

Chromatography

MACHEREY-NAGEL Liquid Chromatography

Columns for HPLC

Macherey-Nagel offers a broad range of eight different column types with lengths from 30 to 600mm and inner diameters from 1 - 80 mm for many different analytical as well as preparative tasks.

These column systems are:

- **ChromCart® column system (CC)**
 - 2,3,4 and 4.6mm ID and lengths from 30 to 250mm
 - Convenient connection of the cartridge without tools
 - Connection with only one connecting kit independent of length and inner diameter (except for 30mm columns)
 - Mounting of guard columns without special adaptor
 - Easy coupling of several columns
 - Broad range of numerous NUCLEOSIL® packings as well as adsorbents from other manufacturers.

- **Microbore columns (MB)**
 - Stainless steel columns with 1mm inner diameter and lengths from 100 to 250mm (0.3, 0.4mm 0.5 mm, 0.75mm and 1.0mm ID as well as lengths of 40, 60, 200 and 300mm on request)
 - Packed with high-quality NUCLEOSIL® phases
 - Suited for HPLC and LC/MS
 - Rapid analyses with high resolution and sensitivity
 - Only small sample volumes required
 - Due to low flow rates, reduced eluent consumption = reduced cost per analysis.

- **EcoChrome columns (ED) the standard MN column system**
 - Stainless steel columns with 2, 3, 4 and 4.6 mm ID
 - Gel bed protected by a sandwich of metal screen and glass fibre paper.
 - Connection of ChromCart® guard column cartridges via adaptor.

- **Valco type columns (VA)**
 - Stainless steel columns with 4.6mm ID
 - Well-known column hardware in many countries, which MN use mainly for their polymer-based columns.



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- **Peek columns (PE)**
 - Completely metal-free columns made from polyether ether ketone with 4.6 or 7.5 mm ID and lengths from 50 to 300 mm
 - Column frits made from ceramics or PEEK/Teflon compound material
 - Recommended for the analysis of metal-sensitive compounds or the separation of metal ions.
- **Standard-Prep Columns (SP)**
 - Preparative columns with 10 - 50.8 mm (2") inner diameter, with non-adjustable end fitting.
 - Column connection depending on diameter via nut and ferrule, direct connection via outer threads on the column tubing or flanged end fittings.
 - Termination of the gel bed with metal frits or metal screen/glass fibre combinations depending on diameter.
 - Broad range of MN packings available on request.
- **VarioPrep® Columns (VP)**
 - Preparative columns with axially adjustable end fitting for compensation of variations of the gel bed.
 - Inner diameters from 10 to 80mm
 - Column packing terminated with a metal screen/glass fibre paper sandwich.
 - Packed with a variety of MN silica packings
- **EcoPrep columns (EP)**
 - Preparative columns with 8 or 16 mm ID; column hardware corresponds to the EcoChrome analytical columns.

Columns for Special Applications

Macherey-Nagel also manufactures HPLC columns for the following special applications:

- **Environmental analysis**
 - Anion exchange chromatography of inorganic anions
 - Polycyclic aromatic hydrocarbons (PAHs)
 - Phenols (EPA method 604)

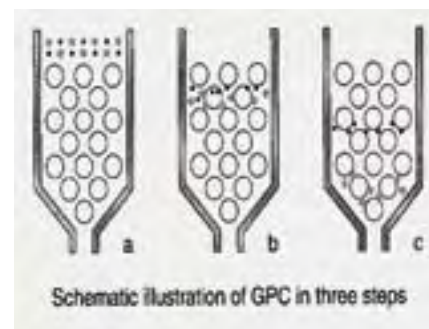
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- **Enantiomer Separation**
 - Ligand exchange
 - Charge-transfer, dipole-dipole interactions and others
 - Enantioselective binding to chiral protein surface structures
 - Formation of inclusion complexes
- **Biochemical Separations**
 - Anion exchange chromatography of biomolecules
 - Cation exchange chromatography of biomolecules
 - Reversed phase chromatography of biomolecules
 - Reversed phase chromatography of small biomolecules
 - Gel filtration of biomolecules
- **Food analysis**
 - Mono and oligosaccharides
 - Sugars, alcohols, organic acids
 - Hop constituents
- **Gel permeation chromatography (GPC) also known as size exclusion chromatography (SEC)**
 - Water-insoluble substances
 - Water-soluble polymers

Packing for HPLC

Macherey-Nagel offer a versatile programme of HPLC packings, briefly summarised as follow:

- Silica, spherical particles totally porous - available under the trade names Nucleosil® and Nucleoprep®
- Silica, irregular particles totally porous - available under the trade name Polygosil® and Polygoprep®



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Sample Preparation

Solid phase extraction (SPE) is a powerful method for sample preparation and is used by almost half of all chromatographers today. It has capabilities in a broad range of applications such as environmental analyses, pharmaceutical and biochemical analyses, organic chemistry and food analyses.

The advantages of SPE compared to classical liquid-liquid extraction are the low solvent consumption, the enormous time saving and the potential for automation. Additionally, a sample preparation task can often be solved more specifically by using SPE, since different interactions of the analyte with the solid phase (absorbent) are possible, and methods can be optimised by adjusting chromatographic conditions.

The Chromabond® columns and Chromafix® cartridges from Macherey-Nagel which have been developed especially for SPE provide rapid, economical and effective systems for sample preparation. They can be used to process samples for HPLC, GC, TLC, UV or IR spectroscopy and many more.

Thin Layer Chromatography

Thin layer chromatography is used for a wide range of analyses, and over the years it has become apparent, that there is no universal plate which meets all possible demands. Macherey-Nagel's range of TLC ready-to-use layers is very versatile to cover many different types of applications.

They offer several advantages:

- They are immediately ready for chromatographic separation. Tedious coatings or impregnations are not necessary.
- They have homogeneous, smooth, well adhering layers, an important criterion especially for reproducible quantitative evaluation.

Stringent production controls guarantees the continuous high quality of Macherey-Nagel TLC plates & sheets

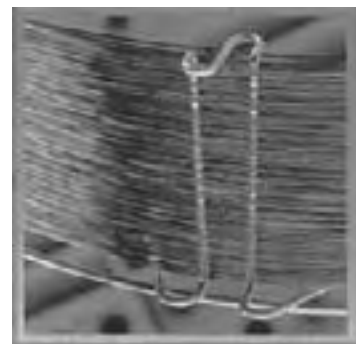


Chromatography

Gas Chromatography

Capillary Columns for GC

The large number of stationary phases and the variability of column parameters have caused a considerable diversification of our column programme. MN now offers more than 30 different phases with a total of more than 650 Cat. Nos.



The following criteria are critically important for selecting the most appropriate column. A capillary column is characterised by the following parameters:

- A = length
- B = Inner diameter
- C = type of chemical bonding, immobilisation
- D = polarity of the stationary phase
- E = film thickness

All these parameters have to be optimised for each particular chromatographic task.

Optima® High Performance Capillary Columns

As a result of Macherey-Nagel's efforts in research and development and the continuous improvements in their manufacturing techniques we present Optima® - a series of high performance capillary columns for gas chromatography.

Optima® capillary columns provide

- *Reduced column bleed*
Improved manufacturing processes offer capillaries with lower bleed levels, which are especially recommended for GC-MS. Less column bleed yields increased sensitivity and accuracy through a better signal-to-noise ratio for any kind of detector. Reduced column bleed improves detectability of solutes in qualitative and quantitative GC-MS analyses.
- *High thermal stability*
Improved temperature stability is the reason why Optima® capillary columns can be operated at about 40°C higher temperatures compared to standard phases. High-boiling solutes (with very low vapour pressures) "normally" have very long retention times and rather broad peak shapes. Optima® columns with their increased operation temperature elute high-boiling compounds faster and with better peak shapes.

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SGE Chromatography

The SGE range covers an extensive selection of products for chromatography. Their main product groupings are:

Instrument Supplies - for the main brands of auto samplers

Syringes, Syringe Valves & Syringe Filters

Gas Chromatography Columns

Gas Chromatography Supplies

HPLC Columns & Accessories

Instrumentation

SGE, well known around the world for its craftsmanship and innovation, has been supplying the scientific industry for over 30 years. SGE products are manufactured to a high level of quality and adhere to strict ISO requirements. Whether you purchase a single syringe from their standard range or take advantage of their custom designs, you can be assured of receiving a quality product which will serve its function time after time.

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