sartorius stedim biotech

Vivacon® 500 and Vivacon® 2

For safe DNA and protein concentration and rebuffering from 500 µl to 2 ml starting volumes.

DNA Concentration

- Sterile and DNA-free devices available
- Highest DNA recoveries with Hydrosart® membranes
- Complete sample recovery with reverse spinning

Disposable devices for DNA concentration and buffer exchange

Working Principle
Centrifugation provides the vector to clear solvent and micro molecules through an ultrafiltration membrane to separate macro-molecular species and solvents primarily on the basis of size. It is particularly appropriate for the concentration of DNA and proteins and can also be used to rebuffer samples. Ultrafiltration is a non denaturing method that is more efficient, flexible and gentle than alternative processes.

Vivacon®, in comparison to the classical Vivaspin® units, features a horizontal membrane design that is optimized for consistency with previously used procedures.

Safe DNA concentration
Selected cut offs of the Vivacon® units are also available in PCR Grade, meaning sterile and DNA-free. For this, they have been treated with a validated, dual-cycle ethylene oxide (ETO) gas process to a safety assurance level (SAL) of 10^{-6}. They are also free of detectable human genomic DNA tested in a qPCR assay over 55 cycles with a verified limit of detection < 2 pg. This high safety level makes Vivacon® 500 and Vivacon® 2 PCR Grade the products of choice for most critical applications, like e.g. case work in the forensic industry.

Highest DNA recoveries
For optimal performance with very dilute samples, e.g. genomic DNA for forensic applications, Vivacon® 500 and Vivacon® 2 are equipped with the patented Hydrosart® regenerated cellulose membrane that guarantees extremely low binding properties and high flux. High recoveries and excellent reproducibility are paired with convenience offered by the molecular weight cut-off printed on individual devices. Vivacon®, in comparison to the classical Vivaspin units, features a horizontal membrane design that is preferred by some users for reasons of consistency with previously used procedures.

Complete sample recovery
The option of a back-spin step after sample processing assures complete and highly reproducible concentrate recovery. This is especially important when working with low sample concentrations.

Applications

- DNA rebuffering of organic extraction samples before sequencing reaction for e.g. forensic case work
- Dye removal after sequencing reaction
- Primer removal after PCR reaction
- Plasmid concentration
- Protein concentration
- Protein rebuffering
- Peptide fractionation (FASP)

Summary
For scientists and lab technicians who need to reliably and safely concentrate, rebuffer or fractionate dilute DNA samples after organic extraction or PCR reactions, Sartorius offers the Vivacon® 500 and 2 centrifugal devices.

Unlike competitive ultrafiltration units, Vivacon® 500 and 2 are additionally available in PCR Grade, meaning sterile and DNA free. This is especially important in forensic case work and enables completely reliable results at highest sample recoveries.

Technical Specifications

	Vivacon® 500	Vivacon® 2
Concentrator capacity		
Fixed angle rotor	0.5 ml	2 ml
Dimensions		
Total length (Concentration)	45 mm	125 mm
Total length (Back-spin)	47.5 mm	115 mm
Width	12.4 mm	16 mm
Active membrane area	0.32 cm^2	0.95 mm^2
Hold-up volume (membrane and support)	< 5 µl	10 µl
Dead stop volume	5 µl (40° rotor)	55 µl (25° rotor)
Equipment required		
Centrifuge		
Rotor type	Fixed angle	Fixed angle
Minimum rotor angle	40°	25°
Rotor cavity	To fit 1.5 | 2.2 ml (11 mm) conical bottom tubes	
Maximum speed	14,000 g*	7,500 g*
Materials of construction		
Body	Polycarbonate	
Filtrate vessel	Polypropylene	
Membrane	Hydrosart®	

* Please note that some membrane cut offs need to be processed at lower g forces. See Operation Instructions for details.

References for DNA concentration | rebuffering for forensic case work:

1. Performance evaluation of the Vivacon(RTM) 2 ml in comparison to the Centricon(RTM) 100 and evaluation of the ability and reliability of the TECAN Freedom EVO(RTM) 150 automated liquid-handling workstation in plate set up for quantification and amplification as part of a system wide validation by Arzate-Abdelfattah, Helvia, M.S., UNIVERSITY OF NORTH TEXAS HEALTH SCIENCE CENTER AT FORT WORTH, 2009, 58 pages; 1474530

2. DNA typing strategy to overcome post-mortem bone maceration
C. Franchia, E. Pillib, F. Barnia, S. Potenzac, A. Bertia,
a Reparto Carabinieri Investigazioni Scientifiche di Roma, Sezione di Biologia, Rome, Italy
b Dipartimento di Biologia Evoluzionistica, Laboratori di Antropologia, Università di Firenze, Via del Proconsolo 12, 50122 Florence, Italy. Progress in Forensic Genetics 14 — Proceedings of the 24th International ISFG Congress, Volume 3, Issue 1, December 2011, Pages e367–e368

3. DNA profiling of skeletal samples from the disappeared in Latin America
Steven Weitza,Lisa A. Riccia, Jon Davorena, Carlos Vullob, Mercedes Saladoc, Fredy Peccerellid; a Bode Technology, 10430 Furnace Road, Suite 107, Lorton, VA, United States; b LIDMO, Independencia 644- 4to A, 5000 Córdoba, Argentina; c Equipo Argentino de Antropología Forense (EAAF), Rivadavia 2443, 2ndo piso, Buenos Aires, (1034) Argentina; d Fundación de Antropología Forense de Guatemala (FAFG),
Primera Calle 1-53, Colonia el Sauce, Zona 2, Guatemala City, Guatemala
Progress in Forensic Genetics 13 — Proceedings of the 23rd International ISFG Congress, Volume 2, Issue 1, December 2009, Pages 245–247

References for FASP:

1. Wisniewski JR, Zougman A, Nagaraj N, Mann M. Universal sample preparation method for proteome analysis (2009). Nat Methods. 6(5):359-62.

2. Jacek R. Wisniewski, Dorota F. Zielinska and Matthias Mann (2010). Anal Biochem Dec 14, 2010

3. Ivan Matic, Ellis G. Jaffray, Senga K. Oxenham, Michael J. Groves, Christopher Barratt, Sudhir Tauro, Nicola R. Stanley-Wall, and Ron Hay J. Proteome Res., Just Accepted Manuscript
– DOI: 10.1021/pr2004715
– Publication Date (Web): 11 August 2011

Performance Characteristics

DNA concentration with Vivacon® 500

Start volume 0.5 ml, sample concentration 50 ng/ml DNA

	Sample size (bp)	Time to concentrate up to 30x [min.] at 20°C	Concentrate recovery %	RCF (× g)
2,000 MWCO	10	60 min	93 %	7,500
10,000 MWCO	30	25 min	94 %	7,500
30,000 MWCO	50	18 min	88 %	5,000
50,000 MWCO	300	18 min	91 %	5,000
100,000 MWCO	600	10 min	87 %	3,000
125,000 MWCO	650	10 min	79 %	1,000
125,000 MWCO	900	9 min	94.8 %	3,000

Protein concentration with Vivacon® 500

Start volume 0.5 ml, sample and concentration of proteins as specified in table

	Sample	Time to concentrate up to 30x [min.] at 20°C	Concentrate recovery %	RCF (× g)
2,000 MWCO	0.25 mg/ml cytochrome c	30 min	95%	14,000
10,000 MWCO	0.25 mg/ml cytochrome c	15 min	92 %	14,000
30,000 MWCO	1.0 mg/ml BSA	10 min	95 %	14,000
50,000 MWCO	1.0 mg/ml BSA	10 min	92 %	14,000
100,000 MWCO	1.0 mg/ml bovine IgG	11 min	90 %	8,000
125,000 MWCO	1.0 mg/ml bovine IgG	10 min	81 %	8,000

DNA concentration with Vivacon® 2

Start volume 2 ml, sample concentration 50 ng/ml DNA

	Sample size (bp)	Time to concentrate up to 30x [min.] at 20°C	Concentrate recovery %	RCF (× g)
2,000 MWCO	10	120 min	92 %	7,500
10,000 MWCO	30	60 min	94 %	5,000
30,000 MWCO	50	60 min	95 %	2,500
50,000 MWCO	300	45 min	96 %	2,500
100,000 MWCO	600	30 min	93 %	2,500
125,000 MWCO	650	30 min	85 %	2,000
125,000 MWCO	900	30 min	88.7 %	2,500

Protein concentration with Vivacon® 2

Start volume 2 ml, sample and concentration of proteins as specified in table

	Sample	Time to concentrate up to 30x [min.] at 20°C	Concentrate recovery %	RCF (× g)
2,000 MWCO	0.25 mg/ml cytochrome c	120 min	95 %	7,500
10,000 MWCO	0.25 mg/ml cytochrome c	90 min	96 %	5,000
30,000 MWCO	1.0 mg/ml BSA	40 min	96 %	5,000
50,000 MWCO	1.0 mg/ml BSA	30 min	94 %	5,000
100,000 MWCO	1.0 mg/ml bovine IgG	30 min	92 %	5,000
125,000 MWCO	1.0 mg/ml bovine IgG	27 min	81 %	5,000

Conversion Table for Hydrosart® MWCO to Nucleotide Cut-off

Membrane	MWCO	Double-Stranded Nucleotide Cut-off (bp)
Hydrosart®	2 kDa	> 10
Hydrosart®	10 kDa	> 30
Hydrosart®	30 kDa	> 50
Hydrosart®	50 kDa	> 300
Hydrosart®	100 kDa	> 600
Hydrosart®	125 kDa	> 650

Ordering Information

Vivacon® 500	Qty. per box	Prod. No.
2,000 MWCO	25	VN01H91
2,000 MWCO	100	VN01H92
10,000 MWCO	25	VN01H01
10,000 MWCO	100	VN01H02
30,000 MWCO	25	VN01H21
30,000 MWCO	100	VN01H22
30,000 MWCO	**25**	**VN01H21ETO**
30,000 MWCO	**100**	**VN01H22ETO**
30,000 MWCO	**500**	**VN01H23ETO**
50,000 MWCO	25	VN01H31
50,000 MWCO	100	VN01H32
100,000 MWCO	25	VN01H41
100,000 MWCO	100	VN01H42
100,000 MWCO	**25**	**VN01H41ETO**
100,000 MWCO	**100**	**VN01H42ETO**
100,000 MWCO	**500**	**VN01H43ETO**
125,000 MWCO	25	VN01H81
125,000 MWCO	100	VN01H82
125,000 MWCO	500	VN01H83
125,000 MWCO	**25**	**VN01H81ETO**
125,000 MWCO	**100**	**VN01H82ETO**
125,000 MWCO	**500**	**VN01H83ETO**

PCR optimized

Highlighted Vivacons® are the products of choice for most critical applications as they are sterile (SAL 10^{-6}) and DNA-free (< 2 pg). The new 125 kDa MWCO membrane is optimally suited for concentrating DNA for case work e.g. in the forensic industry. This larger cut off allows PCR inhibitors like indigo dyes contaminating the sample to pass the membrane.

Ordering Information

Sample Kits	Qty. per box	Prod. No.
Sample Kit L (4 units each of 2, 10, 30 kDa)	12	VN01HL12
Sample Kit H (4 units each of 30, 50, 100 kDa)	12	VN01HH12

Vivacon® 2	Qty. per box	Prod. No.
2,000 MWCO	25	VN02H91
2,000 MWCO	100	VN02H92
10,000 MWCO	25	VN02H01
10,000 MWCO	100	VN02H02
30,000 MWCO	25	VN02H21
30,000 MWCO	100	VN02H22
30,000 MWCO	**25**	**VN02H21ETO**
30,000 MWCO	**100**	**VN02H22ETO**
30,000 MWCO	**500**	**VN02H23ETO**
50,000 MWCO	25	VN02H31
50,000 MWCO	100	VN02H32
100,000 MWCO	25	VN02H41
100,000 MWCO	100	VN02H42
100,000 MWCO	**25**	**VN02H41ETO**
100,000 MWCO	**100**	**VN02H42ETO**
100,000 MWCO	**500**	**VN02H43ETO**
125,000 MWCO	25	VN02H81
125,000 MWCO	100	VN02H82
125,000 MWCO	500	VN02H83
125,000 MWCO	**25**	**VN02H81ETO**
125,000 MWCO	**100**	**VN02H82ETO**
125,000 MWCO	**500**	**VN02H83ETO**

Sartorius Stedim Biotech GmbH
August-Spindler-Strasse 11
37079 Goettingen, Germany

Phone +49.551.308.0
Fax +49.551.308.3289
www.sartorius-stedim.com

USA Toll-Free +1.800.368.7178
UK +44.1372.737159
France +33.442.845600
Italy +39.055.63.40.41
Spain +34.90.2110935
Russian Federation +7.812.6100821
Japan +81.3.3740.5407

Publication No.: SLU2021-e12091
Order No.: 85032-543-91
Ver. 09 | 2012