

# Peptide Synthesis Workflow

Synthesis, Purification, and Evaporation Solutions



# Smarter Solutions for Your Peptide Workflow

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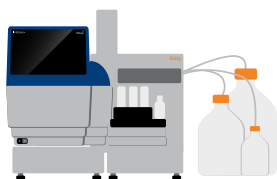
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Biotage has developed a range of tools to improve the peptide synthesis workflow, designed specifically to improve peptide chemists' overall laboratory efficiency without compromising peptide quality. Our workflow solutions are used in pharma, biotech, CRO and academic laboratories globally.







## 1. Synthesis

Biotage® offers a wide range peptide synthesizers for Fmoc solid phase peptide synthesis. Decrease synthesis time using either microwave, for a single peptide, or optional thermal heating blocks for potentially hundreds of peptides in parallel.



Fully automated peptide synthesizers.

## How Do We Improve the Workflow?






-  Elevated temperatures increase the speed of amide bond formation.
-  Use high concentration of activated amino acids to increase the rate of amide bond formation.
-  Efficient oscillation or vortex mixing for superior mixing and homogeneous heat distribution.
-  Better synthesis results in less chromatography runs.

## 2. Purification

The purification step (RP-HPLC) is one of the main bottlenecks in the peptide synthesis workflow. High Performance Flash Chromatography (HPFC) can be used as a fast and efficient technique for the purification of crude synthetic peptides.

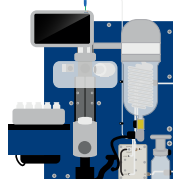


Range of flash columns and instruments for peptide purification.





-  Increased loading capacity compared to prep RP-HPLC which allows more peptide to be processed in a single injection.
-  Enable shorter separation times and better recoveries whilst reducing solvent consumption.
-  Flash purification can be used as the sole purification method or pre-purification step to enhance final purification in tandem with RP-HPLC.
-  High performance flash columns with wide pore media (300 Å), specifically designed for reversed phase purification of peptides.
-  Samples can be loaded as a suspension

## 3. Evaporation

Large numbers of fractions can be generated during purification of peptides and concentrating and pooling them can be time consuming. Peptide chemists are now incorporating our novel evaporation technology in their workflow, to rapidly evaporate aqueous and organic solvents with boiling points from 30 °C to 205 °C.



Thin film evaporator. Liquid handler for automation.

-  Rapid removal of cleavage cocktails.
-  Removal of high boiling solvents used in reactions or storage solvent such as DMSO.
-  Easily combine or concentrate Flash or HPLC fractions prior to freeze drying.
-  Use post synthesis or post purification in the workflow.

## 4. Pure Peptide

Getting the pure peptide is just the start. Now your research really begins in the diverse range of peptide applications.



Basic research



Drug development



Vaccines & Neoantigens



Nanotechnology



Biomaterials



Synthesis

# Biotage Peptide Synthesizers Overview

Instrument	Biotage® Initiator+ Alstra™	Syro I	Syro II
Level of Automation	Full	Full	Full
Microwave Heating	✓	✗	✗
Heating Block	✗	✓	✓
Room Temperature	✓	✓	✓
Max. Number of Peptides at Room Temp.*	1	96	576
Max. Number of Peptides with Heating*	1	24	192
Reactor Vial Sizes (mL)*	5 10 30	0.4 2 5 10 20	0.4 2 5 10 20
Scale Per Reactor Vial (mmol)**	0.005–2.00	0.001–0.60	0.001–0.60
Activation Method	<i>in situ</i> and pre-activation	<i>in situ</i> and pre-activation	<i>in situ</i> and pre-activation
Amino Acid Vessels***	32 x 30 mL (standard)	40 x 50 mL (standard)	40 x 50 mL (standard)
Reagent Bottles	5	5	7
External Bottle Positions	3	1	3
Mixing	Oscillation	Vortex	Vortex
Inert Gas Option	✓	✓	✓
Microwave Assisted Organic Synthesis (MAOS)	✓ (option)	✗	✗
UV Monitoring Option	✓	✗	✗

\*Dependent on reactor block configuration.

\*\*Dependent on reactor vial size, resin type and resin loading.

\*\*\* Custom amino acid rack configurations are available, including 96-position deep well plate. Please enquire for more information.



“ We provide custom peptides supplying standard and exotic peptides, so speed is important but we also need high quality peptides – that’s why we purchased a second Alstra.”

*Director, CRO, Sweden*

## Biotage® Initiator+ Alstra™ Automated Microwave Peptide Synthesizer

The Biotage® Initiator+ Alstra™ is a fully automated microwave peptide synthesizer with built in flexibility for both small and large scale synthesis.

Microwave irradiation is a fast and precise heating method for the synthesis of peptides at elevated temperatures providing dramatic reductions in synthesis time along with an increase in crude purity and yield compared to conventional synthesis methods. With functionality such as the unique Branches™ tool, preactivation, “edit on the fly” as standard and with options for UV monitoring and microwave assisted organic synthesis (MAOS) makes Initiator+ Alstra™ the ideal tool for synthesizing interesting peptides, peptoids, PNAs, peptidomimetics and macrocyclic peptides.

### Flexibility is at the heart of the instrument

The flexible reagent setup and modular amino acid racks allow different coupling strategies which require different reagents to be easily accomplished. Place the amino acids or reagents anywhere on the rack tray.

Flexible synthesis scales from 5 µmol - 2 mmol easily accommodates most laboratory synthesis scale requirements.

Peptide synthesis is performed in disposable reactor vials which can be easily inserted and removed without requiring cumbersome disconnection of parts to change synthesis scales.

Digital syringe pumps guarantee accurate dispensing of all reagents, and the dual needle design reduces the possibility of cross contamination. The patented oscillating mixing

Simplicity of operation using the versatile touch screen interface.

Flexible rack set-up allows reagents to be positioned anywhere.



Cover plates with option to add nitrogen flow over the reagents using the Inert Gas manifold option.

Five reagent bottles allowing different coupling reagents and capping steps during a synthesis.

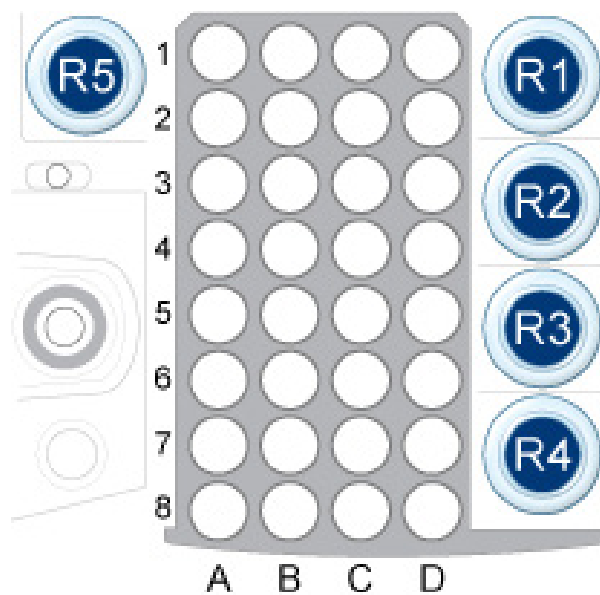
The robot liquid handler accurately dispenses the exact amount of reagents required and can dispense as little as 100 µl.

Three external system solvents.

technology (US 9534011) is superior to nitrogen gas bubbling and ensures homogeneous heat distribution and efficient mixing of reagents up to 2 mmol scale synthesis.

The integrated computer with 10" touch screen controls all the instrument functions. This avoids the need for an external computer thus reducing footprint as space is a valuable commodity in today's research laboratories.

Standard rack showing 5 x 185 mL reagent bottles and 32 x 30 mL amino acid rack.



## Software Features

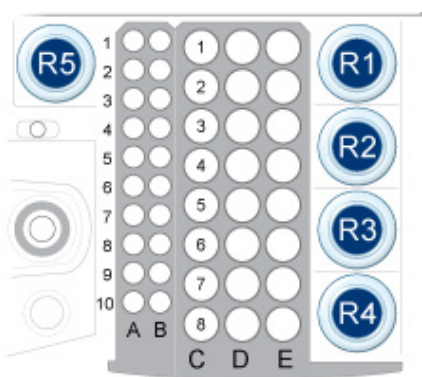
Biotage® Initiator+ Alstra comes with the most user friendly, intuitive and flexible software on the market.

- » No need to create methods for each scale. Just input the scale that you want and select the vial size and the methods which adjusts the reagent quantities accordingly.
- » Fully automate all cycles and/or use semi-automated operations where the Fmoc deprotection and washing steps are automated and then manually add expensive building blocks. This gives you complete control over all reaction steps.
- » Easily pause and re-start a synthesis to remove samples, for monitoring and analysis of intermediate reaction steps, without cumbersome steps just to remove a reactor vial.
- » Assigning positions to non-standard/non-natural amino acids is straightforward and no different than standard amino acids. Using the touch screen just drag and drop to the desired position.
- » Comes with pre-installed methods which are easily customized.
- » Custom methods can be easily changed for different scales for the same vial size.
- » Easily write methods from scratch, enabling full automation of orthogonal protecting group removal, macrocyclization, or many other chemistries.

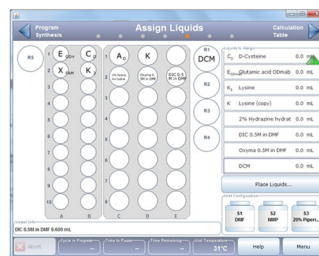
### Preactivation/Premixing

Choose to activate the amino acid *in situ* or preactivate any amino acid in a cycle as required.

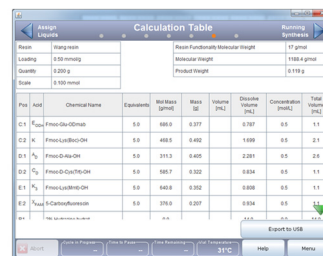
- » Preactivate any position in the sequence.
- » Set the time required for preactivation reaction to occur.
- » Use a designated position on the amino acid rack for premixing to occur.
- » Allows dispensing into the amino acid rack which can be used for other premixing type operations.



Preactivation rack (optional accessory).



Easy to program using the intuitive software wizard.

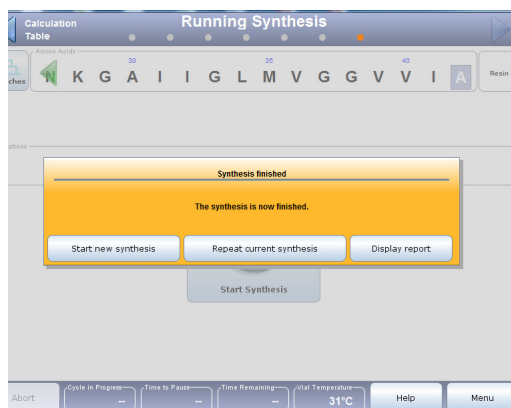


Calculation table can be exported as a pdf document.

### E-mail Notification

Let Initiator+ Alstra™ keep you informed when you are away from the instrument. Receive notification:

- » At the end of a synthesis run
- » When a pause step has been set after an operation
- » When a programmed manual step requires to be executed
- » When an error occurs



Notification when synthesis completed.



## “Edit on the Fly”

This is a very powerful tool providing the user with even more control during a peptide synthesis run, just like in manual synthesis, and allows the user to:

- » Make changes to a synthesis that is already in progress (after pausing operation).
- » Pause and check a coupling and make changes based on the result without having to reprogram the synthesis, with the additional volume of reagents required adjusted in the calculation table.
- » Make changes to a manual, semi-automated or automated operation.
- » Avoid unnecessary double couplings and easy to implement if required thereby conserving valuable building blocks.

Assign Liquids		Calculation Table						Running Synthesis		
Resin	Rink amide ChemMatrix	Resin Functionality	Molecular Weight			17 g/mol				
Loading	0.52 mmol/g	Molecular Weight			1052.5 g/mol					
Quantity	0.192 g	Product Weight			0.106 g					
Scale	0.100 mmol									
Pos	Acid	Chemical Name	Equivalen.	Mol Mass [g/mol]	Mass [g]	Volume [mL]	Dissolve Volume [mL]	Concentration [mol/L]	Total Volume [mL]	Diff Volume [mL]
C:1	I	Fmoc-Ile-OH	5.0	353.4	0.371		1.804	0.5	2.1	
C:2	Q	Fmoc-Gln(Trt)-OH	5.0	610.7	0.641		1.57	0.5	2.1	1.0*
D:1	Y	Fmoc-Tyr(tBu)-OH	5.0	459.6	0.253		0.894	0.5	1.0	
D:2	V	Fmoc-Val-OH	5.0	339.4	0.187		0.952	0.5	1.0	
R:1		DIC 0.5M in DMF	5.0	126.2		1.239	14.761	0.5	16.0	1.0*
R:2		Oxyma 0.5M in DMF	5.0	142.1	1.137		16.0	0.5	16.0	1.0*
S:1		DMF				0.0			895.9	64.9*

\* Indicates volume change after synthesis paused

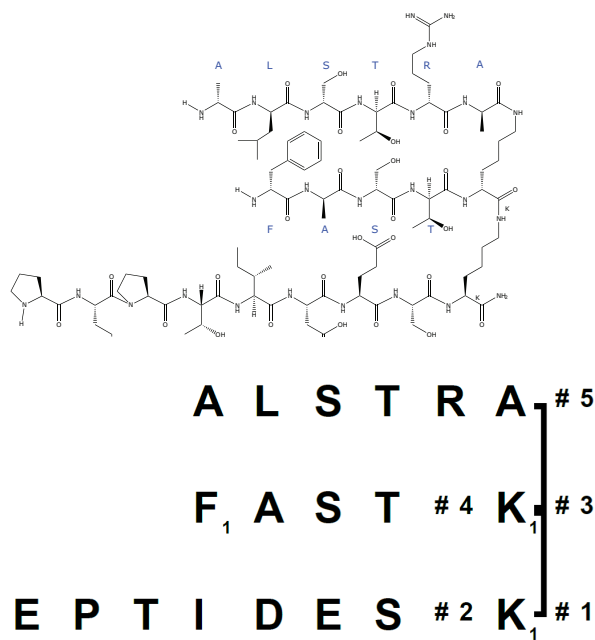
Export to USB

Abort Cycle in Progress 1/10 (G) Time to Pause Time Remaining 07:25:34 Vial Temperature 31°C Help Menu

Calculation table adjusted after changes.

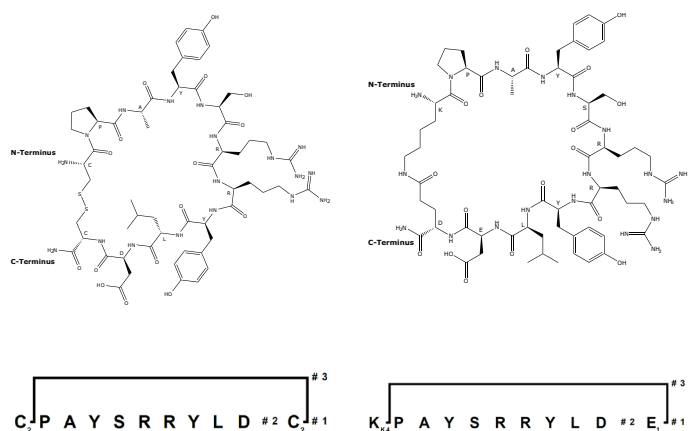
## Branches™

Synthesize cyclic and branched peptides with confidence. Branches™ is a unique tool that simplifies the automation of complex peptide modifications. It allows skilled peptide chemists to assign custom methods and enables scheduling and visualization of operations and can be used with either fully automated or semi-automated protocols.



Top: complex multi-branched peptide synthesized on Biotage® Initiator+ Alstra using the Branches™ feature.

Bottom: Branches™ representation of complex branched peptide.



Cyclic peptides made on Biotage® Initiator+ Alstra using the Branches™ feature. Structure formula (top) and on-screen representation (bottom).

Left: Cyclic peptide formed *via* disulfide bridge using Branches™.

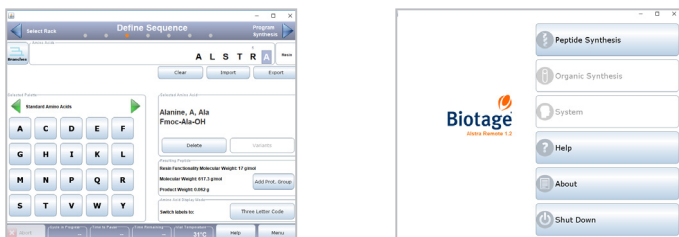
Right: Cyclic peptide formed *via* side-chain to side-chain coupling using Branches™.

## Learn More

- Automated synthesis of cyclic peptides  
**Application Note - AN093**
- Automated synthesis of a complex Multi-branched peptide  
**Application Note - AN094**
- Synthesis of a branched peptidoglycan Mimic and MAP  
**Application Note - AN097**

## Optional Accessories

### Alstra™ Remote



The Alstra™ Remote software provides users the ability to program a complete synthesis setup on their own computer off-line, including calculation of reagents required which can be prepared in advance of a synthesis. The synthesis setup file can then be imported and run on a Biotage® Initiator+ Alstra™ microwave peptide synthesizer. This improves productivity and minimizes turnaround time between consecutive syntheses, which is an important requirement in a multi-user laboratory environment.

### Microwave Assisted Organic Synthesis (MAOS)

The Alstra MAOS kit enables Biotage® Initiator+ Alstra™ to be used as a high-end specification microwave synthesizer, providing access to higher temperatures and pressures of up to 300 °C and 30 bar. Easily switch between microwave peptide and microwave organic synthesis modes of operation, which is useful when synthesizing challenging non-natural building blocks in MAOS mode and then incorporating into a peptidomimetic in peptide mode. This dual capability uses two types of mixing; oscillating mixing for peptide synthesis and magnetic stirring for organic synthesis. Utilize all Biotage glass microwave reaction vials, from 0.2 to 20 mL.



Organic synthesis mode.

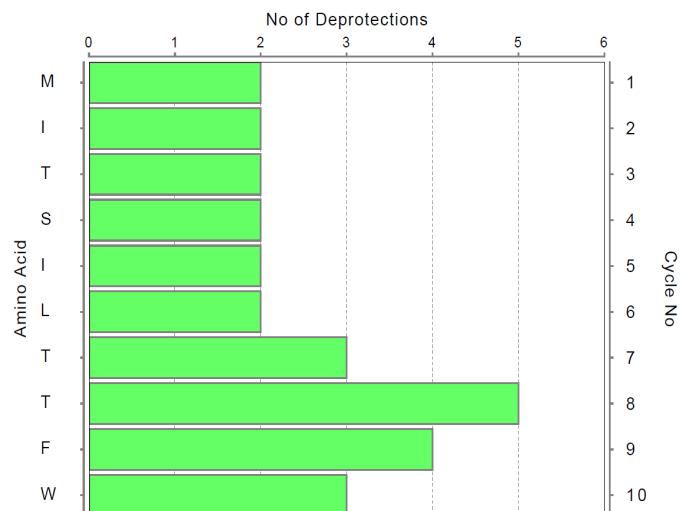
## Learn More



Microwave assisted organic and peptide synthesis of a non-natural arginine residue and incorporation into a cyclic peptide mupain-1 analogue  
**Application Note - AN111**

## UV Monitoring

The Alstra UV monitoring kit enables the Initiator+ Alstra™ to perform UV monitored Fmoc deprotection in the 10 or 30 mL reactor vial. Based on the UV data, you can automatically set the number of deprotection steps (iterations) to be performed and make adjustments to the next coupling method such as extending the time of coupling or increase the number of couplings to be performed. The information is presented clearly for each cycle in the synthesis report and also in the final summary for the complete synthesis.

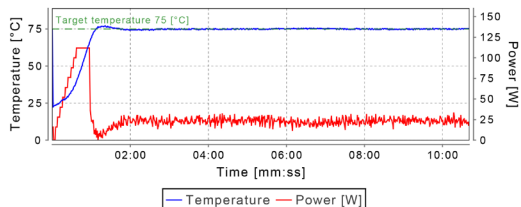


Complete synthesis summary using UV monitoring.

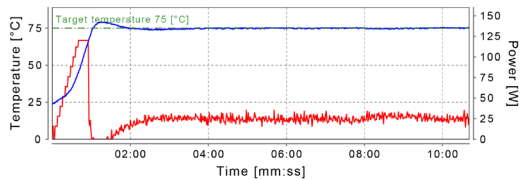
Deprot. no	Time (mm:ss)	Liquid	Extend Next Coupling (mm:ss)	Repeat Next Coupling	Status
1	3:00	20% Piperidine in DMF	0:00	-	●
2	10:00	20% Piperidine in DMF	0:00	-	●
3	10:00	20% Piperidine in DMF	0:00	Twice	●

### DIC/Oxyma 10 min, 2014-01-16 00:43

Reaction: Temp: 75°C Time (mm:ss): 10:00 Oscillating Mixer: On



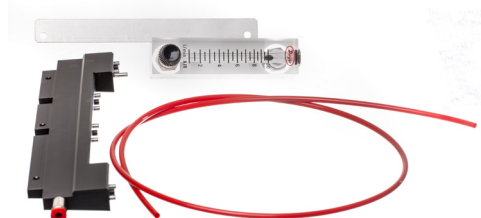
Reaction: Temp: 75°C Time (mm:ss): 10:00 Oscillating Mixer: On



Cycle summary using UV monitoring.

## Inert Gas Manifold

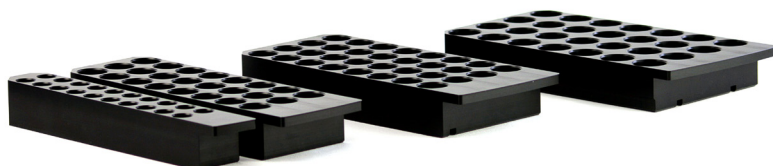
Inert gas can be connected as standard to the microwave cavity on Biotage® Initiator+ Alstra™ systems. However, the inert gas manifold is an optional accessory. When used with the cover plates, it enables nitrogen flow over the reagents on the rack tray, thereby keeping Fmoc amino acids and reagents under an inert atmosphere.



Inert gas manifold includes manifold and regulator.

## Amino Acid Racks

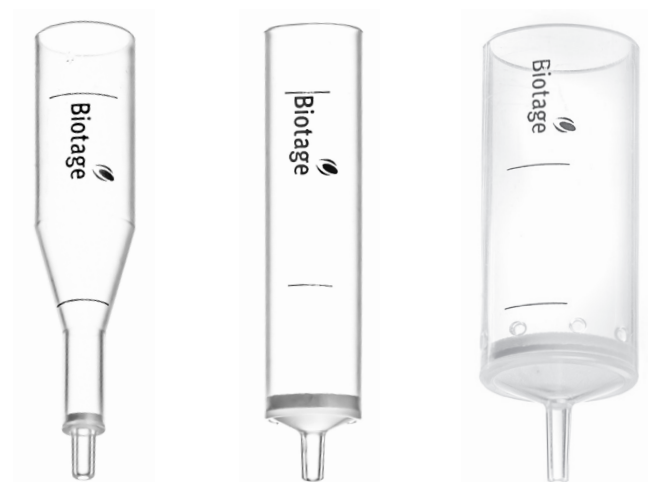
Additional amino acid rack options are available for smaller (10 mL) and larger tubes (50 mL).



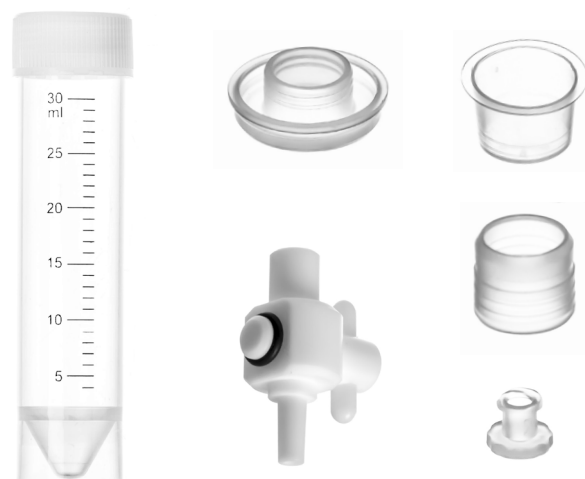
Modular racks allows for flexible reagent setup.

## Consumables

A wide variety of consumables are available for use with Initiator+ Alstra.



Peptide synthesis is performed in disposable polypropylene reactor vials with PTFE frits. Available in three sizes: 5 mL, 10 mL and 30 mL.



Other consumables include amino acid tubes, vial extensions, caps, plugs and PTFE stop cocks are available.

## Learn More

- Peptide Synthesis Workflow Solutions  
**Customer Case - AN439**

Using Biotage® Initiator+ Alstra™ in PNA & Peptide Research  
**Customer Case - PPS410**

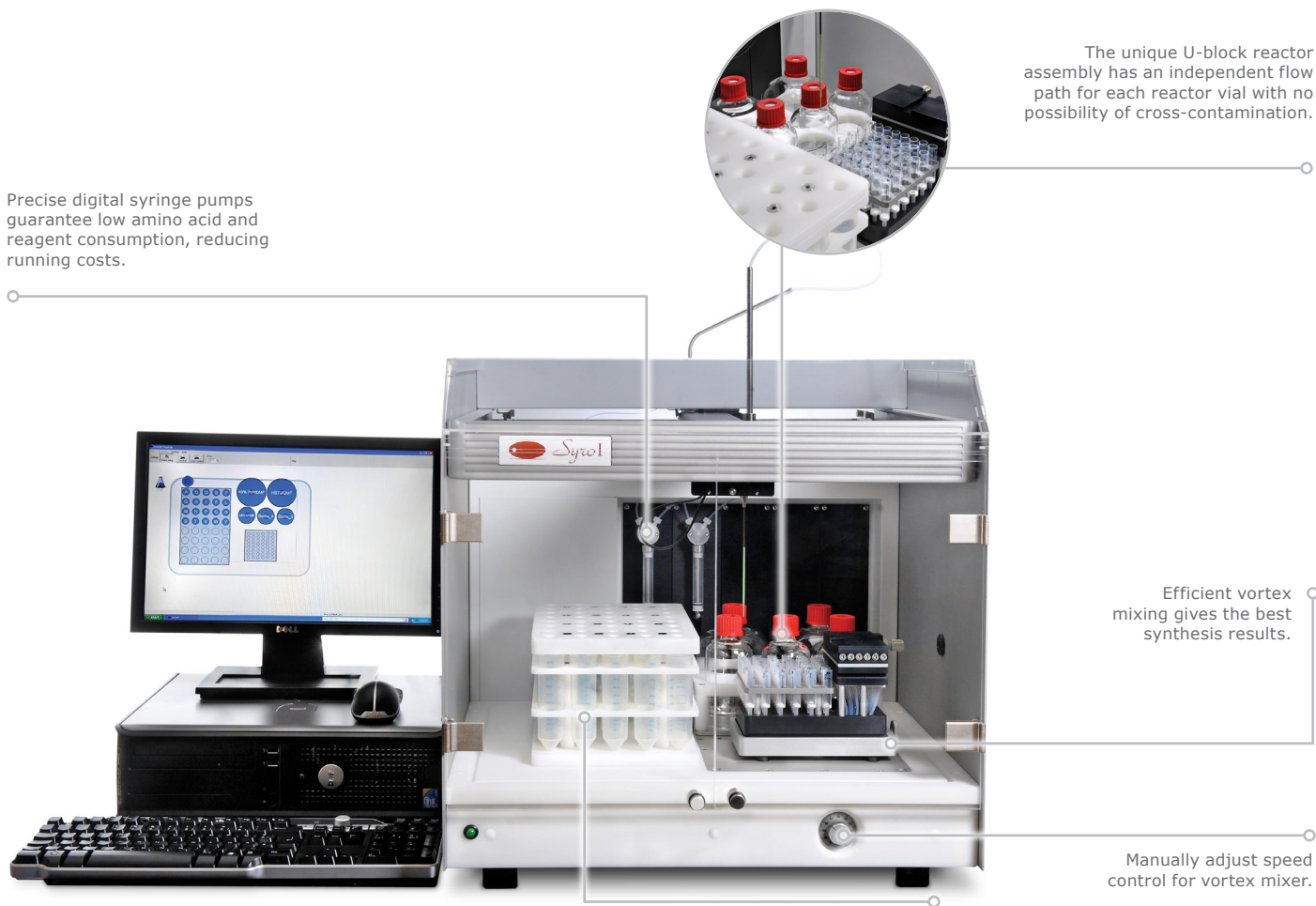
Peptide Workflow at Red Glead Discovery  
**Customer Case - PPS524**

Microwave Assisted synthesis of Peptide Nucleic Acid (PNA) oligomers  
**Application Note - AN110**

High recovery and yield of Amphipathic peptide “18A”  
**Application Note - AN103**

Small μmol Scale Synthesis of a Labeled Antimicrobial Peptide using Biotage® Initiator+ Alstra™  
**Application Note - AN098**

Large Scale Microwave Heated SPPS Using Biotage® Initiator+ Alstra™  
**Application Note - AN068**



Precise digital syringe pumps guarantee low amino acid and reagent consumption, reducing running costs.

The unique U-block reactor assembly has an independent flow path for each reactor vial with no possibility of cross-contamination.

Efficient vortex mixing gives the best synthesis results.

Manually adjust speed control for vortex mixer.

Syro I configured with 24-position reactor block.

Custom amino acid rack configurations are available. Please enquire for more information.

## Syro I and II

### Automated Parallel Peptide Synthesizers

Syro I and Syro II systems are fully automated computer controlled peptide synthesizers with one or two pipetting robot arms. They are the perfect choice for demanding peptide synthesis applications.

Automated parallel operation allows for the synthesis of more peptides in shorter times. The Syro I system is configured with one reactor block, and the Syro II can be configured with two reactor blocks for maximum throughput and productivity.

Digital syringe pumps enable exact dispensing of all reactants with microliter precision minimizing waste and costs. Optimal mixing of the reactants is provided by a variable speed vortex mixer. This guarantees the best synthesis results in terms of yield and purity.

The Syro software controls the instrument functions and calculates all amounts and volumes of amino acids and reagents required. Each cycle of the synthesis can receive a completely different protocol. This flexibility allows not only single or multiple couplings, but also complete freedom in the choice of coupling strategies within any synthesis cycle.

#### Inert Gas

This option enables a way to exclude moisture during peptide synthesis by providing a “blanket” of nitrogen above the reagent bottles, amino acid rack and reactor vials.

#### Tip Synthesis

This option is designed for applications that require large numbers of peptides in small quantities (1–5 μmol).

Intuitive Syro software controls instrument functions and generates calculation sheet with quantities and volumes of amino acids and reagents required.

Supplied with desktop PC, monitor and printer.

Exhaust fan.

3-tip washcomb for fast washing and dispensing of reagents and solvents from external bottles.



Syro II configured with Inert Gas and Tip Synthesis options.

Flexible reactor block formats increases synthesis throughput and results in the highest productivity.

## Heating Blocks

This option enables parallel peptide synthesis at elevated temperatures to increase the speed of amide bond formation.

## Syro I and II at a Glance

	Syro I	Syro II
Robot arms	1	2
Reactor blocks	1	2
Digital syringe pumps	2	4
Reagent bottles	2 x 500 mL 3 x 200 mL	3 x 500 mL 4 x 200 mL
External bottle positions	1	3
Waste bottle	10 L	20 L

“ We chose the Syro because we synthesize non-standard peptides and therefore, an instrument capable of synthesizing small quantities of different peptides on a flexible scale was an absolute requirement.”

*Director, Biopharmaceutical Co., Japan*

## Learn More

Synthesis of Peptides in Parallel at Elevated Temperatures, Using the Heating Blocks for Syro Automated Parallel Peptide Synthesizers  
**Application Note - AN081**

High Throughput Synthesis of over 1700 O-Glycopeptides for the Construction of Novel Peptide Microarrays  
**Application Note - AN096**

## Syro Options

Configure your Syro synthesizer by making five essential pre-order selections:

- » Syro base system
- » Voltage
- » Reactor blocks
- » Inert gas
- » Tip synthesis

### 1 Select Syro System Type



Syro I (one robot arm and one reactor block)



Syro II (two robot arms and two reactor blocks)

### 2 Select Region/Power Requirements

Select the power requirements applicable for your region.

- » 115 V, 60 Hz
- » 230 V, 50 Hz
- » 100 V, 50/60 Hz

### 3 Select Standard Reactor Block



24 position for 2 mL, 5 mL and 10 mL reactor vials, including 24 position empty head.



48 position for 2 mL reactor vials, including 48 position empty head.

## 4 Select or Deselect Inert Gas Option

This option is normally recommended for laboratories that are susceptible to humidity. The inert gas option includes all the gas controls, covers for the amino acid rack (or preactivation rack if selected) and reagent bottles.

### What Is included in the Inert Gas Option?

- » Gas flow controls and pressure regulators
- » Amino acid rack under inert gas
- » Reagent bottles with inert gas caps

Note: Inert gas cover plates for the reactor blocks to be ordered separately.



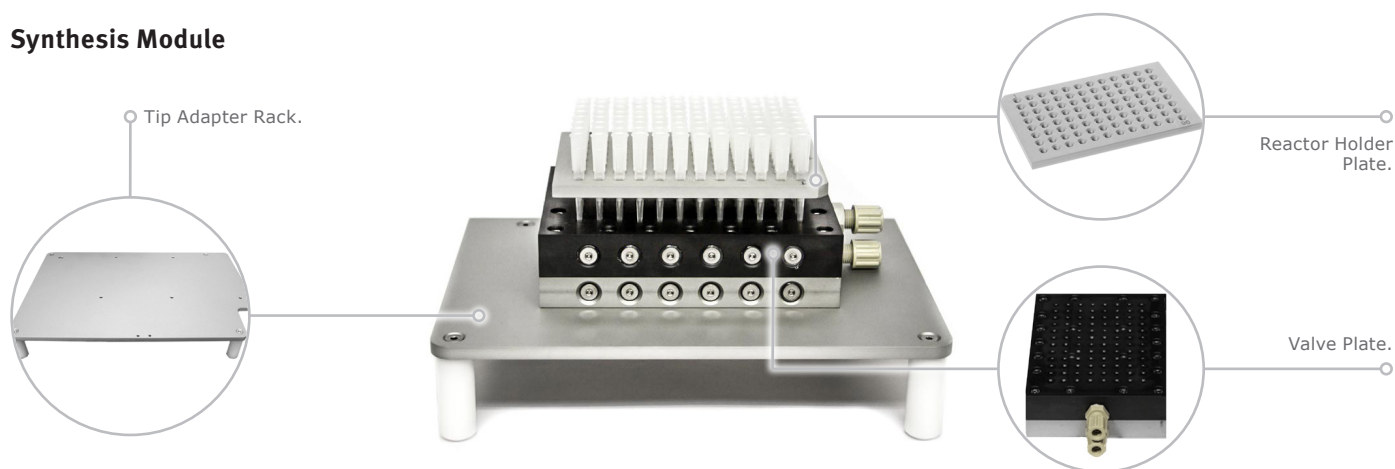
## 5 Select or Deselect Tip Synthesis Option

This option is designed for applications that require large numbers of peptides in small quantities (1–5  $\mu\text{mol}$ ). A Tip Synthesis Module can make up to 96 peptides at a time. Each peptide is synthesized in a 0.4 mL tip (with PE frit) where accurate dispensing of reagents is essential. The Syro I system can be equipped with one Tip Synthesis Module, and the Syro II system can be equipped with three modules in standard configuration, or customized with 6 modules, allowing up to 576 peptides to be made at the same time.

### What is included in the Tip Synthesis option?

- » Vacuum pump box modification
- » Synthesis module
- » Resin dispenser set
- » Cleavage module
- » Pre-activation Rack 50 pos. for 25 x 50 mL/25 x 15 mL tubes

### Synthesis Module



Amino acid pre activation rack 50 positions for 25 x 50 mL and 25 x 15 mL tubes.



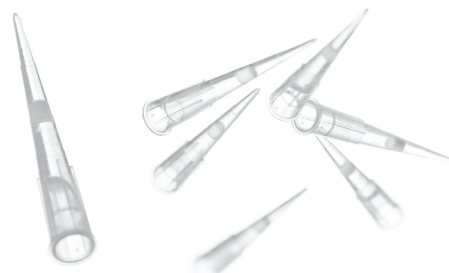
Amino acid pre activation rack 50 positions under inert gas, for 25 x 50 mL and 25 x 15 mL tubes if inert gas option is selected.

### Resin Dispenser Set



Resin dispenser set for dispensing resin into the tip reactors.

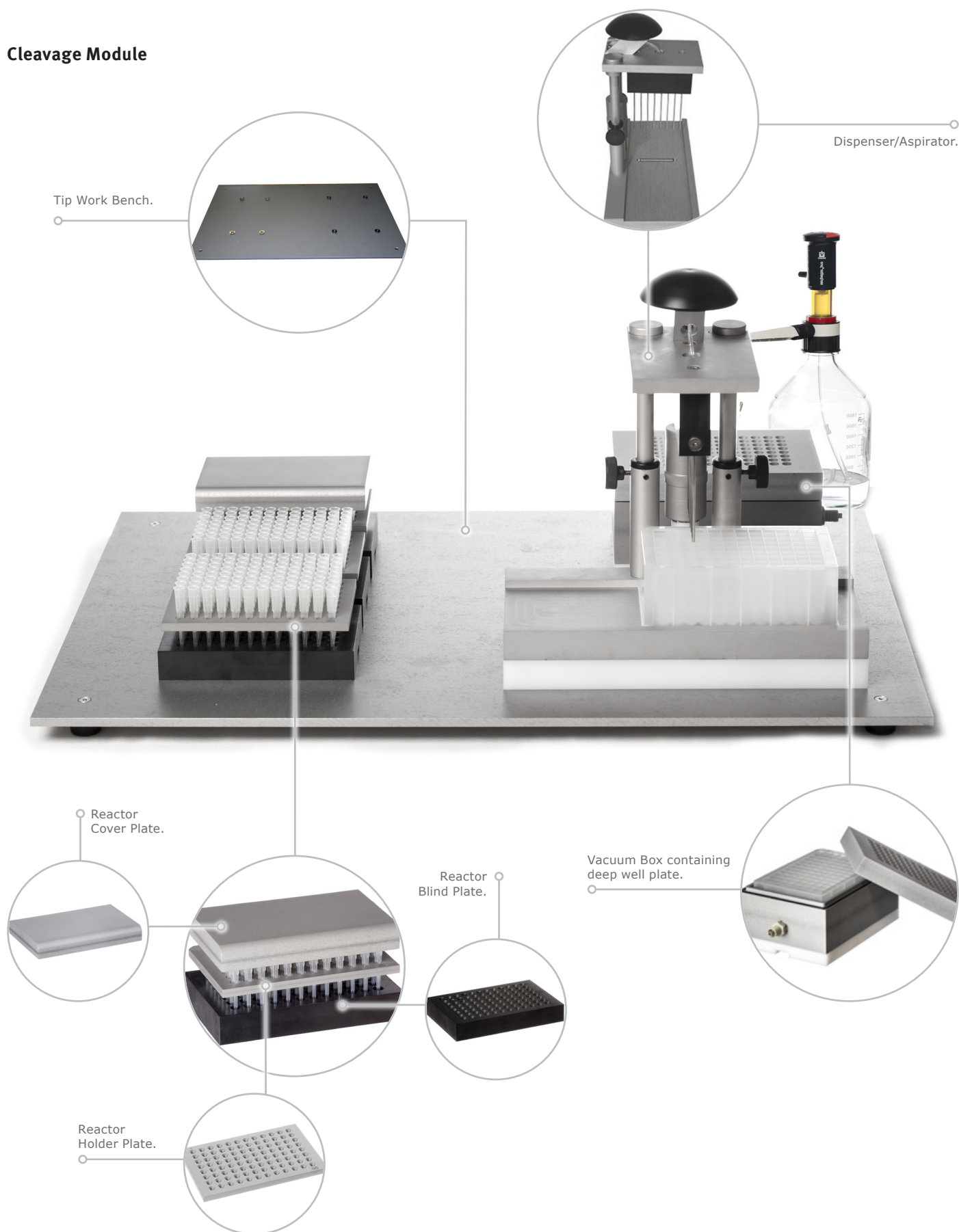
### Tip Reactors



0.4 mL tip reactor with PE frit.

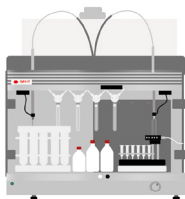


## Cleavage Module



## Syro System Configuration Guide

### 1 Select Syro System Type



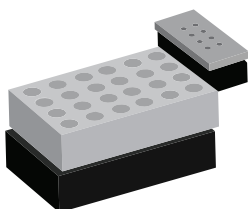
S1PS - Syro I  
S2PS - Syro II

### 2 Select Region/Power Requirements



1 - 60 Hz, 115 VAC (USA)  
2 - 50 Hz, 230 VAC (UK, EU)  
3 - 50/60 Hz, 100 VAC (JPN)

### 3 Select Standard Reactor Block



A - 48 Position (2 mL Reactor Vials)  
B - 24 Position (2 mL, 5 mL, and 10 mL Reactor Vials)

### 4 Select or Deselect Inert Gas Option



IG - Inert Gas Required  
X - Inert Gas Not Required

### 5 Select or Deselect Tip Synthesis Option



TS - Tip Synthesis Required  
X - Tip Synthesis Not Required

### 6 Build Your Syro System Part Number

**S1PS-1-A-IG-TS**

## Syro Workflow Enhancement Accessories

Flexible configurations as your synthesis scale demands change. These optional products can be ordered for your Syro system.

### Reactor Blocks

#### U-blocks (Room Temperature only)

Includes base block and interchangeable adapter racks to fit the reactor vial sizes shown in the table. Requires a corresponding empty head, sold separately.

Adapter rack



#### Empty Heads

Required for use with corresponding reactor blocks.



### Heating Block Kits

The Syro heating block kits are optional accessories for the Syro range of fully automated peptide synthesizers and enables the synthesis of multiple peptides in parallel at elevated temperatures

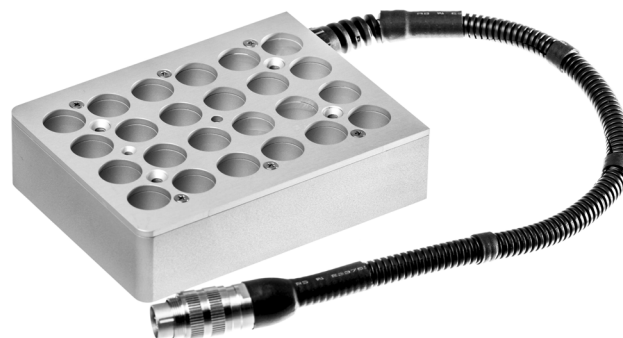
- » Heating block kits now include the heating block(s), heating plate(s) and empty head(s).
- » Some kits for Syro II also include wash tip holder and wash tip holder plates (for the right robot arm) where appropriate and longer screws for the larger footprint heating blocks
- » Temperature control board (sold separately) is also required for installation of heating block kits

**Note:** Service engineer required for field upgrade.



#### Heating Plates

Interchangeable heating plates are available for some heating block configurations.



Summary of reactor block configurations

Reactor Block Configuration	2 mL Reactor	5 mL Reactor	10 mL Reactor	20 mL Reactor	Syro System
12	✓ ✓	✓ ✓	✓ ✓	✓ ✓	I
24	✓ ✓	✓ ✓	✓ ✓		I
48	✓ §				I
18	✓ ✓	✓ ✓	✓ ✓	✓ ✓	II
24	✓ ✓	✓ ✓	✓ ✓		II
36		✓			II
48	✓ § ✓ #	✓ # ✓ #			II
96	✓ ✓				II

✓ Room temperature   
 ✓ Heating plate option   
 § Standard 48 position format   
 # Larger footprint 48 position format

Median reactor vial synthesis scale:\*

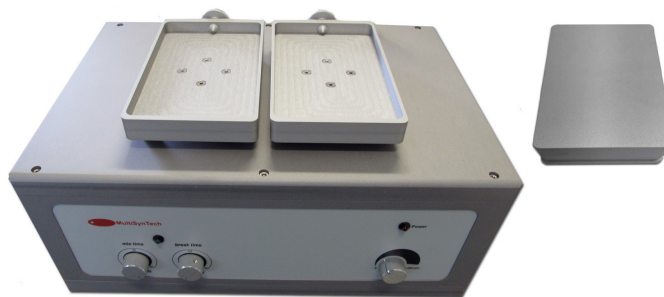
- » 2 mL = 25 µmol                      » 10 mL = 100 µmol
- » 5 mL = 50 µmol                      » 20 mL = 300 µmol

\*Scale is dependent on resin type and resin loading.

**Cleavage**

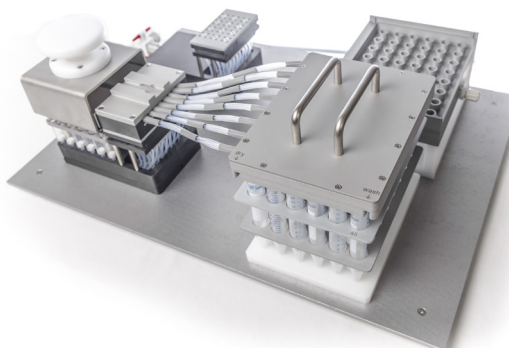
**Standalone Vortex Mixer**

Enables agitation of two reactor blocks during the cleavage step. Includes counter weight to balance vortex mixer when cleaving one standard reactor block.



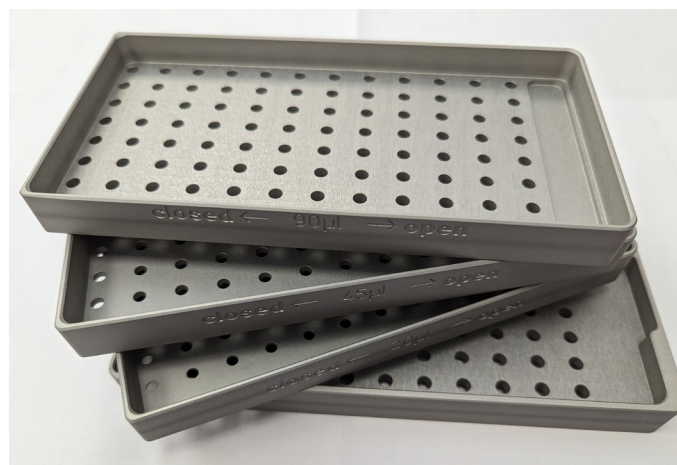
**Transfer Units**

Transfer units for pressure mediated transfer of the cleavage reaction in parallel directly into a collection rack containing centrifuge tubes (2 mL, 15 mL and 50 mL) and now also in 96 position deepwell plates. Available in all formats for both Syro I and Syro II systems.



### Resin Loader Sets

Weighing out resins into reactor vials is a time consuming step. We have created resin loader sets that enable resins to be dispensed into each reactor vial in a fraction of the time. Available for 96 position and larger 48 position formats for Syro II.



## Syro Consumables

### Reactor Vials

Disposable polypropylene reactor vials with PTFE frits are available in various sizes. Compatible with heating blocks and inert gas options. **Note:** 20 mL vials come with PE frits.



2 mL



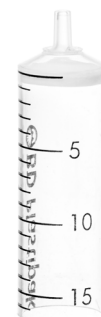
5 mL



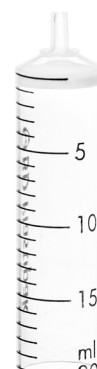
10 mL (inert gas)



10 mL



20 mL (inert gas)



20 mL

### Plungers & Stoppers

Plungers for Syro reactor vials can be used for performing manual cleavage reactions. Stoppers are used to plug unused positions on the reactor block.



2 mL PP plunger



5 mL PP plunger



Position stopper



Luer stopper

# Biotage® Initiator Peptide Workstation

## Manual Microwave Peptide Synthesis

A cost effective and versatile accessory for manual microwave peptide synthesis and cleavage when used with a Biotage® Initiator+ microwave synthesizer.

The Biotage® Initiator Peptide Workstation can be used to perform various types of chemistry including solution phase and solid phase peptide synthesis, organic and PNA synthesis. Reactions are performed in the microwave peptide vial under atmospheric conditions at temperatures up to 100 °C in a Biotage® Initiator+. The vial contents can be filtered quickly and washed using the wash station when connected to a vacuum source.

- » Entry-level microwave peptide synthesis accessory
- » For use on Biotage® Initiator systems without modifications
- » Fast emptying and washing for rapid cycle times
- » Perform solution and solid phase microwave peptide synthesis
- » Reusable 2–5 mL or 10–20 mL microwave peptide vials
- » Synthesis on 50–500 µmol scale
- » Suitable for PNA and peptoid synthesis

### Learn More

Microwave Heating in Solid-Phase Peptide Synthesis:  
Three Degrees of Automation  
Poster - PP043

Reusable snap cap with septum.



Check valve allows for easy emptying of the vial when inserted in the vacuum head.



Attach a vacuum source to the vacuum head for fast and easy emptying.



The microwave peptide vial is available in two different sizes; 2–5 mL and 10–20 mL for synthesis on 50–500 µmol scale respectively.

Material can be collected in a standard GL 45 laboratory glass bottle (shown right), 50 mL centrifuge tube (shown left) or a round bottom flask.

“The Initiator Peptide Workstation is a very versatile add-on to our Initiator, simplifying the workflow considerably for the occasional microwave assisted peptide synthesis.”

*Assistant Professor, Denmark*



Biotage® Initiator+ required (sold separately).



# ⚡ Purification



Biotage® Selekt Enkel



Biotage® Selekt

# Biotage Flash Purification Systems

## A Faster and Greener Way to Purify Peptides

Flash chromatography has been demonstrated to be a very efficient technique to clean-up synthetic peptides.\*The goal of flash purification is to process larger quantities of crude material rapidly and this is now possible for purification of peptides. We can offer close to prep-HPLC performance in a flash format at a fraction of the cost.

The purification step is one of the main bottlenecks in the peptide synthesis workflow. Preparative RP-HPLC is normally the method of choice but is limited by small loading amounts, long separation times, poor recoveries and high costs. In addition, crude synthetic peptides contain impurities with retention characteristics very similar to the target peptide which

can present additional purification challenges. Reverse phase high performance flash chromatography (HPFC) can address these challenges when purifying synthetic peptides.

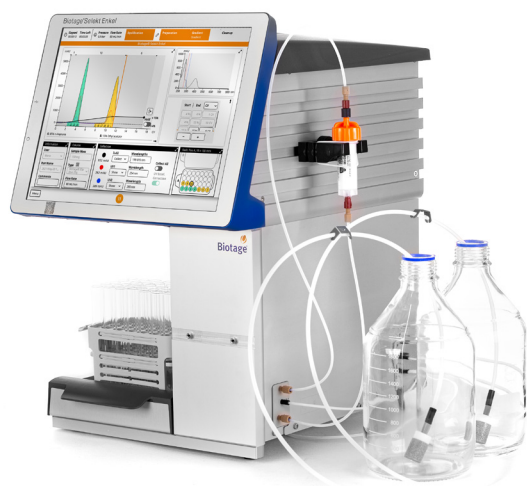
 [Learn More](#)

 [Biotage® Selekt Family Product Brochure - PPS495](#)

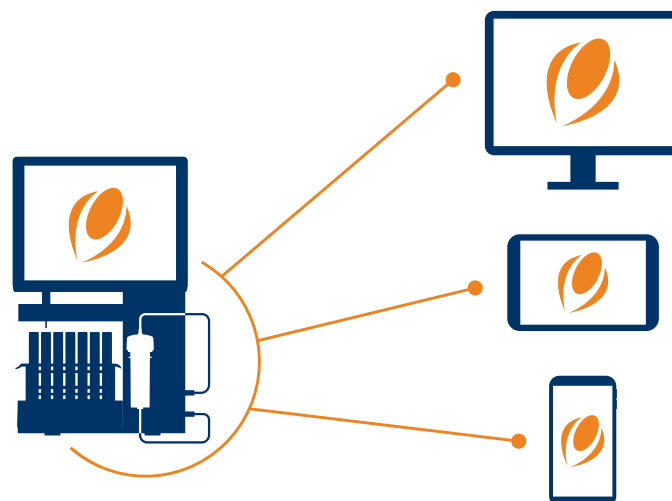
\*Sørensen, K. K.; Mishra, N. K.; Paprocki, M. P.; Mehrotra, A.; Jensen, K. J.; ChemBioChem. 2021, 22, 1-6.

Albin, J. S.; Pentelute, B. L. Aust. J. Chem. 2020, 73, 380-388.





Biotage® Selekt Enkel



Biotage® Selekt Remote Control

## Advanced Automated Flash Purification Systems

### Biotage® Selekt

Biotage® Selekt is a high performance automated flash system with two column channels. With a maximum flow rate of 300 mL/min and a pressure capability of 30 bar, Selekt can routinely run lab scale Sfär columns from 5 to 340 g for laboratory scale reactions.

### Biotage® Selekt Enkel

The Selekt Enkel system is a modular flash system for small-scale applications that can be configured to suit the needs of your laboratory. Selekt Enkel is optimized for applications of columns up to 100 g.

### Biotage® Spektra

Spektra is an optional software package, for the Selekt family, giving full lambda-all spectral data collection and also features baseline correction which negates the effects of solvent compositional changes by real-data baseline subtraction, and wavelength focusing to maximize the response from samples with low absorption. Spektra pushes the envelope on flash detection and fraction collection.

“I would say that around 95% or more of everything we synthesize goes through the Selekt system once”

*Head of Peptide Chemistry, Sweden*

## Why use high Performance flash chromatography for Peptide Purification?

- » Enables fast and efficient purification of peptides and larger molecules.
- » Increased loading capacity compared to prep RP-HPLC which allows more peptide to be processed in a single injection.
- » Reduction in solvent usage and therefore waste compared to RP-HPLC.
- » Depending on the quality of the peptides synthesized, flash chromatography can be adopted in the workflow either as the sole method of purification or as a front end clean-up prior to RP-HPLC.
- » Our flash chromatography solutions have been used to purify peptides, PNA, peptoids and peptidomimetics.
- » Samples can be loaded as a suspension

## Biotage Selekt® Remote Access Technologies


### Remote Access

The accessory consists of two components remote control and monitoring API (application programming interface). This allows the systems to be used from remote locations.

### Security Pack

Incorporating full industry-standard encryption for remote control and monitoring, and login and lock screen options, giving you the ultimate control over your system.

### Learn More

 Biotage® Selekt Remote Access Technologies  
**Product Brochure - PPS715**



Biotage® Sfär Bio columns were developed with a smaller particle size and larger pore size to provide increased resolution and more effective separation of complex peptide mixtures.

## Biotage® Sfär Bio

### Flash Purification Columns for Purification of Peptides

Biotage’s instrumentation is complemented by a complete range of flash columns optimized for use on Biotage flash purification systems. Our various reversed phase media types can address the different peptide purities required for diverse applications.

Biotage® Sfär Bio is a new range of high performance flash cartridges developed with a small particle size (20 µm) and larger pore size (~300 Å) for reversed phase purification of peptides and other larger molecules. Sfär Bio is available in C18 and C4 formats.

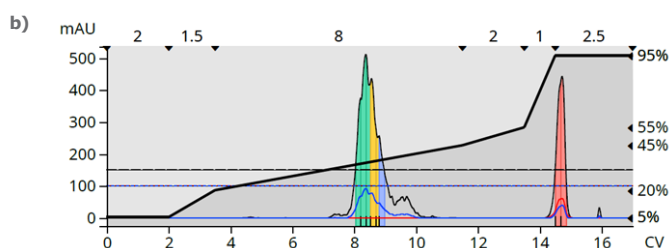
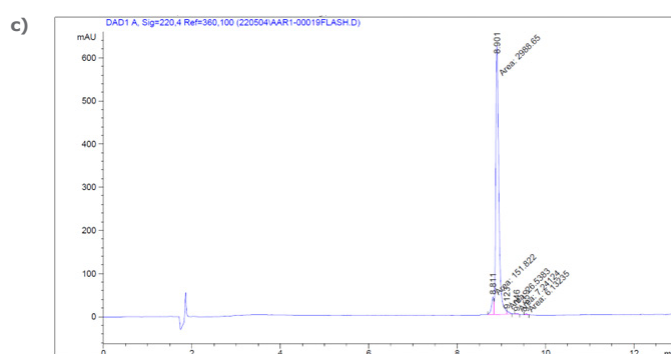
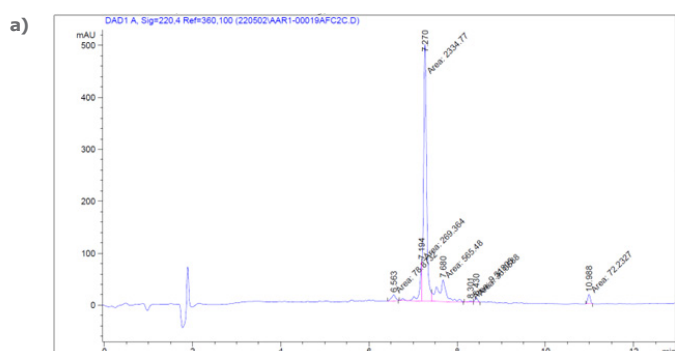
Depending on the purity profile of the peptide, high performance flash chromatography can be used to purify a large quantity of a peptide in a single injection or to enrich an impure crude peptide subsequent to final purification by RP-HPLC.



Samplets are also available for some media types, which can act as a guard cartridge.

## Biotage Reversed Phase Columns

Columns	Silica	Particle Size ( $\mu\text{m}$ )	Pore Diameter ( $\text{\AA}$ )
Biotage® Sfär C18 Duo 100 $\text{\AA}$ 30 $\mu\text{m}$		30	100
Biotage® Sfär Bio C18 Duo 300 $\text{\AA}$ 20 $\mu\text{m}$		20	300
Biotage® Sfär Bio C4 D Duo 300 $\text{\AA}$ 20 $\mu\text{m}$		20	300



### Example of High Performance Flash Chromatography


a. HPLC chromatogram of calcitonin peptide, 69% crude purity.


b. Biotage® Selekt chromatogram of flash purified calcitonin peptide.


c. HPLC chromatogram of flash purified calcitonin peptide, >93% purity.


The 32 aa calcitonin peptide was synthesized on a Biotage® Initiator+Alstra® on 0.125 mmol scale on TentaGel S RAM resin (0.22 mmol/g) using NBP as solvent (20% piperidine in NBP and DIC/Oxyma in NBP).


## Learn More


 Using Peptide Synthesizers for Discovery of Non-standard Peptides  
**Customer Case - PPS406**


 Peptide Synthesis Workflow Solutions  
**Customer Case - PPS439**

 Peptide Workflow at Red Glead Discovery  
**Customer Case - PPS524**

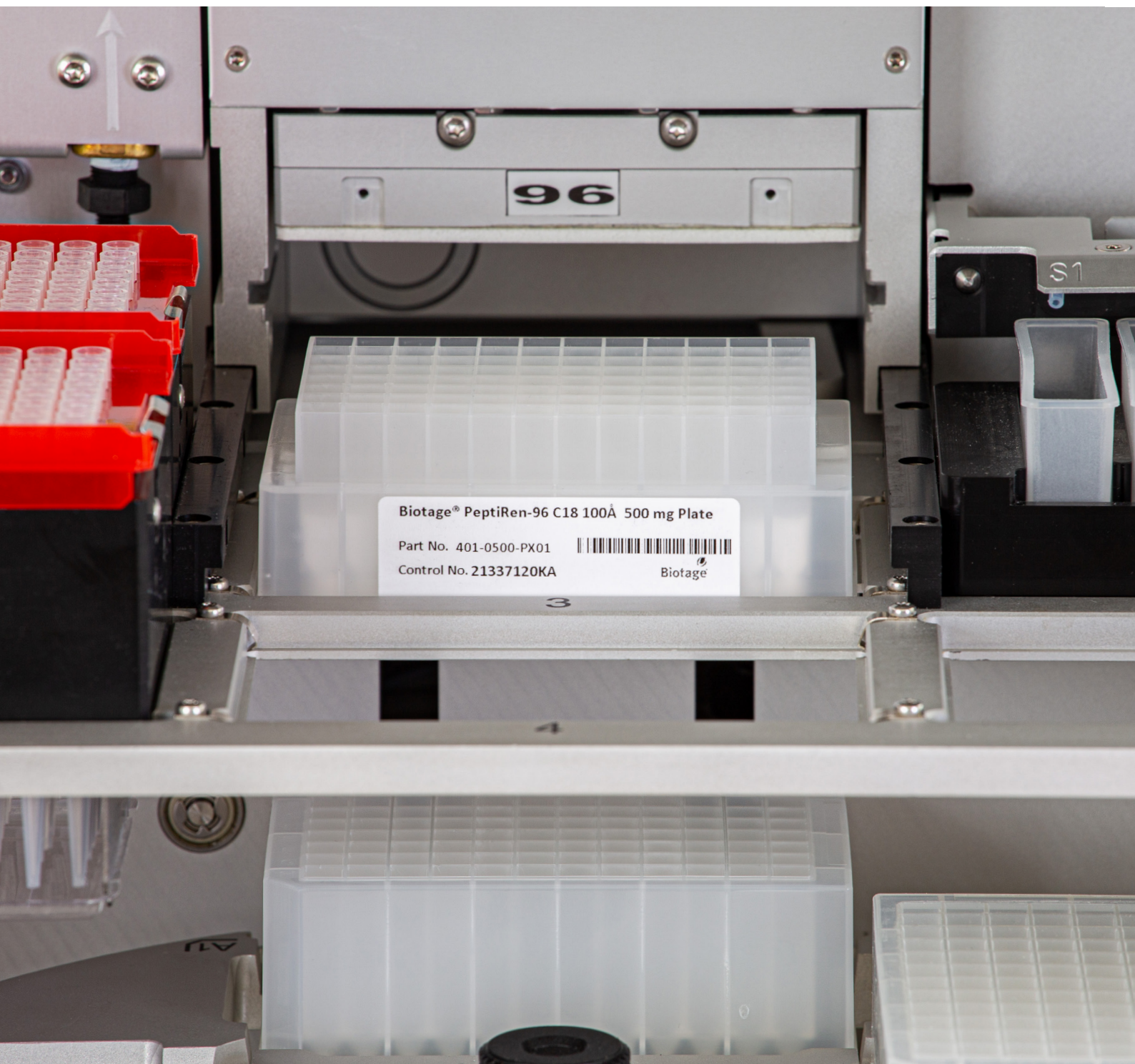
 Flash chromatography, a fast and efficient technique for purification of peptides Part 1  
**Application Note - AN112**

 Flash chromatography, a fast and efficient technique for purification of peptides Part 2  
**Application Note - AN113**

 Biotage® Sfär Columns  
**Product Brochure - PPS497**

 Achieve Highly Pure Peptides with High Performance Flash Chromatography  
**White Paper - PPS510**

# Automated High-Throughput Parallel Peptide Purification





Biotage® PeptiRen-96 C18 plate



Biotage® Extrahera™ - Peptide

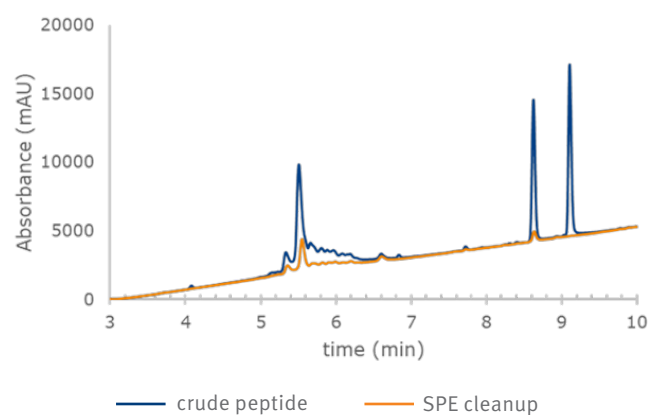
## Parallel Peptide Purification

### Rapid, Environmentally Friendly Purification for Peptide Libraries

When synthesizing peptide libraries, the most time-consuming aspect of the workflow is the purification step. HPLC, traditionally used for peptide purification, is relatively slow, so processing large numbers of samples can become a serious bottleneck, as well as consuming large volumes of solvents. However, it is possible to leverage automated SPE (solid phase extraction) technologies specifically to allow the purification of peptides. Biotage have developed SPE technologies specifically for high-throughput peptide purification applications.

Biotage have developed the Biotage® PeptiRen-96 C18 SPE well plate, designed specifically for the purification of peptide libraries. Containing media specifically developed for peptide clean up, in quantities to suit parallel synthesis protocols, PeptiRen-96 plates are perfectly partnered by the Biotage® Extrahera™ - Peptide workstation, delivering engineered precision in automated sample processing. The result? A complete solution for rapid and environmentally friendly peptide purification – good for you, and great for the planet.

- » **Simpler** – A simple routine protocol to improve peptide purity
- » **Faster** – Reduced purification time through parallel operation; up to 96 peptides at a time
- » **Greener** – Less consumption of organic solvents compared to traditional sequential HPLC chromatography
- » **Cost effective** – enabling increased workflow efficiency and productivity



Crude peptide mixture cleaned up using Biotage® PeptiRen-96 C18 SPE technology.

# Solid Phase Extraction (SPE)

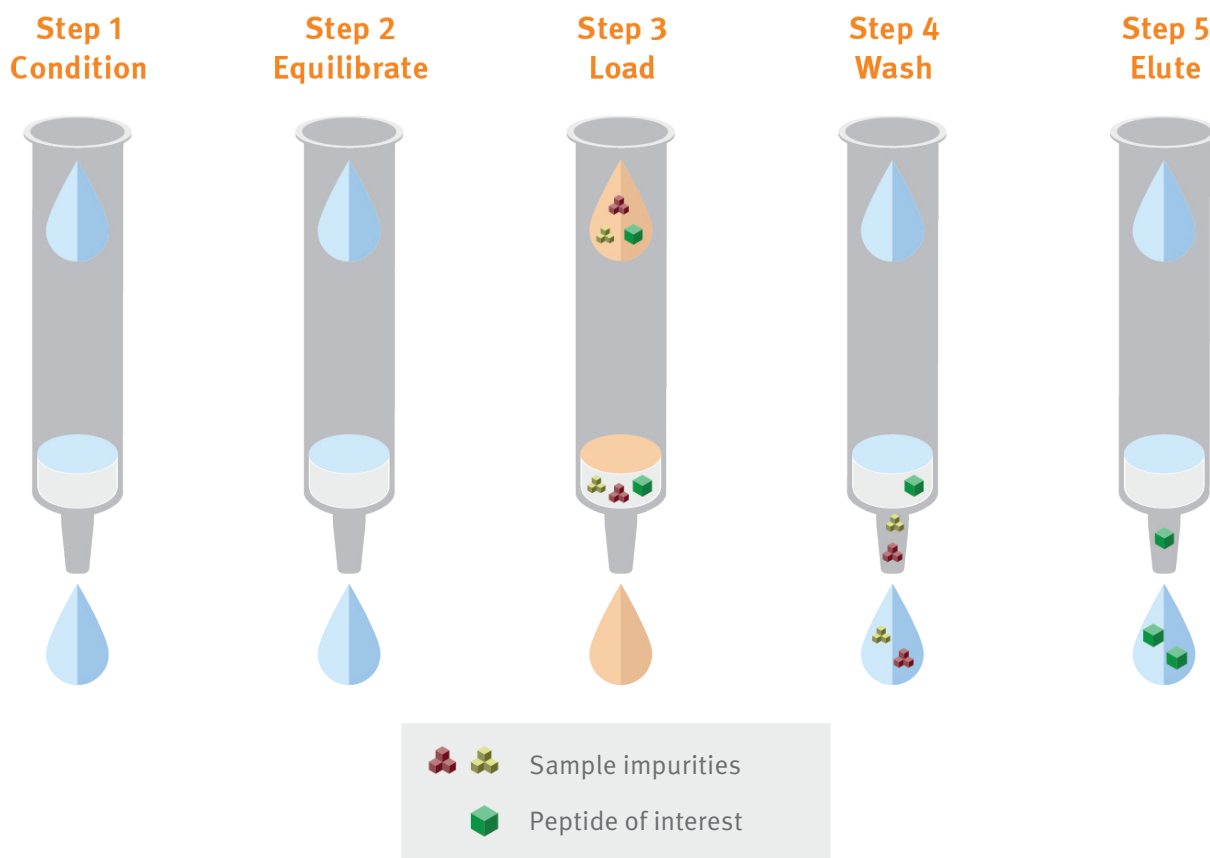
Solid phase extraction (SPE) uses a solid media with physical or chemical adsorption interactions to separate analytes. The media is typically mounted on a sorbent material in the form of a disk, cartridge, or plate. The analytes are retained on the media as the sample passes through the sorbent material and are then eluted using a solvent in which they are soluble. This solution is then retained for analysis, similar to liquid chromatography. To purify crude synthetic peptides by SPE, a reversed phase stationary phase is used, consisting of silica with a C18 bonded phase. This method has been proven effective for peptide purification via reversed phase high-performance flash chromatography.

## The Process of Using the Biotage® PeptiRen-96 C18 Plate for Peptide Purification involves Five main Steps:

**1. Condition:** Before loading samples onto the Biotage® PeptiRen-96 C18 plate, it's necessary to solvate (condition) the sorbent to ensure a proper phase interface between the sorbent and the sample.

- 2. Equilibrate:** The next step involves using a solvent system with low organic concentration (mobile phase) to prepare the media for sample load. This process is called equilibration.
- 3. Load:** After equilibration, peptide samples can be loaded onto the Biotage® PeptiRen-96 C18 plate and retained on the sorbent.
- 4. Wash:** The wash step is performed to remove un-retained compounds (impurities) from the sorbent. Multiple wash conditions can be employed depending on the specific requirements of the sample.
- 5. Elute:** Once the impurities have been removed, the compounds of interest can be eluted from the sorbent and collected for further analysis.





We are using SPE to enrich the purity of the target peptide of interest in the sample.



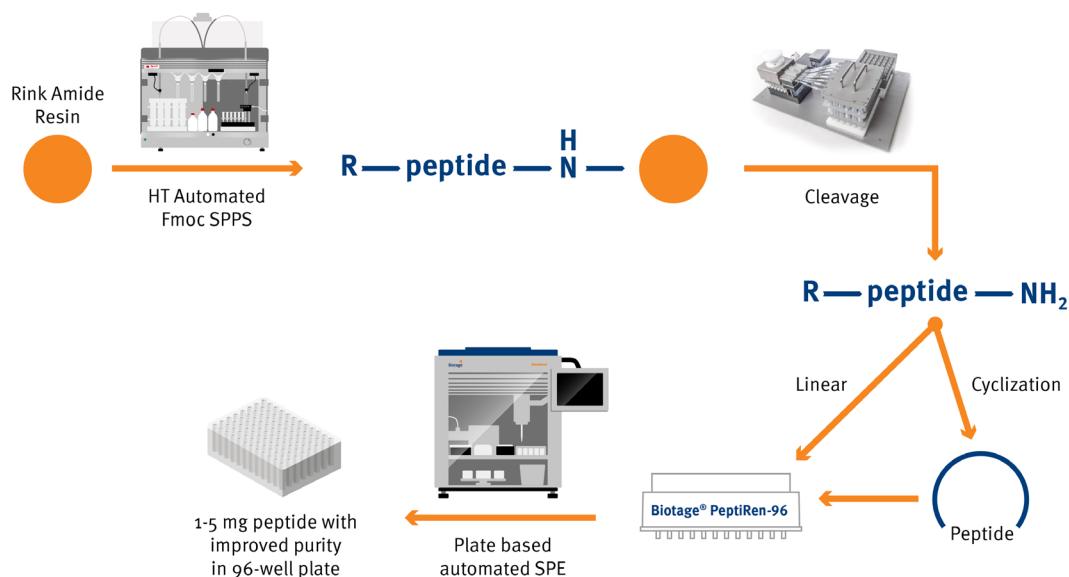
Basic principles of SPE, that works well in plate format.

### Why should you use Biotage® PeptiRen-96 C18 SPE technology with Biotage® Extrahera™ in your laboratory?

- » Enables high-throughput cleanup of 96 peptides simultaneously for screening applications
- » C18 SPE sorbent proven to be effective for peptide purification
- » Remove disruptive by-products such as salts and residual side chain protecting groups
- » Easily remove chromatographically distinct components
- » Exchange salt counter ions
- » Sustainable purification; save on solvents, save time, and save money
- » Clean up cyclic and linear peptide sequences
- » Maximize recovery with known HPLC elution conditions
- » Have sufficient yield and purity for downstream bioactivity assays
- » Biotage® Extrahera™ SPE methods for peptide purification are pre-optimized and included
- » Biotage® Extrahera™ is a proven workhorse in laboratories around the world


Purification Method	Time (H)	Solvent Consumption (L)		
Parallel processing Biotage® PeptiRen-96 plate	1.55	1		
Sequential processing RP-HPLC (35 min run)	56	50		

Time and solvent consumption for purification of 96 peptides.




Schematic example of high-throughput automated peptide synthesis workflow in big pharma/CRO

### Learn More

 Biotage® PeptiRen-96 Product Brochure - PPS714

 Parallel Peptide Purification – Sorbent Selection Application Note - AN987

 Unparalleled Peptide Drug Discovery Solutions White Paper - PPS717



☺☺☺ Evaporation



“Without the V-10, our entire workflow must be changed dramatically at significant time and cost.”

Scientist, Biotechnology Co., USA

You can run high-temperature reactions without worrying about solvent removal. Biotage® V-10 Touch rapidly evaporates high boiling-point solvents like DMF, DMSO and NMP.

You can set up a continuous processing of purified fractions automatically by combining Biotage® V-10 Touch with a Gilson liquid handler.



Fitting the V-10 Touch with a carousel allows multiple samples to be evaporated sequentially.



The V-10 Touch can be fitted with a solvent management module, including a pump and a sampling device. This allows aliquots of solvent to be pumped into the V-10 Touch from large volume containers such as a beaker, and evaporated down into a single or multiple vials with the addition of a carousel.

## Biotage® V-10 Touch

Peptide purification can generate a large number of fractions that require concentrating and pooling prior to freeze drying. The powerful Biotage® V-10 Touch solvent evaporation system rapidly dries samples dissolved in both aqueous and organic solvents. It easily evaporates fractions from purification or high boiling-point solvents from syntheses such as NMP or storage solvents such as DMSO.

The built in optimized methods have been designed to protect the sample against overheating or bumping while still maintaining maximum evaporation speed.

### Typical Solvent Evaporation Times Using Default Settings (Including Final Dry)


Solvent	Volume (mL)	Method	Time (min)
NMP	12	Very High Boil	18
DMF	12	Very High Boil	7
DMSO	12	Very High Boil	15
Water	12	Aqueous	16
50% Acetonitrile in Water	12	HPLC Fractions	15
20% Piperidine in DMF	8	Mixed Vol & HPB	7
TFA	5	Volatile	5

### How Does V10-Touch Help Peptide Chemists?

- » Removal of cleavage cocktails.
- » Concentration and pooling of flash or HPLC fractions prior to freeze drying.
- » Removal of high boiling solvents such as DMF, DMSO that are used in synthesis reactions or as storage solvents.
- » Can be used post synthesis or post purification.

### Learn More

 Biotage® V-10 Touch Product Trifold Leaflet - PPS415

 Using Peptide Synthesizers for Discovery of Non-standard Peptides Customer Case - PPS406

 Biotage® V-10 Maintenance Protocols for Peptide Application User Instruction - UI429













# Technical Specifications

## Biotage® Initiator+ Alstra™




<b>Heating Process</b>		
	<b>Temperature Range</b>	40–100 °C
	<b>Temperature Increase</b>	Typically 2–5 °C/s
	<b>Pressure Range</b>	Run at atmospheric pressure
	<b>Power Range</b>	0–120 W at 2.45 GHz
	<b>Reactor Vial Sizes</b>	5, 10 and 30 mL
	<b>Agitation</b>	Oscillating mixing unit
	<b>Reaction Volumes</b>	5 mL (0.6–3.5 mL) 10 mL (3.5–10 mL) 30 mL (4.5–20 mL)
	<b>Inert Gas (microwave Cavity)</b>	Approx. 2 L/min (0.07 cubic feet/min); 0.5 bar (0.05 MPa; 7.25 PSI)
	<b>Inert Gas (Manifold Option)</b>	Approx. 4 L/min (0.14 cubic feet/min); 0.5 bar (0.05 MPa; 7.25 PSI)
<b>Liquid Handling</b>		
	<b>Syringe Pump</b>	3 x digital syringe pumps, with 10 mL sample loop
	<b>Flow Rate</b>	6–50 mL/min
	<b>Reagent Bottles</b>	5 x 185 mL GL45 glass bottles
	<b>Solvent Bottles</b>	1 x 5 L, 1 x 2 L, and 1 x 1 L, GL45 brown glass bottles
	<b>Amino Acid Rack</b>	32 x 30 mL
	<b>Waste Bottle</b>	10 L
<b>Interfaces</b>		
	<b>Interface</b>	10.4" Capacitive Touch
	<b>Ethernet LAN</b>	Complies with IEEE 802.3 (ANSI 8802-3)
	<b>USB</b>	USB 2.0
	<b>Archiving/back-up</b>	Via USB
	<b>Printing</b>	Via LAN
<b>System Requirements</b>		
	<b>Ambient Temperature</b>	Operating Temperature Storage and Transportation Temperature 18–32 °C -25°C to 60°C (-13°F to 140°F)
	<b>Humidity</b>	20–95% at room temperature
	<b>Power Requirements</b>	Europe: 220–240 V~, 50 Hz (5 A) US and Japan: 100–120 V~, 50/60 Hz (10 A)
	<b>Max. Power Consumed</b>	1100 VA
	<b>Weight</b>	42 kg (92.6 lbs.)
	<b>Dimensions (W X D X H)</b>	640 x 430 x 640 mm (25.2" x 16.9" x 25.2")
	<b>Vacuum Pump</b>	Minimum partial pressure: 100 mbar
	<b>Flow Rate</b>	11 L/min (0.4 cubic feet/min)

## Syro I

### System Specification













	<b>Automation</b>	Single robotic arm
	<b>Liquid Handling</b>	Two 5 mL digital syringe pumps
	<b>Agitation</b>	Vortex mixer for reactor block
	<b>Reactor Block (standard)</b>	One U-type reactor block for 2, 5 and 10 mL reactor vials. Choice of either 24 or 48 positions
	<b>Amino Acid Rack</b>	40 x 50 mL
	<b>Reagent Bottle Rack</b>	2 x 500 mL, 3 x 200 mL
	<b>Waste Bottle</b>	1 x 10 liter Nalgene bottle
	<b>Equipment</b>	Includes desktop PC, flat panel monitor, printer, and Syro XP software
	<b>Dimensions (W X D X H)</b>	56.5 cm x 70 cm x 87 cm
	<b>Weight</b>	60 kg
<b>Power Requirements</b>		
	<b>Robot (max. 250 W)</b>	EU: 230 V~, 50 Hz (1.5 A) USA: 120 V~, 60 Hz (2.5 A) Japan: 100 V~, 50/60 Hz (3.0 A)
	<b>Vacuum Pump</b>	EU: 230 V~, 50/60 Hz (1.4 A) USA: 120 V~, 60 Hz (3 A) Japan: 100–115 V~, 50/60 Hz (3.8 A)

### Operational System Specifications




	<b>Inert Gas Consumption</b>	6 L /min at 0.3 bar
	<b>Heating Time</b>	12 h*
	<b>Temp Range</b>	25-90 °C

## Syro II

### System Specification

	<b>Automation</b>	Dual robotic arm with a three tip pipetting washcomb
	<b>Liquid Handling</b>	Four digital syringe pumps - 1 x 5 mL digital syringe pump for amino acid addition, 3 x 10 mL digital syringe pumps for solvent wash and reagent addition.
	<b>Agitation</b>	Vortex mixer for two reactor blocks
	<b>Reactor Block (standard)</b>	Two U-type reactor blocks for 2, 5 and 10 mL reactor vials. Choice of either 24 or 48 positions
	<b>Amino Acid Rack</b>	40 x 50 mL
	<b>Reagent Bottle Rack</b>	3 x 500 mL, 4 x 200 mL
	<b>Waste Bottle</b>	1 x 20 liter Nalgene bottle
	<b>Equipment</b>	Includes desktop PC, flat panel monitor, printer, and Syro XP software
	<b>Dimensions (W X D X H)</b>	88 cm x 69 cm x 88 cm
	<b>Weight</b>	85 kg
<b>Power Requirements</b>		
	<b>Robot (max. 250 W)</b>	EU: 230 V~, 50 Hz (1.5 A) USA: 120 V~, 60 Hz (2.5 A) Japan: 100 V~, 50/60 Hz (3.0 A)
	<b>Vacuum Pump</b>	EU: 230 V~, 50/60 Hz (1.4 A) USA: 120 V~, 60 Hz (3 A) Japan: 100–115 V~, 50/60 Hz (3.8 A)






















### Operational System Specifications

	<b>Inert Gas Consumption</b>	7 L /min at 0.3 bar
	<b>Heating Time</b>	12 h*
	<b>Temp Range</b>	25-90 °C

\*Peptide synthesis normally requires heating to be applied for short periods of time. If applying heat for extended periods of time, solvent evaporation needs to be taken in to account.











# Biotage® Selekt

## General System Specifications













	<b>Location</b>	A laboratory fume hood with the capacity to handle leakage of solvents and provide suitable airflow to prevent the build-up of flammable vapors. For more information, see "Site Requirements" on page 1.
	<b>Ambient Temperature</b>	Operating: 15–32 °C (59–90 °F). Storage and transportation: -25–60 °C (-13–140 °F).
	<b>Humidity</b>	20–95% RH (non-condensing).
	<b>Altitude</b>	Operation: up to 2000 m above sea level.
	<b>Pollution Degree</b>	The system shall be installed in a level 2 environment in accordance with EN 60664-1.
	<b>Electrical Supply</b>	100–127, 220–240 VAC, 50/60 Hz
	<b>Fuses</b>	T4A-250 VAC, P/N 411916 (2 required).
	<b>Max. Power Consumed</b>	300 VA.
	<b>Fluid Path (Wetted) Materials</b>	The wetted parts of the system consist of stainless steel, FFKM, PEEK, PP, PE, FEP, PTFE, silica, carbon fiber filled PTFE, and fused silica, which are not affected by common chromatographic solvents.
	<b>Weight</b>	23–25 kg (50–54 lbs) depending on the system configuration.
	<b>Dimensions</b>	Footprint: (W x D) 335/550 mm x 393 mm (13.2/21.7" x 15.5"). The width depends on using one or two collection trays. Height: (H): 545 mm (21.5") excl secondary solvent containment.
	<b>Interfaces</b>	15.0" (1024 x 768 px) solvent stable TFT LCD touch screen.
	<b>Ports</b>	Ethernet port, 4 USB ports, 2 D-Sub 9-pin ports, and CAN port.
	<b>Data Entry</b>	Touchscreen or USB connection to mouse/keyboard.
	<b>Software</b>	UNIX based Java interface with full on-screen QWERTY keyboard.
	<b>Certification</b>	CE marked and CB and NRTL certified.
	<b>Operational System Specifications</b>	
	<b>Column Channels</b>	Two
		A maximum of 4 x 5 liter reservoirs on the optional secondary solvent containment. Larger reservoirs than 5 liters must be placed elsewhere.
	<b>Solvent Supply</b>	Note: To be compliant with the secondary containment regulations, only use a maximum of 4 x 4 liter reservoirs.
	<b>Fraction Volume</b>	Programmable from 1 to 9999 mL, depending on rack type.
	<b>Max. Number of Fractions</b>	144 fractions with no rack change (288 with two collection trays) using 13 x 100 mm racks.
	<b>Max. Total Fraction Volume</b>	3,840 mL with no rack change (7,680 mL with two collection trays), 480 mL bottle racks.
	<b>Rack Types</b>	13 x 100 mm, 16 x 100 mm, 16 x 150 mm, 18 x 150 mm, 25 x 150 mm, 120 mL, 240 mL, and 480 mL.
	<b>Internal Detector Wavelength</b>	200–400 nm (UV) or 198–810 nm (UV-VIS). Amplitude range: 0 to 6.4 AU (Absorbance Units); accuracy of ±0.04 AU.
	<b>Flow Rate Range</b>	1–300 mL/min, in 1 mL/min increments.
	<b>Pressure Range</b>	0–30 bar (0–3000 kPa; 0–435 psi).
	<b>Gradient Precision</b>	±2%

# Biotage® Selekt Enkel


## General System Specifications

	<b>Location</b>	A laboratory fume hood with the capacity to handle leakage of solvents and provide suitable airflow to prevent the build-up of flammable vapors.
	<b>Ambient Temperature</b>	Operating: 15–32 °C (59–90 °F). Storage and transportation: -25–60 °C (-13–140 °F).
	<b>Humidity</b>	20–90% RH (non-condensing).
	<b>Altitude</b>	Operation: up to 2000 m above sea level.
	<b>Pollution Degree</b>	The system shall be installed in a level 2 environment in accordance with EN 60664-1.
	<b>Electrical Supply</b>	100–127, 220–240 VAC, 50/60 Hz. Connect only to a grounded outlet.
	<b>Fuses</b>	T4A-250 VAC, P/N 411916 (2 required).
	<b>Max. Power Consumed</b>	300 VA.
	<b>Fluid Path (Wetted) Materials</b>	The wetted parts of the system consist of stainless steel, FFKM, PEEK, PP, PE, FEP, PTFE, silica, carbon fiber filled PTFE, and fused silica, which are not affected by common chromatographic solvents.
	<b>Weight</b>	23–25 kg (50–54 lbs.) depending on the system configuration.
	<b>Dimensions</b>	Footprint: (W x D) 335/550 mm x 393 mm (13.2/21.7" x 15.5"). The width depends on using one or two collection trays. Height: 545 mm (21.5") excluding secondary solvent containment.
	<b>Interfaces</b>	15.0" (1024 x 768 px) solvent stable TFT LCD touch screen.
	<b>Ports</b>	Ethernet port(optional), 2 USB ports(4 optional), 1 D-Sub 9-pin ports, and AUX port.
	<b>Data Entry</b>	Touchscreen or USB connection to mouse.
	<b>Software</b>	UNIX based Java interface with full on-screen QWERTY keyboard.
	<b>Certification</b>	CE and FCC marked. CB and NRTL certified.
	<b>Operational System Specifications</b>	
	<b>Column Channels</b>	One
	<b>Solvent Supply</b>	Two solvent lines. A maximum of 4 x 5 liter reservoirs on the optional secondary solvent containment. Larger reservoirs than 5 liters must be placed elsewhere. Note: To be compliant with the secondary containment regulations, do not use containers larger than 4 liters.
	<b>Max. Number of Fractions</b>	144 fractions with no rack change (288 with two collection trays) using 13 x 100 mm racks.
	<b>Max. Total Fraction Volume</b>	3,840 mL with no rack change (7,680 mL with two collection trays), 480 mL bottle racks.
	<b>Rack Types</b>	13 x 100 mm, 16 x 100 mm, 16 x 150 mm, 18 x 150 mm, 25 x 150 mm, 120 mL, 240 mL, and 480 mL.
	<b>Internal Detector Wavelength</b>	200–400 nm (UV). Amplitude range: 0 to 6400 mAU (Absorbance Units); accuracy of ±5 mAU.
	<b>Flow Rate Range</b>	1–150 mL/min, in 1 mL/min increments.
	<b>Pressure Range</b>	0–15 bar (0–1500 kPa; 0–217 psi).
	<b>Gradient Precision</b>	±2%

## Biotage® V-10 Touch

	<b>Solvent Compatibility</b>	Boiling points from 30 °C to 160 °C (up to 205 °C with an external vacuum pump). The system is not suitable for solutions containing HCl at any concentration.		<b>Vial Compatibility</b>	30 mL scintillation vial 20 mL scintillation vial 16 mL vial 8 mL vial 4 mL
	<b>Heating</b>	20 °C to 70 °C		<b>Solvent Reclamation</b>	Up to 98% of solvent vapors under typical conditions
	<b>Rotational Speed</b>	3000 to 8000 rpm		<b>Exhaust</b>	Double trapping
	<b>Condenser</b>	Refrigerated condenser temperature: -25 °C. Automated and manual draining; and manual defrost.		<b>Electrical Supply</b>	220–240 V~, 50 and 60 Hz, 10 A
	<b>Vacuum</b>	Pressure control method: Variable speed and level. Internal vacuum Pump: 2 mbar. Optionally an external vacuum pump can be connected using a KF-16 vacuum flange.		<b>Max. Power Consumed</b>	2100 VA
				<b>Dimensions (WxDxH)</b>	40 cm x 48 cm x 53 cm 15.7" x 18.9" x 20.9"
				<b>Weight</b>	50 kg/110 lbs

## Biotage® Extrahera™

	<b>Liquid Handling</b>	Pipetting Specifications Up to 1000 µL in one aliquot At 50 µL: ±2.0% accuracy and 1.0% CV* At 100 µL: ±2.0% accuracy and 1.0% CV* At 500 µL: ±1.5% accuracy and 1.0% CV* At 1000 µL: ±1.0% accuracy and 1.0% CV*		<b>Electrical Supply</b>	100 to 240 V~, 50/60 Hz Fuses T4A at the power inlet (2 required) Maximum power consumed 300 VA
	<b>Solvent Capacity</b>	5 solvent pumps with automatic feed in from external reservoirs		<b>Pressurized air Supply</b>	>5 L/min (0.18 cubic feet/min), 6 ± 0.2 bar (0.6 ± 0.02 MPa; 87 ± 3 psi)
	<b>Pressure Unit</b>	0–5 bar positive pressure		<b>Inert Gas Supply</b>	>1 L/min (0.04 cubic feet/min), 6 to 10 bar (0.6 to 1.0 MPa; 87 to 145 psi)
	<b>Sample Processor</b>	Format 96-well extraction plates, 96-array plates for 1- and 2-mL wells 96-position extraction racks for 1 mL tabless columns (A format) 24-position extraction racks for 1-, 3-, and 6-mL columns (A, B, and C format)		<b>Vacuum Supply</b>	Partial pressure range: < 500 mbar (50 kPa; 7 psi) Flow rate: ≥ 8.3 L/min (0.29 cubic feet/min)
	<b>Plate Positions</b>	5 positions used for sample, extraction, and mixing plates etc. 4 used for elution		<b>Weight</b>	75 kg (165 lbs.)
	<b>Disposable Tips</b>	1000 µL clear tips and 1000 µL clear wide bore tips		<b>Dimensions (WxDxH)</b>	Without touch screen: 610 x 510 x 730 mm (24.0" x 22.1" x 28.7") With touch screen: 860 x 570 x 730 mm (33.8" x 22.4" x 28.7")
	<b>Temperature</b>	Operating Temperature: 15–32 °C Storage and transportation temperature: -25 °C to 60 °C Humidity 10–95% RH		<b>Max Sound Level</b>	65 dB (A)
				<b>Interfaces</b>	Touch screen 12" Capacitive Touch Ethernet LAN Complies with IEEE 802.3 (ANSI 8802-3) USB 2.0
				<b>Certifications</b>	CE, CSA certified

# Ordering Information

## Synthesis

### Biotage® Initiator+ Alstra™

Product	Part Number
Initiator+ Alstra Microwave Peptide Synthesizer 220–240 V	356017
Initiator+ Alstra Microwave Peptide Synthesizer 110–120 V	356018
Mains Cord (EU)	351693SP
Mains Cord (US/CA)	06232SP
Mains cord (UK)	352669SP
Accessory Kit, Vacuum pump ME1C Extrahera & Alstra	356604SP
Mains Cord (UK)	C128195SP
Mains Cord (US/CA)	C65902SP
Mains Cord (EU)	C67361SP
Vacuum pump ME1C, 100–230 VAC 50–60 Hz	356330SP
<b>Optional Accessories and Consumables</b>	
Inert gas manifold	356208
Alstra UV Monitoring Kit	356444
Alstra MAOS Kit	356445
Alstra Remote™ Software (single licence)	416408
5 mL Reactor vial with PTFE frit 50/pk	356288
10 mL Reactor vial with PTFE frit 50/pk	356289
30 mL Reactor vial with PTFE frit 50/pk	356290
5 mL Reactor vial extension 5/pk	356291
10 mL Reactor vial extension 5/pk	356221
30 mL Reactor vial extension 5/pk	356222
10 mL Amino acid tubes 100/pk	356239
30 mL Amino acid tubes 100/pk	356240
50 mL Amino acid tubes 100/pk	356241
20 x 10 mL Amino acid rack	356162
24 x 30 mL Amino acid rack	356167
32 x 30 mL Amino acid rack	356193
28 x 50 mL Amino acid rack	356198
20 x 10 mL Rack cover plate	356163
24 x 30 mL Rack cover plate	356168
32 x 30 mL Rack cover plate	356194
28 x 50 mL Rack cover plate	356199
R1-4 reagent bottle cover plate	356158
R5 reagent bottle cover plate	356203
20 x 10 mL Foil septa 5/pk	356166

Product	Part Number
24 x 30 mL Foil septa 5/pk	356192
32 x 30 mL Foil septa 5/pk	356197
28 x 50 mL Foil septa 5/pk	356202
R1-4 reagent bottle foil septa 5/pk	356161
R5 reagent bottle foil septa 5/pk	356206
5 mL/10 mL Reactor vial caps 50/pk	356252
30 mL Reactor vial caps 50/pk	356253
Reactor vial plugs 50/pk	356292
185 mL Reagent bottle, glass	356254
Universal PTFE stopcock, 10/pk	121-0009

#### Service

Installation and Familiarization - Biotage® Initiator+ Alstra™	SER-IA-IN
First Year Maintenance Plan - Initiator+ Alstra™	SER-IA-FYMP
Priority Service Agreement - Initiator+ Alstra™	SER-IA-SAP
Extended Warranty - Initiator+ Alstra™	SER-IA-EXW
Peptide Application Training – 1 day	SER-PEP-AT

## Syro I and II

Product	Part Number
<b>Syro I System</b>	
<b>Parallel Peptide Synthesizer 48 x 2 mL Reactor Block</b>	
<b>60 Hz, 115 VAC (USA)</b>	
No options	S1PS-1A-X-X
Inert Gas	S1PS-1A-IG-X
Inert Gas, Tip Synthesis	S1PS-1A-IG-TS
Tip Synthesis	S1PS-1A-X-TS
<b>50 Hz, 230 VAC (UK/EU)</b>	
No options	S1PS-2A-X-X
Inert Gas	S1PS-2A-IG-X
Inert Gas, Tip Synthesis	S1PS-2A-IG-TS
Tip Synthesis	S1PS-2A-X-TS
<b>50/60 Hz, 100 VAC (JPN)</b>	
No options	S1PS-3A-X-X
Inert Gas	S1PS-3A-IG-X
Inert Gas, Tip Synthesis	S1PS-3A-IG-TS
Tip Synthesis	S1PS-3A-X-TS

Product	Part Number	Product	Part Number
<b>Parallel Peptide Synthesizer 24 x 5 mL Reactor Block</b>		<b>Parallel Peptide Synthesizer 2 (24 x 5 mL) Reactor Blocks</b>	
<b>60 Hz, 115 VAC (USA)</b>		<b>60 Hz, 115 VAC (USA)</b>	
No options	S1PS-1B-X-X	No options	S2PS-1B-X-X
Inert Gas	S1PS-1B-IG-X	Inert Gas	S2PS-1B-IG-X
Inert Gas, Tip Synthesis	S1PS-1B-IG-TS	Inert Gas, Tip Synthesis	S2PS-1B-IG-TS
Tip Synthesis	S1PS-1B-X-TS	Tip Synthesis	S2PS-1B-X-TS
<b>50 Hz, 230 VAC (UK/EU)</b>		<b>50 Hz, 230 VAC (UK/EU)</b>	
No options	S1PS-2B-X-X	No options	S2PS-2B-X-X
Inert Gas	S1PS-2B-IG-X	Inert Gas	S2PS-2B-IG-X
Inert Gas, Tip Synthesis	S1PS-2B-IG-TS	Inert Gas, Tip Synthesis	S2PS-2B-IG-TS
Tip Synthesis	S1PS-2B-X-TS	Tip Synthesis	S2PS-2B-X-TS
<b>50/60 Hz, 100 VAC (JPN)</b>		<b>50/60 Hz, 100 VAC (JPN)</b>	
No options	S1PS-3B-X-X	No options	S2PS-3B-X-X
Inert Gas	S1PS-3B-IG-X	Inert Gas	S2PS-3B-IG-X
Inert Gas, Tip Synthesis	S1PS-3B-IG-TS	Inert Gas, Tip Synthesis	S2PS-3B-IG-TS
Tip Synthesis	S1PS-3B-X-TS	Tip Synthesis	S2PS-3B-X-TS
<b>Service</b>		<b>Service</b>	
Installation and Familiarization - Syro I	SER-PS1-IN	Installation and Familiarization - Syro II	SER-PS2-IN
First Year Maintenance Plan - Syro I	SER-SY1-FYMP	First Year Maintenance Plan - Syro II	SER-SY2-FYMP
Priority Service Agreement - Syro I	SER-SY1-SAP	Priority Service Agreement - Syro II	SER-SY2-SAP
Extended Warranty - Syro I	SER-SY1-EXW	Extended Warranty - Syro II	SER-SY2-EXW
Peptide Application Training – 1 day	SER-PEP-AT	Peptide Application Training – 1 day	SER-PEP-AT
<b>Syro II System</b>		<b>Syro I and II Accessories</b>	
<b>Parallel Peptide Synthesizer 2 (48 x 2 mL) Reactor Blocks</b>		<b>Inert Gas Cover Plates</b>	
<b>60 Hz, 115 VAC (USA)</b>		Inert Gas Cover Plate 12 x 2 mL reactor	
No options	S2PS-1A-X-X	Z002IC012	
Inert Gas	S2PS-1A-IG-X	Inert Gas Cover Plate 12 x 5 mL reactor	
Inert Gas, Tip Synthesis	S2PS-1A-IG-TS	Z005IC012	
Tip Synthesis	S2PS-1A-X-TS	Inert Gas Cover Plate 12 x 10 mL reactor	
<b>50 Hz, 230 VAC (UK/EU)</b>		Z010IC012	
No options	S2PS-2A-X-X	Inert Gas Cover Plate 12 x 20 mL reactor	
Inert Gas	S2PS-2A-IG-X	Z020IC012	
Inert Gas, Tip Synthesis	S2PS-2A-IG-TS	Inert Gas Cover Plate 24 x 2 mL reactor	
Tip Synthesis	S1PS-2A-X-TS	Z002IC024	
<b>50/60 Hz, 100 VAC (JPN)</b>		Inert Gas Cover Plate 24 x 5 mL reactor	
No options	S2PS-3A-X-X	Z005IC024	
Inert Gas	S2PS-3A-IG-X	Inert Gas Cover Plate 24 x 10 mL reactor	
Inert Gas, Tip Synthesis	S2PS-3A-IG-TS	Z010IC024	
Tip Synthesis	S2PS-3A-X-TS	Inert Gas Cover Plate 48 x 2 mL reactor	
		Z002IC048	
		Inert Gas Cover Plate 96 pos. for Tip-reactors	
		Z004IC096	
		Inert Gas Cover Plate 18 x 2 mL Reactors (Syro II)	
		Z018IC020	
		Inert Gas Cover Plate 18 x 5 mL Reactors (Syro II)	
		Z018IC050	
		Inert Gas Cover Plate 18 x 10 mL Reactors (Syro II)	
		Z018IC100	
		Inert Gas Cover Plate 18 x 20 mL Reactors (Syro II)	
		Z018IC200	
		Inert Gas Cover Plate 36 x 2 mL Reactors (Syro II)	
		Z002IC036	
		Inert Gas Cover Plate 36 x 5 mL Reactors (Syro II)	
		Z005IC036	
		Inert Gas Cover Plate 36 x 10 mL Reactors (Syro II)	
		Z010IC036	



Product	Part Number	Product	Part Number
Inert Gas Cover Plate Large 48 x 2 mL Reactors (Syro II)	Z002IC248	Heating Block Kit (2 x 18 position) 20 mL Reactors (Syro II)	Z018HK020
Inert Gas Cover Plate Large 48 x 5 mL Reactors (Syro II)	Z005IC248	Heating Block Kit (2 x 24 position) 2 mL Reactors (Syro II)	Z024HK202
Inert Gas Cover Plate 96 x 2 mL Reactors (Syro II)	Z002IC096	Heating Block Kit (2 x 24 position) 5 mL Reactors (Syro II)	Z024HK205
<b>Transfer Units for Cleavage</b>		Heating Block Kit (2 x 24 position) 10 mL Reactors (Syro II)	Z024HK210
Transfer Unit 12-position Syro I	S011TU112	Heating Block Kit (2 x 36 position) 2 mL Reactors (Syro II)	Z036HK002
Transfer Unit 24-position Syro I	S011TU124	Heating Block Kit (2 x 36 position) 5 mL Reactors (Syro II)	Z036HK005
Transfer Unit 48-position Syro I	S011TU148	Heating Block Kit (2 x 36 position) 10 mL Reactors (Syro II)	Z036HK010
Transfer Unit 24- and 48-positions Syro I	S011TU142	Heating Block Kit (2 x 48 position) 2 mL Reactors (Syro II)	Z048HK002
Transfer Unit 18 Position for 20 mL Reactors (Syro II)	S011TU218	Heating Block Kit (2 x 48 position) 5 mL Reactors (Syro II)	Z048HK005
Transfer Unit 24-position Syro II	S011TU224	Heating Block Kit (2 x 96 position) 2 mL Reactors (Syro II)	Z096HK002
Transfer Unit 36 Position for 10 mL Reactors (Syro II)	S011TU236	Installation and familiarization package for heating block (Field upgrade)	SER-SHB-IN
Transfer Unit 48-position Syro II	S011TU248	<b>Heating Plates</b>	
Transfer Unit 24- and 48-positions Syro II	S011TU242	Heating Plate 12 x 2 mL Reactors (Syro I)	Z012HP020
Transfer Unit Large 48 Position for 2 mL Reactors (Syro II)	S011TU248-2	Heating Plate 12 x 5 mL Reactors (Syro I)	Z012HP050
Transfer Unit Large 48 Position for 5 mL Reactors (Syro II)	S011TU248-5	Heating Plate 12 x 10 mL Reactors (Syro I)	Z012HP100
Transfer Unit 96 x 2 mL to 15 mL tubes (Syro II)	S011TU296	Heating Plate 18 x 2 mL Reactors (Syro II)	Z018HP020
Transfer unit 96 x 2 mL to Deepwell plate 96 (Syro II)	S011TU296-2	Heating Plate 18 x 5 mL Reactors (Syro II)	Z018HP050
Vortex mixer, stand-alone, for two U-block reactors during cleavage	S006VO002	Heating Plate 18 x 10 mL Reactors (Syro II)	Z018HP100
<b>U-Block Reactors and Empty Heads</b>		Heating Plate 24 x 2 mL Reactors	Z024HP020
U-block Reactor, 24 x 10 ml (2 mL and 5 mL)	Z024UB050	Heating Plate 24 x 5 mL Reactors	Z024HP050
U-block Reactor, 48 x 2 mL	Z048UB020	Heating Plate 24 x 10 mL Reactors	Z024HP100
U-block Reactor, 96 x 2 mL (Syro II)	Z096UB021	Heating Plate 36 x 2 mL Reactors (Syro II)	Z036HP020
U-block Reactor, 12 x 20 mL (2 mL, 5 mL and 10 mL)	Z012UB200	Heating Plate 36 x 5 mL Reactors (Syro II)	Z036HP050
U-block Reactor, 48 x 5 mL (Syro II)	Z048UB050	Heating Plate 36 x 10 mL Reactors (Syro II)	Z036HP100
U-block Reactor, 18 x 20 ml (2 mL, 5 mL and 10 mL)	Z018UB200	Heating Plate 48 x 2 mL Reactors (Syro II)	Z048HP002
Empty Head, 12-position	Z012AK000	Heating Plate 48 x 5 mL Reactors (Syro II)	Z048HP050
Empty Head, 18-position (Syro II)	Z018AK000	<b>Resin Loader Sets</b>	
Empty Head, 24-position	Z024AK000	Resin Loader Set for 96 x 2 ml Reactor Block (Syro II)	Z125HZ096
Empty Head, 48-position	Z048AK000	Resin Loader Set for 48 x 5 ml Reactor Block (Syro II)	Z048HZ094
Empty Head, 96-position (Syro II)	Z096AK000	<b>Wash Tip Holder</b>	
<b>Heating Block Kits</b>		Wash tip holder	E003WH000
Temperature Control Board Cpl (Syro I)	Z015HT001	Wash tip holder Plate for 24 Pos.	E003WP024
Temperature Control Board Cpl (Syro II)	Z015HT002	Wash tip holder Plate for 48 Pos./2ml	E003WP048
Heating Block Kit (1 x 12 position) 20 mL Reactors (Syro I)	Z012HK120	Wash tip holder Plate for 48 Pos. /5ml	E003WP048S
Heating Block Kit (1 x 24 position) 2 mL Reactors (Syro I)	Z024HK102	Wash tip holder Plate for 96 Pos.	E003WP096H
Heating Block Kit (1 x 24 position) 5 mL Reactors (Syro I)	Z024HK105	Wash tip holder plate for 18pos/ 20 mL	E003WP018
Heating Block Kit (1 x 24 position) 10 mL Reactors (Syro I)	Z024HK110	Wash tip holder Plate for 36 Pos.	E003WP036

## Syro I and II Consumables

Product	Part Number
PP-Reactor 2 mL with PTFE frit, 100/pk	V020TF062
PP-Reactor 5 mL with PTFE frit, 100/pk	V050TF062
PP-Reactor 10 mL, with PTFE frit, 100/pk	V100TF086
PP-Reactor Tip 0.4 mL with PE Frit, 96/pk	V004PE050
PP-Reactor 10 mL with PTFE frit (for inert gas), 100/pk	V100TF073
PP-Reactor 20 mL, with PE-frit, 100/pk	V200PE086
PP-Reactor 20 mL, with PE-frit (for inert gas), 100/pk	V200PE073
Luer Stoppers, 100/pk	V000LS100
Universal PTFE stopcock, 10/pk	121-0009
PP plunger for 5 mL reactors 100/pk	V050ST050
PP plunger for 2 mL reactors 100/pk	V020ST020
Position Stopper 2 mL reactor, 30/pk	V020PS000
Position Stopper 5 mL reactor, 30/pk	V050PS000
Position Stopper 10 mL reactor, 30/pk	V100PS000

## Biotage® Initiator Peptide Workstation

Product	Part Number
Initiator Peptide Workstation, 2–5 mL vial (355964 + 355968)	355985
Initiator Peptide Workstation, 10–20 mL vial (355965 + 355968)	355986
2–5 mL Microwave peptide vial (barrel, check valve, frit, snap cap, and septum) and additional septum (5), frit (5), and check valve o-ring (2)	355964
10–20 mL Microwave peptide vial (barrel, check valve, frit, snap cap, and septum) and additional septum (5), frit (5), and check valve o-ring (2)	355965
<b>Consumables</b>	
Wash Station, 1/pk	355968
1000 mL GL 45 lab glass bottle, 1/pk	355814
2–5 mL Microwave peptide vial barrel, 1/pk	355782
10–20 mL Microwave peptide vial barrel, 1/pk	355803
Check valve, 1/pk	355957
Check valve o-ring, Kalrez, 2/pk	355962
Snap cap, 1/pk	355804
Septum, 5/pk	355960
Disposable HDPE frit, 5/pk	355961
Magnetic stir bars, 2–5 mL, 25/pk	355543
Magnetic stir bars, 10–20 mL, 5/pk	353930
Vacuum seal, Kalrez, 1/pk	355959
Vacuum seal, Viton, 5/pk	355966
Rubber feet, wash station, 4/pk	355967

## Purification

### Flash Systems

Product	Part Number
<b>Biotage® Selekt Enkel</b>	
Biotage® Selekt Enkel single channel, single collection bed, UV detector	SEL-ESV
<b>Biotage® Selekt</b>	
Biotage® Selekt, Two Channel, Single Collection Bed, UV Detector	SEL-2SV
Biotage® Selekt, Two Channel, Single Collection Bed, UV-VIS Detector	SEL-2SW
Biotage® Selekt, Two Channel, Extended Collection Bed, UV Detector	SEL-2EV
Biotage® Selekt, Two Channel, Extended Collection Bed, UV-VIS Detector	SEL-2EW
Mains Cord (EU)	416276SP
Mains Cord (UK)	416277SP
Mains Cord (US/CA)	416278SP
Mains Cord (China)	418362SP
Mains Cord (India)	418361SP

### Software

Biotage® Spektra Software Package	SEL-SPK
Biotage® Selekt Remote Control	SEL-RC
Biotage® Selekt Monitor API	SEL-mAPI

### Accessories

Cartridge holder 5 g/10 g with O-ring	417538SP
Cartridge holder 25 g with O-ring	417539SP
Column Holder Sfär 50/100 g	415343SP
Column Holder Sfär 200/350 g, 1 pcs.	416301SP
16 x 100 mm RFID Rack (incl. 3 pcs.)	416302SP
16 x 150 mm RFID Rack (incl. 3 pcs.)	416303SP
18 x 150 mm RFID Rack (incl. 3 pcs.)	416305SP
25 x 150 mm RFID Rack (incl. 3 pcs.)	416306SP
120 mL flask RFID Rack (incl. 3 pcs.)	416307SP
240 mL flask RFID Rack (holds 10 flasks)	416230SP
480 mL flask RFID Rack (holds 8 flasks)	416225SP
Biotage® Selekt Secondary Solvent Containment	416321SP
Biotage® Selekt Instrument Tray with Solvent Sensor	416410SP
Biotage® Selekt Enkel network upgrade kit	417501SP
Biotage® Selekt Enkel extended bed upgrade kit	417502SP
Biotage® Selekt Enkel RFID upgrade kit	417504SP

## Flash Consumables

Product	Part Number
<b>Biotage® Sfär C18 D</b>	
Biotage® Sfär C18 D Duo 100 Å 30 µm 6 g	FSUD-0401-0006
Biotage® Sfär C18 D Duo 100 Å 30 µm 12 g	FSUD-0401-0012
Biotage® Sfär C18 D Duo 100 Å 30 µm 30 g	FSUD-0401-0030
Biotage® Sfär C18 D Duo 100 Å 30 µm 60 g	FSUD-0401-0060
Biotage® Sfär C18 D Duo 100 Å 30 µm 120 g	FSUD-0401-0120
Biotage® Sfär C18 D Duo 100 Å 30 µm 240 g	FSUD-0401-0240
Biotage® Sfär C18 D Duo 100 Å 30 µm 400 g	FSUD-0401-0400
<b>Biotage® Sfär Bio C18 D</b>	
Biotage® Sfär Bio C18 D - Duo 300 Å 20 µm 10 g	FSBD-0411-0010
Biotage® Sfär Bio C18 D - Duo 300 Å 20 µm 25 g	FSBD-0411-0025
Biotage® Sfär Bio C18 D - Duo 300 Å 20 µm 50 g	FSBD-0411-0050
Biotage® Sfär Bio C18 D - Duo 300 Å 20 µm 100 g	FSBD-0411-0100
<b>Biotage® Sfär Bio C4 D</b>	
Biotage® Sfär Bio C4 D - Duo 300 Å 20 µm 10 g	FSBD-0412-0010
Biotage® Sfär Bio C4 D - Duo 300 Å 20 µm 25 g	FSBD-0412-0025
Biotage® Sfär Bio C4 D - Duo 300 Å 20 µm 50 g	FSBD-0412-0050
Biotage® Sfär Bio C4 D - Duo 300 Å 20 µm 100 g	FSBD-0412-0100
<b>Samplets</b>	
Biotage® Sfär C18 Samplet® for 5/10 g Column	SAS-0401-0010
Biotage® Sfär C18 Samplet® for 25 g Column	SAS-0401-0025
Biotage® Sfär C18 Samplet® for 50/100 g Column	SAS-0401-0100
Biotage® Sfär C18 Samplet® for 200/350 g Column	SAS-0401-0350

## Parallel Purification

Product	Part Number
Biotage® Extrahera™ - Peptide	419123SP
Mains Cord (Swiss)	416406SP
Mains Cord (UK)	C128195SP
Mains Cord (US/CA)	C65902SP
Mains Cord (EU)	C67361SP
<b>Note:</b> Mains cord required for ME1C pump accessory kit:	
Mains Cord (UK)	C128195SP
Mains Cord (US/CA)	C65902SP

Product	Part Number
Mains Cord (EU)	C67361SP
Configuration Kit for 96 Positions – Peptide	419124SP
Biotage® PeptiRen-96 C18	401-0500-PX01

## Evaporation

Product	Part Number
<b>Biotage® V-10 Touch</b>	
V-10 Touch System	V10-2XX
V-10 Touch System with Solvent Manager and Automation	V10-2SC
Mains Cord (US/CA)	414995SP
Mains Cord (EU)	414996SP
Mains Cord (UK)	108492SP
<b>Configuration Upgrades</b>	
V-10 Solvent Manager Upgrade	414865
V-10 Automation Upgrade	410876
Gilson Liquid Handler GX271 - V-10	411816
<b>Accessories</b>	
Step-up Transformer 100–230 VAC	415082
Hi-vac, oil-free scroll pump, 100-240V	416009SP
Vacuum pump External Connection Kit	413146
Kit, Start-Up for Liquid Handlers, V-10 Touch	414867
Carousel Vial Holder 30/20 mL Vials	411181
Carousel Vial Holder 4 mL A-type HPLC Vials	411182
14.5 mm Diameter (Type A/B)	
Carousel Vial Holder 4 mL 16.5 mm diameter (Type C)	411183
4 mL Vial Upper Adapter Kit 5 pcs (Type A), 8.5 mm Neck Inner Diameter	410647
4 mL Vial Upper Adapter Kit 5 pcs (Type B), 11.1 mm Neck Inner Diameter - V10	410648
4 mL Vial Upper Adapter Kit 5 pcs (Type C), 12.0 mm Neck Inner Diameter - V10	410649
4 mL Vial Lower Adapter Kit 2 pcs (Type A), 14.8 mm Vial Diameter	411031
4 mL Vial Lower Adapter Kit 2 pcs (Type B), 14.1 mm diameter shoulderless vial (2/bag)	411032
4 mL Vial Lower Adapter Kit 2 pcs (Type C), 16.3 mm diameter semi-shouldered vial (2/bag)	411033
8 mL Vial Lower Adapter Kit 2 pcs (Type D), 17.2 mm Vial Diameter	411999
V-10 vial face seal, ChemRaz	413210
Solvent Safety Cap (GL45)	414580SP



## This is Biotage

Biotage is contributing to sustainable science, helping to make the world healthier, greener and cleaner – guided by our ethos of **HumanKind Unlimited**.

We offer workflow solutions to customers in drug discovery & development, diagnostics, alongside analytical, water and environmental testing.

For local office contact information, visit [biotage.com/contact](https://biotage.com/contact)

