

Put your oligo synthesis in good hands

Column selection guide for oligo synthesis



Designed for a safe and high performance synthesis

Columns have always been core part of Cytiva, and we've developed them for chromatography purposes where requirements on liquid distribution and packing conditions are vital for process performance. Our experience combined with expertise in process understanding and engineering are repurposed for oligonucleotide synthesis for an efficient flow of reagents and minimized dead volume. Both these aspects are important for uniform and high synthesis yield.

All columns are compatible with the harsh chemicals used in oligonucleotide synthesis as well as pressure requirements for each scale. To utilize the capacity of each synthesizer, keep three or more columns available at the dimensions you need for your intended scale. One column for preparation and synthesis, one for post synthesis processing, and one being cleaned and prepared for your next synthesis.

Small scale columns are packed manually, while a packing station is commonly preferred for larger scales to limit the exposure of the operator to solvent when adding solid support slurry to the column. To further limit exposure of chemicals and to enclose the process, the packing station can be combined with a cleavage and deprotection system, which will also minimize the number of systems needed for those process steps.

High coupling efficiency at each cycle is crucial for producing high-quality oligonucleotides. High coupling efficiency is highly impacted by the quality of reagents, the selection of solid support, and your synthesis protocol. The synthesis as well as pre- and post-synthesis methods are developed using UNICORN™ software, which is 21 CFR part 11 compliant and keeps all process steps automated.

FineLINE™ 35 oligo column is the smallest diameter column for process development of your scale-up synthesis method.

Its adaptor has flexible positioning, which means the column can be adapted to the column volume needed for your intended synthesis scale. Thus, the column is well-suited for process optimization given the optimal bed height and synthesis conditions for your process.

Once all conditions and parameters are optimized, they can be used for scale-up by using a column with a larger diameter, suitable for your intended scale. Maintain the linear velocity of liquids by using synthesizers designed to support higher flows.

Synthesis development is commonly done on a small scale using fixed-volume columns made out of stainless steel.



AxiTide™ synthesis column is our most modern column designed to withstand the harsh chemicals of oligo synthesis. It holds the same flexibility as FineLINE 35 oligo column and is offered with complete product documentation, including traceability of wetted parts. The top frit is welded firmly in place in the adaptor for rigour at high flows.

AxiTide columns are available in two diameters, 50 and 140 mm and are suitable for process development with ÄKTA oligosynt™ synthesizer and small-scale production with OligoPilot™ synthesizer.



OligoProcess™ columns process large volumes of harsh chemicals. These process columns are designed with safety as well as minimal manual handling in mind. They can be operated with a packing station and/or cleavage and deprotection systems. Ease of maintenance was designed into columns. Only 12 bolts are required to dismount and/or assemble the column adaptor, and both top and bottom filters are easily accessible by a swing-out bottom plate.

As these columns are used for industrial scale production, containing process liquids play an important part in process set-up. To increase the safety for operators, a packing station can be used to add the solid support as a slurry into the column.

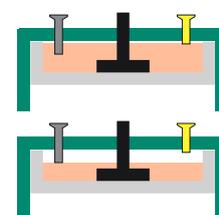
Slurry valves on OligoProcess™ columns and a groove on the top side of the adaptor facing the hydraulic chamber limits the operator's exposure to the solvent. When emptying the hydraulic chamber during unpacking, the groove assures only a minor volume of solvents remains when opening.

Performing cleavage and deprotection on-column will also minimize the exposure as well as minimize material transfers. The next step is to simply move the column into the cleavage and deprotection system.

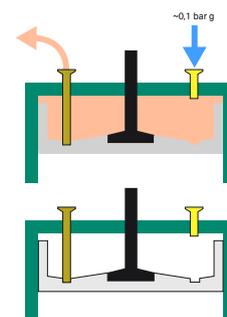
OligoProcess columns are available in sizes suitable for the different scale designs of OligoProcess synthesizers. The most common column sizes are displayed in the table below:

Diameter (mm)	Column volume (L)	Scale (mmol)
400	3.7–10	145–390
600	8.5–22.6	330–880
800	15–40	580–1600
1000	23.5–63	900–2400
1200	34–90	1300–3500

As OligoProcess columns are designed for use in commercial manufacturing, they come with full set of product documentation. Qualification documentation and support services are available on request.



Normal adaptor design.



The groove on the adaptor lid collects any remaining solvent. The outlet pipe is then used to remove excess liquid to leave only a few milliliters.

Column selection



	Item number	Scales at 350 µmol/g	ÅKTA oligosynt	OligoPilot	OligoProcess
Small stainless steel column 1.2 mL*†	18110110	50 µmol	✗		
Small stainless steel column 6.3 mL*	18110113	0.2 mmol	✗		
Small stainless steel column 12 mL*	18110116	0.5 mmol	✗		
Small stainless steel column 24 mL*	18110119	0.9 mmol	✗		
Small stainless steel column 48 mL*	18110122	1.9 mmol	✗		
FineLINE 35	28946841	1.1–3.0 mmol	✗		
AxiTide 50	29358075	2.3–6.1 mmol	✗		
FineLINE 70	29713173	4.5–12 mmol	✗	✗	
FineLINE 100	29732390	9–25 mmol		✗	✗
AxiTide 140	29358080	18–50 mmol		✗	✗
FineLINE 200	29732411	37–100 mmol		✗	✗
FineLINE 350‡	11002793	112–300 mmol			✗
OligoProcess column 400 mm and beyond	Custom	> 150 mmol			✗

* Used with column holder 18113845

† Lower scale using lower loaded solid support

‡ TC clamps, ball valve and grounding kit not incl



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