Innovation in SFC

FlexPacker

Technical Brochure

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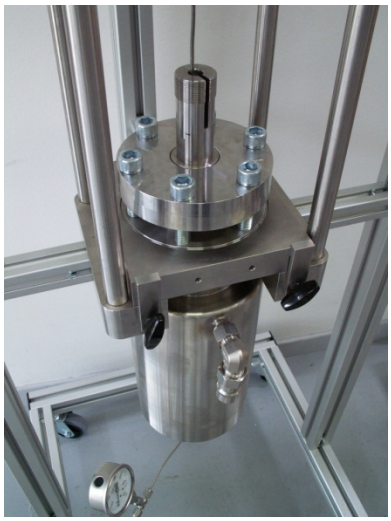
FlexPacker

FlexPacker was designed to allow quick and easy packing of preparative scale columns for SFC, HPLC and SMB with high performance packing materials. Further, it was designed to be able to pack columns of 50, 76 and 100 mm id.

FlexPacker uses Dynamic Axial Compression technology in which the column bed is packed and compressed by a piston moving within the column driven by a hydraulic jack. Hitherto such systems have been limited to a single column diameter.

A vital part of the design criteria for the packing system was to enable columns, once packed, to be stabilised and used in a stand-alone configuration as well as in conventional DAC mode. An innovative piston lock was designed specifically for this purpose.



FlexPacker columns are designed to be operated either while attached to the packing system or as stand-alone units.

Two types of column are used; fixed length and variable length, the latter allowing the user to select the desired length of column (from 50 to 350 mm).

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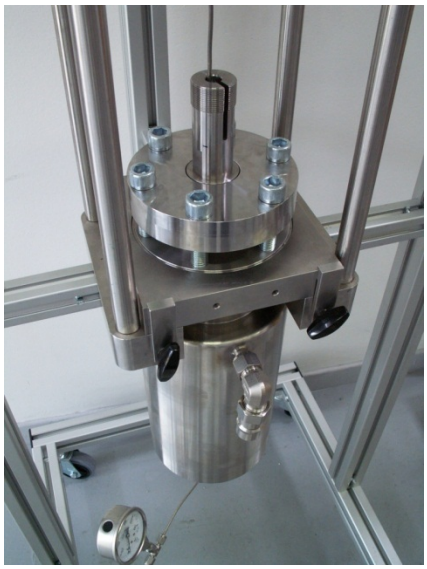
Columns

SFC columns are designed to meet CODAP and ASME standards with an operating pressure up to 300 bar. While these columns can be used for other applications, lower pressure HPLC and SMB columns fitted with jackets to allow temperature control of the column walls are available.

Columns of 50, 76 and 100 mm diameters: are used. They are all packed on the same FlexPacker.



Once the bed is packed, the column can be used while still attached to the packing module. In this way, the column is maintained under dynamic axial compression during use and any bed consolidation is compensated by the piston movement. Alternatively, once the bed is consolidated, the piston is locked and the column can then be removed from the packing module for stand-alone operation. SFC columns should always be used in this latter mode.

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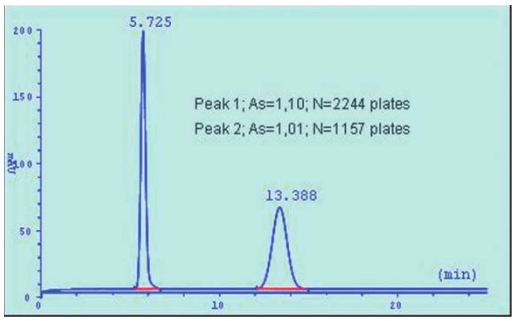
Packing Materials

FlexPacker columns were designed for SFC applications. They are therefore fully compatible with high performance packing materials of 5, 10 and 20 micron diameters. Columns fully exploiting the high efficiency of these media are packed within minutes.

Because the packing pressure is user-selected, other chromatographic media may also be packed; the FlexPacker can handle even the less pressure-stable polymeric materials used in biochromatography when needed.



The QC chromatogram in the figure shows the chromatogram of the enantiomers of *trans*-stilbene oxide using a column 250 x
50 mm packed with 20 micron CHIRALPAK® AD®. The mobile phase was heptane – 2-propanol with a flow rate of 120 ml/min. The peak shape and the efficiency are as expected for these conditions

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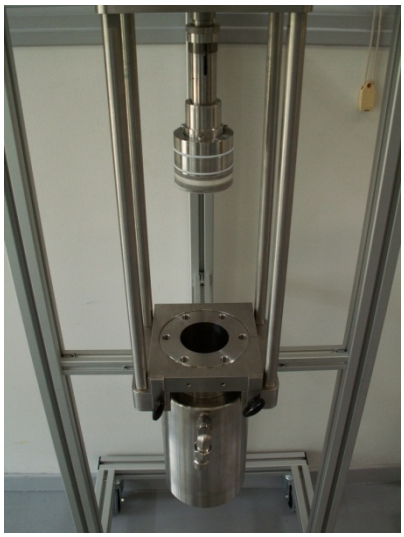
Operation

The hydraulic controls are simple and easy to operate. The piston pressure is set by adjusting the air pressure applied to the hydraulic pump. Piston direction is set by a valve (top right). The emergency stop depressurises the hydraulic pump which instantly stops the piston movement.



The figure on the left shows a fixed-length column ready to be packed with the piston used to pack the column and stabilise the packed bed.

The packing material is suspended in a suitable solvent and is placed in the column.

The piston is then pushed downward into the column, expelling the excess solvent from the lower end of the column, building the bed as it descends. The piston stops when the bed is tightly packed.

Once the bed is packed, the column can be used while still attached to the packing module. In this way, the column is maintained under dynamic axial compression during use and any bed consolidation is compensated by the piston movement. Alternatively, once the bed is consolidated, the piston is locked and the column can then be removed from the packing module for stand-alone operation. SFC columns should always be used in this latter mode.

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Multi-Column Skid

The multi-column skid holds four or six packed columns of 50 or 76 mm id and of any length. The columns are selected by an automatic valve. In this way the columns most used in the laboratory can be maintained ready to use to minimize purification time. The skid, 55 x 60 cm footprint, uses minimal space in the laboratory and can be wheeled to a storage area when not in use.

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Semi-Preparative Columns

In addition to the preparative columns, PIC-Solution provides semi-preparative columns of 10, 20 and 30 mm id. These pre-packed columns are available in a variety of stationary phases and with several lengths, depending on the customer needs.

The columns are designed to operate at pressures up to 300 bar and are compatible with SFC, HPLC and SMB applications.

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