

# Gas Chromatography

Selected products for Gas Chromatography.  
An extract from our Catalogue assortment.



## Gas Chromatography

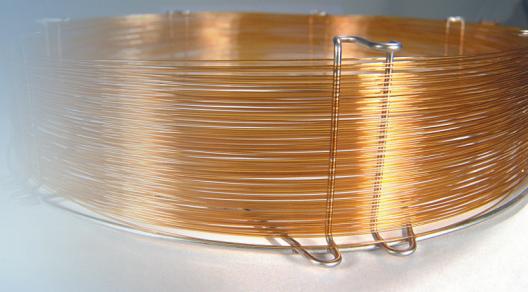
Gas Chromatography (GC) has a wide application scope as an analysis method for separating mixtures of substances into individual chemical compounds.

The GC is applicable when the materials to be tested are gaseous or can be vaporized without decomposition.

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# GC-capillary columns



## ROTI®CAP, the proved high performance capillary columns by ROTH

- Low column bleed
- High thermal stability
- Inert phases

MADE IN GERMANY

Our comprehensive selection of ROTI®CAP GC-capillary columns consists of non-polar, medium polar and polar columns, which are available in different sizes:

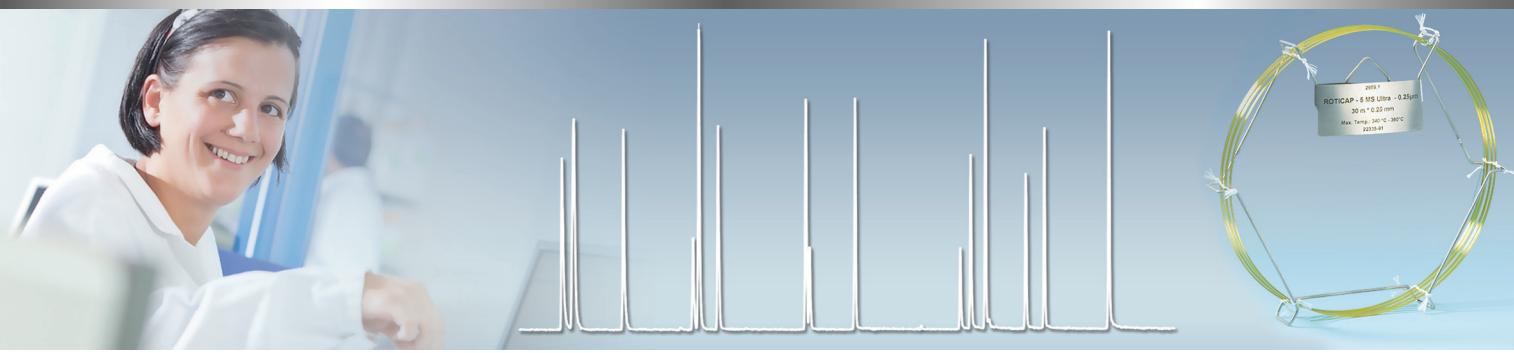
- Length: 10 - 60 m
- Inner diameter: 0.25 - 0.53 mm
- Film thickness: 0.1 - 5.0 µm

Our premium capillary columns have to meet very strict criteria during quality control.

Each column is individually tested and supplied with test certificate and test chromatogramm.

GC-columns by ROTH	Configuration of the column	Similar phases	.... Polarity
ROTI®CAP-1	100 % dimethylpolysiloxane	OV-1, DB-1, SE-30, HP-1, SPB™-1, CP-Sil 5 CB, Rtx®-1, 007-1, BP1, MDN-1, AT™-1, ZB 1, OV 101 equivalent to USP-phases G1 / G2 / G38	lowest
ROTI®CAP-1 MS	100 % dimethylpolysiloxane	Ultra 1, DB-1 MS, Rtx®-1 MS, HP-1 MS, Equity™-1, AT™-1 MS, VF-1 MS, CP-Sil 5 CBMS	
ROTI®CAP-5	5 % phenyl - 95 % dimethylpolysiloxane	SE-54, SE-52, DB-5, HP-5, SPB™-5, CP-Sil 8, Rtx®-5, 007-5, BP5, MDN-5, AT™-5, ZB-5 equivalent to USP-phases G 27 / G 36	
ROTI®CAP-5 MS	5 % phenyl - 95 % dimethylpolysiloxane	DB-5 MS, HP-5 MS, Ultra-2, Equity™-5, CP-Sil 8CB low bleed/MS, Rtx®-5SIL-MS, Rtx®-5 MS, 007-5 MS, BPX5, MDN-5S, ATTM-5 MS, VF-5 MS	
ROTI®CAP-5 MS Ultra	silylarylene phase with selectivity similar to 5 % phenyl - 95 % methylpolysiloxane	equivalent to USP-phases G 27 / G 36	
ROTI®CAP-5 HT	silylarylene phase with selectivity similar to 5 % phenyl - 95 % methylpolysiloxane	DB-5 HT, VF-5 HT, HT-5, XTI-5HT, ZB-5 HT equivalent to USP-phases G27 / G36	
ROTI®CAP-624	6 % cyanopropyl-phenyl -94 % dimethylpolysiloxane	HP-624, HP-VOC, DB-624, DB-VRX, SBP™-624, CP-624, Rtx®-624, Rtx®-Volatiles, 007-624, BP624, VOCOL equivalent to USP-phase G 43	
ROTI®CAP-1701	14 % cyanopropyl-phenyl -86 % dimethylpolysiloxane	OV-1701, DB-1701, CP Sil 19 CB, HP-1701, Rtx®-1701, SPB™-1701, 007-1701, BP10, ZB-1701 equivalent to USP-phase G 46	
ROTI®CAP-35 MS	silylarylene phase with selectivity similar to 35 % phenyl - 65 % methylpolysiloxane	DB-35 MS, HP-35, SPB™-35, Rtx-35, 007-35, BPX™-35, MDN-35, AT™-35 MS, ZB-35, OV-11, VF-35 MS equivalent to USP-phase G 42, annähernd äquivalent zur USP-Phase G28 / G32	
ROTI®CAP-WAX	polyethylene glycol (PEG) 20000 dalton	DB-Wax, Supelcowax™, HP-Wax, HP-INNOWax, Rtx®-Wax, Stabilwax, CP-Wax 52 CB, 007-CW, BP20, AT™-Wax, ZB-Wax equivalent to USP-phase G 16	
ROTI®CAP-FFAP	polyethylene glycol-2-nitrotetraphthalate	DB-FFAP, HP-FFAP, CP-SIL 58 CB, 007-FAP, CP-FFAP CB, Nukol, AT 1000, SPB™-1000, BP 21, OV-351 equivalent to USP-phase G 35, nearly equivalent to USP-phase G25	highest

# GC-capillary columns



## ROTI®CAP-1

100 % Dimethylpolysiloxane

- Non-polar
- Excellent column for routine applications
- **Similar phases:** OV-1, DB-1, SE-30, HP-1, SPB™-1, CP-SIL 5 CB, Rtx®-1, 007-1, BP1, MDN-1, AT™-1, ZB-1, OV-101
- Equivalent to USP phases G1/G2/G38

Length (m)	Inside Ø (mm)	Film thickness (μm)	Art. No.	Pack Qty.
10	0.10	0.10	6077.1	1
10	0.25	0.10	6079.1	1
10	0.25	0.25	6081.1	1
10	0.32	5.00	6097.1	1
10	0.53	1.00	6099.1	1
15	0.32	0.25	6074.1	1
15	0.53	1.00	2849.1	1
25	0.20	0.10	6127.1	1
25	0.25	0.10	6131.1	1
25	0.25	0.25	6135.1	1
25	0.25	0.50	6137.1	1
25	0.25	1.00	6141.1	1
30	0.25	0.10	1358.1	1
30	0.25	0.25	CN10.1	1
30	0.25	0.50	1362.1	1
30	0.25	1.00	1363.1	1
30	0.32	0.10	1370.1	1
30	0.32	0.25	1220.1	1
30	0.32	0.35	1371.1	1
30	0.32	0.50	1372.1	1
30	0.32	1.00	1373.1	1
30	0.32	3.00	1374.1	1
30	0.32	5.00	1375.1	1
30	0.53	0.50	6180.1	1
30	0.53	1.00	6182.1	1
30	0.53	2.00	1376.1	1
30	0.53	5.00	1377.1	1
50	0.25	0.25	6202.1	1
50	0.32	0.25	6209.1	1
60	0.25	0.25	1378.1	1
60	0.32	0.25	1379.1	1

## ROTI®CAP-1 MS

100 % Dimethylpolysiloxane

- Non-polar
- Ideal for GC/MS- and ECD-applications and general analysis at trace level
- **Similar phases:** Ultra 1, DB-1 MS, Rtx®-1 MS, HP-1 MS, Equity™-1, AT™-1 MS, VF-1 MS
- Equivalent to USP phases G1/G2/G38

Length (m)	Inside Ø (mm)	Film thickness (μm)	Art. No.	Pack Qty.
12	0.20	0.35	6242.1	1
15	0.25	0.25	6243.1	1
25	0.20	0.20	6244.1	1
30	0.25	0.25	CN14.1	1
30	0.32	0.25	1381.1	1
50	0.20	0.20	6246.1	1
60	0.25	0.25	1382.1	1

## ROTI®CAP-5

5 % Phenyl - 95 % Dimethylpolysiloxane

- Non-polar
- Standard phase with large range of applications
- **Similar phases:** SE-54, SE-52, DB-5, HP-5, SPB™-5, CP-SIL 8, Rtx®-5, 007-5, BP5, MDN-5, AT™-5, ZB-5
- Equivalent to USP phases G27/G36

Length (m)	Inside Ø (mm)	Film thickness (μm)	Art. No.	Pack Qty.
15	0.53	0.50	6075.1	1
15	0.53	1.00	1231.1	1
30	0.25	0.10	1383.1	1
30	0.25	0.25	CN11.1	1
30	0.25	0.35	1384.1	1
30	0.25	0.50	1385.1	1
30	0.25	1.00	1386.1	1
30	0.32	0.10	1387.1	1
30	0.32	0.25	1227.1	1
30	0.32	0.35	1388.1	1
30	0.32	0.50	1389.1	1
30	0.32	1.00	1390.1	1
30	0.32	3.00	1402.1	1
30	0.32	5.00	1403.1	1
30	0.53	1.00	1406.1	1
30	0.53	2.00	1434.1	1
30	0.53	5.00	1435.1	1
60	0.25	0.25	1436.1	1
60	0.32	0.25	1437.1	1

## ROTI®CAP-5 MS

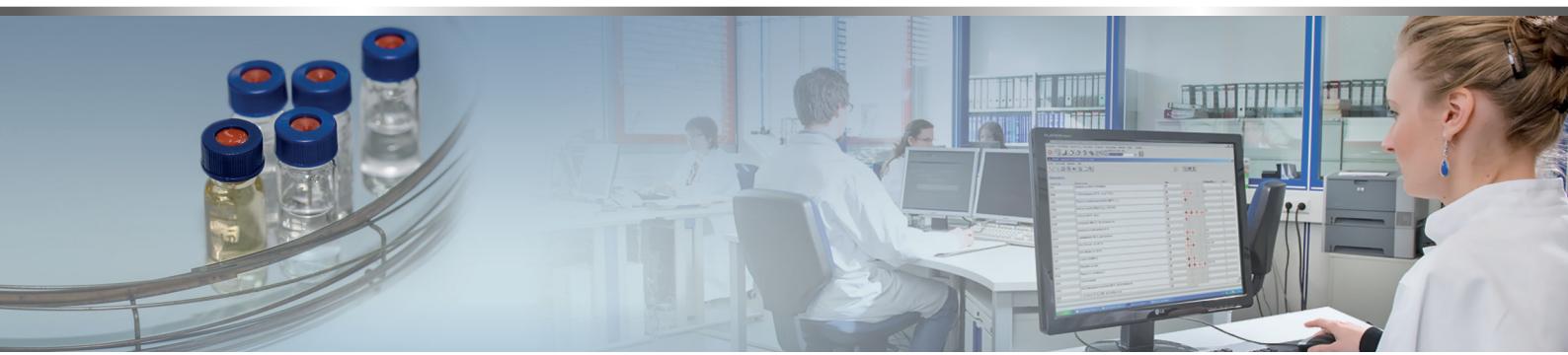
5 % Diphenyl - 95 % Dimethylpolysiloxane

- Non-polar
- Ideal for GC/MS- and ECD-applications and general analysis at trace level
- Selectivity identical to ROTI®CAP 5
- **Similar phases:** DB-5 MS, HP-5 MS, Ultra-2, Equity™-5, CP-SIL 8 CB low bleed/MS, Rtx®-5SIL-MS, Rtx®-5 MS, Rxi®-5 MS, 007-5 MS, BPX™5, MDN-5S, AT™-5 MS, VF-5 MS
- Equivalent to USP phases G27/G36

Length (m)	Inside Ø (mm)	Film thickness (μm)	Art. No.	Pack Qty.
12	0.20	0.20	6362.1	1
15	0.25	0.25	6364.1	1
25	0.20	0.35	6371.1	1
30	0.25	0.25	CN15.1	1
30	0.25	0.50	1438.1	1
30	0.25	1.00	1439.1	1
30	0.32	0.25	1478.1	1
30	0.32	0.50	1492.1	1
50	0.20	0.35	6380.1	1
60	0.25	0.25	1509.1	1
60	0.25	0.50	1519.1	1

Columns have fused ends or are sealed with septa, to protect them from atmospheric oxygen. Ferrules or fittings are not included.

# GC-capillary columns

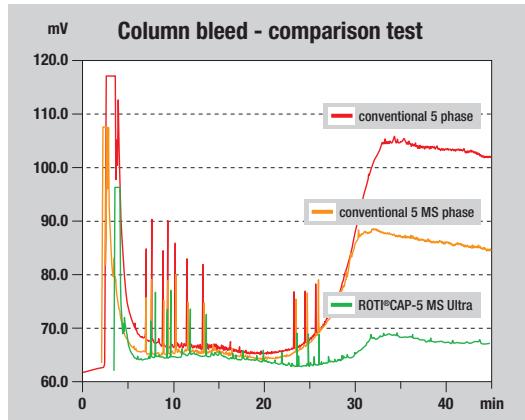


## ROTI®CAP-5 MS Ultra

Silylrene Phase

- Non-polar
- Chemically bound, cross-linked silylrene phase, polarity similar to a 5 % diphenyl - 95 % dimethylpolypropylene phase
- Extremely low column bleed
- Application areas: all-round phase for environmental analyses, trace analyses, EPA methods, pesticides, PCBs, food and drug analyses, ideal for ion-trap and quadrupol MS detectors.
- Similar phases: DB-5 MS, HP-5 MS, Ultra-2, Equity™-5, CP-SIL 8 CB low bleed/MS, Rtx®-5SIL-MS, Rtx®-5 MS, RxI®-5 MS, 007-5 MS, BPX™5, MDN-5S, AT™-5 MS, VF-5 MS
- Equivalent to USP phases G27/G36

Length (m)	Inside Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
12	0.20	0.35	6455.1	1
15	0.25	0.25	6456.1	1
25	0.20	0.20	6457.1	1
25	0.32	1.00	6460.1	1
30	0.25	0.25	2959.1	1
30	0.25	0.50	2960.1	1
30	0.25	1.00	2961.1	1
30	0.32	0.25	2962.1	1
30	0.32	0.50	2963.1	1
50	0.20	0.20	6462.1	1
50	0.20	0.35	6463.1	1
60	0.25	0.25	2969.1	1
60	0.25	0.50	6466.1	1
60	0.25	1.00	6467.1	1
60	0.32	0.25	6468.1	1
60	0.32	1.00	6470.1	1



The bleed comparison test of the **ROTI®CAP-5 MS Ultra** with a conventional 5 phase and 5-MS phase shows the outstanding performance of the silylrene phase.

## GC capillary column ROTI®CAP-5 HT

Silylrene Phase

- Non-polar
- Chemically bound, cross-linked silylrene phase, selectivity similar to a 5 % phenyl - 95 % methylpolysiloxane phase
- Working temperature limits:  
380 °C for isothermal operation  
400 °C for short isothermal operation in a temperature programme
- Application areas: simulated distillation; hydrocarbon, fuel, oil analysis; high boiling analytes
- Similar phases: DB-5HT, VF-5HT, HT-5, XTI-5HT, ZB-5HT
- Equivalent to USP phases G27/G36

Length (m)	Inside Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
15	0.25	0.1	3883.1	1
15	0.25	0.25	3885.1	1
15	0.32	0.1	3884.1	1
15	0.32	0.25	3888.1	1
30	0.25	0.1	3889.1	1
30	0.25	0.25	3891.1	1
30	0.32	0.1	3890.1	1
30	0.32	0.25	3892.1	1

## ROTI®CAP-1701

14 % Cyanopropyl-phenyl - 86 % Dimethylpolysiloxane

- Medium polar
- Special selectivity due to high cyanopropyl percentage
- Reference column for structure clarification, e.g. in combination with ROTI®CAP-5
- Columns with film thickness  $\geq 1 \mu\text{m}$  are used for solvent analyses
- Similar phases: OV-1701, DB-1701, CP Sil 19 CB, HP-1701, Rtx®-1701, SPB™-1701, 007-1701, BP10, ZB-1701
- Equivalent to USP phase G46

Length (m)	Inner Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
10	0.53	1.00	6408.1	1
15	0.53	1.00	3698.1	1
15	0.53	2.00	6415.1	1
25	0.25	0.25	6419.1	1
25	0.32	0.25	6433.1	1
30	0.25	0.25	3700.1	1
30	0.25	0.50	3703.1	1
30	0.25	1.00	3706.1	1
30	0.32	0.25	3708.1	1
30	0.32	0.35	3709.1	1
30	0.32	0.50	3714.1	1
30	0.32	1.00	3715.1	1
30	0.53	1.00	3716.1	1
30	0.53	2.00	3717.1	1
50	0.25	0.25	6442.1	1
50	0.32	0.25	6443.1	1
60	0.25	0.25	3724.1	1
60	0.32	0.25	3725.1	1

Each column is individually tested and supplied with test certificate and test chromatogramm. All columns have fused ends or are sealed with septa, to protect them from atmospheric oxygen. Ferrules or fittings are not included.

# GC-capillary columns



## ROTI®CAP-624

6 % Cyanopropyl-phenyl - 94 % Dimethylpolysiloxane

- Medium polar
- Recommended for environmental analyses
- **Similar phases:** HP-624, HP-VOC, DB-624, DB-VRX, SBP™-624, CP-624, Rtx®-624, Rtx®-Volatiles, 007-624, BP624, VOCOL, ZB-624
- Equivalent to USP phase G43

Length (m)	Inside Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
25	0.20	1.10	6393.1	1
25	0.25	1.40	6398.1	1
25	0.32	1.80	6400.1	1
25	0.53	3.00	6401.1	1
30	0.25	1.40	1872.1	1
30	0.32	1.80	CN16.1	1
30	0.53	3.00	1874.1	1
50	0.25	1.40	6403.1	1
50	0.32	1.80	6404.1	1
60	0.25	1.40	1875.1	1
60	0.32	1.80	1876.1	1

## ROTI®CAP-FFAP

Polyethylene glycol 2-nitroterephthalate

- Polar
- Recommended for FAMEs, free carboxylic acids
- High temperature stability
- **Similar phases:** DB-FFAP, HP-FFAP, CP-SIL 58 CB, 007-FFAP, CP-FFAP CB, Nukol™
- Equivalent to USP phase G35, close equivalent to G25

Length (m)	Inside Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
10	0.10	0.10	6390.1	1
25	0.25	0.25	1828.1	1
25	0.32	0.25	6391.1	1
25	0.32	0.50	1830.1	1
25	0.53	1.00	1836.1	1
30	0.25	0.25	CN13.1	1
30	0.32	0.25	1229.1	1
30	0.32	0.50	1854.1	1
30	0.53	0.50	1856.1	1
50	0.25	0.25	1858.1	1
50	0.32	0.25	1860.1	1
50	0.32	0.50	6392.1	1
60	0.25	0.25	1864.1	1
60	0.32	0.25	1866.1	1

For a comprehensive selection of **ROTI®CAP GC capillary columns**  
please see **Chromatography** chapter in our current catalogue or  
[www.carlroth.com](http://www.carlroth.com)

## ROTI®CAP-35 MS

Silylene Phase

- Medium polar
- Silylene Phase with selectivity analogue 35 % phenyl - 65 % Methylpolysiloxane
- **Very low column bleeding**, ideally suited for ion-trap-detectors
- **Working temperature limits:**  
360 °C for isothermal runs  
370 °C for short isothermal runs in a temperature programm
- **Application areas:** All-round phase for environmental analyses, ultra-trace analyses, EPA methods, pesticides, PCBs, food and drug analyses
- **Reference column** in combination with 1 MS or 5 MS (e.g. ROTI®CAP-1 MS or ROTI®CAP-5 MS)
- **Similar Phases:** DB-35 MS, HP-35, SPB™-35, Rtx®-35, 007-35, BPX™-35, MDN-35, ATT™-35 MS, ZB-35, OV-11, VF-35 MS
- Equivalent to USP phase G42, close equivalent to USP phases G28/G32

Length (m)	Inside Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
30	0.25	0.25	4794.1	1
30	0.32	0.25	4800.1	1
60	0.25	0.25	4801.1	1
60	0.32	0.25	4802.1	1

## ROTI®CAP-WAX

Polyethylene glycol (PEG) 20000 dalton

- Polar
- Recommended for solvent analysis and alcohols
- Suitable for aqueous solutions
- High temperature stability
- Recommended for solvent analysis and alcohols; suitable for aqueous solutions
- **Similar phases:** DB-Wax, Supelcowax, HP-Wax, HP-INNOWAX, Rtx®-Wax, CP-Wax 52 CB, Stabilwax, 007-CW, BP20, AT-Wax, ZB-Wax
- Equivalent to USP phase G16

Length (m)	Inside Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
25	0.25	0.25	1531.1	1
25	0.32	0.25	1545.1	1
25	0.32	0.50	1546.1	1
25	0.53	1.00	6386.1	1
30	0.25	0.25	CN12.1	1
30	0.32	0.25	1618.1	1
30	0.32	0.50	1228.1	1
30	0.53	1.00	1651.1	1
30	0.53	2.00	1877.1	1
50	0.25	0.25	1882.1	1
50	0.32	0.25	1918.1	1
50	0.32	0.50	6387.1	1
60	0.25	0.25	1925.1	1
60	0.32	0.25	1945.1	1
60	0.32	0.50	6388.1	1

# Derivatization reagents



Derivatization reagents are used in gas chromatography mainly to increase the volatility or stability of substances to be separated. It can also be used to enhance detection sensitivity.

Our range of derivatization reagents is ideal for acylation, alkylation and silylation of reagents.

## Reagents for silylation

Product	Purity	Art. No.	Pack Qty.
<b>3-Aminopropyltriethoxysilane / APES</b>	≥98 %, for GC	2328.1 2328.2	25 g 100 g
<b>N,O-Bis(trimethylsilyl) acetamide / BSA</b>	≥98 %, for GC	2330.1	25 g
<b>N,O-Bis(trimethylsilyl)-trifluoroacetamide / BSTFA</b>	≥98 %, for GC	2331.1	10 g
		3840.3 3840.1 3840.2 3840.5 3840.4	10 ml 50 ml 250 ml 500 ml 1 l
<b>1,1,1,3,3-Hexamethyldisilazane / HMDS</b>	≥98 %, for GC	9933.1 8007.1	10 ml (septum bottle) 5 g
<b>N-Methyl-N-(trimethylsilyl)-trifluoroacetamide / MSTFA</b>	≥99 %, for GC ≥97 %, for GC	2338.1	25 g
<b>Trimethylchlorosilane / TMCS</b>	≥99 %, for gas chromatography	0013.1	25 g
<b>N-(Trimethylsilyl)-diethylamine / TMSDEA</b>	≥98 %, for GC	0012.1	10 g
<b>N-(Trimethylsilyl)-imidazole / TSIM</b>	≥97 %, for GC	9935.1	10 ml (septum bottle)

## Reagents for silylation acylation

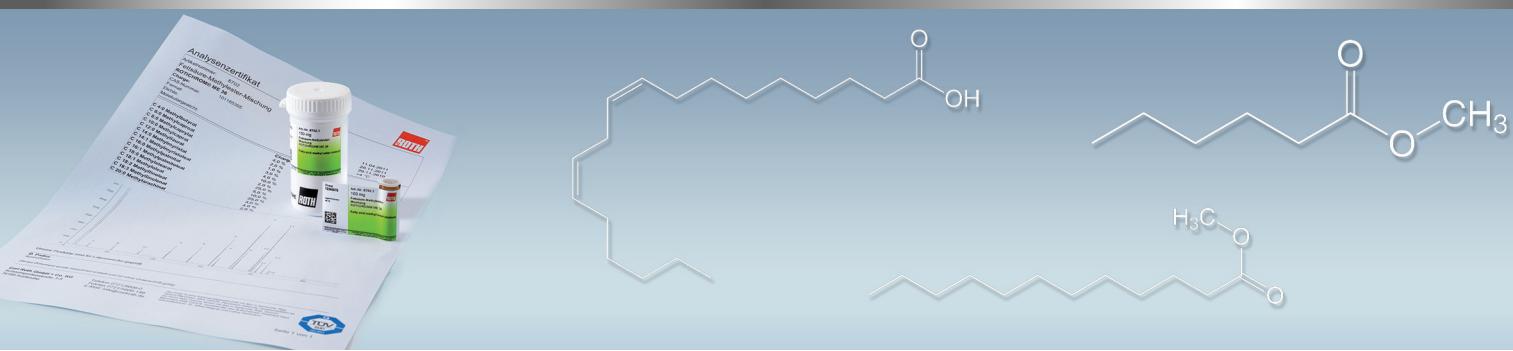
Product	Purity	Art. No.	Pack Qty.
<b>Heptafluorobutyric acid anhydride</b>	≥98 %, for GC	0026.1	5 g
<b>Trifluoroacetic anhydride</b>	≥99 %, for GC	0027.1	100 g

## Reagents for silylation acylation

Product	Purity	Art. No.	Pack Qty.
<b>N,N-Dimethylformamide dimethyl acetal/DMF-DMA</b>	≥98 %	6870.1 6870.2 6870.3 6870.4	5 ml 25 ml 100 ml 500 ml
<b>Trimethylsulfonium hydroxide in methanol / TMSH</b>	~0,2 M, for GC	9934.1	10 ml (septum bottle)

For additional product data and safety information, see our current catalogue or [www.carloroth.com](http://www.carloroth.com)

# Fatty acid references · ROTICHROM®



In the field of lipid analysis we put an extensive collection of reference substances and reference mixtures at the analyst's disposal.

All reference mixtures are prepared from pure components which are carefully tested for purity by TLC and GC.

Precise weighing and a final check guarantee the precision of the mixture. A certificate comes with each product.

## Free fatty acids

Product	Purity (GC)	Art. No.	Pack Qty.
<b>Capric acid</b>	≥99 %	<b>3164.1</b>	1 g
<b>Caprylic acid</b>	≥99 %	<b>3168.1</b>	1 g
<b>Linolenic acid</b>	≥99 %	<b>5320.1</b>	1 g
<b>Linoleic acid</b>	≥99 %	<b>5315.1</b>	1 g
<b>Oleic acid</b>	≥99 %	<b>5362.1</b>	1 g

## Free acid mixture

ROTICHROM® FA 1

Storage temp.: +4 °C

Danger H314-H335

8792.1	100 mg	plastic
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## Fatty acid methyl ester

Product	Purity (GC)	Art. No.	Pack Qty.
<b>Butyric acid methyl ester</b>	≥96 %	<b>5186.1</b>	1 g
<b>Capric acid methyl ester</b>	≥98 %	<b>6709.1</b>	1 g
<b>Caproic acid methyl ester</b>	≥97 %	<b>6653.1</b>	1 g
<b>Caprylic acid methyl ester</b>	≥99 %	<b>4349.1</b>	1 g
<b>Acetic acid methyl ester</b>	≥99 %	<b>5187.1</b>	1 g
<b>Lauric acid methyl ester</b>	≥98.5 %	<b>6787.1</b>	1 g
<b>Linoleic acid methyl ester</b>	≥99 %	<b>3199.1</b>	1 g
<b>Oleic acid methyl ester</b>	≥99 %	<b>3186.1</b>	1 g

## Fatty acid methyl ester mixtures

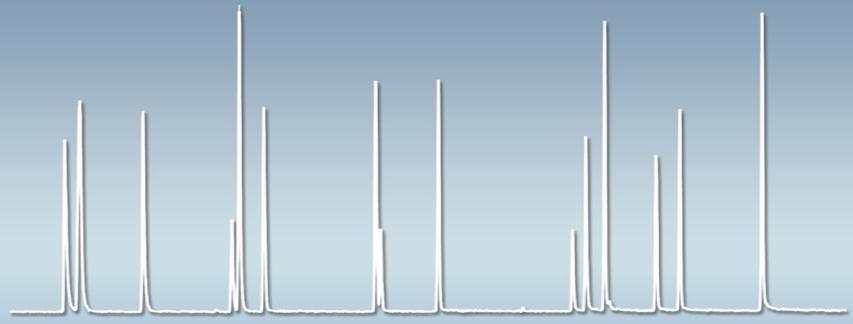
Purity	Mixture	Art. No.	Pack Qty.
<b>ME 17</b>	saturated	<b>8666.1</b>	100 mg
<b>ME 18</b>	saturated	<b>8667.1</b>	100 mg
<b>ME 19</b>	saturated	<b>8669.1</b>	100 mg
<b>ME 21</b>	saturated	<b>8676.1</b>	100 mg
<b>ME 22</b>	saturated	<b>8677.1</b>	100 mg
<b>ME 24</b>	saturated	<b>8679.1</b>	100 mg
<b>ME 28</b>	saturated/unsaturated	<b>8691.1</b>	100 mg
<b>ME 29</b>	unsaturated	<b>8692.1</b>	100 mg
<b>ME 32</b>	saturated/unsaturated	<b>8697.1</b>	100 mg
<b>ME 35</b>	saturated/unsaturated	<b>8701.1</b>	100 mg
<b>ME 36</b>	saturated/unsaturated	<b>8702.1</b>	100 mg
<b>ME 37</b>	saturated/unsaturated	<b>8703.1</b>	100 mg
<b>ME 38</b>	saturated/unsaturated	<b>8705.1</b>	100 mg
<b>ME 39</b>	saturated/unsaturated	<b>8709.1</b>	100 mg
<b>ME 46</b>	saturated/unsaturated	<b>8730.1</b>	100 mg
<b>ME 51</b>	saturated/unsaturated	<b>8737.1</b>	100 mg

## Fatty acid methyl ester mixtures for special applications

Purity	For testing of	Art. No.	Pack Qty.
<b>FO 3</b>	Coconut, rape seed and mustard seed oils	<b>8756.1</b>	100 mg
<b>FO 4</b>	Olive and tea seed oils	<b>8758.1</b>	100 mg
<b>FO 5</b>	Coconut, palm kernel and babassu oils	<b>8759.1</b>	100 mg
<b>FO 7</b>	Rape seed oil	<b>8761.1</b>	100 mg
<b>FO 8</b>	Rape seed oil	<b>6330.1</b>	100 mg

For additional product data and safety information, see our current catalogue or [www.carlroth.com](http://www.carlroth.com).

# ROTISOLV® Pestilyse solvents



## For gas chromatography

### Advantage:

- Highest purity
- Quality control via ECD and PND
- Non-volatile parts: 5 ppm or less
- Specially purified for application in pesticide residue analysis

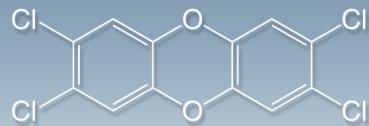
ROTISOLV®-Pestilyse® solvents are ideal as extraction agents for separation, concentration and cleaning of residues.

Field of application: pesticide residue analysis (via ECD, PND detection) in sectors environment, foodstuffs, water, etc.

Product	Purity	Art. No.	Pack Qty.	Packaging
Acetic acid ethyl ester	≥99.8 %, Pestilyse®	T164.2	1 l	glass
		T164.1	2.5 l	glass
		T164.3	4 l	glass
Acetone	≥99.8 %, Pestilyse®	T161.2	1 l	glass
		T161.1	2.5 l	glass
		T161.3	4 l	glass
Acetonitrile	≥99.9 %, Pestilyse®	T168.2	1 l	glass
		T168.1	2.5 l	glass
		T168.3	4 l	glass
Cyclohexane	≥99.5 %, Pestilyse®	T163.2	1 l	glass
		T163.1	2.5 l	glass
		T163.3	4 l	glass
Dichloromethane	≥99.8 %, Pestilyse®	T162.2	1 l	glass
		T162.1	2.5 l	glass
		T162.3	4 l	glass
Diethyl ether	≥99.8 %, Pestilyse®. stab.	T900.1	2.5 l	glass
n-Heptane	≥99 %, Pestilyse®	X878.1	2.5 l	glass
n-Hexane	≥99 %, Pestilyse®	T861.2	1 l	glass
		T861.1	2.5 l	glass
		T165.2	1 l	glass
n-Hexane	≥97.5 %, Pestilyse®	T165.1	2.5 l	glass
		T165.3	4 l	glass
Isohexane	≥99 %, Pestilyse®	T904.1	2.5 l	glass
Isooctane	≥99.5 %, Pestilyse®	T167.1	2.5 l	glass
Methanol	≥99.9 %, Pestilyse®	T169.2	1 l	glass
		T169.1	2.5 l	glass
		T169.3	4 l	glass
n-Pentane	≥99 %, Pestilyse®	T903.2	1 l	glass
		T903.1	2.5 l	glass
Petroleum ether 40-60 °C	Pestilyse®	T170.2	1 l	glass
		T170.1	2.5 l	glass
		T170.3	4 l	glass
2-Propanol	≥99.8 %, Pestilyse®	T902.1	2.5 l	glass
Toluene	≥99.8 %, Pestilyse®	T166.2	1 l	glass
		T166.1	2.5 l	glass
		T166.3	4 l	glass
Trichloromethane/Chloroform	≥99.8 %, Pestilyse®	T901.1	2.5 l	glass
Water	Pestilyse®	T905.1	2.5 l	glass

For additional product data and safety information please see our current catalogue or [www.carlroth.com](http://www.carlroth.com)

# ROTISOLV® Pestilyse® plus solvents



**For determination of dioxines, furanes, PCBs, pesticides, hydrocarbons and further pollutants.**

ROTH created this product line (ROTISOLV® Pestilyse® plus) especially to address the growing requirements in residue analysis. Several relevant parameters are specified for these solvents which allow the use in various applications. With this product line, ROTH sets the benchmark for residue analysis solvents in terms of purity and quality.

## Features:

- Highest purity
  - Controlled by FID, ECD and NPD
  - PAH tested
  - Tested for hydrocarbons C<sub>14</sub>-C<sub>40</sub>
  - Tested for fluorescence
  - Volatile impurities: max. 5 ppm
  - Non-volatile impurities: max. 5 ppm

## Example specification:

## Acetone

**ROTISOLV® ≥99.9 %, Pestilyse® plus**

For determination of dioxins, fu

## 2-Propanone, Dimethyl k

C3H6O • M 58.08 g/mol  
  Danger H225-H319-H336-EUH066

#### Guarantee analysis:

Assay (GC).....	≥99.9 %
Colour (APHA) .....	≤10
Water (KF).....	≤0.3 %
Free acid (as CH <sub>3</sub> COOH).....	≤0.002 %
Evaporation residue .....	≤0.0003 %
GC/FID suitability (as 2-octanol).....	≤10 ng/ml
GC/ECD suitability (as heptachloro epoxide) .....	≤10 ng/l
GC/ECD dioxins, furans and PCBs (as lindane).....	≤5 ng/l
GC/ECD pesticides (as lindane).....	≤5 ng/l
GC/NPD pesticides (as parathion) .....	≤10 ng/l
Oil index (any hydrocarbon C <sub>10</sub> -C <sub>40</sub> ) .....	≤0.1 mg/l
GC/ECD volatile impurities (as ethylene dibromide).....	≤5 ng/ml
PAH-test (less than 2 ppb, HPLC).....	complies
Fluorescence (as quinine):	
254 nm .....	≤1 ppb
365 nm .....	≤1 ppb

Product	Purity	Art. No.	Pack Qty.	Packaging
<b>Acetic acid ethyl ester</b>	≥99.9 %, Pestilyse® plus	7565.1	2.5 l	glass
<b>Acetone</b>	≥99.9 %, Pestilyse® plus	7535.1	2.5 l	glass
<b>Cyclohexane</b>	≥99.9 %, Pestilyse® plus	7542.1	2.5 l	glass
<b>Dichloromethane</b>	≥99.9 %, Pestilyse® plus	7562.1	2.5 l	glass
<b>n-Heptane</b>	≥99 %, Pestilyse® plus	7566.1	2.5 l	glass
<b>n-Hexane</b>	≥99 %, Pestilyse® plus	7573.1	2.5 l	glass
<b>n-Hexane</b>	≥96 %, Pestilyse® plus	7567.1	2.5 l	glass
<b>Isohexane</b>	≥96 %, Pestilyse® plus	7576.1	2.5 l	glass
<b>Isooctane</b>	≥99.7 %, Pestilyse® plus	7580.1	2.5 l	glass
<b>Methanol</b>	≥99.9 %, Pestilyse® plus	7583.1	2.5 l	glass
<b>n-Pentane</b>	≥99 %, Pestilyse® plus	7587.1	2.5 l	glass
<b>Petroleum ether 40-60 °C</b>	Pestilyse® plus	7588.1	2.5 l	glass
<b>2-Propanol</b>	≥99.9 %, Pestilyse® plus	7590.1	2.5 l	glass
<b>Toluene</b>	≥99.8 %, Pestilyse® plus	7591.1	2.5 l	glass
<b>Trichloromethane/Chloroform</b>	≥99.9 %, Pestilyse® plus	7554.1	2.5 l	glass

For additional product data and safety information please see our current catalogue or [www.carlroth.com](http://www.carlroth.com)

# ROTISOLV® GC Ultra Grade solvents



## For gas chromatographic and residue analysis

### Features:

- Highest purity
- Very low water content
- Non-volatile matter less than 2 ppm
- Quality control by means of ECD and NPD
- PAH-test
- Filtered through 0.2 µm membrane
- Bottled under protective gas

In order to monitor and analyse environmentally relevant substances such as pesticides, dioxins, furans, PAH, PCB etc. in trace analysis, solvents with exceedingly high purity specifications are required. ROTH's ROTISOLV® GC Ultra Grade solvents have been developed specially for this application area.

The solvents are produced with the most sophisticated production processes. Extensive quality checks guarantee the same high-grade quality from batch to batch.

### Example specification:

#### Acetone

**ROTISOLV® ≥99.9 %, GC Ultra Grade**

For gas chromatographic residue analysis.

2-Propanone, Dimethyl ketone



M 58.08 g/mol

**Danger H225-H319-H336-EUH066**

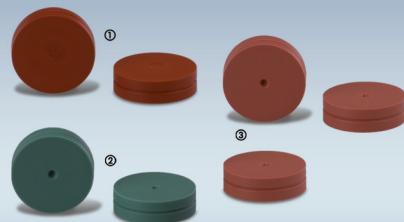
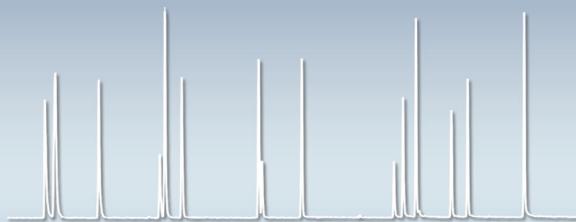
#### Guarantee analysis:

Assay (GC).....	≥99.9 %
Colour (APHA) .....	≤10.
Water (KF).....	≤0.25 %
Free acid (as CH <sub>3</sub> COOH).....	≤0.002 %
Evaporation residue .....	≤0.0002 %
GC/ECD dioxins, furans and PCBs (as lindane).....	≤5 ng/l
GC/ECD pesticides (as lindane).....	≤5 ng/l
GC/NPD pesticides (as parathion) .....	≤5 ng/l
PAH-test (UV- and fluorimetric detectors) .....	complies
Filtered through 0.2 µm membrane and filled under protective gas.	

Product	Purity	Art. No.	Pack Qty.
<b>Acetic acid ethyl ester</b>	≥99.9 %, GC Ultra Grade	<b>KK42.1</b>	2.5 l
<b>Acetone</b>	≥99.9 %, GC Ultra Grade	<b>KK40.1</b>	2.5 l
<b>Cyclohexane</b>	≥99.9 %, GC Ultra Grade	<b>KK41.1</b>	2.5 l
<b>Dichloromethane</b>	≥99.9 %, GC Ultra Grade	<b>KK47.1</b>	2.5 l
<b>n-Hexane</b>	≥95 %, GC Ultra Grade	<b>KK48.1</b>	2.5 l
<b>Methanol</b>	≥99.9 %, GC Ultra Grade	<b>KK44.1</b>	2.5 l
<b>n-Pentane</b>	≥99 %, GC Ultra Grade	<b>KK45.1</b>	2.5 l
<b>Toluene</b>	≥99.8 %, GC Ultra Grade	<b>KK46.1</b>	2.5 l

For additional product data and safety information please see our current catalogue or [www.carlroth.com](http://www.carlroth.com)

# ROTISOLV® Headspace Grade solvents



## For analyses of organic volatile impurities (O.V.I.)

### Features:

- Highest purity (mostly ≥99.99 %)
- High boiling point
- Non volatile matter: ≤0.001 %
- Tested for headspace suitability
- Bottled under protective gas
- Microfiltered

Headspace gas chromatography is a major quality control procedure particularly in the pharmaceutical and food industry. The regulations for this method can be found both in the European as well as the American Pharmacopoeia.

**High-boiling solvents of excellent purity**, which show no background due to organic volatile impurities on the GC-columns, are required for determining solvent residue.

### Example specification:

#### N,N-Dimethylacetamide (DMA)

ROTISOLV® ≥99,99 %, Headspace Grade

For determination of solvent residues (O.V.I.)

DMA, Acetic acid dimethylamide

C<sub>4</sub>H<sub>9</sub>NO

M 87,12 g/mol

Danger H360D-H312+H332-H319

#### Guarantee analysis:

Assay (GC).....	≥99,99 %
Colour (APHA) .....	≤5
Water (KF).....	≤0,03 %
Free acid (as CH <sub>3</sub> COOH).....	≤0,005 %
Refractive index (20 °C) .....	1,437-1,439
Non volatile matter.....	≤0,001 %
UV-Cutoff.....	190-268 nm
Transmission:	
400 nm .....	≥99 %
350 nm .....	≥98 %
300 nm .....	≥85 %
275 nm .....	≥55 %
268 nm .....	≥10 %
Headspace suitability test for O.V.I. ....	complies

Product	Purity	Art. No.
<b>N,N-Dimethylacetamid / DMA</b>	≥99.99 %, Headspace Grade	<b>HN45.1</b>
<b>N,N-Dimethylformamid / DMF</b>	≥99.99 %, Headspace Grade	<b>HN46.1</b>
<b>1,3-Dimethyl-2-imidazolidinon / DMI</b>	≥99.5 %, Headspace Grade	<b>HN48.1</b>
<b>Dimethylsulfoxid / DMSO</b>	≥99.99 %, Headspace Grade	<b>HN47.1</b>

For additional product data and safety information please see our current catalogue or [www.carlroth.com](http://www.carlroth.com)

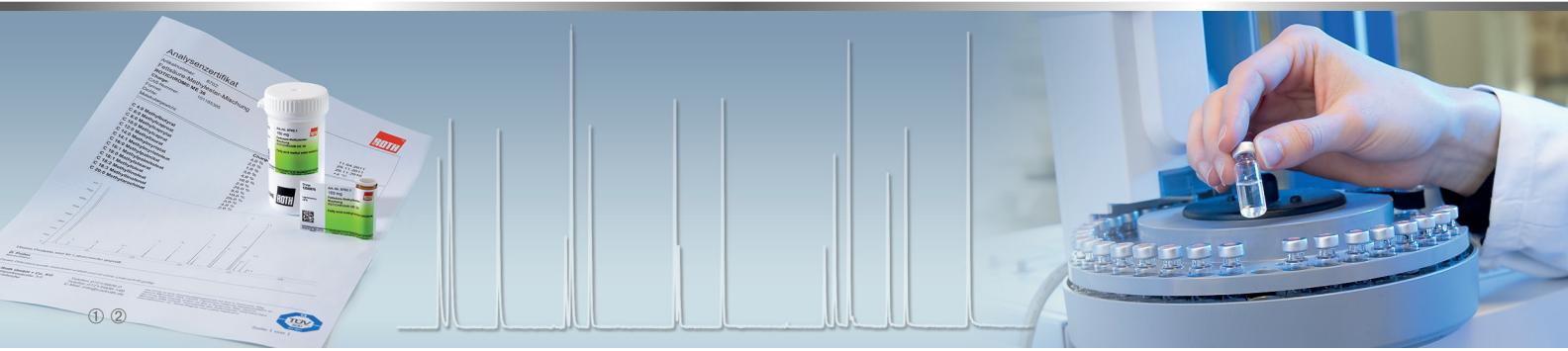
## Injection Port Septa

### Advantages:

- Produced individually using injection moulding procedure
- CenterGuide™ for centred needle guidance and thus perfect fit
- Temperature stability up to 400 °C, Shimadzu plug septa up to 300 °C
- Precision indentations for perfect seat
- Special coating for easy replacement without fixed jaw on the injector
- Septa thickness: 3 mm
- Blister pack for clean and immediately usable septa

Product	Ø (mm)	Art. No.	VE (Blister pack)
<b>BTO Septa N 9, CenterGuideTM</b>	9	<b>9528.1</b>	25 pieces
<b>BTO Septa N 11, CenterGuideTM</b>	11	<b>9529.1</b>	25 pieces
<b>BTO Septa N 11,5, CenterGuideTM</b>	11.5	<b>9530.1</b>	25 pieces
<b>BTO Septa Shimadzu Plug, CenterGuideTM</b>	Shimadzu Plug	<b>9532.1</b>	25 pieces
<b>AG3-Septa N 9, CenterGuideTM</b>	9	<b>9535.1</b>	25 pieces
<b>AG3-Septa N 11, CenterGuideTM</b>	11	<b>9537.1</b>	25 pieces
<b>AG3-Septa N 11,5, CenterGuideTM</b>	11.5	<b>9539.1</b>	25 pieces
<b>AG3-Septa Shimadzu Plug, CenterGuideTM</b>	Shimadzu Plug	<b>9542.1</b>	25 pieces
<b>Marathon Septa N 9, CenterGuideTM</b>	9	<b>9873.1</b>	25 pieces
<b>Marathon Septa N 11, CenterGuideTM</b>	11	<b>9876.1</b>	25 pieces
<b>Marathon Septa N 11,5, CenterGuideTM</b>	11.5	<b>9877.1</b>	25 pieces
<b>Marathon Septa Shimadzu Plug, CenterGuideTM</b>	Shimadzu Plug	<b>9879.1</b>	25 pieces

# Autosampler vials



## ① Rotilabo®-short thread ND9 vials

Made of borosilicate glass, hydrolytic class 1. Wide opening for easy filling. Flat bottom. Dimensions: Ø 11.6 x H 32 mm. CleanPack, bottles packed in clean room under class 10.000 conditions. Standard bottles for GC and HPLC. Suitable for automatic samplers. Please order micro-inserts and screw caps separately.

Type	Volume (ml)	Art. No.	Pack Qty.
Clear glass	1.5	LC02.1	100
Clear glass, with labelling area	1.5	LC03.1	100
Clear glass, with integrated micro-insert	0.2	LC04.1	100
Clear glass, with solid conical bottom	1.1	LC05.1	100
Amber, with labelling area	1.5	LC06.1	100
Transparent PP, with graduation	1.5	NL98.1	100
Brown PP, with graduation	1.5	NL99.1	100

## Micro-inserts

Made of clear borosilicate glass. For short thread ND9 vials.

Type	Volume (ml)	Dimensions L x Ø (mm)	Art. No.	Pack Qty.
Tapered 15 mm tip	0.1	31 x 6	LC07.1	100
With plastic spring	0.1	29 x 5.7	LC08.1	100
Flat base	0.2	31 x 6	LC09.1	100

## Screw caps closed

Made of PP, blue. Without hole. For short-thread screw top vials ND9. Delivery incl. septum, assembled.

Septum materials	Thickness (mm)	Hardness (shore A)	Art. No.	Pack Qty.
PTFE virginal	0.2	53°	TY74.1	100
Silicone white / PTFE red UltraClean	1.0	55°	TY75.1	100

## Screw caps with bore hole

Made of PP, blue. Bore hole Ø 6 mm. For short thread ND9 vials. Also suitable for (robot) claw arms.

Delivery incl. septum, mounted.

Septum materials	Thickness (mm)	Hardness (shore A)	Art. No.	Pack Qty.
PTFE red / silicone white / PTFE red	1.0	45°	LC10.1	100
Silicone white / PTFE red UltraClean	1.0	55°	LC11.1	100
PTFE (*shore D)	0.2	53°*	LC12.1	100
Natural rubber orange-red/ TEF transparent	1.0	60°	LC13.1	100
Silicone white / PTFE blue, slotted	1.0	55°	LC14.1	100

## UltraBond screw caps bore hole

Made of PP, blue. Bore hole Ø 6 mm. For short thread ND9 vials. Joint cap and septum, septum cannot be pressed into the bottle even when using thick or blunt needles.

Delivery incl. septum, mounted.

Septum materials	Thickness (mm)	Hardness (shore A)	Art. No.	Pack Qty.
Silicone beige / PTFE white, slotted	1.3	45°	LC15.1	100

## Screw caps for LC/GC-MS

Inert, non-bleed single-component cap, LC/GC-MS certified. Transparent, with thinned penetration area, penetrable like a septum. For ND9 short threaded vials.

Art. No.	Pack Qty.
NN00.1	100

## Magnetic screw caps with bore hole

Made of PP, blue. Bore hole Ø 6 mm. With mounted magnetic cap, gold. For ND9 short threaded vials.

Delivery incl. septum, mounted.

Septum materials	Thickness (mm)	Hardness (shore A)	Art. No.	Pack Qty.
Silicone white / PTFE red UltraClean	1.0	55°	PT62.1	100

## Silanised ND9 short-thread screw top vials

Made of silanised borosilicate glass of hydrolytic class 1. Please order micro inserts and screw caps separately.

The surface of the vials is deactivated by silanisation. This minimises the adsorption of polar compounds (proteins, amines, phenols etc.) by the glass and prevents the loss of valuable specimens.

Wide opening for easy filling. Flat base.

Dimensions: Ø 11.6 x H 32 mm. CleanPack, vials packed in a clean room under class 10.000 conditions. Suitable for automatic samplers.

Type	Volume (ml)	Art. No.	Pack Qty.
Clear glass	1.5	XC47.1	100
Clear glass, with solid conical base	1.1	XC48.1	100
Brown glass, with labelling space	1.5	XC49.1	100

## Silanised micro inserts

Made of silanised borosilicate glass, clear glass. For ND9 short-thread screw top vials, ND10 screw top vials, and ND11 rolled edge vials snap ring vials.

The surface of the vials is deactivated by silanisation. This minimises the adsorption of polar compounds (proteins, amines, phenols etc.) by the glass and prevents the loss of valuable specimens.

Type	Volume (ml)	Dimensions L x Ø (mm)	Art. No.	Pack Qty.
Tapered 15 mm tip	0.1	31 x 6	XC50.1	100
With plastic spring	0.1	29 x 5.7	XC51.1	100

## ② Certified Vial Kits ND9

HPLC and GC certified, tested for blank values and impurities.

Kits comprising:

- 100 short-thread screw top vials ND9 made of hydrolytic class 1 borosilicate glass. Dimensions: Ø 11.6 x H 32 mm
- 100 PP UltraClean screw caps, with 6 mm hole Ø and fitted septa, white silicone rubber/red PTFE, hardness (shore A) 55°, thickness 1.0 mm

Type	Volume (ml)	Art. No.	Qty. (set)
Clear glass, with labelling space	1.5	XC64.1	1
Brown glass, with labelling space	1.5	XC65.1	1

# Autosampler vials



## ① ND11 Rotilabo®-welt rim vials

**With flange rim.** Made of borosilicate glass, hydrolytic Class 1. Wide opening for easy filling. Flat bottom. CleanPack, bottles packed in a clean room under class 10.000 conditions. Standard bottles for GC and HPLC. Suitable for automatic samplers. Please order micro-inserts and flange caps separately.

Type	Volume (ml)	Dimensions H x Ø (mm)	Art. No.	Pack Qty.
Clear glass	1.5	32 x 11.6	LC22.1	100
Clear glass	2.5	41 x 11.6	TY77.1	100
Clear glass, with labelling area	1.5	32 x 11.6	LC23.1	100
Brown glass, with labelling area	1.5	32 x 11.6	LC24.1	100
TPX, with integrated glass-micro-insert	0.2	32 x 11.6	LC25.1	100

## Micro inserts

Made of borosilicate glass, clear glass.  
For ND11 crimp top and snap ring vials.

Type	Volume (ml)	Dimensions H x Ø (mm)	Art. No.	Pack Qty.
Tapered 15 mm tip	0.1	31 x 6	LC07.1	100
With plastic spring	0.1	29 x 5.7	LC08.1	100
Flat base	0.2	31 x 6	LC09.1	100

## Flange caps with bore hole

Made of aluminium, with transparent coating. Bore hole Ø 5.5 mm.  
For welt rim ND11 vials.

**Delivery incl.** septum, mounted.

Septum materials	Thickness (mm)	Hardness (shore A)	Art. No.	Pack Qty.
PTFE red / silicone white / PTFE red	1.0	45°	LC26.1	100
Silicone white / PTFE red, UltraClean	1.3	45°	LC27.1	100
Natural rubber orange-red / butyl red / TEF transparent	1.0	45°	LC28.1	100
Natural rubber red-orange / TEF transparent, AGILENT-quality	1.0	60°	LC29.1	100
Butyl red / PTFE grey	1.3	55°	LC30.1	100
Silicone white / PTFE blue, slotted	1.5	55°	NN02.1	100

## Magnetic flanged caps with bore hole

Made of aluminium, magnetic, painted gold. Bore hole Ø 5 mm.  
For ND11 rolled edge vials.

**Delivery incl.** septum, mounted.

Septum materials	Thickness (mm)	Hardness (shore A)	Art. No.	Pack Qty.
Silicone white / PTFE red UltraClean	1.3	45°	PT63.1	100
PTFE red / silicone white / PTFE red	1.0	45°	PT64.1	100

## TPF crimp caps with bore hole

Free of halogens, elastomers, plasticisers, silicone, butyl rubber, PTFE, FEP, TEF. Recommended for GC/LC-MS, for the storage of standards and analysis of halogenated compounds, VOC's, plastics, phthalates, polymerisation catalysts and silicones.  
For ND11 rolled edge vials.

Septum materials	Thickness (mm)	Art. No.	Pack Qty.
Aluminium (with O-ring seal)	0.06	NN03.1	100

## ② Rotilabo®-closing and opening pliers

Made of hardened steel with chemical resistant special coating. For sealing and opening standard aluminium crimp caps with ND 8, 11, 13 or 20 mm.

### ① Closing pliers

for aluminium crimp caps	Art. No.	Pack Qty.
ND 8 mm	C780.1	1
ND 11 mm	C781.1	1
ND 13 mm	5001.1	1
ND 20 mm	C782.1	1

### ② Opening pliers

For controlled opening of crimped sample vials without the danger of glass breakage.

for aluminium crimp caps	Art. No.	Pack Qty.
ND 8 mm	ATN3.1	1
ND 11 mm	ATN4.1	1
ND 13 mm	ATN5.1	1
ND 20 mm	ATN6.1	1

## ③ High performance crimping tool ND11 and ND20

By Macherey-Nagel. For secure and reproducible crimping and decapping of crimp caps on sampling bottles and autosampler vials.

- Also suitable for magnetic and bimetal crimp caps thanks to very powerful motor
- Exchangeable crimping and decapping heads
- Digital LED display
- Memory function for different crimp settings
- A stand is optionally available for convenient and safe handling

**Delivery incl.** power supply (12 V) and cable. Please order crimping and decapping heads separately.

Art. No.	Pack Qty.
APE8.1	1

### Accessories:

Crimping head for 11 mm crimp caps	APE9.1	1
Crimping head for 20 mm crimp caps	APH0.1	1
Decapping head for 11 mm crimp caps	APH1.1	1
Decapping head for 20 mm crimp caps	APH2.1	1
Stand for electronic crimping tools	APH3.1	1

# Accessories



## CHROMAFIL® Syringe filters

- For clear or sterile filtration of liquids or gases, as well as for preparation of samples for use in HPLC, GC, ICP, AAS, TOC, DOC, IR, NMR, photometry, spectroscopy, etc.
- Compacted PP housing with very low extractable substances content and good chemical resistance
- Autoclavable at 121 °C and 1.1 bar for 30 min

### CHROMAFIL® Nylon PA and PA Xtra

By Macherey-Nagel.PA (Nylon) membrane for the filtration of medium polar organic-aqueous liquids. Unsterile.

#### PA

Type	Pore size (µm)	Membrane Ø (mm)	Art. No.	Pack Qty.
A0-20/3	0.20	3	XH53.1	100
A0-45/3	0.45	3	XH54.1	100
A0-20/15 MS	0.20	15	XH55.1	100
A0-45/15 MS	0.45	15	XH56.1	100
A0-20/25	0.20	25	XH57.1	100
A0-20/25	0.20	25	XH57.2	400
A0-45/25	0.45	25	XH58.1	100
A0-45/25	0.45	25	XH58.2	400

#### PA Xtra

Uncoloured, low bleed 100 % PP housing for method validation and certification. Imprint for quick and easy identification of membrane type, diameter and pore size.

Type	Pore size (µm)	Membrane Ø (mm)	Art. No.	Pack Qty.
PA-20/25	0.20	25	XH59.1	100
PA-20/25	0.20	25	XH59.2	400
PA-45/25	0.45	25	XH60.1	100
PA-45/25	0.45	25	XH60.2	400

### CHROMAFIL® PTFE and PTFE Xtra

By Macherey-Nagel.Hydrophobic PTFE membrane for nonpolar liquids and gases. Highly resistant to solvents, acids and bases. Unsterile.

**Note:** the membrane can be wetted with water by rinsing with alcohol and subsequently with water.

#### PTFE

Type	Pore size (µm)	Membrane Ø (mm)	Art. No.	Pack Qty.
O-20/3	0.20	3	XH61.1	100
O-45/3	0.45	3	XH62.1	100
O-20/15 MS	0.20	15	XH63.1	100
O-45/15 MS	0.45	15	XH64.1	100
O-20/25	0.20	25	XH65.1	100
O-20/25	0.20	25	XH65.2	400

#### PTFE Xtra

Uncoloured, low bleed 100 % PP housing for method validation and certification. Imprint for quick and easy identification of membrane type, diameter and pore size.

Type	Pore size (µm)	Membrane Ø (mm)	Art. No.	Pack Qty.
PTFE-20/25	0.20	25	XH66.1	100
PTFE-20/25	0.20	25	XH66.2	400
PTFE-45/25	0.45	25	XH67.1	100
PTFE-100/25	1.0	25	XH68.1	100

## Omnifix® disposable syringes

By B. Braun.Acc. to ISO 7886-1. 3-part, made of **PP**. **Sterile** (EO-sterilized, individually wrapped). Black graduation, smudge-proof.

Reliable piston stopper prevents accidental removal of piston rod.

Smooth-running piston with double sealing ring for slow and bubble-free filling and injecting. Particularly ideal for dosing smaller volumes. Made of synthetic rubber, latex-free, acc. to ISO 10993 and DIN EN 90993. PVC-free.

#### ① Luer-fitting

Volume (ml)	Graduations (ml)	Art. No.	Pack Qty.
10	0.5	C538.1	100
20	1.0	C539.1	100
30	1.0	T548.1	100
50	1.0	T549.2	100

#### ② Luer-Lock fitting

Volume (ml)	Graduations (ml)	Art. No.	Pack Qty.
10	0.5	C542.1	100
20	1.0	T550.1	100
30	1.0	T551.1	100
50	1.0	T552.2	100

## Gas-leak tester Roth

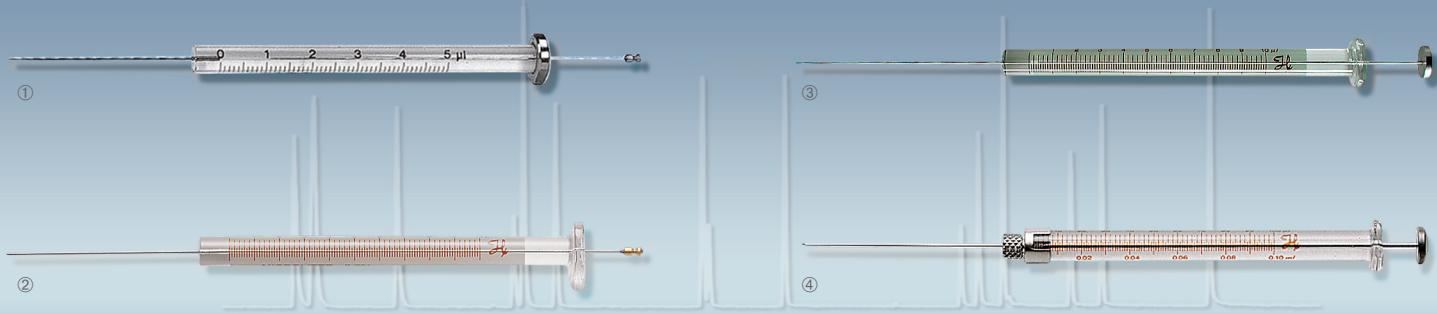
Special liquid for finding smallest leaks in tubing or hollow spaces that are under gas or air pressure. Nontoxic, non-inflammable, non-corrosive.

Suitable for compressed air, butane, natural gas, town gas, propane, CO<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>, H<sub>2</sub> and ammonia. Spray possible leakage area. Bubbles appear at site of leak.

Special liquid for finding smallest leaks in tubing or hollow spaces.

2686.1	500 ml	pump spray bottle
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# Accessories



## ① Microlitre syringes for automatic sampler

For Agilent (HP) Model 7673A. The models with the super elastic plunger have longer working life. Needle caliber 23G, needle-Ø inner 0.15 mm, outer 0.64 mm. Needle length 43 mm, conical tip. Fixed needle.

Plunger material	Volume (µl)	Graduation (µl)	Art. No.	Pack Qty.
Rustproof stainless steel	5	0.1	H136.1	1
Rustproof stainless steel	10	0.2	H138.1	1
Super elastic plunger	5	0.1	H140.1	1
Super elastic plunger	10	0.2	H142.1	1

## ② Series 700 Standard-GC-syringes

By HAMILTON. For dosing liquids in autosamplers HP 7683 / HP 7673. The piston is firmly fixed in the glass body. Needle and piston are made of stainless steel. Needle 43 mm, with an 8° bevel (special tapered tip for autosampler vials) sealed in the tube wall.

Model	Volume (µl)	Needle-Ø inside (mm)	Art. No.	Pack Qty.
701 ASN 23S	10	0.34	X060.1	1
701 ASN 26S	10	0.13	X061.1	1

## ③ Series 700 MICROLITER®-syringes

By HAMILTON. For dosing liquids. The piston is firmly fixed in the glass body. Needle and piston are made of stainless steel. Needle 51 mm, bent slightly inwards, sealed in wall.

### Tip type 2:

Model	Volume (µl)	Pitch (µl)	Needle-Ø inside (mm)	Needle-Ø outside (mm)	Art. No.	Pack Qty.
701 N	10	0.1	0.13	0.47	X033.1	1
702 N	25	0.5	0.15	0.72	X034.1	1
705 N	50	1.0	0.15	0.72	X035.1	1
710 N	100	1.0	0.15	0.72	X036.1	1
725 N	250	5.0	0.15	0.72	X038.1	1
750 N	500	10.0	0.41	0.72	X039.1	1

## Series 1700 GASTIGHT®-syringes

By HAMILTON. For dosing liquids and gases. Glass body and piston are replaceable. Stainless steel pistons with PTFE-seal. Needle made of stainless steel, 51 mm, exchangeable.

### Tip type 2:

Model	Volume (µl)	Pitch (µl)	Needle-Ø inside (mm)	Needle-Ø outside (mm)	Art. No.	Pack Qty.
1701 RN	10	0.1	0.13	0.47	X046.1	1
1702 RN	25	0.5	0.15	0.72	X047.1	1
1705 RN	50	1.0	0.15	0.72	X048.1	1
1710 RN	100	1.0	0.15	0.72	X049.1	1
1725 RN	250	5.0	0.15	0.72	X050.1	1
1750 RN	500	10.0	0.41	0.72	X051.1	1

## Back pressure 0.05-1 bar. Graduated in 0.1 bar-increments.

Type of gas	Connection for bottle	Art. No.	Pack Qty.
Inert gases	W 21.8 x 1/4" right	C286.1	1
Hydrogen	W 21.8 x 1/4" left	C287.1	1
Oxygen	R ¾" right	C288.1	1
Nitrogen	W 24.32 x 1/4" right	C289.1	1
Calibrating gas	M 19 x 1.5 left	C290.1	1

## Back pressure 0.1-3 bar. Graduated in 0.1 bar-increments.

Type of gas	Connection for bottle	Art. No.	Pack Qty.
Inert gases	W 21.8 x 1/4" right	C291.1	1
Hydrogen	W 21.8 x 1/4" left	C292.1	1
Oxygen	R ¾" right	C293.1	1
Nitrogen	W 24.32 x 1/4" right	C294.1	1
Calibrating gas	M 19 x 1.5 left	C295.1	1

## Back pressure 0.5-10 bar. Graduated in 0.5 bar-increments.

Type of gas	Connection for bottle	Art. No.	Pack Qty.
Inert gases	W 21.8 x 1/4" right	C296.1	1
Hydrogen	W 21.8 x 1/4" left	C297.1	1
Oxygen	R ¾" right	C298.1	1
Nitrogen	W 24.32 x 1/4" right	C299.1	1
Calibrating gas	M 19 x 1.5 left	C300.1	1

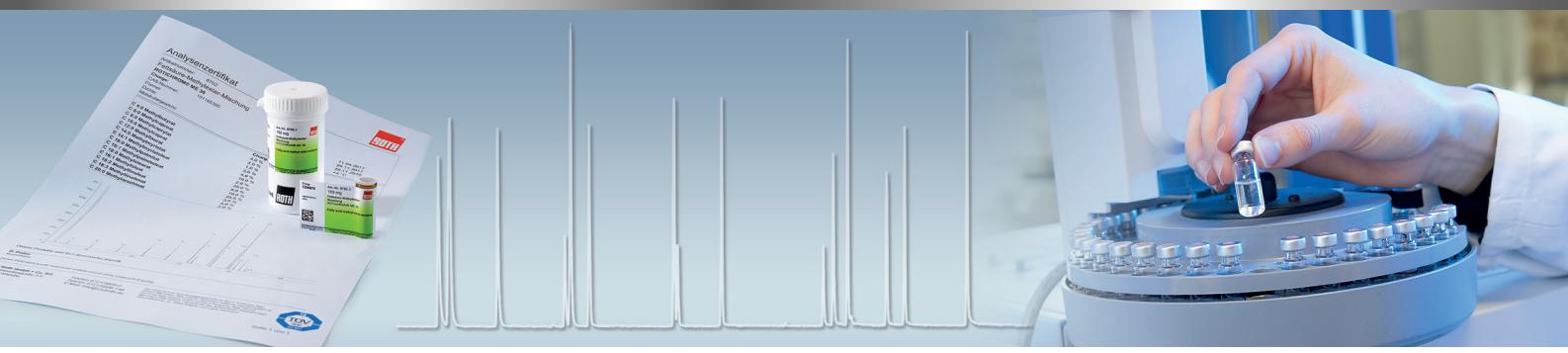


## Gas pressure regulators, two stage

By Air Liquide. Made of chrome-plated brass. Ideal for all high-purity gases and gas compounds except acetylene and corrosive gases. Excellent for use wherever constant outlet pressure is required.

### Technical specifications:

Max. inlet pressure	200 bar
Working temperature	-20 to +50 °C
Weight	1.6 kg
Dimensions (L x W x H)	180 x 98 x 135 mm
Contact inlet	bottle attachment acc. to DIN 477
Contact outlet	clamping ring connection for 6 mm tube
Overall leakage rate	3 x 10⁻⁷ mbar l/s



## Reference substances for gas chromatography

Roth offers an extensive range of about 200 reference substances for gas chromatography from the substance groups of alkanes, alcohols, ketones, esters, aromatic compounds, and much more.

Their **GC purity** is frequently more than 99 %, generally between 95 and 99 %, which allows for accurate analysis.

The ROTICHROM® GC substances come with a certificate of analysis and a GC chromatogram enclosed in the outer packaging.

## A selection from our product range:

Product	Purity (GC)	Art. No.	Pack Qty.
Acetic acid L-bornyl ester	≥98 %	9009.1	1 g
Acetic acid linalyl ester	≥95 %	5199.1	1 g
Acetic acid (L)-menthyl ester	≥98 %	5189.1	1 g
Acetyleugenol	≥97 %	6688.1	1 g
β-Asarone	≥85 %	9363.1	1 g
Benzaldehyde	≥96 %	9039.1	1 g
Benzene	≥99 %	4898.1	1 g
(-)α-Bisabolol	≥93 %	9055.1	1 g
(-)Borneol	≥96 %	8495.1	1 g
Camphepane	≥95 %	5288.1	1 g
Cinnamaldehyde	≥97 %	3618.1	1 g
δ-3-Carene	≥90 %	3572.1	1 g
(-)Carvone	≥98 %	5286.1	1 g
(+)-Carvone	≥94 %	6947.1	1 g
β-Caryophyllen	≥95 %	7232.1	1 g
Citral	≥95 %	5292.1	1 g
Citronellal	≥93 %	6008.1	1 g
Coumarin	≥99 %	5284.1	1 g
Cyclohexane	≥99 %	4901.1	1 g
DL-Camphor	≥95 %	4329.1	1 g
n-Dodecane	≥98.5 %	9029.1	1 g
Eucalyptol	≥97 %	6938.1	1 g
Eugenol	≥98.0 %	6941.1	1 g
Eugenol methyl ether	≥95 %	5073.1	1 g
(+)-Fenchone	≥99 %	6210.1	1 g

Product	Purity (GC)	Art. No.	Pack Qty.
Geraniol	≥95.0 %	5264.1	1 g
Isomenthone	≥75 %	6458.1	1 g
D-(+)-Limonene	≥98 %	5198.1	1 g
Linalool	≥95 %	5201.1	1 g
Linoleic acid	≥99 %	5315.1	1 g
(-)Menthol	≥95 %	9061.1	1 g
Methylchavicol	≥97 %	9413.1	1 g
trans-Nerolidol	≥89 %	6703.1	1 g
γ-Nonalactone	≥97 %	3088.1	1 g
n-Nonane	≥98.5 %	9008.1	1 g
n-Octadecane	≥98.5 %	9059.1	1 g
n-Octane	≥98.5 %	4435.1	1 g
(-)α-Pinene	≥95.0 %	5170.1	1 g
(+)-α-Pinene	≥95 %	3857.1	1 g
β-Pinene	≥90 %	5172.1	1 g
Piperitone	≥96 %	5174.1	1 g
Sabinene	≥98.5 %	7188.2	100 mg
γ-Terpinene	≥94.0 %	8039.1	1 g
α-Terpinene	≥80 %	8038.1	1 g
α-Terpineol	≥95 %	5152.1	1 g
n-Tetradecane	≥98 %	9024.1	1 g
Thymol	≥96 %	3209.1	1 g
n-Tridecane	≥98 %	4822.1	1 g
m-Xylene	≥99 %	4912.1	1 g

For additional product data and safety information please see our current catalogue or [www.carlroth.com](http://www.carlroth.com)

For a comprehensive selection of **reference substances** please see **Natural & Reference Materials** chapter in our current catalogue or [www.carlroth.com](http://www.carlroth.com)

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