand base

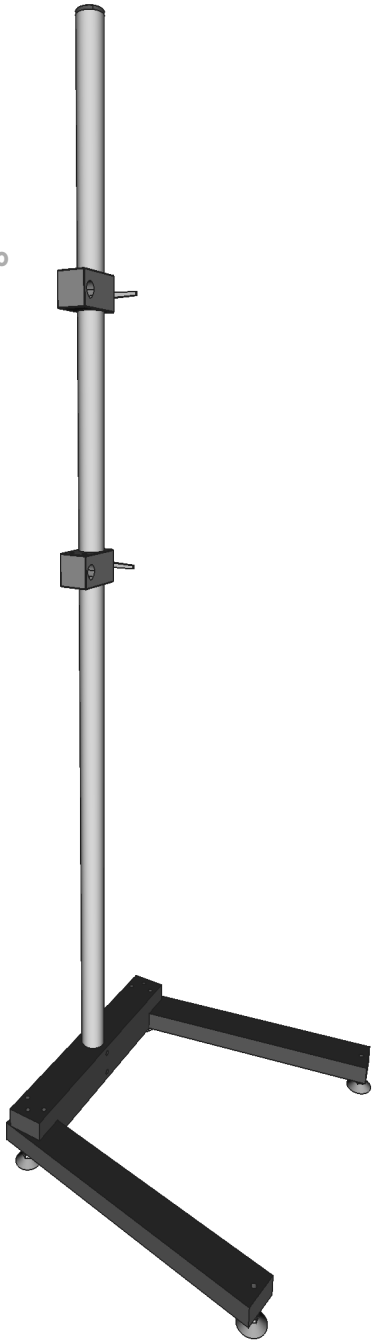
Remove plastic stop at end of vertical tube. Secure cross connectors in place using handles. Re-insert plastic stop at end of tube



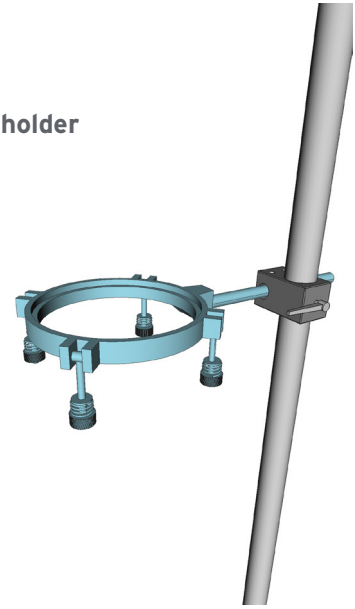
23

Complete assembly

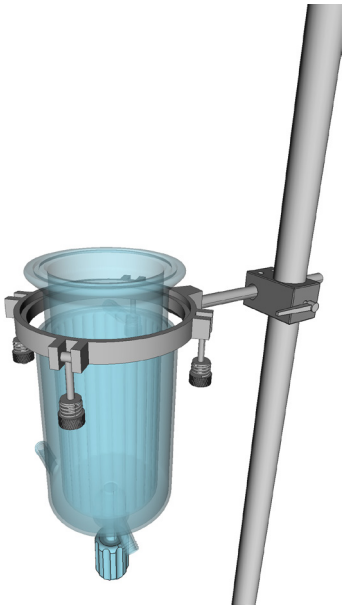
Secure tube to base with two screws using hex key. Adjust height of stand bolts by use of screw-nuts. Tighten to ensure stability



24 Fix bottom piece of vessel holder onto stand



25 Place vessel in holder

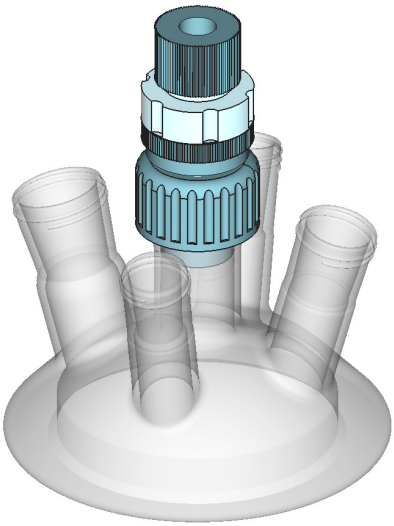


26 Position bottom inserts into holder

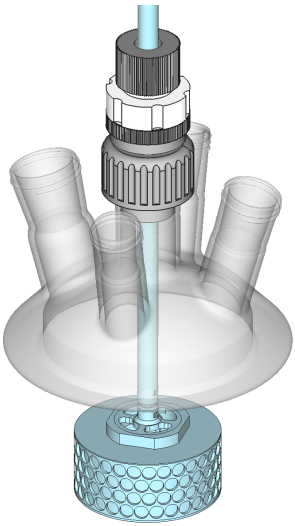
27 Gently snap into place

28 Place seal ring in groove

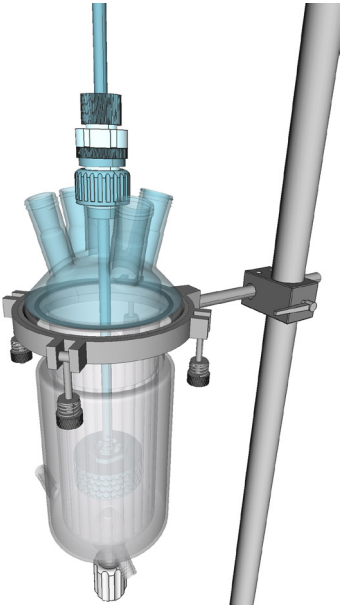
29 Place shaft guide in lid



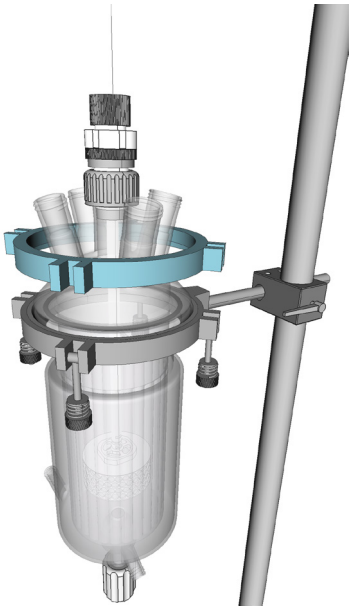
30 Pass RBR shaft through lid and shaft guide



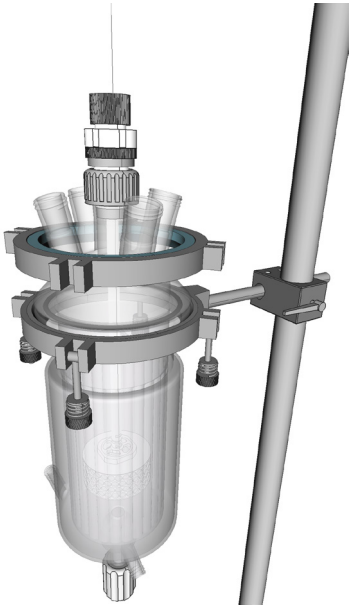
31 Place lid with shaft guide and RBR onto vessel



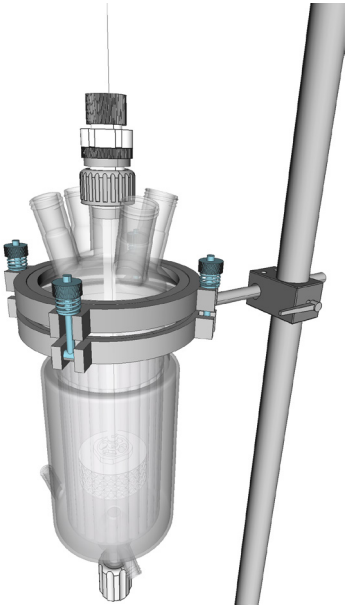
32 Place top piece of holder over lid



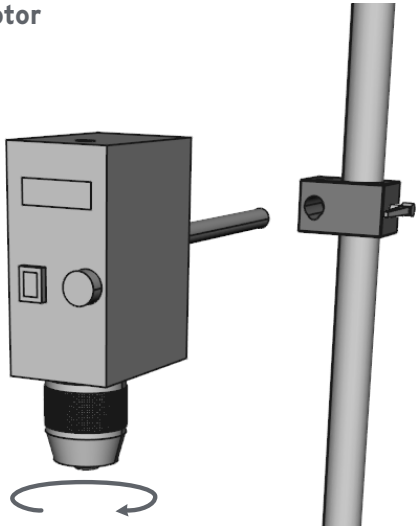
33 Place top inserts in position



34 Tighten bolts while top holder rests on lid



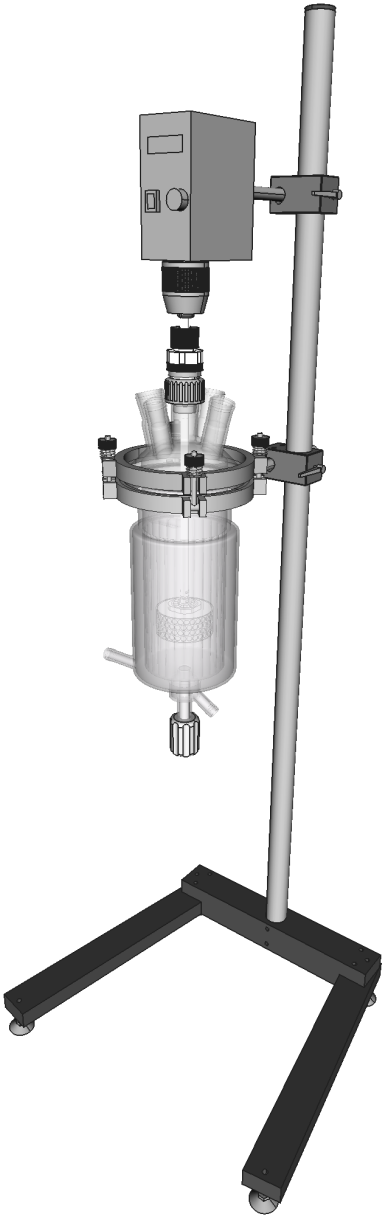
35 Attach overhead stirrer motor



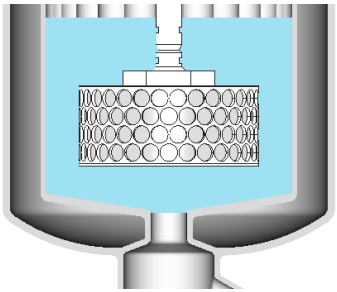
Ensure clockwise rotation

Speed 200-800 rpm

36 **Assembly completed**



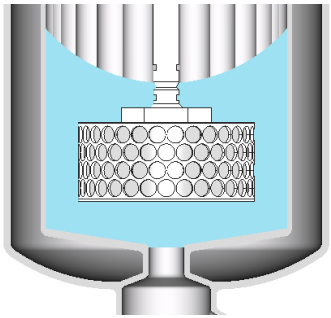
- Ensure the drain valve is closed



- Fill reaction vessel with your reaction solution (250–1500 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 200–800 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

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

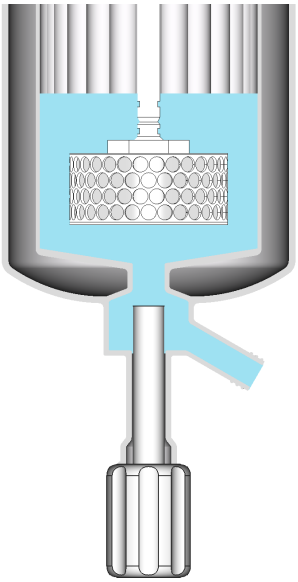
- Open drain valve by turning it clockwise

- 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

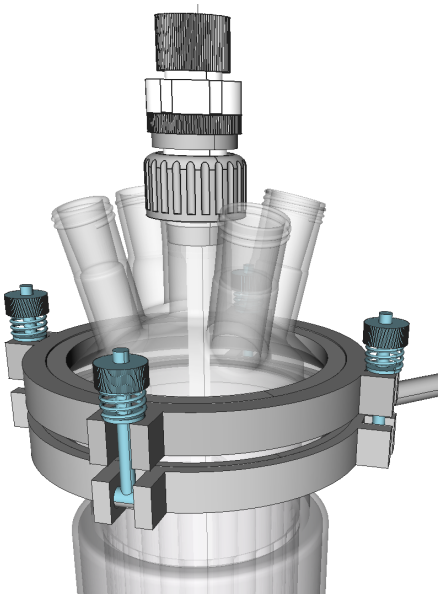
- **Connect your constant temperature liquid circulator unit to the vessel jacket**

- **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**

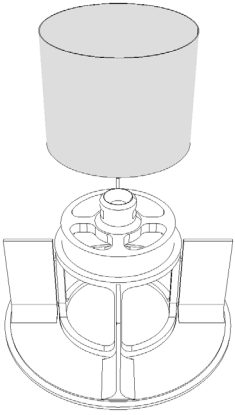
Particle size must be above 100 µm

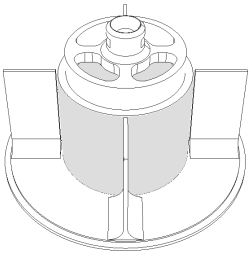
Inspect filters and replace at first sign of damage

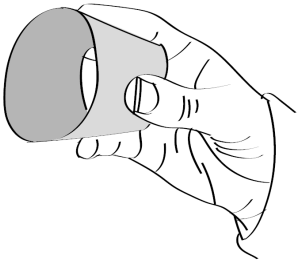
Particle size guide

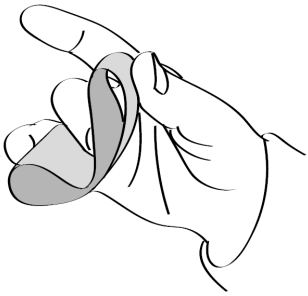
Mesh	µm	Mesh	µm	Mesh	µm	Mesh	µm
18	1000	40	420	80	177	200	74
20	841	45	354	100	149	230	63
25	707	50	297	120	125	270	53
30	595	60	250	140	105	325	44
35	500	70	210	170	88	400	37

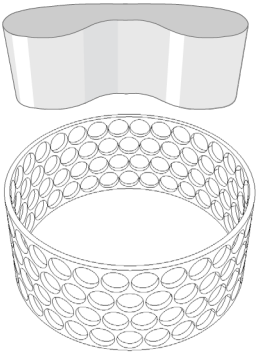
Note that all stated particle sizes have a distribution, meaning that a batch with an average size of 100 µm will contain particles both bigger and smaller than this. For example, a batch with a particle size of 100 µm, and a distribution of ±10%, will contain particles ranging from 90 µm to 110 µm in 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.

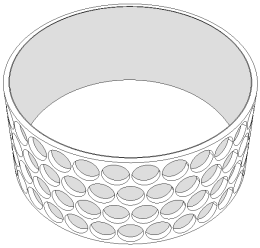












SpinChem® RBR S3

1321-001

SpinChem® rotating bed reactor in electro-polished stainless steel for vessel volumes of 300-2000 mL.

SpinChem® RBR S3 Plus

1321-201

SpinChem® rotating bed reactor in electro-polished stainless steel, for vessel volumes of 400-3000 mL.

Properties

Material S3/S3 Plus:	Stainless steel (SS316L/EN2348)
Diameter S3/S3 Plus:	70 mm
Shaft length S3/S3 Plus:	410 mm
Shaft diameter S3/S3 Plus:	10 mm
Filter porosity S3/S3 Plus:	104 µm
Height S3:	30 mm
Weight S3:	148 g (397 g with shaft)
Volume S3:	69 mL
Height S3 Plus:	63 mm
Weight S3 Plus:	289 g (537 g with shaft)
Volume S3 Plus:	138 mL

Operational conditions

Rotational direction:	Clockwise
Rotational speed:	200-800 rpm NB: Maximum 500 rpm continuously when shaft guide is used!

SpinChem® Vessel V3

2321-001

SpinChem® flower-baffled jacketed reaction vessel DN100 with bottom drain, 1200 mL.

Properties

Material:	Borosilicate glass
Diameter:	140 mm
Height:	260 mm
Weight:	1637 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:	250–1500 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