Packing Silica and Hybrid-Silica Stationary Phases into DAC Columns

**The hybrid-silica material YMC-Triart Prep and silica-based materials YMC*Gel can easily be packed into Dynamic Axial Compression (DAC) columns.
Here, you'll find helpful calculations and tips for packing the materials.**

Calculation of required amount

Calculate amount of the packing material:

$$M_{Material}(g) = r^2(cm^2) \times \pi \times L\,(cm) \times bulk\ density\ (g/cm^3)$$

Determine slurry concentration and total slurry volume:

$$V_{Slurry}(mL) = \frac{M_{Material}(g)}{c_S(\%w/v)} \times 100$$

V_{Slurry} is the total volume of the slurry including the stationary phase and the packing solvent.

Practical example:

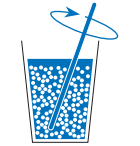
Packing YMC-Triart Prep C18-S into a 250 x 50 mm ID column

$$M_{Material}(g) = 2.5^2(cm^2) \times \pi \times 25\,(cm) \times 0.57\,(g/cm^3) = 280g$$

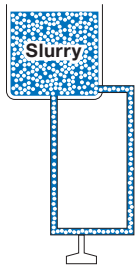
$$V_{Slurry}(mL) = \frac{280\,(g)}{30(\%w/v)} \times 100 = 930\,mL$$

➜ For a 30%-Slurry, weigh 280g of stationary phase and add packing solvent to a final volume of 930 mL.

Column Packing

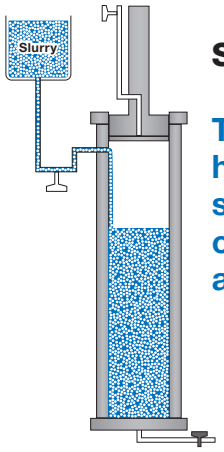


or



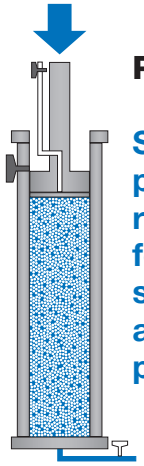
Slurry preparation

Mix the slurry solvent and the stationary phase in a beaker
or
a slurry container with a slurry pump and homogenise.



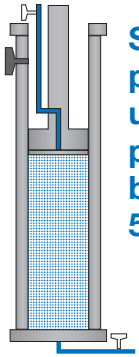
Slurry transfer

Transfer the homogenised slurry into the column as soon as possible.



Packing

Set the packing pressure as recommended for your stationary phase and start the packing.



Operation

Stabilise the packed bed under flow by pumping mobile phase for 5–10 CVs.

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

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Column Qualification

Qualify the column according to the care and use instructions:

Equilibrate the packed column by pumping the mobile phase.

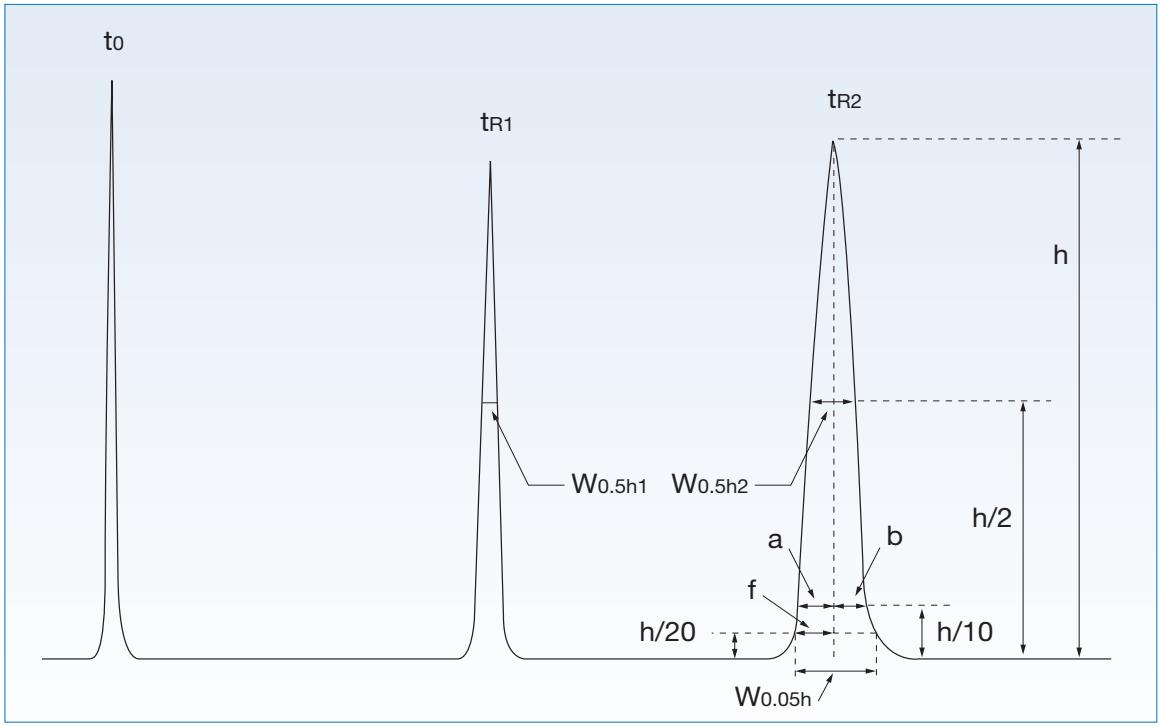
5–10 CV are recommended for equilibration.

Qualify the packed column as recommended and determine the column performance values.

Practical example:

Packing YMC-Triart Prep C18-S into a 250 x 50 mm ID column

Mobile phase:	methanol/water (85/15, v/v)
Flow rate:	50 mL/min
Detection:	UV at 254 nm
Sample:	toluene (40 µL/mL) in mobile phase
Injection:	1 mL



t_0	Void volume, Column dead-time	
t_R	Retention time	
h	Peak height	
$W_{0.5h}$	Peak width at half-height	
N	Theoretical plate count	$N=5.54 \times (t_R / W_{0.5h})^2$
k'	Capacity factor	$k'=(t_R - t_0) / t_0$
α	Separation factor	$\alpha= k'_2 / k'_1$
R_S	Resolution	$R_S= 1.18 \times (t_{R2} - t_{R1}) / (W_{0.5h1} + W_{0.5h2})$
A_S	Asymmetry factor	$A_S=b / a$
T_f	Tailing factor	$Tf= W_{0.5h} / 2f$

Expected theoretical plate count for the different particle sizes:

Modification	7 µm	10 µm	15 µm	20 µm	50 µm
RP	36,000	25,000	16,000	12,000	4,000

See our new website: www.ymc.eu – Latest news and detailed support

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