

# CHROMATOGRAPHY

HPLC



NUCLEOSIL<sup>®</sup> · the original

Find what you are looking for!



**MACHEREY-NAGEL**

[www.mn-net.com](http://www.mn-net.com)



# MACHEREY-NAGEL

## Innovation based on tradition

### Our company

For more than 100 years, MACHEREY-NAGEL has provided highest German quality products and expert service in analytical chemistry and separation technology. Since the foundation of the company in 1911, MACHEREY-NAGEL has evolved from a specialist manufacturer of **laboratory filter paper** to a leading player in the area of **chromatography** and **chemical/biomolecular** analytics.

Within chromatography, we have been pioneers in the field since the 1960s, having successively expanded our product portfolio to include high quality solutions for HPLC, GC, TLC, SPE and flash, as well as syringe filters and vials and caps.

Based in Düren / Germany we have subsidiaries in three different countries, namely the United States, France and Switzerland. World-wide, more than 500 employees work for MACHEREY-NAGEL, while we are active in more than 150 countries.

The company's success is based on our passion for quality, customer focused service and the warm-hearted business approach of an entirely family owned enterprise.

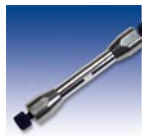
### Our chromatography mission

*"Providing excellent chromatography solutions you can trust"*

We know that the analytical work of our customers – your work – is of fundamental value, as it delivers answers and results to help shaping a better planet. We also believe that such answers and results can only be generated with products and tools that inspire trust and within which you have the utmost confidence.

Our comprehensive portfolio includes technically advanced HPLC and GC columns, high purity SPE phases as well as premium autosampler vials and caps. MACHEREY-NAGEL – your one-stop solution provider for premium sample preparation and reliable analytics.

### Chromatography product families



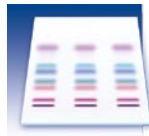
HPLC columns  
NUCLEODUR®  
NUCLEOSHELL®



GC columns  
OPTIMA®  
Reagents



SPE phases  
CHROMABOND®  
Accessories



TLC plates  
ALUGRAM®  
POLYGRAM®



Syringe filters  
CHROMAFIL®



Vials and  
closures

Customers around the globe trust in MN products – discover how you can trust in MN as well to optimize your analysis.

# NUCLEOSIL®

## manufacturer-packed columns from MACHEREY-NAGEL

### Highest quality in HPLC for over 40 years

#### You probably know that

- NUCLEOSIL® was one of the first spherical silicas for HPLC
- NUCLEOSIL® comes in numerous different modifications, particle sizes and pore sizes
- NUCLEOSIL® is renowned around the globe due to its versatile applicability

#### Do you also know that

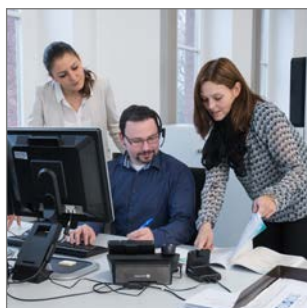
- NUCLEOSIL® was originally developed by MACHEREY-NAGEL in 1974?
- NUCLEOSIL® is still manufactured exclusively by MACHEREY-NAGEL in Germany?
- NUCLEOSIL® is still one of the most used HPLC silicas in quality control around the globe?

#### Buy NUCLEOSIL® directly from MACHEREY-NAGEL, the silica specialists who invented it.

Thus, you will receive

- A finely tuned portfolio of NUCLEOSIL® phases for all your individual applications
- Expert know-how and highly trained staff for unrivaled customer support
- Decades of experience in manufacturing and packing columns for safe and reliable results
- A wide variety of NUCLEOSIL® – and other – applications  
in our free-of-charge application database ([www.mn-net.com/apps](http://www.mn-net.com/apps))

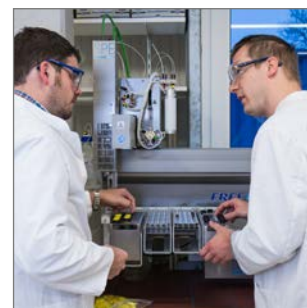
*"For more than forty years it's our main goal to ensure highest quality standards for our NUCLEOSIL® and NUCLEODUR® columns. Reproducibility, column life-time and excellent performance are our ambition."*



**Julia Schweigert, Heike Heyne  
Andreas Bohne**  
Customer Service / Order Processing



**Monika Kosiahn, Maria Thelen  
Sieglinde Harth**  
Column Production / Quality Control



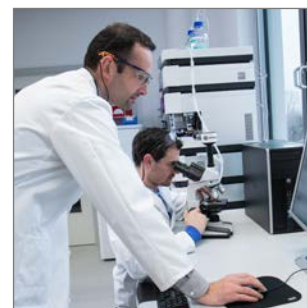
**Dr. Hans Rainer Wollseifen  
Torsten Kretschmer**  
Application Development



**Dr. Helmut Riering**, Senior Scientist  
Separation Science and Analytics



**Achim Kippels**, Sorbent Synthesis  
and Scale-up Production



**Dr. Simon Forster, Stephan Frech**  
R&D Surface Chemistries

## Selection of most popular phases

We want our customers to achieve the best possible results, hence we offer a wide variety of chemistries to the standard NUCLEOSIL® silica. The following table gives an overview of the most well known and heavily used NUCLEOSIL® phases.

For additional modifications, please visit [www.mn-net.com/NUCLEOSIL](http://www.mn-net.com/NUCLEOSIL).

Phase	Modification	Stability	Structure	Separation principle
<b>NUCLEOSIL® RP phases</b>				
C <sub>18</sub>	Octadecyl phase, medium density modification, endcapping 15% C · USP L1	pH 2–8		hydrophobic (van der Waals) interactions slight residual silanol interactions
C <sub>18</sub> HD	Octadecyl phase, high density monomeric modification, endcapping 20% C · USP L1	pH 2–9		hydrophobic (van der Waals) interactions
C <sub>18</sub> AB	Octadecyl phase, special crosslinked modification, endcapping 25% C · USP L1	pH 1–9		steric interactions and hydrophobic interactions
C <sub>8</sub>	Octyl phase, no endcapping 8.5% C · USP L7	pH 2–8		hydrophobic (van der Waals) interactions noticeable residual silanol interactions
C <sub>2</sub>	Dimethyl phase 3.5% C · USP L16	pH 2–8		hydrophobic (van der Waals) interactions noticeable residual silanol interactions
C <sub>6</sub> H <sub>5</sub>	Phenyl phase, no endcapping 8% C · USP L11	pH 2–8		π–π interactions and hydrophobic interactions noticeable residual silanol interactions
<b>Polar NUCLEOSIL® phases and NUCLEOSIL® ion exchangers</b>				
CN/CN-RP	Cyano (nitrile) phase USP L10	pH 2–8		π–π interactions, polar interactions and hydrophobic interactions
NH <sub>2</sub> /NH <sub>2</sub> -RP	Amino USP L8	pH 2–8		polar and hydrophobic interactions, weak ion exchange interactions
SA	Sulfonic acid, strongly acid cation exchanger (SCX) · USP L9	pH 2–8		strong ion exchange interactions
SB	Quaternary ammonium, strongly basic anion exchanger (SAX) · USP L14	pH 2–8		strong ion exchange interactions
SiOH	Unmodified spherical silica USP L3	pH 2–8		polar interactions

# Selected NUCLEOSIL® columns

## When quality counts, trust the original.

In order to facilitate your purchase, we have compiled a selection of our most common NUCLEOSIL® columns. If you require different variations, please do not hesitate to contact us at [info@mn-net.com](mailto:info@mn-net.com).

### Columns with selected RP phases

HPLC phase	ID	Length [mm]			EC guard columns*	
		100	125	150		250
NUCLEOSIL® 100-3 C <sub>18</sub> , particle size 3 µm, pore size 100 Å	4 mm		720150.40		720133.40	721022.30
	4.6 mm	720841.46	720150.46	720949.46	720133.46	721022.30
NUCLEOSIL® 100-5 C <sub>18</sub> , particle size 5 µm, pore size 100 Å	2 mm			720120.20		721074.20
	3 mm		720002.30		720014.30	721074.30
	4 mm	720141.40	720002.40	720120.40	720014.40	721074.30
	4.6 mm	720141.46	720002.46	720120.46	720014.46	721074.30
NUCLEOSIL® 100-7 C <sub>18</sub> , particle size 7 µm, pore size 100 Å	4 mm				720018.40	721005.30
	4.6 mm		720951.46	720110.46		721005.30
NUCLEOSIL® 100-10 C <sub>18</sub> , particle size 10 µm, pore size 100 Å	4 mm				720023.40	721181.30
	4.6 mm				720023.46	721181.30
NUCLEOSIL® 120-3 C <sub>18</sub> , particle size 3 µm, pore size 120 Å	4.6 mm	720149.46	720040.46			721075.30
NUCLEOSIL® 120-5 C <sub>18</sub> , particle size 5 µm, pore size 120 Å	4 mm				720041.40	721070.30
	4.6 mm				720041.46	721070.30
NUCLEOSIL® 100-5 C <sub>18</sub> HD, particle size 5 µm, pore size 100 Å	4 mm				720280.40	721072.30
	4.6 mm				720280.46	721072.30
NUCLEOSIL® 100-5 C <sub>18</sub> AB, particle size 5 µm, pore size 100 Å	3 mm				720936.30	721073.30
	4.6 mm				720936.46	721073.30
NUCLEOSIL® 100-5 C <sub>8</sub> , particle size 5 µm, pore size 100 Å	4 mm		720001.40		720013.40	721194.30
	4.6 mm			720990.46	720013.46	721194.30
NUCLEOSIL® 100-7 C <sub>2</sub> , particle size 7 µm, pore size 100 Å	4.6 mm				720089.46	721030.30
NUCLEOSIL® 100-5 C <sub>6</sub> H <sub>5</sub> , particle size 5 µm, pore size 100 Å	4.6 mm				720956.46	721137.30

### Columns with selected polar phases

HPLC phase	ID	Length 250 mm	EC guard columns*
NUCLEOSIL® 100-5 CN, particle size 5 µm, pore size 100 Å	4 mm	720090.40	721078.30
	4.6 mm	720090.46	721078.30
NUCLEOSIL® 100-10 CN, particle size 10 µm, pore size 100 Å	4 mm	720024.40	721942.30
	4.6 mm	720024.46	721942.30
NUCLEOSIL® 100-5 CN-RP, particle size 5 µm, pore size 100 Å	4.6 mm	720205.46	721039.30
NUCLEOSIL® 100-5 NH <sub>2</sub> , particle size 5 µm, pore size 100 Å	4.6 mm	720095.46	721020.30
NUCLEOSIL® 100-5 SA, particle size 5 µm, pore size 100 Å	4.6 mm	720097.46	721024.30
NUCLEOSIL® 100-10 SA, particle size 10 µm, pore size 100 Å	4.6 mm	720028.46	721163.30
NUCLEOSIL® 100-5, particle size 5 µm, pore size 100 Å	4.6 mm	720099.46	721518.30

\* Column Protection System required (REF 718966, see next page)

Other NUCLEOSIL® phases and other column dimensions are available on request.

*A global network of subsidiaries and distributors in 150 countries ensures the availability of original manufacturer-packed NUCLEOSIL® columns all over the world.*





# Column hardware

## Technical information

High vertical range of manufacture does not stop at sorbent technology. All stainless steel column hardware components are generated in our in-house CNC controlled production processes.

### EC standard columns for analytical HPLC

- Analytical column system manufactured from stainless steel
- Hardware guarantees pressure stability up to 1,200 bar (17,400 psi):  
Thus EC columns are suitable for UHPLC applications and can be run on all HPLC systems.

*Ideal protection for your main column:  
Column Protection System  
significant increase in column lifetime*



Especially designed to meet our customers' requirements, we have developed a universal guard column holder for analytical columns – our **Column Protection System**

### Column Protection System

- Innovative and universal screw-on guard column holder system
- Suitable for all analytical HPLC columns with 1/16" connections
- Minimized void volume: suitable also for ultra fast HPLC
- Pressure stability up to 1,034 bar (15,000 psi)



# MN products for chromatography

## Expertise beyond HPLC

In addition, we have established a broad range of other high quality chromatography products and services. All products are made in Germany and include SPE, TLC, GC, syringe filters as well as vials and caps.

### Experienced customer service

Service at MN is all about customers. For us, great service starts way before the sales process and continues even after the product has been supplied and used.

Please contact us per telephone (+49 24 21 969-0) or e-mail at [info@mn-net.com](mailto:info@mn-net.com).

### Our website also offers a wide variety of services and valuable information, such as

- A vast online application database with more than 3000 applications from all fields of chromatography: [www.mn-net.com/apps](http://www.mn-net.com/apps)
- An informative and helpful troubleshooting section [www.mn-net.com/chroma](http://www.mn-net.com/chroma)
- Find our entire network of local distributors
- Multiple finder tools, e.g., for syringe filters, vials and caps
- Download sections for certificates, flyers, manuals, catalogs, MSDS and much more



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**MACHEREY-NAGEL**



*Since 1911*