



Oligosynthesis Manufacturing Solutions

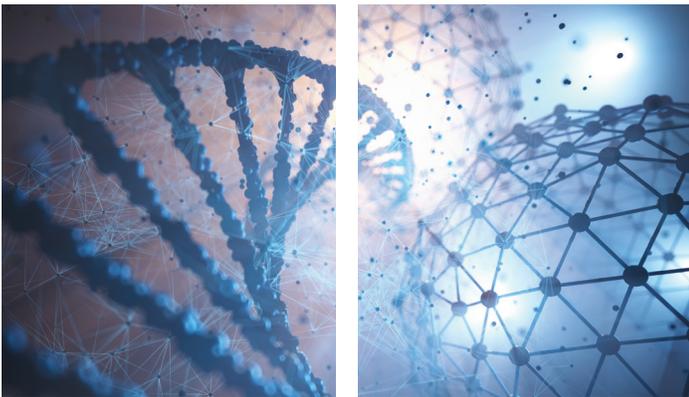
A suite of solid and liquid handling systems to efficiently produce large-scale oligonucleotides



Built For You.

Oligonucleotides are one of the most promising therapeutic modalities for today and the future. This class of therapeutics primarily consists of small interfering RNAs (siRNAs), antisense oligonucleotides (ASO), and micro RNAs (miRNAs).

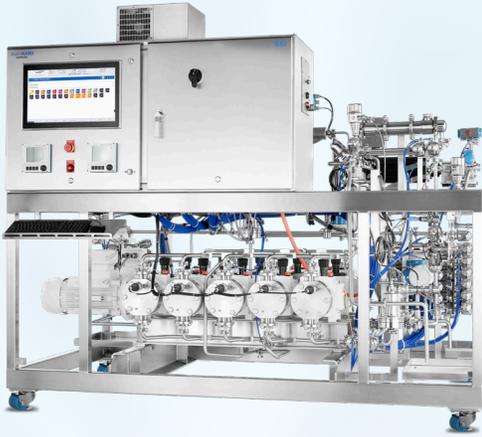
Due to their molecular complexity, oligonucleotides more closely resemble biologics than small molecules; however, their relatively low molecular weight and 16 – 25 mer nucleic acid makeup call for a chemical synthesis approach to manufacturing.



Since 1998, Asahi Kasei Bioprocess has been supporting oligonucleotide developers and manufacturers with novel equipment solutions from synthesis to purification. With an industry-leading portfolio of equipment and a focus on the oligonucleotide market, we are helping manufacturers around the world meet the growing demand for oligo drug substance through the supply of high-performance columns, systems and automation solutions.

AKBA is committed to actively listening to our customers and continuously improving our oligo equipment platform.

Asahi Kasei Bioprocess Suite of Products for *Oligonucleotide Synthesis*



Asahi Oligosynthesizer™



Asahi ACS Columns™



Asahi SCS Columns™



SCS Ergo Option



C&D Systems



MPLC Systems



HPLC Systems



DAC Ergo Option



MPLC DAC Columns



HPLC DAC Columns



Slurry Prep Systems

Asahi Oligosynthesizer™

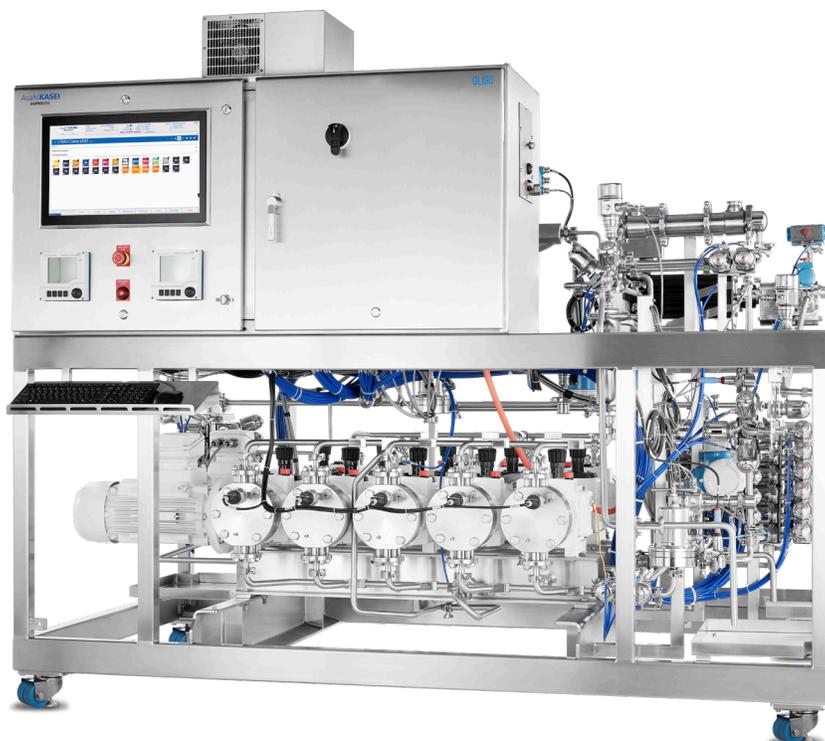
Solid phase synthesis is the gold standard approach for oligonucleotide process development and manufacturing due to the relative ease of developing a synthesis route, straightforward path to scale up and improved in-process controls. Further, the supply of API necessary to fulfill the demand of current can be managed well by today's more efficient solid phase synthesis technologies.

The Asahi Oligosynthesizer™ is a proven solid phase oligonucleotide synthesizer platform available for millimole to mole scale synthesis.

For more than 10 years, this patented synthesizer platform has been trusted by manufacturers around the world to produce preclinical, clinical and validation batches of oligonucleotide drug substance.

Our oligosynthesizer offers a groundbreaking design – employing one pump for amidite additions and a second pump for reagent additions with inline mixing capability. Each pump includes a patented valve manifold that enhances functionality.

A higher flow third pump is also available.



The Asahi Oligosynthesizer™ was awarded Patent number EP1714695 by the European Patent Office.

DID YOU KNOW?

A stepwise coupling efficiency of 98.5% for a 20-mer oligo results in an overall yield of 75.0%, whereas a 99.5% stepwise coupling efficiency for the same molecule increases overall yield to 90.9%.



Each system offers:

- » **Improved coupling efficiency** – after connecting all necessary amidites to inlet ports on a single pump, the synthesizer will automatically dose precise volumes of amidite to your synthesis column in sequence with no carryover and minimized dilution.
- » **Reduced risk and a more durable synthesis process** – through real-time monitoring of a range of available sensors and in-process controls.
- » **Additional customization to fit your needs** – whether process, automation or facility fit requirements.

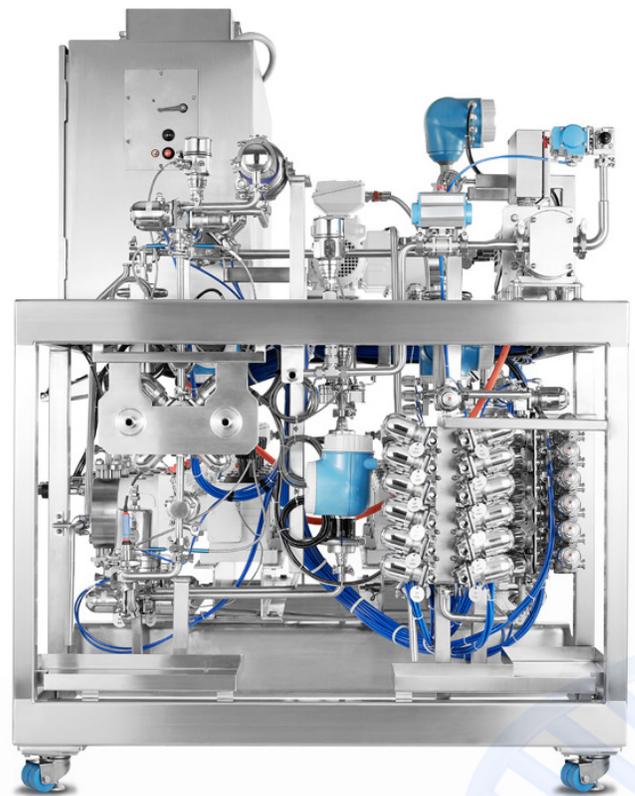


Oligonucleotide Synthesis Solutions

Manufacturing of oligonucleotides requires the handling of both solid phase (synthesis solid supports, chromatography resins) and liquid phases (synthesis reagents and solvents, elution buffers and elution solvents).

Asahi Oligosynthesizer Key Features:

- » **Patented valve design** to ensure minimized phosphoramidite and reagent carryover from one step to the next.
- » **Flexible** two-pump and three-pump designs with hygienic triple head diaphragm pumps to offer a wide flow rate range and minimize pulsations to the synthesis column.
- » **Advanced process controls** with monitoring and control by UV, conductivity, density, pressure, flow rate or volume.
- » **Hygienic design** that is chemically compatible with ACN and toluene and rated for hazardous area use.
- » **OCELOT™ System Control** – our latest universally plant-compatible automation software.
- » **Customizable options** to meet your process and facility requirements.



powered by **OCELOT™**
SYSTEM CONTROL

Asahi SCS and ACS Synthesis Columns

Pioneered by AKB two decades ago and continually improved since, the flow-through synthesis column serves as the reactor in mid- to large-scale synthesis processes. Fundamentally, such a column has two primary functions:

- 1 Retain a well-packed bed of solid support during a volumetrically turbulent and hours-long synthesis process.
- 2 Ensure an equal distribution of phosphoramidites and reagents to all beads in the packed bed.

Polymeric-based solid supports swell significantly in the presence of toluene and then shrink in the presence of ACN. The synthesis column must be able to handle these back-and-forth swings in volume over the course of the synthesis cycle.

Asahi Kasei Bioprocess offers two types of synthesis columns to address these challenges:

Asahi SCS Column™

- » Static compression synthesis column that has become ubiquitous with large-scale oligosynthesis – designed with a fixed but adjustable top plate, allowing the user to “set and forget” bed height.
- » Allows for a gap between the solid support and the top plate frit to accommodate swelling of polymeric support during the synthesis cycle, reducing the risk of column overpressure alarms.

Asahi ACS Column™

- » Builds on the SCS design by adding a slurry inlet port as well as an adjustable piston to enable axial compression of the support, simplifying column packing and unpacking.



Both SCS and ACS columns are provided with CAD-modeled flow distribution plates optimized for typical linear velocities of oligosynthesis. The plates uniformly disperse amidites and reagents across the entire column surface, significantly improving yield.

Top-Selling Synthesis Column Platform

Manufacturing of oligonucleotides requires the handling of both solid phase (synthesis solid supports, chromatography resins) and liquid phases (synthesis reagents and solvents, elution buffers and elution solvents).



Hundreds of kilograms of oligonucleotide API produced

Asahi SCS Column Key Features:

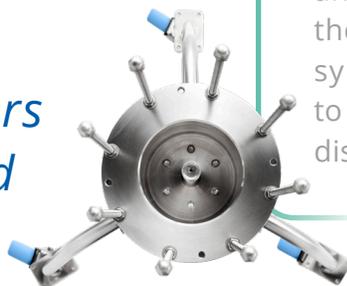
- » **CAD-modeled “active” flow distribution** for uniform dispersal of amidites and reagents
- » Fixed bed height configuration to **reduce risk of column overpressure**
- » **Scalable design** from 10 cm to 100 cm i.d.
- » **SCS Ergo option** allows column rotation to improve handling for column unpacking and maintenance

Asahi ACS Column Key Features:

- » **CAD-modeled “active” flow distribution** for uniform dispersal of amidites and reagents
- » **Slurry inlet port** to permit closed transfer of slurried solid support prior to packing
- » Integrated piston to pack and unpack the support via **axial compression**
- » **Scalable design** from 10 cm to 100 cm i.d.



Trusted by manufacturers and developers around the world.



DID YOU KNOW?

Due to the significant differences in linear velocities for synthesis and purification applications, the flow distributor for our synthesis column is not identical to our purification column flow distributors of the same diameter.



Cleavage and Deprotection Systems

Once your full-length oligonucleotide has been successfully synthesized on the column, the next steps are cleavage of the molecule from the solid support, and removal of the protecting groups from the now-dissolved oligo. These processes require harsh chemicals and elevated temperatures.

A typical cleavage may require an amine wash of the column to remove phosphate groups followed by concentrated ammonia to liberate the oligo from the support. For the deprotection step, the oligo must be heated in a vessel for several hours to temperatures between 30 and 60 C, depending on the molecule and the process. In the case of RNA, deprotection may also require the addition of TEA·3HF (triethylamine trihydrofluoride) at elevated temperatures.

The mid- to large-scale C&D systems from Asahi Kasei Bioprocess allow you to automate the cleavage and deprotection steps while allowing for increased synthesis capacity.

Our C&D Systems are designed to accommodate both DNA and RNA processes with numerous in-process controls to automate steps.

DID YOU KNOW?

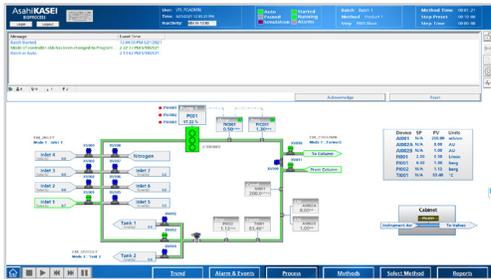
While it is much more expensive than 316L stainless steel, Hastelloy® is the high-performance alloy of choice for chemical compatibility with HF due to its durability.



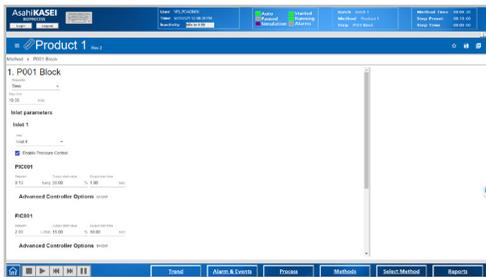
Universal Run Phase	Universal Wait Phase
Pumps are monitored and controlled by independent Coriolis mass flowmeters to ensure that both the flow rate and the total volume delivery is consistent with programmed set points.	Pumps are not running but other in-process controls such as timers, temperature and analytical monitors are active.
End conditions can be triggered by time, volume, column volume, conductivity or UV signals.	This configurable phase is ideal for reaction watching and other process hold steps.
This phase can be configured for column washing, oligonucleotide liberation and base deprotection additions.	

Enhance Safety and Efficiency

Post-synthesis, the crude oligonucleotide must be cleaved from the solid support and conditioned for further downstream processing steps. Asahi Kasei Bioprocess C&D Systems can be designed for chemical compatibility with HF as needed. Systems are available with integrated deprotection vessels, or alternatively can be used with your existing vessel.



Process Control Screen during a batch



Inlet parameter and advanced controller options

C&D System Key Features:

- » **Automated system designed for cleavage and deprotection**, freeing up your synthesizer.
- » **Chemically compatible with HF** or other chemicals as required and rated for hazardous area use.
- » **Advanced process controls** with monitoring and control by UV, conductivity, pressure, temperature, flow rate or volume.
- » Available with deprotection vessels for a turnkey solution.
- » **OCELOT™ System Control** – our latest universally plant-compatible automation software.
- » **Customizable** to meet your process and facility requirements.

*The **only** large-scale automated cleavage and deprotection system – designed to enhance production safety and efficiency.*



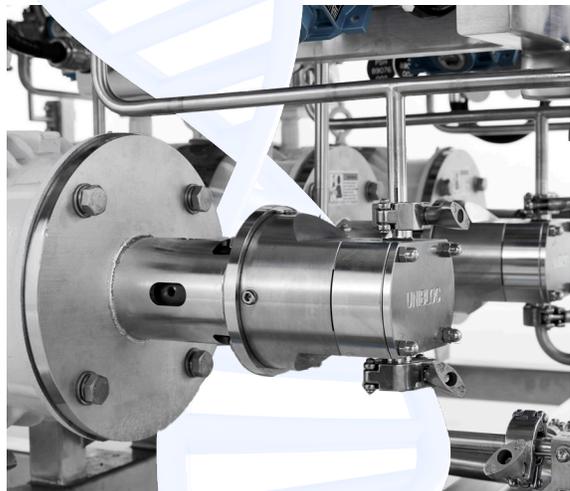
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SYSTEM CONTROL

LC Systems for Purification

After cleavage and deprotection, the liberated crude oligonucleotide is ready for chromatographic purification, typically achieved through two modes. Reversed phase (RP) purification offers higher recoveries but requires organic solvent mobile phase. Ion exchange (IEX) chromatography benefits from largely aqueous eluents, but recoveries tend to be lower.

No matter which mode is employed, the mechanical design of the LC System is crucial:

- » **For IEX purification** – sanitary design with reduced bioburden risk to address the biologic complexity of an oligonucleotide molecule together with the potential aqueous environment.
- » **For RP purification** – safety rating compliance with regionally mandated fire protection and explosion proof regulations to address the chemical nature of nucleic acids and the flammable solvent-based technique.
- » The purification system must also be capable of delivering consistent and precise gradients to enable shorter and longer impurity removal while maintaining the highest level of recovery.
- » An MPLC or HPLC System must offer user-friendly, robust software that can operate on a standalone basis or easily connect to the plant-wide automation platform.



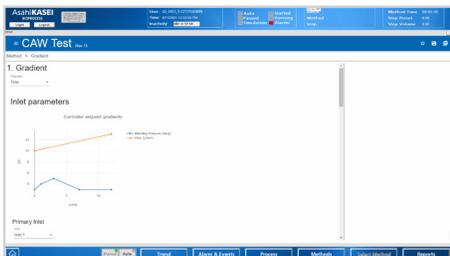
Making sanitary HPLC Systems with hazardous area ratings compliant in the US, Europe and Korea was the first step in our purification system journey. Asahi Kasei Bioprocess was also the first to launch an MPLC System targeted for oligonucleotide purification – ideal for oligo purifications performed on chromatography media with 30 to 50-micron particle sizes.

We also brought the innovative Enhanced Low-Pressure Gradient technology to the oligo manufacturing world, which provides accurate and reproducible linear gradients without requiring eluent feeds to be held under constant tank pressure, simplifying your operations.

Melding the sanitary design needs of biologics with the solvent safety rating requirements of small molecules to offer a hybrid solution for oligonucleotides.

MPLC and HPLC Systems

Purification of therapeutic oligonucleotides typically requires step or linear gradient elution in either ion exchange or reversed phase mode.



Gradient inlet parameters

Order	Flow rate	Concentration	Volume	Time
1	1000.00	0.00	100.00	0.00
2	1000.00	10.00	100.00	0.00
3	1000.00	20.00	100.00	0.00
4	1000.00	30.00	100.00	0.00
5	1000.00	40.00	100.00	0.00
6	1000.00	50.00	100.00	0.00
7	1000.00	60.00	100.00	0.00
8	1000.00	70.00	100.00	0.00
9	1000.00	80.00	100.00	0.00
10	1000.00	90.00	100.00	0.00
11	1000.00	100.00	100.00	0.00

Fractionization table

LC System Key Features:

- » **Reliable gradient format** with Classic Low Pressure, Enhanced Low Pressure and High-Pressure configurations.
- » **Uncompromising sanitary design** together with **hazardous area rating**, ideal for oligonucleotides.
- » **Advanced process controls** with monitoring and control by UV, conductivity, density, pressure, flow rate or volume.
- » **Data analysis capability built for the chromatographer** including HETP measurement, column asymmetry, and frontal peak analysis.
- » **OCELOT™ System Control** – our latest universally plant-compatible automation software.
- » **Customizable** to meet your process and facility requirements.

DID YOU KNOW?

Low molecular weight shorter impurities in an oligonucleotide batch typically arise from incomplete coupling during synthesis. High molecular weight longer impurities can arise from contaminants in starting materials.



MPLC and HPLC Columns

With automated pumps and fractionation routines, the LC System might be the brains of the purification process, but the separation of oligonucleotide from impurities occurs in the heart of the unit operation – the packed chromatography column.

Mid-sized oligonucleotides favor the use of spherical chromatography media with relatively small pore size to permit migration through the pores and small particle size to promote resolution. These particles are best packed with dynamic axial compression – a technique in which the bulk media is slurried, transferred into the empty column and compressed into a packed bed by an axial piston. The axial compression eliminates gaps and channels, while the dynamic nature of the compression warrants longer bed lifetimes. These resins also generate backpressures of 10 to 50 bar, depending on bed height, temperature, eluent conditions, and flow rate so the column must be able to reliably withstand these pressures.

Asahi Kasei Bioprocess has spent decades focused on offering best-in-class flow distribution and the broadest range of column diameters, pressure ratings and column options available.

The groundbreaking DAC Ergo option allows the bottom plate for large DAC Columns to be removed with a pneumatically driven unit, permitting a single operator to safely remove the bottom plate in minutes using a simple handheld pendant control.

Additionally, we are the first supplier to decouple the hydraulics compression unit from the main column. For oligo manufacturers and CDMOs that operate multiple DAC columns, you can save cost by connecting a single hydraulics unit to multiple columns, when they are not in use simultaneously.



*The oligonucleotide manufacturer's go-to
DAC column provider for over 20 years.*



Proven and Reliable Performance

Asahi Kasei Bioprocess has installed hundreds of purification columns at oligo development and manufacturing sites across the US, Europe, Korea, Japan and China. With a 20-bar pressure rating, our MPLC Columns are ideal for 30 to 50 μm particle size media. For 15 to 20 μm media, our HPLC Column is the right choice.



DAC Column Key Features:

- » **CAD-modeled “active” flow distribution** for uniform dispersal of eluents and crude product.
- » **Helpful temperature control and electropolish options** for purification of oligos.
- » Separate hydraulic compression cart for **flexibility and cost savings**.
- » **DAC Ergo option** to reduce time and labor when unpacking large DAC Columns.
- » **Scalable design** from 10 cm to 120 cm i.d.

MPLC and HPLC Column options include:

- » Liquid heating jacket option for temperature control
- » Column insulation for temperature maintenance during elevated temperature elution
- » Electropolishing of wetted surfaces of the column

Slurry Prep Systems

In order to implement a resin for oligonucleotide purification, you must first pack the bulk media into the DAC column and qualify with column performance tests. In the past, columns have been packed manually. This process may require multiple operators up to 30 minutes to prepare the slurry and raise the risk of the media settling out of the suspension in the column.

Creating a more consistent process would require a system platform on which an operator can be easily trained. The platform should provide for defining of the bulk media. It should also be able to transfer all prepared slurry into an empty column quickly to avoid settling prior to compression. Ultimately, such a system should reduce column packing time and improve packed column performance.

To meet these challenges, Asahi Kasei Bioprocess developed a platform to simplify the media prep and slurry transfer process. The multi-function design of the Slurry Prep System (SPS) permits any RP or IEX bulk chromatography media to be mixed into a slurry, de-fined, recirculated and charged into a suitable DAC LC Column.

The SPS vessel includes:

- » Low-shear agitator with speed control to ensure gentle mixing of the media particles in a reproducible fashion.
- » Sight glass and integral decanting dip tube to provide a safe means for the operator to remove the fine-containing supernatant from the settled slurry.
- » Recirculation using the included slurry transfer pump to allow resuspension of settled media for further de-fining or transfer into the column.
- » The system pump is sized for rapid slurry transfer, ensuring a homogenous slurry for axial compression and improved column test performance results.



DID YOU KNOW?

Many bulk chromatography media should be de-fined more than one time to achieve the best results. Check your media manufacturer's recommendations.





Safe for Hazardous Areas

The SPS is available in various sizes to accommodate our portfolio of large-scale DAC Columns. Each unit is fully non-electrical, allowing seamless installation into hazardous areas without additional costs for electrical protection or controls validation. See page 19 for ordering options.

SPS Key Features:

- » **Improved operator safety** with a closed vessel for media preparation.
- » **Low-shear agitator with speed control** to promote gentle mixing of slurry.
- » **Integral decanting tube** to aid the removal of fine particles.
- » **High-flow slurry transfer pump** to ensure fast charging of slurry into the column.
- » Available for column diameters between **30 cm and 120 cm i.d.**



OCELOT™ System Control

All automated systems offered by Asahi Kasei Bioprocess now include the latest in control software – OCELOT. In an easy-to-use universally compatible format, OCELOT can integrate and/or interface with your plant-wide control system, allowing for far-reaching data collection and analysis.

Step	Outlet	Equipment	Operator	Limit	Block	Delay	Start time	Stop time
Step 1	Outlet 1	ADGSA UV	Up	5.0000 AU	Up	5.00 min	2.00 min	
Step 2	Outlet 2	ADGSA Cond	Down	150.00 mOsm/cm	Down	2.00 min	3.00 min	
Step 3	Outlet 4	Volume	Operator	500 L	Stop			

Fractionation table

Variable	Operator	Limit	Block	Delay	Start time	Stop time
Cond Post-Cl	Up	10.00 mOsm/cm	None	5.00 min	1.00 min	Latch
pH Post-Cl	Up	10.00 pH	None	4.00 min	20.00 min	Latch

Condition table

Step	Limit	Block	Delay	Start time	Stop time
1	1.00 mm	SP	3.00 barg		
2	1.00 mm	SP	4.00 barg		
3	2.00 mm	SP	5.00 barg		
4	4.00 mm	SP	3.00 barg		

Method editor gradient tables

powered by **OCELOT™**
SYSTEM CONTROL



Our software platform emphasizes simple operation and seamless integration.

Key Features:

- » Designed to be simple and straightforward
- » OPC-ready architecture plugs into your existing DCS, OPC Server or Historian for batch monitoring and control
- » Browser-based to allow remote method configuration and review of batches, even while the system is in use
- » Recipe configuration, report templates and trend displays allow daily customization of system operations
- » Default parameters, favorite steps, chart presets and report templates allow for easy repeat use
- » Point-of-use scale-up/scale-down through Control Parameter functionality
- » Each system is built to manage your critical process conditions
- » Settings, helper text and key process parameters can all be customized to create a unique user experience

Ordering information

Asahi Oligosynthesizer

Catalog No.	Product Specifications	Pressure Rating	Typical ACS or SCS Column Pairing
Synth30	3 – 30 mmol*	10 bar	10 – 15 cm i.d. **
Synth100	10 – 100 mmol*	10 bar	10 – 30 cm i.d. **
Synth300	30 – 300 mmol*	10 bar	15 – 50 cm i.d. **
Synth1000	0.1 – 1 mol*	6 bar	30 – 90 cm i.d. **
Synth1500	0.15 – 1.5 mol*	5 bar	30 – 100 cm i.d. **
Synth2500	0.25 – 2.5 mol*	5 bar	30 – 100 cm i.d. **

*Actual synthesis scale is dependent on solid support loading and packed bed height.

**Column pairing is dependent on loading of solid support.

Asahi SCS Columns

Catalog No.	Column Dimensions	Pressure Rating	Adjustable Bed Height	Theoretical DNA Capacity*	Theoretical RNA Capacity**
SCS10	10 cm i.d. x 15 cm L	20 bar	2 – 15 cm	8 – 30 mmol	4 – 18 mmol
SCS15	15 cm i.d. x 15 cm L	20 bar	2 – 15 cm	40 – 70 mmol	18 – 40 mmol
SCS20	20 cm i.d. x 15 cm L	20 bar	2 – 15 cm	70 – 130 mmol	40 – 75 mmol
SCS30	30 cm i.d. x 15 cm L	20 bar	2 – 15 cm	130 – 280 mmol	75 – 160 mmol
SCS35	35 cm i.d. x 15 cm L	20 bar	2 – 15 cm	200 – 380 mmol	100 – 230 mmol
SCS40	40 cm i.d. x 15 cm L	20 bar	2 – 15 cm	280 – 500 mmol	160- 300 mmol
SCS45	45 cm i.d. x 15 cm L	20 bar	2 – 15 cm	300 – 630 mmol	190 – 380 mmol
SCS50	50 cm i.d. x 15 cm L	20 bar	2 – 15 cm	500 – 750 mmol	300 – 470 mmol
SCS60	60 cm i.d. x 15 cm L	20 bar	2 – 15 cm	0.75 – 1 mol	460 – 670 mmol
SCS70	70 cm i.d. x 15 cm L	20 bar	2 – 15 cm	0.80 – 1.5 mol	500 – 920 mmol
SCS80	80 cm i.d. x 15 cm L	20 bar	2 – 15 cm	1 – 2 mol	0.67 – 1.2 mol
SCS100	100 cm i.d. x 15 cm L	20 bar	2 – 15 cm	2 – 3 mol	1.2 – 1.8 mol

Asahi ACS Columns

Catalog No.	Column Dimensions	Pressure Rating	Adjustable Bed Height	Theoretical DNA Capacity*	Theoretical RNA Capacity**
ACS10	10 cm i.d. x 30 cm L	10 bar	4 – 15 cm	8 – 30 mmol	4 – 18 mmol
ACS15	15 cm i.d. x 30 cm L	10 bar	4 – 15 cm	40 – 70 mmol	18 – 40 mmol
ACS20	20 cm i.d. x 30 cm L	10 bar	4 – 15 cm	70 – 130 mmol	40 – 75 mmol
ACS30	30 cm i.d. x 30 cm L	10 bar	4 – 15 cm	130 – 280 mmol	75 – 160 mmol
ACS35	35 cm i.d. x 30 cm L	10 bar	4 – 15 cm	200 – 380 mmol	100 – 230 mmol
ACS40	40 cm i.d. x 30 cm L	10 bar	4 – 15 cm	280 – 500 mmol	160- 300 mmol
ACS45	45 cm i.d. x 30 cm L	10 bar	4 – 15 cm	300 – 630 mmol	190 – 380 mmol
ACS50	50 cm i.d. x 30 cm L	10 bar	4 – 15 cm	500 – 750 mmol	300 – 470 mmol
ACS60	60 cm i.d. x 30 cm L	10 bar	4 – 15 cm	0.75 – 1 mol	460 – 670 mmol
ACS70	70 cm i.d. x 30 cm L	10 bar	4 – 15 cm	0.80 – 1.5 mol	500 – 920 mmol
ACS80	80 cm i.d. x 30 cm L	10 bar	4 – 15 cm	1 – 2 mol	0.67 – 1.2 mol
ACS100	100 cm i.d. x 30 cm L	10 bar	4 – 15 cm	2 – 3 mol	1.2 – 1.8 mol

Asahi Oligosynthesizer is a trademark of Asahi Kasei Bioprocess America, Inc. Asahi SCS Column is a trademark of Asahi Kasei Bioprocess America, Inc. Asahi ACS Column is a trademark of Asahi Kasei Bioprocess America, Inc.

Ordering information

DAC HPLC Chromatography Columns

Catalog No.	Column Dimensions	Pressure Rating
HP6x50	6 cm i.d. x 50 cm L	100 bar
HP6x70	6 cm i.d. x 70 cm L	100 bar
HP7.5x50	7.5 cm i.d. x 50 cm L	100 bar
HP7.5x70	7.5 cm i.d. x 70 cm L	100 bar
HP10x50	10 cm i.d. x 50 cm L	100 bar
HP10x70	10 cm i.d. x 70 cm L	100 bar
HP15x50	15 cm i.d. x 50 cm L	70 bar
HP15x70	15 cm i.d. x 70 cm L	70 bar
HP17x50	17 cm i.d. x 50 cm L	70 bar
HP17x70	17 cm i.d. x 70 cm L	70 bar
HP20x50	20 cm i.d. x 50 cm L	70 bar
HP20x70	20 cm i.d. x 70 cm L	70 bar
HP30x50	30 cm i.d. x 50 cm L	70 bar
HP30x70	30 cm i.d. x 70 cm L	70 bar
HP40x50	40 cm i.d. x 50 cm L	70 bar
HP40x70	40 cm i.d. x 70 cm L	70 bar
HP45x50	45 cm i.d. x 50 cm L	70 bar
HP45x70	45 cm i.d. x 70 cm L	70 bar
HP50x50	50 cm i.d. x 50 cm L	70 bar
HP50x70	50 cm i.d. x 70 cm L	70 bar
HP60x50	60 cm i.d. x 50 cm L	70 bar
HP60x70	60 cm i.d. x 70 cm L	70 bar
HP80x50	80 cm i.d. x 50 cm L	70 bar
HP80x70	80 cm i.d. x 70 cm L	70 bar
HP100x50	100 cm i.d. x 50 cm L	70 bar
HP100x70	100 cm i.d. x 70 cm L	70 bar

DAC MPLC Chromatography Columns

Catalog No.	Column Dimensions	Pressure Rating
MP15x50	15 cm i.d. x 50 cm L	20 bar
MP15x70	15 cm i.d. x 70 cm L	20 bar
MP17x50	17 cm i.d. x 50 cm L	20 bar
MP17x70	17 cm i.d. x 70 cm L	20 bar
MP20x50	20 cm i.d. x 50 cm L	20 bar
MP20x70	20 cm i.d. x 70 cm L	20 bar
MP30x50	30 cm i.d. x 50 cm L	20 bar
MP30x70	30 cm i.d. x 70 cm L	20 bar
MP40x50	40 cm i.d. x 50 cm L	20 bar
MP40x70	40 cm i.d. x 70 cm L	20 bar
MP45x50	45 cm i.d. x 50 cm L	20 bar
MP45x70	45 cm i.d. x 70 cm L	20 bar
MP50x50	50 cm i.d. x 50 cm L	20 bar
MP50x70	50 cm i.d. x 70 cm L	20 bar
MP60x50	60 cm i.d. x 50 cm L	20 bar
MP60x70	60 cm i.d. x 70 cm L	20 bar
MP80x50	80 cm i.d. x 50 cm L	20 bar
MP80x70	80 cm i.d. x 70 cm L	20 bar
MP100x50	100 cm i.d. x 50 cm L	20 bar
MP100x70	100 cm i.d. x 70 cm L	20 bar
MP120X50	120 cm i.d. x 50 cm L	20 bar
MP120X70	120 cm i.d. x 70 cm L	20 bar

Ask about our DAC ERGO options built for you.

Ordering information

C&D Systems

Catalog No.	Deprotection Vessel Working Volume	Pressure Rating	Metering Pump Flow Rate	Material of Construction
CD020	20 L	6 bar	6 to 180 L/h	316L SS
CD100	100 L	6 bar	20 to 600 L/h	316L SS
CD350	350 L	6 bar	48 to 2000 L/h	316L SS

MPLC Systems

Catalog No.	Typical Flow Rate Range	Pressure Rating	Typical Column Pairing
MPC240	24 – 240 L/h	20 bar	15 – 30 cm i.d.
MPC360	36 – 360 L/h	20 bar	15 – 40 cm i.d.
MPC600	60 – 600 L/h	20 bar	20 – 45 cm i.d.
MPC900	90 – 900 L/h	20 bar	30 – 60 cm i.d.
MPC1K2	120 – 1200 L/h	20 bar	30 – 80 cm i.d.
MPC2K4	240 – 2400 L/h	20 bar	40 – 100 cm i.d.

HPLC Systems

Catalog No.	Typical Flow Rate Range	Pressure Rating	Typical Column Pairing
HPC060	6 – 60 L/h	100 bar	6 – 15 cm i.d.
HPC120	12 – 120 L/h	100 bar	7.5 – 20 cm i.d.
HPC180	18 – 180 L/h	70 bar	10 – 20 cm i.d.
HPC240	24 – 240 L/h	70 bar	10 – 30 cm i.d.
HPC360	36 – 360 L/h	70 bar	15 – 40 cm i.d.
HPC600	60 – 600 L/h	70 bar	20 – 45 cm i.d.
HPC900	90 – 900 L/h	70 bar	30 – 60 cm i.d.
HPC1K2	120 – 1200 L/h	70 bar	30– 80 cm i.d.

Slurry Prep Systems

Catalog No.	Vessel Working Volume	Pressure Rating	Suitable AKB DAC LC Column Pairings (i.d. x L, cm)
SPS100	100 L	1.4 bar	30 x 70, 35 x 50, 35 x 70, 40 x 50, 40 x 70, 45 x 50
SPS200	200 L	1.4 bar	45 x 70, 50 x 50, 50 x 70, 60 x 50
SPS350	350 L	1.4 bar	60 x 70, 80 x 50, 80 x 70
SPS600	600 L	1.4 bar	80 x 70, 100 x 50, 100 x 70, 120 x 50

Customized volumes and configurations are available upon request. Note: This product may be subject to export control

Our Expertise, Your Confidence

The Fluid Management Business Unit of Asahi Kasei Bioprocess is devoted to solving therapeutic product safety, efficiency and purity challenges within the pharmaceutical and bioprocessing industries.

With technology platforms for virus filtration, inline buffer formulation, chromatography, and oligonucleotide synthesis, our bioprocessing systems, columns, and automation solutions advance GMP manufacturing of critical drug substances around the world. Built with pride, built with quality, built to exceed your high expectations. "Built for You."



Aftermarket Services

Technical Support Network

A reliable technical support network is available throughout North and South America, Europe and Asia.

Warranty

We offer an extendable 1-year warranty, service contracts and a personalized level of service for peace of mind and timely support when you need it.

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Technical Client Services

Technical Client Services (TCS), is a customer-centric interface to our product and science experts. Our TCS team will guide your process and engineering needs as your personal liaison for inquiries.

Contact us to learn more about how TCS can support your virus filtration and downstream processing equipment needs.

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