SGE Analytical Science

A TRAJAN Brand

Every One an Expert

eVol® XR

- Digital analytical syringe
- Speed up and simplify laboratory workflow
- Improve accuracy and reproducibility
- Standardize results independent of operator skill

Supplied by

Greyhound CHROMATOGRAPHY AND ALLIED CHEMICALS

www.sge.com

eVol XR

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2010 R&D 100 Award Winner

The World's First Digital Analytical Syringe

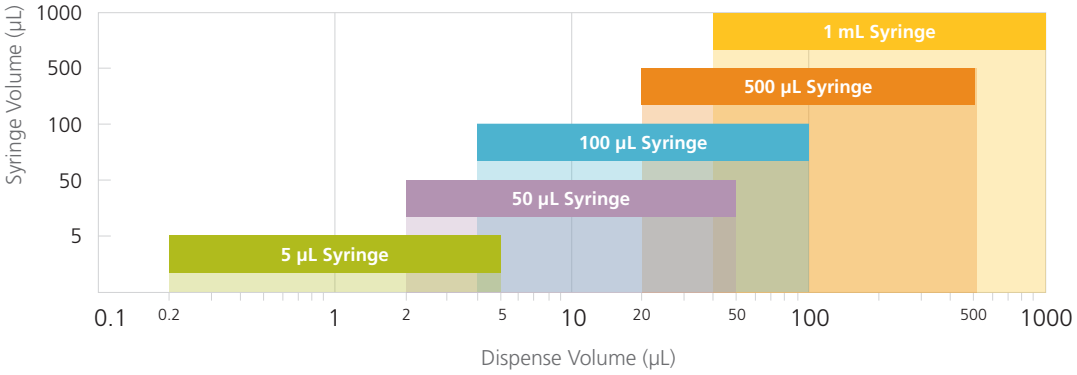
eVol XR is the coupling of two precision devices: a digitally controlled electronic drive and an XCHANGE® enabled analytical syringe.

- Ergonomic, comfortable and easy to use.
- Suitable for use with volatile samples.
- Variable speed of operation.
- eVol XR syringes are easily and quickly changed allowing them to be dedicated to individual liquids or methods to prevent possible cross-contamination of reagents.
- Easily calibrated by operators, and calibration factors saved for each syringe, enabling laboratories to comply with stringent global laboratory standards (e.g. GLP, GMP, FDA).
- Programmable and able to store a laboratory workflow (up to 98 steps).
- Password protection options enabling standardization of work processes.
- Inject directly onto a chromatography column with a consistent flow rate.
- eVol XR syringe stainless steel needle enables direct injection through septa.

Syringe Capacities to Suit a Range of Applications

- 5 µL, 50 µL, 100 µL, 500 µL, and 1 mL syringe capacities.
- Range of needle lengths and tips.

Volume Range of eVol Syringes



Applications include:

- Preparation of calibration standards.
- Preparation and addition of internal standards.
- Precise dispensing of aqueous and non-aqueous liquids.
- Routine dispensing.
- Sample dilution.
- Ergonomic operation with substances in a fume hood.
- GC and LC Instrument injections.
- Eliminates the need for serial dilutions.
- Micro titrations.
- TLC spotting.
- FDA methods requiring a 1 mL syringe.

Improve Standard Laboratory Processes

The award winning eVol XR improves the pace of laboratory processes while delivering improved accuracy and reproducibility.

Process	Without eVol	With eVol	Benefits of Using eVol
Standard preparation	Standards prepared in a large volume flask. From this standard aliquots are individually dispensed into autosampler vials.	Standards are made up directly in the vial, including the make up solvent.	• Less glassware usage. • Reduces waste fluid. • Significant time saving. • Improved accuracy and reproducibility.
Addition of standards	Small amounts of standard aspirated and dispensed into all samples before being transferred to an autosampler vial.	One aspiration and a fast series of repeated accurate dispenses directly into vials.	• Significant time saving. • Improved accuracy and reproducibility.
Delivery of derivatization agents	Laboratory staff required to work in a fume hood with potentially hazardous materials, to prepare combinations of derivatization agents in open vials.	Process completed with eVol programmed to aspirate an amount of solvent or agent and then dispense aliquots into sealed vials, Single handed operation.	• Improved operator safety, lower spill and splash risk. • Ergonomic benefits behind fume hood screen. • Improved accuracy and reproducibility. • Less glassware use.
Serial dilutions	Transfer of a small amount of solution to another container. Solvent added to achieve the required volume. This is repeated multiple times to obtain the required final accurate concentration.	One aspiration of the solution can be dispensed directly into the solvent to achieve the required accurate concentration.	• Complete workflow simplification. • Significant time savings. • Improved accuracy. • Less solvent required. • Less glassware used.

eVol XR Starter Kit

Use eVol XR to avoid problems with pipettes and dispensing organic solvents.

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eVol XR for NMR

Needle lengths of 115 mm and 180 mm for NMR.

Designed for the Specific Needs of Nuclear Magnetic Resonance Spectroscopy

eVol XR NMR long stainless steel needles, enable in-tube sample dilution and mixing, and recovery of samples facilitating re-use of NMR tubes.

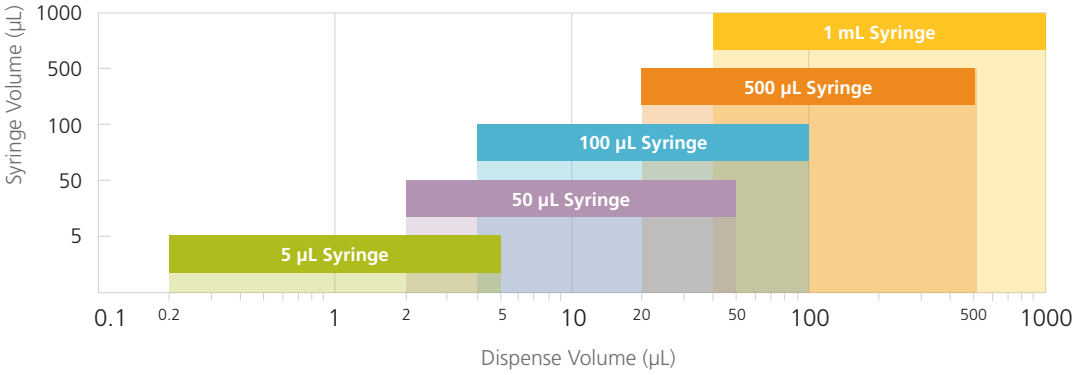
- Suitable for small sample quantities.
- Very high levels of accuracy and reproducibility.
- Can be used with specialist samples and solvents.
- Conserves high cost consumables.

Configuration for NMR

eVol syringes and needles are available separately.

- 5 µL, 50 µL, 100 µL, 500 µL, and 1 mL syringe capacities.
- 115 mm and 180 mm needle lengths.
- Bevel or cone needle tips.

Volume Range of eVol Syringes for NMR



Saving NMR Capillaries

eVol XR allows accurate manipulation of small volumes of NMR samples enabling dilution directly in the analysis tube – even in tubes with the smallest internal diameters.

Precious samples can be easily recovered to store in alternative vessels (such as inexpensive vials) rather than being left in valuable tubes. These tubes can now be emptied using eVol XR for washing and re-use.

eVol XR Starter Kit for NMR

Suitable for small quantities of precious NMR samples.

NMR Laboratory Experience With eVol XR

eVol XR is used at France's Laboratoire de Résonance Magnétique Nucléaire, Institut de Biologie Structurale (LRMN, IBS) with positive results. During method development the laboratory tests a large number of samples with high repetition.

The screening procedures use very small sample volumes and involve titration of samples directly in NMR tubes. The laboratory has been impressed with eVol XR which has provided improved accuracy and decreased sample handling time.

"We use eVol for the preparation of multiple low-volume NMR tubes in parallel. eVol is reliable, accurate and practical for titrations and filling tubes with small diameters. eVol is easy and fast to use and dispenses samples accurately."

Jérôme Boisbouvier - LRMN, IBS, Grenoble, France.

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eVol XR for MEPS®

Enabling MEPS Automation

MEPS® is Micro Extraction by Packed Sorbent, the miniaturization of conventional SPE packed bed devices from milliliter bed volumes to microliter volumes. The MEPS approach to sample preparation is suitable for reversed phases, normal phases, mixed mode or ion exchange chemistries.

MEPS advantages over conventional SPE:

- Less sample required giving you greater flexibility when you have small sample quantities.
- Less solvent used means less solvent waste and ultimately reduced expense.
- Faster preparation time, reducing from hours to minutes for improved laboratory workflow.

MEPS incorporates packed phase in a micro-cartridge or BIN (Barrel Insert and Needle) which is then integrated into an SGE analytical syringe to make miniaturized SPE possible. With MEPS, the sample processing, extraction and injection steps are performed using the same syringe.

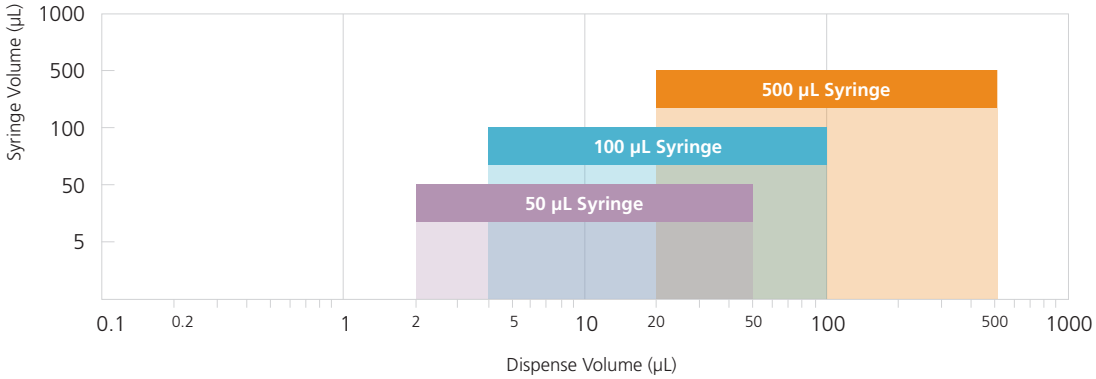
Together, eVol XR with MEPS offers improvements in workflow and resource savings. eVol custom programming enables MEPS to be semi-automated, reducing errors, and improving reproducibility.

Configuration for MEPS

MEPS BINs are available for use with eVol MEPS syringes, with C2, C8, C18, Amino-Propyl Silane phases, for LC and GC applications.

- MEPS BINs can be used with 50 µL, 100 µL and 500 µL eVol MEPS syringes.
- LC needles are 55.5 mm in length, 22 gauge and LC tipped.
- GC needles are 55.5 mm in length, 23 gauge and cone tipped.

Volume Range of eVol Syringes for MEPS



How to use eVol XR with MEPS

eVol MEPS Applications

Use eVol XR MEPS for sample preparation, SPE method development, sample cleanup and proofing before transition to fully automated platforms. Quickly process small sample batches, or urgent samples.

Suitable for a range of analyses:

- Environmental, e.g. Determination of organic priority pollutants and emerging compounds in wastewater and snow samples.
- Forensics, e.g. Contribution of micro-extraction in packed sorbent for the analysis of cotinine in human urine by GC-MS.
- Pharmaceutical, e.g. Liquid chromatographic analysis of oxcarbazepine and its metabolites in plasma and saliva.
- Food and Flavor, e.g. Determination of 2,4,6-trichloroanisole and 2,4,6-tribromoanisole in wine.
- Life Sciences, e.g. Rapid and sensitive method for determination of cyclophosphamide in patients plasma samples.

Extraction Comparison of LLE, SPE and MEPS

Description	Liq-Liq Extraction	Liq-Solid Extraction	MEPS Extraction
Concentration of sample	5 ng/mL	5 ng/mL	5 ng/mL
Extraction volume	1000 mL	20 mL	1 mL
Volume of solvent used	150 mL DCM	3 mL DCM	0.04 mL DCM
Concentration in solvent	33.33 ng/mL	33.33 ng/mL	125.00 ng/mL
Final volume of extract	1 conc vol (mL)	0.2 conc vol (mL)	NO CONCENTRATION STEP REQUIRED
Concentration in final volume	5000 ng/mL	500 ng/mL	
Injection volume	1 µL inj	2 µL inj	2 µL inj
Concentration of injection volume	5 ng per µL	0.5 ng per µL	0.125 ng per µL
Concentration injection on column	5 ng	1 ng	0.25 ng
Approx. time to prepare	Extraction to injection ~ 2-3 hours	Extraction to injection ~ 40-60 min	Extraction to injection ~ 5-10 min
Approx. volume of waste generated	Waste generated ~1+ Liter	Waste generated ~50 mL	Waste generated <2 mL

MEPS reduces solvent use and waste.

eVol XR

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SGE Analytical Science (SGE) is a world renowned brand for components and consumables used in scientific analysis.

Primarily in the field of scientific glass engineering for liquid handling and separation science, since its beginnings in 1960, SGE has become the global market leader in niche areas such as autosampler syringes and GC inlet liners.

Completing the transition into Trajan after acquisition in 2013, SGE products make up a solid foundation of Trajan's portfolio and will continue to be created and supported by Trajan customer service and distribution networks worldwide.

For more information visit www.sge.com or contact techsupport@sge.com.

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Approved Distribution Partner

BR-0412-S_Rev© Trajan Scientific and Medical 04/2015

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