separlab

PREPARATIVE LIQUID CHROMATOGRAPHY COLUMNS

SEPARCHROM PC 01

Columns PC 01 perfectly correspond to the requirements of modern high performance preparative liquid chromatography (HPPLC). Both theoretical principles and specialists practice experiences were taken in the account during their development.

The result is a flexible system that has no weaknesses and allows to exploits full potential of modern microparticular sorbents in broad scale of columns' variations. Sedimentation technique as well as dynamic slurry methods are available for PC 01 column packing. The automatic unpacking possibility is offered too.

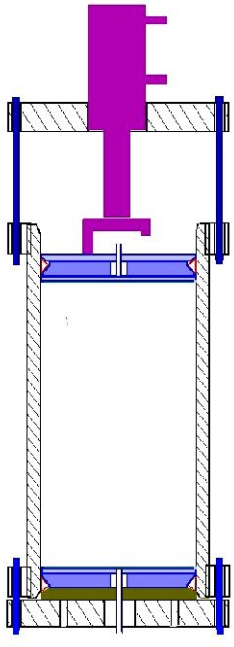
All PC 01 columns are equipped with identical pistons on input and output. They are therefore used currently in the mode of axial (one piston is moved) compression, but they can be easily modified for or biaxial compresion mode (both pistons are movable).

All pistons are provided by Poremet® frits with a minimum hydraulic resistance and a Separlab patented liquid distributing system. Its design provides perfect and uniform flow distribution through whole column (see Figures) and simple accessibility of frit for cleaning.

PC 01 pistons are usually moved by a force generated in hydraulic cylinder (only e few customers nowadays use columns flange bolts to move the piston). Single hydraulic cylinders fitted on upper flange are recommended, but fully automated stands for columns' packing, unpac-king and use are available too.

Columns PC 01 are completed by a broad scale of accessories. There are available filling adapters, column stands, slurry mi-xing vessels, slurry pumps etc.

The most sophisticated versions of PC 01 columns present a complete electronically controlled system with suspension preparing, automatic packing by dynamic slurry, automatic unpacking and electronic hydraulic pressure control.



All products are delivered in a standard environment design or with adjustments for operations in potentially explosive atmosphere accor-ding ATEX rules.

The basis of preparative column is a perfect fluid distribution as a sample comes into the column and leaves it in a narrow pipe to be in between distributed around the entire diameter of the column cylinder.

In PC 01 columns Poremet® discs consisting of 10 compacted layers of metal nets (AISI 316L) with gradient porosity having 5 mm thickness are used. Frits have no any holes or additional gates for their

fixing. They are inserted into stainless steel ring and its rim is then pressed to fix the frit inside. Using this technology we can produce frits with large diameter (cca 95 % of column diameter).

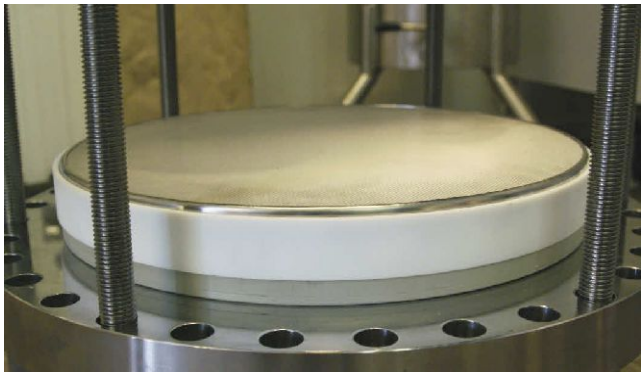
Frits are combined with a stainless steel nets system comprising of several layers which are located between the porous disc and piston body. Different shapes channels are cut out in these nets. Properly orientated they create a labyrinth-like system, which distributes the liquid to column edges in small volume. Liquid flow is not limited to the channels. Restricted liquid stream flows over the net directly too.

The result is fast and uniform mobile phase distribution. Net layers have function of frit support as well and prevent its deformation under the pressure of the sor-bent.

Efficiency of PC 01 distributing system is demonstrated on the picture. The piston of a 100 mm column I.D. is inserted into a liquid reservoir and a colorized sample is injected into a liquid stream.

Experiments have shown that the full flow through the piston surface is achieved in three seconds (flow rate 130 ml / min) from a moment when first trace of sample is coming to the frit surface. It means that, when

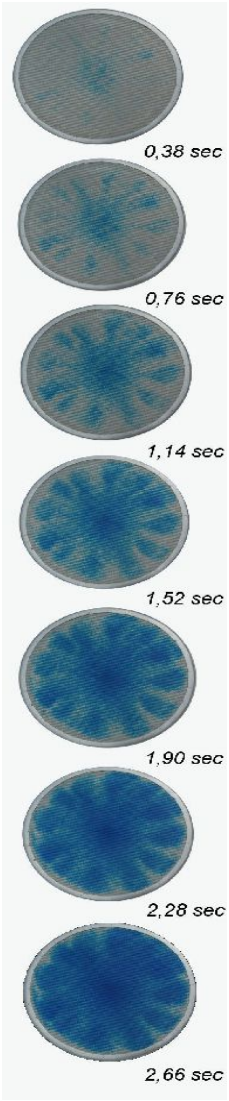
a sample zone is fed into the column, its undulation from the ideal flatness perpendicular to the column axis



is of only ± 0,4 mm.

Due the long time column operation the column frits are being partially blocked and their replacement is comlicated operation. For PC 01 was therefore designed closed circular steel ring, where the frit is integrated. The ring and piston plate can be diassembled by column operating personnel

Two-piece piston seal is made of a sealing PTFE ring and PP (polypropylene) supporting ring (not in contact with a mobile phase). The seal has a long life and allows repetitious packing. It is robust and minimizes the possibility, that the manipulation will damage the surface of the column tube. The system is self sealing, as the piston has conical shape, is pressed into PTFE ring and sealing power is thus as higher as higher is inner pressure.

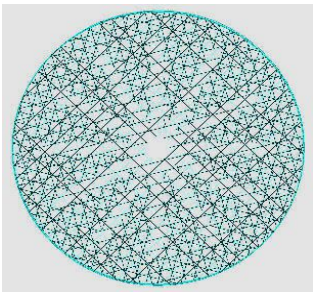


Polished column tube (Ra = 0.2 µm or better) is equipped by screwed flanges and no welded connection is used at all. Short connecting bolts are used to fasten an output piston flange. Strong tightening is not necessary as the piston self sealing ring is inside the column.

The input flange holding a hydraulic cylinder is connected by long bolts with distance tubes to the column flange. Hydraulic cylinder piston is attached to the column piston by a connecting tube. Inside the tube is located an input of mobile phase.

Separchrom PC 01 columns are available in a wide variety of modifications:

- **PC 01 M** in the basic design with flanges pulled together by screws (designed for axial compression) and are deliverd with a simple stand made of a combination of stainless steel tubes and polypropylene plate.
- **PCB 01 MB** for biaxial compression with flanges pulled together by bars and sliding column tube may also be accompanied by a simple circular stand made of a combination of stainless steel and polypropylene
- The most popular **PC 01H** columns are supplemented with a hydraulic cylinder of small dimensions (for oil pressure up to 700 bar) with a stroke of 100-500 mm and a hand oil pump. They are supplied either with single-acting cylinder with spring return, or - for larger diameter cylinders - with double acting cylinder. They are delivered with a simple stand made of a combination of stainless steel tubes and polypropylene plate.
- Columns with manual hydraulic system can be modified to allow the use of hydraulic force to push the sorbent out of the column tube. Delivered stand is fixed to column flange. It means that bottom flange with piston can be removed easily. Elongation rods are delivered as an option to move the main piston through whole column length to push the sorbent out.



- **PC 01AH** are designed for mounting in an automatic stands with a hydraulic cylinder, which are equipped with motor oil pump and control electronics to be able to keep preset oil pressure.

Adapters that extend the length of the column are supplied for a packing procedure without pressure. They are made of stainless steel thin wall tube with velded flange. Flanges are sealed to the columns by an expanded PTFE gaskets.

Dynamic slurry packing method demands such columns whose total length is greater than the height of sorbent bed after compression and where the piston is moved by a high stroke hydraulic booster.

Column stands with oil pumps driven by electric motors with capacity to move the piston by a sufficient speed are recommended.

Delivered columns
(other lengths and diameters available)

Type of column	Inner diameter mm	Length mm	Pressure bar
SEPARCHROM PC 01-100/100 M	100	100	150
SEPARCHROM PC 01-100/250 M	100	250	150
SEPARCHROM PC 01-100/500 M	100	500	150
SEPARCHROM PC 01-150/150 M	150	150	150
SEPARCHROM PC 01-150/300 M	150	300	150
SEPARCHROM PC 01-150/600 M	150	600	150
SEPARCHROM PC 01-200/200 M	200	200	120
SEPARCHROM PC 01-200/400 M	200	400	120
SEPARCHROM PC 01-200/800 M	200	800	120
SEPARCHROM PC 01-300/300 M	300	300	100
SEPARCHROM PC 01-300/600 M	300	600	100
SEPARCHROM PC 01-300/900 M	300	900	100
SEPARCHROM PC 01-400/400 M	400	400	80
SEPARCHROM PC 01-400/800 M	400	800	80

Type of column	Inner diameter mm	Length mm	Pressure bar
SEPARCHROM PC 01-100/100 H	100	100	150
SEPARCHROM PC 01-100/250 H	100	250	150
SEPARCHROM PC 01-100/500 H	100	500	150
SEPARCHROM PC 01-150/150 H	150	150	150
SEPARCHROM PC 01-150/300 H	150	300	150
SEPARCHROM PC 01-150/600 H	150	600	150
SEPARCHROM PC 01-200/200 H	200	200	120
SEPARCHROM PC 01-200/400 H	200	400	120
SEPARCHROM PC 01-200/800 H	200	800	120
SEPARCHROM PC 01-300/300 H	300	300	100
SEPARCHROM PC 01-300/600 H	300	600	100
SEPARCHROM PC 01-300/900 H	300	900	100
SEPARCHROM PC 01-400/400 H	400	400	80
SEPARCHROM PC 01-400/800 H	400	800	80

Delivered hydraulic systems

Type and specification	Power t	Stroke mm
SEPARPRESS S05 MM 80/50 PC01	5	80
SEPARPRESS S05 MM 180/50 PC01	5	180
SEPARPRESS S05 MM 240/50 PC01	5	240
SEPARPRESS D05 MM 150/50 PC01	5	150
SEPARPRESS D20 MM 150/100 PC01	20	150
SEPARPRESS D20 MM 250/100 PC01	20	250
SEPARPRESS D30 MM 150/150 PC01	30	150
SEPARPRESS D30 MM 250/150 PC01	30	250
SEPARPRESS D50 MM 150/200 PC01	50	150
SEPARPRESS D50 MM 250/200 PC01	50	250
SEPARPRESS D100 MM 150/300 PC01	100	150
SEPARPRESS D100 MM 350/300 PC01	100	350
SEPARPRESS D150 MM 330/400 PC01	150	330
SEPARPRESS D20 EE 250/100 PC01	20	250
SEPARPRESS D30 EE 250/150 PC01	30	250
SEPARPRESS D50 EE 250/200 PC01	50	250
SEPARPRESS D100 EE 350/300 PC01	100	350
SEPARPRESS D150 EE 330/400 PC01	150	330

The first letter in the product code (S, D) provides information, what type of cylinder is used:
S - to reverse movement of the piston spring is used
D - double acting piston, reversing is done by oil pressure
The following number defines the maximum compressive strength of the piston in tons
The next two letters indicate the design:
MM - Mechanical control of the cylinders piston, hydraulic hand pump with a mechanical gauge
EE - Electronic control of solenoid valves, oil pump with an electric motor, electronic pressure gauge
AE – Electronic control of solenoid valves, oil pump driven by compressed air, electronic pressure gauge
AM - Mechanical valves control, oil pump driven by compressed air, mechanical gauge
Other issues in the specification provides information about the hydraulic piston stroke in millimeters and determine what the inner diameter of the column is a device intended

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Manufacturer reserves the privilege to change design and parameters of the product.

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