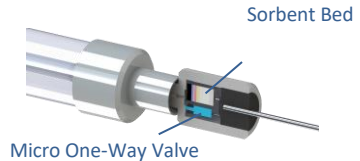


μSPEed® Cartridge Instructions

μSPEed cartridges revolutionise microSPE sample preparation by utilising a one-way valve and packed sorbent bed with a positive displacement syringe.

The one-way valve enables aspiration into a syringe past the SPE sorbent bed. Liquids can be dispensed through the sorbent bed at pressures up to 1200 psi enabling small particle sorbents ($\leq 3\mu\text{m}$) to be used for greater efficiency, cleaner analyte, faster performance and use far less solvent.



CARTRIDGE SPECIFICATIONS

Sorbent Bed

Sorbent Bed Dimensions = $\varnothing 2.1 \text{ mm} \times 2.3 \text{ mm}$ (8 μL)

Approximate Sorbent weight = $4.2 \pm 0.2 \text{ mg}$ (silica)

Needle & Valve Area Volume = 3 μL

Minimum Elute Volume (unretained) = 23 μL

Sorbent Bed = Cartridges are supplied dry. Must be Conditioned before use.

μSPEed Flowpath Materials

Polypropylene, Fluoroelastomer (cream) or ChemResP™ (black) valve and 303 Stainless Steel Needle

Solvent Compatibility

a) Fluoroelastomer Avoid Strong Non-Polar and Aprotic Polar Solvents (eg.

Dichloromethane and 100% Acetonitrile) which can affect the function of the valve.

a) ChemResP: Suitable for use with all solvents including Dichloromethane and Acetone.

Maximum Pressure

1200psi

Operational Flowrates

a) Fluoroelastomer (cream)

Activation & Condition	1000 $\mu\text{L}/\text{min}$	Backflow may be observed when sorbent bed is dry.
Aspiration Maximum Flowrate	500 $\mu\text{L}/\text{min}$	Where possible reduce aspiration to avoid sorbent bed backflow.
Load, Wash and Elute	250 $\mu\text{L}/\text{min}$	With consideration to valve operation flowrates down to 50 $\mu\text{L}/\text{min}$ can be used
Aspiration Maximum Flowrate	See Note	Depends on sample, solvent, kinetic and pressure considerations (use slower dispense flowrates for "dirty" samples to reduce pressure build up.)
Dispense Minimum Flowrate		
Dispense Maximum Flowrate		

b) ChemResP (black)

Activation & Condition Aspiration Maximum Flowrate	1000µL/min	Backflow may be observed when sorbent bed is dry.
Load, Wash and Elute Aspiration Maximum Flowrate	500µL/min	Where possible reduce aspiration to avoid backflow.
Dispense Minimum Flowrate	350 µL/min	Note the minimum flowrate higher than Fluoroelastomer
Dispense Maximum Flowrate	See Note	Depends on sample, solvent, kinetic and pressure considerations (use slower dispense flowrates for “dirty” samples to reduce pressure build up.)

PREFILTER SAMPLES

To ensure maximum performance, flowrate, reproducibility, and recovery, it is recommended that samples be pre-filtered prior to use with a µSPEed cartridge. It is also recommended that viscous samples be diluted if dispensing pressure is excessive.

STANDARD OPERATIONAL PROCEDURE (SOP)

Where possible for critical samples include duplicate/triplicate sampling with different µSPEed cartridges for result assurance.

MULTIPLE USE

µSPEed cartridges can be used multiple times depending on sample matrix and standard Operational Procedures (SOPs) requirements. To reuse, aspirate and dispense 100µL organic conditioning solvent multiple times prior to beginning a next sequence.

Note: Limit the number of times the cartridge is pushed-on and pulled-off the syringe, as this may reduce the hold pressure due to distortion of the cartridge at the connection point.

CONTROLLED VOLUMES AND FLOWRATE

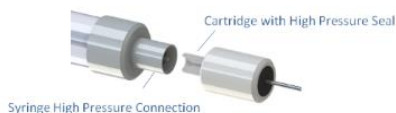
Separation kinetics should be controlled using µSPEed cartridges. The ePrep or digiVOL Digital Syringe Driver can be programmed for accurate volume and flowrate sequences.

STORAGE FOR REUSE

µSPEed cartridges should be stored in 10% Methanol/ 90% Water between use.

SYRINGES DESIGNED FOR µSPEed CARTRIDGES

µSPEed cartridges feature a high-pressure connection, designed for unattended automated operation. This connector requires a syringe with a “spiked” termination to guide and seal with the connection. Syringes with the “spiked” termination are available for the ePrep, digiVOL and manual operation.



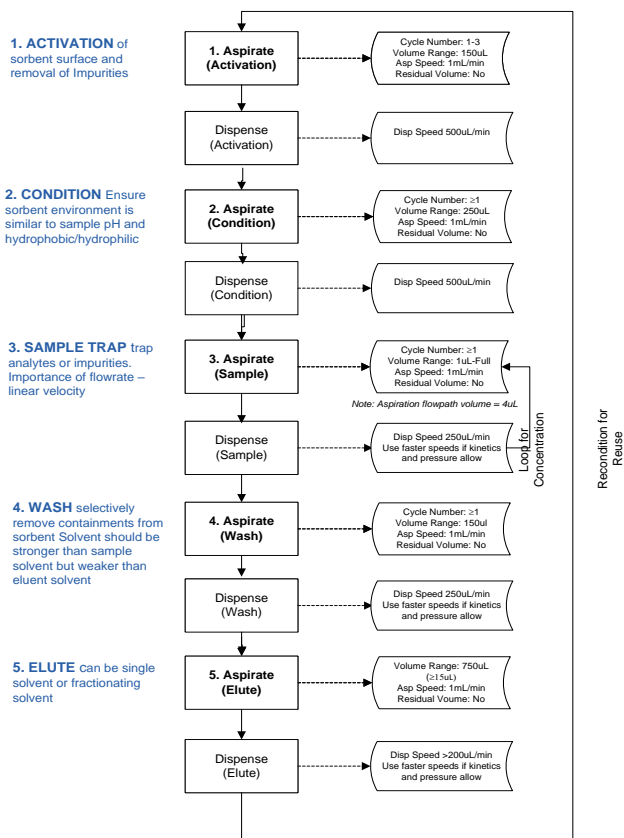
TYPICAL µSPEed OPERATION STEPS

Standard liquid chromatography principles can be applied to µSPEed cartridges to change trapping and elution conditions. Parameters such as multiple sample load, multiple washes, solvent buffers, pH adjustment, solvent choice, % organic, stepped elution etc. can be changed to optimise sample clean-up, recovery and repeatability.

STEP 1	ACTIVATION	Activate cartridge with solvent (e.g. methanol for Reverse Phase cartridges). Minimum 2 x 100µL
STEP 2	CONDITIONING	Wash cartridge with conditioning solvent (e.g. ultra-pure water or buffer) to make ready for sample trapping. Minimum 2 x 100µL
STEP 3	SAMPLE LOAD	Aspirate Sample (for manual use volume + 3µL for needle and valve)
STEP 3b	SAMPLE DISPENSE	Dispense all aspirated liquid to Trap Analyte(s) on µSPEed sorbent
STEP 4	SAMPLE WASH	Wash cartridge and syringe to ensure all sample is loaded onto the cartridge (wash solvent is typically same as Conditioning Solvent). Note: Several wash steps (of differing solvents) may be used to selectively remove impurities and/or change the solvent conditions before Analyte Elution steps
STEP 5	ANALYTE ELUTE	Use Elution solvent(s) to remove selected analytes.

EXAMPLE µSPEed SEQUENCE

The following is an example process workflow sequence for µSPEed Cartridges which includes; Activation>Condition>Sample Load>Elution operation. Conditions provide are an example only for C18 cartridges and should be modified and optimised for a specific analysis with consideration to sample matrix and analyte.



ORDERING INFORMATION

μSPEed Cartridges

Part No	Code	Description
Silica Based		
01-10105	C4, 3 μm / 300Å μSPEed Cartridges (Pkt 10)	C4 wide pore silica packing for protein analysis
01-10106	C8, 3 μm / 120Å μSPEed Cartridges (Pkt 10)	C8 packing for highly retained hydrophobic compounds
01-10110	C18RP-3μm/120Å, μSPEed Cartridges (Pkt 10)	ODS spherical silica packing with high acidic resistance suitable for general organic compound applications.
01-10111	C18RP-3μm/120Å, μSPEed Cartridges (Pkt 50)	
01-10124	C18/P (Hydrophilic ODS), 3 μm / 120Å μSPEed Cartridges (Pkt 10)	Valve Hydrophilic ODS for large volume aqueous sample with ChemResP valve
01-10125	C18/P (Hydrophilic ODS), 3 μm / 120Å μSPEed Cartridges (Pkt 50)	
01-10115	Silica-3μm/120Å, μSPEed Cartridges (Pkt 10)	Spherical bare silica 3μm/120Å packing.
01-10116	Silica-3μm/120Å, μSPEed Cartridges (Pkt 50)	
Specialty Silica Based		
01-10117	WAX (APS), μSPEed Cartridges (Pkt 10)	For PFAS environmental analysis.
01-10118	PFAS, μSPEed Cartridges (Pkt 10)	For PFAS environmental analysis.
Cxyl Customisable Chemistry		
01-10185	Cxyl-3μm/120Å, μSPEed Cartridges (Pkt 10)	Carboxyl terminated for customisable chemistry
PS/DVB Polymer Based		
01-10149	PS/DVB -3μm/ 300Å, μSPEed Cartridges (Pkt 50)	
01-10150	PS/DVB -3μm/ 300Å, μSPEed Cartridges (Pkt 10)	Spherical, crosslinked polystyrene divinyl benzene
01-10151	PS/DVB RP-3μm/ 300Å, μSPEed Cartridges (Pkt 10)	3μm/ 300Å Phenyl (RP) spherical, crosslinked polystyrene divinyl benzene
01-10155	PS/DVB SAX-3μm/ NP, μSPEed Cartridges (Pkt 10)	3μm/Non Porous SAX spherical, crosslinked polystyrene divinyl benzene
01-10156	PS/DVB SCX-3μm/ NP, μSPEed Cartridges (Pkt 10)	3μm/Non-Porous SCX spherical, crosslinked polystyrene divinyl benzene
Specialty Porous Graphitic Carbon μSPEed		
01-10135	μCARB, 3μm/250Å μSPEed cartridges (Pkt 10)	Porous Graphitic Carbon for very polar analytes, structurally-related substances, wide pH stability and high-temperature applications

digivol Digital Syringe Driver

Part No	Description
01-08100	digivol Digital Syringe Driver (110-240v) with 250μL μSPEed Syringe

ePrep Sample Preparation Workstation

Part No	Description
01-01000-01	ePrep Sample Preparation Workstation

Manual μSPEed Syringes

Part No	Code	Description
01-09040	100μL μSPEed Syringe	100μL μSPEed Manual Syringe with eZy-Connect
01-09045	500μL μSPEed Syringe	500μL μSPEed Manual Syringe with eZy-Connect

For further information please contact: ePrep Pty Ltd, info@eprep.com.au, www.eprep-analytical.com
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