Peptide Synthesis Workflow

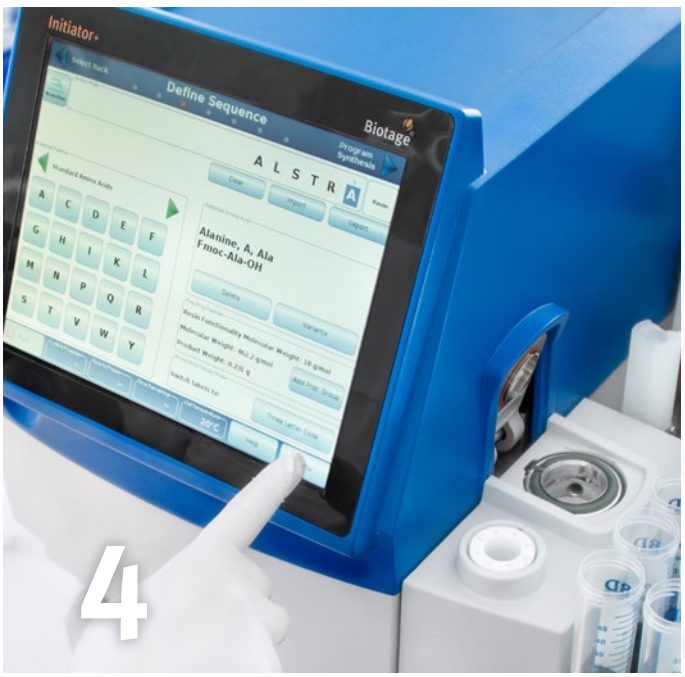
Synthesis, Purification, and Evaporation Solutions

Biotage®

Smarter Solutions for Your Peptide Workflow

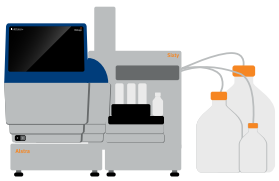
CONTENTS

The typical peptide synthesis workflow broadly involves synthesis, purification and evaporation steps to give the final pure peptide. Although the synthesis step is the most important part of the workflow, purification and evaporation issues can impact dramatically on the efficiency of your workflow and are the cause of many bottlenecks. Biotage has developed a range of tools to improve the peptide synthesis workflow, from synthesis of crude peptides through to the final purified product. These solutions make your workflow more efficient and improve the quality of peptides you synthesize. Our workflow solutions are used in pharma, biotech, CRO and academic laboratories throughout the world.



1 Synthesis

Biotage® offers a wide range peptide synthesizers for Fmoc solid phase peptide synthesis. Synthesize peptides at elevated temperatures using either microwave heating or in parallel with a heating block. Synthesize a single peptide or even hundreds of peptides in parallel.



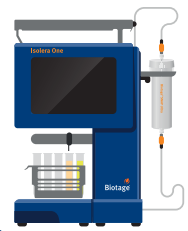
Manual, semi-automated and fully automated peptide synthesizers. Resins.

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. Flash chromatography can now be used as a fast and efficient purification tool for peptide chemists using a new range of flash cartridges designed specifically for the purification of crude synthetic peptides.

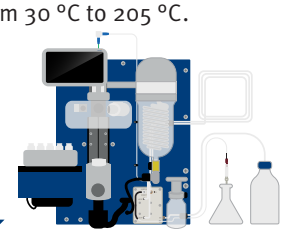


Flash purification and mass detection instruments supported by a range of flash cartridges for peptide purification.

- 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.
- 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 cartridges with wide pore media (300 Å) for reversed phase purification of peptides.

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 vast field of peptide applications.

Basic research | Drug development | Vaccines | Nanotechnology

Synthesis

Biotage Peptide Synthesizers Overview

	Biotage® Initiator+ Alstra™	Syro I	Syro II	Biotage® Initiator+ SP *Wave*	Biotage® Initiator Peptide Workstation#
Instrument					
Level of Automation	Full	Full	Full	Semi	Manual
Microwave Heating	✓	✗	✗	✓	✓
Conventional Heating Option	✗	✓	✓	✗	✗
Room Temperature	✓	✓	✓	✓	✓
Max. Number of Peptides*	1	96	576	1	1
Reactor Vial Sizes (mL)*	5 10 30	0.4 2 5 10 20	0.4 2 5 10 20	2 5 10	5 20
Scale Per Reactor Vial (mmol)**	0.005–2.00	0.001–0.60	0.001–0.60	0.005–0.30	0.05–0.5
Activation Method	*in situ* and pre-activation	*in situ* and pre-activation	*in situ* and pre-activation	*in situ* and pre-activation	*in situ* and pre-activation
Amino Acid Vessels (Other Racks Available)	32 x 30 mL (standard)	40 x 50 mL (standard)	40 x 50 mL (standard)	N/A	N/A
Reagent Bottles	5	5	7	3	N/A
External Bottle Positions	3	1	2	1	N/A
Mixing	Oscillation	Vortex	Vortex	Vortex or magnetic stirring	Magnetic stirring
Inert Gas Option	✓	✓	✓	✓	✗
Microwave Assisted Organic Synthesis (MAOS)	✓ (option)	✗	✗	✓	✓
UV Monitoring Option	✓	✗	✗	✗	✗

#Requires Biotage® Initiator+ (sold separately). Can be used with Biotage® Initiator+ SP Wave or Biotage® Initiator+ Alstra™ in organic synthesis mode.

*Dependent on reactor block configuration.

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

> 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 and peptidomimetics.

Flexibility Is at the Heart of the instrument

The flexible reagent setup and modular amino acid racks allow different coupling strategies which require different coupling 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.

Digital syringe pumps guarantee accurate dispensing of all reagents, and the dual needle design reduces the possibility

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.

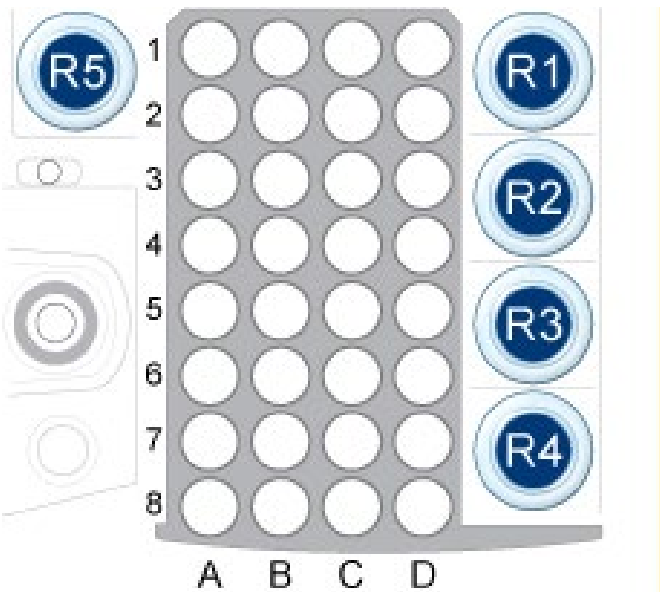
Five reagent bottles allowing different coupling reagents and capping steps during a synthesis.

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

Three external system solvents.

of cross contamination. The patented oscillating mixing 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 which is tablet like in operation 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 to 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.

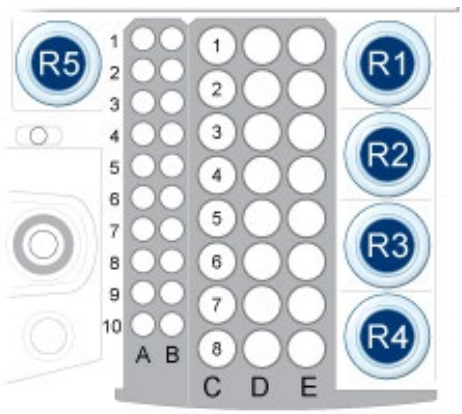
Easy to program using the intuitive software wizard.

Calculation table can be exported as a pdf document.

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).

E-mail Notification

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

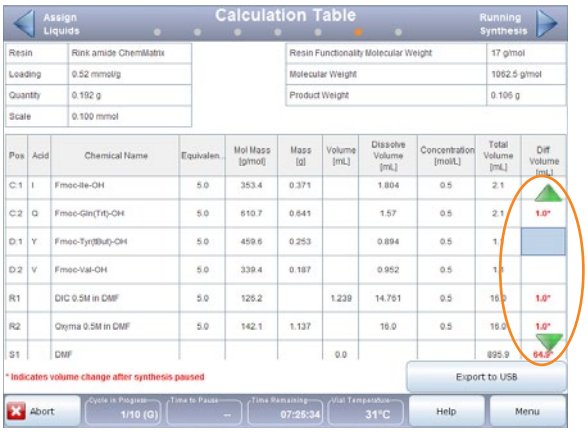
- At the end of a synthesis run
- When a pause step has been set after an operation
- When a programmed manual step requires to be executed
- When an error occurs

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:

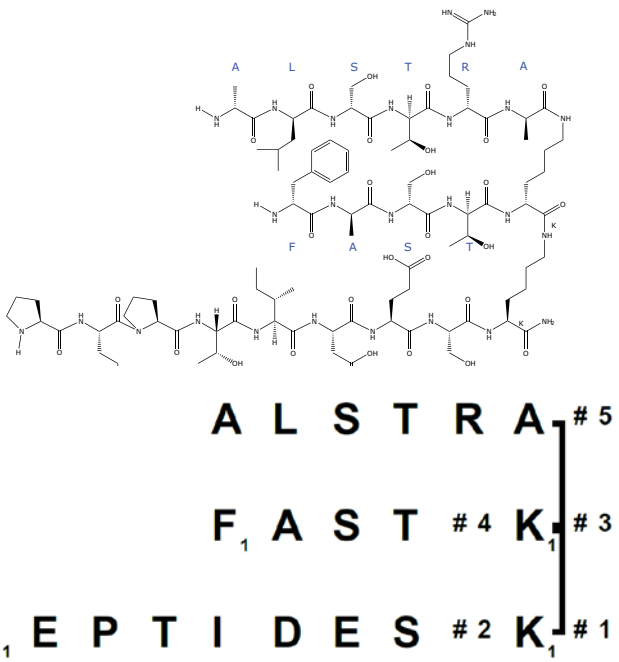
- Make changes to a synthesis that is already in progress (after pausing operation).
- Pause and check a coupling and make changes based on the result without having to reprogram the synthesis, with the additional volume of reagents required adjusted in the calculation table.
- Make changes to a manual,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



Calculation table adjusted after changes.

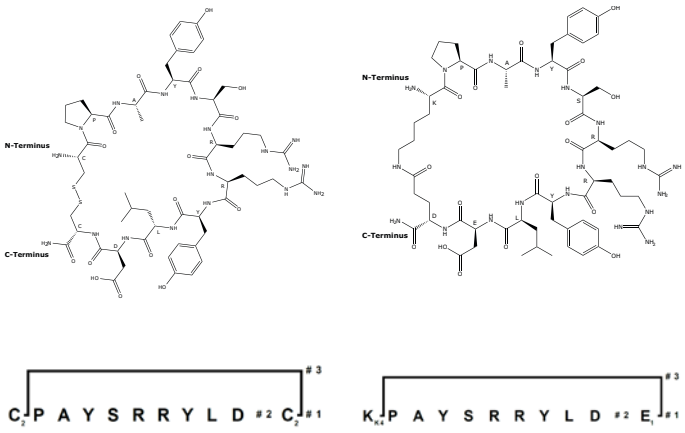
Branches™

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. Synthesize cyclic and branched peptides with confidence.



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)

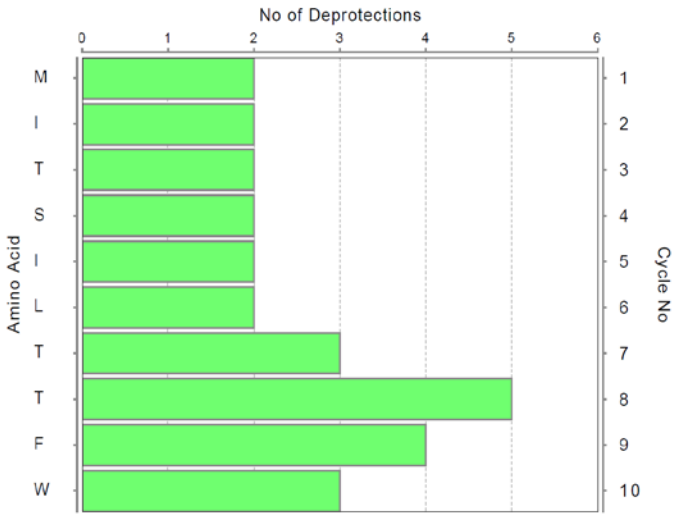
Synthesis of a Branched Peptidoglycan Mimic and MAP
Application Note (AN097)

Making Branched Peptides on Biotage® Initiator+ Alstra™ Peptide Synthesizer
Product Video

Optional Accessories

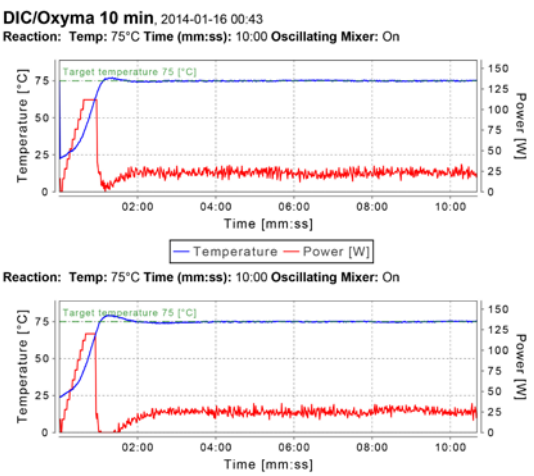
UV Monitoring

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	



Cycle summary using UV monitoring.

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 (AN 111)

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.

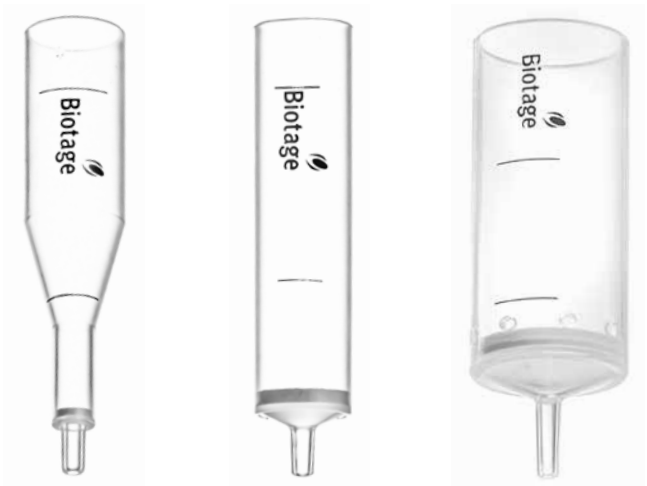
Amino Acid Racks

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.

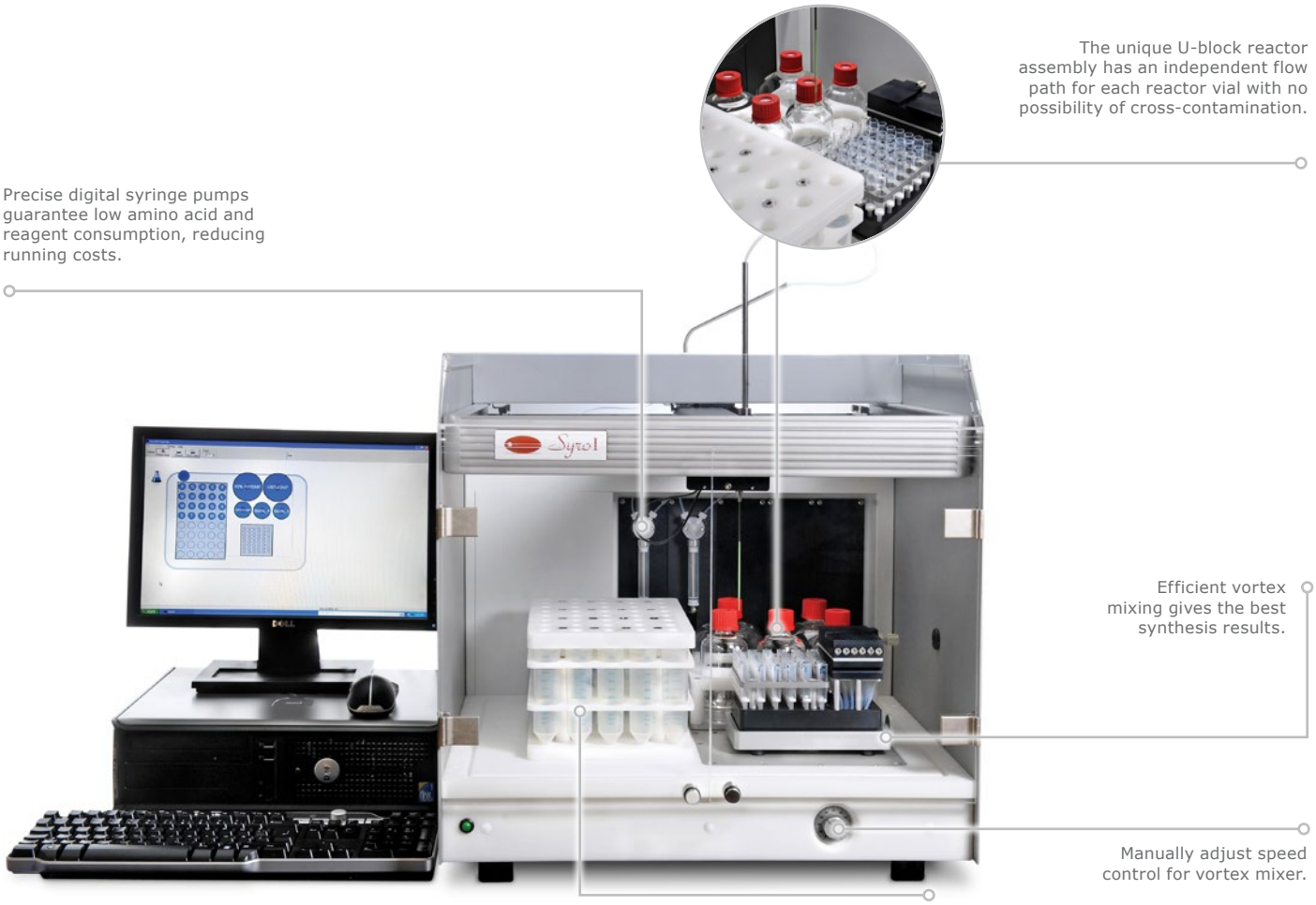


Peptide synthesis is performed in disposable polypropylene reactor vials with PTFE frits. Available in three sizes: 5 mL, 10 mL and 30 mL.

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

ⓘ Learn More

- **Peptide Synthesis Workflow Solutions**
  Customer Case (PPS439)
- **Using Biotage® Initiator+ Alstra™ in PNA & Peptide Research**
  Customer Case (PPS410)
- **Microwave Assisted Synthesis of Peptide Nucleic Acid (PNA) Oligomers**
  Application Note (AN 110)
- **High Recovery and Yield of Amphipathic Peptide "18A"**
  Application Note (AN 103)
- **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)
- **Biotage® Initiator+ Alstra™ Peptide Synthesizer**
  Product Video



Syro I with 24-position reactor block.

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).

Syro II with Inert Gas and Tip Synthesis options.

Heating Blocks

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

> “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*

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	2
Waste bottle	10 L	20 L

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 System Options Depending on Your Throughput Requirements

Syro I (one robot arm and one reactor block)

Syro II (two robot arms and two reactor blocks)

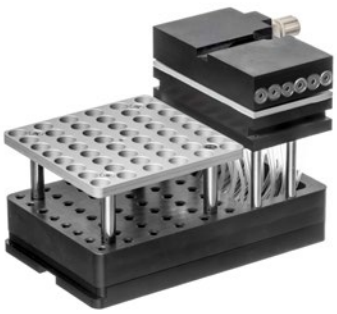
2 Power Options

Select the power requirements applicable for your region.

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

3 Standard Reactor Block Options

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 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.

Amino acid rack under inert gas.

Reagent bottles with inert gas caps.

2 mL and 5 mL reactor vials can be used with all systems. Larger vials have special inert gas compatible size.

Gas flow controls and pressure regulators. Individually control flow for amino acid rack, reagent bottles and reactor block. Open valves only for the components in use.

Inert gas cover plates available for different reactor block formats.

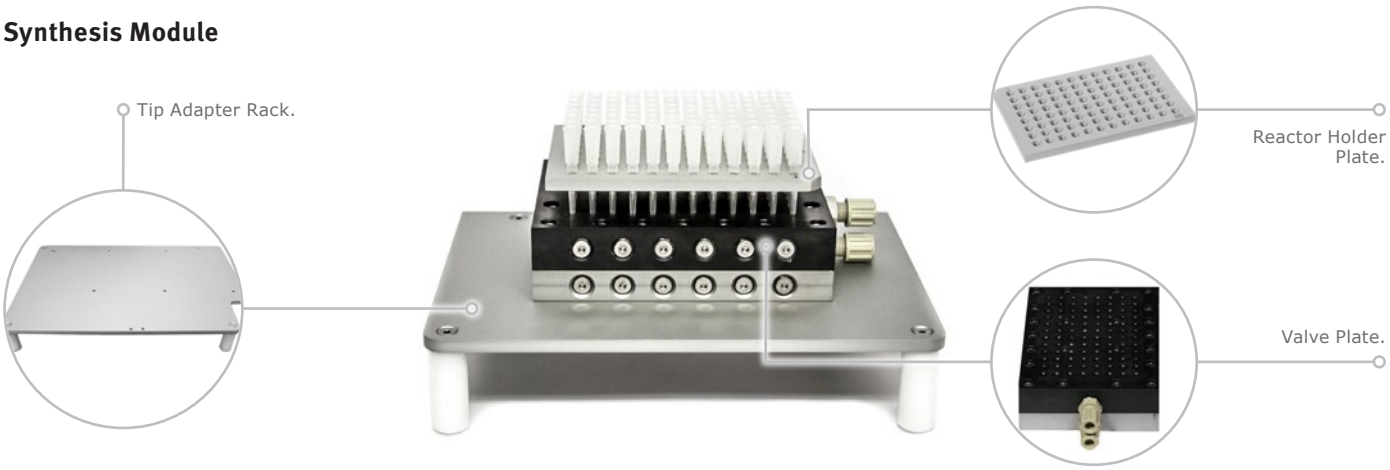
5 Tip Synthesis Option

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

Synthesis Module



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

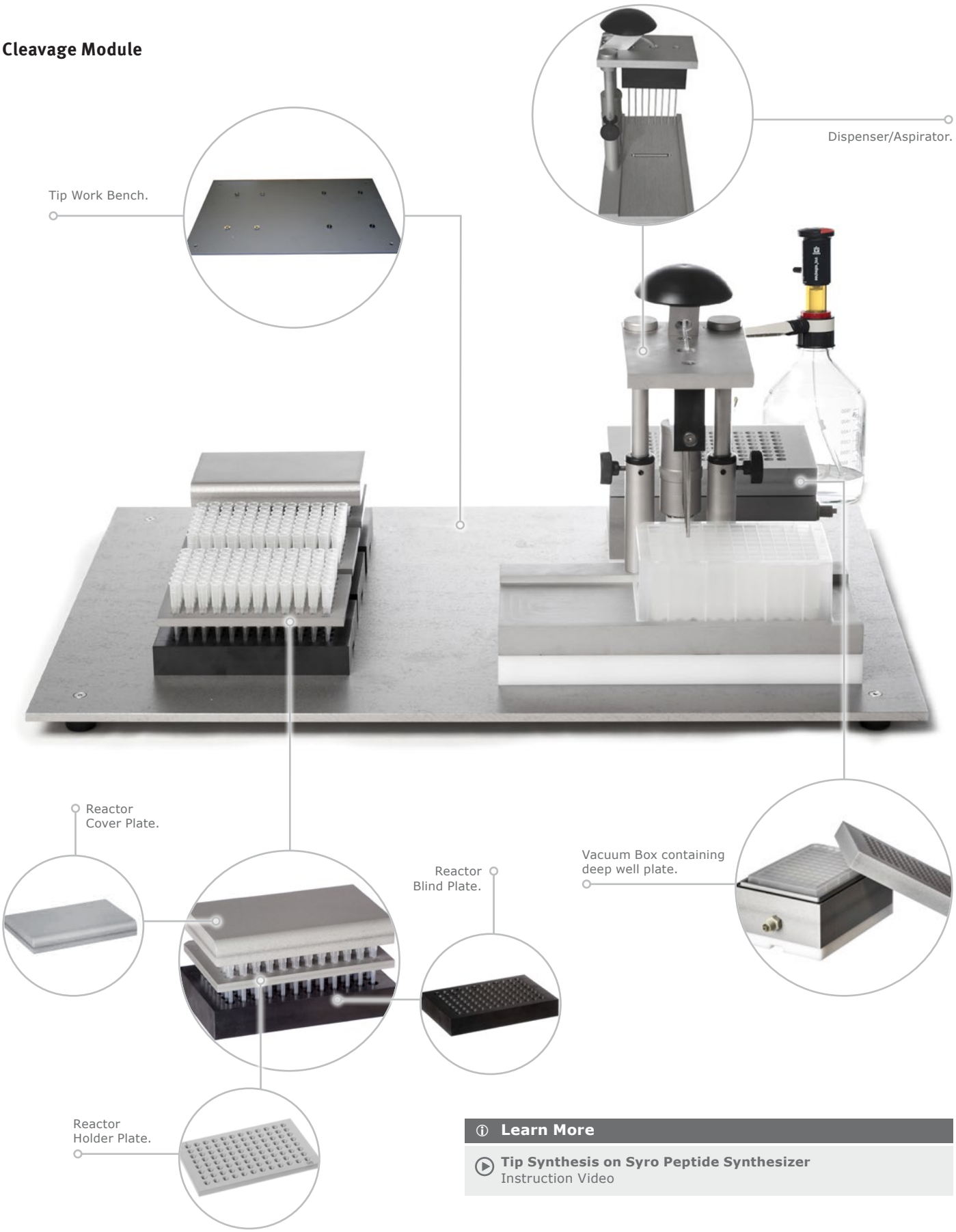
Resin Dispenser Set

Resin dispenser set for dispensing resin in to the tip reactors.

Tip Reactors

0.4 mL tip reactor with PE frit.

Cleavage Module

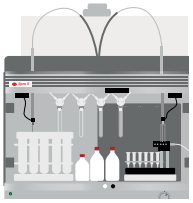


Learn More

Tip Synthesis on Syro Peptide Synthesizer
Instruction Video

Syro System Configuration Guide

1 Select Syro System Type

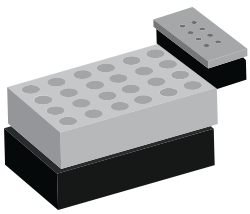


S1PS - Syro I
S2PS - Syro II

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 Accessories

These products can be ordered separately for your existing Syro system.

Reactor Blocks

U-blocks

Includes base block and interchangeable adapter racks to fit the vial sizes as indicated below. Requires a corresponding empty head, sold separately.

- 12 position for 2 mL, 5 mL, 10 mL and 20 mL reactor vials
- 24 position for 2 mL, 5 mL and 10 mL reactor vials
- 48 position for 2 mL reactor vials
- 48 position for 5 mL reactor vials (Syro II only)
- 96 position for 2 mL reactor vials (Syro II only)

Heating Blocks

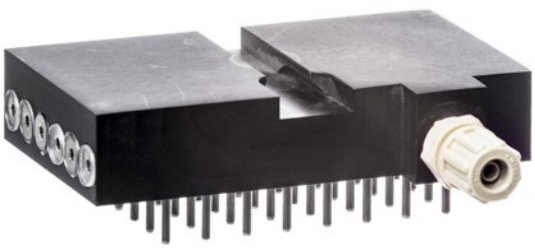
Includes base block and heating plate. Available in 24 position format only. Requires a 24 position empty head, sold separately.

Note: Service engineer required for field upgrade.

- 24 position for 2 mL reactor vials
- 24 position for 5 mL reactor vials
- 24 position for 10 mL reactor vials

Empty Heads

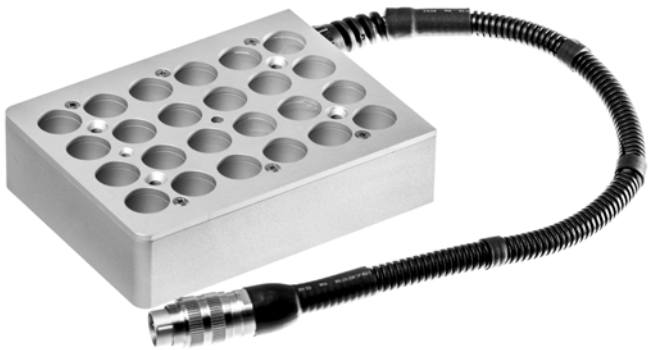
Required for use with corresponding reactor blocks.



- Empty head 12 position
- Empty head 24 position
- Empty head 48 position
- Empty head 96 position (Syro II only)

Heating Plates

Interchangeable heating plates for heating blocks.



- 24 position for 2 mL reactor vials
- 24 position for 5 mL reactor vials
- 24 position for 10 mL reactor vials

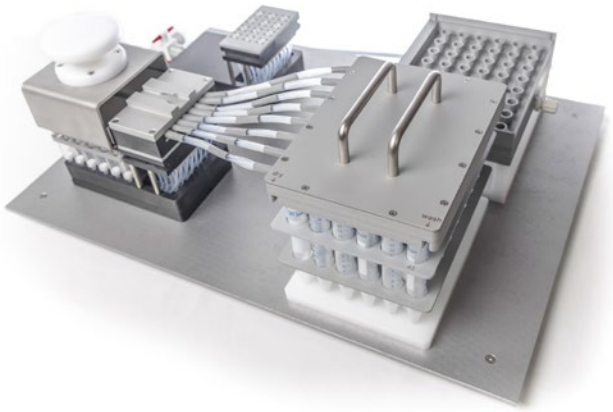
Cleavage

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 Unit

Transfer units for pressure mediated transfer of the cleavage reaction in parallel directly into a collection rack containing centrifuge tubes. Available in 24 position and 48 position formats for both Syro I and Syro II systems.



Learn More

Biotage® Cleavage and Transfer Workstation 2012
Instruction video

Syro Consumables

Reactor Vials

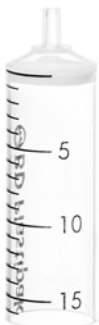
Disposable polypropylene reactor vials with PTFE frits are available in various sizes. Compatible with heating blocks and inert gas options.

2 mL

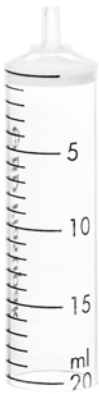
5 mL

10 mL (inert gas)

10 mL



20 mL (inert gas)

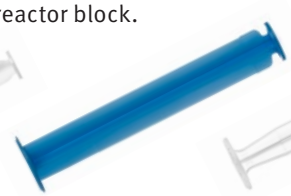


20 mL

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

5 mL PP plunger with PTFE cap

10 mL PP plunger with PTFE cap

Position stopper

Luer stopper

> 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).

Biotage® Initiator Peptide Workstation

Manual Microwave Peptide Synthesis

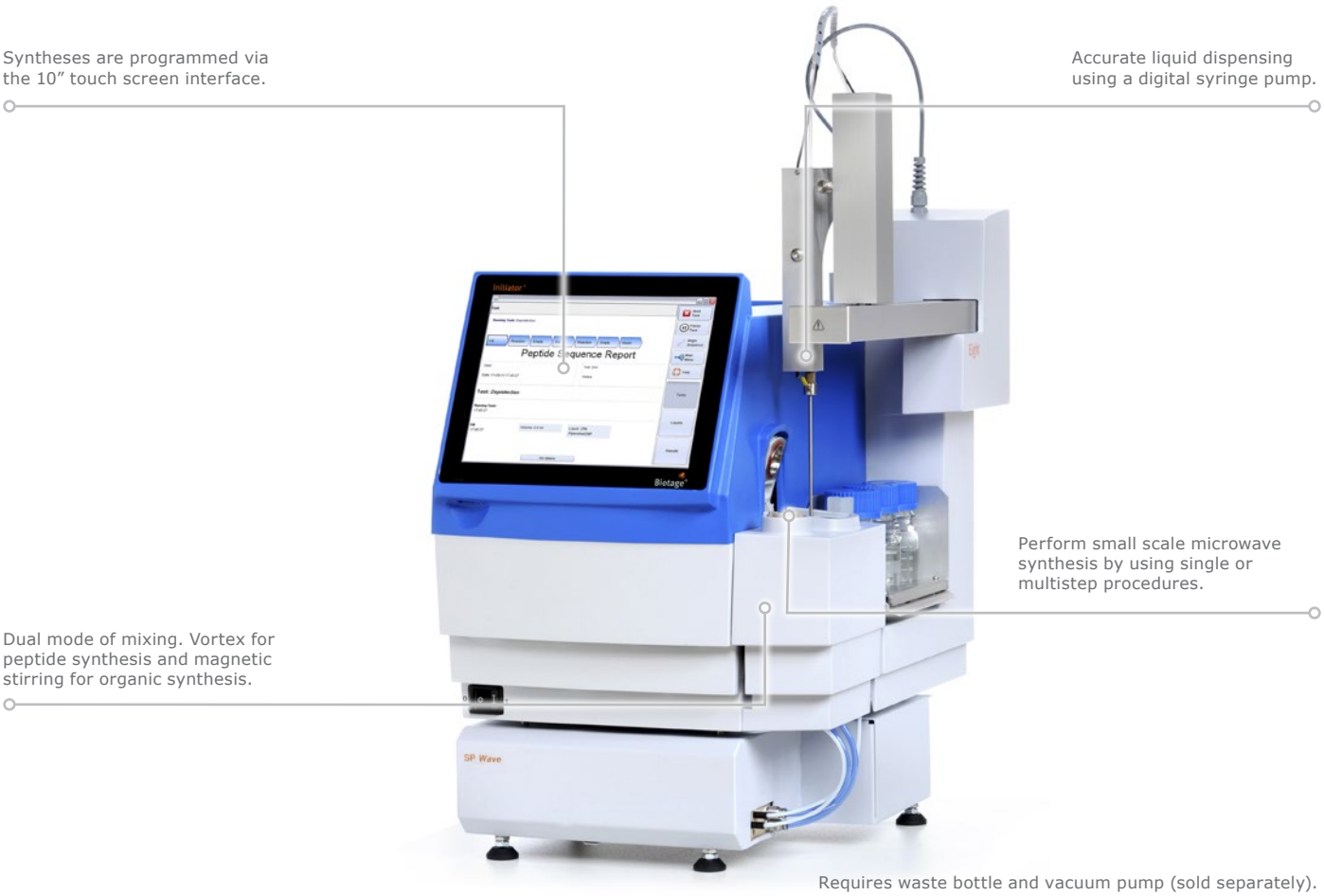
A cost effective and versatile accessory for manual microwave peptide synthesis and cleavage when used with a Biotage® Initiator+ microwave synthesizer.

The Biotage® Initiator+ microwave 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 (P043)



Biotage® Initiator+ SP Wave

Two Synthesizers in One

Biotage® Initiator+ SP Wave is a versatile microwave system for the synthesis of both peptides and organic compounds. It can be used as a standalone single channel microwave peptide synthesizer or easily converted to a high-end microwave synthesizer.

Peptide Mode

It is the ideal tool for the synthesis of peptides, peptidomimetics, PNA and for organic, medicinal, materials, nano and polymer chemistry applications.

The instrument functions are controlled directly on the built in touch screen interface. Deprotection and washing steps are automated, while adding activated building blocks is performed manually. With this approach, intermediate reaction steps are easily monitored, and less equivalents can be added to reduce unnecessary waste of expensive reagents. Reactions are performed in disposable polypropylene reactor vials and mixing is achieved by vortex mixing.

This is a powerful development tool giving total control of the method development process using single or multi-step procedures.

Microwave Assisted Organic Synthesis Mode

When configured as a microwave synthesizer, the Initiator+ SP Wave is able to perform reactions at a temperature of 300 °C and 30 bar pressure and capable of processing up to eight reactions unattended. Reactions are performed in microwave glass vials and mixing is achieved by magnetic stirring.

The 8-position sample bed gives the user a compact automation solution to start scale-up process and library build-up. The 8-position system is useful in a multi-user environment or for queuing multiple reactions. Flexible operation enables the use of both large and small vials in combination at any time and in any order without manual intervention.

Biotage® Initiator+ SP Wave in MAOS configuration.

Consumables

A variety of reactor vials in different sizes are available for microwave peptide synthesis and microwave organic synthesis.

Peptide synthesis is performed in disposable polypropylene reactor vials with PTFE frits. Available in three sizes: 2 mL, 5 mL and 10 mL.

Organic synthesis is performed in high precision glass vials. Available in four sizes: 0.2–0.5 mL, 0.5–2.0 mL, 2.0–5.0 mL and 10–20 mL.

> “I think it’s an amazing little beast. Semi-automated, which I think is ideal for an academic lab making lots of bizarre peptides and exotics on a day-to-day basis then it’s a fantastic instrument.”
>
> *Professor, UK*

Learn More

- **Synthesis of a Glycopeptide Aldehyde Using the O-BAL Strategy on the Initiator+ SP Wave**
  Application Note (AN055)
- **Microwave Assisted Organic and Peptide Synthesis of a Non-natural Arginine Residue and Incorporation Into a Cyclic Peptide Mupain-1 Analogue**
  Application Note (AN111)
- **Microwave Heating in Solid-Phase Peptide Synthesis: Three Degrees of Automation**
  Poster (P043)
- **Microwave Reaction Vials**
  Product Note (PPS449)

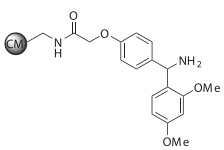
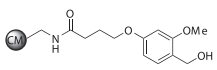
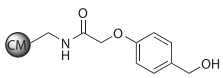
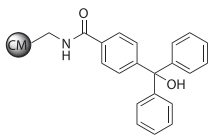
ChemMatrix® Resins

A Major Advance in Solid Phase Peptide Synthesis

ChemMatrix® is a patented, 100% PEG (polyethyleneglycol) based resin that offers substantial advantages over traditional PEG based polystyrene resins for solid phase peptide synthesis. Peptides produced with ChemMatrix have higher purity and can be obtained with better yields.

Why use ChemMatrix® resins?

- Synthesize peptides with higher crude purity
- High chemical stability
- High loading
- Compatibility with a large range of solvents
- Compatible with microwaves

	Rink Amide-ChemMatrix®	HMPB-ChemMatrix®	Wang-ChemMatrix®	Trityl-ChemMatrix®
Product				
				
Description	One of the most popular resins for both manual and automated SPPS, under microwave or non-microwave conditions. This is an excellent support for the synthesis of peptide amides and is compatible with our range of microwave peptide synthesizers.	Recommended for peptide acids, as this resin will provide high crude purity and a recovery yield of 90–95%. The Wang-ChemMatrix will produce similar crude peptide purity, but the recovery yield is lower (60–70%).	The first ChemMatrix resin developed for peptide acids. While the purity of peptides synthesized with this resin are excellent, the recovery yield is limited to 60–70%. For enhanced yields and higher recoveries (90–95%), we recommend using the HMPB-ChemMatrix.	Mainly used to obtain a protected peptide as it requires very low TFA cleavage conditions (under 1%). This resin therefore uses the same cleavage conditions as the Cl-Trityl-polystyrene. (Cl-Trityl-ChemMatrix resin is not offered for stability reasons. It is more effective to start with the Trityl-ChemMatrix resin, chlorinate the resin and then add the amino acid required.)
Final Product	Peptide amide resin	Peptide acid resin	Peptide acid resin	Peptide acid resin
Cleavage Conditions	TFA/H_2O/Et_3SiH (95/2.5/2.5)	TFA/H_2O/Et_3SiH (95/2.5/2.5)	TFA/H_2O/Et_3SiH (95/2.5/2.5)	TFA < 1%
Loading	0.4–0.6 mmol/g	0.4–0.6 mmol/g	0.40–0.65 mmol/g	0.40–0.65 mmol/g
Bead Size	100–200 mesh dry	100–200 mesh dry	100–200 mesh dry	100–200 mesh dry

Purification

Isolera™ Spektra is a high performance ACI™ Accelerated Chromatographic Isolation system with time, efficiency and cost saving purification run features that are normally only found on the world's most expensive high-end chromatography systems.

Isolera™ Dalton Mass Detector uses a chip-based electrospray system with a miniaturized quadrupole and internal vacuum pumps. Mass detection range m/z 80–800.

Biotage® Dalton 2000 is a compact single quadrupole mass detector with simultaneous positive and negative polarity switching. Mass detection range m/z 10–2000.

Isolera™ Flash Purification Systems

The Fast Track to Pure Peptides

Flash chromatography has been demonstrated to be a very efficient technique to dramatically 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. Is there an alternative to prep-HPLC? Although there are a number of examples in the literature, flash chromatography is a largely overlooked technique for purification of synthetic peptides.

> "It's just chromatography! If you produce a peptide of sufficient purity with no critical impurities, why not use the Isolera."
>
> *Senior Lecturer, UK*

Flash Purification Systems

Biotage has a range of chromatography systems from single channel entry-level instruments to fully automated systems with variable wavelength UV detection for high throughput laboratories. Isolera™ Spektra is a software package available for Isolera™ One and Four with extended features for chromatography and purity analysis. Methods can easily be edited either on the touch screen. Edit the gradient, flow rate, collection volume, fraction wavelengths and even add more collection racks if you need to – all while the run is in progress.

Isolera™ Prime

Isolera™ One

Isolera™ Four

Integrated Mass Detection

Combine your Isolera™ purification system with a mass detector to experience true mass-directed flash chromatography of peptides. Mass-based fractionation offers the advantage of being able to separate products with no UV signal and also resolve peaks with overlapping UV signals such as peptidic deletion sequences. Isolera™ Nanolink is a coupling interface which handles all the sampling flows between Isolera™ and the mass detector.

Isolera™ Nanolink

Isolera™ Dalton 2000 system

Why Use High Performance Flash Chromatography?

- 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.

Learn More

Biotage Flash Purification Systems – Pure Compounds in a Flash
Product Brochure (PPS319)

Mass Directed Flash Chromatography by Biotage - Dalton Mass Detectors
Product Brochure (PPS450)

Separation of Peptidic Deletion Sequences with Reversed Phase Mass Directed Flash Purification Using Isolera™ Dalton and SNAP KP-C18-HS Flash Cartridges
Application Note AN087

Mass Directed Flash Purification of Amphipathic Peptide '18A' Using Isolera™ Dalton
Application Note AN108

Isolera™ Dalton - Flash Chromatography with Integrated Mass Identification
Product Video

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

Biotage® SNAP Bio

Flash Purification Cartridges for Purification of Peptides

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

Biotage® SNAP 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. SNAP Bio is available in C18 and C4 formats.

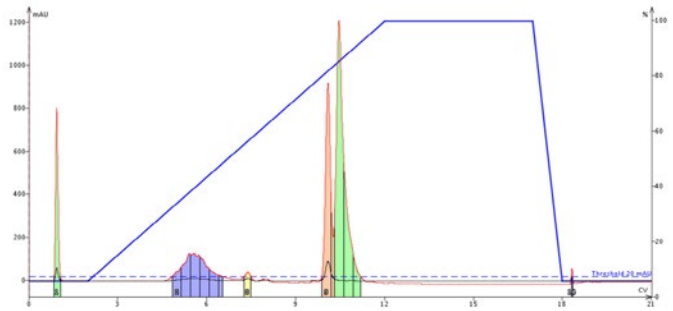
Some peptides can be purified in a single injection (page 27 a, b) and for other peptides you can quickly remove many of the impurities by flash, and make the subsequent HPLC purification easier by reducing the quantity to be purified (page 27 c, d, e).

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

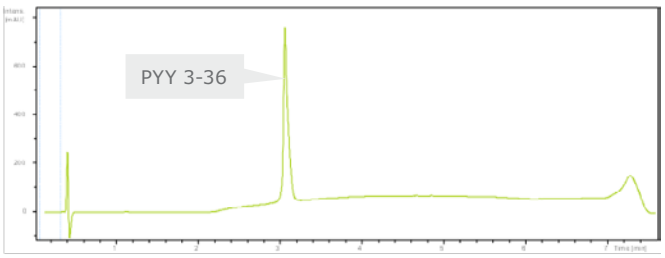
Biotage Reversed Phase Cartridges

Cartridge	Silica	Particle Size (µm)	Pore Volume (mg/L)	Surface Area (m^2/g)	Pore Diameter (Å) Nominal
Biotage® SNAP KP-C18-HS	KP-C18-HS	50	0.9	400	90
Biotage® SNAP Ultra C18	HP-Sphere C18	25	0.9	400	95
Biotage® SNAP Bio C18 300 Å	HP-Biosphere C18	20	0.95	150	300
Biotage® SNAP Bio C4 300 Å	HP-Biosphere C4	20	0.95	150	300

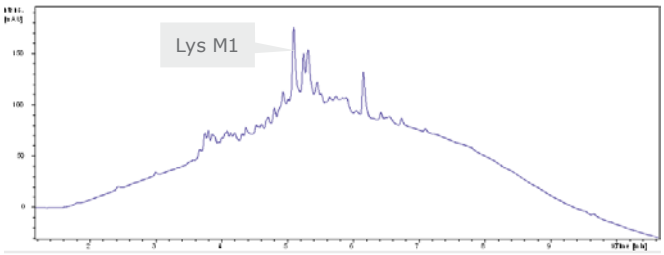
a)



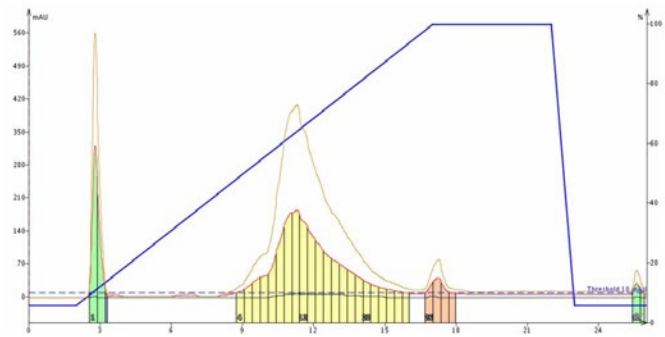
b)



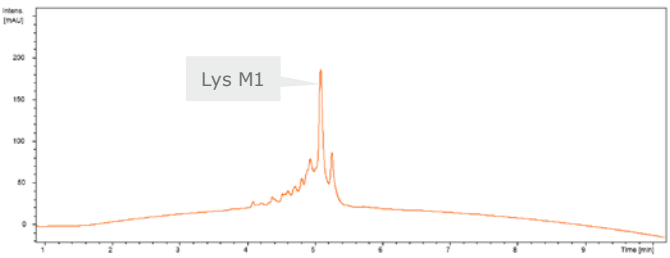
c)



e)



d)



Learn More

- **Biotage® SNAP Bio C18 & C4 300 Å Cartridges**
  Product Note (PPS437)
- **Using Peptide Synthesizers for Discovery of Non-standard Peptides**
  Customer Case PPS406
- **Peptide Synthesis Workflow Solutions**
  Customer Case PPS439
- **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

Sole Purification Methods
a. Chromatogram of PYY (3-36) peptide purified using a Biotage® SNAP Bio C18 flash cartridge.

b. HPLC chromatogram of flash purified PYY (3-36) peptide, >95% purity.

Front-end Cleanup Prior to RP-HPLC
c.HPLCchromatogram of crude Lys M1.

d. Chromatogram from the flash purification of Lys M1 using Biotage® Bio C18 300 Å flash cartridge.

e. HPLC chromatogram of Lys M1 peptide purified by flash chromatography on Biotage® Bio C18 300 Å flash cartridge.

Evaporation

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.

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.

How Does V10-Touch Help Peptide Chemists?

- Removal of cleavage cocktails, either completely or reducing the volume before ether precipitation.
- 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.

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

Learn More

Biotage® V-10 Touch Evaporation System
Product Video

Biotage® V-10 Touch
Product Folder (PPS415)

Using Peptide Synthesizers for Discovery of Non-standard Peptides
Customer case (PPS406)

Technical Specifications

Biotage® Initiator+ Alstra™

Heating Process

Temperature Range	40–100 ºC
Temperature Increase	Typically 2–5 ºC/s
Pressure Range	Run at atmospheric pressure
Power Range	0–120 W at 2.45 GHz
Reactor Vial Sizes	5, 10 and 30 mL
Agitation	Oscillating mixing unit
Reaction Volumes	5 mL (0.6–3.5 mL) 10 mL (3.5–10 mL) 30 mL (4.5–20 mL)
Inert Gas (microwave Cavity)	Approx. 2 L/min (0.07 cubic feet/min); 0.5 bar (0.05 MPa; 7.25 PSI)
Inert Gas (Manifold Option)	Approx. 4 L/min (0.14 cubic feet/min); 0.5 bar (0.05 MPa; 7.25 PSI)

Liquid Handling

Syringe Pump	3 x digital syringe pumps, with 10 mL sample loop
Flow Rate	6–50 mL/min
Reagent Bottles	5 x 185 mL GL45 glass bottles
Solvent Bottles	1 x 5 L, 1 x 2 L, and 1 x 1 L, GL45 brown glass bottles
Amino Acid Rack	32 x 30 mL
Waste Bottle	10 L

Interfaces

Touch Screen	10.4”
Ethernet LAN	Complies with IEEE 802.3 (ANSI 8802-3)
USB	USB 2.0
Archiving/back-up	Via USB
Printing	Via LAN

System Requirements

Operating Temperature	18–32 °C
Storage and Transportation Temperature	-25°C to 60°C (-13°F to 140°F)
Humidity	20–95% at room temperature
Power Requirements	Europe: 220–240 V~, 50 Hz (5 A) US and Japan: 100–120 V~,50/60 Hz (10 A)
Max. Power Consumed	1100 VA
Weight	42 kg (92.6 lbs.)
Dimensions (W X D X H)	640 x 430 x 640 mm (25.2” x 16.9” x 25.2”)
Vacuum Pump	Minimum partial pressure: 100 mbar
Flow Rate	11 L/min (0.4 cubic feet/min)

Certifications

CE, CAN/CSA certified

Syro I

System Specification

Automation	Single robotic arm
Liquid Handling	Two 5 mL digital syringe pumps
Agitation	Vortex mixer for reactor block
Reactor Block (standard)	One U-type reactor block for 2, 5 and 10 mL reactor vials. Choice of either 24 or 48 positions
Vacuum Pump	ME 2C
Amino Acid Rack	40 x 50 mL
Reagent Bottle Rack	2 x 500 mL, 3 x 200 mL
Waste Bottle	1 x 10 liter Nalgene bottle
Equipment	Includes desktop PC, flat panel monitor, printer, and Syro XP software
Dimensions (W X D X H)	56 cm x 70 cm x 91 cm
Weight	60 kg

Power Requirements

Robot (max. 250 W)	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)
Vacuum Pump	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)

Syro II

System Specification

Automation	Dual robotic arm with a three tip pipetting washcomb
Liquid Handling	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.
Agitation	Vortex mixer for two reactor blocks
Reactor Block (standard)	Two U-type reactor blocks for 2, 5 and 10 mL reactor vials. Choice of either 24 or 48 positions
Vacuum Pump	ME 4C
Amino Acid Rack	40 x 50 mL
Reagent Bottle Rack	3 x 500 mL, 4 x 200 mL
Waste Bottle	1 x 20 liter Nalgene bottle
Equipment	Includes desktop PC, flat panel monitor, printer, and Syro XP software
Dimensions (W X D X H)	82 cm x 70 cm x 91 cm
Weight	85 kg

Power Requirements

Robot (max. 250 W)	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)
Vacuum Pump	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)

Biotage Initiator+ SP Wave

Heating Process

Temperature Range	Peptide synthesis: 40°C to 100°C Organic synthesis: 40°C to 300°C Note: Biotage® Microwave Reaction Vials 10–20 mL for organic synthesis may not be used at temperatures above 250°C.
Temperature Increase	Typically 2°C to 5°C per second depending on solvent and power applied.
Pressure Range	Peptide synthesis: Run at atmospheric pressure Organic synthesis: 0 to 30 bar (3 MPa; 435 PSI) Note: Biotage Microwave Reaction Vials 10–20 mL may not be used at pressures above 20 bar.
Power Range	Peptide synthesis: 0 to 120 W from magnetron at 2.45 GHz Organic synthesis: 0 to 400 W from magnetron at 2.45 GHz
Reactor Vial Sizes	Peptide synthesis: 2 mL, 5 mL and 10 mL Organic synthesis: 0.2–0.5 mL, 0.5–2.0 mL, 2.0–5.0 mL and 10–20 mL
Agitation	Peptide synthesis: Vortex unit (500 to 1300 rpm) Organic synthesis: Magnetic stirrer (300 to 900 rpm)
Reaction Volumes	Peptide synthesis: 2 mL reactor vial: 0.8–1.1 mL 5 mL reactor vial: 1.6–3.2 mL 10 mL reactor vial: 3.2–6.4 mL Organic synthesis: 0.2 to 20 mL in microwave reaction vials
Inert Gas (optional)	Approximately 2 L/min (0.07 cubic feet/min), 0.5 bar (0.05 MPa; 7.25 PSI)

Liquid Handling

Syringe Pump	Digital single syringe pump, 11 mL with sample loop
Flow Rate	2–50 mL/min
Reagent Bottle Rack	3 x 100 mL
System Solvent	1 x 2000 mL

Interfaces

Touch Screen	10.4”
Ethernet LAN	Complies with IEEE 802.3 (ANSI 8802-3)
USB	USB 2.0
Archiving/back-up	Via USB
Printing	Via LAN

System Requirements

Operating Temperature	18–32 °C
Storage and Transportation Temperature	-25 °C to 60 °C
Humidity	20–95% at room temperature
Electrical Supply	Europe: 220–240 V~, 50 Hz (5 A) US and Japan: 100–120 V~, 50/60 Hz (10 A)
Max. Power Consumed	1100 VA
Weight	33 kg (72.7 lbs.)
Dimensions (W X D X H)	400 mm x 500 mm x 685 mm (15.7” x 19.7” x 27.0”)
Vacuum Source	Minimum partial pressure: 100 mbar
Flow Rate	11 L/min (0.4 cubic feet/min)

Certifications

CE, CSA certified

Isolera

System Specification	
Solvent Delivery	Two constant volume (3 mL) electric HPFC pumps
Flow Rate	1–200 mL/min
Pressure Limit	145 psi (10 bar)
Sample Interval	Milligrams–75 grams
UV Detection	Choice of variable wavelength (200–400 nm), fixed (254 nm), or UV-VIS (200–800 nm) detectors
Flow Cell Path Length	0.3 mm
UV Collection Modes	Single/dual/λ-All wavelengths (variable UV and UV-VIS)
Fractionation Modes	Volume, threshold, threshold with volume, low slope, medium slope, custom slope or via external detection
Collection Vessels	Test tubes (13 mm, 16 mm, 18 mm, and 25 mm) and bottles (120 mL, 240 mL, and 480 mL)
System Control & Data Management	On-board computer with 10.4” capacitive touch screen interface
Dimensions (W X H X D)	355 mm (14”) x 596 mm (23.5”) x 497 mm (19.6”). Add 178 mm (7”) with EXP
Weight	30–35 kg (66–77 lbs)
Power Requirements	100–240 VAC, 50/60 Hz, 4.0 A
Certifications	CE, cTÜVus

Biotage® V-10

Solvent Compatibility	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.
Heating	20 °C to 70 °C
Rotational Speed	3000 to 8000 rpm
Condenser	Refrigerated condenser temperature: -25 °C. Automated and manual draining; and manual defrost.
Vacuum	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.
Vial Compatibility	30 mL scintillation vial 20 mL scintillation vial 16 mL vial 8 mL vial 4 mL
Solvent Reclamation	Up to 98% of solvent vapors under typical conditions
Exhaust	Double trapping
Electrical Supply	220–240 V~, 50 and 60 Hz, 10 A
Max. Power Consumed	2100 VA
Dimensions (WxDxH)	40 cm x 48 cm x 53 cm 15.7” x 18.9” x 20.9”
Weight	50 kg/110 lbs
Part Numbers	V10-2XX V-10 Touch System V10-2SC V-10 Touch System with Solvent Manager and Automation
Accessories	411181 Carousel Vial Holder 30/20 mL vials 411816 Gilson Liquid Handler GX271 - V-10

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
Vacuum pump ME1C, 100–230 VAC 50–60 Hz	356330SP
Optional Accessories and Consumables	
Inert gas manifold	356208
Alstra UV Monitoring Kit	356444
Alstra MAOS Kit	356445
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
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 training	SER-IA-IN
Service Agreement - Priority - Alstra	SER-IA-SAP
Peptide Application Training – 1 day	SER-PEP-AT

Syro I and II

Product	Part Number
Syro I System	
Parallel Peptide Synthesizer 48 x 2 mL Reactor Block	
60 Hz, 115 VAC (USA)	
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
50 Hz, 230 VAC (UK/EU)	
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
50/60 Hz, 100 VAC (JPN)	
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
Parallel Peptide Synthesizer 24 x 5 mL Reactor Block	
60 Hz, 115 VAC (USA)	
No options	S1PS-1B-X-X
Inert Gas	S1PS-1B-IG-X
Inert Gas, Tip Synthesis	S1PS-1B-IG-TS
Tip Synthesis	S1PS-1B-X-TS
50 Hz, 230 VAC (UK/EU)	
No options	S1PS-2B-X-X
Inert Gas	S1PS-2B-IG-X
Inert Gas, Tip Synthesis	S1PS-2B-IG-TS
Tip Synthesis	S1PS-2B-X-TS
50/60 Hz, 100 VAC (JPN)	
No options	S1PS-3B-X-X
Inert Gas	S1PS-3B-IG-X
Inert Gas, Tip Synthesis	S1PS-3B-IG-TS
Tip Synthesis	S1PS-3B-X-TS
Service	
Service, installation and initial training	SER-PS1-IN
Service Agreement - Priority - Syro I	SER-SY1-SAP
Peptide Application Training – 1 day	SER-PEP-AT

Product	Part Number

Syro II System

Parallel Peptide Synthesizer 2 (48 x 2 mL) Reactor Blocks

60 Hz, 115 VAC (USA)	
No options	S2PS-1A-X-X
Inert Gas	S2PS-1A-IG-X
Inert Gas, Tip Synthesis	S2PS-1A-IG-TS
Tip Synthesis	S2PS-1A-X-TS
50 Hz, 230 VAC (UK/EU)	
No options	S2PS-2A-X-X
Inert Gas	S2PS-2A-IG-X
Inert Gas, Tip Synthesis	S2PS-2A-IG-TS
Tip Synthesis	S1PS-2A-X-TS
50/60 Hz, 100 VAC (JPN)	
No options	S2PS-3A-X-X
Inert Gas	S2PS-3A-IG-X
Inert Gas, Tip Synthesis	S2PS-3A-IG-TS
Tip Synthesis	S2PS-3A-X-TS

Parallel Peptide Synthesizer 2 (24 x 5 mL) Reactor Blocks

60 Hz, 115 VAC (USA)	
No options	S2PS-1B-X-X
Inert Gas	S2PS-1B-IG-X
Inert Gas, Tip Synthesis	S2PS-1B-IG-TS
Tip Synthesis	S2PS-1B-X-TS
50 Hz, 230 VAC (UK/EU)	
No options	S2PS-2B-X-X
Inert Gas	S2PS-2B-IG-X
Inert Gas, Tip Synthesis	S2PS-2B-IG-TS
Tip Synthesis	S2PS-2B-X-TS
50/60 Hz, 100 VAC (JPN)	
No options	S2PS-3B-X-X
Inert Gas	S2PS-3B-IG-X
Inert Gas, Tip Synthesis	S2PS-3B-IG-TS
Tip Synthesis	S2PS-3B-X-TS

Service

Service, installation and initial training	SER-PS2-IN
Service Agreement - Priority - Syro II	SER-SY2-SAP
Peptide Application Training – 1 day	SER-PEP-AT

Syro I and II Accessories

Inert Gas Cover Plates

Inert Gas Cover Plate 24 x 2 mL reactor	Z002IC024
Inert Gas Cover Plate 24 x 5 mL reactor	Z005IC024
Inert Gas Cover Plate 24 x 10 mL reactor	Z010IC024
Inert Gas Cover Plate 48 x 2 mL reactor	Z002IC048
Inert Gas Cover Plate 96 pos. for Tip-reactors	Z004IC096
Inert Gas Cover Plate 12 x 2 mL reactor	Z002IC012
Inert Gas Cover Plate 12 x 5 mL reactor	Z005IC012
Inert Gas Cover Plate 12 x 10 mL reactor	Z010IC012
Inert Gas Cover Plate 12 x 20 mL reactor	Z020IC012

Product	Part Number

Transfer Units for Cleavage

Transfer Unit 24-position Syro I	S011TU124
Transfer Unit 48-position Syro I	S011TU148
Transfer Unit 24- and 48-positions Syro I	S011TU142
Transfer Unit 24-position Syro II	S011TU224
Transfer Unit 48-position Syro II	S011TU248
Transfer Unit 24- and 48-positions Syro II	S011TU242
Vortex mixer, stand-alone, for two U-block reactors during cleavage	S006VO002

U-Block Reactors and Empty Heads

U-block Reactor, 24 x 2-5-10 mL	Z024UB050
U-block Reactor, 48 x 2 mL	Z048UB020
U-block Reactor, 96 x 2 mL (Syro II only)	Z096UB020
U-block Reactor, 12 x 2-5-10-20 mL	Z012UB200
U-block Reactor, 48 x 5 mL (Syro II only)	Z048UB050
Empty Head, 12-position	Z012AK000
Empty Head, 24-position	Z024AK000
Empty Head, 48-position	Z048AK000
Empty Head, 96-position (Syro II only)	Z096AK000

Heating Block Reactors and Plates

Heating Block (24 position) Syro I for 2ml Reactors	S015HT021
Heating Blocks (2 x 24 position) Syro II for 2ml Reactors	S015HT022
Heating Block (24 position) Syro I for 5ml Reactors	S015HT051
Heating Blocks (2 x 24 position) Syro II for 5ml Reactors	S015HT052
Heating Block (24 position) Syro I for 10ml Reactors	S015HT101
Heating Blocks (2 x 24 position) Syro II for 10ml Reactors	S015HT102

Heating Plates

Heating plate (24 position), 2 mL vials	Z024HP020
Heating plate (24 position), 5 mL vials	Z024HP050
Heating plate (24 position), 10 mL vials	Z024HP100

Syro I and II Consumables

Product	Part Number
PP-Reactor 2 mL with PTFE frit, 100/pk	V020TF051
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 PTFE-frit, 100/pk	V200TF086
PP-Reactor 20 mL, with PTFE-frit (for inert gas), 100/pk	V200TF073
Luer Stoppers, 100/pk	V000LS100
Universal PTFE stopcock, 10/pk	121-0009
Plunger with PTFE cap 5 mL, 1/pk	V050TF050
Plunger with PTFE cap 10 mL, 1/pk	V100TF100
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+ SP Wave

Product	Part Number
Initiator+ SP Wave (EU)	356014
Initiator+ SP Wave (USA/JPN)	356015
Optional Accessories and Consumables	
PP-Reactor 2 mL with PTFE frit, 100/pk	V020TF051
PP-Reactor 5 mL with PTFE frit, 100/pk	V050TF062
PP-Reactor 10 mL with PTFE frit, 100/pk	V100TF086
Vacuum pump ME1C, 100–230 VAC 50–60 Hz	356330SP
Waste and scrubber kit	356016
Biotage Microwave Reaction Kits, 0.2–0.5 mL, 100/pk	355458
Biotage Microwave Reaction Kits, 0.5–2 mL, 100/pk	352016
Biotage Microwave Reaction Kits, 2–5 mL, 100/pk	351521
Biotage Microwave Reaction Kits, 10–20 mL, 50/pk	354833
Cap 10 mL vial	355838
Cap 5 mL vial	355839
Cap 2 mL vial	355918
Plunger with PTFE cap 5 mL, 1/pk	V050TF050
Plunger with PTFE cap 10 mL, 1/pk	V100TF100
Universal PTFE stopcock, 10/pk	121-0009
Service	
Installation and training	SER-ISPW-IN
Service Agreement - Priority - SP Wave	SER-SPW-SAP
Peptide Application Training – 1 day	SER-PEP-AT

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
Instruments	
Initiator+ Microwave System (EU)	356006
Initiator+ Microwave System (US/JPN)	356007
Consumables	
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, 5/pk	355984
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

ChemMatrix® Resins

Resin	Volume	Part Number
HMPB-ChemMatrix	5 g	7-820-1310-5
HMPB-ChemMatrix	25 g	7-820-1310-25
Wang-ChemMatrix	5 g	7-320-1310-5
Wang-ChemMatrix	25 g	7-320-1310-25
Trityl-ChemMatrix	5 g	7-420-1310-5
Trityl-ChemMatrix	25 g	7-420-1310-25
Rink Amide-ChemMatrix	5 g	7-600-1310-5
Rink Amide-ChemMatrix	25 g	7-600-1310-25

Purification

Isolera™ Flash System

Product	Part Number
Isolera™ One, One Channel, Single Collection Bed, 200–400 nm Detector	ISO-1SV
Isolera™ One, One Channel, Single Collection Bed, 200–800 nm UV-VIS Detector	ISO-1SW
Isolera Spektra Package	ISO-SPK
13 x 100 mm Isolera vial rack, pk/4	411789
18 x 150 mm Isolera vial rack pk/4	411792
25 x 150 mm Isolera vial rack pk/4	411793

Flash Consumables

Product	Part Number
Flash Cartridges	
Biotage® SNAP Bio C18 300 Å 10 g, 2/pk	FBIO-0411-0010
Biotage® SNAP Bio C18 300 Å 25 g, 2/pk	FBIO-0411-0025
Biotage® SNAP Bio C18 300 Å 50 g, 2/pk	FBIO-0411-0050
Biotage® SNAP Bio C18 300 Å 100g, 2/pk	FBIO-0411-0100
Biotage® SNAP Bio C4 300 Å 10 g, 2/pk	FBIO-0412-0010
Biotage® SNAP Bio C4 300 Å 25 g, 2/pk	FBIO-0412-0025
Biotage® SNAP Bio C4 300 Å 50 g, 2/pk	FBIO-0412-0050
Biotage® SNAP Bio C4 300 Å 100 g, 2/pk	FBIO-0412-0100
Biotage® SNAP Ultra C18 12 g, 2/pk	FSUL-0401-0012
Biotage® SNAP Ultra C18 30 g, 2/pk	FSUL-0401-0030
Biotage® SNAP Ultra C18 60 g, 2/pk	FSUL-0401-0060
Biotage® SNAP Ultra C18 120 g, 2/pk	FSUL-0401-0120
Biotage® SNAP KP-C18-HS 12 g, 2/pk	FSL0-1118-0012
Biotage® SNAP KP-C18-HS 30 g, 2/pk	FSL0-1118-0030
Biotage® SNAP KP-C18-HS 60 g, 2/pk	FSL0-1118-0060
Biotage® SNAP KP-C18-HS 120 g, 2/pk	FSL0-1118-0120
Samplets	
Biotage® SNAP Ultra C18 Samplet 1.2 g, 20/pk	SAS-0401-0012
Biotage® SNAP Ultra C18 Samplet 3 g, 20/pk	SAS-0401-0030
Biotage® SNAP Ultra C18 Samplet 12 g, 20/pk	SAS-0401-0120
Biotage® SNAP Samplet KP-C18-HS 1 g, 20/pk	SAS-1118-0012
Biotage® SNAP Samplet KP-C18-HS 3 g, 20/pk	SAS-1118-0030
Biotage® SNAP Samplet KP-C18-HS 12 g, 20/pk	SAS-1118-0120

Evaporation

Product	Part Number
V-10 Touch System	V10-2XX
V-10 faceseal, Chemraz, 1/pk	413210
Vacuubrand RZ 2.5 external vacuum pump kit, 120V	412905
External vacuum pump connection kit for Vacuubrand and Edwards hi-vac. pumps	413146
Vacuubrand RZ 2.5 external vacuum pump kit, 230V	413149

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