



# Chro ma to gra phy

A Product Selection of our  
Catalogue Assortment.

**Sampling  
Sample Preparation  
Analysis**

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# Sampling

Sampling, Sample Preparation, Analysis



## Glass beakers



Material DURAN®



Made of DURAN®. Graduated, has spout. In acc. with DIN 12331, ISO 3819. With retrace code. Autoclavable.

\*Without graduation. \*\*Without graduation and not in acc. with DIN

### Low form

Volume (ml)	Outside Ø (mm)	Height (mm)	Art. No.	Pack Qty.
5*	22	30	C108.1	10
10*	26	35	C109.1	10
25	34	50	C110.1	10
50	42	60	C111.1	10
100	50	70	C112.1	10
150	60	80	C113.1	10
250	70	95	C114.1	10
400	80	110	C115.1	10
600	90	125	C116.1	10
800	100	135	C117.1	10
1000	105	145	C118.1	1
2000	132	185	C119.1	1
3000	152	210	C120.1	1
5000	170	270	C121.1	1
10000**	217	350	C122.1	1

### High form

Volume (ml)	Outside Ø (mm)	Height (mm)	Art. No.	Pack Qty.
50	38	70	C123.1	10
100	48	80	C124.1	10
150	54	95	C125.1	10
250	60	120	C126.1	10
400	70	130	C127.1	10
600	80	150	C128.1	10
800	90	175	C129.1	10
1000	95	180	C130.1	1
2000	120	240	C131.1	1
3000	135	280	C132.1	1



## SteriPlast®Bio sample spoon S

By Bürkle. Made of green PE, sterile. For sampling powders, granulates, pastes and liquids. Sample spoon and packaging are made from renewable raw materials and are fully recyclable. Cleanroom-manufactured (class 7), individually packed. Suitable for use with foodstuffs.

Volume (ml)	Length (mm)	Art. No.	Pack Qty.
2,5	127	CPT3.1	100
10	170	CPT4.1	100



## Wide-neck Erlenmeyer flasks



Material DURAN®



Made of DURAN®, graduated. In acc. with DIN ISO 24450. With retrace code. Flasks up to 2000 ml graduated. Autoclavable.

\* Not in acc. with DIN. \*\* Not graduated

Volume (ml)	Outer neck Ø (mm)	Flask outer Ø (mm)	Height (mm)	Art. No.	Pack Qty.
25 *	31	43	70	C144.1	10
50	34	51	85	C145.1	10
100	34	64	105	C146.1	10
200	50	79	131	C147.1	10
250	50	85	140	C148.1	10
300	50	87	156	C149.1	10
500	50	105	175	C150.1	10
1000	50	131	220	C151.2	1
2000 *	72	153	276	C152.2	1
3000 **	106	190	285	AAA3.1	1
5000 **	108	220	322	AAA4.1	1
10000 **	147	285	420	AAA5.1	1



## SecurTainer™ III sample tubs S

Made from transparent PP with screw cap made from PE. For storage or transportation of liquids, paste-like and solid samples. Shatterproof, stackable and leakproof. Temperature stable from -90 to +100 °C. CE marking according to IVD.

Volume (ml)	Ø x H (mm)	Art. No.	Pack Qty.
20	35 x 54	HYE7.1	500
40	48 x 54	HYE8.1	500
60	48 x 64	HYE9.1	500
90	56 x 63	HYH0.1	400
120	56 x 78	HYH1.1	300

# Sampling



**A** 121 °C

## Screw neck bottles Rotilabo®, clear glass

Made of borosilicate glass 3.3. In acc. with ISO 4796-1. With subdivisions and DIN-thread GL. Autoclavable. **Delivery incl.** screw-on cap and pouring spout ring made of PP.

Volume (ml)	Thread	Outside Ø (mm)	Height (mm)	Art. No.	Pack Qty.
50	32	46	91	<b>ANP4.1</b>	10
100	45	56	105	<b>X712.1</b>	10
250	45	70	143	<b>X713.1</b>	10
500	45	86	182	<b>X714.1</b>	10
1000	45	101	230	<b>X715.1</b>	10
2000	45	136	265	<b>X716.1</b>	10
5000	45	186	355	<b>Y682.1</b>	1
10 000	45	234	435	<b>Y683.1</b>	1
20 000	45	299	505	<b>TK83.1</b>	1



**A** 121 °C **Material DURAN®**

## Class A measuring cylinders, blue graduated

By Hirschmann. **Tall form.** Made of DURAN®. In acc. to DIN EN ISO 4788. Comes with batch identification. Certificate of conformity can be requested. Adjusted to IN. With spout and hexagonal foot. Autoclavable.

Volume (ml)	Graduations (ml)	Limit of error (±ml)	Height (mm)	Ø (mm)	Art. No.	Pack Qty.
5	0,1	0,05	115	13	<b>Y568.1</b>	2
10	0,2	0,10	140	14	<b>Y569.1</b>	2
25	0,5	0,25	170	21	<b>Y570.1</b>	2
50	1,0	0,50	200	25	<b>Y571.1</b>	2
100	1,0	0,50	260	29	<b>Y572.1</b>	2
250	2,0	1,00	335	39	<b>Y573.1</b>	2
500	5,0	2,50	390	53	<b>Y574.1</b>	2
1000	10,0	5,00	470	65	<b>Y575.2</b>	1
2000	20,0	10,00	500	85	<b>Y576.1</b>	1



## Single-use samplers for fluids

**S**

By Bürkle. Made of **HDPE**. For sampling viscous media and liquids. No contamination by other samples, no complicated and time-consuming cleaning. Manufactured under cleanroom conditions. Packed individually in film, unsterile or **sterile**.

### ① ViscoDispo

For high-viscosity media up to max. 100 000 mPas. Insert the sampler into the liquid. Pull up the handle of the pull rod to take the sample. Then press the pull rod down to empty the sample into a vessel.

Length (mm)	Volume (ml)	Ø (mm)	Version	Art. No.	Pack Qty.
500	100	21	non-sterile	<b>HC52.1</b>	10
500	100	21	<b>sterile</b>	<b>ETT5.1</b>	10
1000	200	21	non-sterile	<b>HC53.1</b>	10
1000	200	21	<b>sterile</b>	<b>ETT6.1</b>	10

### ② LiquiDispo

For low-viscosity liquids up to max. 2000 mPas. Insert the sampler into the liquid. Pull up the handle of the pull rod to take the sample. Then press the pull rod down to empty the sample into a vessel.

Length (mm)	Volume (ml)	Ø (mm)	Version	Art. No.	Pack Qty.
500	100	21	non-sterile	<b>HC50.1</b>	10
500	100	21	<b>sterile</b>	<b>ETT7.1</b>	10
1000	200	21	non-sterile	<b>HC51.1</b>	10
1000	200	21	<b>sterile</b>	<b>ETT8.1</b>	10

### ③ DispoPipette

For cross-section and target point samples of liquids with a variety of viscosities (opening Ø 2.5/5.5 mm). When the sampler is opened, the liquid flows in or out; when closed, it is held in the sampler.

Length (mm)	Volume (ml)	Ø (mm)	Version	Art. No.	Pack Qty.
500	100	21	non-sterile	<b>ETT9.1</b>	10
500	100	21	<b>sterile</b>	<b>ETX0.1</b>	10
1000	200	21	non-sterile	<b>ETX1.1</b>	10
1000	200	21	<b>sterile</b>	<b>ETX2.1</b>	10



# Sample Preparation



## CELLSTAR®-centrifuge tubes



By Greiner Bio-One.  
 Made of PP. Blue HDPE screw cap. **Sterile.**  
 Excellent thermal, mechanical and chemical stability.  
 Conical base. Blue graduations and white labelling space.  
 DNase/RNase and human DNA free, non-pyrogenic and non-cytotoxic.  
 Temperature stable from -50 to +100 °C.

Type	Max. centrifugability (x g)	
	Fixed angle rotor	Oscillating rotor
15 ml tubes	15 000	4000
50 ml tubes	9000	3200
50 ml tubes with rim	11 500	2800

### Transparent, without rim

Volume (ml)	Ø x H (mm)	Packaging	Art. No.	Pack Qty.
15	17 x 120	50 in rack	XH97.1	500
15	17 x 120	100 in bag	XH97.2	1000
50	29 x 115	20 in bag	XH98.1	500
50	29 x 115	25 in rack	XH98.2	300

### Transparent, with rim

Volume (ml)	Ø x H (mm)	Packaging	Art. No.	Pack Qty.
50	29 x 115	25 in bag	XH99.1	450
50	29 x 115	25 in rack	XH99.2	300

### Light Protection Tubes, brown, without rim

For light-sensitive substances and reactions.

Volume (ml)	Ø x H (mm)	Packaging	Art. No.	Pack Qty.
15	17 x 120	100 in bag	KL46.1	100
15	17 x 120	50 in rack	KL46.2	50
50	29 x 115	20 in bag	KL47.1	20
50	29 x 115	25 in rack	KL47.2	25



## Wetted glasses

Made of soda-lime glass. **Delivery incl. press-on lid (PE), tightly closing.**

Volume (ml)	Outside Ø (mm)	Height (mm)	Neck inner Ø (mm)	Art. No.	Pack Qty.
5	19	40	13	X654.1	200
10	22	45	17	X655.1	200
15	24	52	17	X656.1	200
20	25	70	17	X657.1	200
20	27	55	17	X658.1	200
25	29	50	22	X659.1	200
30	28	75	17	X660.1	200
35	28	65	22	X661.1	200
40	29	80	22	X662.1	200
50	29	100	22	X663.1	200

## Mortars 55, coarse

By Haldenwanger.  
Made of glazed porcelain, **coarse grind surface (unglazed).**

Volume (ml)	Size	Height (mm)	Innner Ø (mm)	Art. No.	Pack Qty.
20	00	32	50	XL89.1	1
70	0a	40	65	1567.1	1
75	1	45	70	3773.1	1
100	2	50	80	3782.1	1
170	3	55	90	1568.1	1
300	4	63	115	3820.1	1
400	5	65	130	3823.1	1
700	6a	70	150	3824.1	1
1000	8	80	180	3826.1	1
2600	11	100	240	XL90.1	1
6000	15	140	330	XL91.1	1

## Pestles 56, coarse

By Haldenwanger.  
Made of glazed porcelain, **coarse grind surface (unglazed).**

Ø Head (mm)	Size	Height (mm)	Art. No.	Pack Qty.
24	00	115	1570.1	1
28	0a	125	3831.1	1
30	1	135	1571.1	1
36	2	150	3832.1	1
42	3	175	3836.1	1
45	4	180	XL92.1	1
48	5	185	3839.1	1
55	6a	210	3841.1	1
60	8	215	XL93.1	1
74	13	262	XL94.1	1
85	15	280	XL95.1	1

## Mortars 55, smooth

By Haldenwanger.  
Made of glazed porcelain, **smooth grind surface (glazed),**  
prevents accumulation of sample residues and cross-contamination.

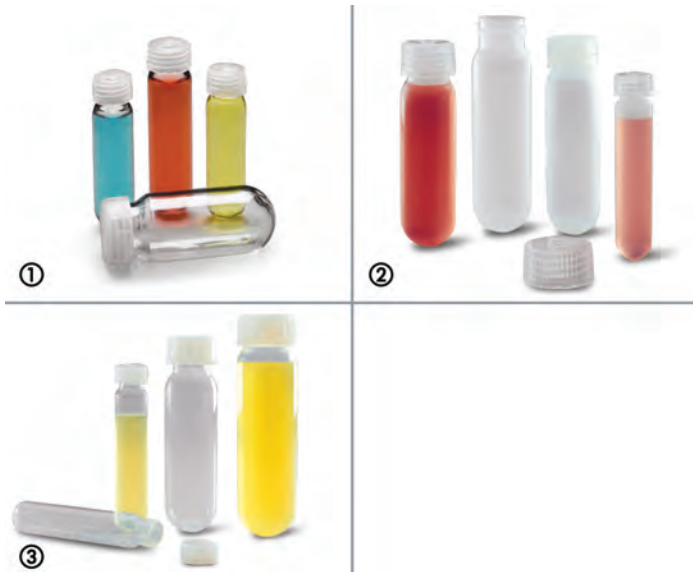
Volume (ml)	Size	Height (mm)	Innner Ø (mm)	Art. No.	Pack Qty.
20	00	32	50	XL96.1	1
70	0a	40	65	XL97.1	1
170	3	55	90	XL98.1	1
700	6a	70	150	XL99.1	1
1000	8	80	180	XP00.1	1

## Pestles 56, smooth

By Haldenwanger.  
Made of glazed porcelain, **smooth grind surface (glazed).**

Ø Head (mm)	Size	Height (mm)	Art. No.	Pack Qty.
24	00	115	XP01.1	1
28	0a	125	XP02.1	1
30	1	135	XP03.1	1
42	3	175	XP04.1	1
55	6a	210	XP05.1	1
60	8	215	XP06.1	1

# Sample Preparation



## Oak Ridge centrifuge tubes

**A 121°C**

By Nalgene®. Made of **PC**, **PPCO**, **PSF** or **FEP**.

For **high speed centrifugation**.

For use in cooled or uncooled centrifuges up to 50 000 x g. Before centrifuging, the tubes must be at least 80 % full and FEP tubes 100 % full.

**Please note:** screw closures with a seal are necessary for centrifuging hazardous substances or for centrifugal forces exceeding 10 000 x g. Autoclavable. Before autoclaving, please make sure you always unscrew the lid.

Type 3115. Made of **PSF**, transparent. Screw closure made of **PP** without seal.

Nominal capacity (ml)	Filling capacity (ml)	Ø x H (mm)	Art. No.	Pack Qty.
30	30	25,7 x 94,5	<b>ATC6.1</b>	10
50	43	29,0 x 107,7	<b>ATC7.1</b>	10

① Type 3118. Made of **PC**, transparent. Screw closure made of **PP** without seal.

Nominal capacity (ml)	Filling capacity (ml)	Ø x H (mm)	Art. No.	Pack Qty.
10	10	16,1 x 81,7	<b>PH26.1</b>	10
28	28	25,4 x 101,8	<b>PH27.1</b>	10
30	30	25,7 x 94,5	<b>PH28.1</b>	10
50	43	28,8 x 107,0	<b>PH29.1</b>	10
85	81	38,2 x 105,7	<b>PH30.1</b>	10

② Type 3119. Made of **PPCO** (polypropylene copolymer), translucent. Screw closure made of **PP** without seal.

Nominal capacity (ml)	Filling capacity (ml)	Ø x H (mm)	Art. No.	Pack Qty.
10	10	16,0 x 81,4	<b>PH36.1</b>	10
28	28	25,4 x 101,9	<b>PH37.1</b>	10
30	30	25,5 x 94,3	<b>PH38.1</b>	10
50	42	28,8 x 106,7	<b>PH39.1</b>	10

③ Type 3114. Made of **FEP**, screw closure made of **ETFE** without seal. Resistant to acids, bases and solvents. Ideal for chloroform and phenol extractions.

Nominal capacity (ml)	Filling capacity (ml)	Ø x H (mm)	Art. No.	Pack Qty.
10	10	16,0 x 81,5	<b>PH40.1</b>	2
30	30	25,7 x 93,7	<b>PH41.1</b>	2
50	46	28,8 x 107,7	<b>PH42.1</b>	2



## Centrifuge bottles

**A 121°C**

By Nalgene®. Made of **PPCO**, **PC** or **FEP**. Before centrifuging, bottles must be at least 80 % full and FEP bottles 100 % full, with the exception of 500 ml bottle PH81.1 which should not be more than 75 % full. Autoclavable. Before autoclaving, always remove the lid.

① Type 3120. Made of **PPCO** (polypropylene copolymer), translucent. Screw closure made of **PP** without seal.

\*Max. 75 % fill \*\*for IEC rotors

Volume (ml)	Ø x H (mm)	max. RCF (x g)	Art. No.	Pack Qty.
250	61,8 x 127,7	13 200	<b>PH79.1</b>	4
500	73,8 x 169,8	4800	<b>PH80.1</b>	4
500	69,5 x 170,2	4800	<b>PH81.1</b>	4
1000	97,5 x 184,5	7100	<b>PH82.1</b>	4
1000**	97,7 x 179,0	7100	<b>PH83.1</b>	4

② Type 3122. Made of **PC**, transparent. Screw closure made of **PP** without seal.

Volume (ml)	Ø x H (mm)	max. RCF (x g)	Art. No.	Pack Qty.
250	61,8 x 127,6	27 500	<b>PH84.1</b>	4
500	69,5 x 169,6	13 700	<b>PH85.1</b>	4
1000	97,6 x 188,4	7100	<b>PH86.1</b>	4

③ Type 3127. Made of **FEP**. Screw closure made of **ETFE** without seal. Cooled centrifugation at 4 °C. Room temperature is not recommended.

Volume (ml)	Ø x H (mm)	max. RCF (x g)	Art. No.	Pack Qty.
250	60,0 x 128,8	4000	<b>PH88.1</b>	1



# Sample Preparation

Sampling, Sample Preparation, Analysis



## Desiccator sets



Material DURAN®

Made of DURAN®. Designed for use up to the maximum technically possible vacuum (0 mbar). For drying moist products and storage of moisture-sensitive substances. To accelerate the drying process or de-gas samples, the stopcock can be used to produce a vacuum.

**Delivery incl.** bottom part, lid with stopcock and porcelain plate.

### ① Type NOVUS with tube (NS 24/29) and stopcock in the lid

DN	approx. volume (l)	Height without stopcock (mm)	Flange ID (mm)	Flange OD (mm)	Art. No.	Pack Qty.
150	2,4	239	172	215 ±2	ETP4.1	1
200	5,8	296	222	270 ±2	ETP5.1	1
250	10,5	344	272	320 ±2	ETP6.1	1
300	18,5	420	332	380 ±2	ETP7.1	1

### ② Type MOBILEX with thread GL 32 and stopcock in the lid

DN	approx. volume (l)	Height without stopcock (mm)	Flange ID (mm)	Flange OD (mm)	Art. No.	Pack Qty.
150	2,4	239	172	215 ±2	ETP8.1	1
200	5,8	296	222	270 ±2	ETP9.1	1
250	10,5	344	272	320 ±2	ETT0.1	1
300	18,5	420	332	380 ±2	ETT1.1	1



## Silica gel blue

2-4 mm, with colour indicator, pearls

Drying agent

Colour change from blue to pink.

Silica gel with a mixture of different indicators. Free of cobalt(II) chloride.

### Type analysis:

Particle size. .... 2-4 mm

Adsorption capacity:

20 % rel. humidity. .... approx. 8 %

50 % rel. humidity. .... approx. 20 %

Filled under protective gas. Change in colour from blue to fuchsia.

Regeneration at 80-100 °C, approximately 2-4 hours.

2440.1	500 g	plastic
2440.2	1 kg	plastic
2440.3	2,5 kg	plastic
2440.4	10 kg	plastic



## Silica gel orange

2-5 mm, with colour indicator, pearls

Drying agent

Colour change from orange to colourless.

### Type analysis:

Particle size. .... 2-5 mm

BET-surface. .... approx. 750 m<sup>2</sup>/g

Adsorptive capacity:

10 % rel. humidity. .... approx. 6,5 weight %

80 % rel. humidity. .... approx. 42 weight %

Filled under protective gas. Colour change from orange to colourless

at approx. 6 weight % load. Regeneration at 130 °C, approx. 4 hours.

P077.4	500 g	plastic
P077.1	1 kg	plastic
P077.2	2,5 kg	plastic
P077.3	10 kg	plastic



## Silica gel water resistant

2-5 mm, bead form

### Properties:

- water resistant
- regeneration at 130 °C for approx. 4 hours
- can be mixed with other silica gels
- protects other silica gels from liquid water

### Type analysis:

Particle size. .... 2-5 mm

BET-surface. .... ca. 650 m<sup>2</sup>/g

Absorption capacity:

80 % rel. humidity. .... approx. 42 %

Regeneration at 130-150 °C.

8109.1	500 g	plastic
8109.2	1 kg	plastic
8109.3	2,5 kg	plastic
8109.4	10 kg	plastic

► For our detailed assortment on silica gels see current Catalogue or [www.carlroth.com](http://www.carlroth.com)

# Sample Preparation

## Silica Gel - Not Modified

Product	Purity	Art. No.	Pack Qty.
Silica gel 22	Grade 12 0,07-0,21 mm (200-70 mesh)	9698.1	250 g
		9698.2	500 g
		9698.3	1 kg
		9698.4	2,5 kg
Silica gel 35	0,04-0,063 mm (400-230 mesh)	5400.1	250 g
		5400.2	500 g
		5400.3	1 kg
		5400.4	2,5 kg
Silica gel 60	0,006-0,035 mm	9779.1	250 g
		9779.2	500 g
		9779.3	1 kg
		9779.4	2,5 kg
	0,010-0,014 mm	9859.1	25 g
		9859.2	50 g
		9859.3	100 g
	0,016-0,024 mm	9817.1	250 g
		9817.2	500 g
		9817.3	1 kg
		9817.4	2,5 kg
	0,02-0,045 mm	0712.1	250 g
		0712.2	500 g
		0712.4	1 kg
		0712.3	2,5 kg
	0,03-0,2 mm	P090.1	500 g
		P090.2	1 kg
		P090.3	2,5 kg
		P090.4	5 kg
		P090.5	25 kg
	Grade 710 NW 0,035-0,07 mm (400-220 mesh)	5401.1	250 g
		5401.2	500 g
		5401.3	1 kg
		5401.4	2,5 kg
	0,04-0,063 mm (400-230 mesh)	P091.1	250 g
		P091.2	1 kg
		P091.3	2,5 kg
		P091.4	5 kg
		P091.5	25 kg
	0,07-0,2 mm	9820.1	250 g
		9820.2	500 g
		9820.3	1 kg
9820.4		2,5 kg	
0,09-0,13 mm	0399.1	250 g	
	0399.2	500 g	
	0399.3	1 kg	
	0399.4	2,5 kg	
0,2-0,5 mm	CN18.1	500 g	
	CN18.2	1 kg	
	CN18.3	2,5 kg	
1,0-3,0 mm	9833.1	250 g	
	9833.2	500 g	
	9833.3	1 kg	
	9833.4	2,5 kg	
Silica gel 150	0,035-0,07 mm (400-220 mesh)	5402.1	250 g
		5402.2	500 g
		5402.3	1 kg
		5402.4	2,5 kg
	0,07-0,2 mm (220-70 mesh)	5403.1	250 g
		5403.2	500 g
		5403.3	1 kg
		5403.4	2,5 kg
	0,315-0,5 mm	0485.1	250 g
		0485.2	500 g
		0485.3	1 kg
		0485.4	2,5 kg
0,6-1,4 mm	9856.1	250 g	
	9856.2	500 g	
	9856.3	1 kg	
	9856.4	2,5 kg	



Product	Purity	Art. No.	Pack Qty.
Silica gel 250	0,04-0,063 mm (400-230 mesh)	5405.1	250 g
		5405.2	500 g
		5405.3	1 kg
		5405.4	2,5 kg
Silica gel 500	0,035-0,07 mm (400-220 mesh)	5407.5	100 g
		5407.1	250 g
		5407.2	500 g
		5407.3	1 kg
	0,09-0,13 mm	5407.4	2,5 kg
		0512.1	50 g
		0512.2	100 g
		0512.3	250 g
0,1-0,3 mm	0512.4	500 g	
	0524.1	50 g	
	0524.2	100 g	
	0524.3	250 g	
Silica gel 1000	0,016-0,024 mm	0524.4	500 g
		0533.1	10 g
		0533.2	50 g
		0533.3	100 g
	0,035-0,07 mm (400-220 mesh)	0533.4	250 g
		5409.5	100 g
		5409.1	250 g
		5409.2	500 g
	0,09-0,13 mm	5409.3	1 kg
		5409.4	2,5 kg
		0153.1	10 g
		0153.2	50 g
0,016-0,024 mm	0153.3	100 g	
	0153.4	250 g	
	0559.1	10 g	
	0559.2	50 g	
0,09-0,13 mm	0559.3	100 g	
	0559.4	250 g	
	0171.1	10 g	
	0171.2	50 g	
Silica gel 2500	0,09-0,13 mm	0171.3	100 g
		0171.4	250 g
		0177.1	10 g
		0177.2	50 g
Silica gel 4500	0,1-0,3 mm	0177.3	100 g
		0186.1	10 g
		0186.2	50 g
		0186.3	100 g

For additional product data and safety information, see chapter Chemicals A-Z.



## Silica Gel - Modified

Product	Purity	Art. No.	Pack Qty.
Silica gel 60 amino	0,010-0,014 mm	0600.1	10 g
		0600.2	50 g
		0600.3	100 g
	0,035-0,07 mm (400-220 mesh)	5475.1	50 g
		5475.2	100 g
		5475.3	250 g
Silica gel C <sub>18</sub>	0,01-0,014 mm	5509.1	50 g
		5509.2	100 g
		5509.3	250 g
	0,035-0,07 mm (400-220 mesh)	5504.1	50 g
		5504.2	100 g
		5504.3	250 g
Silica gel cyano	0,01-0,014 mm	5531.1	50 g
		5531.2	100 g
		5531.3	250 g
	0,035-0,07 mm (400-220 mesh)	5499.1	50 g
		5499.2	100 g
		5499.3	250 g
Silica gel diol	0,010-0,014 mm	0567.1	10 g
		0567.2	50 g
		0567.3	100 g
	0,035-0,07 mm (400-220 mesh)	5458.1	50 g
		5458.2	100 g
		5458.3	250 g

\*For additional product data and safety information, see chapter Chemicals A-Z.



**Florisil® PR**  
for (pesticides) residue analysis 60-100 mesh  
specially activated.  
Magnesium silicate  
MgO · 3,6 SiO<sub>2</sub> · 1,53 OH

T201.1	100 g	plastic
T201.2	500 g	plastic
T201.3	1 kg	plastic



**Celite® - Kieselgur**  
Prepared and standardised Celite®  
is used as a filtering aid or as adsorbent  
in column chromatography.

**Composition:**  
approx. 90 % SiO<sub>2</sub>, 2-5 % Al<sub>2</sub>O<sub>3</sub>, 1-4 % Fe<sub>2</sub>O<sub>3</sub>  
and various other oxides in low concentrations,  
that is why the Celites® may be slightly tinted.

### The complete Celite® range at a glance

Product	Permeability (Darcy)	Art. No.	Pack Qty.
Celite® 503	1,27-2,4	0007.2	1 kg
		0007.1	2,5 kg
Celite® 512	0,28-0,76	0050.2	1 kg
		0050.1	2,5 kg
Celite® 535	1,8-3,9	0009.2	1 kg
		0009.1	2,5 kg
Celite® 545	3,5-5,5	0011.3	250 g
		0011.2	1 kg
		0011.1	2,5 kg
		0011.4	10 kg
		0011.5	25 kg
Celite® Hyflo Super Cel®	0,73-1,64	0005.2	1 kg
		0005.1	2,5 kg
Celite® Standard Super Cel®	0,16-0,36	0003.2	1 kg
		0003.1	2,5 kg

For additional product data and safety information, see chapter Chemicals A-Z.



Material  
DURAN®

### Chromatography columns

Made of DURAN®. With ground glass socket and PTFE stopcock (NS 14.5).

#### ① Without frit.

With grooves under the stopcock to apply a piece of cotton wool.

Length (mm)	Volume (ml)	Inner Ø (mm)	Ground glass joint	Art. No.	Pack Qty.
200	15	10	14/23	TK54.1	1
200	35	15	14/23	Y669.1	1
400	125	20	29/32	Y670.1	1
600	430	30	29/32	Y671.1	1
800	1000	40	29/32	TK55.1	1

#### ② With fused-in frit (porosity 0)

Length (mm)	Volume (ml)	Inner Ø (mm)	Ground glass joint	Art. No.	Pack Qty.
100	8	10	14/23	TK56.1	1
200	15	10	14/23	Y672.1	1
300	23	10	14/23	Y673.1	1
200	35	15	14/23	Y674.1	1
400	125	20	29/32	Y675.1	1
600	430	30	29/32	HX73.1	1



# Sample Preparation



## Charcoal

**p.a., powder, activated**

Adsorbent

C

M 12,01 g/mol

Analytic activated carbon with extensive trace analysis.

X865.1	250 g	plastic
X865.2	500 g	plastic
X865.3	1 kg	plastic

## Charcoal

**powder, for decolourisation, phosphoric acid activated**

C

M 12,01 g/mol

**Warning H252**

Activated carbon with high absorption capacity and excellent filtering quality. Primarily used for the absorption of organic substances of high molecular weight, e.g. proteins and large colour molecules.

5963.3	500 g	plastic
5963.1	1 kg	plastic
5963.4	2,5 kg	plastic
5963.2	5 kg	plastic
5963.5	10 kg	plastic



## Glass wool, 25 µm

**chemically resistant glass according to DIN 1259-1**

Filter aid, for laboratory work.

### Type analysis:

Fiber diameter .....22,0-28,0 µm  
Loss on ignition .....≤0,3 %

0700.1	500 g	plastic
0700.2	1 kg	plastic



## Cellulose

**for column chromatography**

Fibre length 0,02-0,1 mm

5873.3	100 g	plastic
5873.1	500 g	plastic
5873.2	1 kg	plastic

## Aluminium Oxide



Our range of aluminium oxides (neutral - alkaline - acidic) for conventional **column chromatography** most certainly includes the right one for you.

All aluminium oxides are available in activity grade I. Activity grades II to V can be set up by adding water:

- Activity grade I - 0 % water
- Activity grade II - 3 % water
- Activity grade III - 6 % water
- Activity grade IV - 10 % water
- Activity grade V - 15 % water

## Aluminium Oxide

Product	Art. No.	Pack Qty.
Aluminium oxide 90 neutral	P092.1	500 g
	P092.2	1 kg
	P092.3	2,5 kg
Aluminium oxide 90 acidic	X909.1	500 g
	X909.2	1 kg
	X909.3	2,5 kg
Aluminium oxide 90 basic	X908.1	500 g
	X908.2	1 kg
	X908.3	2,5 kg

For additional product data and safety information, see chapter Chemicals A-Z.

## Thin Layer Chromatography



### TLC-layers with silica gel 60

- Spec. surface: approx. 500 m<sup>2</sup>/g
- Medium pore width: 60 Å
- Spec. pore volume: 0,75 ml/g
- Particle size: 5-17 µm

### Aluminium foil with silica gel 60

The aluminium foils are produced with a special, highly polymeric binder, which is resistant towards almost all organic solvents and aggressive visualisation reagents. It is also completely stable in pure aqueous eluents.

#### Properties:

- Easy cutting of foils, **no flaking of silica**
- Outstanding wettability, precise colourisation even with 100 % aqueous eluents
- Excellent separation efficiency and reproducibility from lot to lot

### ALUGRAM® Xtra SIL G

Plate format	Layer thickness	Art. No.	Pack Qty.
5 x 7,5 cm	0,2 mm	<b>3868.1</b>	20
5 x 10 cm	0,2 mm	<b>3869.1</b>	50
5 x 20 cm	0,2 mm	<b>3871.1</b>	50
20 x 20 cm	0,2 mm	<b>3873.1</b>	25

### ALUGRAM® Xtra SIL G / UV<sub>254</sub>

Plate format	Layer thickness	Art. No.	Pack Qty.
4 x 8 cm	0,2 mm	<b>3874.1</b>	50
5 x 7,5 cm	0,2 mm	<b>3875.1</b>	20
5 x 10 cm	0,2 mm	<b>3876.1</b>	50
5 x 20 cm	0,2 mm	<b>3877.1</b>	50
10 x 20 cm	0,2 mm	<b>3878.1</b>	20
20 x 20 cm	0,2 mm	<b>3879.1</b>	25

### Polyester foil with Silica gel 60

### POLYGRAM® SIL G

Plate format	Layer thickness	Art. No.	Pack Qty.
4 x 8 cm	0,2 mm	<b>N733.1</b>	50
5 x 20 cm	0,2 mm	<b>N734.1</b>	50
20 x 20 cm	0,2 mm	<b>N735.1</b>	25

### POLYGRAM® SIL G / UV<sub>254</sub>

Plate format	Layer thickness	Art. No.	Pack Qty.
4 x 8 cm	0,2 mm	<b>0816.1</b>	50
4 x 8 cm	0,2 mm	<b>0816.2</b>	200 (4 x 50)
5 x 20 cm	0,2 mm	<b>N736.1</b>	50
20 x 20 cm	0,2 mm	<b>N737.1</b>	25

### TLC-layers for preparative purposes

These TLC-plates are particularly suitable for separating larger sample amounts due to the layer thickness of 1 mm and 2 mm respectively.

### SIL G-200

Glass plates, silica gel layer 60

Plate format	Layer thickness	Art. No.	Pack Qty.
20 x 20 cm	2,00 mm	<b>CN40.1</b>	12

### SIL G-200 / UV<sub>254</sub>

Glass plates, silica gel layer 60, with fluorescence indicator

Plate format	Layer thickness	Art. No.	Pack Qty.
20 x 20 cm	2,00 mm	<b>CN41.1</b>	12



### TLC-layers with cellulose MN 300

Native fibrous cellulose

- Fibre length (95 %): 2-20 µm
- Average degree of polymerisation: 400-500
- Specific surface acc. to Blaine: 15000 cm<sup>2</sup>/g

**Recommended application:** partition chromatography of polar substances such as amino acids, carboxylic acids or carbohydrates

### Polyester foil POLYGRAM® CEL 300

Plate format	Layer thickness	Art. No.	Pack Qty.
4 x 8 cm	0,1 mm	<b>0818.1</b>	50

### Glass plate, cellulose MN 300 layer

Plate format	Layer thickness	Art. No.	Pack Qty.
5 x 20 cm	0,1 mm	<b>1320.1</b>	100
10 x 20 cm	0,1 mm	<b>1321.1</b>	50
20 x 20 cm	0,1 mm	<b>1322.1</b>	25

### TLC-foil POLYGRAM® CEL 400

Polyester foil, cellulose MN 400 (AVICEL®) layer

Microcrystalline cellulose

- Prepared by hydrolysis of high purity cellulose with HCl
- Mean degree of polymerisation: 40-200

**Recommended application:** carboxylic acids, lower alcohols, urea and purine derivatives

Plate format	Layer thickness	Art. No.	Pack Qty.
5 x 20 cm	0,1 mm	<b>1330.1</b>	50
20 x 20 cm	0,1 mm	<b>1331.1</b>	25

## Solvents for TLC

### ROTISOLV® UV/IR-Grade solvents

for chromatography and spectroscopy

- High chemical purity
- Spectroscopically tested for UV and IR
- High UV-permeability
- Low fluorescence



### Solvents for TLC

Product	Purity	Max. permeability at	Art. No.	Pack Qty.
Acetone	≥99,9 %, UV/IR-Grade	350 nm	T906.1	2,5 l
Acetonitrile	≥99,9 %, UV/IR-Grade	230 nm	T907.1	2,5 l
1-Butanol	≥99,8 %, UV/IR-Grade	270 nm	4431.1	2,5 l
Cyclohexane	≥99,9 %, UV/IR-Grade	250 nm	CP81.1	2,5 l
Dichloromethane	≥99,8 %, UV/IR-Grade	260 nm	4433.1	2,5 l
N,N-Dimethylformamide	≥99,9 %, UV/IR-Grade	330 nm	CP79.1	2,5 l
Acetic acid ethyl ester	≥99,8 %, UV/IR-Grade	280 nm	4442.1	2,5 l
n-Heptane	≥99 %, UV/IR-Grade	245 nm	CP78.1	2,5 l
n-Hexane	≥99 %, UV/IR-Grade	245 nm	T908.1	2,5 l
Isooctane	≥99,8 %, UV/IR-Grade	255 nm	CP80.1	2,5 l
Methanol	≥99,9 %, UV/IR-Grade	260 nm	T909.1	2,5 l
n-Pentane	≥99 %, UV/IR-Grade	240 nm	4443.1	2,5 l
2-Propanol	≥99,9 %, UV/IR-Grade	260 nm	T910.1	2,5 l
Tetrachlorethylene	≥99,9 %, UV/IR-Grade	305 nm	CP83.1	2,5 l
Tetrahydrofuran	≥99,9 %, UV/IR-Grade	310 nm	CP82.1	2,5 l
Toluene	≥99,8 %, UV/IR-Grade	350 nm	4445.1	2,5 l
Trichloromethane/Chloroform	≥99,8 %, UV/IR-Grade	280 nm	4432.1	2,5 l

For additional product data and safety information, see chapter Chemicals A-Z.



## TLC sprayer

Versatile sprayer with gas cartridge for spraying reagents and other liquids. Spray pressure: constant 4,4 bar. Eco-friendly propellant mixture of dimethyl ether, propane and isobutane. Sufficient for approx. 500 ml of liquid.

Easy to clean: unscrew cartridge, immerse uptake into vessel containing cleaning fluid and spray until the spray is free of residues.

Propellants: dimethyl ether, isobutane, propane.

**Delivery incl.** propellant cartridge (55 g or 94 ml), 170 ml glass reservoir bottle, suction tube and screw cap.

Art. No.	Pack Qty.
YC44.1	1

### Accessories:

Replacement cartridges with spray nozzle and suction tube	YC45.1	5
Replacement 170 ml glass bottle	YC46.1	1



Material DURAN® **A 121°C**

## TLC atomizers

Made of DURAN®. NS 19/26, volume 100 ml. Overall height 160 mm. Autoclavable without rubber tube.

**Delivery incl.** Erlenmeyer flasks, wire joint clamps, rubber ball incl. rubber tube 25 cm.

Type	Art. No.	Pack Qty.
TLC atomizers complete	0707.1	1

### Accessories:

Spare spray nozzle	H451.1	1
Spare rubber bulb, incl. tube, length 20 cm	5914.1	1

## Test tube atomizers

Made of DURAN®. **Delivery incl.** ground joint clamp and rubber bulb.

Volume (ml)	Standard taper (NS)	Art. No.	Pack Qty.
6	14/23	TK61.1	1
12	19/26	TK62.1	1



## Capillary tubes

By Hirschmann. Made of soda-lime glass. Open at both ends.

Length (mm)	Outer Ø (mm)	Inner Ø (mm)	Art. No.	Pack Qty.
80	1,0	0,8	EAC7.1	10 x 100
80	1,35	0,95	EAC8.1	10 x 100
80	1,55	1,15	EAC9.1	10 x 100
90	1,0	0,8	EAE0.1	10 x 100
100	1,0	0,8	EAE1.1	10 x 100
100	1,35	0,95	EAE2.1	10 x 100
100	1,55	1,15	EAE3.1	10 x 100
120	1,0	0,8	EAE4.1	4 x 250
120	1,35	0,95	EAE5.1	4 x 250
150	1,0	0,8	EAE6.1	4 x 250



## Developing chambers for TLC

Simultaneous developing chambers made of glass.

**Type 1:** for 5 plates up to size 20 x 20 cm

**Type 2:** for 2 plates up to size 10 x 10 cm

Type	Art. No.	Pack Qty.
1	3133.1	1
2	3134.1	1

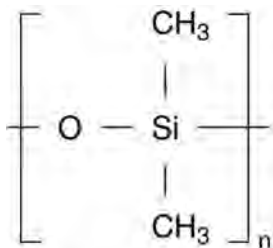


## TLC separation chamber **A 121°C**

Made of borosilicate glass 3.3. For immersing pre-treated TLC ready-to-use 8 x 4 cm foils in solvents. Cylindrical glass beaker with loose glass lid. Inner height 100, Ø 60 mm. Autoclavable.

Art. No.	Pack Qty.
0823.1	1

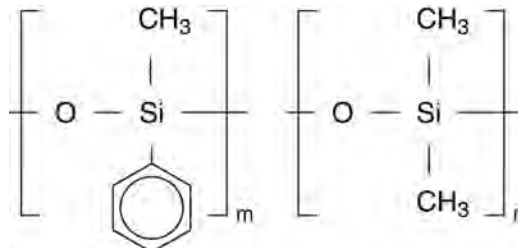
## A Product Selection of our GC Capillary Columns



### GC capillary column ROTI®Cap-1 100 % Dimethylpolysiloxane

- **Non-polar**
- Solvent rinsing applicable
- **Working temperature limits:**
  - for columns with 0,10 - 0,32 mm inner diameter and films <3 µm:
    - 340 °C for isothermal operation
    - 360 °C for short isotherms in a temperature programme
  - for columns with 0,53 mm inner diameter and films <3 µm:
    - 320 °C for isothermal operation
    - 340 °C for short isotherms in a temperature programme
  - for thick film columns with films >3 µm:
    - 300 °C for isothermal operation
    - 320 °C for short isotherms in a temperature programme
- **Application areas:** Excellent column for routine applications.
- **Similar phases:** OV-1, DB-1, SE-30, HP-1, SPB®-1, CP-SIL 5 CB, Rtx®-1, Quadrex 007-1, BP1, MDN-1, AT™-1, ZB-1, OV-101
- Equivalent to USP phases G1/G2/G38

Length (m)	Inner Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
10	0,25	0,25	6081.1	1
10	0,25	0,50	6085.1	1
10	0,32	0,25	6087.1	1
10	0,32	0,50	6088.1	1
10	0,53	5,00	6101.1	1
12	0,20	0,20	6103.1	1
12	0,20	0,35	6106.1	1
15	0,25	0,10	6107.1	1
15	0,25	0,25	6112.1	1
15	0,32	1,00	6113.1	1
25	0,25	0,10	6131.1	1
25	0,25	0,25	6135.1	1
25	0,32	0,10	6143.1	1
25	0,32	0,25	6148.1	1
25	0,32	0,35	6152.1	1
25	0,32	0,50	6154.1	1
25	0,53	5,00	6172.1	1
30	0,25	0,10	1358.1	1
30	0,25	0,25	CN10.1	1
30	0,32	0,10	1370.1	1
30	0,32	0,25	1220.1	1
30	0,53	0,50	6180.1	1
30	0,53	1,00	6182.1	1
50	0,20	0,20	6184.1	1
50	0,20	0,35	6185.1	1
50	0,20	0,50	6199.1	1
50	0,25	0,25	6202.1	1
50	0,25	0,50	6204.1	1
50	0,25	1,00	6206.1	1
50	0,32	0,10	6208.1	1
50	0,32	0,25	6209.1	1
50	0,32	3,00	6218.1	1
50	0,32	5,00	6221.1	1
50	0,53	5,00	6222.1	1
60	0,25	0,25	1378.1	1
60	0,25	0,10	6223.1	1
60	0,25	0,50	6224.1	1
60	0,25	1,00	6226.1	1



### GC capillary column ROTI®Cap-5 5 % Phenyl - 95 % Methylpolysiloxane

- **Non-polar**
- Solvent rinsing applicable
- **Working temperature limits:**
  - for columns with 0,10 - 0,32 mm inner diameter and films <3 µm:
    - 340 °C for isothermal operation
    - 360 °C for short isotherms in a temperature programme
  - for columns with 0,53 mm inner diameter and films <3 µm:
    - 320 °C for isothermal operation
    - 340 °C for short isotherms in a temperature programme
  - for thick film columns with films ≥3 µm:
    - 300 °C for isothermal operation
    - 320 °C for short isotherms in a temperature programme
- **Application areas:** standard phase with large range of applications
- **Similar phases:** SE-54, SE-52, HP-5, SPB®-5, CP-SIL 8, Rtx®-5, Quadrex 007-5, BP5, MDN-5, AT™-5, ZB-5
- Equivalent to USP phases G27/G36

Length (m)	Inner Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
10	0,25	0,25	6253.1	1
10	0,53	0,50	6260.1	1
10	0,53	2,00	6267.1	1
15	0,25	0,25	6270.1	1
15	0,32	0,25	6273.1	1
15	0,53	0,50	6075.1	1
25	0,20	0,35	6282.1	1
25	0,25	0,25	6285.1	1
25	0,32	0,25	6295.1	1
25	0,32	0,35	6296.1	1
25	0,53	0,50	6289.1	1
25	0,53	1,00	6303.1	1
30	0,25	0,25	CN11.1	1
30	0,25	0,50	1385.1	1
30	0,25	1,00	1386.1	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	0,53	0,50	6306.1	1
30	0,53	2,00	1434.1	1
50	0,20	0,20	6307.1	1
50	0,25	0,10	6313.1	1
50	0,25	0,35	6316.1	1
50	0,32	0,10	6320.1	1
50	0,32	0,50	6323.1	1
50	0,32	1,00	6324.1	1
50	0,53	2,00	6328.1	1
60	0,25	0,25	1436.1	1
60	0,25	1,00	6346.1	1
60	0,32	0,35	6349.1	1
60	0,32	1,00	6354.1	1

► For detailed GC capillary column assortment see current catalogue or [www.carlroth.com](http://www.carlroth.com)



## GC capillary column ROTI®Cap-5 MS

5 % Diphenyl - 95 % Dimethylpolysiloxane

- **Non-polar**
- Low column bleed
- Selectivity identical to ROTI®Cap-5
- **Working temperature limits:**  
340 °C for isothermal operation  
360 °C for short isotherms in a temperature programme
- **Application areas:** ideal for GC-MS- and ECD-applications and general analysis at trace level
- **Similar phases:** DB-5, 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, Quadrex 007-5 MS, BPX™5, MDN-5S, AT™-5 MS, VF-5 MS
- Equivalent to USP phases G27/G36

Length (m)	Inner 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	1,00	1439.1	1
30	0,32	0,50	1492.1	1
50	0,20	0,20	6373.1	1
50	0,32	1,00	6381.1	1
60	0,25	0,50	1519.1	1
60	0,32	1,00	6384.1	1

## GC capillary column ROTI®Cap-5 MS Ultra

Silarylene Phase

- **Non-polar**
- Polarity similar to a 5 % diphenyl - 95 % dimethylpolypropylene phase
- **Extremely low column bleed**
- Solvent rinsing applicable for removing impurities
- **Working temperature limits:**  
340 °C for isothermal runs  
360 °C for short isothermal runs in a temperature programme  
**for columns with film thickness >0,5 µm:**  
320 °C for isothermal runs  
340 °C for short isothermal runs in a temperature programme
- **Application areas:** all-round phase for environmental analysis, trace analysis, EPA methods, pesticides, PCBs, food and drug analysis. Ideal for ion trap and quadrupol analyzers.
- **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, Quadrex 007-5 MS, BPX™5, MDN-5S, AT™-5 MS, VF-5 MS
- Equivalent to USP phases G27/G36

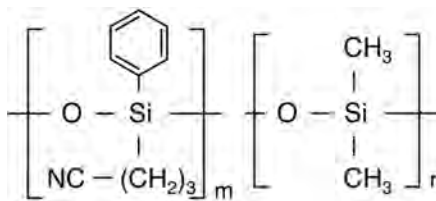
Length (m)	Inner Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
30	0,25	0,25	2959.1	1
30	0,25	0,50	2960.1	1



## 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

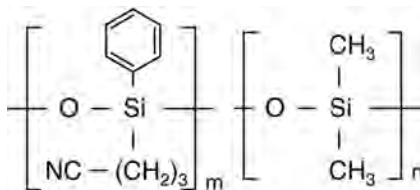


## GC capillary column ROTI®CAP-624

6 % Cyanopropylphenyl - 94 % Dimethylpolysiloxane

- **Medium polar**
- **Working temperature limits:**  
280 °C for isothermal operation  
300 °C for short isotherms in a temperature programme
- **Application areas:** recommended for environmental analysis
- **Similar phases:** HP-624, HP-VOC, DB-624, DB-VRX, SPB®-624, CP-624, Rtx®-624, Rtx®-Volatiles, Quadrex 007-624, BP624, VOCOL®
- Equivalent to USP phase G43

Length (m)	Inner Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
25	0,25	1,40	6398.1	1
25	0,53	3,00	6401.1	1
30	0,32	1,80	CN16.1	1
50	0,25	1,40	6403.1	1
60	0,25	1,40	1875.1	1



## GC capillary column ROTI®Cap-1701

14 % Cyanopropylphenyl - 86 % Dimethylpolysiloxane

- **Medium polar**
- **Working temperature limits:**  
280 °C for isothermal runs  
300 °C for short isothermal runs in a temperature programme
- **Application areas:** reference column for structure determination, e.g. in combination with ROTI®Cap-5; columns with film thickness ≥1 µm are used for solvent analysis
- **Similar phases:** OV-1701, DB-1701, CP Sil 19 CB, HP-1701, Rtx®-1701, SPB®-1701, Quadrex 007-1701, BP10, ZB-1701
- Equivalent to USP phase G46

Length (m)	Inner Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
10	0,25	0,25	6406.1	1
10	0,53	1,00	6408.1	1
15	0,32	0,25	6411.1	1
15	0,53	1,00	3698.1	1
25	0,20	0,20	6417.1	1
25	0,32	0,35	6434.1	1
25	0,32	1,00	6436.1	1
25	0,53	2,00	6440.1	1
30	0,25	0,25	3700.1	1
30	0,25	1,00	3706.1	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
50	0,25	0,25	6442.1	1
50	0,32	0,35	6444.1	1
50	0,32	1,00	6447.1	1
60	0,25	0,25	3724.1	1
60	0,32	0,25	3725.1	1
60	0,32	0,50	6453.1	1

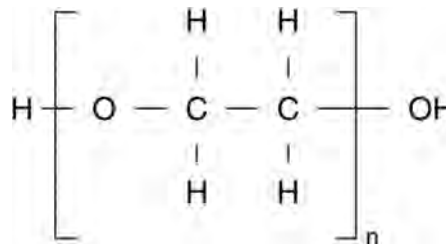
# Analysis

## GC capillary column ROTI®Cap-XLB

Silarylene phase with optimised silarylene content for lowest column bleed. Recommended for the separation of PCBs.

- **Non-polar - low polar**
- Very low column bleed
- **Working temperature limits:**  
340 °C for isothermal operation  
360 °C for short isotherms in a temperature programme
- Ideal for ion trap and quadrupol analyzers
- Perfect inertness for basic compounds
- Solvent rinsing applicable for removing impurities
- **Application areas:** highly selective for environmental and trace analyses, pesticides
- **Similar phases:** DB-XLB, Rtx®-XLB, Rxi®-XLB, MDN-12, VF-XMS

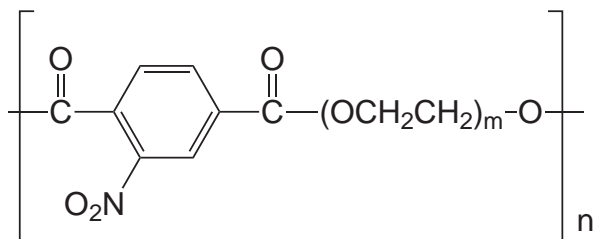
Length (m)	Inner Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
30	0,25	0,25	3044.1	1
60	0,25	0,25	3046.1	1



## GC capillary column ROTI®Cap-WAX Polyethylene glycol 20000 Dalton

- **Polar**
- **Working temperature limits:**  
**for columns with 0,25 - 0,32 mm inner diameter:**  
240 °C for isothermal operation  
250 °C for short isotherms in a temperature programme  
**for columns with 0,53 mm inner diameter:**  
220 °C for isothermal operation  
240 °C for short isotherms in a temperature programme
- **Application areas:** 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®, Quadrex 007-CW, BP20, AT™-Wax, ZB-Wax
- Equivalent to USP phase G16

Length (m)	Inner Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
25	0,25	0,25	1531.1	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
50	0,32	0,25	1918.1	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



## GC capillary column ROTI®CAP-FFAP Polyethylene glycol 2-nitroterephthalate

- **Polar**
- **Working temperature limits:**  
**for columns with 0,10 - 0,32 mm inner diameter:**  
250 °C for isothermal operation  
260 °C for short isotherms in a temperature programme  
**for columns with 0,53 mm inner diameter:**  
220 °C for isothermal operation  
240 °C for short isotherms in a temperature programme
- **Application areas:** recommended for FAMES, free carboxylic acids
- **Similar phases:** DB-FFAP, HP-FFAP, CP-Wax 58 FFAP CB, Quadrex 007-FFAP, CP-FFAP CB, Nukol™, AT™ 1000, SPB®-1000, BP 21, OV-351
- Equivalent to USP phase G35, close equivalent to G25

Length (m)	Inner Ø (mm)	Film thickness (µm)	Art. No.	Pack Qty.
25	0,25	0,25	1828.1	1
25	0,32	0,50	1830.1	1
30	0,25	0,25	CN13.1	1
30	0,32	0,50	1854.1	1
50	0,25	0,25	1858.1	1
50	0,32	0,50	6392.1	1
60	0,25	0,25	1864.1	1



## Derivatisation Reagents for GC

Derivatisation reagents are mainly used in gas chromatography when adequate volatility or stability of the substances to be separated is required.

Detection sensitivity can also be increased through derivatisation.

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



### Reagents for Silylation

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

### Reagents for Acylation

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

### Reagents for Alkylation / Methylation

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

For additional product data and safety information, see chapter Chemicals A-Z.

**Septum bottle:** Aluminium seal with PTFE-lined rubber disc (septum). The pierced septum is no longer absolutely air-tight, therefore we suggest to use up the content as quickly as possible and keep the vial standing upright. Otherwise the reagents come in contact with the rubber which can cause contamination to the point of making them useless.



## ROTISOLV® GC Ultra Grade Solvents

for gas chromatographic and residue analysis

In order to monitor and analyse environmentally relevant substances such as pesticides, dioxins, furans, PAHs, PCBs etc. in trace analysis, solvents with exceedingly high purity specifications are required.

### Features:

- Highest purity
- Very low water content
- Non-volatile matter: less than 2 ppm
- Quality control by means of ECD and PND
- PAH-test
- Filtered through 0,2 µm membrane
- Bottled under protective gas



### ROTISOLV® GC Ultra Grade Solvents

Product	Purity	Art. No.	Pack Qty.	Packaging
Acetone	≥99,9 %, GC Ultra Grade	<b>KK40.1</b>	2,5 l	glass
Cyclohexane	≥99,9 %, GC Ultra Grade	<b>KK41.1</b>	2,5 l	glass
Dichloromethane	≥99,9 %, GC Ultra Grade	<b>KK47.1</b>	2,5 l	glass
Acetic acid ethyl ester	≥99,9 %, GC Ultra Grade	<b>KK42.1</b>	2,5 l	glass
n-Hexane	≥95 %, GC Ultra Grade	<b>KK48.1</b>	2,5 l	glass
Methanol	≥99,9 %, GC Ultra Grade	<b>KK44.1</b>	2,5 l	glass
n-Pentane	≥99 %, GC Ultra Grade	<b>KK45.1</b>	2,5 l	glass
Toluene	≥99,8 %, GC Ultra Grade	<b>KK46.1</b>	2,5 l	glass

For additional product data and safety information, see chapter Chemicals A-Z.

## ROTISOLV® Pestilyse® plus Solvents

for determination of dioxines, furanes, PCBs, pesticides, hydrocarbons and further pollutants

### Features:

- Highest purity
- Controlled by FID, ECD and PND
- 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



### ROTISOLV® Pestilyse® plus Solvents

Product	Purity	Art. No.	Pack Qty.	Packaging
Acetone	≥99,9 %, Pestilyse® plus	<b>7535.1</b>	2,5 l	glass
Cyclohexane	≥99,9 %, Pestilyse® plus	<b>7542.1</b>	2,5 l	glass
Dichloromethane	≥99,9 %, Pestilyse® plus	<b>7562.1</b>	2,5 l	glass
Acetic acid ethyl ester	≥99,9 %, Pestilyse® plus	<b>7565.1</b>	2,5 l	glass
n-Heptane	≥99 %, Pestilyse® plus	<b>7566.1</b>	2,5 l	glass
n-Hexane	≥99 %, Pestilyse® plus	<b>7573.1</b>	2,5 l	glass
	≥96 %, Pestilyse® plus	<b>7567.1</b>	2,5 l	glass
Isohexane	≥96 %, Pestilyse® plus	<b>7576.1</b>	2,5 l	glass
Isooctane	≥99,7 %, Pestilyse® plus	<b>7580.1</b>	2,5 l	glass
Methanol	≥99,9 %, Pestilyse® plus	<b>7583.1</b>	2,5 l	glass
n-Pentane	≥99 %, Pestilyse® plus	<b>7587.1</b>	2,5 l	glass
Petroleum ether 40-60 °C	Pestilyse® plus	<b>7588.1</b>	2,5 l	glass
2-Propanol	≥99,9 %, Pestilyse® plus	<b>7590.1</b>	2,5 l	glass
Toluene	≥99,8 %, Pestilyse® plus	<b>7591.1</b>	2,5 l	glass
Trichloromethane/Chloroform	≥99,9 %, Pestilyse® plus	<b>7554.1</b>	2,5 l	glass

For additional product data and safety information, see chapter Chemicals A-Z.

# ROTISOLV® Pestilyse® Solvents

for residue and environmental analysis



### Advantage:

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

## ROTISOLV® Pestilyse® Solvents

Product	Purity	Art. No.	Pack Qty.	Packaging
Acetone	≥99,8 %, Pestilyse®	T161.2	1 l	glass
		T161.1	2,5 l	glass
		T161.3	4 l	glass
Acetonitrile	≥99,9 %, Pestilyse®	T168.1	2,5 l	glass
		T168.3	4 l	glass
Cyclohexane	≥99,5 %, Pestilyse®	T163.2	1 l	glass
		T163.1	2,5 l	glass
Dichloromethane	≥99,8 %, Pestilyse®	T162.2	1 l	glass
		T162.1	2,5 l	glass
Diethyl ether	≥99,8 %, Pestilyse®, stab.	T162.3	4 l	glass
		T900.1	2,5 l	glass
Acetic acid ethyl ester	≥99,8 %, Pestilyse®	T164.2	1 l	glass
		T164.1	2,5 l	glass
		T164.3	4 l	glass
n-Heptane	≥99 %, Pestilyse®	X878.1	2,5 l	glass
n-Hexanen-Hexane	≥99 %, Pestilyse®	T861.2	1 l	glass
		T861.1	2,5 l	glass
	≥97,5 %, Pestilyse®	T165.2	1 l	glass
		T165.1	2,5 l	glass
Isohexane	≥99 %, Pestilyse®	T165.3	4 l	glass
		T904.1	2,5 l	glass
Isooctane	≥99,5 %, Pestilyse®	T167.1	2,5 l	glass
		T169.2	1 l	glass
Methanol	≥99,9 %, Pestilyse®	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
		T166.2	1 l	glass
Toluene	≥99,8 %, Pestilyse®	T166.1	2,5 l	glass
		T166.3	4 l	glass
		T901.1	2,5 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, see chapter Chemicals A-Z.

### Safety data sheets

can be found on our homepage next to the product description.

# ROTI®Star Standards for AAS and ICP

Carl ROTH has an extensive range of products which meets the highest standards of quality in the field of element standards and ion standards. The solutions and mixtures are made using materials of the highest purity, and therefore meet the requirements for instrumental analysis by AAS and ICP. All solutions are certified and can be traced to NIST standard reference materials. Solutions are produced according to **ISO 17034** in an accredited environment. The solutions are tested in a laboratory accredited to **ISO/IEC 17025** and supplied with a detailed, batch-specific certificate of analysis.

ready-to-use

## Single Element Standards for AAS (Atomic Absorption Spectroscopy)



AAS standard solutions are made from high-quality reagents, and therefore ensure maximum precision during calibration. Accuracy and precision for reliable measurement results.

- 42 single element standards
- Concentration 1000 mg/l (1 g/l)
- Container sizes: 100 ml and 500 ml
- 24 months shelf life for unopened bottle

### Single element standards for the AAS 1000 mg/l (1 g/l) - ready for use

Element	Matrix	Art. No.	Pack Qty. (ml)	
Aluminium	Al	2 % HNO <sub>3</sub>	2212.1	100
			2212.2	500
Antimony	Sb	20 % HCl	2223.1	100
			2223.2	500
Arsenic	As	2 % HNO <sub>3</sub>	2224.1	100
			2224.2	500
Barium	Ba	1 % HNO <sub>3</sub>	2225.1	100
			2225.2	500
Beryllium	Be	2 % HNO <sub>3</sub> /0,5 % HF	2226.1	100
			2226.2	500
Bismuth	Bi	3 % HNO <sub>3</sub>	2227.1	100
			2227.2	500
Lead	Pb	2 % HNO <sub>3</sub>	2228.1	100
			2228.2	500
Boron	B	H <sub>2</sub> O	2237.1	100
			2237.2	500
Cadmium	Cd	2 % HNO <sub>3</sub>	2238.1	100
			2238.2	500
Caesium	Cs	2 % HNO <sub>3</sub>	2239.1	100
			2239.2	500
Calcium	Ca	2 % HNO <sub>3</sub>	2240.1	100
			2240.2	500
Chromium	Cr	2 % HNO <sub>3</sub>	2250.1	100
			2250.2	500
Cobalt	Co	2 % HNO <sub>3</sub>	2251.1	100
			2251.2	500
Iron	Fe	2 % HNO <sub>3</sub>	2252.1	100
			2252.2	500
Gold	Au	2 % HCl	2258.1	100
			2258.2	500
Indium	In	2 % HNO <sub>3</sub>	2284.1	100
			2327.1	100
Potassium	K	2 % HNO <sub>3</sub>	2327.2	500
			2329.1	100
Copper	Cu	2 % HNO <sub>3</sub>	2329.2	500
			2332.1	100
Lithium	Li	2 % HNO <sub>3</sub>	2332.2	500
			2333.1	100
Magnesium	Mg	2 % HNO <sub>3</sub>	2333.2	500
			2334.1	100
Manganese	Mn	2 % HNO <sub>3</sub>	2334.2	500
			2335.1	100
Molybdenum	Mo	4 % NH <sub>3</sub>	2335.2	500

Element	Matrix	Art. No.	Pack Qty. (ml)	
Sodium	Na	2 % HNO <sub>3</sub>	2337.1	100
			2337.2	500
Nickel	Ni	2 % HNO <sub>3</sub>	2339.1	100
			2339.2	500
Palladium	Pd	3 % HNO <sub>3</sub>	2340.1	100
			2599.1	100
Phosphorus	P	H <sub>2</sub> O	2599.2	500
			2341.1	100
Platinum	Pt	10 % HCl	2341.2	500
			2346.1	100
Mercury	Hg	10 % HNO <sub>3</sub>	2346.2	500
			2347.1	100
Scandium	Sc	2 % HNO <sub>3</sub>	2347.2	500
			2348.1	100
Selenium	Se	2 % HNO <sub>3</sub>	2348.2	500
			2349.1	100
Silver	Ag	2 % HNO <sub>3</sub>	2349.2	500
			2350.1	100
Silicon	Si	H <sub>2</sub> O	2350.2	500
			2351.1	100
Strontium	Sr	2 % HNO <sub>3</sub>	2352.1	100
			2352.2	500
Tellurium	Te	2 % HNO <sub>3</sub>	2353.1	100
			2353.2	500
Thallium	Tl	2 % HNO <sub>3</sub>	2354.1	100
			2354.2	500
Titanium	Ti	2 % HNO <sub>3</sub> /0,1 % HF	2355.1	100
			2355.2	500
Vanadium	V	2 % HNO <sub>3</sub>	2360.1	100
			2360.2	500
Tungsten	W	4 % NH <sub>3</sub>	2361.1	100
			2361.2	500
Yttrium	Y	2 % HNO <sub>3</sub>	2371.1	100
			2371.2	500
Zinc	Zn	2 % HNO <sub>3</sub>	2383.1	100
			2383.2	500
Tin	Sn	10 % HCl	2384.1	100
			2384.2	500
Zircon	Zr	5 % HCl/0,5 % HF	2396.1	100
			2396.2	500

For additional product data and safety information, see chapter Chemicals A-Z.

## Multi Element Standards for ICP-OES

ready-to-use

### (Inductively Coupled Plasma – Optical Emission Spectrometry)

The solutions and mixtures are made using materials of the highest purity, and therefore meet the requirements for instrumental analysis by AAS and ICP. All solutions are certified and can be traced to NIST standard reference solutions. Solutions are produced according to **ISO 17034** in an accredited environment. The solutions are tested in a laboratory accredited to **ISO/IEC 17025** and supplied with a detailed, batch-specific certificate of analysis.



- Quality control standards
- Surface water analysis ①
- Sewage sludge analysis ②
- 12 months shelf life for unopened bottle

Sampling, Sample Preparation, Analysis

Product	Elements	Composition	Matrix	Art. No.	Pack Qty. (ml)
ICP Multi-Element Standard Solution I (Concentration in mg/l)	19	Ag (50), Al (100), B (15), Ba (5), Be (1), Bi (200), Cd (20), Co (20), Cr (25), Cu (20), Fe (15), Ga (150), In (200), Mn (5), Ni (50), Pb (200), Sr (1), Tl (400), Zn (20)	5 % HNO <sub>3</sub>	<b>2636.1</b>	100
ICP Multi-Element Standard Solution III	4	Ba, Ca, Mg, Sr	2 % HNO <sub>3</sub>	<b>2637.1</b>	100
ICP Multi-Element Standard Solution IV	23	Ag, Al, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, In, K, Li, Mg, Mn, Na, Ni, Pb, Sr, Ti, Zn	2 % HNO <sub>3</sub>	<b>2638.1</b>	100
ICP Multi-Element Standard Solution VIII	24	Al, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, K, Li, Mg, Mn, Na, Ni, Pb, Se, Sr, Te, Ti, Zn	2 % HNO <sub>3</sub>	<b>2639.1</b>	100
ICP Multi-Element Standard Solution IX	9	As, Be, Pb, Cd, Cr, Ni, Hg, Se, Ti	2 % HNO <sub>3</sub>	<b>2640.1</b>	100
ICP Multi-Element Standard Solution X ① (Concentration in mg/l)	23	Ca (35000), Mg (15000), Na (8000), K (3000), B (100), Fe (100), Mo (100), Sr (100), As (50), Ba (50), Ni (50), V (50), Zn (50), Mn (30), Co (25), Pb (25), Be (20), Cd (20), Cr (20), Cu (20), Bi (10), Se (10), Ti (10)	2 % HNO <sub>3</sub>	<b>2642.1</b>	100
ICP Multi-Element Standard Solution XI ② (Concentration in mg/l)	7	Cd (10), Cr (900), Cu (800), Hg (8), Ni (200), Pb (900), Zn (2500)	2 % HNO <sub>3</sub>	<b>2643.1</b>	100
ICP Multi-Element Standard Solution XIII (Concentration in mg/l)	15	Al (500), As (100), Be (100), Cd (25.0), Co (100), Cr (100), Cu (100), Fe (100), Hg (5.0), Mn (100), Ni (100), Pb (100), Se (25.0), V (250), Zn (100)	2 % HNO <sub>3</sub>	<b>2644.1</b>	100
ICP Multi-Element Standard Solution XVI	21	As, Be, Ca, Cd, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sr, Ti, Tl, V, Zn	2 % HNO <sub>3</sub>	<b>2645.1</b>	100
ICP Multi-Element Standard Solution XVII	7	Hf, Ir, Sb, Sn, Ta, Ti, Zr	15 % HCl	<b>2646.1</b>	100
ICP Multi-Element Standard Solution A (Concentration in mg/l)	24	Al (1000), As (100), Ba (500), B (500), Ca (1000), Cd (100), Co (500), Cr (500), Cu (500), Fe (1000), Hg (10), K (1000), Li (100), Mg (1000), Mn (500), Na (1000), Ni (500), Pb (500), Rb (500), Sr (500), Te (500), Ti (500), V (500), Zn (500)	5 % HNO <sub>3</sub>	<b>8248.1</b>	100
ICP Multi-Element Standard Solution B (Concentration in mg/l)	25	Al (200), As (5), Ba (50), B (20), Ca (500), Cd (5), Co (20), Cr (40), Cu (20), Fe (100), Hg (0.5), K (100), Li (10), Mg (500), Mn (10), Na (100), Ni (40), P (40), Pb (10), Rb (10), Sr (100), Te (10), Ti (10), V (40), Zn (50)	5 % HNO <sub>3</sub>	<b>8249.1</b>	100
ICP Multi-Element Standard Solution (9 elements, 1000 mg/l)	9	As, Cd, Cr, Cu, Mo, Ni, Sb, Se, Zn	5 % HNO <sub>3</sub>	<b>9987.1</b>	100
ICP Multi-Element Standard Solution (22 elements, 1 mg/l)	22	As, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sr, Ti, Tl, V, Zn	5 % HNO <sub>3</sub>	<b>2647.1</b>	100
ICP Multi-Element Standard Solution (22 elements, 100 mg/l)	22	As, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sr, Ti, Tl, V, Zn	5 % HNO <sub>3</sub>	<b>2648.1</b>	100
ICP Multi-Element Standard Solution (28 elements, 1 mg/l)	28	Al, Ag, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sr, Ti, Tl, V, Zn	5 % HNO <sub>3</sub>	<b>2649.1</b>	100
ICP Multi-Element Standard Solution (28 elements, 100 mg/l)	28	Al, Ag, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sr, Ti, Tl, V, Zn	5 % HNO <sub>3</sub>	<b>2650.1</b>	100

For additional product data and safety information, see chapter Chemicals A-Z.

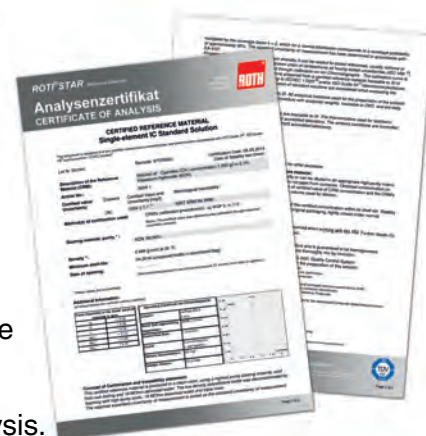
► Multi-element standards for ICP-MS see current catalogue or [www.carlroth.com](http://www.carlroth.com)

# Ion Chromatographie (IC)

## ROTI®Star Standards for IC

Carl ROTH has an extensive range of products which meets the highest standards of quality in the field of ion standards.

The solutions and mixtures are made using materials of the highest purity, and therefore meet the requirements for instrumental analysis by IC. All solutions are certified and can be traced to NIST or BAM standard reference solutions. Solutions are produced according to **ISO 17034** in an accredited environment. The solutions are tested in a laboratory accredited to **ISO/IEC 17025** and supplied with a detailed, batch-specific certificate of analysis.



## Ion Standards for IC

Each standard solution is made of high-purity starting materials, and its content is determined gravimetrically and by ion chromatography. Comprehensive certificates of analysis with ion chromatogram included.

- Single and multi-element standards
- Anion and cation multi-element standards
- Container sizes: 100 ml and 500 ml

### Anion Standards for IC 1000 mg/l (1 g/l) - ready-to-use

ready-to-use

Product	Ion	Matrix	Art. No.	Pack Qty.
Acetate IC Standard Solution	CH <sub>3</sub> COO <sup>-</sup>	H <sub>2</sub> O	1989.1	100 ml
			1989.2	500 ml
Benzoate IC Standard Solution	C <sub>6</sub> H <sub>5</sub> COO <sup>-</sup>	H <sub>2</sub> O	8168.1	100 ml
			8168.2	500 ml
Bromate IC Standard Solution	BrO <sub>3</sub> <sup>-</sup>	H <sub>2</sub> O	8170.1	100 ml
			8170.2	500 ml
Bromide IC Standard Solution	Br <sup>-</sup>	H <sub>2</sub> O	2655.1	100 ml
			2655.2	500 ml
Chlorate IC Standard Solution	ClO <sub>3</sub> <sup>-</sup>	H <sub>2</sub> O	8171.1	100 ml
			8171.2	500 ml
Chloride IC Standard Solution	Cl <sup>-</sup>	H <sub>2</sub> O	2656.1	100 ml
			2656.2	500 ml
Chlorite IC Standard Solution	ClO <sub>2</sub> <sup>-</sup>	H <sub>2</sub> O	8172.1	100 ml
Chromate IC Standard Solution	CrO <sub>4</sub> <sup>2-</sup>	H <sub>2</sub> O	2657.1	100 ml
			2657.2	500 ml
Citrate IC Standard Solution	C <sub>3</sub> H <sub>4</sub> (OH)(COO) <sub>3</sub> <sup>3-</sup>	H <sub>2</sub> O	8173.1	100 ml
			8173.2	500 ml
Cyanide IC Standard Solution	CN <sup>-</sup>	0,1% KOH	2658.1	100 ml
			2658.2	500 ml
Fluoride IC Standard Solution	F <sup>-</sup>	H <sub>2</sub> O	2659.1	100 ml
			2659.2	500 ml
Formate IC Standard Solution	HCOO <sup>-</sup>	H <sub>2</sub> O	1999.1	100 ml
			1999.2	500 ml
Iodate IC Standard Solution	IO <sub>3</sub> <sup>-</sup>	H <sub>2</sub> O	8174.1	100 ml
			8174.2	500 ml
Iodide IC Standard Solution	I <sup>-</sup>	H <sub>2</sub> O	2660.1	100 ml
			2660.2	500 ml
Lactate IC Standard Solution	C <sub>2</sub> H <sub>4</sub> (OH)COO <sup>-</sup>	H <sub>2</sub> O	8176.1	100 ml
			8176.2	500 ml

Product	Ion	Matrix	Art. No.	Pack Qty.
Maleate IC Standard Solution	C <sub>2</sub> H <sub>2</sub> (COO) <sub>2</sub> <sup>2-</sup>	H <sub>2</sub> O	8181.1	100 ml
			8181.2	500 ml
Nitrate IC Standard Solution	NO <sub>3</sub> <sup>-</sup>	H <sub>2</sub> O	2661.1	100 ml
			2661.2	500 ml
Nitrite IC Standard Solution	NO <sub>2</sub> <sup>-</sup>	H <sub>2</sub> O	2664.1	100 ml
			2664.2	500 ml
Oxalate IC Standard Solution	C <sub>2</sub> O <sub>4</sub> <sup>2-</sup>	H <sub>2</sub> O	2008.1	100 ml
			2008.2	500 ml
Perchlorate IC Standard Solution	ClO <sub>4</sub> <sup>-</sup>	H <sub>2</sub> O	8186.1	100 ml
			8186.2	500 ml
Phosphate IC Standard Solution	PO <sub>4</sub> <sup>3-</sup>	H <sub>2</sub> O	2665.1	100 ml
			2665.2	500 ml
Propionate IC Standard Solution	C <sub>2</sub> H <sub>5</sub> COO <sup>-</sup>	H <sub>2</sub> O	8183.1	100 ml
			8183.2	500 ml
Succinate IC Standard Solution	C <sub>2</sub> H <sub>4</sub> (COO) <sub>2</sub> <sup>2-</sup>	H <sub>2</sub> O	8187.1	100 ml
			8187.2	500 ml
Sulphate IC Standard Solution	SO <sub>4</sub> <sup>2-</sup>	H <sub>2</sub> O	2666.1	100 ml
			2666.2	500 ml
Sulphite IC Standard Solution	SO <sub>3</sub> <sup>2-</sup>	H <sub>2</sub> O	8192.1	100 ml
			8192.2	500 ml
Tartrate IC Standard Solution	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub> (COO) <sub>2</sub> <sup>2-</sup>	H <sub>2</sub> O	8201.1	100 ml
			8201.2	500 ml
Thiocyanate IC Standard Solution	SCN <sup>-</sup>	H <sub>2</sub> O	8205.1	100 ml
			8205.2	500 ml
Thiosulphate IC Standard Solution	S <sub>2</sub> O <sub>3</sub> <sup>2-</sup>	0,1 % Pentanol	8207.1	100 ml
			8207.2	500 ml

For additional product data and safety information, see chapter Chemicals A-Z.

## Cation Standards for IC 1000 mg/l (1 g/l) - ready-to-use

ready-to-use

Product	Ion	Matrix	Art. No.	Pack Qty.
Ammonium IC Standard Solution	NH <sub>4</sub> <sup>+</sup>	H <sub>2</sub> O	2654.1	100 ml
			2654.2	500 ml
Barium IC Standard Solution	Ba <sup>2+</sup>	H <sub>2</sub> O	8167.1	100 ml
			8167.2	500 ml
Caesium IC Standard Solution	Cs <sup>+</sup>	H <sub>2</sub> O	8166.1	100 ml
Calcium IC Standard Solution	Ca <sup>2+</sup>	H <sub>2</sub> O	1986.1	100 ml
			1986.2	500 ml
Potassium IC Standard Solution	K <sup>+</sup>	H <sub>2</sub> O	1985.1	100 ml
			1985.2	500 ml
Lithium IC Standard Solution	Li <sup>+</sup>	H <sub>2</sub> O	8158.1	100 ml
			8158.2	500 ml
Magnesium IC Standard Solution	Mg <sup>2+</sup>	H <sub>2</sub> O	1987.1	100 ml
			1987.2	500 ml
Sodium IC Standard Solution	Na <sup>+</sup>	H <sub>2</sub> O	1984.1	100 ml
			1984.2	500 ml
Strontium IC Standard Solution	Sr <sup>2+</sup>	H <sub>2</sub> O	1988.1	100 ml
			1988.2	500 ml

For additional product data and safety information, see chapter Chemicals A-Z.

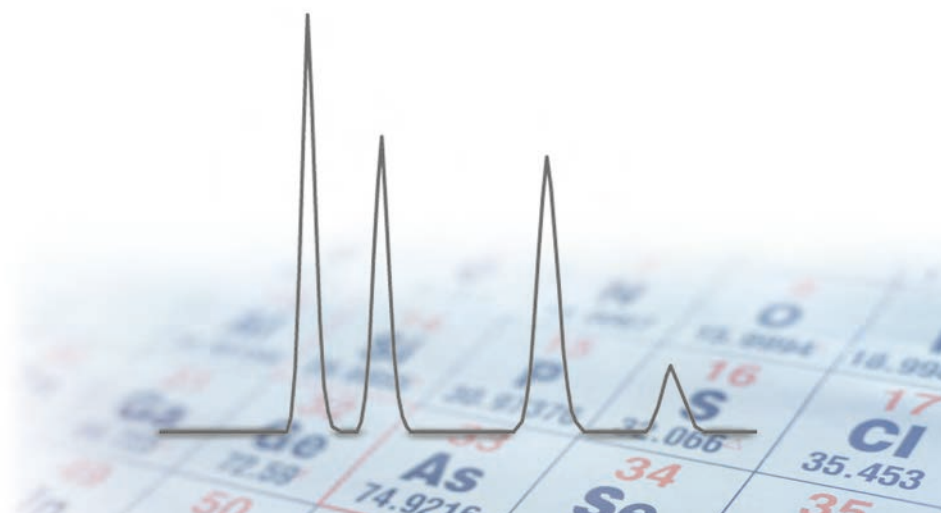
## Ion Multi-Element Standards for IC - ready-to-use

ready-to-use

Designation	Elements	Composition	Matrix	Art. No.	Pack Qty.
Anion Multi-Element Standard I, 1000 mg/l	3	Cl <sup>-</sup> , NO <sub>3</sub> <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup>	H <sub>2</sub> O	2026.1	100 ml
				2026.2	500 ml
Anion Multi-Element Standard II, 1000 mg/l	3	Br <sup>-</sup> , F <sup>-</sup> , PO <sub>4</sub> <sup>3-</sup>	H <sub>2</sub> O	2029.1	100 ml
				2029.2	500 ml
Anion Multi-Element Standard, 10 mg/l	6	Br <sup>-</sup> , Cl <sup>-</sup> , F <sup>-</sup> , NO <sub>3</sub> <sup>-</sup> , PO <sub>4</sub> <sup>3-</sup> , SO <sub>4</sub> <sup>2-</sup>	H <sub>2</sub> O	2030.1	100 ml
				2030.2	500 ml
Anion Multi-Element Standard (concentration in mg/l)	7	Br <sup>-</sup> (25), Cl <sup>-</sup> (10), F <sup>-</sup> (5), NO <sub>2</sub> <sup>-</sup> (15), NO <sub>3</sub> <sup>-</sup> (25), PO <sub>4</sub> <sup>3-</sup> (40), SO <sub>4</sub> <sup>2-</sup> (30)	H <sub>2</sub> O	2668.1	100 ml
				2668.2	500 ml
Cation Multi-Element Standard, 10 mg/l	4	Ca <sup>2+</sup> , K <sup>+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup>	H <sub>2</sub> O	2032.1	100 ml
				2032.2	500 ml
Cation Multi-Element Standard (concentration in mg/l)	6	Ca <sup>2+</sup> (40), K <sup>+</sup> (20), Li <sup>+</sup> (10), Mg <sup>2+</sup> (20), Na <sup>+</sup> (20), NH <sub>4</sub> <sup>+</sup> (40)	0,1 % HNO <sub>3</sub>	2669.1	100 ml
				2669.2	500 ml

For additional product data and safety information, see chapter Chemicals A-Z.

- ▶ Ultra pure acids, alkaline solutions and water for IC see current catalogue or [www.carlroth.com](http://www.carlroth.com)
- ▶ High-purity salts for preparing eluent mixtures see current catalogue or [www.carlroth.com](http://www.carlroth.com)



## QuEChERS Products

### For pesticide residue analysis in food

Within a few years after its development the QuEChERS method has gained a leading position for determination of pesticide residues in food samples by GC-MS or LC-MS, allowing rapid and cheap clean-up of highly matrix-contaminated samples.

For optimising the extraction of pH-dependent compounds, for minimising decomposition of sensitive substances, and for broadening the matrix spectrum, different modifications of the QuEChERS method have been elaborated.

In addition to the required adsorbent Silica gel 60 diamino a number of individually weighed and premixed buffer and extraction mixtures are offered, specially composed for different sample matrices.

For extraction, the European standard EN 15662 recommends a citrate extraction mix (Mix I), while AOAC standard 2007.1 uses an acetate extraction mix (Mix II).

For clean-up, the Diamino phase (PSA) removes, e.g. sugars and organic acids. Magnesium sulphate removes water, C<sub>18</sub> ec removes nonpolar interferences such as fats and the carbon phase removes pigments, sterols, and non-polar interferences.



#### Standard clean-up in food samples:

10 g sample are homogenised with 10 ml acetonitrile. After adding the internal standard the sample is shaken with 4 g magnesium sulphate and 1 g sodium chloride and afterwards centrifuged. 1 ml of the supernatant is spiked with 25 mg CHROMABOND® Diamino and 150 mg magnesium sulphate and shaken again. After centrifugation the supernatant is injected to GC-MS.

To select the proper clean-up mix see following table.

Sample property	Low fat content (e.g. apples, strawberries)	Moderate content of chlorophyll and carotinoids (e.g. carrots, lettuce)	High content of chlorophyll and carotinoids (e.g. bell peppers, spinach)	High fat content (e.g. avocado)
Extraction	Mix I or Mix II Citrate or acetate extraction	Mix I or Mix II Citrate or acetate extraction	Mix I Citrate extraction	Mix I Citrate extraction
Clean-up	Mix III Diamino clean-up	Mix IV Diamino/Carbon clean-up	Mix V Diamino/Carbon clean-up (higher carbon content)	Mix VI Diamino/C <sub>18</sub> ec clean-up

### Extraction mixes

Product	Type	Composition	Art. No.	Pack Qty.
QuEChERS Extraction Mix I	CHROMABOND® Citrate mix	Magnesium sulphate, anhydrous 4 g / Sodium chloride 1 g / di-Sodium hydrogen citrate 1,5-hydrate 0,5 g / tri-Sodium citrate dihydrate 1 g	4867.1	50 x 15 ml
QuEChERS Extraction Mix II	CHROMABOND® Acetate mix	Magnesium sulphate, anhydrous 6 g / Sodium acetate 1,5 g	4868.1	50 x 15 ml

### Clean-up mixes

Product	Type	Composition	Art. No.	Pack Qty.
QuEChERS Clean-up Mix III	CHROMABOND® Diamino mix	Magnesium sulphate, anhydrous 0,9 g / CHROMABOND® Diamino 0,15 g	4870.1	50 x 15 ml
QuEChERS Clean-up Mix IV	CHROMABOND® Diamino/Carbon mix	Magnesium sulphate, anhydrous 0,9 g / CHROMABOND® Diamino 0,15 g / CHROMABOND® Carbon 0,015 g	4871.1	50 x 15 ml
QuEChERS Clean-up Mix V	CHROMABOND® Diamino/Carbon mix	Magnesium sulphate, anhydrous 0,9 g / CHROMABOND® Diamino 0,15 g / CHROMABOND® Carbon 0,045 g	4875.1	50 x 15 ml
QuEChERS Clean-up Mix VI	CHROMABOND® Diamino/C <sub>18</sub> ec mix	Magnesium sulphate, anhydrous 0,9 g / CHROMABOND® Diamino 0,15 g / CHROMABOND® C <sub>18</sub> ec 0,15 g	4877.1	50 x 15 ml

For additional product data and safety information, see chapter Chemicals A-Z.

► Silica gels for the QuEChERS method see current catalogue or [www.carlroth.com](http://www.carlroth.com)



## Flash Chromatography



### CHROMABOND® Flash DL empty cartridges

- Suitable as solid injection system or for self-filling and packaging of flash cartridges
- Female Luer lock inlet and male Luer outlet
- Each cartridge comes with 3 filter elements: one already inserted, two more filters aside

Product	Column length (cm)	Inner Ø (mm)	For filling quantity SiOH (g)	For filling quantity kieselgur (g)	Volume (ml)	Art. No.	Pack Qty.
CHROMABOND® Flash DL 4	9,8	12,4	4	3	8	<b>8909.1</b>	50 pieces
CHROMABOND® Flash DL 15	11,6	21,2	15	10	30	<b>8910.1</b>	50 pieces
CHROMABOND® Flash DL 25	16,5	21,2	25	15	45	<b>8912.1</b>	50 pieces
CHROMABOND® Flash DL 40	17,1	26,4	40	30	75	<b>8917.1</b>	20 pieces
CHROMABOND® Flash DL 80	24,0	30,8	80	60	160	<b>8920.1</b>	20 pieces
CHROMABOND® Flash DL 120	25,2	36,0	120	80	220	<b>8924.1</b>	20 pieces
CHROMABOND® Flash DL 200	20,0	60,0	200	150	410	<b>8928.1</b>	10 pieces
CHROMABOND® Flash DL 330	27,0	60,0	330	250	600	<b>8932.1</b>	10 pieces

ready-to-use

### CHROMABOND® Flash RS cartridges SiOH

For Isco® Flash instruments

- Female Luer lock inlet and male Luer outlet
- Adsorbent: standard silica, unmodified (SiOH)
- Particle size 40-63 µm, specific surface 500 m<sup>2</sup>/g
- pH stability 2-8



Product	Column length (cm)	Inner Ø (mm)	Adsorbent weight (g)	Art. No.	Pack Qty.
CHROMABOND® Flash RS 15 SiOH	11,6	21,2	15	<b>8664.1</b>	20 pieces
CHROMABOND® Flash RS 25 SiOH	16,5	21,2	25	<b>8670.1</b>	15 pieces
CHROMABOND® Flash RS 40 SiOH	17,1	26,4	40	<b>8674.1</b>	15 pieces
CHROMABOND® Flash RS 80 SiOH	24,0	30,8	80	<b>8675.1</b>	12 pieces
CHROMABOND® Flash RS 120 SiOH	25,2	36,0	120	<b>8681.1</b>	10 pieces
CHROMABOND® Flash RS 200 SiOH	20,0	60,0	200	<b>8708.1</b>	6 pieces
CHROMABOND® Flash RS 330 SiOH	27,0	60,0	330	<b>8714.1</b>	4 pieces



# Sample Preparation

## Solid Phase Extraction



### SPE-polypropylene columns CHROMABOND® HR-P

Highly porous polystyrene/divinylbenzene copolymer  
Particle size: 50-100 µm  
Spec. surface: 1200 m<sup>2</sup>/g

**Recommended applications:** Aromatic compounds, phenols from water, nitroaromatic compounds from water, pesticides from water, PAHs from oil

**Similar phases:** Strata® SDB-L, Bond Elut ENV, Bond Elut LMS, Bakerbond™ H<sub>2</sub>O-phobic DVB, Isolute® 101, LiChrolut® EN

Volume (ml)	Adsorbent weight (mg)	Art. No.	Pack Qty.
3	200	N760.1	30
3	200	N760.2	250 (5x50)
3	500	N761.1	30
6	500	N762.1	30
6	1000	N763.1	30



### SPE-polypropylene columns CHROMABOND® HR-XC

Benzenesulphonic acid modified spherical polystyrene/divinylbenzene copolymer, strong cation exchanger (mixed-mode)

Pore size: 65-75 Å, particle size: 85 µm  
Spec. surface: 800 m<sup>2</sup>/g, pH-stability: 1-14  
Pore volume: 1,4 cm<sup>3</sup>/g

Exchange capacity: 1,0 meq/g  
RP-capacity: 300 mg/g (caffeine in water)

**Please note:** high-purity material with homogenous surface and optimised pore structure - due to optimised production process - enables lowest blanks, outstanding recovery rates and highest reproducibility. Especially for the enrichment of basic analytes.

**Recommended applications:** Basic active ingredients from strongly matrix contaminated samples like urine, plasma, serum, fungicides from food, basic analytes like e.g. amines, bases with pKa 2-10

**Similar phases:** Oasis® MCX, Strata™-X-C, Styre Screen® DBX, Hyper Sept™ Retain

Volume (ml)	Adsorbent weight (mg)	Art. No.	Pack Qty.
3	60	3090.1	30
3	200	3092.1	30
6	500	3095.1	30



### SPE Polypropylene column CHROMABOND® SA/SiOH

Extraction of PCBs from waste oil.

Special combination phase:

**SA:** strongly acidic cation exchanger based on silica with benzenesulphonic acid modification

**SiOH:** unmodified silica for removal of polar compounds

**Recommended application:** extraction of PCBs from waste oil (hexane extract)

**Similar phases:** Bakerbond™ PCB-N

Volume (ml)	Adsorbent weight (mg)	Art. No.	Pack Qty.
3	500/500	CN42.1	50
3	500/500	CN42.2	250 (5x50)

### SPE-polypropylene columns CHROMABOND® HR-X

Spherical, hydrophobic polystyrene/divinylbenzene copolymer

Pore size: 55-60 Å, particle size: 85 µm  
Spec. surface: 1000 m<sup>2</sup>/g, pH stability: 1-14  
RP-capacity: 390 mg/g (caffeine in water)

**Please note:** high-purity material with homogenous surface and optimised pore structure - due to optimised production process - enables lowest blanks, outstanding recovery rates and highest reproducibility. Especially for the enrichment of pharmaceuticals and active ingredients.

**Recommended applications:** pharmaceuticals/active ingredients from tablets, creams and water/waste water, drugs and pharmaceuticals from urine, blood, serum and plasma, trace analysis of pesticides, herbicides, phenols, PAHs and PCBs from water

**Similar phases:** Supelclean™ ENVI-Chrom P, Strata™-X, Oasis® HLB, Bond Elut Nexus

Volume (ml)	Adsorbent weight (mg)	Art. No.	Pack Qty.
1	30	3079.1	30
3	200	3081.1	30
3	200	3081.2	250 (5x50)
6	200	3086.1	30
6	200	3086.2	250 (5x50)
6	500	3087.1	30



### SPE-polypropylene columns CHROMABOND® HR-XCW

Carboxylic acid modified spherical polystyrene/divinylbenzene copolymer, weak acidic cation exchanger (mixed-mode)

Pore size: 50-60 Å, particle size: 85 µm  
Spec. surface: 850 m<sup>2</sup>/g, pH stability: 1-14  
Pore volume: 1,2-1,4 cm<sup>3</sup>/g

Exchange capacity: >0,7 meq/g  
RP capacity: 350 mg/g (caffeine in water)

**Please note:** high-purity material with homogenous surface and optimised pore structure - due to optimised production process - enables lowest blanks, outstanding recovery rates and highest reproducibility. Especially for the enrichment of basic analytes.

**Recommended applications:** Active ingredients from strongly matrix contaminated samples like e.g. urine, plasma, serum, strong bases with pKa >10. Basic compounds like quaternary amines.

**Similar phases:** Oasis® WCX, Strata™-X-CW

Volume (ml)	Adsorbent weight (mg)	Art. No.	Pack Qty.
3	60	3917.1	30
3	200	3919.1	30
3	500	3924.1	30



## Solid Phase Extraction



### SPE-polypropylene columns CHROMABOND® CN/SiOH

#### Enrichment of PAHs from soil

Special combination phase:

**CN:** Cyanopropyl phase for selective adsorption of polycyclic aromatics via  $\pi$ - $\pi$  interactions

**SiOH:** Unmodified silica phase for removal of polar components

**Recommended application:** extraction of the 16 PAHs according to EPA from soil samples

Volume (ml)	Adsorbent weight (mg)	Art. No.	Pack Qty.
3	500/1000	<b>2992.1</b>	50
6	500/1000	<b>2995.1</b>	30
6	500/1000	<b>2995.2</b>	250 (5x50)



### SPE-polypropylene columns CHROMABOND® C18 ec

#### Octadecyl-modified silica gel, endcapped

Pore size: 60 Å, particle size: 45 µm

Spec. surface: **500 m<sup>2</sup>/g**, pH stability: 2-8

**Please note:** Extremely non-polar, hydrophobic interaction with many organic compounds.

**Recommended applications: non-polar compounds,** preservatives, fatty acids, PAHs, pesticides, PCBs, heavy metals, vitamins, aflatoxins, amphetamines, antibiotics, antiepileptics, barbiturates, caffeine, nicotine, drugs, etc. Ideal for the determination of phthalates. Also suitable for desalting samples.

**Similar phases:** Strata® C18-E, Sep-Pak® tC18, Bond Elut C18, Discovery® DSC-18(Lt), ENVI-18, Supelclean™ LC-18, CLEAN-UP® C18, Bakerbond™ Octadecyl, Isolute® C18(EC), LiChrolut® RP-18 E

Volume (ml)	Adsorbent weight (mg)	Art. No.	Pack Qty.
1	100	<b>N745.1</b>	100
3	200	<b>N746.1</b>	50
3	500	<b>N747.1</b>	50
3	500	<b>N747.2</b>	250 (5x50)
6	500	<b>N748.1</b>	30
6	500	<b>N748.2</b>	250 (5x50)
6	1000	<b>N749.1</b>	30
6	1000	<b>N749.2</b>	250 (5x50)



### SPE-polypropylene columns CHROMABOND® Easy

#### Polar modified polystyrene/divinylbenzene copolymer with a weak ion exchanger

Pore size: 50 Å, particle size: 80 µm

Spec. surface: **650-700 m<sup>2</sup>/g**, pH-stability: 1-14

**Please note:** Due to its bifunctional modification it is much more hydrophilic than conventional polystyrene/divinylbenzene polymers and thus easily wettable with water.

**Recommended applications:** Drug analysis from urine, blood, serum, plasma, pharmaceuticals/active ingredients from tablets, creams, polar herbicides/pesticides from water (acidic, neutral, basic), polar phenols from water, PAHs, PCBs

**Similar phases:** Strata™-X, Oasis® HLB, Sep-Pak® Porapak RDX, Nexus, Bond Elut® PPL, Styre Screen® DVB, Bakerbond™ H<sub>2</sub>O philic DVB, Isolute® ENV+

Volume (ml)	Adsorbent weight (mg)	Art. No.	Pack Qty.
3	60	<b>1335.1</b>	30
3	200	<b>1336.1</b>	30
3	200	<b>1336.2</b>	250 (5x50)
3	500	<b>1337.1</b>	30
6	200	<b>1338.1</b>	30
6	200	<b>1338.2</b>	250 (5x50)
6	500	<b>1339.1</b>	30

### SPE-polypropylene columns CHROMABOND® Florisil®

#### Magnesium silicate, high-purity

MgO - SiOH (15:85)

Particle size: 150-250 µm

**Recommended applications:** PCBs, PAHs, aliphatic carboxylic acids, organic tin compounds

**Similar phases:** Strata® FL-PR Florisil®, Sep-Pak® Florisil®, Bond Elut Florisil®, Supelclean™ ENVI-Florisil®, Supelclean™ LC-Florisil®, CLEAN-UP® Florisil®, Bakerbond™ Florisil®, Isolute® FL, LiChrolut® Florisil®

Volume (ml)	Adsorbent weight (mg)	Art. No.	Pack Qty.
3	200	<b>N764.1</b>	50
3	500	<b>N765.1</b>	50
6	1000	<b>1291.1</b>	30
6	1000	<b>1291.2</b>	250 (5x50)



### Adapter

For coupling of several CHROMABOND® columns of the same or different sizes or for coupling of disposable syringes with CHROMABOND® columns.

Art. No.	Pack Qty.
<b>2996.1</b>	4
<b>2996.2</b>	10

► Hose adapters as accessories for the solid phase extraction see current catalogue or [www.carlroth.com](http://www.carlroth.com)

# Sample Preparation

## Syringe filters



### ReZist®-syringe filters

By Whatman. **Hydrophobic**. Ideal for ventilation, gas filtration and HPLC-sample preparation of organic solvents. Luer-Lock inlet/Luer outlet.

Membrane-Ø 30 mm, outer 34 mm

Pore size (µm)	Membrane material	Colour code	Material housing	Art. No.	Pack Qty.
0,2	PTFE	white	PP	5994.2	100
0,45	PTFE	green	PP	5996.2	100
1	PTFE	yellow	PP	5998.2	100
5	PTFE	grey	PP	6000.2	100

### Rotilabo®-syringe filters

With hydrophilic or hydrophobic membranes.

**Hydrophilic membrane: Polyethersulfone (PES)**  
For removing finest particles from **aqueous** solutions.

**Hydrophilic membrane: Cellulose mixed ester (CME = Cellulose acetate and -nitrate)**  
For clear filtration of **aqueous** solutions.

**Hydrophilic membrane: Polyvinylidene fluoride (PVDF)**  
For clear filtration of **aqueous and slightly organic** solutions.

**Hydrophilic membrane: Nylon**  
For clear filtration of **aqueous and organic** solutions.

**Hydrophobic membrane: Polytetrafluoroethylene (PTFE)**  
For clear filtration of **organic** solutions and for air filtration.

#### Technical specifications:

Nominal-Ø (mm)	13	25	33
Sample capacity (ml)	up to 10	up to 100	up to 100
Dead capacity (µl)	<15	<100	<80
Max. Input pressure (bar)	10	5	8.6
Max. operating temperature (°C)	45	45	45
Filter surface (cm²)	0,8	3,9	4,52
Connection	Luer-Lock inlet / Luer outlet		

#### Non-sterile, nominal-Ø 13 mm, Ø outer 19 mm

Pore size (µm)	Membrane material	Material housing	Art. No.	Pack Qty.
0,20	nylon	PP	CCX8.1	100
0,45	nylon	PP	CCX9.1	100
0,22	PVDF	PP	CCY0.1	100
0,45	PVDF	PP	CCY1.1	100
0,20	PTFE	PP	CCY2.1	100
0,45	PTFE	PP	CCY3.1	100

#### Non-sterile, nominal-Ø 25 mm, Ø outer 29 mm

Pore size (µm)	Membrane material	Material housing	Art. No.	Pack Qty.
0,20	PTFE	PE	P815.1	100
0,45	PTFE	PE	P816.1	100
5,0	PTFE	PE	P817.1	100
0,22	CME	PVC	P818.1	100
0,45	CME	PVC	P819.1	100
0,8	CME	PVC	P820.1	100

**Non-sterile, Ø outer 33 mm. Increased speed of flow due to larger filter surface and higher allowable operating pressure.**

Pore size (µm)	Membrane material	Material housing	Art. No.	Pack Qty.
0,22	PES	co-polymer	P821.1	100
0,20	Nylon	PP	KY61.1	100
0,45	Nylon	PP	KY64.1	100
0,22	PVDF	PP	KY62.1	100
0,45	PVDF	PP	KY63.1	100



### Millex®-PTFE-filter units IC

By MERCK MILLIPORE. **IC-certified**.

Specially designed for sample preparation in ion chromatography.

- Low extractable substances content
- Low-binding hydrophilic PTFE membrane
- For clear filtration of aqueous and slightly organic solutions

#### Technical specifications:

Membrane Ø (mm)	13	25
Type	<b>non-sterile</b>	
Housing material	HDPE	
Sample volume (ml)	up to 10	up to 100
Dead volume (µl)	< 25	< 100
Max. inlet pressure (bar)	7	
Max. working temperature (°C)	45	
Inlet connection	Luer-Lock	
Outlet connection	Luer	

Type	Pore size (µm)	Membrane Ø (mm)	Art. No.	Pack Qty.
Millex®-LG	0,20	13	XE82.1	100
Millex®-LG	0,20	25	XE83.1	50
Millex®-LH	0,45	13	XE84.1	100
Millex®-LH	0,45	25	XE85.1	50



**A 121 °C**

## DURAN® GL 45 HPLC reservoir bottles

Made of borosilicate glass 3.3. Outstanding chemical resistance, extremely low profile of extractable inorganic ions; free from organic extractable substances. Safe and practical alternative to media bottles with a flat bottom. The central cavity in the base of the bottle enables mobile phases and solvents to be dispensed without having to tilt the bottle. The side opening on the base of the bottle prevents the bottle from floating during degassing in an ultrasonic bath and enables water to drain away after cleaning. GL 45 thread.

With retrace code. Autoclavable at 121 or 134 °C.

**Delivery without lock.**

Volume (ml)	Outside Ø (mm)	Height (mm)	Art. No.	Pack Qty.
1000	110	295	<b>KCP3.1</b>	1
2000	145	309	<b>KCP4.1</b>	1
5000	190	386	<b>KCP5.1</b>	1
10 000	235	481	<b>KCP6.1</b>	1

### Accessories:

GL 45 HPLC connection cap with three threaded connections ¼"-28 for ETFE tubes with outer Ø of 3.2 mm, rounded off by three ¼"-28 ETFE stoppers and O-ring made of TFE/propylene	<b>KCP7.1</b>	1
Replacement ETFE dummy stopper ¼"-28 thread for HPLC connection cap ¼"	<b>KCP8.1</b>	1



Material  
DURAN®

**A 121 °C**

## HPLC-bottles

Made of DURAN®. Vacuum and pressure resistant. With retrace code. Suitable for loading HPLC-equipment and for safe transfer of solvents in closed or sterile systems. Cap can be rotated freely, which prevents the hose from being twisted when changing the bottle.

**Delivery incl.** HPLC-screw cap (Made of PP. GL 45, four metric M8-threaded necks) with hose connection set (4 seal inserts each made of silicone for hose Ø 1.6 mm and Ø 3.2 mm, 4 sealing gaskets made of silicone and 4 screw caps with bore hole).

**Please order pressure compensation set separately if required.**

Type	Art. No.	Pack Qty.
HPLC-bottle 500 ml	<b>KY94.1</b>	2
HPLC-bottle 1000 ml	<b>KY93.1</b>	2

### Accessories:

Screw cap GL 45 with 4 threaded necks and hose connection set	<b>HE24.1</b>	2
Spare hose connection set	<b>HE26.1</b>	1
Spare membrane filter pore size 0.2 µm	<b>HE27.1</b>	2
Pressure compensation set (Screw cap with olive, hose made of tygon, membrane filter)	<b>HE25.1</b>	1
DURAN®-pressure plus-screw thread bottle, 500 ml	<b>CK35.1</b>	1
DURAN®-pressure plus screw top bottle, 1000 ml	<b>H995.1</b>	1



## 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.

### Technical specifications:

Accuracy	≤ ±1 % of nominal volume
Test pressure	0.6 MPa
Working temperature	-10 to +50 °C
Material of body	Borosilicate glass
Tip type 2	<b>12° grinding</b> , bent slightly inwards; for piercing septum, in all chromatographic methods.
Tip type 3	<b>90° grinding, blunt</b> ; for HPLC-applications or for exact dosing e.g. for thin-layer chromatography.

### 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	<b>X033.1</b>	1
702 N	25	0,5	0,15	0,72	<b>X034.1</b>	1
705 N	50	1,0	0,15	0,72	<b>X035.1</b>	1
710 N	100	1,0	0,15	0,72	<b>X036.1</b>	1
725 N	250	5,0	0,15	0,72	<b>X038.1</b>	1
750 N	500	10,0	0,41	0,72	<b>X039.1</b>	1

### Tip type 3:

Model	Volume (µl)	Pitch (µl)	Needle-Ø inside (mm)	Needle-Ø outside (mm)	Art. No.	Pack Qty.
701 NR	10	0,1	0,13	0,47	<b>EY37.1</b>	1
702 NR	25	0,5	0,15	0,72	<b>EY38.1</b>	1
705 NR	50	1,0	0,15	0,72	<b>EY39.1</b>	1
710 NR	100	1,0	0,15	0,72	<b>EY40.1</b>	1
725 NR	250	5,0	0,41	0,72	<b>EY41.1</b>	1
750 NR	500	10,0	0,41	0,72	<b>EY42.1</b>	1



## Certified Vial Kits ND9

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

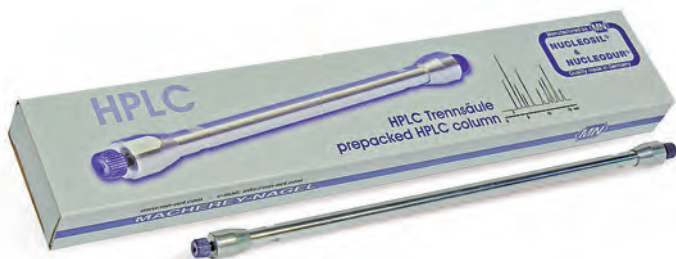
Kits comprising:

- 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.	Pack Qty. (set)
Clear glass, with labelling space	1,5	<b>XC64.1</b>	1
Brown glass, with labelling space	1,5	<b>XC65.1</b>	1

## NUCLEODUR®- Columns for HPLC

NUCLEODUR® as a state-of-the-art silica is the ideal base material for modern HPLC phases. We offer two phases **NUCLEODUR® C18 Gravity** which is ideal for sophisticated analytical separations and **NUCLEODUR® C18 ec** suitable for routine HPLC analysis.



### NUCLEODUR® C<sub>18</sub> Gravity

The ideal phase for overall sophisticated analytical separations

- Especially suitable for LC-MS applications due to low bleeding properties
- Ideal for method development
- Superior base deactivation

#### Properties:

Octadecyl phase, multi-encapped  
Carbon content: 18 %  
Pore size: 110 Å  
pH stability: 1-11  
Eluent on column: acetonitrile / water

#### Applications:

Pharmaceuticals, e.g. analgesics, antiinflammatory drugs, antidepressants, immunosuppressants, phytopharmaceuticals; herbicides

#### Similar phases:

Zorbax® Extend C<sub>18</sub>, Synergi™ 4 µm Max RP, Phenomenex Luna® C<sub>18</sub> (2), Waters Xterra® RP<sub>18</sub> / MS C<sub>18</sub>, Inertsil® ODS III, Purospher® RP-18, Star RP-18, USP L1

#### NUCLEODUR® C<sub>18</sub> Gravity, particle size 3 µm

Innner Ø (mm)	Length (mm)	Art. No.	Pack Qty.
4	250	<b>KK86.1</b>	1
4,6	150	<b>KK87.1</b>	1
4,6	250	<b>KK88.1</b>	1

#### NUCLEODUR® C<sub>18</sub> Gravity, particle size 5 µm

Innner Ø (mm)	Length (mm)	Art. No.	Pack Qty.
4	250	<b>KK89.1</b>	1
4,6	150	<b>KK90.1</b>	1
4,6	250	<b>KK91.1</b>	1

### NUCLEODUR® C<sub>18</sub> ec

The ideal standard RP phase for routine HPLC analysis

- Cost-effective and reliable
- Long-life columns
- For all standard routine applications in modern RP-chromatography

#### Properties:

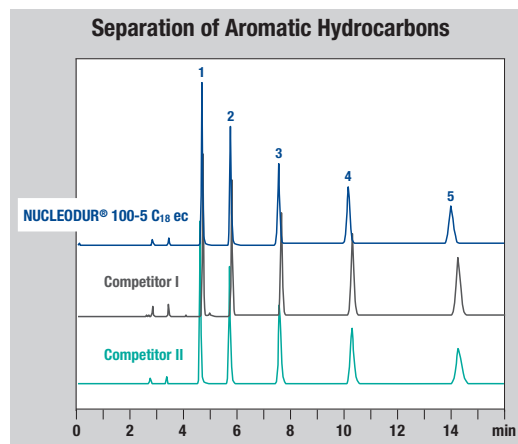
Octadecyl phase, endcapped  
Carbon content: 17,5 %  
Pore size: 110 Å  
pH stability: 1-9  
Eluent on column: acetonitrile / water

#### Applications:

Basic, neutral or acidic pharmaceuticals, derivatised amino acids, pesticides, aldehydes and ketones, fat-soluble vitamins, phenolic compounds

#### Similar phases:

For many applications the following phases can be replaced with identical or even better results: NUCLEOSIL® C<sub>18</sub>, Spherisorb® ODS I and II, Hypersil® ODS, Waters Symmetry® C<sub>18</sub>, Inertsil® ODS II, Kromasil® C<sub>18</sub>, LiChrospher® RP<sub>18</sub>, RP C<sub>18</sub> ec, USP L1



#### Conditions:

Eluent: acetonitril / water (75/25, v/v)  
Flow: 1,3 ml/min  
Temperature: 30 °C  
Detection: UV 254 nm

#### Legend:

1. Toluene, 2. Ethylbenzene, 3. Propylbenzene, 4. Butylbenzene, 5. Pentylbenzene

#### NUCLEODUR® 100-3 C<sub>18</sub> ec, particle size 3 µm

Innner Ø (mm)	Length (mm)	Art. No.	Pack Qty.
4	250	<b>KK80.1</b>	1
4,6	150	<b>KK81.1</b>	1
4,6	250	<b>KK82.1</b>	1

#### NUCLEODUR® 100-5 C<sub>18</sub> ec, particle size 5 µm

Innner Ø (mm)	Length (mm)	Art. No.	Pack Qty.
4	250	<b>KK83.1</b>	1
4,6	150	<b>KK84.1</b>	1
4,6	250	<b>KK85.1</b>	1

- Universal precolumns see catalogue or [www.carlroth.com](http://www.carlroth.com)

## ROTISOLV® Ultra LC-MS Solvents



Short analysis times in ultra-fast HPLC as well as systems coupled to a mass spectrometer require solvents which offer utmost reliability, sensitivity and reproducibility.

Our **ROTISOLV® Ultra LC-MS solvents** are specially suited for meeting these demands and have undergone extremely intensive production and quality controls.

### Properties:

- Filtered through **0,1 µm** membrane
- Extra high purity (≥99,98 %)
- Bottled under protective gas
- High UV-permeability
- Low fluorescence
- LC-MS suitability tested
- Solid residue from evaporation max. 1 ppm
- Metal trace impurities max. 100 ppb

## ROTISOLV® LC-MS-Grade Solvents



Modern analysis methods such as LC-MS (combination of liquid chromatography and mass spectrometry) call for a special solvent quality which has the required purity and which has been tested under application-oriented conditions.

Very high purity and very low metal concentrations are features of these products which allow exact interpretations of the mass spectra.

- High chemical purity (≥99,95 %)
- High UV-permeability
- Low fluorescence
- Superior gradient baseline
- Metal trace impurities (≤0,05 ppm)
- Test for LC-MS suitability
- Filtered through 0,2 µm membrane
- Bottled under inert gas

Product	Purity	Art. No.	Pack Qty. (l)	Packaging
Acetonitril	≥99,98 %, Ultra LC-MS	HN40.1	1	glass
		HN40.2	2,5	glass
Methanol	≥99,98 %, Ultra LC-MS	HN41.1	1	glass
		HN41.2	2,5	glass
2-Propanol	≥99,95 %, Ultra LC-MS	0733.1	1	glass
		0733.2	2,5	glass
Tetrahydrofuran	≥99,9 %, Ultra LC-MS, not stabilised	0739.1	1	glass
Water	Ultra LC-MSUltra LC-MS	HN43.1	1	glass
		HN43.2	2,5	glass

Product	Purity	Art. No.	Pack Qty. (l)	Packaging
Acetonitrile	≥99,95 %, LC-MS-Grade	AE70.1	1	glass
		AE70.2	2,5	glass
Acetic acid ethyl ester	≥99,9 %, LC-MS-Grade	AE69.1	1	glass
		AE69.2	2,5	glass
Methanol	≥99,95 %, LC-MS-Grade	AE71.1	1	glass
		AE71.2	2,5	glass
2-Propanol	≥99,95 %, LC-MS-Grade	AE73.1	1	glass
		AE73.2	2,5	glass
Water	LC-MS-Grade	AE72.1	1	plastic
		AE72.2	5	plastic

### Safety data sheets

can be found on our homepage next to the product description.

## ROTISOLV® HPLC Solvents for liquid chromatography



Available in different quality grades:

- HPLC Grade
- HPLC Gradient Grade
- HPLC Ultra Gradient Grade

ROTISOLV® HPLC solvents meet all the requirements in high-performance liquid chromatography (HPLC). Their application ranges from routine applications (HPLC Grade) to specific analytic tasks (HPLC Ultra Gradient Grade).

- High chemical purity
- High UV-permeability
- Low fluorescence
- Low residue from evaporation
- Low water and acid content
- Filtered through 0,2 µm membrane
- Bottled under inert gas

## ROTISOLV® HPLC Solvents

Product	Purity	Art. No.	Pack Qty.	Packaging
Acetone	HPLC	7328.1	1 l	glass
		7328.2	2,5 l	glass
Acetonitrile	HPLC Ultra Gradient Grade	T195.1	1 l	glass
		T195.2	2,5 l	glass
	HPLC Gradient Grade	8825.1	1 l	glass
		8825.2	2,5 l	glass
	HPLC Gradient	HN44.1	1 l	glass
		HN44.2	2,5 l	glass
	HPLC	7330.1	1 l	glass
		7330.2	2,5 l	glass
	HPLC, isocratic	CN20.1	1 l	glass
		CN20.2	2,5 l	glass
≥99,8 %, for preparative HPLC	6827.1	2,5 l	glass	
	6827.2	25 l	tinplate	
1-Butanol	HPLC	T178.1	2,5 l	glass
tert-Butyl methyl ether	HPLC	T175.2	1 l	glass
		T175.1	2,5 l	glass
Cyclohexane	HPLC	7333.2	1 l	glass
		7333.1	2,5 l	glass
Dichloromethane	HPLC	7334.2	1 l	glass
		7334.1	2,5 l	glass
N,N-Dimethylformamide (DMF)	HPLC	0702.1	2,5 l	glass
Dimethyl sulphoxide (DMSO)	HPLC	0728.1	2,5 l	glass
1,4-Dioxane	HPLC, not stabilised	X949.1	1 l	glass
		X949.2	2,5 l	glass
Acetic acid ethyl ester	HPLC	7336.2	1 l	glass
		7336.1	2,5 l	glass
Ethanol	HPLC Gradient Grade	P076.1	1 l	glass
		P076.2	2,5 l	glass
n-Heptanen-Heptane	≥99 %, HPLC	6828.1	2,5 l	glass
		7337.2	1 l	glass
		7337.1	2,5 l	glass
n-Hexane	HPLC	7339.2	1 l	glass
		7339.1	2,5 l	glass
Isohexane	HPLC	T176.2	1 l	glass
		T176.1	2,5 l	glass
Isooctane	HPLC	7340.1	2,5 l	glass
Methanol	HPLC Ultra Gradient Grade	X948.1	1 l	glass
		X948.2	2,5 l	glass
	HPLC Gradient Grade	7342.1	1 l	glass
		7342.2	2,5 l	glass
HPLC Gradient	KK39.2	2,5 l	glass	
	HPLC	P717.2	1 l	glass
P717.1		2,5 l	glass	
n-Pentane	HPLC	CN99.1	1 l	glass
		CN99.2	2,5 l	glass
Petroleum ether 40-60 °C	HPLC	0731.1	2,5 l	glass
1-Propanol	HPLC	T177.1	2,5 l	glass
2-Propanol	HPLC	7343.2	1 l	glass
		7343.1	2,5 l	glass
Tetrahydrofuran	HPLC, not stabilised	7344.1	1 l	glass
		7344.2	2,5 l	glass
Toluene	HPLC	7346.2	1 l	glass
		7346.1	2,5 l	glass
Trichloromethane/Chloroform	HPLC	7331.2	1 l	glass
		7331.1	2,5 l	glass
Water	HPLC, Gradient Grade	A511.1	1 l	glass
		A511.2	2,5 l	glass
		A511.3	5 l	plastic
		A511.7	20 l	plastic

For additional product data and safety information, see chapter Chemicals A-Z.



# Sample Preparation



## Spectra/Por® Float-A-Lyzer® G2

Ready-to-use Dialysis device combining efficiency, convenience and sample protection **with a sample recovery rate of 95-98 %**. The cylindrical dialysis tubing from cellulose ester is fixed to polycarbonate pieces. **Packaged dry** with glycerol to protect against brittleness. Before use the glycerol is to be removed by rinsing with distilled water for 15-30 min.

- Sample volume 1-10 ml
- The leak-proof screw-on cap allows easy for handling and in-process testing during dialysis is possible
- The tubing is made of cellulose ester with no heavy metal and sulfide contaminants, therefore, no special purification is necessary
- Low-protein and liposome binding membrane, can be used directly with biological samples
- Flotation ring improves sample buoyancy and vertical orientation during dialysis
- Available in precise MWCOs with colour-coded caps
- Several Float-A-Lyzer can be used in one vessel

### Technical specifications:

Capacity	1 ml	5 ml	10 ml
Length (mm)	50	100	160
Membrane Diameter (mm)	10	10	10
Top Piece Diameter (mm)	23	23	23
Flotation Ring Diameter (mm)	38	38	38

MWCO	Colour code	5 ml	10 ml	10 ml
		Art. No.	Art. No.	Art. No.
100-500	green	<b>P560.1</b>	<b>P586.1</b>	<b>P599.1</b>
500-1000	orange	<b>4549.1</b>	<b>4617.1</b>	<b>4657.1</b>
3500-5000	black	<b>P564.1</b>	<b>P590.1</b>	<b>P603.1</b>
8000-10 000	yellow	<b>P566.1</b>	<b>P592.1</b>	<b>P605.1</b>
20 000	red	<b>P568.1</b>	<b>P594.1</b>	<b>P607.1</b>
50 000	violet	<b>P569.1</b>	<b>P595.1</b>	<b>P608.1</b>
100 000	blue	<b>P570.1</b>	<b>P596.1</b>	<b>P609.1</b>
300 000	amber	<b>4550.1</b>	<b>4624.1</b>	<b>4660.1</b>
1 000 000	pink	<b>4608.1</b>	<b>4653.1</b>	<b>4663.1</b>
Pack Qty.		12	12	12



## Spectra/Por®-dialysis cylinder

Made of PS. For use with magnetic stirrers. The tube is centred and dialysis speeded up by the stirring movement.

- MINI - for dialysis tubes and systems up to a length of 10 cm
- MAXI - for dialysis tubes and systems up to a length of 25 cm

**Delivery incl.** magnetic bar and cover.

Model	Volume (ml)	Height (cm)	Ø (cm)	Art. No.	Pack Qty.
MINI	600	12,5	11,5	<b>CL82.1</b>	1
MAXI	1800	30	11,5	<b>CL83.1</b>	1



## ZelluTrans/Roth Mini Dialyzer MD 300

Made of **regenerated cellulose**.

**Ready-to-use dialysis system for samples from 50 to 300 µl.**

The Mini Dialyzer consists of a U-shaped polypropylene capillary with 75 µl graduations and membranes on both sides. The filled sample forms a thin layer over a large surface area, ensuring very short dialysis times.

- Available as an **individual dialyzer** packed in a 5 ml test tube (can be separated)
- Membranes are made of high-quality regenerated cellulose with different pore sizes (MWCO), **dry packed**
- Easy to use: can be filled with sample and emptied using any standard pipette (100-1000 µl)
- Short dialysis times (30-480 min)
- Flexible: uses ranging from low-volume dialysis (in test tube, 96-deepwell plates, 2.5 ml) to high-volume dialysis (using a suitable flotation aid, 4768.1)

The Mini Dialyzers are ready for use straight away - no pretreatment required.

For sensitive applications, soak in water or buffer for 15 min to remove any traces of glycerine.

MWCO	Designation	Art. No.	Pack Qty.
3500	Individual dialyzer in 5 ml test tube	<b>NH91.1</b>	12
3500	Dialyzer strip (8 connected individual dialyzers)	<b>NH92.1</b>	1
6000-8000	Individual dialyzer in 5 ml test tube	<b>NH94.1</b>	12
6000-8000	Dialyzer strip (8 connected individual dialyzers)	<b>NH95.1</b>	1
12 000-14 000	Individual dialyzer in 5 ml test tube	<b>NH97.1</b>	12
12 000-14 000	Dialyzer strip (8 connected individual dialyzers)	<b>NH98.1</b>	1



# Protein Isolation by Affinity Chromatography

## Nickel Charged IMAC Beads and Columns - NTA Linker

The matrix of choice if His-tagged proteins shall be isolated from reducing buffer solutions without loss.

- Very fast and simple purification of His-tagged proteins from total lysates
- High binding capacity for 6xHis-tagged protein
- Reliable elution and regeneration
- Minimized Nickel leaching
- **Compatible with denaturing and reducing reagents**

The Matrix is stable in all commonly used reagents including denaturing reagents (like 8 M urea, 6 M guanidinium hydrochloride) and (dependent on the respective buffer) reducing substances (for instance  $\leq 30$  mM glutathion,  $\leq 10$  mM DTT,  $\leq 10$  mM DTE,  $\leq 20$  mM  $\beta$ -mercaptoethanol and  $\leq 0,3$  % SDS).



ready-to-use

### Roti®garose-His/Ni NTA-Cartridges

For isolation of His-tagged proteins by high pressure affinity chromatography under reducing conditions.

Affinity chromatography columns/nickel charged, IMAC columns

Storage temp.: +4 °C

**Warning** H226-H319

Prepacked cartridges with Nickel charged NTA-agarose bead matrix. Prepacked matrix, stabilised with 15 % ethanol.

- Recommended flow rate 5 ml/min.
- Standard ports (10-32)
- **Very versatile. Applicable with ÄKTA™FPLC™, pump and syringe**

Binding capacity/cartridge (GFPuv-6xHis).....250 mg

0804.1	1 x 5 ml	plastic
0804.2	5 x 5 ml	plastic



### Empty cartridges FPLC

Compatible with common chromatography instruments like ÄKTA™FPLC™.

Max. pressure: 200 psi / 14 bar / 1,38 MPa

Pore size: 10  $\mu$ m

#### Technical specifications:

Type	Vol. (ml packed column matrix)*	Cartridges (no.)	Frits (no.)	End caps (no.)	Ø (mm)	Height (mm)
FPLC-8	8	3	9	6	12	70
FPLC-30	30	2	6	4	21	87
FPLC-45	45	2	6	4	21	137
FPLC-80	80	1	3	2	26	144

\* The actual filling volume depends on the respective resin used, varying by approx.  $\pm 10$  %.

Type	Art. No.	Pack Qty.
FPLC-8	0860.1	3
FPLC-30	0862.1	2
FPLC-45	0866.1	2
FPLC-80	0868.1	1

### Roti®garose-His/Ni NTA-Beads

For isolation of His-tagged proteins by affinity chromatography under reducing conditions.

IMAC matrix/nickel charged, Column matrix for protein isolation

Storage temp.: +4 °C

**Warning** H226-H319-EUH208

50 % bead slurry in 15 % ethanol.

- **For batch mode and gravity flow**

Binding capacity (gel) (GFPuv-6xHis)..... $\geq 50$  mg/ml

0807.1	25 ml	plastic
0807.2	100 ml	plastic

### Roti®garose-His/Ni NTA-HPBeads

For isolation of His-tagged proteins by fast or large scale affinity chromatography under reducing conditions.

Agarose beads "high pressure" for affinity chromatography, IMAC matrix/nickel charged, Column matrix for protein isolation

Storage temp.: +4 °C

**Warning** H226-H319

50 % bead slurry in 20 % ethanol.

- For batch mode, gravity flow, MPLC und FPLC
- **Recommended for big matrix volumes**

Binding capacity (gel) (GFPuv-6xHis)..... $\geq 60$  mg/ml

0805.1	25 ml	plastic
0805.2	100 ml	plastic



### Empty cartridges for protein isolation

Column material: Polypropylene, Material column frit: Polyethylene.

Product	Volume*	Inner Ø	Frit pore size	Chromatography by
Empty cartridges	1 ml	6,2 mm	12 $\mu$ m	Pressure

\* The actual filling volume depends on the respective resin used, varying between approx. 1 and 1.3 ml.

Product	Art. No.	Pack Qty.
Empty cartridges	1345.1	5
Column plugs	0197.1	10
Luer adapter	0198.1	1

# Affinity Chromatography - His-tag Proteins

## Nickel and Cobalt loaded IMAC Beads - IDA Linker

For efficient isolation of His-tagged proteins.

- Rapid one-step purification of very pure His-tagged proteins from total lysates
- Very high binding capacity for 6xHis-tagged protein
- Easy elution and regeneration
- Very low Nickel leaching
- Compatible with denaturing reagents
- **"HP" Beads for a high flow rate**
- **For batch mode, gravity flow, MPLC und FPLC**
- **Recommended for big matrix volumes**

The Matrix is stable in all commonly used reagents including denaturing and reducing reagents (like 8 M urea, 6 M guanidinium hydrochloride, 5 mM DTT).

May be autoclaved at 121 °C for 30 mins.



Product	Variant	Suitable for	Ligand	Metal Ion	Binding Capacity*	Pack Qty.	Pack Qty.
① Roti®garose-His/Ni HPCartridges	prepacked columns	ÄKTA™FPLC™, pump, syringe	IDA	Ni <sup>2+</sup>	approx. 500 mg	1318.1	1 x 5 ml
						1318.2	5 x 5 ml
② Roti®garose-His/Ni Columns	prepacked columns	batch, gravity	IDA	Ni <sup>2+</sup>	approx. 100 mg approx. 500 mg	1314.1	8 x 1 ml
						1314.2	5 x 5 ml
③ Roti®garose-His/Ni Beads	bead suspension	batch, gravity	IDA	Ni <sup>2+</sup>	approx. 117 mg/ml	1308.1	25 ml
						1308.2	100 ml
③ Roti®garose-His/Ni HPBeads	bead suspension	batch, gravity, LPLC, FPLC, MPLC, all volumes	IDA	Ni <sup>2+</sup>	approx. 20 µmol/ml	0835.1	25 ml
						0835.2	100 ml
③ Roti®garose-His/Ni HPBeads plus	bead suspension	batch, gravity, LPLC, FPLC, MPLC, all volumes, EDTA and DTT-containing samples	polychelator	Ni <sup>2+</sup>	≥80 mg/ml	0806.1	25 ml
						0806.2	100 ml
④ Roti®garose-His/Co Columns	prepacked columns	batch, gravity	IDA	Co <sup>2+</sup>	approx. 120 mg approx. 600 mg	1267.1	8 x 1 ml
						1267.2	5 x 5 ml
⑤ Roti®garose-His/Co Beads	bead suspension	batch, gravity	IDA	Co <sup>2+</sup>	approx. 135 mg/ml	1235.1	25 ml
						1235.2	100 ml
⑤ Roti®garose-His/Co HPBeads	bead suspension	batch, gravity, LPLC, FPLC, MPLC, all volumes	IDA	Co <sup>2+</sup>	approx. 20 µmol/ml	0838.1	25 ml
						0838.2	100 ml
Roti®garose-His/Co HPBeads	bead suspension	batch, gravity, LPLC, FPLC, MPLC, all volumes	IDA	-	-	0838.1	25 ml
						0838.2	100 ml

For additional product data and safety information, see chapter Chemicals A-Z.

\*Binding capacity in mg/ml: per ml matrix. Binding capacity in mg: per pre-packed column.

# Affinity Chromatography

## Protein A and G Coated Agarose Beads for Antibody Purification

- High binding capacity for IgG-antibodies of a variety of species
- Rapid one-step purification of immunoglobulins from cell lysates and biological solutions
- High yield of very pure immunoglobulins
- Easy elution and regeneration
- Covalent binding of protein A and G in high ligand density
- "HP" Beads for high flow rate
- For batch mode, gravity flow, MPLC und FPLC
- Recommended for big matrix volumes

### Roti®garose-Protein A Beads for biochemistry

For purification of immunoglobulins by affinity chromatography.  
Storage temp.: +4 °C

**Warning H226-H319**

Protein A coated agarose beads for low pressure affinity chromatography. High-performance affinity resin for antibody purification.

Binding capacity (humane IgG).....~25 mg/ml

1278.1	5 ml	plastic
1278.2	25 ml	plastic

### Roti®garose-Protein G HPBeads

For purification of immunoglobulins by affinity chromatography.  
Agarose beads "high pressure"  
Storage temp.: +4 °C

**Warning H226-H319**

Protein G coated agarose beads for affinity chromatography under medium pressure, with high flow rate or with big sample-/matrix volume. 50 % bead slurry in 20 % ethanol.

Binding capacity (humane IgG).....~25 mg/ml

0808.1	5 ml	plastic
0808.2	25 ml	plastic

### Roti®garose-Protein A/G HPBeads

For purification of immunoglobulins by affinity chromatography.  
Agarose beads "high pressure"  
Storage temp.: +4 °C

**Warning H226-H319**

Mixture (1:1) of protein A- and protein G coated agarose beads for affinity chromatography under medium pressure, with high flow rate or with big sample-/matrix volume. 50 % bead slurry in 20 % ethanol.

Binding capacity (humane IgG).....~25 mg/ml

0809.1	0,5 ml	plastic
0809.2	1 ml	plastic
0809.3	2 ml	plastic

## Isolation of Biotinylated or Streptavidinated Proteins

- One-step isolation of avidin/streptavidin-tagged or biotinylated molecules from total lysates
- Rapid, mild and highly specific purification
- Suitable for isolation of DNA, proteins and other molecules of all sizes
- High binding capacity
- High recovery rates
- For batch mode and gravity flow



### Roti®garose-Biotin Beads

For isolation of avidin/streptavidin-coupled molecules by affinity chromatography.

Agarose beads for affinity chromatography, Biotin-agarose beads.  
Storage temp.: +4 °C

**Warning H226-H319**

Biotin coupled agarose beads for affinity chromatography. 50 % bead slurry in water stabilised with 0,02 % sodium azide. Recommended for isolation of avidin- or streptavidin labelled molecules in batch mode or via columns via low pressure affinity chromatography.

Slurry in water stabilised with 0,02 % sodium azide. May be autoclaved at 121 °C for 30 mins.

Binding capacity (gel) (Avidin) .....≥30 mg/ml

0844.1	5 ml	plastic
0844.2	10 ml	plastic

### Roti®garose-Streptavidin Beads

For isolation of biotin-coupled molecules by affinity chromatography.  
Agarose beads for affinity chromatography, Streptavidin-agarose beads.  
Storage temp.: +4 °C

**Warning H226-H319**

Streptavidin coupled agarose beads for affinity chromatography. 50 % bead slurry in 20 % ethanol. Recommended for isolation of biotinylated molecules in batch mode or via columns via low pressure affinity chromatography. Isolation of antigens via biotinylated antibodies can be done with 0,1 M glycine. May be autoclaved at 121 °C for 30 mins.

Binding capacity (gel) (free biotin) .....≥120 nmol/ml

0846.1	5 ml	plastic
0846.2	10 ml	plastic



# Affinity Chromatography

## Roti®garose Beads and Columns for Isolation of GST-tag Proteins

Efficient and highly specific isolation of GST-tagged proteins via affinity chromatography is based on the affinity of the glutathion-S-transferase to its substrate glutathione. Merely no unspecific binding of proteins without GST-tag takes place, even during purification from raw extracts, while the biological activity of the purified proteins is preserved by chromatography conditions.

- **One-step isolation of GST-tagged proteins from total lysates**
- Rapid, mild and highly specific purification
- Suitable for isolation of GST-peptides and protein complexes of all sizes
- High binding capacity
- Easy elution and regeneration
- Suitable for big matrix volumes



ready-to-use

### Roti®garose-Glu/GST Cartridges

For isolation of GST-tagged proteins. Affinity chromatography columns with glutathione-agarose. Storage temp.: +4 °C

**Warning H226-H319**

Glutathione coupled agarose beads for medium pressure affinity chromatography (MPLC). Prepacked matrix, stabilised with 20 % ethanol. Optimal for isolation of glutathione-S-transferase (GST) or GST fusion proteins via automated liquid chromatography, or if proteins shall be isolated under pressure.

- Easy elution and regeneration
- Recommended flow rate 0,5-5 ml/min.
- Standard ports (10-32)
- **Very versatile. Applicable with ÄKTA™FPLC™, pump and syringe**

The matrix of Roti®garose Glu/GST Cartridges consists of beaded 4 % agarose without crosslinking, coupled with glutathione. Roti®garose Glu/GST Cartridges may be regenerated, making them very cost-effective. Column material made from polypropylene and polyethylene (frit). Binding capacity/cartridge (GST<sub>rek</sub>) ..... ≥50 mg

0843.1	1 x 5 ml	plastic
0843.2	5 x 5 ml	plastic

### Roti®garose-Glu/GST Beads

For isolation of GST-tagged proteins. Glutathione-agarose beads. Storage temp.: +4 °C

**Warning H226-H319**

Glutathione coupled agarose beads for affinity chromatography. 75 % bead slurry in 20 % ethanol. Recommended for isolation of glutathione-S-transferase (GST) or GST fusion proteins in batch mode or via columns. **Suitable for batch mode, LPLC, FPLC and MPLC and big matrix volumes.** Binding capacity (gel) (GST<sub>rek</sub>) ..... ≥8 mg/ml

0841.1	10 ml	plastic
0841.2	100 ml	plastic



### Empty columns for protein isolation

Empty columns for protein isolation by chromatography. Chemically stabile and versatile. Column material: Polypropylene, Material column frit: Polyethylene. Delivery includes end caps for Columns Grav S, M and L. Delivery includes top caps with Luer lock and screw lock plus end caps for columns Luer.

Type	Figure	Matrix volume	Total volume	Frit pore size	Chromatography by
Spin	①	100-250 µl	1,5 ml	20 µm	Centrifugation
Grav S	②	100-200 µl	1 ml	20 µm	Gravity
Grav M	③	0,5-2 ml	12 ml	20 µm	Gravity
Grav L	③	2-6 ml	35 ml	20 µm	Gravity
Luer	④	50-100 µl	0,8 ml	35 µm	Pressure

Type	Art. No.	Pack Qty.
Spin	1541.1	25
Spin	1541.2	100
Grav S	1515.1	20
Grav M	1516.1	50
Grav L	1518.1	50
Luer	1527.1	25

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