Packing of BioPro IEX Resins into Glass Columns

BioPro IEX and BioPro IEX SmartSep ion exchange resins can easily be packed into chromatographic glass columns.
Here, you'll find helpful calculations and tips for packing the resins.

Calculation of required amount

Determine the bed volume:

$$V_{Bed}\,(mL) = r^2\,(cm) \times \pi \times l\,(cm)$$

Calculate amount of non-compressed packing material:

$$V_{Material}\,(mL) = V_{Bed}\,(mL) \times f_{compression}$$

Determine slurry concentration and total slurry volume:

$$V_{Slurry}\,(mL) = \frac{V_{Material}\,(mL)}{c_{Slurry}}$$

Practical example:

Packing BioPro IEX SmartSep S30 into a 200 x 15 mm ID column with 100 mm bed height

$V_{Bed}\,(mL) = 0.75^2\,(cm) \times \pi \times 10\,(cm) = 17.7\,mL$

$V_{Material}\,(mL) = 17.7 \times 1.05 = 18.6\,mL$

$V_{Slurry}\,(mL) = \frac{18.6\,(mL)}{0.3} = 62.0\,mL^*$

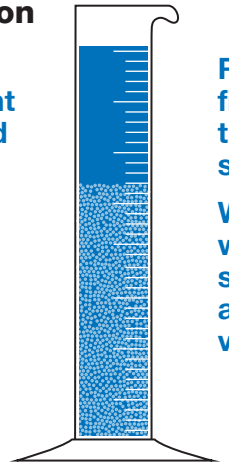
**In this case, a packing adapter is required*

➜ *To pack a bed volume of 17.7 mL, 18.6 mL settled resin are needed. For a 30% slurry, add packing solvent to a final volume of 62 mL.*

Preparation

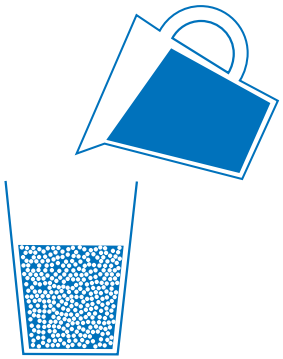
Resin Preparation

Measure the required amount of homogenised resin using a graduated cylinder.



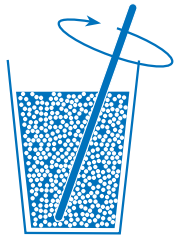
Remove potential fines by decanting the supernatant several times.

Wash the resin with packing solvent for approx. 5 resin volumes.



Slurry preparation for packing

Adjust the required slurry concentration with packing solvent.



Directly before slurry transfer:

Homogenise the slurry by gently stirring.
Avoid entry of air.

More detailed support: easy online calculations with the YMC Packing Calculator

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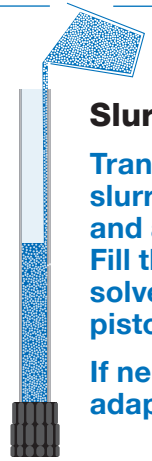
Packing of BioPro IEX Resins into Glass Columns

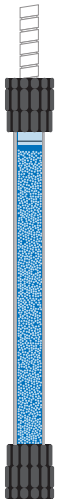
Column packing



Slurry transfer

Transfer the homogenised slurry into the glass column and avoid the entry of air. Fill the column with packing solvent and insert the piston.

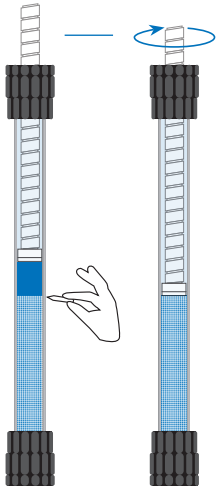
If necessary, use a packing adapter or reservoir.



Consolidation

Close the column and connect a pump. Increase the flow rate until the packing flow rate is reached.

Pump packing solvent until a resin bed has formed that does not change in volume.



Compression

Lower the piston until it reaches the resin bed and start the pump. Repeat the step until the bed height does not change anymore and mark the position on the glass tube.

Lower the piston until you reach the mark for final compression.

Column Qualification

Qualify the column according to the care and use instructions:

Equilibrate the column by pumping the mobile phase for 5 CV.
Qualify the packed column as recommended and determine the qualification values.

Typical Qualification Results for BioPro IEX SmartSep S30:

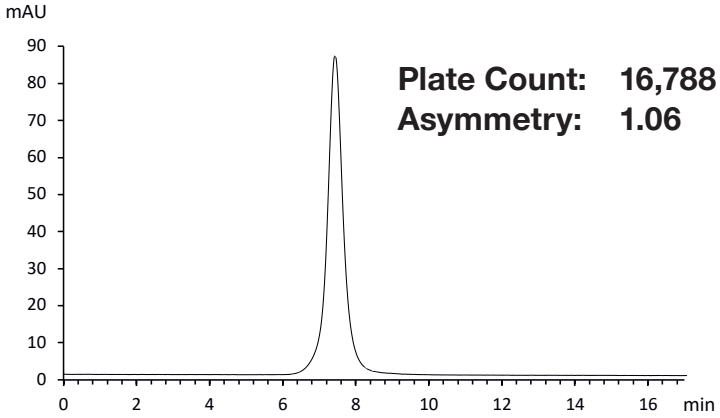


Plate Count: 16,788
Asymmetry: 1.06

Practical example:

Qualifying a column of 15 mm ID packed with BioPro IEX SmartSep S30 with 100 mm bed height

Mobile phase:	20 mM Sodium Phosphate Buffer pH 7.0
Flow rate:	2.1 mL /min
Detection:	UV at 220 nm
Sample:	Formamide (0.2%)
Injection:	200 µL

Expected theoretical plate counts for different particle sizes

Particle Size (µm)	10	20	30	75
Theoretical Plate Count (N/m)	> 20,000	> 10,000	> 5,000	> 3,500
Asymmetry factor (As)	0.7–1.4			

Rely on the YMC Packing Service:
Purchase your pre-packed glass column!

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