

MACHEREY-NAGEL

Per- and polyfluoroalkyl substances

Chromatography



Solutions for PFAS analysis

- SPE columns and QuEChERS mixes
- HPLC columns
- Vials and caps

MACHEREY-NAGEL

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Solutions for PFAS analysis

More than 4730 compounds belong to the group of PFAS (which stands for per- and polyfluoroalkyl substances), which have been produced since the 1940s. Since these compounds do not originate in nature, global pollution is the result of human activities. PFAS are "forever chemicals", chemicals that are very persistent in the environment and in the human body. For reliable PFAS analysis, we have developed products that are ideally suited for sample preparation, sample integrity and determination of these harmful substances by HPLC.

The special phase for sample preparation – CHROMABOND® PFAS

CHROMABOND® PFAS is a polymer-based combination phase which contains a weak anion exchange functionality. The combination of different SPE phases makes it possible to use various interactions (dipole-dipole, ionic, hydrophobic, H-bond).

SPE product solutions – CHROMABOND® HR-X and HR-XAW

According to DIN 38407-42, EPA 537.1 and 533 guidelines, MACHEREY-NAGEL also offers further SPE product solutions for the enrichment of PFAS:

- CHROMABOND® HR-X: hydrophobic PS / DVB copolymer
- CHROMABOND® HR-XAW: weak mixed mode anion exchanger (WAX) PS / DVB copolymer

These allow outstanding recovery rates and high reproducibility.



SPE column, CHROMABOND® PFAS

PFAS in food using QuEChERS extraction and clean-up method

QuEChERS ("Quick, Easy, Cheap, Effective, Rugged and Safe") sample preparation products from MACHEREY-NAGEL ensure a time efficient and simple extraction of PFAS from food and a subsequent solid phase extraction for further sample clean-up according to procedure C-010.01 developed by the US Food and Drug Administration (FDA) for the measurement of 16 PFAS in food.



dSPE columns, CHROMABOND® QuEChERS Mix XII, 15 mL centrifuge tubes, CHROMABOND® QuEChERS Mix XX, 2 mL centrifuge tubes

Plastic vials and fluorine-free closures for PFAS analysis

When you are doing PFAS analysis, it is crucial to select the right vials and closures for this application. Adsorption effects of glass as well as possible contaminations of the sample by particles from the septa, especially from the PTFE lamination, may put your analysis results at risk.

MACHEREY-NAGEL offers polypropylene screw neck vials N 9 and snap ring vials N 11 as well as appropriate closures with a silicone/polyimide septum that – in contrast to PTFE laminated liners – is fluorine-free.



Polypropylene vials and fluorine-free closures for PFAS analysis

CHROMABOND® PFAS provides several advantages

- Solution for various PFAS substances classes
- > 28 PFAS can be enriched
- Sorbent retention mechanisms according to DIN 38407-42, EPA 537.1 and 533 guidelines
- High capacity
- High recovery rates

Good to know

There are CHROMABOND® QuEChERS mixes available that are especially suitable for sample preparation of PFAS in:

- Dairy products
- Bread
- Lettuce
- Fish

Get more details

If you want to learn more, read the detailed [PFAS test report](#) showing the performance of different MN vials and fluorine-free closures in PFAS analysis.

Solutions for PFAS analysis

The special HPLC columns: NUCLEODUR® PFAS and NUCLEODUR® PFAS Delay

NUCLEODUR® PFAS HPLC columns are a perfect choice for analyzing PFAS substances. These columns show a high batch-to-batch reproducibility, are specially batch tested for PFAS analyses and are very well suited for LC-MS due to a low bleeding characteristics.

The NUCLEODUR® PFAS Delay column provide high retention for PFAS compounds and are used to retain PFAS contaminants from the HPLC system, which could otherwise falsify the sample to be analyzed. For this purpose, the NUCLEODUR® PFAS Delay column is connected in flow direction between the mixing vessel and the sample injector.

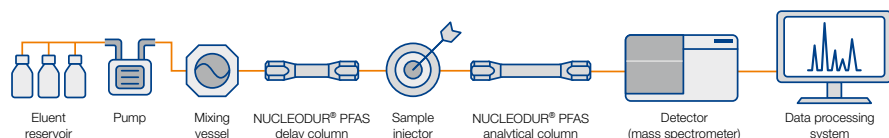


Illustration of installation and usage of NUCLEODUR® PFAS Delay column



NUCLEODUR® PFAS analytical HPLC column

Product selection according to ISO 21675:2019, DIN 38407-42, EPA 537.1, 533, 8327 and FDA C-010.01 guidelines

Method →	ISO 21675:2019	ISO 21675:2019 and DIN 38407-42	EPA 537.1	EPA 533	EPA 8327	EPA 1633	FDA C-010.01	DIRECTIVE (EU) 2020/2184
Product type ↓								
SPE columns	CHROMABOND® PFAS (REF 7300009)	CHROMABOND® HR-XAW (REF 730747)	CHROMABOND® HR-X (REF 730931P45)	CHROMABOND® HR-XAW (REF 730748P45)	Direct injection	CHROMABOND® WAX (REF 7300011)	CHROMABOND® PFAS (REF 730283)	CHROMABOND® PFAS (REF 7300009)
dSPE centrifuge tubes		CHROMABOND® PFAS (REF 730283)	CHROMABOND® HR-X (REF 730939)	CHROMABOND® HR-XAW (REF 730745)		CHROMAFIL® Xtra PA (REF 729212)	CHROMABOND® QueChERS Mix XII (REF 730648)	
Syringe filters				CHROMABOND® PFAS (REF 730283)	CHROMABOND® WAX (REF 7300011)		CHROMABOND® QueChERS Mix L (REF 7300008)	CHROMABOND® QueChERS Mix XX (REF 730670.2)
Delay column			EC 50/2 NUCLEODUR® PFAS Delay, 5 µm (REF 760673.20)					
HPLC column			EC 50/2 NUCLEODUR® PFAS, 3 µm (REF 760663.20) EC 100/2 NUCLEODUR® PFAS, 3 µm (REF 760666.20)					
Vials and caps			0.3 mL N 9 screw neck vial, PP transparent (REF 702009) 0.7 mL N 9 screw neck vial, PP transparent (REF 702010) 1.5 mL N 9 screw neck vial, PP transparent (REF 702500) 0.3 mL N 9 screw neck vial, PP amber (REF 702172) 0.3 mL N 11 snap ring/crimp neck vial, PP transparent (REF 702809) 0.7 mL N 11 snap ring/crimp neck vial, PP transparent (REF 702174) 0.3 mL N 11 snap ring/crimp neck vial, PP amber (REF 702173) N 9 screw closure, PP, blue, silicone white / polyimide orange (REF 702402) N 11 snap ring closure, PE (soft), light blue, silicone white / polyimide orange (REF 702403)					



[PFAS analysis according to EPA 8327](#)



[PFAS analysis according to EPA 533](#)



[PFAS analysis according to ISO 21675:2019 and DIN 38407-42](#)



[PFAS analysis according to EPA 537.1](#)



[PFAS HPLC analysis according to EPA 533 and 537.1](#)



[PFAS Landing page](#)



[PFAS Analysis with CHROMABOND® WAX according to EPA 533](#)



[PFAS analysis according to EPA Draft Method 1633](#)



[PFAS analysis according to DIRECTIVE \(EU\) 2020/2184](#)



[PFAS analysis according to ISO 21675:2019](#)

Solutions for PFAS analysis

Ordering information

Product description	REF	Pack of
SPE columns and dSPE centrifuge tubes		
CHROMABOND® PFAS, 85 µm, 6 mL / 300 mg	730283	30
CHROMABOND® PFAS, 3 mL / 120 mg	7300009	30
CHROMABOND® HR-XAW, 85 µm, 6 mL / 500 mg	730745	30
CHROMABOND® WAX, 30 µm, 6 mL / 150 mg	7300011	30
CHROMABOND® HR-XAW, 85 µm, 3 mL / 60 mg	730747	30
CHROMABOND® WAX, 30 µm, 6 mL / 500 mg	7300012	30
CHROMABOND® HR-X, 45 µm, 3 mL / 200 mg	730931P45	30
CHROMABOND® WAX, 30 µm, 3 mL / 200 mg	7300015	30
CHROMABOND® HR-X, 85 µm, 6 mL / 500 mg	730939	30
CHROMABOND® WAX, 30 µm, 3 mL / 60 mg	7300014	30
CHROMABOND® QuEChERS Mix XII, extraction mix consisting of: 4000 mg MgSO ₄ , 1000 mg NaCl, individually weighed and filled into 15 mL centrifuge tubes (PP) with screw cap (PE)	730648	50
CHROMABOND® QuEChERS Mix L Diamino / Carbon clean-up mix consisting of: 900 mg MgSO ₄ , 300 mg CHROMABOND® Diamino, 150 mg CHROMABOND® Carbon, individually weighed and filled into 15 mL centrifuge tubes (PP) with screw cap (PE)	7300008	50
CHROMABOND® QuEChERS Mix XX Diamino clean-up mix (acc. to AOAC) consisting of: 150 mg MgSO ₄ , 50 mg CHROMABOND® Diamino individually weighed and filled into 2 mL centrifuge tubes (PP) with snap cap (PP)	730670.2	50
HPLC columns		
EC 100/2 NUCLEODUR® PFAS, 3 µm	760666.20	1
EC 50/2 NUCLEODUR® PFAS, 3 µm	760663.20	1
EC 50/2 NUCLEODUR® PFAS Delay, 5 µm	760673.20	1
Vials and caps		
0.3 mL N 9 screw neck vial, PP transparent, 11.6 x 32.0 mm, inner cone	702009	100
0.7 mL N 9 screw neck vial, PP transparent, 11.6 x 32.0 mm, round bottom insert	702010	100
1.5 mL N 9 screw neck vial, PP transparent, 11.6 x 32.0 mm, flat bottom	702500	100
0.3 mL N 9 screw neck vial, PP amber, 11.6 x 32.0 mm inner cone	702172	100
0.3 mL N 11 snap ring/crimp neck vial PP transparent, 11.6 x 32.0 mm inner cone	702809	100
0.7 mL N 11 snap ring/crimp neck vial, PP transparent, 11.6 x 32.0 mm round bottom insert	702174	100
0.3 mL N 11 snap ring/crimp neck vial, PP amber, 11.6 x 32.0 mm inner cone	702173	100
N 9 screw closure, PP, blue, center hole, silicone white / polyimide orange, 1.0 mm	702402	100
N 11 snap ring closure, PE (soft), light blue, center hole, silicone white / polyimide orange, 1.0 mm	702403	100
N 9 screw closure, PP, blue, center hole, silicone white / polyimide orange, slit, 1.0 mm	702405	100
0.1 mL N 9 N 10 N 11 micro-insert, 5.7 x 29.0 mm, 0.1 mL, conical, PP, spring	702819	100

Registered trademarks

NUCLEODUR®	MACHEREY-NAGEL GmbH & Co. KG (Germany)
CHROMABOND®	MACHEREY-NAGEL GmbH & Co. KG (Germany)
CHROMAFIL®	MACHEREY-NAGEL GmbH & Co. KG (Germany)

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Management System
EN ISO 13485:2016
ISO 9001:2015



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