

MAGic 5 columns are stainless steel made, designated for high-performance preparative chromatography. They have moving piston(s) which is able to compensate sorbent bed getting down. Depending on the diameter, they withstand pressure 80 - 200 bar (1100 - 2800 PSI).

The column inlet is provided with a piston with affixed robust self prime sealing made of PTFE. Stainless steel (316 L) sintered wire disks POREMET® with 2 µm pore diameter are used to separate sorbent in column. Liquid distributors are made as the combination of stainless steel and fluoroplastic screen multilayers. Stainless steel screens are pressed to form axial and radial channels in the distributor disc to force liquid distribution. The same frits distributors are used on both sides of the column.

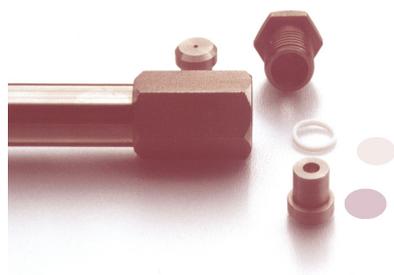
The piston compensating settling of the packing during operation is moved either by flange screws or by hydraulic system optionally delivered. Hydraulics can be either manually operated or fully automatic equipped with a pressure sensor and electronic control.

MAGic 5 columns can be packed either under the pressure (slurry method) or pressureless using a sedimentation. Packing adaptors are delivered for this low cost method, which gives in combination with moving piston good column efficiency. They are made of polypropylene and can be simply connected to the upper column flange.

MAGic 5 columns can be equipped with simple portable stand (I.D. up to 100 mm) or with stand with wheels (I.D. 100 mm - 300 mm). It is recommended to operate with hydraulic column stand system **PCS** for columns over 100 mm I.D.

Simple hydraulic stands keeping stable pressure on the top of the column are delivered. Oil pressure is generated either by manual (I.D. 25 mm, I.D. 50 mm) or by motor driven oil pump. Automatically operated hydraulic stands included pressure gauge and control units with up and down movement function and automatic pressure keeping function.

More sophisticated systems secure not only the work with constant piston pressure, but are able also to pack column in dynamic slurry mode or to unpack it. Column is lifted using the hydraulic power and fixed in upper position. Then the bottom cap with frit is removed and the unconnected piston is moved down through the column, to press the sorbent out.



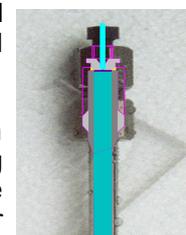
Semipreparative stainless steel columns MAGic 3 are manufactured in diameters 10 mm and 16 mm, made of high quality internally polished tubes. They are packed with all **BIOSPHER PSI** sorbents (other manufacturers sorbents on the request).

All **MAGic 3** columns are manufactured and supplied in lengths of 150 mm, 250 mm and 500 mm. Metal tube is provided on both ends with threads. Hexagon fittings are connected to the tube. End part of each fitting forms a recess, where two stainless steel screens with different porosity are inserted on the tube edge. They act both as a frit and flow distributor. Screens are fixed via PTFE sealing ring.

The end piece is screwed to the fitting. It presses the stopper with a hole and cone shoulder into the fitting recess. End piece is provided with inner thread for the inlet capillary bushing. The inlet capillary of 1.6 mm (1/16") O.D. ferrule is sealed in the stopper hole cone. Columns can be connected using standard UNF 10/32 or M5 bushing. On special request columns having other input and output capillaries diameter can be delivered. The maximum operating liquid pressure of **MAGic 3** columns is 300 bar (4200 PSI). Recommended flow is in the range 2 ml/min – 10 ml/min.

Stainless steel columns for analytical chromatography MAGic 1 (I.D. 4.6 mm) exhibits very good efficiency and excellent peak symmetry. Columns are completely designed and manufactured by Labio, using high quality internal surface electropolished tubes, destined specially for HPLC.

Metal tube is provided on both sides with fittings fixed on the tube by double cone ferrule. End part of the fitting forms a recess, where are inserted two stainless steel screens with different porosity acting as a frit and flow distributor. Screens are fixed via PTFE sealing ring and a stopper. The stopper with an open hole and a cone shoulder for sealing ferrule fix the inlet capillary of 1.6-mm (1/16") O.D.. It is pressed by the endpiece which has a thread for



the inlet capillary bushing. Columns can be connected using standard UNF 10/32 or M5 bushings. The maximum operating pressure of **MAGic 1** columns is 300 bar (4200 PSI). The columns are packed with all proprietary sorbents **BIOSPHER PSI**. Available particle diameters: 5, μm , 7 μm , 10 μm or other upon request. **MAGic 1** columns are manufactured and supplied with lengths of 50 mm, 150 mm, and 250 mm. Packed columns are supplied with a certificate. **MAGic 1** columns can be packed with other manufacturers sorbents too. For detail contact our sales department.

The columns of the **MAGic 1** series are supplemented by cartridge precolumns of identical diameter and 20 mm length. The sorbent in precolumn is retained on both ends by a stainless screen and a fixation seal ring (PEEK). Precolumn is inserted in precolumn holder and attached directly to the main column by means of an insert (shapped like double column stopper). The holder inlet is provided with standard connection to 1.6 mm (1/16") O.D. Capillary.

Spherical silica sorbents BIOSPHER psi are made by an efficient technology of colloid SiO_2 suspension gelatinisation. Primary colloid particles are highly pure, chemically stable against hydrolysis having narrow size distribution. These properties are transmitted to final spheres of sorbent and its modification.

Ready made silica particles are heated to the temperature 500 °C to remove all remaining organic impurities and improve mechanical stability. Subsequent acidic treatment and high quality distilled water washing is to remove the remaining ionic substances.

Properties of different types of **BIOSPHER psi** (specific surface area, inner pore volume, mean pore diameter) were carefully selected according to our experience and user needs. All sorbents are made under ISO 9001:2000 certified conditions which are regularly audited by NQA (GB).

BIOSPHER psi 100 is an universal sorbent for all applications and modifications. Its parameters (surface area 300 m^2/g , pore diameter 100 Å) makes it comparable with most other manufacturers products.

BIOSPHER psi 200 is similar to the 100 type, even k' factor are a bit lower. Its destination is (due relatively large pore diameter 200 Å) the use (mainly after modification) for chromatography of peptides and other medium molecular weight compounds (exclusion limit is 70000 D).

Due the original production technology **BIOSPHER psi** sorbents do not contain micropores and thus present an excellent base for subsequent modifications. Internal pore volume is optimal to attain the highest possible chemical and pressure resistance and allow the access to all surface. All above mentioned properties make from BIOSPHERs an ideal tool for preparative chromatography.

PSI C18, C8 and C4 are the most popular are sorbents for reversed-phase chromatography with bonded octadecyl, octyl or butyl groups. All sorbents are produced by a two-stage reaction with efficient endcapping, and are suitable for chromatography of components containing basic or acidic groups (AB type). Tests demonstrate the high efficiency and good peak symmetry of columns packed with these sorbents. Reverse phase sorbents can be used in pH range 1,5 – 10,5. There is a lot of applications where nonendcapped C18 sorbents are inaf to secure good separation. **PSI C18N** is offered having optimized price mainly for standard preparative chromatography.

PSI PH modification means bonded phenyl groups for special applications.

PSI SRP (= strong reverse phase) is suitable for separation of highly polar compounds both in pure water and organic solvents mixtures.

PSI NH2 coded sorbents contain chemically bonded aminopropyl groups. They are determined for chromatography of carbohydrates in water - acetonitrile mixtures, but can be used in classical chromatography with nonpolar mobile phases as well.

PSI CN phase is a polar sorbent containing chemically bonded cyanoethyl groups, which exhibit more reversible sorption than pure silica. Similar use has OH type with bonded diol groups (hydrolyzed glycidoxypropylsilane).

All **BIOSPHER psi** sorbents are delivered in a broad range of particle sizes (5, 7, 10, 15, 20, 40 and 50 μm). Fractions are sufficiently narrow to be used in HPLC ($d_{90}/d_{10} < 1,8 - 2,0$ - depending on particle size).

Modifications available

Sorbent	Modification	C18	C8	C4	SRP	C18N	NH2	OH	PH	CN
psi 100		yes	yes	yes	yes	yes	yes	yes	yes	yes
psi 200		yes	yes	yes			yes	yes		yes

PARAMETERS OF BIOSPHER psi

Physical and chemical properties

Sorbent	Specific surface area [m ² /g]	Pore volume [ml/g]	Average pore diameter {nm}	pH (5 % suspension)	Loss of drying on 150 °C [wt %]
PSI 100	240 - 360	0,6 - 0,8	9 - 14	4,0 - 6,5	< 2
PSI 200	140 - 240	0,7 - 0,9	15 - 21	4,0 - 6,5	< 2
PSI 300	90 - 140	0,7 - 1,1	25 - 31	4,0 - 6,5	< 2

Chromatographic properties

	PSI 100	PSI 100 CN, OH	PSI 100 NH	PSI 100 C18	PSI 100 C8	PSI SRP
Nitrobenzene [k']	0,6 - 1,1	0,6 - 1,1	0,6 - 1,1	n.a.	n.a.	n.a.
Phenol [k']	n.a.			0,3 - 0,5	n.a.	n.a.
Toluene [k']	n.a.			2,8 - 3,9	n.a.	4,4 - 5,2
	PSI 200	PSI 200 CN	PSI 200 NH	PSI 200 C18	PSI 200 C8	
Dimethylaniline [k']				1,4 - 1,9	0,7 - 1,1	
Nitrobenzene [k']	0,35 - 0,60	0,3 - 0,6	0,3 - 0,6			
Phenol [k']				0,2 - 0,4	0,1 - 0,3	
Toluene [k']				1,7 - 2,4	0,8 - 1,3	

For Biospher PSI 100 and Biospher PSI 100 CN heptane with 0,1 % of isopropanole was used as mobile phase, k' of biphenyle = 0.
For Biospher PSI 100 C18 and Biospher PSI 100 C8 a mixture of methanole and water (7:3 v/v) was used as mobile phase, k' of thiourea = 0.

Typical efficiency of analytical columns (4.6x250 mm)

Particle size [um]	5	7	10	15	20	40
Biospher PSI 60 [TP/m]	50000	45000	35000	20000	14000	5000
Biospher PSI 100 [TP/m]	55000	50000	40000	20000	14000	5000
Biospher PSI 100 C18 [TP/m]	70000	60000	45000	25000	16000	8000
Biospher PSI 200 [TP/m]	55000	50000	40000	25000	14000	5000
Biospher PSI 200 C18 [TP/m]	75000	60000	45000	30000	16000	8000

Conditions: column 4,6 x 250 mm, flow rate 0,6 ml/min, measured for nitrobenzene (PSI) or toluene (PSI C18).