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### General information about vials and caps

#### Technical Information – Vials

In chromatography a broad variety of glass or plastic vials are used as sample containers for analysis usage. As they are mainly used within autosamplers or any other automatic instrument, strict obedience of all dimensions is crucial for a trouble-free run. Besides these physical properties the vials also have to fulfill requirements regarding inertness and cleanliness, as otherwise analysis results may be incorrect. LLG Labware consider the physical and chemical demands in their production process by various implementations:

Almost all vials are made out of 1st hydrolytic class glass. First hydrolytic class glass is very hard and has a low expansion coefficient even at high temperature variations. It shows an excellent chemical resistance to acidic and neutral solutions, and even to alkaline solutions due to its relatively low Alkali content. Higher density of the glass surface offers a higher hydrolytic resistance. Clear Glass of 1st hydrolytic class is differentiated by 33 expansion (Type 1, Class A) and 51 expansion glass (Type 1, Class B), whereas amber is generally worldwide only available as 51 expansion glass. The indicated lower expansion coefficient of 33 implies that this harder clear glass has to be processed at higher temperatures. These amount to approx. 1,200°C for 33 expansion glass in comparison to only approx. 1,000°C for glass of 51 expansion. In the USA typically clear glass in 33 expansion and amber glass in 51 expansion is used, whereas in Europe solely 51 expansion glass is processed. From a quality point of view both types of glass are equally suitable for usage in chromatography, as they both are glasses of 1st hydrolytic class.

#### Technical Information – Seals

Seals are the assembled combination of a cap and a septa. To carry out a correct analysis, it is important that besides the vial the seal is also inert and uncontaminated. The closures sold by LLG Labware are automatically assembled and packed according to internally defined conditions of the supplier. Photocells check the side-orientation of the liner, so that it is ensured that the PTFE lamination is always directed towards the sample to build an inert barrier between sample and carrier material of the septa. A gauge control ensures that not more or less than one septa is installed. The final seals are automatically counted – and not weighed – by automates to guarantee quantity obedience. They are packed in tamper-proof evident zip-lock bags that allow easy identification of the content due to the transparent PE material. The zip-lock enables resealing of the bag to avoid any contamination of the closures during consumption. The batch number of the manufactured seal is printed on each PE-bag for traceability.

#### Technical Information – Septa

The right choice of septa depends on the application. Almost all septa are laminated on one side with PTFE, which has a high chemical resistance and forms an inert barrier between sample and carrier material of the septa. The carrier materials have different physical and chemical properties, such as temperature resistance, resealability properties, cleanliness, hardness, thickness, etc.

The individual conditions of the customer's application aim at the specific characteristics of the carrier material, e.g.:

Multiple injection?	Temperature?			Thin, fragile needle?	Blunt, thick needle?	Critical analysis?	Low coring?
	-40°C up to 120°C	-40°C up to 110°C	-60°C up to 200°C				
↓ good resealability properties necessary	↓ Natural Rubber/TEF; Butyl/PTFE	↓ Red Rubber/PTFE	↓ Silicone/PTFE	↓ soft and thin septa required	↓ Slitted/pre-cut liner as penetration aid (HPLC)	↓ very clean liner required	↓ Both sided PTFE laminated liners required
↓ Natural Rubber/TEF				↓ e.g. Silicone/PTFE	↓ e.g. 08 02 0039	↓ Silicone/PTFE septa	↓ PTFE/Silicone/PTFE PTFE/Butyl/PTFE

LLG - Vials and autosamplers: compatibility chart

<b>Agilent</b>
Alternative LLG Labware products for use on Agilent GC, HPLC and Headspace instruments.

<b>Agilent GC Products</b>						
	<b>Crimp Neck ND 8</b>	<b>Agilent Art.-No.</b>	<b>Screw Neck ND9</b>	<b>Agilent Art.-No.</b>	<b>Crimp Neck ND11</b>	<b>Agilent Art.-No.</b>
<b>Vials</b>	4.001 554	5180-0841	9.003 448	5182-0714	7.086 520	5181-3375
	6.235 006	5180-0844	6.803 174	5182-0715	7.608 160	5182-0543
			6.088 871	5182-0716	7.620 828	5181-3376
			4.008 249	5183-2030	6.233 918	9301-1388
			6.266 869			
			6.260 742			
			6.260 743			
<b>Micro-Inserts</b>			7.401 744	5183-2085	7.401 744	5183-2085
			6.093 247	5181-1270	6.093 247	5181-1270
			4.008 196	5181-3377	4.008 196	5181-3377
<b>Seals</b>	9.003 444	5180-0842	4.008 228	5182-0717	4.008 243	5181-1210
			9.003 451	5182-0720	9.003 446	5182-0552
			4.008 218	5182-0723	7.050 759	5181-1211
			4.008 216	5182-0717	4.001 564	5188-5386
			4.008 214	5185-5823	4.008 239	5181-1210

<b>Agilent HPLC Products</b>						
	<b>Screw Neck ND9</b>	<b>Agilent Art.-No.</b>	<b>Crimp Neck ND11</b>	<b>Agilent Art.-No.</b>	<b>Snap Ring ND11</b>	<b>Agilent Art.-No.</b>
<b>Vials</b>	9.003 448	5182-0714	7.086 520	5181-3375	6.073 833	5182-0544
	6.803 174	5182-0715	7.608 160	5182-0543	7.622 228	5182-0546
	6.088 871	5182-0716	7.620 828	5181-3376	7.613 330	5182-0545
	6.266 869					
	6.260 742					
	6.260 743					
	4.008 249	5183-2030	6.233 918	9301-1388	4.008 255	5188-6593
<b>Micro-Inserts</b>	7.401 744	5183-2085	7.401 744	5183-2085	7.401 744	5183-2085
	6.093 247	5181-1270	6.093 247	5181-1270	6.093 247	5181-1270
	4.008 196	5181-3377	4.008 196	5181-3377	4.008 196	5181-3377
<b>Seals</b>	4.008 228	5182-0717	4.008 243	5181-1210	4.008 257	5182-3458
	9.003 451	5182-0720	9.003 446	5182-0552	4.008 258	5182-0541
	4.008 218	5182-0723	7.050 759	5181-1211	4.008 259	5182-0566
	4.008 216	5182-0717	4.001 564	5188-5386	4.008 256	5183-4511
	4.008 214	5185-5823	4.008 239	5181-1210		
	4.008 215	5185-5824	4.001 555			
	4.001 521	5183-2076				

<b>Agilent Headspace Products</b>				
	<b>Headspace Screw ND 18 (Combi Pal + G 1888A)</b>	<b>Agilent Art.-No.</b>	<b>Headspace Crimp Neck ND 20</b>	<b>Agilent Art.-No.</b>
<b>Vials</b>	9.003 466	5188-5392	7.050 285	5182-0838
	6.227 874	5188-6538	9.003 452	5182-0837
	4.008 270	5188-2753	7.401 840	5183-4474
	6.237 909	5188-6537		
	7.401 840	5183-4474		
<b>Seals</b>	4.008 268	5188-2759	4.001 557	5183-4479
			9.003 460	5183-4477
			9.003 453	5183-4474

**Autosampler compatibility chart**

The autosampler compatibility chart generally shows the most typical LLG-Labware vials and closures for usage on instruments of different manufacturers. Additionally the corresponding part number of the manufacturer is indicated. Beside these there also may be further products in our catalogue which may technically and functionally be suitable. We will gladly recommend other suitable products.

If applicable for a manufacturer, each table has been divided by the application HPLC, GC and Headspace. We generally recommend asking for cost-free samples for testing purposes.

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## LLG - Vials and autosamplers: compatibility chart

**CTC Analytics**

Alternative LLG Labware products for use on CTC Analytics GC, HPLC and Headspace instruments.

**CTC Analytics GC Products**

	Crimp Neck ND 8	CTC Art.-No.	Screw Neck ND9	CTC Art.-No.	Crimp Neck ND11	CTC Art.-No.
<b>Vials</b>	4.001 554		9.003 448		7.086 520	
	6.235 606		6.803 174		7.608 160	
	4.001 515		6.088 871		7.620 828	
	6.902 044		4.008 249		6.233 918	
	4.008 202		6.266 869			
	4.008 203		6.260 742			
			6.260 743			
<b>Micro-Inserts</b>			7.401 744		7.401 744	
			6.093 247		6.093 247	
			4.008 196		4.008 196	
<b>Seals</b>	9.003 444		4.008 228		4.001 564	GC PAL
	4.008 198		9.003 451		9.003 446	
			4.001 521		7.050 759	
			4,008 218			
			4,008 215			
			4,008 218			
			4,008 215			

**CTC Analytics HPLC Products**

	Crimp Neck ND 8	CTC Art.-No.	Screw Neck ND9	CTC Art.-No.	Crimp Neck ND11	CTC Art.-No.	Snap Ring ND11	CTC Art.-No.
<b>Vials</b>	4.001 554		9.003 448		7.086 520		6.073 833	
	6.235 606		6.803 174		7.608 160		7.622 228	
	4.001 515		6.088 871		7.620 828		7.613 330	
	6.902 044		4.008 249		6.233 918		4.008 255	
	4.008 202		6.266 869					
	4.008 203		6.260 742					
			6.260 743					
<b>Micro-Inserts</b>			7.401 744		7.401 744		7.401 744	
			6.093 247		6.093 247		6.093 247	
			4.008 196		4.008 196		4.008 196	
<b>Seals</b>	9.003 444		4.008 228		4.008 243		4.008 258	
	4.008 198		9.003 451		9.003 446		4.008 259	
			4.001 521		7.050 759			
			4,008 218					
			4,008 215					
			4,008 218					
			4,008 215					

**CTC Analytics Headspace Products**

	Headspace Screw Neck ND 18 (Combi Pal)	CTC Art.-No.	Headspace Crimp Neck ND 20 (Combi Pal)	CTC Art.-No.
<b>Vials</b>	9.003 466		7.850 009	
	6.227 874		9.003 453	
	4.008 270			
	6.237 909			
<b>Seals</b>	4.008 268		7.850 010	
	6.241 111		6.234 541	

LLG - Vials and autosamplers: compatibility chart

**Dionex**  
 Alternative LLG Labware products for use on Dionex HPLC instruments.

<b>Dionex HPLC Products</b>										
	<b>Crimp Neck ND 8</b>	<b>Dionex Art.-No.</b>	<b>Screw Neck ND8</b>	<b>Dionex Art.-No.</b>	<b>Screw Neck ND9</b>	<b>Dionex Art.-No.</b>	<b>Crimp Neck ND11</b>	<b>Dionex Art.-No.</b>	<b>Snap Ring ND11</b>	<b>Dionex Art.-No.</b>
<b>Vials</b>	4.008 206		9.003 481		9.003 448		7.086 520		6.073 833	
	6.235 606		7.613 087		6.803 174		7.608 160		7.622 228	
	4.001 554		9.003 480		6.088 871		7.620 828		7.613 330	
			7.613 388		4.008 249		6.233 918		4.008 255	
					6.266 869					
					6.260 742					
					6.260 743					
<b>Micro-Inserts</b>			7.401 066		7.401 744		7.401 744		7.401 744	
			4.001 556		6.093 247		6.093 247		6.093 247	
			4.008 194		4.008 196		4.008 196		4.008 196	
<b>Seals</b>	4.008 200		4.008 209		4.008 228		4.008 243		4.008 257	
	9.003 444		9.003 484		9.003 451		9.003 446		4.008 258	
			6.232 178		4.001 521		7.050 759		4.008 259	
					4.008 214		4.001 555		4.008 256	
					4.008 215					

**Autosampler compatibility chart**

The autosampler compatibility chart generally shows the most typical LLG-Labware vials and closures for usage on instruments of different manufacturers. Additionally the corresponding part number of the manufacturer is indicated. Beside these there also may be further products in our catalogue which may technically and functionally be suitable. We will gladly recommend other suitable products.

If applicable for a manufacturer, each table has been divided by the application HPLC, GC and Headspace. We generally recommend asking for cost-free samples for testing purposes.

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## LLG - Vials and autosamplers: compatibility chart

**PerkinElmer**

Alternative LLG Labware products for use on Agilent GC, HPLC and Headspace instruments.

**PerkinElmer GC Products**

	Crimp Neck ND 8	PerkinElmer Art.-No.	Screw Neck ND9	PerkinElmer Art.-No.	Screw Neck ND10	PerkinElmer Art.-No.	Crimp Neck ND11	PerkinElmer Art.-No.
Vials	6.235 606	N9302136	9.003 448	N9306201	6.242 103		7.086 520	N9301385
	9.003 427	N9301069	6.803 174	N9306201	7.615 715		7.608 160	N9301385
			4.008 247	N9306220	6.238 867		7.620 828	N9302680
			6.088 871	N9306220				
			6.266 869					
			6.260 742					
			6.260 743					
Micro-Inserts			6.093 247	N9300703	6.093 247	N9300703	6.093 247	N9300703
			4.008 196	N9300704	4.008 196	N9300704	4.008 196	N9300704
Seals	4.001 558	N9302140	4.008 228	N9306200	4.008 234	N9306205	7.060 469	N9306230
	9.003 443	03300806	9.003 451	N9306202	4.008 235	N9306205	4.008 243	N9306015
	4.008 200	03300806	4.008 214	N9306202			4.001 522	N9302684
							7.300 348	N9302685
							6.900 233	N9302686
							9.003 446	N9306228
							7.050 759	N9306229

**PerkinElmer HPLC Products**

	Crimp Neck ND 8	PerkinElmer Art.-No.	Screw Neck ND9	PerkinElmer Art.-No.	Screw Neck ND10	PerkinElmer Art.-No.	Crimp Neck ND11	PerkinElmer Art.-No.	Snap Ring ND11	PerkinElmer Art.-No.
Vials	6.235 606	N9302136	9.003 448	N9306201	6.242 103		7.086 520	N9301385	6.073 833	N9303418
			6.803 174	N9306201	7.615 715		7.608 160	N9301385	7.622 228	
			4.008 247	N9306220	6.238 867		7.620 828	N9302680	7.613 330	
			6.088 871	N9306220						
			6.266 869							
			6.260 742							
			6.260 743							
Micro-Inserts			6.093 247	N9300703	6.093 247	N9300703	6.093 247	N9300703	6.093 247	N9300703
			4.008 196	N9300704	4.008 196	N9300704	4.008 196	N9300704	4.008 196	N9300704
Seals	9.003 443	03300806	4.008 228	N9306200	4.008 234	N9306205	7.060 469	N9306230	6.073 555	N9303417
	4.008 200	03300806	9.003 451	N9306202	4.008 235	N9306205	4.008 243	N9306015	4.001 544	N9303419
			4.008 214	N9306202	4.008 237	N9306052	4.001 522	N9302684	4.008 256	N9303416
			4.001 521	N9306203			7.300 348	N9302685		
							6.900 233	N9302686		
							9.003 446	N9306228		
							7.050 759	N9306229		
							4.001 555			

**PerkinElmer Headspace Products**

	Headspace Screw Neck ND 18 CTC Combi Pal + Turbo Matrix™ HS16+40	PerkinElmer Art.-No.	Headspace Crimp Neck ND20 CTC Combi PAL	PerkinElmer Art.-No.	Headspace Crimp Neck ND20 Turbo Matrix™ HS 16, 40 + 110 *** not suitable for TurboMatrix™ 110	PerkinElmer Art.-No.
Vials	9.003 466	N6356479	7.850 009	N6356478	7.052 186 ***	N9302134
	6.227 874		9.003 453	N6356471	7.060 463	N9306079
	4.008 270	N9306075			4.008 281	N9303349
	6.237 909					
Seals	4.008 268	N9306077	7.850 010	N6356559	4.001 557	N9306266
	6.241 111	N6356475	6.234 541	N6356566	9.003 455	N9306266
			6.902 419	N6356562	4.008 276	N9306266
			6.229 635	N6356560	9.003 456	B0104241
			4.001 548	N6356560	7.050 286	B0104242
					7.060 477	B0110728
					7.060 433	B0038137

### LLG - Vials and autosamplers: compatibility chart

#### Shimadzu

Alternative LLG Labware products for use on Shimadzu GC, HPLC and Headspace instruments.

Shimadzu GC Products										
	Crimp Neck ND 8	Shimadzu Art.-No.	Screw Neck ND9	Shimadzu Art.-No.	Screw Neck ND10	Shimadzu Art.-No.	Crimp Neck ND11	Shimadzu Art.-No.	Screw Neck ND13	Shimadzu Art.-No.
Vials	4.001 554		9.003 448		6.242 103		7.086 520	980-01705	9.003 482	
	6.235 006		4.008 247				7.608 160		7.058 142	
	4.001 515		4.008 249				7.620 828			
	6.902 044		6.266 869				6.233 918			
	4.008 202		6.260 742							
	4.008 203		6.260 743							
Micro-Inserts			7.401 744	980-04987	7.401 744	980-04987	7.401 744	980-04987	7.055 4856	
			6.093 247	980-01707	6.093 247	980-01707	6.093 247	980-01707		
			4.008 196		4.008 196		4.008 196			
Seals	9.003 444		9.003 451		4.008 234		4.001 564	0980-01706	7.510 053	
	4.008 198		4.008 218		4.008 235		9.003 446			
			4.008 214		4.008 236		7.050 759			

Shimadzu HPLC Products										
	Crimp Neck ND 8	Shimadzu Art.-No.	Screw Neck ND9	Shimadzu Art.-No.	Screw Neck ND10	Shimadzu Art.-No.	Crimp Neck ND11	Shimadzu Art.-No.	Snap Ring ND 11	Shimadzu Art.-No.
Vials	4.001 554		9.003 448		6.242 103		7.086 520	980-01705	6.073 833	
	6.235 006		4.008 247				4.001 565		6.224 358	
			4.008 249				4.001 516			
			6.266 869							
			6.260 742							
			6.260 743							
Micro-Inserts			7.401 744	980-04987	7.401 744	980-04987	7.401 744	980-04987	7.401 744	980-04987
			6.093 247	980-01707	6.093 247	980-01707	6.093 247	980-01707	6.093 247	980-01707
			4.008 196		4.008 196		4.008 196		4.008 196	
Seals	9.003 444		9.003 451		4.008 234		4.008 243	0980-01706	4.008 256	
	4.008 198		4.008 222		4.008 235		9.003 446		4.008 260	
	4.008 200		4.008 224		4.008 237		4.001 555		4.001 544	
			4.008 225						4.008 258	
			4.008 214							
			4.001 521							
			4.008 223							
			4.008 226							
		4.008 215								
		4.008 221								

Shimadzu Headspace Products						
	Screw Neck ND 18 (AOC 5000)	Shimadzu Art.-No.	Headspace ND 18 (AOC 5000)	Shimadzu Art.-No.	Headspace ND 18 (HTA200H)	Shimadzu Art.-No.
Vials	9.003 466	980-00247	7.850 009	980-00664	7.050 285	
	4.003 270	961-00915	9.003.453	980-00111	9.003 453	980-00111
Seals	4.008 268	961-00914	7.850 010	961-01256	9.003 447	
	6.241 111	980-01708	6.234 541	980-03372	4.001 553	
			6.229 635	980-00112		
			4.001 548	980-00112		

#### Autosampler compatibility chart

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## LLG - Vials and autosamplers: compatibility chart

**Thermo Scientific**

Alternative LLG Labware products for use on Thermo Scientific GC, HPLC and Headspace instruments.

**Thermo Scientific GC Products**

	Crimp Neck ND 8	Thermo Scientific Art.-No.	Screw Neck ND8	Thermo Scientific Art.-No.	Screw Neck ND9	Thermo Scientific Art.-No.	Crimp Neck ND11	Thermo Scientific Art.-No.
<b>Vials</b>	9.003 427	60180-707	9.003 481	60180-508	9.003 448	60180-723	7.086 520	60180-701
	4.001 554		7.613 087		6.803 174	60180-509	7.608 160	60180-502
	6.235 606		9.003 480	60180-560	4.008 247	60180-724	7.089 998	60180-702
	4.008 206	60180-505	7.613 388		6.088 871	60180-561	7.620 828	
	4.001 515				6.266 869			
	6.902 044				6.260 742			
	4.008 202				6.260 743			
	4.008 203							
<b>Micro-Inserts</b>			7.401 066	60180-265	7.401 744		7.401 744	
			9.003 435		6.093 247	60180-734	6.093 247	60180-734
			4.001 556	60180-721	4.008 196	60180-735	4.008 196	60180-735
			4.008 194	60180-722	4.001 547	60180-266	4.001 547	60180-266
<b>Seals</b>	9.003 443		4.008 209		4.008 228	60180-728	4.001 564	GC PAL
	4.008 200		9.003 484	60180-719	9.003 451	60180-729	4.008 239	
	9.003 444	60180-525	4.008 207		4.008 218		7.060 469	
	4.008 198				4.008 214		4.008 243	60180-705
							9.003 446	60180-706
							7.050 759	

**Thermo Scientific HPLC Products**

	Crimp Neck ND 8	Thermo Scientific Art.-No.	Screw Neck ND8	Thermo Scientific Art.-No.	Screw Neck ND9	Thermo Scientific Art.-No.	Crimp Neck ND11	Thermo Scientific Art.-No.	Snap Ring ND 11	Thermo Scientific Art.-No.
<b>Vials</b>	4.001 554		9.003 481	60180-508	9.003 448	60180-723	7.086 520		6.073 833	60180-740
	6.235 006		7.613 087		6.803 174	60180-509	7.608 160	60180-502	7.622 228	
	4.008 206	60180-505	9.003 480	60180-560	4.008 247	60180-724	7.089 998		7.613 330	60180-711
	4.001 515		7.613 388		6.088 871	60180-561	7.620 828			
	6.902 044				6.266 869					
	4.008 202				6.260 742					
	4.008 203				6.260 743					
<b>Micro-Inserts</b>			7.401 066	60180-265	7.401 744		7.401 744		7.401 744	
			9.003 435		6.093 247	60180-734	6.093 247	60180-734	6.093 247	60180-734
			4.001 556	60180-721	4.008 196	60180-735	4.008 196	60180-735	4.008 196	60180-735
			4.008 194	60180-722	4.001 547	60180-266	4.001 547	60180-266	4.001 547	60180-266
<b>Seals</b>	9.003 443	60180-708	4.008 209		4.008 228	60180-728	4.008 239		4.008 256	
	4.008 200		9.003 484	60180-719	9.003 451	60180-729	7.060 469		4.008 260	
	9.003 444	60180-525	4.008 207		4.008 218		4.008 243	60180-705	4.001 544	
	4.008 198				4.008 214		9.003 446	60180-706	4.008 258	60180-713
							7.050 759		4.008 261	
									4.008 257	60180-712

**Thermo Scientific Headspace Products**

	Headspace Screw Neck ND 18 (Combi Pal)	Thermo Scientific Art.-No.	Headspace Crimp Neck ND 20 (Combi Pal)	Thermo Scientific Art.-No.	Headspace Crimp Neck ND 20 (HS850/HS2)	Thermo Scientific Art.-No.
<b>Vials</b>	9.003 466		7.850 009	60180-740	7.850 009	60180-504
	6.227 874		9.003.453	60180-506	9.003 453	60180-506
	4.008 270					
	6.237 909					
<b>Seals</b>	4.008 268		7.850 010		4.001 553	60180-511
	6.241 111		6.234 541	60180-520	9.003 454	60180-513
			6.229 635		4.001 549	60180-513
			4.001 548			



LLG - Vials and autosamplers: compatibility chart

**VWR (Merck / Hitachi)**  
Alternative LLG Labware products for use on VWR (Merck / Hitachi) HPLC instruments.

VWR (Merck / Hitachi) HPLC Products												
	Crimp Neck ND 8	VWR (Merck) Art.-No.	Screw Neck ND8	VWR (Merck) Art.-No.	Screw Neck ND9	VWR (Merck) Art.-No.	Crimp Neck ND11	VWR (Merck) Art.-No.	Snap Ring ND11	VWR (Merck) Art.-No.	Screw Neck ND13	VWR (Merck) Art.-No.
Vials	6.235 606	548-0078	9.003 481	548-0018	9.003 448	548-0028	7.086 520	548-0003	6.073 833	548-0011	9.003 0482	548-0051
	4.001 554	548-0080	7.613 087	548-0420	6.803 174	548-0029	7.608 160	548-0004	7.622 228	548-0422	13 09 1335	548-0509
			9.003 480	548-0448	6.088 871	548-0030	7.620 828	548-0005	7.613 330	548-0012	9.003 549	548-0052
			7.613 388	548-0019	4.008 249	548-0081	6.233 918	548-1442	4.008 255	548-1442	13 09 1336	548-0510
					6.266 869	548-1523						
					6.260 742	548-1524						
					6.260 743	548-1525						
Micro-Inserts			7.401 066	548-0020	7.401 744	548-0006	7.401 744	548-0006	7.401 744	548-0006	7.055 486	548-0093
			9.003 435	548-0308	6.093 247	548-0002	6.093 247	548-0002	6.093 247	548-0002	4.001 567	548-0094
			4.001 556	548-0083	4.008 196	548-0001	4.008 196	548-0001	4.008 196	548-0001		
			4.008 194	548-0780								
Seals	9.003 444	548-0040	4.008 209	548-3322	4.008 228	548-0896	4.008 243	548-3272	4.008 258	548-0432	7.510 053	548-0054
	4.008 198	548-0038	9.003 484	548-0024	9.003 451	548-0085	9.003 446	548-0009	4.008 259	548-0434		
			6.232 178	548-0834	4.001 521	548-0088	7.050 759	548-0007				
					4.008 218	548-0087						
					4.008 215	548-0373						

**Waters**  
Alternative LLG Labware products for use on Waters HPLC instruments.

Waters HPLC Products										
	Screw Neck ND9	Waters Art.-No.	Screw Neck ND10	Waters Art.-No.	Snap Ring ND11	Waters Art.-No.	Screw Neck ND13	Waters Art.-No.	Shell Vials ND8	Waters Art.-No.
Vials	9.003 448		6.242 103	WAT063300	6.073 833		9.003 482	186000840	7.300 174	WAT025054C
	6.803 174	186000273	7.615 715		7.622 228	WAT094219	9.003 549	186001135	4.008 205	WAT025053C
	6.088 871	186000848	6.238 867		7.613 330	WAT094220				
	4.008 249				4.008 255					
	4.008 250									
	4.008 252									
	6.266 869									
	6.260 742									
	6.260 743									
Micro-Inserts	7.401 744		7.401 744		7.401 744		7.055 486	WAT015199		
	6.093 247	WAT094170	6.093 247	WAT094170	6.093 247	WAT094170	4.001 567	WAT072708		
	4.008 196		4.008 196		4.008 196					
Seals	4.008 214	186000274	4.008 243	WAT058874	4.008 258	186000303	7.510 053	186000841		
	4.008 215	186000305	9.003 446		6.242 212	186000304				
			7.050 759							

**Autosampler compatibility chart**

The autosampler compatibility chart generally shows the most typical LLG-Labware vials and closures for usage on instruments of different manufacturers. Additionally the corresponding part number of the manufacturer is indicated. Beside these there also may be further products in our catalogue which may technically and functionally be suitable. We will gladly recommend other suitable products.

If applicable for a manufacturer, each table has been divided by the application HPLC, GC and Headspace. We generally recommend asking for cost-free samples for testing purposes.

We kindly ask for your understanding that we do not take any guarantee for the correctness nor for the completeness of the data indicated here.

# 14. Chromatography

## Vials/Authentic 1:1 size drawings of all vials

### LLG - Flasks types

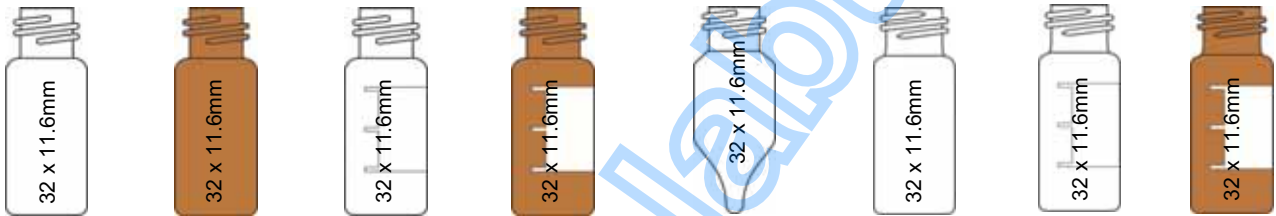
#### Crimp Neck ND8



4.001 554    6.235 606    9.003 427    4.008 206    4.008 202    4.008 203    4.001 515    6.902 044

#### Screw Neck ND8, small opening

#### Screw Neck ND10, wide opening



9.003 481    9.003 480    7.613 087    7.613 388    4.001 563    6.242 103    7.615 715    6.238 867

#### Short Thread ND9

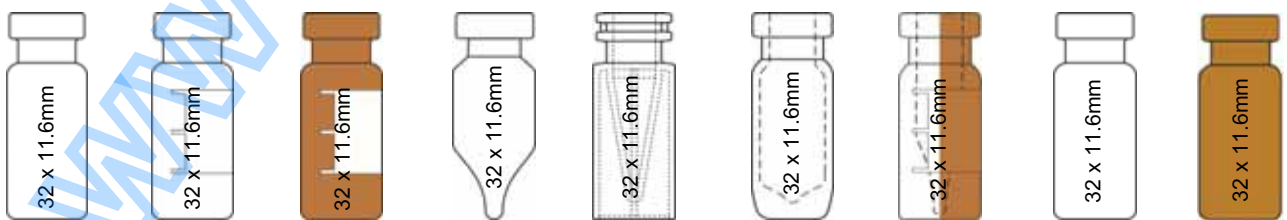


4.008 262    9.003 448    6.803 174    6.088 871    4.008 247    4.008 249    4.008 250  
4.008 252    6.266 869    6.260 742    7.260 743

#### Crimp / Snap Neck ND11

small opening

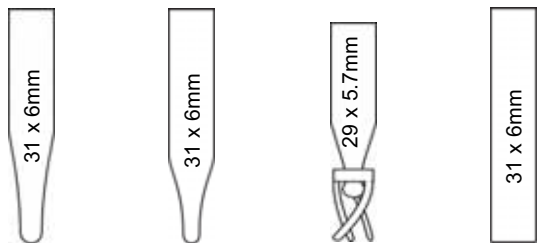
small opening



7.086 520    7.608 160    7.620 828    4.001 516    6.224 358    4.001 565    4.008 251  
6.233 918    7.085 511    7.089 998

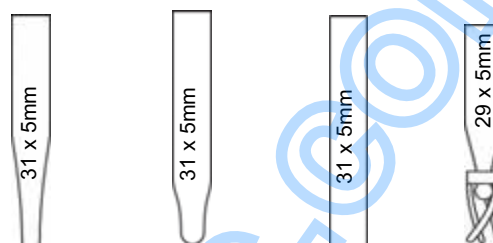
LLG - Flasks types

**Micro-Inserts for wide opening**



7.401 744    4.001 547    6.093 247    4.008 196

**Micro-Inserts for small opening**



7.401 066    9.003 435    4.008 194    4.001 556

**Screw Neck ND13**



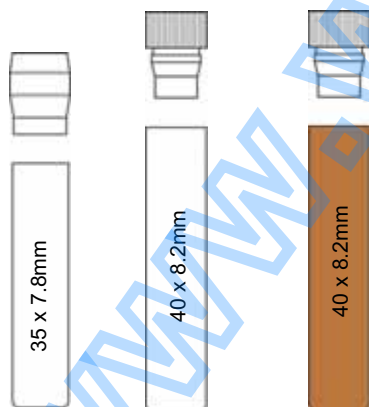
9.003 482    7.058 142    6.267 117    9.003 549    7.055 486

**Schnapping ND11**



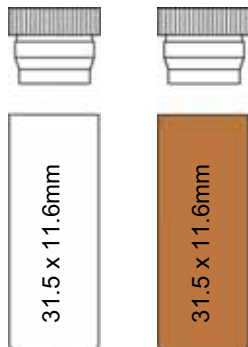
6.073 833    7.622 228    7.613 330

**Shell Vials, 1ml (Insert)**



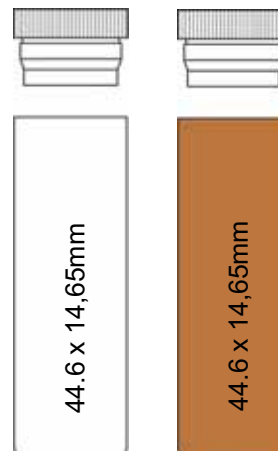
7.612 017    7.300 174    4.008 205

**Shell Vials, 2ml**



4.008 248    6.226 501

**Shell Vials, 4ml (Insert)**



7.632 226    6.227 544

# 14. Chromatography

## Vials/Authentic 1:1 size drawings of all vials

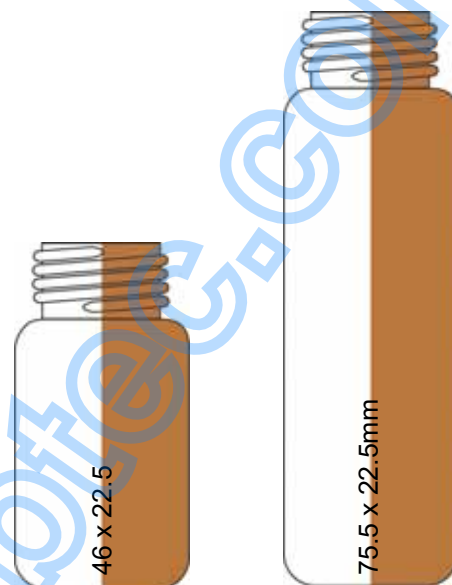
LLG - Flasks types

### Storage Vials ND13, ND 15, ND18



7.613 421    7.616 898    7.616 655    6.239 037

### Headspace ND 18



9.003 466    4.008 270  
6.227 874    6.237 909

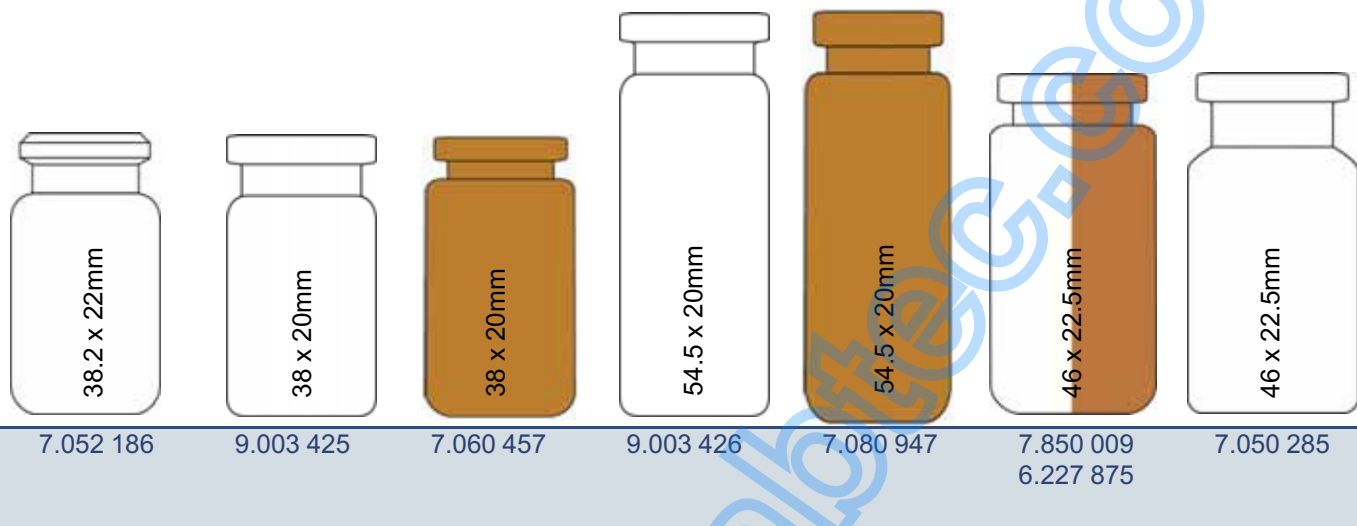
### Snap Cap Vials



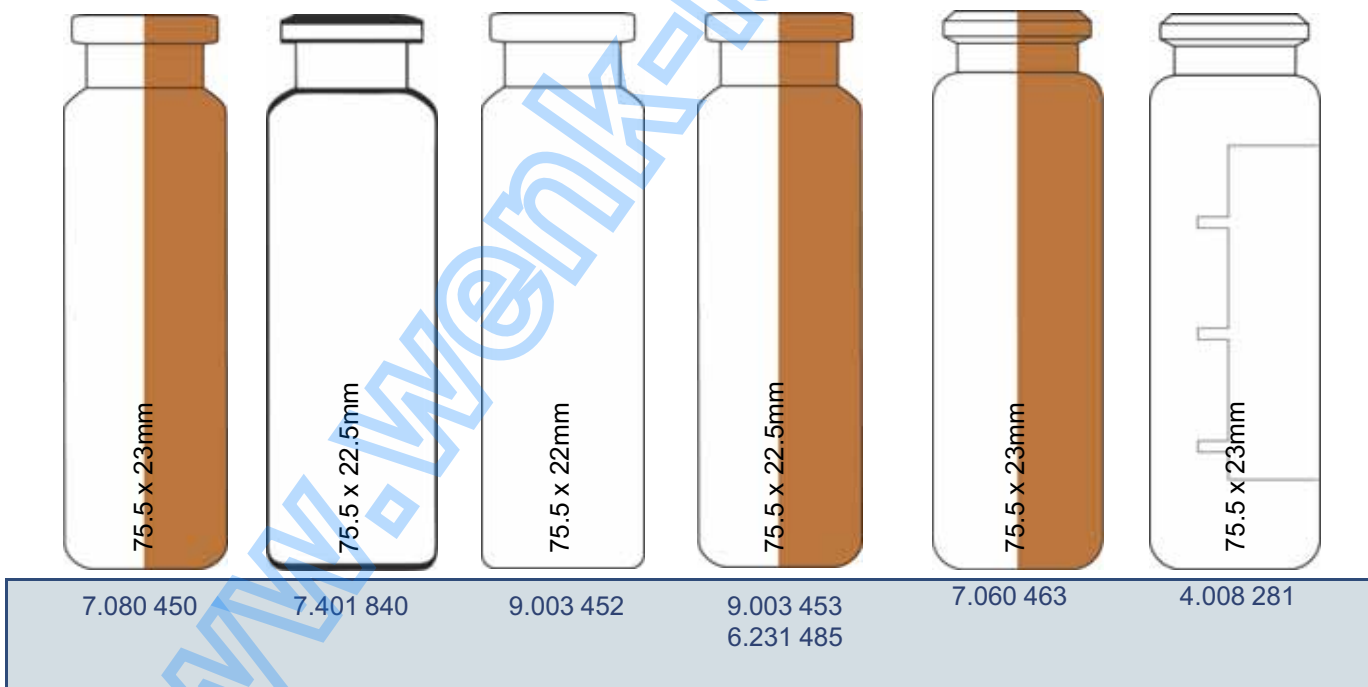
7.051 404    6.803 717    4.008 282    7.090 616

LLG - Flasks types

**Headspace ND 20**

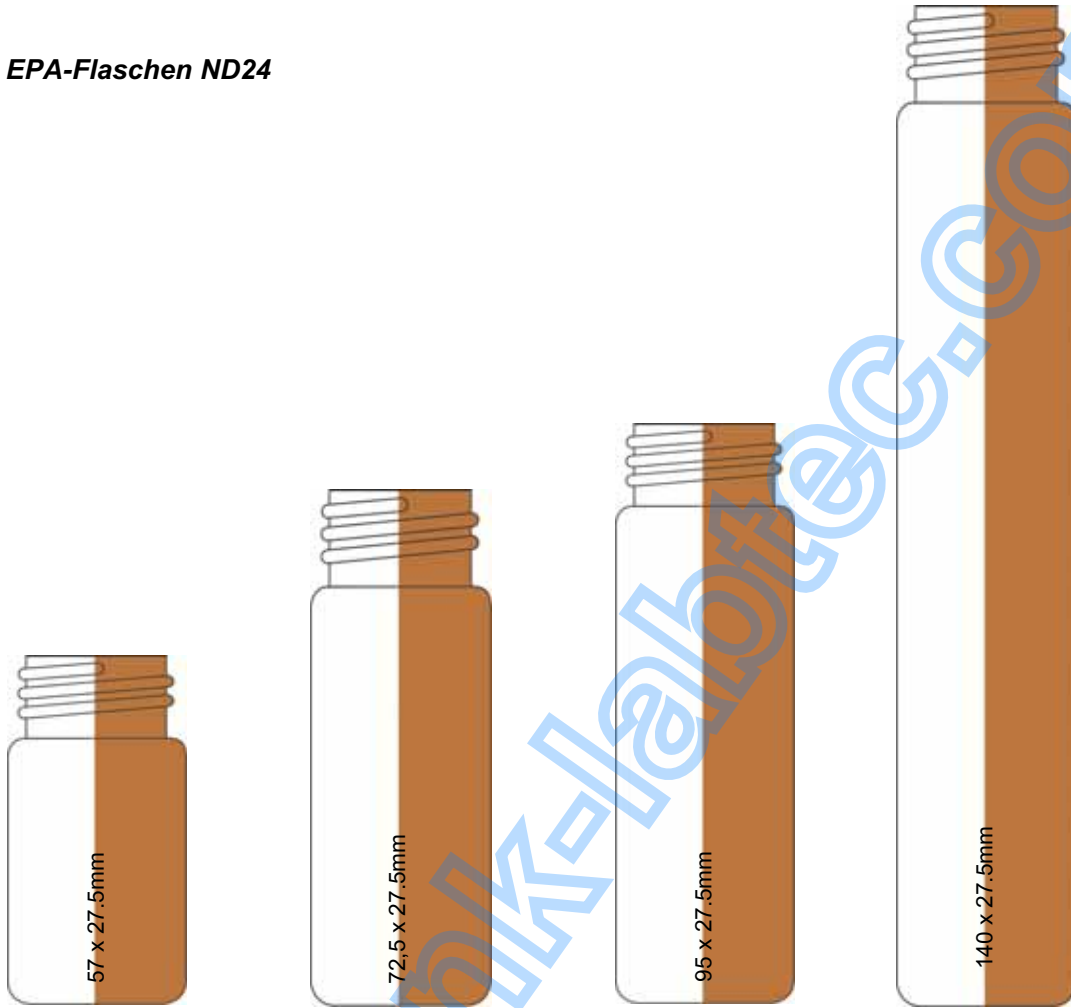


**Headspace ND 20**



LLG - Flasks types

**EPA-Flaschen ND24**



4.008 204	6.267 124	4.008 297	6.267 126
4.008 298	6.267 125	4.008 299	6.267 127

**Crimp Neck ND 20**



7.060 465	7.060 459
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LLG - Cap types

*Aluminum Crimp Caps, centre hole*

<b>Size</b>	<b>8mm</b>	<b>11mm</b>	<b>13mm</b>	<b>20mm</b>
Size centre hole Material Lacquer	4mm centre hole Aluminum clear	5.5mm centre hole Aluminum clear, red, blue, green, gold	6mm centre hole Aluminum clear, red, blue, green, gold	10mm centre hole Aluminum plain, red, blue, green, gold

*Special Aluminum Crimp Caps*

<b>Size</b>	<b>11mm</b>	<b>13mm</b>	<b>13mm</b>	<b>20mm</b>	<b>20mm</b>	<b>20mm</b>
Type of Cap Material Lacquer  Special features	Centre hole Cap Aluminum clear  with roll groove	Centre Tear Off Cap Aluminum clear, red, blue, green, gold	Complete Tear Off Cap Aluminum clear, red, blue, green, gold	Centre Tear Off Cap Aluminum clear, red, blue, green, gold	Complete Tear Off Cap Aluminum clear, red, blue, green, gold	Headspace Cap* Aluminum clear

Headspace Cap.\* This cap has the function of a pressure release cap and is designed with special scorelines whose bridges break open at an internal vial pressure of 3.0 ± 0.5 bar to let the excess pressure escape. It is comparable with the three component PerkinElmer Headspace Closure (Aluminum Crimp Cap with slits, metal star washer, liner with ears) which offers the same effect with a different technical design.

*Magnetic Caps, centre hole*

<b>Size</b>	<b>9mm Screw Cap</b>	<b>11mm Crimp Cap</b>	<b>20mm Crimp Cap</b>	<b>20mm Crimp Cap</b>	<b>20mm Bimetal Crimp Cap</b>	<b>18mm Screw Cap</b>	<b>18mm Screw Cap</b>
Size centre hole Application Material Lacquer	6mm centre hole (GC) PP Screw Cap blue/ magn. overcap gold GC PAL Thermo Scientific TriPlus	5mm centre hole (GC) magnetic gold GC PAL, Thermo Scientific Tri Plus	5mm centre hole (HS) magnetic gold CE HS250/500/HS800, CTC 500 Fisons HS250/500 HS800	8mm centre hole (HS) magnetic Gold  CTC Combi PAL	8mm centre hole (HS) Alu/magnetic red  CTC Combi PAL	8mm centre hole (Universal) (Headspace/SPME) magnetic silver CTC Combi PAL PerkinElmer Agilent G1888A	Closed top Universal Screw Cap  silver

*PE-Caps for Crimp Necks*

<b>Size</b>	<b>8mm</b>	<b>9mm</b>	<b>11mm</b>	<b>13mm</b>	<b>22mm</b>	<b>22mm</b>
Approp. Vial Size Cap Size centre hole Material, colour	For Crimp Neck ND8  8mm with thinned penetration point PE, blue	For Crimp Neck ND8  9 x 5.9mm 4mm centre hole PE, transparent	For Crimp Neck and Snap Ring ND11  11mm with thinned penetration point PE, blue	For Crimp Neck ND11  13 x 7.5mm 4.5mm centre hole PE, transparent	For HS Neck ND20  22 x 8.4mm 4.3mm centre hole PE, transparent Only for bevelled tops	For Crimp Neck ND20  22 x 9.1mm 4.3 centre hole or 6mm centre hole PE, transparent only for flat DIN Crimp Necks!

The drawings of the caps are not actual size. They should only visualize the special features of certain types of caps.



## LLG - Cap types

### Screw Caps

				
<b>Size</b>	<b>8mm</b>	<b>9mm</b>	<b>10mm</b>	<b>13mm</b>
Approp. Vial Thread Cap Design Size centre hole Material, colour	Screw Neck Vials ND8 8-425 thread Closed or open top 5.5mm centre hole PP, black or white	Short Thread Vials ND9 short thread, Closed or open top 6mm centre hole PP, black, transparent, blue, red, yellow, green	Screw Neck Vials ND10 10-425 thread, Closed or open top 7mm centre hole PP, black	Screw Neck Vials ND13 13-425 thread, Closed or open top 8.5mm centre hole PP, black, white
				
<b>Size</b>	<b>15mm</b>	<b>18mm</b>	<b>20mm</b>	<b>24mm</b>
Approp. Vial Thread Cap Design Size centre hole Material, colour	Screw Neck Vials ND15 15-425 thread, Closed or open top, 9mm centre hole PP, black, white	Screw Neck Vials ND18 18-400 thread, Closed or open top 12mm centre hole PP, black	Screw Neck Vials ND20 20-400 thread, Closed or open top, PP, white	Screw Neck Vials ND24 24-400 thread, Closed or open top 12.5mm centre hole PP, white

### PE-Plugs for Shell Vials

						
<b>Size</b>	<b>8mm</b>	<b>8mm</b>	<b>8mm</b>	<b>8mm</b>	<b>12mm</b>	<b>15mm</b>
Vial/Plug combination Plug Size Material, colour Special Features	Plug 6mm PE, transparent	Plug 8mm PE, blue	Plug 8mm PE, transparent with insertion barrier for Micro-Inserts	Plug 8mm PE, transparent without insertion barrier for Micro-Inserts	Plug 12mm PE, transparent	Plug 15mm PE, transparent

### Snap Ring Caps

	
<b>Size</b>	<b>11mm</b>
Approp. Vial Cap Design Size centre hole Material Colour	Snap Ring Vials ND11 open top 6mm centre hole PE transparent*, blue*, red, yellow, green

### Snap Caps

			
<b>Size</b>	<b>18mm</b>	<b>22mm</b>	<b>28mm</b>
Approp. Vial Cap Design Size Cap Material Colour	Snap Cap Vials ND18 closed top 19.8 x 5.2mm PE transparent	Snap Cap Vials ND22 closed top 23.5 x 5.5mm PE transparent	Snap Cap Vials ND28 closed top 29.7 x 5.6mm PE transparent

- available as a hard or soft PE Caps
- Hard Cap: tighter, but not so easy to push on or to remove
- Soft Cap: convenient in handling, but not as tight

The drawings of the caps are not actual size. They should only visualize the special features of certain types of caps.

Product Information – Sample Requests – Price Enquiries?  
Our Customer Service Team is always at your disposal for further questions.



**LLG-Crimp Neck Micro-Vials ND8**



Capacity o.d. x Height Colour Form	ml mm						
		0.20 5.5 x 31.5 clear conical	0.30 5.5 x 31.5 clear round bottom	0.60 7 x 40 clear conical	0.60 7 x 40 amber conical	1.20 8.2 x 40 clear flat bottom	1.20 8.2 x 40 amber flat bottom
PK		100	100	100	100	100	100
Cat. No.		<b>6.235 606</b>	<b>4.001 554</b>	<b>4.001 515</b>	<b>6.902 044</b>	<b>4.008 206</b>	<b>6.266 864</b>

**LLG-Aluminium Crimp Caps ND8, ready assembled**



Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	Natural rubber, red-orange / TEF transparent	60° shore A	1.00	100	<b>9.003 443</b>
	Red Rubber / PTFE beige	45° shore A	1.00	100	<b>4.008 200</b>
	Silicone white / PTFE red	45° shore A	1.30	100	<b>9.003 444</b>
	PTFE red / Silicone white, slit	45° shore A	1.30	100	<b>6.266 865</b>
	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	<b>4.008 198</b>

**LLG-Screw Neck Vials ND8, small opening**

Capacity o.d. x Height Colour Form	ml mm					
		1.50 11.6 x 32 clear flat bottom	1.50 11.6 x 32 clear, labeling field flat bottom	1.50 11.6 x 32 amber flat bottom	1.50 11.6 x 32 amber, labeling field flat bottom	1.10 11.6 x 32 clear conical
PK		100	1000	100	1000	100
Cat. No.		<b>9.003 481</b>	<b>7.613 087</b>	<b>9.003 480</b>	<b>7.613 388</b>	<b>4.001 563</b>

**LLG-Micro-Inserts for Screw Vials ND8, small opening**

Capacity o.d. x Height Colour Form	ml mm				
		0.10 5 x 31 clear conical, 15mm tip	0.10 5 x 31 clear conical, 9mm tip	0.10 5 x 29 clear with plastic spring	0.20 5 x 31 clear flat bottom
PK		100	100	100	100
Cat. No.		<b>7.401 066</b>	<b>9.003 435</b>	<b>4.001 556</b>	<b>4.008 194</b>

### LLG-PP Screw Seals ND8, ready assembled, and empty Screw Caps ND8

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	black, centre hole	Natural rubber red-orange / TEF transparent	60° shore A	1.30	100	6.266 866
	black, closed	Natural rubber red-orange / TEF transparent	60° shore A	1.30	100	6.266 867
	black, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	4.008 209
	black, closed	Red Rubber / PTFE beige	45° shore A	1.00	100	4.008 210
	black, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	9.003 484
	black, centre hole	Silicone white / PTFE red, slit	45° shore A	1.30	100	6.232 178
	black, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	4.008 207
	black, centre hole	no liner	-	-	100	7.060 421
	black, closed	no liner	-	-	100	7.075 960

### LLG Septa for Screw Caps ND8

	Septa	Hardness	Thickness mm	PK	Cat. No.
	PTFE virginal, white	53° shore D	0.25	100	7.085 238
	Red Rubber / PTFE beige	45° shore A	1.00	100	4.008 197
	Silicone white / PTFE red	45° shore A	1.30	100	7.060 419
	Silicone white / PTFE blue, slit	55° shore A	0.90	100	7.085 892



### 1 LLG - 2in1 and 3in1 Kits with Screw Neck Vials ND8 (small opening)

2in1 KITS contain 100 vials and 100 closures in a blue PP-Box. As both components are always required at the same time, 2in1 KITS are a convenient way to obtain and store all required items for analysis. 2in1 KITS are available for any type of 1.5ml (32 x 11.6mm), 4ml (45 x 14.75mm) or 20ml Headspace Vial (75.5 x 23mm) with an appropriate seal. All advantages of the individual components (cleanroom packaging of the vials, recloseability of the packaging, etc.) remain unchanged.

Any other combination of vial and seal as a 2in1 KIT available.

Type	Capacity ml	Description	Cover type	PK	Cat. No.
2in1 Kit	1.50	clear	Screw Cap, black, hole, Silicon white / PTFE red	100	6.238 965
2in1 Kit	1.50	amber	Screw Cap, black, hole, Silicon white / PTFE red	100	9.003 557
2in1 Kit	1.50	amber, labelling field	Screw Cap, black, hole, Silicon white / PTFE red	100	9.003 558
2in1 Kit	1.50	clear, labelling field	Screw Cap, black, hole, Silicon white / PTFE red	100	9.003 559
3in1 Kit	1.50	clear	Screw Cap, black, hole, Silicon white /PTFE blue, slitted (Septa unassembled)	100	6.223 506








➔ Storage Boxes - please see page 1349.

### LLG-Short Thread Vials ND9, wide opening

Capacity o.d. x Height Colour Form	ml mm				
Capacity	ml	1.50	1.50	1.50	1.50
o.d. x Height	mm	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32
Colour		clear	clear, labelling field	amber	amber, labelling field
Form		flat bottom	flat bottom	flat bottom	flat bottom
PK		100	1000	100	1000
Cat. No.		9.003 448	6.803 174	4.008 247	6.088 871

### LLG-Short Thread Vials ND9, wide opening, Micro-Vials and inserts



Capacity o.d. x Height Colour Form	ml mm							
Capacity	ml	1.10	0.20	0.20	0.30	0.10	0.10	0.10
o.d. x Height	mm	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32	6 x 31	6 x 31	5.7 x 29
Colour		clear	clear	clear	transparent	clear	clear	clear
Form		flat bottom, 15µl funnel in solid glass bottom	flat bottom with integrated 0.2mL insert	TPX®, flat bottom with integrated 0.2mL insert	PP, with inner cone	conical 15mm tip	conical 12mm tip	with plastic spring
PK		100	100	100	100	100	100	100
Cat. No.		4.008 249	4.008 250	6.266 868	4.008 262	7.401 744	4.001 547	6.093 247

### LLG-Short Thread Vials ND9, wide opening, SureStop™



The short thread vials ND9 SureStop™ are the best available on the market in terms of seal tightness and reliability. The vials have an additional stopper ring at the end of the thread which clearly marks the end point in the screwing-in process. This ensures that the tightness of the seal is independent of the touch or feel of the user screwing the stopper in. This ensures the lowest possible number of standard deviations and high reproducibility of analysis results.

- Stopper ring as protection against over-tightening
- 1st hydrolytic class glass
- In clear and amber glass
- Wide opening requires matching micro-inserts


Capacity o.d. x Height Colour Form	ml mm			
Capacity	ml	1.50	1.50	1.50
o.d. x Height	mm	11.6 x 32	11.6 x 32	11.6 x 32
Colour		clear	clear, labelling field	amber, labelling field
Form		flat bottom	flat bottom	flat bottom
PK		100	100	100
Cat. No.		6.266 869	6.260 742	6.260 743

### LLG-Short thread screw caps ND9, magnetic



These short thread screw seals have a magnetic sleeve and are more convenient and secure to handle than 11mm magnetic crimp seals. They have been officially tested and approved for CTC.

- Screw cap with short thread and 6mm hole
- Mounted magnetic metal sleeve (gold colour)
- Temperature resistant from -60°C to 200°C
- Very low particle formation during penetration

Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
 Gold / blue, with center hole	Silicone white / PTFE red, UltraBond	55° shore A	1.00	100	6.266 870






### LLG-PP Short Thread Seals ND9, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	transparent, centre hole	Natural rubber, red-orange / TEF transparent	60° shore A	1.00	100	6.266 872
	blue, centre hole	Natural rubber, red-orange / TEF transparent	60° shore A	1.00	100	6.266 883
	transparent, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	4.008 229
	blue, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	4.008 228
	blue closed	Red Rubber / PTFE beige	45° shore A	1.00	100	4.008 230
	transparent, centre hole	Silicone white / PTFE red	55° shore A	1.00	100	7.076 778
	blue, centre hole	Silicone white / PTFE red	55° shore A	1.00	100	9.003 451
	black, centre hole	Silicone white / PTFE red	55° shore A	1.00	100	4.008 225
	green, centre hole	Silicone white / PTFE red	55° shore A	1.00	100	4.008 224
	blue closed	Silicone white / PTFE red	55° shore A	1.00	100	4.008 227
	transparent, centre hole	Silicone white / PTFE blue, slit	55° shore A	1.00	100	7.200 809
	blue, centre hole	Silicone white / PTFE blue, slit	55° shore A	1.00	100	4.001 521
	black, center hole	Silicone white / PTFE blue, slit	55° shore A	1.00	100	4.008 226
	blue, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	4.008 218
	blue, centre hole	PTFE virginal, white	53° shore D	0.25	100	4.008 221
	blue closed	PTFE virginal, white	53° shore D	0.25	100	7.930 366

### LLG-Septa for Thread Screw Caps ND9

	Septa	Hardness	Thickness mm	PK	Cat. No.
	Silicone white / PTFE red	55° shore A	1.00	100	4.008 212
	PTFE virginal, white	53° shore D	0.25	100	4.008 211

### LLG-PP UltraBond\*Short Thread Seals ND9

Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
 Ultrabond* Seal blue, center hole	Red Rubber / PTFE beige	45° shore A	1.00	100	<b>4.008 216</b>
 Ultrabond* Seal blue, center hole	Silicone beige / PTFE white	45° shore A	1.30	100	<b>4.008 214</b>
 Ultrabond* Seal blue, center hole	Silicone beige / PTFE white, slit	45° shore A	1.30	100	<b>4.008 215</b>

\*Cap+Liner form an inseparable unit, so that the liner cannot be pushed into the vial even with a blunt needle

### 1 LLG - 2in1 Kits with Short Thread Vials ND9 (wide opening)

2in1 KITS contain 100 vials and 100 closures in a blue PP-Box. As both components are always required at the same time, 2in1 KITS are a convenient way to obtain and store all required items for analysis. All advantages of the individual components (cleanroom packaging of the vials, recloseability of the packaging, etc.) remain unchanged.







Any other combination of vial and seal as a 2in1 KIT available.



Description	Volume ml	Cover type	PK	Cat. No.
clear	1.5	Short Thread Cap, transparent, hole, natural rubber / PP red-orange	100	<b>7.620 724</b>
clear	1.5	Short Thread Cap, blue, hole, Silicon white / PTFE red	100	<b>9.003 560</b>
clear	1.5	Short Thread Cap, blue, hole, Silicon white / PFE blue, slitted	100	<b>7.621 765</b>
clear	1.5	Short Thread Cap, transparent, hole, Silicon white / PTFE red	100	<b>9.003 561</b>
clear, labelling field	1.5	Short Thread Cap, blue, hole, Silicon white / PFE blue, slitted	100	<b>9.003 562</b>
clear, labelling field	1.5	UltraClean Short Thread Cap, blue, hole, Silicon white / PFE red	100	<b>7.970 892</b>
amber, labelling field	1.5	UltraBond Short Thread Cap, blue, hole, Silicon beige / PTFE white, slitted	100	<b>9.003 563</b>
amber, labelling field	1.5	UltraClean Short Thread Cap, blue, hole, Silicon white / PFE red	100	<b>6.266 871</b>

### LLG-Screw Neck Vials ND10, wide opening and Micro-Inserts

















						
Capacity	ml 1.50	1.50	1.50	0.10	0.10	0.20
o.d. x Height	mm 11,6 x 32	11,6 x 32	11,6 x 32	6 x 31	5,7 x 29	6 x 31
Colour	clear	clear, labeling field	amber, labeling field	clear	clear	clear
Form	flat bottom	flat bottom	flat bottom	conical, 15mm tip	with plastic spring	flat bottom
PK	100	1000	1000	100	100	100
Cat. No.	<b>6.242 103</b>	<b>7.615 715</b>	<b>6.238 867</b>	<b>7.401 744</b>	<b>6.093 247</b>	<b>4.008 196</b>

➔ Storage Boxes - please see page 1349.

### LLG-PP Screw Seals ND10











	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	 black, center hole	Natural Rubber red-orange / TEF transparent	60° shore A	1.30	100	6.267 111
	 black, closed	Natural Rubber red-orange / TEF transparent	60° shore A	1.30	100	6.267 112
	 black, center hole	Red rubber / PTFE beige	45° shore A	1.00	100	6.242 104
	 black, center hole	Silicone white / PTFE beige	45° shore A	1.50	100	4.008 234
	 black, center hole	Silicone white / PTFE red	45° shore A	1.30	100	4.008 235
	 black, center hole	Silicone white / PTFE blue, slit	55° shore A	1.50	100	4.008 237
	 black, center hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	4.008 236

### LLG Crimp Neck Vials ND11, small and wide opening (flat bottom)

					
Capacity ml	1.50	1.50	1.50	1.50	1.50
o.d. x Height mm	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32
Colour	clear	amber	clear	clear, labeling field	amber, labeling field
Form	small opening	small opening	wide opening	wide opening	wide opening
PK	100	100	100	1000	1000
Cat. No.	7.085 511	7.089 998	7.086 520	7.608 160	7.620 828







### LLG-Micro Inserts for Crimp Neck Vials ND11














								
Capacity ml	0.10	0.10	0.10	0.20	0.10	0.10	0.10	0.20
o.d. x Height mm	5 x 31	5 x 31	5 x 29	5 x 31	6 x 31	6 x 31	5,7 x 29	6 x 31
Colour	clear	clear	clear	clear	clear	clear	clear	clear
Form	for small opening, conical, 15mm tip	for small opening, conical, 9mm tip	for small opening, with plastic spring	for small opening, flat bottom	for wide opening, conical, 15mm tip	for wide opening, conical, 12mm tip	for wide opening, with plastic spring	for wide opening, flat bottom
PK	100	100	100	100	100	100	100	100
Cat. No.	7.401 066	9.003 435	4.001 556	4.008 194	7.401 744	4.001 547	6.093 247	4.008 196





**LLG-Micro Crimp Neck Vials ND11**

Capacity o.d. x Height Colour Form	ml mm						
	1.10 11,6 x 32	1.10 11,6 x 32	1.10 11,6 x 32	1.10 11,6 x 32	1.10 11,6 x 32	0.20 11,6 x 32	0.20 11,6 x 32
	clear	clear	clear	clear	amber	clear	amber
	flat bottom, 15 µl funnel in solid glass bottom	conical	conical with a round pedestal glass plate	conical with a round pedestal glass plate	conical with a round pedestal glass plate	flat bottom, with integrated 0.2 mL insert	flat bottom, with integrated 0.2 mL insert
PK		100	100	100	100	100	100
<b>Cat. No.</b>		<b>4.001 565</b>	<b>4.001 516</b>	<b>4.008 253</b>	<b>4.008 254</b>	<b>6.233 918</b>	<b>4.008 251</b>

**LLG-Aluminium Crimp Seals ND11, ready assembled**

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	aluminium, silver, centre hole	Natural rubber red-orange / TEF transparent	60° shore A	1.30	100	<b>9.003 441</b>
	aluminium, silver, centre hole	Natural rubber red-orange / TEF transparent (corresponds to Agilent quality)	60° shore A	1.00	100	<b>4.008 239</b>
	aluminium, silver, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	<b>7.060 469</b>
	aluminium, green, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	<b>4.001 522</b>
	aluminium, blue, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	<b>6.900 233</b>
	aluminium, silver, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	<b>4.008 243</b>
	aluminium, silver, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	<b>9.003 446</b>
	aluminium, silver, centre hole	Silicone white / PTFE blue, cross-slit	55° shore A	1.50	100	<b>4.001 555</b>
	<b>magnetic,</b> gold, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	<b>4.001 564</b>
	aluminium, silver, centre hole	PTFE virginal, white	53° shore D	0.25	100	<b>4.001 559</b>
	aluminium, silver, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	<b>7.050 759</b>

 Crimping Tools - please see page 1348.

 Storage Boxes - please see page 1349.

### LLG-Aluminium Crimp Seals ND11, ready assembled

Crimp seals ND11 with aluminium septa

Septa made from aluminium are suitable for storing standards or reactive substances that can attack normal septum materials. There is also no risk of contamination of the samples with plasticisers, silicone or butyl rubbers or by PTFE, FEP or TEF components. A ring placed above the aluminium septum achieves an excellent seal on the stopper system.

Properties

- Plain lacquered cap with 5.5 mm hole
- Elastomer- and halogen-free
- Excellent seal tightness thanks to additional ring
- Packaged in plasticiser-free packaging (glass container)

Application areas

- Elastomer and plastomer analysis
- Phthalate analysis
- Analysis of fluorinated/halogenated organic compounds
- VOC analysis (volatile organic compounds)
- Analysis of polymerisation catalysts

Caps		Septa	Hardness	Thickness mm	PK	Cat. No.
		Aluminium, clear lacquered, center hole	Aluminium liner	-	0.06	100 6.267 113
		Aluminium, clear lacquered, center hole	PTFE virginal	53° shore D	0.25	100 6.267 114



### 1 LLG - 2in1 Kits with Crimp Neck Vials ND11 (wide opening)

2in1 KITS contain 100 vials and 100 closures in a blue PP-Box. As both components are always required at the same time, 2in1 KITS are a convenient way to obtain and store all required items for analysis. 2in1 KITS are available for any type of 1.5ml (32 x 11.6mm), 4ml (45 x 14.75mm) or 20ml Headspace Vial (75.5 x 23mm) with an appropriate seal. All advantages of the individual components (cleanroom packaging of the vials, recloseability of the packaging, etc.) remain unchanged.

Any other combination of vial and seal as a 2in1 KIT available.

Description	Cover type	PK	Cat. No.
clear	Crimp Cap, silver, hole, Natural Rubber red-orange / TEF transparent	100	6.257 139
clear	Crimp Cap, silver, hole, Natural Rubber / Butyl red-orange / TEF transparent	100	9.003 564
clear, labelling field	Crimp Cap, silver, hole, Natural Rubber / Butyl red-orange / TEF transparent	100	9.003 565
amber, labelling field	Crimp Cap, silver, hole, Natural Rubber red-orange / TEF transparent	100	9.003 566
clear	Crimp Cap, silver, hole, Silicon white / PTFE red	100	6.238 979

### LLG-Snap Ring Vials ND11, wide opening and Micro-Inserts

As an alternative to snap ring seals, snap ring vials and micro-vials ND11 can also be sealed with crimp seals ND11 since the two snap ring lips have the same height as a crimp neck.

Capacity	1.50	1.50	1.50	0.30	0.30	0.10	0.10	0.10	0.10
o.d. x Height	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32	11.6 x 32	6 x 31	5.7 x 29	6 x 31	6 x 31
Colour	clear	clear,	amber,	clear	clear, PP	clear	clear	clear	clear
		labeling field	labeling field						
Form	flat bottom	flat bottom	flat bottom	flat bottom, integrated 0.3mL insert	flat bottom, integrated 0.3mL insert	conical, 15mm tip	with plastic spring		flat bottom
PK	100	1000	1000	100	100	100	100	100	100
Cat. No.	6.073 833	7.622 228	7.613 330	4.008 255	6.267 115	7.401 744	6.093 247		4.008 196



LLG-PE Snap Ring Seals ND11, ready assembled



Caps		Septa	Hardness	Thickness mm	PK	Cat. No.
	transparent, PE centre hole	Natural Rubber red-orange / TEF transparent	60° shore A	1.00	100	6.267 116
	transparent, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	4.008 261
	blue, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	4.008 257
	transparent, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	4.001 544
	transparent, centre hole	Silicone white / PTFE blue, cross-slit	55° shore A	1.00	100	4.008 256
	snap ring cap, blue, centre hole	Silicone white / PTFE blue, cross-slit	55° shore A	1.00	100	6.242 212
	transparent, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	6.073 555
	blue, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	4.008 259

LLG Crimp neck vials ND13









Capacity	ml	Image		PK	Cat. No.
2.00	16 x 32		clear flat bottom	1000	6.228 969
4.00	14,7 x 45		clear flat bottom	1000	9.003 535










LLG-Aluminium Crimp Seals ND13, ready assembled and empty Crimp Caps ND13

Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	Pharma-Fix- Septa (Butyl/PTFE)	50° shore A	2.00	100	7.060 475
	Butyl dark grey / Pharma-Fix- Septa (Butyl/PTFE)	50° shore A	2.00	100	9.003 442
	Butyl dark grey / Pharma-Fix- Septa (Butyl/PTFE)	50° shore A	2.00	1000	9.003 548
	-			100	6.801 727





### LLG-Screw Neck Vials and appropriate Micro-Insert

Capacity o.d. x Height Colour	ml mm						
		4.00 14.7 x 45 clear	4.00 14.7 x 45 clear, labelling field flat bottom	4.00 14.7 x 45 amber	4.00 14.7 x 45 amber, labelling field flat bottom	0.30 6 x 40 clear	7.5 x 50
Form		flat bottom	flat bottom	flat bottom	flat bottom	conical, metal spring necessary (6.267 118)	metal spring
PK		100	100	100	1000	100	100
Cat. No.		<b>9.003 482</b>	<b>6.267 117</b>	<b>7.058 142</b>	<b>9.003 549</b>	<b>7.055 486</b>	<b>6.267 118</b>

### LLG-PP Screw Seals ND13, ready assembled and empty Screw Caps ND13




	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	black, closed top	Butyl red / PTFE grey	55° shore A	1.30	1000	<b>6.240 135</b>
	black, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	<b>6.242 468</b>
	black, closed top	Red Rubber / PTFE beige	45° shore A	1.00	100	<b>4.008 267</b>
	black, centre hole	Silicone creme / PTFE red	55° shore A	1.50	100	<b>7.510 053</b>
	black, closed top	Silicone creme / PTFE red	55° shore A	1.50	100	<b>6.242 267</b>
	black, centre hole	Silicone white / PTFE blue, cross-slitted	55° shore A	1.50	100	<b>6.267 119</b>
	black, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	<b>6.267 120</b>
	black, centre hole				100	<b>7.071 151</b>
	black, closed top				100	<b>7.060 437</b>

### LLG-Septa for Screw Caps ND13

Septa	Hardness	Thickness mm	PK	Cat. No.
	Butyl red / PTFE grey	55° shore A	1.30	1000 <b>9.003 536</b>
	Red Rubber / PTFE beige	45° shore A	1.00	100 <b>4.008 264</b>
	Silicone creme / PTFE red	55° shore A	1.50	100 <b>4.008 263</b>
	PTFE virginal, white	53° shore D	0.25	100 <b>7.058 143</b>



LLG-Screw Neck Vials for Storage Purposes ND 15, ND 18



Capacity o.d. x Height	ml mm			
Colour		8.00 16,6 x 61 clear	12.00 18,5 x 66 clear	16.00 20,6 x 71 clear
Form		ND15, flat bottom	ND15, flat bottom	ND18, flat bottom
PK		1000	1000	1000
Cat. No.		<b>7.616 898</b>	<b>7.616 655</b>	<b>6.239 037</b>


LLG-Screw Seals for Screw Neck Vials ND 15, ND 18








Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
 15mm cap, black, closed top	Butyl red / PTFE grey	55° shore A	1.60	1000	<b>7.616 653</b>
 18mm cap, black, closed top	Butyl red / PTFE grey	55° shore A	1.60	1000	<b>7.910 125</b>

LLG-Replacement Septa for Screw Caps ND15, ND18






Description	Hardness	Thickness mm	PK	Cat. No.
 15mm, Butyl red / PTFE grey	55° shore A	1.60	1000	<b>9.003 537</b>
 18mm, Butyl red / PTFE grey	55° shore A	1.60	1000	<b>9.003 538</b>

LLG-Shell Vials with PE cap (fire-polished neck) ND8 and ND12

Capacity o.d. x Height	ml mm					
Colour		1.00 8,2 x 40 clear	1.00 8,2 x 40 amber	2.00 11,6 x 31,5 clear	4.00 14,65 x 44,60 clear	4.00 14,65 x 44,60 clear
Form		ND8, flat bottom	ND8, flat bottom	ND12, flat bottom	ND8, flat bottom	ND8, flat bottom
PK		100	100	100	1000	1000
Cat. No.		<b>7.300 174</b>	<b>4.008 205</b>	<b>4.008 248</b>	<b>7.632 226</b>	<b>6.227 544</b>





LLG Plugs, PE

For	PK	Cat. No.
 ND8	100	<b>7.300 175</b>
 ND12	100	<b>4.008 265</b>
 ND15	1000	<b>9.003 540</b>



# 14. Chromatography

## Vials/Vials, Septa





### LLG-Snap Cap Vials ND18 and ND22, without lid

Capacity o.d. x Height Colour Form	ml mm				
		5.00 20 x 40 clear ND18, flat bottom	10.00 22 x 50 clear ND18, flat bottom	15.00 26 x 48 clear ND22, flat bottom	25.00 26 x 65 clear ND22, flat bottom
PK		100	100	100	100
Cat. No.		7.051 404	6.803 717	4.008 282	7.090 616

### LLG-Snap Caps, PE, ND18 and ND22






For	PK	Cat. No.
 ND18	100	6.051 403
 ND22	100	7.090 617

### LLG-Headspace-Precision Thread Vials ND18









Capacity o.d. x Height Colour Form	ml mm				
		10.00 22,5 x 46 clear rounded bottom	10.00 22,5 x 46 amber rounded bottom	20.00 22,5 x 75,5 clear rounded bottom	20.00 22,5 x 75,5 amber rounded bottom
PK		100	1000	100	1000
Cat. No.		9.003 466	6.227 874	4.008 270	6.237 909

### LLG-Magnetic Universal Screw Seals ND18 for Precision Thread Vials ND18










Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	silver, center hole Butyl red / PTFE grey	55° shore A	1.60	100	4.008 269
	silver, center hole Silicone blue transparent / PTFE white	45° shore A	1.30	100	6.241 111
	silver, center hole Silicone white / PTFE blue	55° shore A	1.50	100	4.008 268
	silver, without hole Butyl red / PTFE grey	55° shore A	1.60	100	6.262 513
	silver, without hole Silicone white / PTFE red UltraClean	45° shore A	1.30	100	6.267 122








### LLG-Headspace-Vials ND20 (5ml and 10ml)

									
Capacity	ml	5.00	5.00	6.00	5.00	10.00	10.00	10.00	10.00
o.d. x Height	mm	20 x 38	20 x 38	22 x 38,20	21,7 x 38,20	20,0 x 54,5	20,0 x 54,5	22,5 x 46	22,5 x 46
Colour		clear	amber	clear	clear	clear	amber	clear	clear
Form		flat bottom flat DIN crimp neck	flat bottom flat DIN crimp neck	rounded bottom bevelled HS crimp neck	flat bottom bevelled HS crimp neck	flat bottom flat DIN crimp neck	flat bottom flat DIN crimp neck	flat bottom flat DIN crimp neck	rounded bottom bevelled HS crimp neck
For		Varian	Varian	PerkinElmer	Metrohm	Varian	Varian	DANI, Agilent	CTC, Varian
PK		100	100	100	100	100	100	100	100
Cat. No.		<b>9.003 425</b>	<b>7.060 457</b>	<b>7.052 186</b>	<b>4.008 285</b>	<b>9.003 426</b>	<b>7.080 947</b>	<b>7.050 285</b>	<b>7.850 009</b>



### LLG-Headspace-Vials ND20 (20ml and 50 ml)

								
Capacity	ml	20.00	20.00	20.00	20.00	20.00	20.00	50.00
o.d. x Height	mm	23.25 x 75.5	23.25 x 75.5	22.5 x 75.5	22.5 x 75.5	23 x 75.5	23 x 75.5	31 x 101
Colour		clear	amber	clear	clear	clear	clear, with label	clear
Form		flat bottom flat DIN crimp neck	flat bottom flat DIN crimp neck	flat bottom flat DIN crimp neck	rounded bottom flat DIN crimp neck	rounded bottom bevelled HS crimp neck	rounded bottom bevelled HS crimp neck	flat bottom flat DIN crimp neck
For				DANI, Agilent	CTC, Varian	PerkinElmer	PerkinElmer	
PK		100	100	100	100	100	100	100
Cat. No.		<b>7.401 840</b>	<b>7.080 450</b>	<b>9.003 452</b>	<b>9.003 453</b>	<b>7.060 463</b>	<b>4.008 281</b>	<b>7.060 459</b>

### LLG-Crimp Seals ND20, Aluminium, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	silver, center hole	Butyl red / PTFE grey	50° shore A	3.00	100	<b>9.003 454</b>
	silver, center hole	Butyl grey / PTFE grey	50° shore A	3.00	100	<b>4.001 549</b>
	silver, center hole	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	<b>9.003 430</b>
	gold, center hole	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	<b>4.008 275</b>
	silver, center hole	Silicone blue / PTFE colourless	45° shore A	3.00	100	<b>9.003 434</b>
	silver, center hole	Silicone white / PTFE beige	45° shore A	3.20	100	<b>9.003 460</b>
	silver, center hole				100	<b>7.060 477</b>

### LLG-Crimp Seals ND20 (Center Tead Off Caps), Aluminium, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	gold	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	<b>9.003 445</b>
	silver	Butyl stopper, grey only unassembled	37° shore A		100	<b>7.087 863</b>

### LLG-Headspace Seals ND20 (Pressure Release Caps), Aluminium, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	silver, centre hole	Butyl red / PTFE grey	50° shore A	3.00	100	9.003 455
	silver, centre hole	Butyl grey / PTFE grey	50° shore A	3.00	100	4.001 557
	silver, centre hole	Pharma-Fix- Septa Butyl/PTFE	50° shore A	3.00	100	4.008 276
	silver, centre hole	Silicone blue transp. / PTFE transparent	45° shore A	3.00	100	7.050 286
	silver, centre hole	Silicone white / PTFE beige	45° shore A	3.20	100	9.003 456
	silver, centre hole (no liner)				100	4.008 271

### LLG-Crimp Seals ND20 (Complete Tear Off Caps), Aluminium, ready assembled

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	silver	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	7.060 471
	silver	Butyl stopper, grey only unassembled	37° shore A		100	7.060 479
	silver (no liner)				100	7.056 751

### LLG-Bimetal Crimp Seals ND20, ready assembled, magnetic

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	red/silver, centre hole	Butyl grey / PTFE grey	50° shore A	3.00	100	9.003 457
	red/silver, centre hole	Silicone blue transp. / PTFE transparent	45° shore A	3.00	100	6.234 541
	red/silver, centre hole	Silicone white / PTFE beige	45° shore A	3.20	100	9.003 458
	red/silver, centre hole (no liner)				100	4.008 272

### LLG-Steel Crimp Seals ND20, ready assembled, magnetic







	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	gold, center hole 8 mm	Butyl grey / PTFE grey	50° shore A	3.00	100	6.229 635
	gold, center hole 8 mm	Pharma-Fix- Septa Butyl/PTFE	50° shore A	3.00	100	6.902 419
	gold, center hole 8 mm	Silicone blue transp./ PTFE transparent	45° shore A	3.00	100	7.850 010
	gold, center hole 8 mm (no liner)				100	7.625 012





## LLG-PE Caps ND20, transparent and appropriate Septa ND19

Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
 PE cap, transparent 22.00 x 8.40mm for HS crimp neck 4.3mm centre hole	Natural rubber red-orange/ TEF transparent	60° shore A	1.30	1000	9.003 543
 PE cap, transparent 22.00 x 9.10mm for DIN crimp neck 4.3mm centre hole	Natural rubber red-orange/ TEF transparent	60° shore A	1.30	1000	6.234 902
 PE cap, transparent 22.00 x 8.40mm for HS crimp neck 4.3mm centre hole	Butyl red / PTFE grey	55° shore A	1.30	1000	9.003 544
 PE cap, transparent 22.00 x 9.10mm for DIN crimp neck 4.3mm centre hole	Butyl red / PTFE grey	55° shore A	1.30	1000	9.003 545
 height 8.4mm, for HS crimp neck, 4.3mm centre hole (no liner)				100	6.227 768
 height 9.1mm, for DIN crimp neck, 4.3mm centre hole (no liner)				100	7.052 184
	Butyl red / PTFE grey	55° shore A	1.30	100	7.060 425
	Natural rubber red-orange/ TEF transparent	45° shore A	1.30	100	7.051 039

## LLG-Septa for Crimp Caps ND20

Septa	Hardness	Thickness mm	PK	Cat. No.
 Butyl red / PTFE grey	50° shore A	3.00	100	7.060 427
 Butyl grey / PTFE grey	50° shore A	3.00	100	4.008 273
 Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.00	100	7.071 063
 Silicone blue transp./ PTFE transparent	45° shore A	3.00	100	4.008 274
 Silicone white / PTFE beige	45° shore A	3.20	100	7.050 202
 Silicone white / Aluminium foil silver	50° shore A	3.00	100	4.001 550

## LLG Stoppers ND20

Description	PK	Cat. No.
 butyl grey	100	7.060 433
 bromine butyl red	100	6.900 963

## 1 LLG-Crimp Neck Vial ND20

**NEW!**

1

100 mL crimp neck vial, 51.6 x 94.5mm, clear, flat bottom, flat DIN crimp neck









Description	PK	Cat. No.
Vials only	88	6.231 858
Cap	100	7.060 471













## Vials/Vials, Septa

### LLG-Screw Neck Vials ND24 (EPA Vials)



Capacity o.d. x Height Colour Form	ml mm								
		20.00 27.5 x 57 clear flat bottom	20.00 27.5 x 57 amber flat bottom	30.00 27.5 x 72.5 clear flat bottom	30.00 27.5 x 72.5 amber flat bottom	40.00 27.5 x 95 clear flat bottom	40.00 27.5 x 95 amber flat bottom	60.00 27.5 x 140 clear flat bottom	60.00 27.5 x 140 amber flat bottom
PK		100	100	100	100	100	100	100	100
Cat. No.		4.008 204	4.008 298	6.267 124	6.267 125	4.008 297	4.008 299	6.267 126	6.267 127

### LLG-PP Screw Seals ND24 (UltraBond Seals and ready assembled Seals ND24), PP Screw Caps ND24 (empty) and Septa ND22

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	white, perforated	Butyl red / PTFE gray (mounted)	55° shore A	2.50	1000	7.633 064
	white, closed	Butyl red / PTFE gray (mounted)	55° shore A	2.50	1000	7.615 156
	Ultrabond*, white, center hole	Silicone white / PTFE beige	45° shore A	3.20	100	4.008 293
	Ultrabond*, white, closed top	Silicone white / PTFE beige	45° shore A	3.20	100	4.008 292
	white, perforated	Silicone white / PTFE beige (mounted)	45° shore A	3.20	1000	6.233 339
	white, closed	Silicone white / PTFE beige (mounted)	45° shore A	3.20	1000	9.003 541
	white, center hole	no liner			100	4.008 295
	white, closed top	no liner			100	4.008 296
		Silicone white / PTFE beige	45° shore A	3.20	100	4.008 291
		Butyl red / PTFE gray	55° shore A	2.50	1000	9.003 542

\*Cap+Liner form an inseparable unit, so that the liner cannot be pushed into the vial even with a blunt needle



### 1 LLG-Crimping Tools ND8/ND11/ND13/ND20

Stainless steel crimping Tools ND11, ND13, ND20 for cleanroom use available on request.

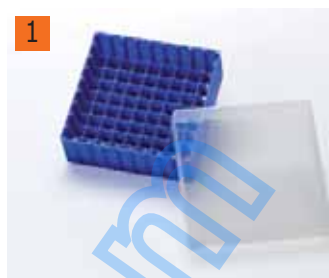
Description	Size	PK	Cat. No.
Manual crimper for 8 mm aluminium caps	ND8	1	9.003 470
Manual decapper for 8 mm aluminium caps	ND8	1	9.003 511
Manual crimper, height adjustable, for 11 mm aluminium crimp caps	ND11	1	9.003 471
Manual decapper for 11 mm aluminium crimp caps	ND11	1	9.003 367
Manual crimper, height adjustable, for 13 mm aluminium crimp caps	ND13	1	9.003 473
Manual crimper, height adjustable, for 13 mm flip top/flip off caps	ND13	1	4.008 266
Manual decapper for 13 mm aluminium crimp caps	ND13	1	9.003 368
Manual crimper, height adjustable, for 20mm aluminium crimp caps	ND20	1	9.003 475
Manual crimper, height adjustable, for 20mm flip top/flip off caps	ND20	1	4.008 278
Manual decapper for 20mm aluminium crimp caps	ND20	1	9.003 369



## LLG-Storage Boxes, PP

9.405 750-751-753-754-756: With alphanumeric coding on the edge and the bottom of each cavity. Suitable for storage in the fridge.

Dimensions (l x w x h)	Colour	Array	For	Bottle size	PK	Cat. No.
mm				ml		
130 x 130 x 45	blue	9 x 9	ND8, 9, 10, 11	1.5	1	<b>9.405 750</b>
130 x 130 x 45	orange	9 x 9	ND8, 9, 10, 11	1.5	1	<b>9.405 751</b>
130 x 130 x 45	yellow	9 x 9	ND8, 9, 10, 11	1.5	1	<b>9.405 753</b>
130 x 130 x 45	green	9 x 9	ND8, 9, 10, 11	1.5	1	<b>9.405 754</b>
130 x 130 x 52	red	7 x 7	ND13	4.0	1	<b>9.405 756</b>
130 x 130 x 102	blue	5 x 5	ND20	5 / 10 / 20 ml	1	<b>4.001 528</b>
67 x 67	neon-green	4 x 4	ND8, 9, 10, 11	1.5 / 2.0	1	<b>9.405 760</b>
67 x 67	neon-pink	4 x 4	ND8, 9, 10, 11	1.5 / 2.0	1	<b>9.405 761</b>
67 x 67	blue	4 x 4	ND8, 9, 10, 11	1.5 / 2.0	1	<b>9.405 762</b>



## 2 NMR tubes, 5mm borosilicate glass 3.3, standard

The NMR tubes have precise tolerances for consistent high accuracy. Most suitable for autosampling NMR systems and high-throughput NMR.

- Borosilicate glass 3.3
  - Economy quality
  - One end closed, rim fire polished
  - Applicable until 600MHz
- Please order closing caps separately.

Outer diam. mm	Int. diam. mm	Wall thickness mm	Length mm	PK	Cat. No.
4.95 ± 0.05	4.19 ± 0.05	0.38	178	100	<b>9.400 310</b>
4.95 ± 0.05	4.19 ± 0.05	0.38	203	100	<b>9.400 311</b>



## 3 Closing caps for 5mm NMR tubes

Description	Colour	PK	Cat. No.
NMR closing caps for 5mm tubes	red	100	<b>9.400 312</b>
NMR closing caps for 5mm tubes	green	100	<b>9.400 313</b>
NMR closing caps for 5mm tubes	yellow	100	<b>9.400 314</b>
NMR closing caps for 5mm tubes	black	100	<b>9.400 315</b>
NMR closing caps for 5mm tubes	blue	100	<b>9.400 316</b>



## 4 NMR tubes, 5mm, DURAN®, three accuracy classes

NMR tubes are available, according to requirement, in three accuracy classes. The correct tube can be selected depending on magnetic field and spin. The tubes are noteworthy for their close tolerances and accuracy, especially to their straightness, wall thickness and wall thickness distribution. Consequently, quick and accurate test results are achievable.

**Type Economic:**

The disposable for economical use in fully automatic sample dispensers or where high throughputs are involved.

- Applicable until 300 MHz

**Type Professional:**

For professional use in industry and research in the medium and high resolution area of NMR spectroscopy.

- Applicable until 400 MHz

**Type Scientific:**

For scientific use with high value samples and optimum substance exploitation in the highest resolution range of NMR spectroscopy.

- Applicable until 500 MHz

Please order closing caps separately.

Type	Outer diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
Economic	4,95 +/- 0,05	4,20 +/- 0,05	178	1	<b>7.083 596</b>
Professional	4,97 +/- 0,025	4,20 +/- 0,025	178	1	<b>7.083 595</b>
Scientific	4,97 +/- 0,013	4,20 +/- 0,025	178	1	<b>7.084 720</b>



## Vials/NMR tubes

1



### 1 NMR tubes, 3 and 5mm, borosilicate glass 3.3, KIMAX®-HQ

**NEW!**

Kimble Kontes

Our KIMAX®-HQ NMR tubes are our highest quality NMR tubes and are 100% gauged for wall thickness, concentricity and camber specifications.

- High-Quality NMR tubes
- Attached polyethylene caps
- Sandblasted marking spot
- Manufactured from 33 expansion, low extractable borosilicate glass conforming to USP Type I and ASTM E438, Type I, Class A requirements

External diameter

at 3mm: 3.0124 (+0.00/-0.013) mm

at 5mm: 4.97 (+0.00/-0.013) mm

Inner diameter

at 3mm: 2.4003 (+0.013/+0.00) mm

at 5mm: 4.20 (+0.013/+0.000) mm

Wall thickness

at 3mm: 0.284mm

at 5mm: 0.375mm

Type	Diam. mm	Length mm	PK	Cat. No.
600-700 MHz	5	178	5	9.400 317
600-700 MHz	5	203	5	9.400 318
900 MHz	5	178	5	9.400 319
900 MHz	5	203	5	9.400 320
100 MHz	3	178	5	9.400 321
300 MHz	3	203	5	9.400 322
200 MHz	3	178	5	9.400 323
400 MHz	3	178	5	9.400 324
500 MHz	3	178	5	9.400 325
500 MHz	3	203	5	9.400 326
600-800 MHz	3	178	5	9.400 327
600-800 MHz	3	203	5	9.400 328

2



### 2 NMR Tube Rack, polypropylene

**NEW!**

Polypropylene rack with carrying handles features an upper deck with holes and a lower deck support for tube ends. Stackable. For 72 tubes with 3 or 5mm diameter. Dimensions: 213x115x222mm (LxWxH)

Type	PK	Cat. No.
NMR Tube Rack	1	9.301 065

We can supply this  
**manufacturer's**  
**whole**  
**product range !**

partner of the  
**LLG**  
 Lab Logistics Group

**HAMILTON**

**1 Syringe Terminations**

Syringe terminations are offered in a number of different configurations designed to accommodate a broad range of applications. From cemented to removable needles, and luer taper /PTFE luer-lock to special syringe fittings, syringe barrel terminations serve a key function at the interface of a syringe and its mating connection.

Hamilton

**N, NR (Cemented Needle, Rheodyne)**

Needles are cemented into the glass syringe barrel at a point corresponding to the zero graduation mark. NR stands for syringes with Rheodyne specified needles.

**LTN (Luer Tip Cemented Needle)**

Needles are cemented into the conical glass luer tip of the barrel at a point corresponding to the zero graduation mark.

**SN (Special Needle)**

Hamilton offers customized syringes with special needles. State the following details: needle length, gauge, point style, and whether electro-tapered. Example of a correct specification: 701 SN, 70mm, gauge 25, point style 3, not electro-tapered. Without these details the corresponding standard syringe 701 N will be supplied.

**RN (Removable Needle)**

Removable needles seat precisely to the zero graduation mark of the syringe. Allows the use of different specification needles on the same syringe barrel.

**LT (Luer Tip)**

Ground glass syringe barrel with a male luer taper accepts most hypodermic needles. Use Kel-F hub needles and connectors for a tight seal.

**KH (Knurled Hub)**

Knurled hub is used on 7000 Series syringes. The attachment of a spacer enables repeatable depth injections.

**C (ChemSeal)**

1/4"-28 UNF, male fitting. Used in low volume applications where system dead volumes need to be minimized.

**TLL, TLLX (PTFE Luer-Lock)**

Male luer taper with nickel-plated brass hub accepts, and locks in place, luer hub needles and connectors. The X-style plunger stop incorporates a 6-32 UNC female thread on the end of the stop to allow attachment to drive arm mechanisms, such as on the Microlab 500 Series diluters/dispensers.

**AD (AccuDil®)**

M8 x 0.75, male fitting. Used with Microlab 1000 PLUS diluter/dispenser.

**DAD (Diluter AccuDil®)**

M8 x 0.75 male fitting with M6 x 1 side port. Used with Microlab 1000 Plus diluter/dispenser.

**SL (SampleLock)**

On/Off syringe valve with RN needle is cemented to a syringe barrel. Used for headspace, environmental sample collection and storage, pre-pressurization of gaseous samples for GC analysis, and sample spiking.

**2 Microlitre syringes, Needle Types**

Point Style 2 (pst2): 12° bevelled non-coring needle point recommended for septum penetration. Ideal for gas chromatographic applications.

Hamilton

Point Style 3 (pst3): Blunt needle point (90°) for use with HPLC injection valves. Also recommended for applications where exact dosing is required (e.g. thin layer chromatographs).

Point Style 4 (pst4): 10-12° bevelled needle point recommended for life science applications; sharp point for animal injection.

Point Style 5 (pst5): Conical needle with side port for penetration of septa, thin-gauged vinyls and plastics without coring; minimizes septum damage

Point Style AS (pstAS): Special conical style needle point (8° taper) designed to withstand the demands of multiple injections; exclusively used on GC autosampler syringes




**1**

### 1 Microlitre syringes, 700 series, with fixed needle

With fixed needle (N, NR). NR stands for syringes with Rheodyne specified needles. Plungers are individually fitted, therefore cannot be interchanged and are not available as replacement parts. Needles are electro-tapered.

Hamilton

Needle length 51mm

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
75 N	5	26s	2 (GC)	1	9.221 001
701 N	10	26s	2 (GC)	1	9.221 002
701 N	10	26s	2 (GC)	6	9.221 010
702 N	25	22s	2 (GC)	1	9.221 003
705 N	50	22s	2 (GC)	1	9.221 004
710 N	100	22s	2 (GC)	1	9.221 005
725 N	250	22s	2 (GC)	1	9.221 006
750 N	500	22s	2 (GC)	1	9.221 007
75 N	5	26s	3 (HPLC)	1	9.221 011
701 N	10	26s	3 (HPLC)	1	9.221 012
702 NR	25	22s	3 (HPLC)	1	9.221 013
705 NR	50	22s	3 (HPLC)	1	9.221 014
710 NR	100	22s	3 (HPLC)	1	9.221 015
725 NR	250	22s	3 (HPLC)	1	9.221 016
750 N	500	22s	3 (HPLC)	1	6.055 335


**2**

### 2 Microlitre syringes, 700 series, for removable needles

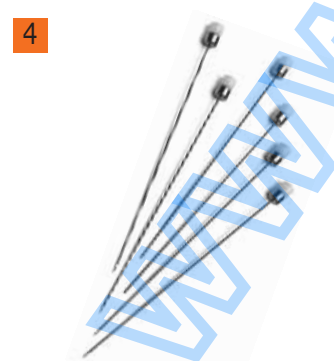
- 5µl - 500µl
- For use with liquids
- Removable needles (RN9, or luer tip (LT))
- Plungers and Syringe barrels are not interchangeable or replaceable
- Tight tolerances between the plunger and the barrel

Hamilton

 Needle length 51mm  
 Point style 2 (GC)

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
75 RN	5	26s	2 (GC)	1	9.221 080
701 RN	10	26s	2 (GC)	1	9.221 081 <b>2</b>
701 RN	10	26s	2 (GC)	6	6.059 899
702 RN	25	22s	2 (GC)	1	9.221 082
705 RN	50	22s	2 (GC)	1	9.221 083
710 RN	100	22s	2 (GC)	1	9.221 084
725 RN	250	22s	2 (GC)	1	9.221 085
750 RN	500	22s	2 (GC)	1	9.221 086
701 LT*	10			1	9.221 021 <b>3</b>
702 LT*	25			1	9.221 022
705 LT*	50			1	9.221 023
710 LT*	100			1	9.221 024
725 LT*	250			1	9.221 025
750 LT*	500			1	9.221 026

\* Needle - please order separately.


**3**

**4**

### 4 Needles for RN syringes

Removable. Not for use in HPLC applications.

Hamilton

 Length 51mm  
 Point style 2

Type	Ext. diam. mm	Int. diam. mm	Gauge	Volume	PK	Cat. No.
7758-02	0.5	0.13	26s	2,5 µl - 100 µl	6	9.221 692
7758-03	0.7	0.15	22s	2,5 µl - 100 µl	6	9.221 693
7779-01	0.7	0.41	22s	250 µl - 10 ml	6	9.221 694
7779-03	0.7	0.15	22s	250 µl - 10 ml	6	9.221 695

## 1 Microlitre syringes, 800 series, with cemented/ removable needles

### With cemented-in, standard needles (N).

With metal handle. Plungers are individually fitted, therefore cannot be interchanged and are not available as replacement parts. Needles are electro-tapered.

Hamilton

### With removable needle (RN).

Type RN complete with metal plunger handles.

Type RN B/P are syringes only without metal plunger (replacement syringes).

Needle length 51mm  
Point style 2 (GC)

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
85 N		26s	2	1	9.221 105
801 N	10	26s	2	1	9.221 110
802 N	25	22s	2	1	9.221 111
805 N	50	22s	2	1	9.221 112
810 N	100	22s	2	1	9.221 113
85 RN	5	26s	2	1	9.221 115
801 RN	10	26s	2	1	9.221 116
802 RN	25	22s	2	1	9.221 117
805 RN	50	22s	2	1	9.221 118
810 RN	100	22s	2	1	9.221 119
825 RN	250	22s	2	1	9.221 120
85 RN	5	26s		1	6.803 384
801 RN	10	26s		1	6.222 013
810 RN	100	22s		1	6.231 153
801 RN B/P	10			1	9.221 172



## Microlitre syringes, 1700/1000 series, with LT and gas-tight

Glass barrel with PTFE-coated plunger, seal and with Luer Tip (LT).

Gas-tight microlitre syringe without needle.

MS = Plunger stop fitted to prevent damage to the PTFE seal. Prevents the plunger tip from reaching the end of the syringe.

Hamilton

Type	Capacity µl	Grad. µl	PK	Cat. No.
1710 LT	100	1	1	9.221 210
1725 LT	250	5	1	9.221 225
1750 LT	500	10	1	9.221 250
1001 LT	1000	10	1	9.221 251
1002 LT	2500	50	1	9.221 252
1005 LT	5000	100	1	9.221 255



## Microlitre syringes, 1700/1000 series, with TLL/ TLLX and gas tight

Glass barrel with PTFE-coated plunger and seal, and Luer lock outlet (TLL). TLLX with 6-32 UNC female thread. Allows attachment to drive arm mechanisms, e.g. Microlab 500 Series diluters/dispensers.

Gas-tight microlitre syringe without needle. TLLX= Plunger stop fitted to prevent damage to the PTFE seal. Prevents the plunger tip from reaching the end of the syringe.

Hamilton

Type	Capacity µl	Grad. µl	PK	Cat. No.
1702 TLLX, TLL with stop	25	0,25	1	9.221 300
1705 TLLX, TLL with stop	50	0,5	1	9.221 305
1710 TLLX, TLL with stop	100	1	1	9.221 310
1725 TLLX, TLL with stop	250	5	1	9.221 315
1750 TLLX, TLL with stop	500	10	1	9.221 320
1001 TLL	1000	10	1	9.221 348
1001 TLLX	1000	20	1	9.221 325
1001 TLLX	1000	0,01	1	9.221 328
1002 TLL	2500	50	1	9.221 330
1005 TLL	5000	100	1	9.221 335
1010 TLL	10000	200	1	9.221 340
1025 TLL	25000	500	1	9.221 347
1025 TLL	25000	500	1	9.221 345







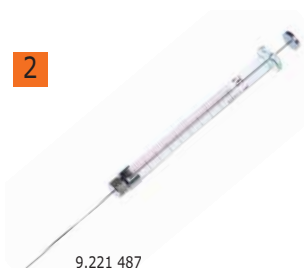
### 1 Needles for LT/TLL/TLLX syringes

Removable. With Luer tip made of Kel-F. All hypodermic needles available according to specification in 10mm to max. 1000mm lengths. Further point styles available on request.

Hamilton

Needle length 51mm

Type	Ext. diam. mm	Int. diam. mm	Gauge	Point style	PK	Cat. No.
KF 726s pst2	0.47	0.13	26s	2 (GC)	6	9.221 609
KF 726 pst2	0.46	0.26	26s	2 (GC)	6	9.221 626
KF 725 pst2	0.51	0.26	25s	2 (GC)	6	9.221 625
KF 724 pst2	0.57	0.31	24s	2 (GC)	6	9.221 624
KF 723 pst2	0.64	0.34	23s	2 (GC)	6	9.221 623
KF 722s pst2	0.72	0.15	22s	2 (GC)	6	9.221 607
KF 722 pst2	0.72	0.41	22s	2 (GC)	6	9.221 622
KF 721 pst2	0.82	0.51	21s	2 (GC)	6	9.221 621
KF 720 pst2	0.91	0.60	20s	2 (GC)	6	9.221 620
KF 726s pst3	0.47	0.13	26s	3 (HPLC)	6	9.221 709
KF 726 pst3	0.46	0.26	26s	3 (HPLC)	6	9.221 726
KF 725 pst3	0.51	0.26	25s	3 (HPLC)	6	9.221 735
KF 724 pst3	0.57	0.31	24s	3 (HPLC)	6	9.221 724
KF 723 pst3	0.64	0.34	23s	3 (HPLC)	6	9.221 723
KF 722s pst3	0.72	0.15	22s	3 (HPLC)	6	9.221 707
KF 722 pst3	0.72	0.41	22s	3 (HPLC)	6	9.221 722
KF 721 pst3	0.82	0.51	21s	3 (HPLC)	6	9.221 721
KF 720 pst3	0.91	0.60	20s	3 (HPLC)	6	9.221 720



### 2 Microlitre syringes, 1700/1000 series, with removable needle

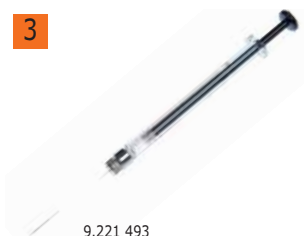
Gas-tight microlitre syringes with removable needle (RN).

Hamilton

Needle length 51mm

Point style 2 (GC)

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1701 RN	10	26s	2 (GC)	1	9.221 487 2
1702 RN	25	22s	2 (GC)	1	9.221 488
1702 RN	50	22s	2 (GC)	1	9.221 489
1710 RN	100	22s	2 (GC)	1	9.221 490
1725 RN	250	22s	2 (GC)	1	9.221 491
1750 RN	500	22s	2 (GC)	1	9.221 492
1001 RN	1000	22s	2 (GC)	1	9.221 493 3
1002 RN	2500	22s	2 (GC)	1	9.221 494



### 4 Microlitre syringes, 1700/1000 series, with cemented needle

With PTFE plunger seal.

Hamilton

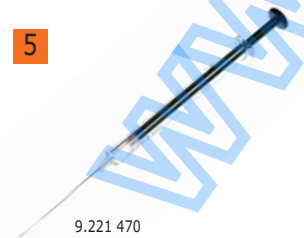
Gas-tight microlitre syringes with cemented-in needles (N).

Needles are electro-tapered (LTN).

Needle length 51mm

Point style 2 (GC)

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1701 N	10	26s	2 (GC)	1	9.221 448 4
1702 N	25	22s	2 (GC)	1	9.221 449
1705 N	50	22s	2 (GC)	1	9.221 450
1710 N	100	22s	2 (GC)	1	9.221 455
1725 N	250	22s	2 (GC)	1	9.221 460
1750 LTN	500	22s	2 (GC)	1	9.221 465
1001 LTN	1000	22	2 (GC)	1	9.221 470 5
1002 LTN	2500	22	2 (GC)	1	9.221 475
1005 LTN	5000	22	2 (GC)	1	9.221 480
1010 LTN	10000	22	2 (GC)	1	9.221 485



## 1 Microlitre syringes, 1800 series, with cemented or removable needle

Hamilton

- 10µl to 250µl
- for use with gases and liquids
- removable needles (RN) or cemented needles (N)
- precision-machined PTFE-tipped plungers
- reinforced plungers
- plunger assemblies and glass barrels are replaceable

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1801 N	10	26s	2	1	9.221 836
1802 N	25	22s	2	1	9.221 837
1805 N	50	22s	2	1	9.221 838
1810 N	100	22s	2	1	9.221 839
1825 N	250	22s	2	1	9.221 840
1801 RN	10	26s	2	1	9.221 831
1802 RN	25	22s	2	1	9.221 832
1805 RN	50	22s	2	1	9.221 833
1810 RN	100	22s	2	1	9.221 834
1825 RN	250	22s	2	1	9.221 835

## 2 Microlitre syringes, 7000 series

Hamilton

For dispensing minute liquid volumes and features a Modified Microliter design. The end of the plunger has a tungsten wire extension that fits the entire length of the needle all the way to the tip, resulting in a zero dead volume syringe.

Needle length 70mm

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
7000.5 KH	0.5	25	2	1	6.700 111
7001 KH	1.0	25	2	1	9.221 121
7101 KH	1.0	22	2	1	6.802 391
7002 KH	2.0	25	2	1	6.204 624
7102 KH	2.0	23	2	1	6.801 037
7105 KH	5.0	24	2	1	9.221 125
7000.50C KH	0.5	32	3	1	9.221 590
7000.5 KH	0.5	25	3	1	9.221 126
7001 KH	1.0	25	3	1	6.802 598
7101 KH	1.0	22	3	1	9.221 131
7002 KH	2.0	25	3	1	9.221 122
7102 KH	2.0	23	3	1	9.221 132
7105 KH	5.0	24	3	1	6.050 160

## 3 Microlitre syringe needles for HPLC

Hamilton

Removable. For use with Rheodyne valves and Valco system VSF 2. Fit Hamilton syringes from 5 to 100µl or 250 to 1000µl capacity.

Needle length 51mm  
Point style 3 (HPLC)

Type	Volume	Gauge	Point style	PK	Cat. No.
7780-04	250 µl - 1000 µl	22s	3 (HPLC)	6	6.203 934
7770-01	2,5 µl - 100 µl	22s	3 (HPLC)	6	9.221 603

## Microlitre syringes for GC-autosamplers A

**NEW!** Hamilton

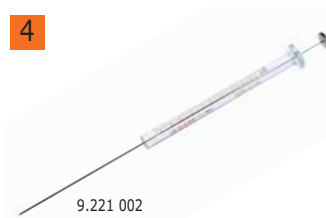
With cemented-in needles (N) for GC-autosamplers Agilent 7670 A, 7671 A, 7672 A.  
With fixed needle for CTC GC PAL autosamplers.

Syringe types with Special needle (SN) available on request.

Needle length 51mm

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1701 N	10.0	26s	2 (GC)	1	9.221 448
701 N	10.0	26s	2 (GC)	1	9.221 002
75 FN CTC	5.0	26s	AS	1	6.304 828
701 FN CTC	10.0	26s	2 (GC)	1	6.301 578
701 FN CTC	10.0	26s	AS	1	6.303 229
7701.2 CTC	1.2	26s	AS	1	6.900 991
1702 FN CTC Slim Line	25.0	26s	AS	1	9.221 040
1702 FN CTC	25.0	26s	AS	1	6.239 337
1710 FN CTC	100.0	26s	AS	1	6.206 124
1725 FN CTC	250.0	26s	AS	1	6.239 360
1750 FN CTC	500.0	26s	AS	1	9.221 041

➔ Microlitre syringes for GC-autosamplers please see page 1386.





### 1 Microlitre syringe for GC-Autosampler

With cemented-in needles (N). For autosamplers Agilent 7673 - 7683, 6850 ALS and CTC GC PAL instruments.

Hamilton

Syringe types with Special needle (SN) available on request.



Type	Capacity µl	Gauge	Point style	Needle length	PK	Cat. No.
701 N CTC	10	23s	2	51	1	9.221 063
701 N CTC	10	23s	AS	51	1	7.636 288 2
701 ASN	10	23s	AS	43	1	9.221 196 1



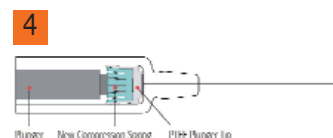
### 3 4 GC-Syringes CTC Headspace®

The new High Dynamic (HD-) plunger has been optimised for higher throughput in the headspace technique. This headspace syringe has been designed for the CTC PAL autosampler system. Modern GC Headspace analysis requires injecting over large temperature ranges. Traditional headspace syringes are composed of rubber O-ring sealed plungers which have a limited sealing performance at high temperatures.

Hamilton

#### Advantages:

- New sealing system based on a novel metal spring allows working with enhanced tightness
- Excellent performance over a large temperature range and temperature gradients
- Increased life-time compared to traditional headspace syringes
- Increased accuracy and reproducibility of headspace GC analysis



Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1001	1000	23	5	1	6.200 515
1001	1000	26	5	1	6.303 926
1002	2500	23	5	1	6.201 089
1002	2500	26	5	1	6.801 137
1005	5000	23	5	1	6.235 326
1005	5000	26	5	1	9.221 065



### 5 Microlitre syringe C-Line for HPLC autosamplers

With fixed needles (FN).

Hamilton

Needle length 51mm  
Point style 3 (HPLC)

Type	Capacity µl	Gauge	PK	Cat. No.
700 Slim Line	10	22s	1	6.200 686
1700 Slim Line	10	22s	1	9.221 052
1700	25	22s	1	6.200 903
1700 Slim Line	25	22s	1	6.236 085
1700 Slim Line	100	22s	1	7.200 498
1700	250	22s	1	6.803 417
1700	500	22s	1	9.221 051
1000	1000	22s	1	7.210 113
1000	2500	22s	1	7.210 114
1000	5000	22s	1	9.221 053



### 6 Microlitre syringe x-type for HPLC autosamplers

**NEW!**

With deactivated needle and glass barrel for inert liquid path and enhanced lifetime. Near zero carryover.

Hamilton

Type	Capacity µl	Gauge	PK	Cat. No.
1702	25	22s	1	6.256 766
1705	50	22s	1	9.221 061
1710	100	22	1	9.221 062
1710	100	22s	1	6.260 430



### 7 Repeat dispensing device PB600-1 for Microlitre syringes

For syringes 25µl to 2.5ml. Dispenses 2% of total syringe volume each time the plunger is depressed.

Hamilton

Type	PK	Cat. No.
PB 600-1	1	9.221 650



## Gas syringes, FORTUNA®, Borosilicate glass

Borosilicate glass. Transparent calibrated barrel.  
With chemically-resistant, diffused amber stain graduations.

Poulten & Graf

Capacity ml	Grad. ml	Type	PK	Cat. No.
25	0.5	Without stopcock	1	9.143 055
50	0.5	Without stopcock	1	9.143 056
100	1.0	Without stopcock	1	9.143 057 1
50	0.5	With capillary stopcock	1	9.143 066
100	1.0	With capillary stopcock	1	9.143 067 2



9.143 057



9.143 067

## 3 4 Syringes, FORTUNA OPTIMA®, Glass

Made of Durobax® glass. With centre glass or metal luer nozzle (Luer or Luer-Lock).  
Interchangeable plungers and barrels (between identical capacity syringes). Autoclavable  
up to +134°C. The amber graduation is acid and alkali resistant. With CE marking.

Poulten & Graf

Capacity ml	Material Cone	Nozzle type	PK	Cat. No.
1	Glass	Luer	1	9.222 021
2	Glass	Luer	1	9.222 022
5	Glass	Luer	1	9.222 025
10	Glass	Luer	1	9.222 030
20	Glass	Luer	1	9.222 032
50	Glass	Luer	1	9.222 035
1	Metal	Luer-Lock	1	9.222 061
2	Metal	Luer-Lock	1	9.222 062
5	Metal	Luer-Lock	1	9.222 065
10	Metal	Luer-Lock	1	9.222 070
20	Metal	Luer-Lock	1	9.222 072
50	Metal	Luer-Lock	1	9.222 075



## 5 All-glass syringes Dosys™ ganzglas 155, borosilicate glass 3.3

**NEW!**

Socorex

The reusable borosilicate glass syringes stand for superior chemical heat and shock  
resistance in various application fields. A precious, low cost alternative to disposable  
plastic syringes for easy infusing, diluting, aspirating and sampling.

Product advantages

- Precision-machined plunger and barrel
- Excellent fitting and liquid tightness (not gas tight)
- Permanent, high visibility graduations
- Glass Luer and metal Luer Lock nozzle
- Sterilisation up to 160°C/320°F
- Very easy to disassemble and clean

Capacity ml	Grad. ml	Material Cone	Nozzle type	PK	Cat. No.
0.1 - 1	0.05	Glass	Luer	3	6.253 931
0.2 - 5	0.2	Glass	Luer	3	6.261 028
1 - 10	0.2	Glass	Luer	3	6.261 029
1 - 20	1	Glass	Luer	2	6.235 425
1 - 30	2	Glass	Luer	2	7.658 119
10 - 100	10	Glass	Luer	1	6.254 727
0.1 - 1	0.05	Metal	Luer-Lock	3	6.902 600
0.5 - 2	0.1	Metal	Luer-Lock	3	6.902 601
0.2 - 5	0.2	Metal	Luer-Lock	3	6.902 602
1 - 10	0.2	Metal	Luer-Lock	3	6.902 603
1 - 20	1	Metal	Luer-Lock	2	6.902 604
1 - 30	2	Metal	Luer-Lock	2	7.658 120
1 - 50	2	Metal	Luer-Lock	1	6.902 605
10 - 100	10	Metal	Luer-Lock	1	6.241 758
10 - 150	10	Metal	Luer-Lock	1	6.261 030
10 - 200	10	Metal	Luer-Lock	1	6.261 031
10 - 250	10	Metal	Luer-Lock	1	6.241 759





### 1 2 Syringes, Glass-metal

With calibrated glass cylinder and plunger made of stainless steel. Plungers and cylinders interchangeable. With central metal cone. Graduated. Sterilisable up to +134°C.

*Poulsen & Graf*

Capacity ml	Nozzle type	PK	Cat. No.
1	Luer	1	9.222 221
2	Luer	1	9.222 222
5	Luer	1	9.222 225
10	Luer	1	9.222 230
20	Luer	1	9.222 232
50	Luer	1	9.222 235
1	Luer-Lock	1	6.401 380
2	Luer-Lock	1	9.222 242
5	Luer-Lock	1	9.222 245
10	Luer-Lock	1	9.222 250
20	Luer-Lock	1	9.222 252
50	Luer-Lock	1	9.222 255



### 3 LLG-Disposable syringes, 3-parts, PP, non-sterile, bulk



- Barrel: PP, Plunger: PP and Polyisoprene rubber
- Luer tip
- Smooth flow, tight, high transparency barrel
- Latex-free, pyrogen-free, DEHP-free, non-toxic
- Non-sterile, bulk packed in box of 500
- Defined safety stop to avoid accidental pull-out of plunger

Capacity ml	PK	Cat. No.
2	500	6.267 267
5	500	6.267 268
10	500	6.267 269
20	500	6.267 270



### 4 Disposable syringes HSW NORM-JECT®, 2-part, PP/PE, sterile

*Henke-Sass Wolf*

- PP barrel, with PE piston
- smooth flow, tight, high transparency barrel
- no rubber, styrene or DEHP, latex- and silicone-oil-free
- pyrogen-free, PVC-free, non-toxic
- sterile, individually blister strip packed
- defined position of the plunger at volume "0" to feel when plunger is completely inserted
- extended graduation for wider range of application
- tested for use in HPLC
- defined safety stop to avoid accidental pull-out of plunger and loss of medicine

Capacity ml	PK	Cat. No.
1 : 1/100 (Tuberculin)	100	9.410 000
2 (3)	100	9.410 002
5 (6)	100	9.410 005
10 (12)	100	9.410 010
20 (24)	100	9.410 020
30	50	9.410 025
50 (60)	30	9.410 050



### 5 Disposable syringes HSW SOFT-JECT®, 3-part, PP, sterile

*Henke-Sass Wolf*

- Barrel: PP, Plunger: PP and polyisoprene rubber
- Luer tip
- smooth flow, tight, high transparency barrel
- gliding of plunger supported by added slipping agent
- latex-free, pyrogen-free, DEHP-free, non-toxic
- sterile, individually blister strip packed
- defined safety stop to avoid accidental pull-out of plunger and loss of medicine

Capacity ml	PK	Cat. No.
1 (Tuberculin)	100	9.410 061
3	100	9.410 062
5	100	9.410 063
10	100	9.410 064
20	100	9.410 065
50 (60)	50	9.410 066

## 1 Syringes BD Discardit™ II, disposable, 2-piece, PP/PE, sterile

Clear barrel for perfect visualisation of syringe contents.

- 2-piece syringes with Luer-Tip
- Smooth plunger movement, reduced sliding force
- Retaining ring: prevents accidental plunger rod withdrawal
- Leak-tight: Tested in compliance with ISO 7886-1
- Scale marking: accurate graduation suited to user's needs
- Design of finger grip flanges ensure stability and comfort during injection
- Ergonomically designed plunger for single-handed operation
- Barrel material: Polypropylene
- Plunger material: Polyethylene
- Plunger lubricant: Oleamide
- Colour-coded packing units
- Sterilization method: Ethylene oxide
- Silicone oil-free
- Sterile single packing, single use, latex-free, PVC-free

For pressure applications we recommend three-part syringes.

Becton Dickinson



Capacity ml	Nozzle type	Grad. ml	PK	Cat. No.
2	Concentric	0.10	100	6.052 153
5	Eccentric	0.20	100	7.619 784
10	Eccentric	0.50	100	9.410 403
20	Eccentric	1.00	80	6.052 157

## 2 Disposable syringes, 3-piece, PP, sterile

Polypropylene with two-piece plunger and Luer nozzle. Without needle. Supplied sterile, individually pouch-sealed in outer boxes.

Capacity ml	PK	Cat. No.
1	100	9.950 296
2	100	9.950 297
5	100	9.950 298
10	100	9.950 299
20	120	9.950 300
50	60	9.950 301

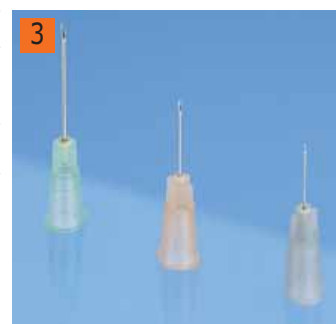


## 3 Disposable syringes HSW FINE-JECT®, PP/stainless steel, sterile

Sterile. Individually wrapped.  
Disposable. Luer fitting with plastic sheath.

Henke-Sass Wolf

Type	Diam. mm	Length mm	Colour	PK	Cat. No.
Pravaz 1	0.9	40	yellow	100	9.410 101
Pravaz 2	0.8	40	green	100	9.410 102
Pravaz 12	0.7	30	black	100	9.410 112
Pravaz 14	0.6	30	blue	100	9.410 114
Pravaz 16	0.6	25	blue	100	9.410 116
Pravaz 18	0.5	25	brown	100	9.410 118
Pravaz 20	0.4	20	grey	100	9.410 120



## 4 Disposable needles, PP/Stainless steel, sterile

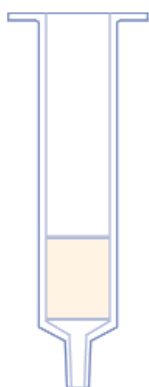
With Luer push-on fitting for use with disposable syringes. Supplied sterile in boxes of 100.

Gauge	Diam. mm	Length mm	PK	Cat. No.
18G x 1½ inch*	1.2	40	100	9.950 302
19G x 1½ inch	1.1	40	100	9.950 303
20G x 1 inch**	0.9	25	100	9.950 304
21G x 1½ inch**	0.8	40	100	9.950 305
23G x 1 inch	0.6	25	100	9.950 306
25G x ¾ inch	0.5	16	100	9.950 307

\* is a thin wall needle with a short bevel.  
\*\*are intravenous thin wall needles.



1



### 1 CHROMABOND® C<sub>18</sub>

**Octadecyl modified silica phase for SPE, not endcapped**

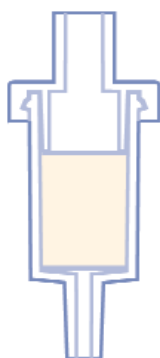
MACHEREY-NAGEL

Base material silica, pore size 60Å, particle size 45µm for C<sub>18</sub>, specific surface 500m<sup>2</sup>/g, pH stability 2 to 8 octadecyl phases, not endcapped, carbon content 14% possesses more free silanols (SiOH), which allow secondary interactions with polar groups of the analytes.

Recommended applications: non-polar compounds, pesticides.

Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	6.226 798
3	200	50	9.003 487
3	500	50	9.003 488
6	500	30	6.902 222
6	2000	30	4.003 512
6	1000	30	6.234 031
15	2000	20	4.003 464
45	5000	20	6.700 747
70	10000	10	4.003 561
3	500	250	4.003 433
6	500	250	4.003 435
6	1000	250	4.003 437

2



### 2 CHROMAFIX® C<sub>18</sub>

**Octadecyl modified silica phase for SPE, not endcapped**

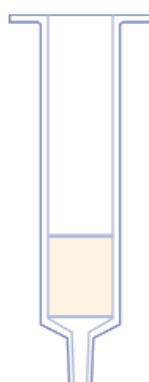
MACHEREY-NAGEL

Base material silica, pore size 60Å, particle size 45µm for C<sub>18</sub>, specific surface 500m<sup>2</sup>/g, pH stability 2 to 8 octadecyl phases, not endcapped, carbon content 14% possesses more free silanols (SiOH), which allow secondary interactions with polar groups of the analytes.

Recommended applications: non-polar compounds, pesticides.

Size	Capacity mg	PK	Cat. No.
S	270	50	7.083 665
M	530	50	7.079 617
L	950	50	4.003 838

3



### 3 CHROMABOND® C<sub>18</sub> Hydra

**Octadecyl modified silica phase for SPE of polar analytes**

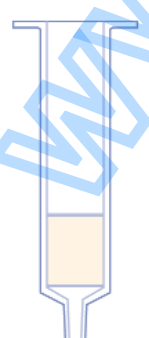
MACHEREY-NAGEL

Base material silica, pore size 60Å, particle size 45µm, specific surface 500m<sup>2</sup>/g, pH stability 2 to 8, special octadecyl phase for polar analytes, not endcapped, carbon content 15%.

Recommended applications: more polar compounds like pesticides and their polar degradation products, phenols, phenoxyacetic acids, nitroaromatics, pharmaceuticals.

Capacity ml	Capacity mg	PK	Cat. No.
1	50	100	4.003 565
1	100	100	4.003 566
3	200	50	4.003 567
3	500	50	4.003 569
6	500	30	4.003 573
3	1000	50	4.003 571
6	1000	30	4.003 575
6	2000	30	4.003 576
6	3000	30	4.003 577

4



### 4 CHROMABOND® CN/SiOH

**Combination phase for SPE analysis of PAH**

MACHEREY-NAGEL

Special combination phase, cyanopropyl phase for selective adsorption of polycyclic aromatics via II-II interactions, unmodified silica phase for removal of polar compounds.

Recommended applications: Extraction of the 16 PAHs according to EPA from soil samples.

Capacity ml	Capacity ml / mg	PK	Cat. No.
3	500 / 1000	50	4.003 507
6	500 / 1000	30	6.233 128
6	500 / 1000	250	4.003 514

BIGpack: 4.003 514

**1 CHROMABOND® HR-X****Spherical, hydrophobic polystyrene-divinylbenzene resin for SPE**

MACHEREY-NAGEL

Hydrophobic polystyrene-divinylbenzene copolymer pH stability 1 to 14. High-purity material with highest reproducibility and lowest blank values due to a novel manufacturing process, spherical particles 85µm; pore size 55 to 60Å. Very high surface 1000m<sup>2</sup>/g; capacity 390mg/g (caffeine in water). Excellent recovery rates especially for the enrichment of pharmaceuticals/active ingredients due to the spherical structure of the particles, very homogeneous surface, and optimised pore structure.

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.

Capacity ml	Capacity mg	PK	Cat. No.
1	30	30	<b>4.003 808</b>
3	60	30	<b>4.003 811</b>
1	100	30	<b>4.003 809</b>
6	200	30	<b>4.003 814</b>
3	500	30	<b>4.003 813</b>
15	500	20	<b>4.003 819</b>
15	1000	20	<b>4.003 820</b>
3	200	250	<b>4.003 806</b>
6	200	250	<b>4.003 815</b>

BIGpacks: 4.003 806/4.003 815

Cartridges in further sizes and phases of the HR-X product range available on request.



1

**2 CHROMABOND® NH<sub>2</sub>****Aminopropyl modified silica phase for SPE**

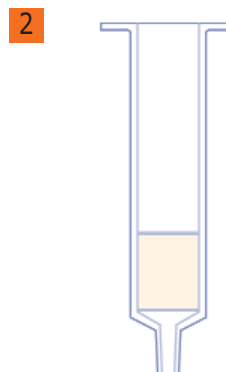
MACHEREY-NAGEL

Base material silica, pore size 60Å, particle size 45µm, specific surface 500m<sup>2</sup>/g, pH stability 2 to 8, aminopropyl phase, carbon content 3.5%, polar, weak anion exchanger.

Recommended applications: trace elements, lipids.

Volume ml	Capacity mg	PK	Cat. No.
1	100	100	<b>4.003 465</b>
3	200	50	<b>4.003 609</b>
3	500	50	<b>6.228 063</b>
3	500	250	<b>4.003 466</b>
6	500	30	<b>6.224 868</b>
6	1000	30	<b>6.224 845</b>

BIGpacks: 4.003 466



2

**3 CHROMABOND® SiOH****Unmodified silica phase for SPE**

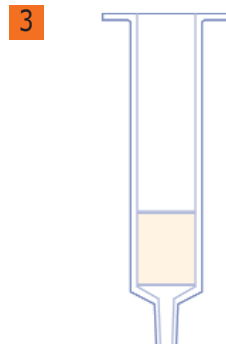
MACHEREY-NAGEL

Unmodified, weakly acidic silica, pore size 60Å, particle size 45µm, specific surface 500m<sup>2</sup>/g, pH stability 2 to 8, very polar, adsorbs humidity from air, for this reason it should be kept well closed and if necessary dried before use due to its high affinity for polar compounds it should not be conditioned with polar (e.g. methanol) or water-containing solvents.

Recommended applications: aflatoxins, chloramphenicol, pesticides, steroids, vitamins.

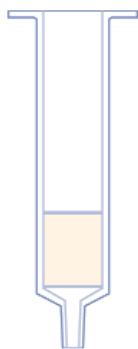
Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	<b>6.225 223</b>
3	200	50	<b>4.003 547</b>
3	500	50	<b>7.085 047</b>
6	500	30	<b>6.801 894</b>
6	1000	30	<b>4.003 481</b>
6	2000	30	<b>4.003 498</b>
15	2000	20	<b>4.003 550</b>
45	5000	20	<b>4.003 605</b>
70	10000	10	<b>6.202 850</b>
150	50000	10	<b>4.003 630</b>
3	500	250	<b>4.003 477</b>
6	1000	250	<b>4.003 482</b>
6	2000	250	<b>4.003 499</b>

BIGpacks: 4.003 477/4.003 482/4.003 499



3

1



### 1 CHROMABOND® Florisil®

**Magnesium silicate for SPE**

MACHEREY-NAGEL

Matrix magnesium silicate (MgO to SiOH 15:85), high purity, particle size 150 to 250µm.

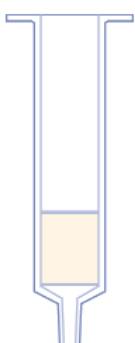
Recommended application: organic tin compounds, aliphatic carboxylic acids, PCB, PAH.

Volume ml	Capacity mg	PK	Cat. No.
3	200	50	4.003 624
3	500	50	4.003 488
6	500	30	4.003 557
6	1000	30	6.224 842
6	1000	250	4.003 489
6*	1000	30	4.003 490

BIGpacks: 4.003 489

\*Glass columns

2



### 2 CHROMABOND® PA

**Polyamide 6 for SPE**

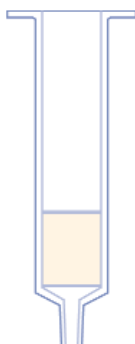
MACHEREY-NAGEL

Matrix polyamide 6, unmodified, high purity, particle size 40 to 80µm.

Recommended application: flavonoids, PAH.

Capacity ml	Capacity mg	PK	Cat. No.
3	200	50	4.003 595
3	500	50	4.003 511
6	500	30	7.089 089
6	1000	30	7.400 537

3



### 3 CHROMABOND® SA

**Benzenesulphonic acid modified silica cation exchanger for SPE (SCX)**

MACHEREY-NAGEL

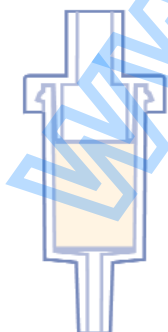
Base material silica, pore size 60Å, particle size 45µm, specific surface 500m<sup>2</sup>/g, pH stability 2 to 8, benzenesulphonic acid modified silica, strongly acidic cation exchanger (capacity ~ 0.5meq/g). Adsorbent with hydrophobic and IT-IT interactions (benzene ring). Ion exchange of organic compounds from aqueous matrix. Elution of interesting compounds with solvent systems, which compensate the ionic and nonpolar interactions, e.g. methanolic HCl.

Recommended application: amino acids, amines, chlorophyll, PCB.

Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	6.314 563
3	200	50	4.003 563
3	500	50	7.051 056
6	500	30	4.003 613
6	1000	30	6.224 846
3	500	250	4.003 485

BIGpack: 4.003 485

4



### 4 CHROMAFIX® PS

MACHEREY-NAGEL

Phase	Size	Capacity mg	PK	Cat. No.
PS-RP	S	200	50	4.003 869
PS-OH-	S	200	50	4.003 867
PS-H+	S	230	50	4.003 866
PS-Ag+	S	240	50	4.003 865
PS-Ba2+	S	280	50	4.003 868
PS-RP	M	320	50	6.228 258
PS-OH-	M	380	50	4.003 861
PS-H+	M	430	50	7.401 474
PS-Ag+	M	480	50	4.003 864
PS-Ba2+	M	550	50	7.402 218
PS-OH	L	800	50	4.003 862
PS-H+	L	900	50	4.003 863

E &amp; OE.



**1 CHROMABOND® vacuum manifolds and accessories**

For simultaneous preparation of up to 12, 16 or 24 samples, replacement parts and accessories for special applications

MACHEREY-NAGEL

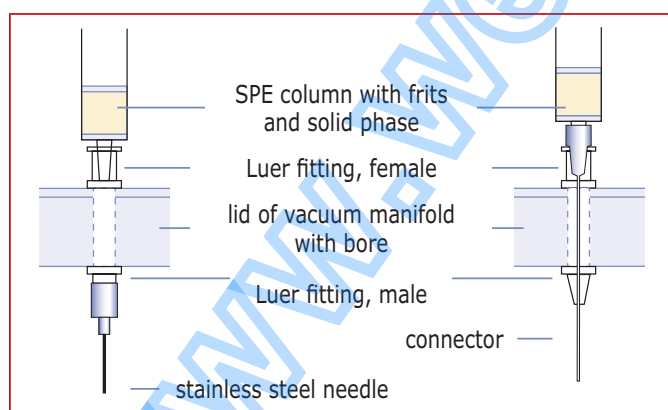
Vacuum manifold complete consists of: glass cabinet with lid and lid gasket, removable needles on lower side of lid, vacuum gauge, control valve, valves and caps, variable rack.



Description	PK	Cat. No.
Vacuum manifold complete for up to 12 columns or cartridges (incl. reservoir tank)	1	9.003 479
Vacuum manifold complete for up to 16 columns or cartridges	1	4.003 586
Vacuum manifold complete for up to 24 columns or cartridges	1	7.056 914
Lids with gaskets for 12 columns (incl. Luer fittings and valves), plastic	1	4.003 530
Gaskets for lid with 12 positions (4.003 530, 9.003 479)	2	6.801 608
Luer fittings for lid, female	12	4.003 534
Luer fittings for lid, male	12	4.003 535
Valves, plastic	12	7.089 161
Stainless steel needles	12	7.079 432
Drying attachment for 12 columns	1	4.003 536
Products for protection from cross contamination valve, brass, tarnished	1	4.003 538
Products for protection from cross contamination valve as above	12	7.089 162
Products for protection from cross contamination stainless steel connectors	12	7.079 431
Tubing adaptor for 1,3 and 6 ml polypropylene columns (PTFE)	4	6.900 713

**Protection from cross contamination**

For special applications, which require maximum protection from cross contamination we supply chrome-plated brass valves and stainless steel or PTFE connectors, the application of which is shown below. These special connectors are fitted through the lid; thus the sample only has contact with the inert connector and not with the lid, directly flowing into the receptacle.

**Drying attachment**

If the eluate has to be evaporated, this can be performed with the so-called drying attachment (**11**, see below). This special lid has a gas connector on one side (**12**), from which the gas is fed simultaneously to the 12 or 24 stations (**13**). Thus 12 or 24 eluates can be evaporated simultaneously by just changing the lid and applying a stream of inert gas, e.g. nitrogen.





### 1 SPE phases for food analysis

#### QuEChERS method and pre-mixes

MACHEREY-NAGEL

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

#### Standard clean-up of food samples

10 g sample are homogenised with 10 ml acetonitrile. After adding the internal standard the sample is shaken with 4 g  $MgSO_4$  and 1 g NaCl and afterwards centrifuged. 1 ml of the supernatant is spiked with 25 mg CHROMABOND® Diamino and 150 mg  $MgSO_4$  and shaken again. After centrifugation the supernatant is injected into the GC/MS.

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.



### 2 CHROMABOND® QuEChERS extraction buffer mixes/clean-up mixes

#### Extraction mixtures for sample preparation for determination of pesticides in food samples.

MACHEREY-NAGEL

MACHEREY-NAGEL offers a number of individually weighed and pre-mixed buffers and extraction mixtures, specially composed for different sample matrices.

Mix I and Mix II are extraction mixtures, Mix III to Mix VI are clean-up mixtures.

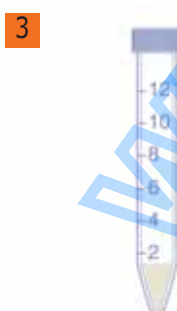
The food samples will be extracted with either Mix I or Mix II.

Afterwards they will be purified with one of the following mixtures:

- Mix III (samples with low fat content; e.g. apples, strawberries),
- Mix IV (moderate content of chlorophyll and carotinoids; e. g. carrots, lettuce),
- Mix V (high content of chlorophyll and carotinoids; e. g. bell peppers, spinach),
- Mix VI (high fat content; e. g. avocados).

**Every mix is prepacked in a 15 ml centrifuge tube. Pack of 50 pieces.**

Capacity ml	Description	Composition	PK	Cat. No.
15	Mix I Citrat-Extraction-Mix	4g $MgSO_4$ , 1g NaCl, 0.5g Na:H citrate; 1.5 H <sub>2</sub> O, 1g Na <sub>2</sub> citrate; 2 H <sub>2</sub> O	50	4.003 824
15	Mix II Acetat-Extraction-Mix	6g $MgSO_4$ , 1.5g Na acetate	50	4.003 825
15	Mix III Diamino Clean-up Mix	0.15g CHROMABOND® Diamino with 0.9g $MgSO_4$ .	50	4.003 826
15	Mix IV Diamino/Carbon Clean-up Mix	0.15g CHROMABOND® Diamino with 0.9g $MgSO_4$ and 15mg Carbon	50	4.003 827
15	Mix V Diamino/Carbon Clean-up Mix	0.15g CHROMABOND® Diamino with 0.9g $MgSO_4$ and 45mg Carbon	50	4.003 829
15	Mix VI Diamino/Carbon Clean-up Mix	0.15g CHROMABOND® Diamino with 0.9g $MgSO_4$ and 45mg Carbon	50	4.003 828



### 3 Accessories CHROMABOND® QuEChERS

Empty PP centrifuge tube with screw cap, 50 ml, without QuEChERS mixtures.

MACHEREY-NAGEL

Type	PK	Cat. No.
50ml PP-centrifuge tube with crew cap	50	4.003 552

For more centrifuge tubes, please see page 646.

### Chemical compatibility of filter materials

The following table lists the chemical compatibility of our CHROMAFIL® materials. The chemical compatibility depends on several parameters such as time, pressure, temperature and concentration.

In most cases, CHROMAFIL® filters will have only short contact with a solvent. In these cases they may be used despite of limited compatibility.

For example, a PTFE filter with PP housing does not liberate any UV-detectable substances during filtration of 5 ml THF, although PP shows only limited resistance towards THF.

Solvent	Material										
	MV	CA	RC	PA	PTFE	PVDF	PES	PET	GF	PP	
Acetaldehyde	⊖	⊖	⊕	⊙	⊕	⊕		⊕	⊕	⊙	
Acetic acid, 100 %	⊖	⊖	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	
Acetone	⊖	⊖	⊕	⊕	⊕	⊖	⊖	⊕	⊕	⊕	
Acetonitrile	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	
Ammonia, 25 %	⊖	⊖	⊙	⊖	⊕	⊕	⊕	⊙	⊕	⊕	
Benzene	⊕	⊕	⊕	⊕	⊕	⊙		⊕	⊕	⊙	
n-Butanol	⊕	⊕	⊕	⊙	⊕	⊕	⊕	⊕	⊕	⊕	
Cyclohexane	⊕	⊕	⊕	⊙	⊕	⊕	⊕	⊕	⊕	⊕	
Dichloromethane	⊕	⊖	⊕	⊖	⊕	⊕	⊖	⊕	⊕	⊖	
Diethyl ether	⊙	⊙	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊙	
Dimethylformamide	⊖	⊖	⊙	⊕	⊕	⊖	⊖	⊕	⊕	⊕	
1,4-Dioxane	⊖	⊖	⊕	⊕	⊕	⊙	⊖	⊕	⊕	⊙	
Ethanol	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	
Ethyl acetate	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊙	
Ethylene glycol	⊙	⊙	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	
Formic acid, 100 %	⊕	⊖	⊙	⊖	⊕	⊕	⊕	⊙	⊕	⊕	
Hydrochloric acid, 30 %	⊖	⊖	⊖	⊖	⊕	⊕	⊕	⊖	⊕	⊕	
Methanol	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	
Nitric acid, 65 %	⊖	⊖	⊖	⊖	⊙	⊙		⊙	⊕	⊖	
Oxalic acid, 10 % aqueous	⊕	⊖	⊕	⊖	⊕	⊕		⊕	⊕	⊕	
Petroleum ether	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	
Phosphoric acid, 80 %	⊖	⊖	⊙	⊖	⊕	⊙		⊕	⊕	⊕	
Potassium hydroxide, 1 mol/l	⊖	⊖	⊙	⊕	⊕	⊙	⊕	⊙	⊕	⊕	
2-Propanol	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	
Sodium hydroxide, 1 mol/l	⊖	⊖	⊙	⊕	⊕	⊙	⊙	⊙	⊙	⊕	
Tetrachloromethane	⊕	⊖	⊕	⊕	⊕	⊙		⊕	⊕	⊙	
Tetrahydrofuran	⊖	⊖	⊕	⊙	⊕	⊕	⊖	⊕	⊕	⊙	
Toluene	⊕	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊙	
Trichloroethene	⊕	⊕	⊕	⊙	⊕	⊕		⊕	⊕	⊙	
Trichloromethane	⊕	⊖	⊕	⊖	⊕	⊕	⊖	⊕	⊕	⊖	
Urea	⊕	⊕	⊕	⊕	⊕	⊕		⊕	⊕	⊕	
Water	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	
Xylene	⊕	⊕	⊕	⊕	⊕	⊙		⊕	⊕	⊙	

Data not guaranteed. ⊕ resistant, ⊖ not resistant, ⊙ limited resistance

MV = cellulose mixed esters, CA = cellulose acetate, RC = regenerated cellulose, PA = polyamide, PTFE = polytetrafluoroethylene (Teflon), PVDF = polyvinylidene difluoride, PES = polyethersulfone, PET = polyester, GF = glass fibre, PP = polypropylene (housing material)

### LLG-Syringe Filters

We offer a line of syringe filters especially designed to provide efficient filtration of a broad variety of fluids, solvents, aqueous or inorganic solutions. Our syringe filters cover most applications in HPLC, pharmaceutical, environmental, biotechnology and food and beverage testing laboratories.

- Housing injected in Polypropylene or MABS
- Multifunctional Syringe filters equipped with Female Luer-Lock/Male Luer Lock or Male Luer Slip connections for different applications
- Pre-sterilised or non-sterile
- Sterile products in individual hard blister
- Superior pressure stability
- Easy to identify because of colour code and printed description



9.055 500

#### LLG Syringe Filter CA, Cellulose acetate (NEW!)

Hydrophilic membrane for filtration of aqueous solutions

This membrane features excellent shape stability in aqueous solutions and a very low binding capacity for proteins (21µg per 25 mm Filter).

Ideal for use with biological macromolecules, water soluble oligomers and polymers. With Luer-Lock-outlet.

Filter diam.	Pore size	Housing	Type	PK	Cat. No.
mm	µm				
13	0.20	Acrylic, blue	non sterile	500	<b>9.055 500</b> 1
13	0.45	Acrylic, yellow	non sterile	500	<b>9.055 502</b>
13	0.80	Acrylic, green	non sterile	500	<b>9.055 504</b>
25	0.20	Acrylic, blue	non sterile	500	<b>9.055 501</b>
25	0.45	Acrylic, yellow	non sterile	500	<b>9.055 503</b> 2
25	0.80	Acrylic, green	non sterile	500	<b>7.970 389</b>
13	0.20	Acrylic, blue	sterile	50	<b>9.055 510</b>
13	0.45	Acrylic, yellow	sterile	50	<b>9.055 512</b>
25	0.20	Acrylic, blue	sterile	50	<b>9.055 511</b>
25	0.45	Acrylic, yellow	sterile	50	<b>9.055 513</b>



9.055 503

#### LLG Syringe Filter NY, Nylon/Polyamide (NEW!)

This is a rather hydrophilic membrane; it is recommended for filtration of aqueous and organic/aqueous medium polar liquids.

Excellent chemical compatibility with esters, bases and alcohols.

Filter diam.	Pore size	Housing	Type	PK	Cat. No.
mm	µm				
13	0.20	PP	non sterile	500	<b>9.055 520</b> 3
13	0.45	PP	non sterile	500	<b>9.055 522</b>
25	0.20	PP	non sterile	500	<b>9.055 521</b>
25	0.45	PP	non sterile	500	<b>9.055 523</b>



9.055 520

#### LLG Syringe Filter PE, Polyethylene (NEW!)

Universal Filter membrane for all analytical requirements. For aqueous and aggressive organic solvent filtration.

Wide application in sample preparation, Ion chromatography.

Filter diam.	Pore size	Housing	Type	PK	Cat. No.
mm	µm				
13	0.20	PP	non sterile	500	<b>9.055 540</b>
13	0.50	PP	non sterile	500	<b>9.055 542</b>
25	0.20	PP	non sterile	500	<b>9.055 541</b> 4
25	0.50	PP	non sterile	500	<b>9.055 543</b>



9.055 541

#### LLG Syringe Filter RC, Regenerated cellulose (NEW!)

Hydrophilic membrane features very low adsorption. It is recommended for filtration of aqueous and organic/aqueous liquids.

For filtration of polar and medium polar liquids.

Filter diam.	Pore size	Housing	Type	PK	Cat. No.
mm	µm				
13	0.20	PP	non sterile	500	<b>9.055 530</b> 5
13	0.45	PP	non sterile	500	<b>9.055 532</b>
25	0.20	PP	non sterile	500	<b>9.055 531</b>
25	0.45	PP	non sterile	500	<b>9.055 533</b>



9.055 530

### LLG Syringe Filter PTFE, Polytetrafluorethylene



Hydrophobic membrane. Ideal for filtration of non-polar liquids and gases. It is very resistant to various solvents as well as acids and bases.

Filter diam.	Pore size	Housing	Type	PK	Cat. No.
mm	µm				
13	0.20	PP	non sterile	500	<b>7.970 402</b>
13	0.45	PP	non sterile	500	<b>7.970 385</b>
25	0.20	PP	non sterile	500	<b>9.055 535</b>
25	0.45	PP	non sterile	500	<b>6.255 331</b>



6.255 331

### LLG Syringe Filter PES, Polyethersulfone



Hydrophobic membrane. Ideal for filtration of non-polar liquids and gases. It is very resistant to various solvents as well as acids and bases.

Filter diam.	Pore size	Housing	Type	PK	Cat. No.
mm	µm				
13	0.20	Acrylic	non sterile	500	<b>9.055 524</b>
13	0.45	Acrylic	non sterile	500	<b>9.055 526</b>
25	0.20	Acrylic	non sterile	500	<b>9.055 525</b>
25	0.45	Acrylic	non sterile	500	<b>7.970 213</b>



7.970 213

### LLG Syringe Filter PVDF, Polyvinylidene fluoride



Hydrophilic membrane for aqueous polar and light unpolar solutions. Very low protein binding High flow rates ideal for use with biological macromolecules, water soluble oligomers and polymers.

Filter diam.	Pore size	Housing	Type	PK	Cat. No.
mm	µm				
13	0.20	PP	non sterile	500	<b>7.970 258</b>
13	0.45	PP	non sterile	500	<b>9.055 534</b>
25	0.20	PP	non sterile	500	<b>7.970 387</b>
25	0.45	PP	non sterile	500	<b>7.970 286</b>



7.970 286

### LLG Syringe Filter GF, Glass-fibre



Hydrophilic membrane suitable for pre-filtration. They can be used for solutions with high particulate loads or for highly viscous solutions (e.g. soil samples, fermentation broths) either alone or in combination with other filters.

Filter diam.	Pore size	Housing	Type	PK	Cat. No.
mm	µm				
25	0.70	PP	non sterile	500	<b>9.055 550</b>
25	1.00	PP	non sterile	500	<b>9.055 551</b>
25	1.20	PP	non sterile	500	<b>9.055 552</b>
25	3.10	PP	non sterile	500	<b>9.055 553</b>



9.055 552

➔ Syringe Filters please see page 672.



1



### 1 HPLC columns with NUCLEODUR® Phasen

#### NUCLEODUR® C18 - C 8 Gravity nonpolar high density phases

MACHEREY-NAGEL

available as octadecyl (C18 -USP L!) and octyl (C8 - USP L7) modifications  
 Pore size 110 Å; particle sizes 1.8µm, 3µm and 5µm for C18, 1.8 and 5µm for C8  
 7, 10, 12 and 16µm particles for preparative separations on request  
 carbon content 18 %C for C18 , 11%C for C8  
 ideal for method development  
 allows HPLC at pH extremes (pH 1 - 11)  
 suitable for **LC/MS** due to low bleeding characteristics  
 recommended for overall sophisticated analytical separations  
 optimal for: pharmaceuticals, e.g. analgesics, antiinflammatory drugs, antidepressants; herbicides;  
 phytopharmaceuticals; immunospressants

#### EC analytical columns NUCLEODUR® C18 Gravity, 3µm

particle size 3µm, 18% C.

MACHEREY-NAGEL

Int. diam. mm	Length mm	PK	Cat. No.
2.0	50	1	4.004 400
3.0	50	1	4.004 401
4.0	50	1	4.004 402
4.6	50	1	4.004 403
2.0	125	1	4.004 404
3.0	125	1	6.232 333
4.0	125	1	4.004 405
4.6	125	1	4.004 406
2.0	150	1	4.004 411
3.0	150	1	4.004 412
4.0	150	1	4.004 413
4.6	150	1	4.004 414
2.0	250	1	4.004 407
3.0	250	1	4.004 408
4.0	250	1	4.004 409
4.6	250	1	4.004 410

#### Guard columns for EC columns NUCLEODUR® C18 Gravity, 3µm

MACHEREY-NAGEL

Type	PK	Cat. No.
for 2 and 3 mm i.d.	3	4.004 624
for 4 and 4.6 mm i.d.	3	4.004 625

Guard columns for EC columns require guard column adapter EC (Cat. No. 7.081 898)

#### NUCLEOSIL® 100-5 C18 PAH special octadecyl phase for PAH analysis

MACHEREY-NAGEL

Base material NUCLEOSIL® silica, particle size 5µm, pore size 110 Å; polymeric coating -  
 USP L1; eluent in column acetonitrile/water 70:30; allows efficient gradient separation of  
 the 16 PAH in accordance with EPA, detection of the separated PAH by UV (250 to 280nm), with diode array or with  
 fluorescence detection at different wavelengths for excitation and emission (acenaphthylene cannot be analysed with  
 fluorescence detection).  
 Other HPLC columns on request.

#### EC analytical columns NUCLEOSIL® 100-5 C18 PAH, 5µm

Octadecyl phase PAH, particle size 5µm.

MACHEREY-NAGEL

 Guard columns for EC columns NUCLEOSIL® 100-5 C<sub>18</sub> PAH, 5µm available on request.

Int. diam. mm	Length mm	PK	Cat. No.
4.0	50	1	4.002 491
3.0	150	1	4.002 493
4.0	150	1	4.002 494
2.0	250	1	7.089 855
3.0	250	1	4.002 372
4.0	250	1	4.002 373
4.6	250	1	4.002 374

➔ Other HPLC-columns on request.



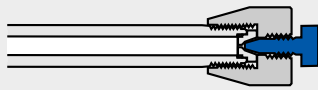
### MN column systems

#### EC standard columns for analytical HPLC

MACHEREY-NAGEL

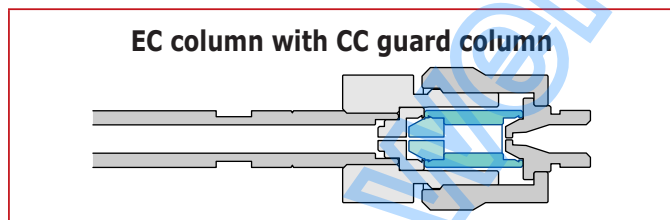
analytical column system manufactured from stainless steel M 8 outer threads on both ends combination of sealing element and very fine-meshed stainless steel screen, PTFE sealing ring and fitting adaptor column heads SW 12 with inner threads M8 x 0.75 and UNF 10-32, as built -in guard columns use ChromCart® guard column cartridges with 8mm length with the guard column adaptor EC, packed with NUCLEODUR® spherical silica.

#### Available standard dimensions of EC columns · please ask for availability of certain phases

ID [mm]	Length [mm]											End fitting design	
	8*	20	30	50	75	100	125	150	200	250	300		
2	-	X	X	X	X	X	X	X	X	X	X	X	
3	X	X	X	X	X	X	X	X	X	X	X		
4	X	X	X	X	X	X	X	X	X	X	X		
4,6	-	X	X	X	X	X	X	X	X	X	X		

\* Please note that 3 mm ID guard column cartridges are applicable for 2 mm ID and 3 mm ID EC columns, while 4 mm ID guard column cartridges are also used for 4.6 mm ID EC columns.

#### Installation of the EC guard column adaptor (Cat.No. 7.081 898)



#### Accessories and replacement parts for EC columns

MACHEREY-NAGEL

Description	PK	Cat. No.
Guard column adapter EC	1	7.081 898
1/16" nut for connecting 1/16" capillaries	5	4.002 179
1/16" ferrule	5	4.002 180
1/16" end cap, plastic	4	4.002 178
EC fitting adaptor	1	4.002 219
EC column head (nut)	1	4.002 220
EC PTFE sealing ring	4	4.002 221
3-part sealing combination for EC columns	1	4.002 222

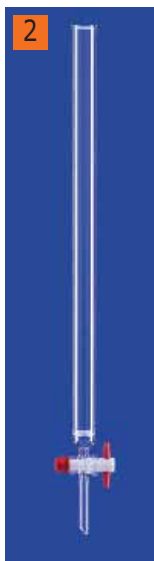


### 1 Chromatographic columns with Frit, PTFE- /or Valve Stopcock

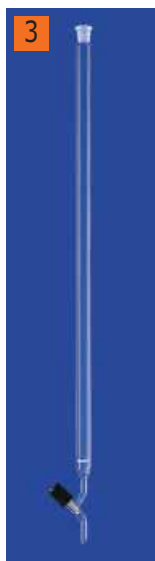
Chromatography columns with socket and with frit.  
Manufactured from borosilicate glass 3.3 which is resistant to heat and almost all chemicals.  
NS necks are in compliance with DIN 12242 standards.

Isolab

Length	Int. diam.	Capacity	Description	PK	Cat. No.
mm	mm	ml			
200	10	15	without frit NS 14/23	1	4.008 398
400	20	125	without frit NS 29/32	1	4.008 399
600	30	430	without frit NS 29/32	1	4.008 400
200	10	15	with frit (P=0) NS 14/23	1	4.008 401
300	10	25	with frit (P=0) NS 14/23	1	4.008 402
200	15	35	with frit (P=0) NS 14/23	1	4.008 403



6.202 416



6.223 574

### 2 Chromatographic columns, PTFE- or Valve Stopcock, DURAN® tubing

Made of DURAN® tubing. Chromatography columns with sintered frit, porosity 0.  
Available in three versions:

Lenz

- with frit, beaded rim and PTFE stopcock
- with frit, NS socket and PTFE stopcock
- with NS socket and needle-valve stopcock (bore 0 - 2.5mm)

Length	Int. diam.	Capacity	Description	Stopcock	PK	Cat. No.
mm	mm	ml				
200	15	35	beaded rim	PTFE	1	6.205 017
400	20	125	beaded rim	PTFE	1	6.202 416 2
600	30	430	beaded rim	PTFE	1	6.202 417
800	40	1000	beaded rim	PTFE	1	6.202 418
100	10	8	socket NS 14/23	PTFE	1	6.225 859
200	10	15	socket NS 14/23	PTFE	1	9.025 912
300	10	23	socket NS 14/23	PTFE	1	9.025 913
200	15	35	socket NS 14/23	PTFE	1	9.025 914
400	20	125	socket NS 29/32	PTFE	1	6.203 961
600	30	430	socket NS 29/32	PTFE	1	6.303 297
200	15	35	socket NS 29/32	Valve	1	6.223 574 3



9.025 936

### 4 Chromatographic columns with indentations and NS socket, DURAN® tubing

Made of DURAN® tubing. Basic chromatographic columns with indentations above the stopcock for placing a cotton plug, with NS socket, with PTFE stopcock and retaining device.

Lenz

Length	Int. diam.	Capacity	Description	PK	Cat. No.
mm	mm	ml			
200	10	15	with NS 14 / 23 socket	1	9.025 932
400	20	125	with NS 29 / 32 socket	1	9.025 934
600	30	430	with NS 29 / 32 socket	1	9.025 936 4



### 5 Glass wool

Extra fine. In packs as outlined below.

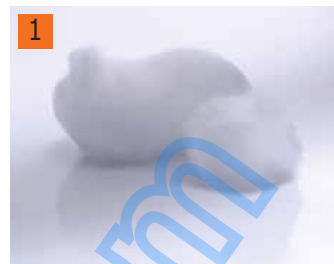
Capacity	PK	Cat. No.
g		
30	1	9.114 303
1000	1	9.114 310

→ Stands and fittings - please see page 168.

**1 Quartz wool**

Silica. Fibre thickness 4µm to 12µm.

proQuarz



Capacity g	PK	Cat. No.
500	1	9.114 331

**Silica adsorbents for low pressure column chromatography**

standard silica 60, pore size ~ 60 Å; pore volume ~ 0.75ml/g; spec. surface BET ~ 500m<sup>2</sup>/g. highly porous, amorphous silicic acid in the form of hard, opalescent particles, prepared by precipitation of water glass with sulphuric acid. For higher demands on the performance of column packings we recommend our high-purity irregular Polyoprep silicas. Silica FIA for the fluorescence indicator adsorption procedure for the determination of hydrocarbon groups in the testing of liquid fuels in accordance with DIN 51791 and ASTM D 1319-58T. The FIA method determines saturated hydrocarbons, olefins and aromatic hydrocarbons of a sample chromatographically by adsorption and desorption in a column filled with FIA silica, in the presence of a fluorescent dye mixture.

MACHEREY-NAGEL

Description	Particle size	Weight kg	PK	Cat. No.
Silica 60, 0.015 - 0.04 mm		1	1	4.004 999
Silica 60, 0.025 - 0.04 mm		1	1	4.004 948
Silica 60, 0.04 - 0.063 mm	230 - 400 mesh	1	1	4.004 968
Silica 60 M, 0.04 - 0.063 mm	230 - 400 mesh	1	1	4.004 971
Silica 60, 0.05 - 0.1 mm	130 - 270 mesh	1	1	4.004 974
Silica 60, 0.05 - 0.2 mm	70 - 270 mesh	1	1	4.004 954
Silica 60, 0.063 - 0.2 mm	70 - 230 mesh	1	1	4.004 957
Silica 60, < 0.063 mm	+ 230 mesh	1	1	4.004 977
Silica 60, < 0.08 mm	+ 190 mesh	1	1	4.004 951
Silica 60, 0.1 - 0.2 mm	70 - 130 mesh	1	1	4.004 960
Silica 60, 0.2 - 0.5 mm	35 - 70 mesh	1	1	4.004 962
Silica 60, 0.5 - 1.0 mm	18 - 35 mesh	1	1	4.004 965
Silica 60, 0.015 - 0.04 mm		5	1	4.005 001
Silica 60, 0.025 - 0.04 mm		5	1	4.004 950
Silica 60, 0.04 - 0.063 mm	230 - 400 mesh	5	1	4.004 970
Silica 60 M, 0.04 - 0.063 mm	230 - 400 mesh	5	1	4.004 973
Silica 60, 0.05 - 0.1 mm	130 - 270 mesh	5	1	4.004 976
Silica 60, 0.05 - 0.2 mm	70 - 270 mesh	5	1	4.004 956
Silica 60, 0.063 - 0.2 mm	70 - 230 mesh	5	1	4.004 959
Silica 60, < 0.063 mm	+ 230 mesh	5	1	4.004 979
Silica 60, < 0.08 mm	+ 190 mesh	5	1	4.004 953
Silica 60, 0.1 - 0.2 mm	70 - 130 mesh	5	1	4.004 961
Silica 60, 0.2 - 0.5 mm	35 - 70 mesh	5	1	4.004 964
Silica 60, 0.5 - 1.0 mm	18 - 35 mesh	5	1	4.004 967
Silica 60, 0.015 - 0.04 mm		25	1	4.005 000
Silica 60, 0.025 - 0.04 mm		25	1	4.004 949
Silica 60, 0.04 - 0.063 mm	230 - 400 mesh	25	1	4.004 969
Silica 60 M, 0.04 - 0.063 mm	230 - 400 mesh	25	1	4.004 972
Silica 60, 0.05 - 0.1 mm	130 - 270 mesh	25	1	4.004 975
Silica 60, 0.05 - 0.2 mm	70 - 270 mesh	25	1	4.004 955
Silica 60, 0.063 - 0.2 mm	70 - 230 mesh	25	1	4.004 958
Silica 60, < 0.063 mm	+ 230 mesh	25	1	4.004 978
Silica 60, < 0.08 mm	+ 190 mesh	25	1	4.004 952
Silica 60, 0.2 - 0.5 mm	35 - 70 mesh	25	1	4.004 963
Silica 60, 0.5 - 1.0 mm	18 - 35 mesh	25	1	4.004 966
Silicia FIA fine	0,071 - 0,16 mesh	1	1	4.004 980
Silicia FIA coarse	0,071 - 0,63 mesh	1	1	4.004 981

**2 HPLC bottles, DURAN® complete system 4-port screw cap**

For sterile transfer of media or for feeding solvent to HPLC instruments. The bottle is pressure/vacuum resistant from -1 to +1.5 bar (tested by TÜV in accordance with EN 1596, GS marked). Complete with a 4-port screw cap (autoclavable, reusable) made from PP, 4 connection screw caps (black, M8 thread) and silicone seal. Suitable for tube diameters of 1.6mm and 3.2mm. Spare parts are available individually. Further connection system components for the GL45 thread are available upon request (Tubing not included). Neutral/Type I glass acc. to USP/EP. With Retrace Code (Batch Identification), with certificate available via the internet. Autoclavable.

DURAN Group

Capacity ml	PK	Cat. No.
500	1	9.072 526
1000	1	9.072 525



### 1 Flexible connecting system for DURAN® GL 45 flasks

**NEW!**

DURAN Group

Materials used: PP and PTFE. Flexible modular system. Four different tube diameters (1.6mm; 3.0mm; 3.2mm and 6.0mm) can be connected. Sterile pressure equalisation is possible through use of a membrane filter. Unused ports can be provided with a blind cap. Typical applications: safe transfer of liquid media within a closed and sterile system (evaporation is reduced). Temperature resistant up to max. 140°C. For all solvents PP-resistant.

Description	PK	Cat. No.
Screw cap GL 45, 2 port x GL 14	1	6.227 780
Screw cap GL 45, 3 port x GL 14	1	7.623 018
Screw cap GL 14 for tubing connector	1	6.227 781
Liner for GL 14 screw cap, 1.6mm i.d. hole	1	6.229 494
Liner for GL 14 screw cap, 3mm i.d. hole	1	6.229 495
Liner for GL 14 screw cap, 3.2mm i.d. hole	1	6.230 213
Liner for GL 14 screw cap, 6mm i.d. hole	1	6.227 782
Screw cap, GL 14, red	1	7.623 838
Pressure equalising set, 0.2µm filter, for 2- / 3-Port screw cap	1	6.228 023
Replacement 0.2µm membrane filter for pressure equalising set	2	6.230 844
Bottle 1000ml, GL 45, DURAN® pressure resistant up to +1.5 bar	1	9.971 704
Bottle 500ml, GL 45, DURAN® pressure resistant up to +1.5 bar	1	9.071 707



### 2 Accessories for connecting system for DURAN® GL 45 bottles, DURAN®

**NEW!**

DURAN Group

Description	PK	Cat. No.
Screw cap HPLC GL 45, 4 Port complete	1	6.226 328
Spare set for HPLC screw cap	1	6.226 329
Pressure equilization, 0.2µm for 4-Port-cap, incl. membrane filter	1	6.226 915
Spare membrane filter for pressure equilization, 0,2 µm	1	6.230 844
Bottle 1000 ml, GL 45, DURAN® pressure resistant up to +1,5 bar	1	9.971 704
Bottle 500 ml, GL 45, DURAN® pressure resistant up to +1,5 bar	1	9.071 707



➔ Connecting system for GL 80 flasks please see page 67.

### SafetyCaps

The integral air filter blocks hazardous vapours and cleans the inflowing air from dust and dirt particles. With various connectors for capillaries and tubes. SafetyCaps are available for most common glass bottles (e.g. thread size GL45). They can be customised for other container sizes by using different adapters. Especially recommended for HPLC use: Solvents stay clean and components of solvent mixtures can not evaporate. Optimum protection against health hazards caused by evaporation and insufficient sealing.

Scat

Key advantages:

- No evaporation of hazardous gases, no contamination of solvents
- No crimping of connection tubing, easy container exchange
- No air intake (HPLC)
- Save expensive solvents by avoiding evaporation, cost efficiency
- Reproducible analysis results through stable mobile phase

### SafetyCaps, S 40/GL 40/GL 45

Safe solvent supply. With integral air filter vent. For maximum efficiency, we recommend that the vent is changed every 6 months. The filter membrane absorbs dust and dirt particles to protect your solvent reservoirs. The vent is universally suitable for all SafetyCaps. It also works with your current SafetyCaps, simply replace the old vent with the new one.

Scat

Description	Thread	Connections	PK	Cat. No.
SafetyCap I	S40 / GL40	1 capillaries (3.2mm o.d.)	1	6.253 976
SafetyCap II	S40 / GL40	2 capillary (3.2mm o.d.)	1	7.628 821
SafetyCap I (1with stopcock)	S40 / GL40	1 capillaries (3.2mm o.d.)	1	9.139 895
SafetyCaps I	GL45	1 capillary (3.2mm o.d.)	1	9.139 850 <sup>1</sup>
SafetyCaps II	GL45	2 capillaries (3.2mm o.d.)	1	9.139 851
SafetyCaps III	GL45	3 capillaries (3.2mm o.d.)	1	9.139 852
SafetyCaps IV	GL45	4 capillaries (3.2mm o.d.)	1	9.139 853
SafetyCaps VI	GL45	6 capillaries (3.2mm o.d.)	1	9.139 854
SafetyCaps I, with 1 stopcock	GL45	1 capillary (3.2mm o.d.)	1	9.139 855
SafetyCaps II, with 2 stopcocks	GL45	2 capillaries (3.2mm o.d.)	1	9.139 856
SafetyCaps III, with 3 stopcocks	GL45	3 capillaries (3.2mm o.d.)	1	9.139 857
SafetyCaps IV, with 4 stopcocks	GL45	4 capillaries (3.2mm o.d.)	1	9.139 858
SafetyCaps VI, with 6 stopcocks	GL45	6 capillaries (3.2mm o.d.)	1	9.139 859
SafetyCaps II, combined (1with stopcock / 1 without stopcock)	GL45	2 capillaries (3.2mm o.d.)	1	9.139 860 <sup>2</sup>
SafetyCaps III, combined (2 with stopcocks / 1 without stopcock)	GL45	3 capillaries (3.2mm o.d.)	1	9.139 861
SafetyCaps I, for preparative operation	GL45	1 capillary (4.76 mm o.d.)	1	9.139 862 <sup>3</sup>
SafetyCaps II, for ground neck bottles	NS 29/32	2 capillaries (3.2mm o.d.)	1	9.139 863 <sup>4</sup>



### 5 | 6 | 7 HPLC starter kits, GL 45

**NEW!**

- Extraction initial equipment for a HPLC system
- Price advantage compared to ordering piece by piece
- Suitable for all current HPLC systems

Supplied with:

**HPLC SafetySet 1:** 3 x SafetyCap I, 1 x SafetyCap II, 1 x blind plug

**HPLC SafetySet 2:** 4 x SafetyCap II, 4 x blind plug

**HPLC SafetySet 3:** 3 x SafetyCap I fire resistant, 1 x SafetyCap II fire resistant, 1 x blind plug

Type	PK	Cat. No.
HPLC SafetySet 1	1	7.627 142
HPLC SafetySet 2	1	7.670 287
HPLC SafetySet 3	1	6.264 451

Scat





**1**

**1 Pressure relief valve for SafetyCaps**
**NEW!**

Scat

Pressure relief valve for SafetyCaps, with integral air filter.  
The valve opens when the HPLC pump is operated, and allows air to flow into the bottle - this prevents a vacuum building up in the bottle. As soon as the pump stops, the membrane immediately seals properly and no dangerous solvent vapours can escape.

Description	Flow rate amount ml/min	PK	Cat. No.
Pressure relief valve for SafetyCaps	150	1	9.139 864
Pressure relief valve for SafetyCaps (refill pack of 10)	150	10	4.005 886
Pressure relief valve SafetyCaps, fire-resistant	150	1	4.005 769
Pressure relief valve SafetyCaps (preparative)	400	1	4.005 948

**2**

**2 HPLC Safety Set**
**NEW!**

Scat

HPLC Safety Set suitable for all HPLC Systems  
Complete system for removal and disposal of solvents.

One single set for Solvent supply and Waste:

- 4x SafetyCap III GL45
- 4x Air Valve
- 4x Solvent bottle 1 L, GL45, glass
- 12x Blind plug for capillary connections
- 10x Fittings diam. 2.3mm grey
- 4x Fittings diam. 3.2mm blue
- 10x Fitting diam. 1.6 mm green
- 4x Fittings diam. 3.2mm red
- 6x Fittings diam. 3.2mm yellow
- 1x Tube connector 6.4-9.0mm
- 1x SafetyWasteCap GL45
- 1x Exhaust filter size M
- 1x Container 5 L, GL45, PE-HD
- 2x Tube connector 6-8mm

Type	PK	Cat. No.
HPLC Safety Set	1	6.264 436

**SafetyWasteCaps with or without hose connection**

For a safe disposal of liquid waste. SafetyWasteCaps have a connection for an exhaust vent filter. The exhaust vent filter absorbs 99% of all volatile substances that can evaporate from the containers during solvent disposal. For optimum protection of health and environment. SafetyWasteCaps are manufactured of pure PTFE and PE-HD, ensuring maximum chemical resistance against organic solvents and other aggressive chemicals. Further thread sizes and configuration are available on request.

Fittings for connections are included in delivery.

Please order exhaust vent filter separately.

Thread	Connections	PK	Cat. No.
S40 / GL40	3 x tubing connectors 2.3/3.2mm o.d.	1	7.628 820
S40 / GL40	2 x tubing connectors 2.3/3.2mm o.d., 1 x tubing connector 6.4-9.0mm i.d.	1	9.139 896
GL45	3 x tubing connectors Ø 2.3/3.2mm o.d.	1	9.139 865
GL45	2 x tubing connectors Ø 2.3/3.2mm o.d., 1x tubing connector Ø 6.4-9.0mm i.d.	1	9.139 866 5
S51	2 x tubing connectors 2.3 / 3.2mm o.d., 1 x tubing connector 6.4-9.0mm i.d.	1	4.005 583
S55	2 x tubing connectors 2.3 / 3.2mm o.d., 1 x tubing connector 6.4-9.0mm i.d.	1	4.005 584
S60/61	3 x tubing connectors 2.3 / 3.2mm o.d.	1	9.139 867 3
S60/61	2 x tubing connectors 2.3 / 3.2mm o.d., 1 x tubing connector 6.4-9.0mm i.d.	1	9.139 868 4
S70/71	2 x tubing connectors 2.3 / 3.2mm o.d., 1 x tubing connector 6.4-9.0mm i.d.	1	4.005 585
S90	4 x tubing connectors 2.3 / 3.2mm o.d., 1 x tubing connector 6.4-9.0mm i.d.	1	9.139 870

**3**


9.139 867

**4**


9.139 868

**5**


9.139 866



### Charcoal filters for SafetyWasteCaps

3 sizes of absorbent charcoal filters (with capacity for 3, 6 or 9 months respectively) available.

Scat

Depending on the required capacity 3 filter sizes each with a different lifetime are available. With S.C.A.T. special granulates 99% of the solvent vapors are absorbed. Exhaust filters with splash guard are recommended for SafetyWasteCaps with integrated Safety Funnels. Filters should be changed according to filter life.

Filter also available with change indicator, do not forget change interval..

Filter size	Life time	Description	Volume	PK	Cat. No.
			litres		
S	3 months		≤ 5	1	9.139 871
S	3 months	Supply pack	≤ 5	4	4.005 884 <b>1</b>
S	3 months	with splash guard	≤ 5	1	4.005 634
S	3 months	Fire-resistant	≤ 5	1	4.005 782
S	3 months	with change indicator + splash guard	≤ 5	1	9.042 895 <b>2</b>
M	6 months		≤ 20	1	9.139 872 <b>3</b>
M	6 months	Supply pack	≤ 20	3	4.005 885
M	6 months	with splash guard	≤ 20	1	4.005 631 <b>4</b>
M	6 months	Fire-resistant	≤ 20	1	4.005 784
M	6 months	with change indicator + splash guard	≤ 20	1	9.042 896 <b>5</b>
L	9 months		≥ 20	1	9.139 873
L	9 months	with splash guard	≥ 20	1	4.005 635



4.005 884



9.042 895



9.139 872



4.005 631



9.042 896

### 6 Thread adapters for SafetyCaps/SafetyWasteCaps, PTFE

Use SafetyCaps and SafetyWasteCaps also for bottles with GL40 or GL38 thread. Further adapters in different thread sizes are available on request.

Scat

Description	PK	Cat. No.
Adapter GL38 (f) - GL45 (m)	1	9.139 882
Adapter S40 / GL40 (f) - GL45 (m)	1	9.139 883



### 7 Accessories for charcoal filters for SafetyWasteCaps



The adapters can be combined so that the charcoal filters can be fixed on the waste containers. Space-saving at low heights.

Scat

Description	PK	Cat. No.
90°-Adapter for angled connection	1	4.005 508
45°-Adapter for angled connection	1	4.005 511



### 8 Hose barbs for tube connector for SafetyCaps/SafetyWasteCaps



Connectors for variable tube connector sizes on SafetyWasteCaps. Further configuration available on request.

Scat

Description	Material	PK	Cat. No.
Hose barb, curved 6.4-9.0mm i.d.	PP	1	7.940 304 <b>8</b>
Hose barb, straight for capillary connector 6-8mm i.d.	PP	1	4.005 793 <b>9</b>
Hose barb, straight 3-4mm i.d.	PP	1	4.005 558
Hose barb, angled 9.5-10mm i.d.	PP	1	4.005 556



7.940 304



4.005 793

## Liquid chromatography/Solvent storage/handling



### SafetyWasteCaps with safety funnel

**NEW!**

The safety funnel with shut-off valve has to be opened manually only during the disposal of liquids. At the safety funnel with automatic closing the container will be closed and sealed automatically when releasing the button. In both versions, the port for the exhaust filter is integrated for optimum protection against vapors. Each cap is equipped with variable connections for capillaries and tubes. Further thread sizes with safety funnel are available on request.

Scat

**Please order exhaust vent filter separately, we recommend the splash protected exhaust filters.**

Thread	Connections	PK	Cat. No.
S50	2 x connectors 2.3/3.2mm o.d.	1	9.139 874
S51	1 x connector 2.3/3.2mm o.d., 1 x tube connector 6.4-9.0mm i.d.	1	6.264 449
S51	1 x connector 2.3/3.2mm o.d., 1 x tube connector 6.4-9.0mm i.d.*	1	6.266 051 <b>1</b>
S55	2 x connectors 2.3/3.2mm o.d.	1	9.139 875
S60 / 61	2 x connectors 2.3/3.2mm o.d.	1	9.139 876 <b>2</b>
S65	4 x connectors 2.3/3.2mm o.d.	1	9.139 877
S70 / 71	4 x connectors 2.3/3.2mm o.d.	1	9.139 878
S90	4 x connectors 2.3/3.2mm o.d.*	1	4.005 825
S90	4 x connectors 2.3/3.2mm o.d.	1	9.139 880

\*automatic



### SafetyWasteCaps with mechanical level control

The red floater is immediately visible when the container has reached the critical fill level. Even suitable for canister of opaque material, when fill level can not be shown from the outside.

Scat

- Proven S.C.A.T. technology for SafetyWasteCaps
  - Different thread sizes
  - Connections for capillaries and tubings
  - Exhaust filter
  - Safety funnel
  - Mechanical level control
  - Supplied as a set with connectors
  - With connection for S.C.A.T. exhaust filters **(Please order charcoal filters separately. )**
- Further thread sizes are available on request.

Thread	Connections	PK	Cat. No.
S55	2 x connectors 2.3/3.2mm o.d., 1 x connector 6.4-9.0mm i.d.	1	4.005 612
S60/61	2 x connectors 2.3/3.2mm o.d., 1 x connector 6.4-9.0mm i.d.	1	4.005 613 <b>3</b>
S90	4 x connectors 2.3/3.2mm o.d., 1 x connector 6.4-9.0mm i.d.	1	4.005 616

### Collectors for tube connector for SafetyWasteCaps

**NEW!**

Collectors for additional parts to add more tubings and capillaries. Delivered with fittings. Further configurations available on request.

Scat

Description	Material	PK	Cat. No.
3 x connectors (90°) for 3 capillaries diam. 2.3/3.2mm o.d.	PTFE/PFA/PP	1	9.139 888 <b>5</b>
3 x connectors (90°) for 2 capillaries diam. 2.3/3.2mm o.d. and 1 tubing diam. 6.4-9.0mm i.d.	PTFE/PFA/PP	1	4.005 859 <b>6</b>
3 x connectors (straight) for 3 capillaries diam. 6.4mm i.d.	PTFE/PP	1	6.262 289 <b>4</b>
2 x connectors (90°) for 3 tubings diam. 6.4-9.0mm i.d.	PTFE/PP	1	4.005 865 <b>7</b>
2 x connectors (straight) for 2 capillaries diam. 2.3/3.2mm o.d.	PTFE/PFA	1	4.005 866
3 x connectors (straight) for 3 capillaries diam. 2.3/3.2mm o.d.	PTFE/PFA	1	4.005 860
8 x connectors (straight) for 8 capillaries diam. 2.3/3.2mm o.d.	PTFE/PFA	1	9.139 889
8 x connectors (straight) for 7 capillaries diam. 2.3/3.2mm o.d. and 1 tubing diam. 6.4mm i.d.	PTFE/PFA/PP	1	4.005 976 <b>8</b>



**1** Fittings and Ferrules for capillary connector for SafetyCaps/SafetyWasteCaps

Fittings with integrated ferrule for SafetyCaps and SafetyWasteCaps.  
Parts not in use can be closed with a plug.

Scat

Description	Material	Colour	PK	Cat. No.
Fittings for capillaries diam. 1.6mm o.d.	PFA	green	5	<b>6.241 792</b>
Fittings for capillaries diam. 1.6mm o.d.	PTFE	white	10	<b>4.005 444</b>
Fittings for capillaries diam. 2.3mm o.d.	PFA	violet	5	<b>6.255 961</b>
Fittings for capillaries diam. 2.3mm o.d.	PFA	grey	5	<b>6.241 793</b>
Fittings for capillaries diam. 2.3mm o.d.	PTFE	white	10	<b>4.005 445</b>
Fittings for capillaries diam. 3.2mm o.d.	PFA	black	5	<b>9.042 891</b>
Fittings for capillaries diam. 3.2mm o.d.	PFA	blue	5	<b>9.042 892</b>
Fittings for capillaries diam. 3.2mm o.d.	PFA	red	5	<b>7.639 112</b>
Fittings for capillaries diam. 3.2mm o.d.	PFA	yellow	5	<b>9.042 893</b>
Fittings for capillaries diam. 3.2mm o.d.	PFA	neutral	5	<b>9.042 894</b>
Fittings for capillaries diam. 3.2mm o.d.	PTFE	white	10	<b>4.005 446</b>
Fittings for capillaries diam. 4.76mm (3/16") o.d.	PTFE	white	1	<b>4.005 448</b>
Fittings for capillaries diam. 6.35mm (1/4") o.d.	PTFE	white	1	<b>4.005 447</b>
Blind plugs for capillary connections diam. 1.6/2.3/3.2mm o.d.	PFA	neutral	10	<b>9.139 890</b> <sup>2</sup>
Blind plugs for capillary connections diam. 4.76mm o.d.	PTFE	white	5	<b>4.005 945</b>
Blind plugs for capillary connections diam. 4.76mm o.d.	PTFE	white	10	<b>4.005 880</b>
Blind plug for tubing connection + capillary connection diam. 6.35mm o.d.	PTFE	white	1	<b>4.005 883</b> <sup>3</sup>
Blind plugs for charcoal filter connections	PTFE/VITON	white/black	1	<b>4.005 504</b> <sup>4</sup>



9.139 890



4.005 883



4.005 504

We can supply this  
**manufacturer's**  
whole  
product range !



### 1 Hydrogen Generators for GC combustion detector applications and GC and GC/MS carrier gas applications

The Parker domnick hunter H high purity hydrogen and H-MD for ultra high purity gas generators offer the optimum combination of safe operation, reliability and performance.

Parker Hannifin

Utilising field proven PEM cell technology, hydrogen is produced on demand from deionised water and electricity, at low pressure and with minimal stored volume. Innovative control software allows unrivalled operational safety and reliability. The H generators ideally supply fuel gas to all known GC combustion detectors used in today's laboratory workflows. Three models operate at flow rates; 160 ml/min, 250 ml/min and 500 ml/min. Hydrogen generators are available with Remote Networking software. RemoteNet allows up to 27 hydrogen generators to be actively controlled from one central PC, and facilitates true cascading capabilities.

The H-MD generators ideally supply GC and GC/MS carrier gas, in addition to all known combustion detectors that are routinely used in today's laboratory workflows. Four models operate at flow rates; 160 ml/min, 250 ml/min, 500 ml/min and 1100 ml/min.

- Eliminate dangerous hydrogen cylinders from the work place
- Simple to install and operate
- Compact, reliable with minimal maintenance
- Produces a continuous supply of 99.9995% pure hydrogen at up to 6.9 bar
- (H-MD) Produces a continuous supply of 99.99995% pure hydrogen up to 1.100ml/min and 6.9 bar
- 2 year warranty for the cell
- Optional automatic water fill and remote networking capability

#### Specifications

Ambient Temperature Range:	5 - 40°C
Water Supply Pressure*:	0.1 bar g
Water Supply Flow Rate*:	1 L/min
Water Quality:	Deionised. ASTM II, >1MΩ, <1µs, filtered to <100µm
Supply Voltage Range:	90 - 264V 50/60Hz
Port Connections	
Hydrogen Outlet:	1/8" Compression Fitting
Water Drain:	Quick Release Push in Fitting
Water Fill*:	Quick Release Push in Fitting

\*With optional AWF

Type	Flow rate L / min.	Purity %	Flow rate L / week	Delivery Pressure bar g	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
20H*	0.16	>99.9995	1.25	0.3 - 6.89	342 x 437 x 456	19.0	1	9.870 301
40H*	0.25	>99.9995	2.00	0.3 - 6.89	342 x 437 x 456	19.0	1	9.870 302
60H*	0.50	>99.9995	4.00	0.3 - 6.89	342 x 437 x 456	19.0	1	9.870 303
20H-MD*	0.16	>99.99995	1.69	0.69 - 6.89	342 x 470 x 456	20.5	1	9.870 311
40H-MD*	0.25	>99.99995	2.41	0.69 - 6.89	342 x 470 x 456	20.5	1	9.870 312
60H-MD*	0.50	>99.99995	4.82	0.69 - 6.89	342 x 470 x 456	20.5	1	9.870 313
110H-MD	1.10	>99.99995	10.60	0.69 - 6.89	342 x 470 x 456	23.6	1	9.870 314

Note: For auto water fill option add suffix AWF ie 20H-AWF or 20H-MD-AWF

\*With optional AWF



### Preventative Maintenance

Parker Hannifin

Description	Change interval	PK	Cat. No.
Replacement desiccant cartridge	As required*	1	9.870 308

\* 20H Continuous operation approx 6 to 7 months

\* 40H Continuous operation approx 4 to 5 months

\* 60H Continuous operation approx 2 to 3 months

**1 Zero Air Generators for GC combustion detector applications**

Parker Hannifin

The Parker domnick hunter UHP-ZA zero air generators produce a continuous stream of organic impurity free air from an external dry compressed air source and offer superior limits of detection over and above other modes of supply. Flow rates range from 1 L/min to 30 L/min. The UHP-ZA generators feature an interchangeable top panel facilitating the direct mounting of any Parker domnick hunter hydrogen generator. The stackable system forms an innovative, modular FID gas station suitable for all known GC combustion detectors such as FID, FPD and NPD. UHP-ZA generators may also be used in many other chemical analysis and life science applications, including LC/MS source gas, zero and combustion gas for total hydrocarbon analysers and as a gas sensing calibration and dilution gas.

- Ultra high purity, organic free, air for GC combustion detectors
- Increase resolution and detection limits of analysis
- Compact, reliable with minimal operator attention and maintenance
- Eliminate inconvenient and potentially dangerous air cylinders
- Payback period typically less than 24 months
- Models available to supply up to 75 FID's

**Specifications**

Ambient Temperature Range:	5 - 40°C
Organic Impurity:	< 0.1ppm
Inlet Air Quality:	Clean dry compressed air ISO8573-1:2001 Class 3.2.1
Supply Voltage Range:	103 - 126V 60Hz 207 - 253V 50/60Hz
Port Connections	
Outlet (UHP-10ZA-S & UHP-35ZA-S):	1/8" Compression Fitting
Inlet (UHP-10ZA-S & UHP-35ZA-S):	1/8" Compression Fitting
Outlet (UHP-50ZA-S - UHP-300ZA-S):	1/4" Compression Fitting
Inlet (UHP-50ZA-S - UHP-300ZA-S):	1/4" Compression Fitting

Type	Flow rate	Air Inlet	Delivery Pressure	Dimensions (W x D x H)	Weight	PK	Cat. No.
	L / min.	L/min	bar g	mm	kg		
UHP-10ZA-S	1.00	1.2	4 - 10	340 x 425 x 325	10.2	1	9.870 331
UHP-35ZA-S	3.50	42.0	4 - 10	340 x 425 x 325	14.2	1	9.870 332
UHP-50ZA-S	5.00	6.0	4 - 10	340 x 425 x 325	14.2	1	9.870 333
UHP-75ZA-S	7.50	9.0	4 - 10	340 x 425 x 325	14.2	1	9.870 334
UHP-150ZA-S	15.00	18.0	4 - 10	340 x 425 x 325	15.2	1	9.870 335
UHP-200ZA-S	20.00	24.0	4 - 10	340 x 425 x 325	15.2	1	9.870 336
UHP-300ZA-S	30.00	35.0	4 - 10	340 x 425 x 325	15.2	1	9.870 337

Note: Add suffix 'E' for 207-253V 50/60Hz ie. UHP-10ZA-S-E  
Add suffix 'W' for 103 -126V 60Hz ie. UHP-10ZA-S-W



**Preventative Maintenance**

Parker Hannifin

Description	Change interval	PK	Cat. No.
Inlet Filter PM Kit - all models	12 Months	1	9.870 338
Outlet Filter PM Kit - all models	12 Months	1	9.870 339
Fan PM Kit, 230V - all models	24 Months	1	9.870 340



**1**


9.870 412

### Generators for GC makeup gas and carrier gas applications

*Parker Hannifin*

The Parker domnick hunter zero nitrogen generators employ robust, field proven technology to produce ultra high purity nitrogen for GC makeup and carrier gas applications. An integral heated platinum catalyst ensures carrier grade nitrogen free from organic impurities to <0.1ppm. The generators provide a continuous stream of ultra high purity nitrogen from a single plug & play' unit. Models are available with and without an integral oil free compressor, are extremely quiet in operation and are fully approved for use by major instrumentation manufacturers. Innovative design features include economy mode as standard which extends compressor life and significantly reduces on going running costs.

- Ultra high purity, organic free, nitrogen
- Economy mode as standard, increases compressor life
- Ideal for GC make-up and carrier gas applications including ECD
- Integral oil free compressor, with advanced noise reduction technology
- Eliminate inconvenient and potentially dangerous nitrogen cylinders
- Compact, reliable with minimal operator attention and maintenance

#### Specifications

Ambient Temperature Range:	15 - 25°C
Organic contaminants:	< 0.1ppm total hydrocarbons
Inlet Air Quality*:	Clean dry compressed air ISO8573-1:2001 Class 2.-.1
Supply Voltage Range:	207 - 253V 50/60Hz
Port Connections	
Inlet*:	1/4" Compression Fitting
Outlet:	1/8" Compression Fitting

\*Non compressor models only

Type	Flow rate	Purity	Air Inlet	Delivery Pressure	Dimensions (W x D x H)	Weight	PK Cat. No.
	L / min.	%	L/min	bar g	mm	kg	
UHPZN2-1000	1.00	>99,9995 %	42.0	5	345 x 667 x 869	86.0	1 <b>9.870 412 1</b>
UHPZN2-3000	3.00	>99,9995 %	52.0	5	345 x 667 x 869	86.0	1 <b>9.870 414</b>

**2**


9.870 404

### Ultra High Purity Nitrogen Generators for GC and other critical analytical applications

*Parker Hannifin*

The Parker domnick hunter nitrogen gas generators employ robust, field proven technology to produce ultra high purity nitrogen for critical life science, chemical analysis and spectroscopy applications. Flow rates range from 0.55 L/min to 3 L/min, with purities >99.9995%. The generators provide a continuous stream of ultra high purity nitrogen from a single plug & play' unit. Models are available with and without an integral oil free compressor, are extremely quiet in operation and are fully approved for use by major instrumentation manufacturers. Innovative design features include economy mode as standard which extends compressor life and significantly reduces on going running costs.

- Complete Plug and Play' system specifically designed for critical analytical applications
- Produces a continuous supply of 99.999% purity nitrogen 24 hours a day
- Integral oil free compressor, with advanced noise reduction technology
- Eliminate inconvenient and potentially dangerous nitrogen cylinders
- Compact, reliable with minimal operator attention and maintenance
- Economy mode as standard; increases compressor life

#### Specifications

Ambient Temperature Range:	15 - 25°C
Inlet Air Quality*:	Clean dry compressed air ISO8573-1:2001 Class 2.-.1
Supply Voltage Range:	207 - 253V 50/60Hz
Port Connections	
Inlet*:	1/4" Compression Fitting
Outlet UHPN2 550 & 750:	1/8" Compression Fitting
Outlet UHPN2 1500 & 3000:	1/4" Compression Fitting

\*Non compressor models only

Type	Flow rate	Purity	Air Inlet	Oulet Pressure	Dimensions (W x D x H)	Weight	PK Cat. No.
	L / min.	%	L/min	bar g	mm	kg	
UHPN2-550	0.55	>99,9995	33.0	5	345 x 417 x 869	44.0	1 <b>9.870 404 2</b>
UHPN2-750	0.75	>99,9995	33.0	5	345 x 417 x 869	44.0	1 <b>9.870 406</b>
UHPN2-1500	1.50	>99,9995	117.0	5	345 x 667 x 869	84.0	1 <b>9.870 408</b>
UHPN2-3000	3.00	>99,9995	117.0	5	345 x 667 x 869	84.0	1 <b>9.870 410</b>



### 1 Nitrogen Generators for Agilent 6400 & 6500 LC/MS instruments

Parker Hannifin

The Parker domnick hunter LCMS64/65 dual flow nitrogen gas generators employ robust, field proven technology to meet the drying, sheath, nebulisation and collision gas requirements of the Agilent Technologies QQQ & Q-TOF instrumentation portfolio. The LCMS64/65 generators provide two continuous streams of high purity nitrogen from a single plug & play' unit. Models are available both with and without an integral oil free compressor, are extremely quiet in operation, and fully approved for use by major instrumentation manufacturers. Innovative design and technology facilitate optimised operating time, attractive return on investment and proven analytical performance, eliminating the need for other modes of supply.

- Complete Plug and Play' system specifically designed for the Agilent 6400 & 6500
- Produces a continuous supply of LC/MS grade nitrogen 24 hours a day
- Integral oil free compressor, with noise reduction technology
- Eliminate inconvenient and potentially dangerous nitrogen cylinders
- Compact, reliable with minimal operator attention and maintenance
- Phthalate-free componentry

#### Specifications

Ambient Temperature Range: 5 - 40°C  
 Inlet Air Quality\*: Clean dry compressed air  
 ISO8573-1:2001 Class 2.-.1

Supply Voltage Range: 103 - 126V 60Hz  
 207 - 253V 50/60Hz

Port Connections  
 Nitrogen Outlet: 1/4" Compression Fitting  
 Air Inlet\*: 1/4" Compression Fitting

\*Non compressor models only



Type	Description	Flow rate Nitrogen L / min.	Purity %	Air Inlet L/min	Delivery Pressure bar g	Dimensions (W x D x H) mm	Air Inlet L/min	PK	Cat. No.
LCMS64-0		0.20	> 99.999	90.0	6.8	510 x 559 x 705	103.0	1	9.870 389
LCMS64-1	with Compressor	0.20	> 99.999		6.8	510 x 826 x 705	143.0	1	9.870 390
LCMS65-0		0.20	> 99.999	90.0	6.8	510 x 559 x 705	103.0	1	9.870 391
LCMS65-1	with Compressor	0.20	> 99.999		6.8	510 x 826 x 705	143.0	1	9.870 392

Note: Add suffix E' for 207-253V 50/60Hz ie LCMS64-0-E  
 Add suffix W' for 103 -126V 60Hz ie LCMS64-0-W

### 2 Nitrogen and Dry Air Generators for LC/MS instruments

Parker Hannifin

The Parker domnick hunter LCMS20/3 dual flow nitrogen and dry air generators employ robust, field proven technology to meet the nebulisation requirements of LC/MS instruments, both in positive and negative ionisation mode. The LCMS20/3 generators provide two continuous streams of high purity nitrogen and dry air from a single plug & play' unit. Models are available with and without an integral oil free compressor, are extremely quiet in operation and are fully approved for use by major instrumentation manufacturers. Innovative design and technology facilitate optimised operating time, attractive return on investment and proven analytical performance, eliminating the need for other modes of supply.

- Complete Plug and Play' system specifically designed for LC/MS
- Produces a continuous supply of LC/MS grade nitrogen 24 hours a day
- Integral oil free compressor, with noise reduction technology
- Eliminate inconvenient and potentially dangerous nitrogen cylinders
- Compact, reliable with minimal operator attention and maintenance
- Phthalate-free componentry

#### Specifications

Ambient Temperature Range: 5 - 40°C  
 Inlet Air Quality\*: Clean dry compressed air  
 ISO8573-1:2001 Class 2.-.1

Supply Voltage Range: 103 - 126V 60Hz  
 207 - 253V 50/60Hz

Port Connections  
 Outlet: 1/4" Compression Fitting  
 Inlet\*: 1/4" Compression Fitting

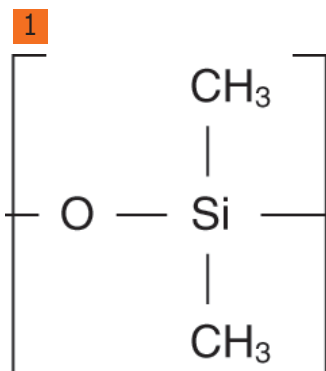
\*Non compressor models only



9.870 394

Type	Description	Flow rate Nitrogen L / min.	Purity %	Air Inlet L/min	Delivery Pressure bar g	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
LCMS20/3-0		20.00	> 99	85.0	7	510 x 559 x 705	103.0	1	9.870 393
LCMS20/3-1	with Compressor	20.00	> 99		7	510 x 826 x 705	143.0	1	9.870 394

Note: Add suffix E' for 207-253V 50/60Hz ie LCMS20/3-0-E  
 Add suffix W' for 103 -126V 60Hz ie LCMS20/3-0-W



### 1 OPTIMA® 1 high performance capillary columns for GC

#### 100% dimethylpolysiloxane

MACHEREY-NAGEL

nonpolar phase separation of components according to boiling points thick film columns  $\geq 3\mu\text{m}$  film are especially recommended for solvent analysis.

Similar phases: Permabond® SE-30, OV-1, DB-1, SE-30, HP-1, SPB-1, CP-Sil 5 CB, Rtx-1, 007-1, BP1, MDN-1, AT-1, ZB-1, OV-101.

For columns with 0.25 to 0.32mm ID and films  $< 3\mu\text{m}$  the max. temperature for isothermal operation is 340°C, the max. temperature for short isotherms in a temperature programme is 360°C.

For 0.53mm ID columns with films  $< 3\mu\text{m}$  the max. temperatures are 320 and 340°C, resp. for thick film columns with films  $\geq 3\mu\text{m}$  the max. temperatures are 300 and 320°C, resp.

Int. diam. mm	Ext. diam. mm	Film thickness $\mu\text{m}$	Length m	PK	Cat. No.
0.25	0.4	0.10	25	1	9.003 657
0.25	0.4	0.25	25	1	9.003 662
0.25	0.4	0.50	25	1	9.003 667
0.25	0.4	1.00	25	1	9.003 671
0.25	0.4	0.10	30	1	9.003 658
0.25	0.4	0.25	30	1	9.003 663
0.25	0.4	0.50	30	1	9.003 668
0.25	0.4	1.00	30	1	9.003 672
0.25	0.4	0.25	50	1	9.003 664
0.25	0.4	0.50	50	1	9.003 669
0.25	0.4	1.00	50	1	9.003 673
0.25	0.4	0.10	60	1	9.003 659
0.25	0.4	0.25	60	1	9.003 665
0.25	0.4	0.50	60	1	9.003 670
0.25	0.4	1.00	60	1	9.003 674
0.32	0.5	0.10	25	1	9.003 676
0.32	0.5	0.25	25	1	9.003 682
0.32	0.5	0.35	25	1	9.003 686
0.32	0.5	0.50	25	1	9.003 691
0.32	0.5	1.00	25	1	9.003 697
0.32	0.5	3.00	25	1	9.003 701
0.32	0.5	5.00	25	1	9.003 706
0.32	0.5	0.10	30	1	9.003 677
0.32	0.5	0.25	30	1	9.003 683
0.32	0.5	0.35	30	1	9.003 687
0.32	0.5	0.50	30	1	9.003 692
0.32	0.5	1.00	30	1	9.003 698
0.32	0.5	3.00	30	1	9.003 702
0.32	0.5	5.00	30	1	9.003 707
0.32	0.5	0.10	50	1	9.003 678
0.32	0.5	0.25	50	1	9.003 684
0.32	0.5	0.35	50	1	9.003 688
0.32	0.5	0.50	50	1	9.003 693
0.32	0.5	1.00	50	1	9.003 699
0.32	0.5	3.00	50	1	9.003 703
0.32	0.5	5.00	50	1	9.003 708
0.32	0.5	0.10	60	1	9.003 679
0.32	0.5	0.25	60	1	9.003 685
0.32	0.5	0.35	60	1	9.003 689
0.32	0.5	0.50	60	1	9.003 694
0.32	0.5	1.00	60	1	9.003 700
0.32	0.5	3.00	60	1	9.003 704
0.53	0.8	0.50	25	1	4.003 149
0.53	0.8	1.00	25	1	4.003 164
0.53	0.8	2.00	25	1	4.003 152
0.53	0.8	5.00	25	1	4.003 265
0.53	0.8	0.50	30	1	4.003 150
0.53	0.8	1.00	30	1	4.003 165
0.53	0.8	2.00	30	1	4.003 153
0.53	0.8	5.00	30	1	4.003 266
0.53	0.8	5.00	30	1	4.003 267

Custom-made columns to your specifications available on request.

Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules.

Column ends are melted or closed with septa, and thus protected from atmospheric oxygen. Additionally, we supply the corresponding test mixture with each column.

## 1 OPTIMA® 5 capillary columns for GC

5% phenyl - 95% dimethylpolysiloxane

MACHEREY-NAGEL

USP G27, G36 nonpolar standard phase with large range of application similar phases: Permabond® SE-52, SE-54, SE-52, DB-5, HP-5, SPB-5, CP-Sil 8, Rtx-5, 007-5, BP5, MDN-5, AT-5, ZB-5 for columns with 0.1 to 0.32mm ID and films <3µm the max. temperature for isothermal operation is 340°C, the max. temperature for short isotherms in a temperature programme is 360°C for 0.53mm ID columns with films < 3µm the max. temperatures are 320 and 340°C, resp. for thick film columns with films ≥ 3µm the max. temperatures are 300 and 320°C, resp.

Further lengths available on request.

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.10	0.4	0.10	10	1	4.003 235
0.25	0.4	0.10	25	1	9.003 709
0.25	0.4	0.25	25	1	9.003 715
0.25	0.4	0.35	25	1	9.003 719
0.25	0.4	0.50	25	1	9.003 723
0.25	0.4	1.00	25	1	9.003 727
0.25	0.4	0.10	30	1	9.003 710
0.25	0.4	0.25	30	1	9.003 716
0.25	0.4	0.35	30	1	9.003 720
0.25	0.4	0.50	30	1	9.003 724
0.25	0.4	1.00	30	1	9.003 728
0.32	0.5	0.10	25	1	9.003 733
0.32	0.5	0.25	25	1	9.003 738
0.32	0.5	0.35	25	1	9.003 742
0.32	0.5	0.50	25	1	9.003 746
0.32	0.5	1.00	25	1	9.003 751
0.32	0.5	3.00	25	1	9.003 755
0.32	0.5	5.00	25	1	9.003 760
0.32	0.5	0.10	30	1	9.003 734
0.32	0.5	0.25	30	1	9.003 739
0.32	0.5	0.35	30	1	9.003 743
0.32	0.5	0.50	30	1	9.003 747
0.32	0.5	1.00	30	1	9.003 752
0.32	0.5	3.00	30	1	9.003 756
0.32	0.5	5.00	30	1	9.003 761
0.53	0.8	0.50	25	1	4.003 155
0.53	0.8	1.00	25	1	4.003 168
0.53	0.8	2.00	25	1	4.003 158
0.53	0.8	5.00	25	1	4.003 261
0.53	0.8	0.50	30	1	4.003 156
0.53	0.8	1.00	30	1	4.003 169
0.53	0.8	2.00	30	1	4.003 159
0.53	0.8	5.00	30	1	4.003 262

Custom-made columns to your specifications available on request.

Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules. Column ends are melted or closed with septa, and thus protected from atmospheric oxygen.

Additionally, we supply the corresponding test mixture with each column.



## 2 OPTIMA® 5 MS capillary columns for GC

5% diphenyl - 95% dimethylpolysiloxane

MACHEREY-NAGEL

nonpolar phase with low bleeding, ideal for GC/MS and ECD applications and general analyses at trace level perfect inertness for basic compounds.

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, 007-5 MS, BPX5, MDN-5S, AT-5 MS, VF-5 MS.

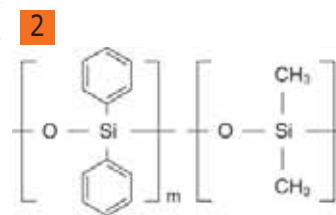
max. temperature for isothermal operation: 340°C, max. temperature for short isotherms in a temperature program: 360°C

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	0.25	30	1	7.080 092
0.25	0.4	0.50	30	1	4.003 099
0.25	0.4	1.00	30	1	4.003 101
0.32	0.5	0.25	30	1	6.700 690
0.32	0.5	0.50	30	1	4.003 093

Custom-made columns to your specifications available on request.

Each column is individually tested and supplied with test certificate and test chromatogram, but without fittings or ferrules. Column ends are melted or closed with septa, and thus protected from atmospheric oxygen.

Additionally, we supply the corresponding test mixture with each column.



Other GC-columns on request.

### Reagents and methods for derivatisation

#### Derivatisation reagents

MACHEREY-NAGEL

for improved volatility, better thermal stability or low limit of detection in gas chromatography prerequisite: quantitative, rapid and reproducible formation of only on derivative halogen atoms introduced by derivatisation (e.g. trifluoroacetates) allow specific detection (ECD) with the advantage of high sensitivity elution order and fragmentation patterns in MS can be influenced by a specific derivatisation reagents for **silylation - alkylation (methylation) - acylation** are available

These products contain harmful substances which must be specially labelled as hazardous. For detailed information please see the MSDS, which can be downloaded under [www.mn-net.com](http://www.mn-net.com).

#### Derivatisation method development kit

Which type of derivatisation is best suited for your sample (alkylation, silylation or acylation)? Test kit for determination of the optimum derivatisation.

MACHEREY-NAGEL

Content	PK	Cat. No.
2 x 1 ml each for TMSH, MSTFA, MBTFA	2	4.001 514

#### Acylation kit

Which is the proper reagent for acylation?  
Test kit for determination of the optimum acylation.

MACHEREY-NAGEL

Content	PK	Cat. No.
2 x 1 ml each for MBTFA, TFAA, MBHFBA	1	6.207 118

#### Alkylation kit

Which is the proper reagent for methylation?  
Test kit for determination of the optimum alkylation.

MACHEREY-NAGEL

Content	PK	Cat. No.
3x1 ml each for TMSH, DMF-DMA	3	4.001 513

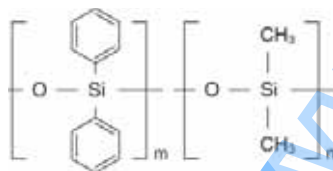
#### Silylation kit

Which is the proper reagent for silylation?  
Test kit for determination of the optimum silylation.

MACHEREY-NAGEL

Content	PK	Cat. No.
2 x 1 ml each for MSTFA, BSTFA, TSIM, MSHFBA	1	6.704 458

1



#### 1 Silylation reagents - MSTFA

N-methyl-N-trimethylsilyl-trifluoroacetamide

MACHEREY-NAGEL

m.w. 199.1, Bp 70°C (75mm Hg), density d<sub>20</sub><sup>4</sup> = 1.11

MSTFA: R' = CF<sub>3</sub>, R'' = CH<sub>3</sub>

the most volatile trimethylsilyl amide available

very strong TMS donor which does not cause any noticeable fouling of the FID burning chamber even after long-time measuring series

The already good solution characteristics can be improved by addition of submolar quantities of protic solvents (e.g. TFA for extremely polar compounds such as hydrochlorides) or pyridine (e.g. for carbohydrates).

**recommended application:** carboxylic acids, hydroxy and ketocarboxylic acids, amino acids, amines, alcohols, polyalcohols, sugars, mercaptans and similar compounds with active hydrogen atoms. Even amine hydrochlorides can be silylated directly.

advantages: complete reaction with high reaction rates, even without a catalyst (1 to 2% TMCS or TSIM)  
the by-product of the reaction (N-methyltrifluoroacetamide) features high volatility and short retention time.

Description	Capacity ml	PK	Cat. No.
MSTFA	1	20	7.055 892
MSTFA	10	1	6.704 091
MSTFA	10	5	6.085 475
MSTFA	50	6	6.227 450
MSTFA	100	6	4.001 493

Due to their purpose, derivatisation reagents are very reactive substances. For this reason they should be stored cool and protected from moisture.

The derivatisation reagents are supplied in vials with crimp caps for easy access with a syringe. Vials with pierced sealing disks have limited stability and should be used soon.

## Silylation reagents - BSTFA, SILYL-991

N,O-bis-trimethylsilyl-trifluoroacetamide MACHERY-NAGEL  
 m.w. 257.4, Bp 40°C (12mm Hg), density  $d_{20^{\circ}/4^{\circ}} = 0.961$   
 BSTFA: R = CF<sub>3</sub> powerful trimethylsilyl donor with approximately the same donor strength as the non-fluorinated analogue BSA  
 advantage of BSTFA over BSA: greater volatility of its reaction products (particularly useful for GC of some lower boiling TMS amino acids.

BSTFA is nonpolar (less polar than MSTFA), and can be mixed with acetonitrile for improved solubility. For silylating fatty acid amides, hindered hydroxyls and other compounds, which are difficult to silylate (like secondary alcohols and amines), we recommend BSTFA + 1% trimethylchlorosilane (TMCS), available under the designation SILYL-991.

Description	Capacity ml	PK	Cat. No.
BSTFA	1	20	4.001 486
BSTFA	10	1	6.803 320
BSTFA	10	5	4.001 487
SILYL-991 (BSTFA - TMCS (99:1))	1	20	4.001 511
SILYL-991 (BSTFA - TMCS (99:1))	50	1	4.001 510

Due to their purpose, derivatisation reagents are very reactive substances. For this reason they should be stored cool and protected from moisture.

The derivatisation reagents are supplied in vials with crimp caps for easy access with a syringe. Vials with pierced sealing disks have limited stability and should be used immediately.

## Acylation reagents for GC - Bisacylamides

Acylation with fluorinated acid amides is recommended for alcohols, primary and secondary amines as well as for thiols under mild, neutral conditions. MBTFA also forms very volatile derivatives with carbohydrates. MACHERY-NAGEL

by-products: corresponding neutral acylamides, which can be easily removed due to their high volatility; because of neutral conditions and favourable chromatographic properties often removal of the bisacylamide is not necessary. Thus sample preparation is much more convenient.

MBTFA /MBHFBA

N-methyl-bis(trifluoroacetamide) MBTFA  
 m.w. 223.08, Bp 123 - 124°C (760mm Hg), density  $d_{20^{\circ}/4^{\circ}} = 1.55$ ,  
 CF<sub>3</sub> - CO - N(CH<sub>3</sub>) - CO - CF<sub>3</sub>

Description	Capacity ml	PK	Cat. No.
MBTFA	1	20	7.401 143
MBTFA	10	1	7.510 796
MBTFA	10	5	6.228 605

Due to their purpose, derivatisation reagents are very reactive substances. For this reason they should be stored cool and protected from moisture.

The derivatisation reagents are supplied in vials with crimp caps for easy access with a syringe. Vials with pierced sealing disks have limited stability and should be used soon.

## Acylation reagents for GC - Anhydrides

Acylation with fluorinated acid anhydrides can be used for alcohols, phenols, carboxylic acids, amines, amino acids and steroids forming volatile, stable derivatives suited for FID as well as for ECD detection. MACHERY-NAGEL

by-products of acylation with anhydrides: corresponding acids  
 excess reagent and the acid formed have to be removed

Heptafluorobutyric acid anhydride (HFBA)  
 m.w. 410.06, Bp 106 - 107°C (760mm Hg),  
 C<sub>3</sub>F<sub>7</sub> - CO - O - CO - C<sub>3</sub>F<sub>7</sub>  
 density  $d_{20^{\circ}/4^{\circ}} = 1.665$

Description	Capacity ml	PK	Cat. No.
HFBA	1	20	4.001 480
HFBA	10	1	4.001 479
HFBA	10	5	4.001 481

## Alkylation reagents for GC - Trimethylsulphonium hydroxide

TMSH (0.2M in methanol) M.G. 94.06 MACHERY-NAGEL

Description	Capacity ml	PK	Cat. No.
TMSH	1	10	7.086 147
TMSH	1	20	7.083 308
TMSH	10	5	4.001 512





Providing Confidence  
in Your Analysis



SGE Analytical Science  
for your instrument and  
laboratory since 1960.

[www.sge.com](http://www.sge.com)

1

1 Syringes for Agilent GC autosampler



GC syringes for Agilent autosampler 7673, 7683 and 6850  
with fixed or removable needle  
two different needle diameter and tapered needles  
high reproducibility, low carry-over

SGE Analytical Science



Gauge (OD) mm	Needle Typ	Capacity µl	PK	Cat. No.
23-26s (0.63/0.47)	fixed	5	1	9.221 270
23-26s (0.63/0.47)	fixed	5	6	6.204 103
23-26s (0.63/0.47)	fixed	10	1	6.226 427
23-26s (0.63/0.47)	fixed	10	6	6.254 971
23-26s (0.63/0.47)	fixed	10 (Gas tight)	1	9.221 271
23-26s (0.63/0.47)	fixed	10 (Gas tight)	6	9.221 272
26 (0.47)	fixed	5	1	6.203 350
26 (0.47)	fixed	5	6	6.205 076
23 (0.63)	fixed	5	1	9.221 273
23 (0.63)	fixed	5	6	6.072 528
26 (0.47)	fixed	10	1	9.221 274
26 (0.47)	fixed	10	6	6.206 502
23 (0.63)	fixed	10	1	6.089 587
23 (0.63)	fixed	10	6	6.050 962
26 (0.47)	removable	0.5	1	6.228 788
23 (0.63)	removable	0.5	1	9.221 275
23 (0.63)	removable	1	1	9.221 276



### Inlet Liner and o-rings for Agilent GC

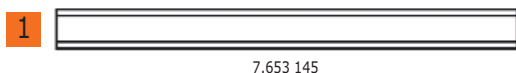
**(NEW!)**

Inlet Liner for Agilent 5890, 6850, 6890, 7890 und HP4890. SGE's inlet liners come as a complete, single packed unit.

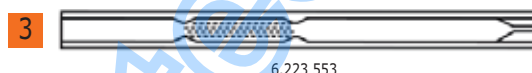
SGE Analytical Science

5 or 25 packs, individually packed  
Complete with instrument appropriate o-rings and sealing rings  
Each pack is supplied with quality test results

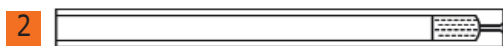
Description	Ext. diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
Split, Straight-through Liner	6.3	4.0	78.5	5	7.653 145 <b>1</b>
Split, with Quartz wool	6.3	4.0	78.5	5	9.003 576
Split / Splitless with Single Taper	6.3	4.0	78.5	5	9.003 579
Split / Splitless with Single Taper (Quartz Wool)	6.3	4.0	78.5	5	6.236 751 <b>2</b>
Split/Splitless Focus Liner	6.3	4.0	78.5	5	6.223 552
Split/Splitless Focus Liner	6.3	4.0	78.5	25	6.239 332
Split/Splitless Tapered Focus Liner	6.3	4.0	78.5	5	6.223 553 <b>3</b>
Split/Splitless Tapered Focus Liner	6.3	4.0	78.5	25	9.003 572
Split/Splitless FAST Focus Liner	6.3	2.3	78.5	5	6.223 554
Split/Splitless Tapered FAST Focus Liner	6.3	2.3	78.5	5	9.003 586
Split/Splitless Recessed Gooseneck (Quartz Wool)	6.3	4.0	78.5	5	9.003 588 <b>4</b>
ConnectTite Liner Bottom Hole	6.3	4.0	78.5	5	9.003 587
Viton o-ring, suitable for liners with OD 6,3mm	6.3	4.0	78.5	10	9.221 277



7.653 145



6.223 553



6.236 751



9.003 588

### Inlet Liner for Thermo GC

**(NEW!)**

Liners come individually packed complete with instrument appropriate o-rings and sealing rings.  
Each pack is supplied with quality test results.  
Further liners und pack sizes available on request.

SGE Analytical Science

Description	Ext. diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
Split FocusLiner™	8.0	5.0	105.0	5	6.265 466 <b>5</b>
Splitless FocusLiner™	8.0	5.0	105.0	5	6.265 467 <b>6</b>
Splitless with Single Taper	8.0	5.0	105.0	5	6.265 468 <b>7</b>
Splitless, Straight-through Liner	8.0	3.0	105.0	5	6.265 469
Split, Straight-through Liner	8.0	5.0	105.0	5	6.265 470 <b>8</b>
Trace 2000 PTV Liner	2.8	1.75	120.0	5	7.630 911



6.265 466



6.265 468



6.265 467



6.265 470

### Inlet Liner for Shimadzu GC

**(NEW!)**

Liners come individually packed complete with instrument appropriate o-rings and sealing rings.

SGE Analytical Science

Each pack is supplied with quality test results.  
Further liners und pack sizes available on request.

Description	Ext. diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
Split / Splitless FocusLiner™	5.0	3.4	95.0	5	6.205 958
Split / Splitless Tapered FocusLiner™	5.0	3.4	95.0	5	6.228 225 <b>11</b>
Split, Straight-through Liner	5.0	3.4	95.0	5	6.265 473 <b>9</b>
Split / Splitless with Single Taper	5.0	3.4	95.0	5	6.265 474 <b>10</b>
Split / Splitless with middle gooseneck	5.0	3.4	95.0	5	6.265 475



6.265 473



6.265 474



6.228 225

➔ Consumables from other GC manufacturers on request

**1**


### 1 Ferrules for Agilent GC

**NEW!**

High quality ferrules made of 100% Graphite or 15% Graphite/85% Vespel

SGE Analytical Science

**Type A:** 15% Graphite/85% Vespel, for injectors and detectors at atmospheric pressure (e.g. FID)

**Type B:** 15% Graphite/85% Vespel, for GC-MS interface connection

**Type C:** 100% Graphite, for injectors and detectors at atmospheric pressure (not for GC-MS)

Column ID mm	Ferrule ID mm	Type	PK	Cat. No.
0.1 - 0.25	0.4	A	10	6.223 558
0.32	0.5	A	10	9.221 278
0.53	0.8	A	10	9.221 279
0.1 - 0.25	0.4	B	10	6.088 109
0.32	0.5	B	10	6.059 976
0.53	0.8	B	10	6.059 977
0.1 - 0.32	0.5	C	10	7.652 355
0.45 - 0.53	0.8	C	10	9.221 280

**2**


### 2 Septa for Agilent GC

**NEW!**

All Septa are made with a high grade silicone material to minimize needle coring. These new materials meet or exceed industry standards, giving you reassurance in the quality of your work. All of these Septa are durable with excellent resealing properties and excellent solvent resistance.

SGE Analytical Science

GP = General Purpose Silicone Septa for non-demanding routine applications up to 200°C.

EC = High Temperature Silicone Septa, for significantly longer injection life, low bleed and low injection port adhesion.

MN = High Temperature Premium Silicone Septa for autosamplers, up to 400 injections per septum.

**Also available: Septa for instruments from Perkin-Elmer, Shimadzu, Thermo and Varian/Bruker.**

Diam. mm	Material	Temp. max. °C	PK	Cat. No.
5.0	GP	200	50	9.003 590
5.0	MN	400	50	9.003 591
9.5	GP	200	50	6.224 189
9.5	EC	400	25	9.003 592
9.5	HT	400	25	9.003 593
11.0	GP	200	50	6.085 419
11.0	EC	400	25	9.003 594
11.0	MN	400	50	6.255 348
11.0	HT	400	25	9.003 595
12.5	GP	200	48	6.087 242
12.5	HT	400	25	9.003 596
12.5	EC	400	25	9.003 597

**3**


### 3 Syringes for CTC autosampler

**NEW!**

Type A - syringes for CTC Analytics HTS, HTC and LC PAL (needle tip: LC)

SGE Analytical Science

Type B - syringes for CTC Analytics CombiPal and GC PAL with fixed or removable needle, two different needle diameters (needle tip: cone). High reproducibility, low carry-over

Gauge (OD) mm	Type	Needle length mm	Needle Typ	Capacity µl	PK	Cat. No.
22 (0.72)	A	51	fixed	25 (Gas tight)	1	9.221 286
22 (0.72)	A	51	fixed	100 (Gas tight)	1	9.221 287
22 (0.72)	A	51	removable	250 (Gas tight)	1	9.221 288
23 (0.63)	B	50	fixed	5	1	7.607 298
26 (0.47)	B	50	fixed	10 (Gas tight)	1	9.221 289
26 (0.47)	B	50	fixed	10 (Gas tight)	6	9.221 290
23 (0.63)	B	50	fixed	10	1	7.607 297
23 (0.63)	B	50	fixed	10	6	9.221 291

### 1 Syringes for Perkin-Elmer GC autosampler



GC syringes for all Perkin-Elmer autosampler e.g. Clarus. With fixed or removable needle. Two different needle diameter. All needles are 70mm long with a cone point style. High reproducibility, low carry-over.

SGE Analytical Science

1



Gauge (OD) mm	Needle Typ	Capacity µl	PK	Cat. No.
26 (0.47)	fixed	5	1	9.221 281
23 (0.63)	fixed	5	1	9.221 282
26 (0.47)	fixed	5 (Gas tight)	1	9.221 283
23 (0.63)	fixed	5 (Gas tight)	1	6.204 955

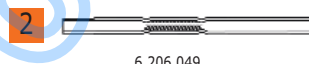
### Inlet Liner for Perkin-Elmer GC



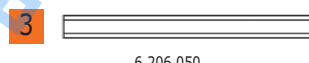
Inlet Liner for Perkin-Elmer Autosystem and Clarus 500, 600. SGE's inlet liners come as a complete, single packed unit. 5 or 25 packs, individually packed. Complete with instrument appropriate o-rings and sealing rings. Each pack supplied with quality test results.

SGE Analytical Science

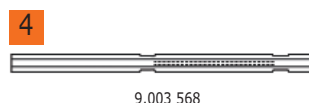
2



3



4



Description	Ext. diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
Split / Splitless Focus Liner	6.2	4.0	92.0	5	6.206 049
Split / Splitless Tapered Focus Liner	6.2	4.0	92.0	5	9.003 567
Split straight through liner	6.2	4.0	92.0	5	6.206 050
Split / Splitless Focus Liner for PSS Injector	4.0	2.0	86.2	5	9.003 568
PTV liner with 0.25 mm ID restriction	2.0	1.0	88.0	5	9.003 569
Liner SH17A 3.4mm ID FOC	5.0	3.4	95.0	5	6.205 958
Liner AG 4mm ID, GN QW	6.3	4.0	78.5	25	7.670 774

### 5 Ferrules for Perkin-Elmer GC



High quality ferrules made of 100% Graphite or 15%Graphite/85%Vespel  
 Type A - 15%Graphite/85%Vespel, for injectors and detectors at atmospheric pressure (e.g. ID)  
 Type C - 100%Graphite, for injectors and detectors at atmospheric pressure (not for GC-MS)

SGE Analytical Science

5



Column ID mm	Ferrule ID mm	Type	PK	Cat. No.
0.1 - 0.25	0.4	A	10	6.088 109
0.32	0.5	A	10	6.059 976
0.53	0.8	A	10	6.059 977
0.1 - 0.32	0.5	C	10	9.221 284
0.45 - 0.53	0.8	C	10	9.221 285

### 6 Three-layer septa for GC inlet

Low density silicone wad sandwiched between two high density silicone layers. Working temperature max. 200°C.

Hamilton

6



Diam. mm	PK	Cat. No.
6.35	12	9.221 801
8.00	12	9.221 802
9.00	12	9.221 803
9.50	12	9.221 804
10.00	12	9.221 805
12.70	12	9.221 806
11.00	12	9.221 807
13.00	12	9.221 809
16.00	12	9.221 808

➔ Consumables from other GC manufacturers on request

### Ready-to-use layers for TLC

#### Support materials for TLC ready-to-use layers

MACHEREY-NAGEL

**Glass plates:** glass, ~ 1.3mm thick, high requirements for weight, packaging and storage, ideal torsional strength, high temperature stability, susceptible to breakage, can not be cut with scissors, high resistance against solvents, mineral acids and conc. ammonia, suitability for aqueous detection reagents depends on the phase

**POLYGRAM®:** polyester, ~ 0.2mm thick, low requirements for weight, packaging and storage, low torsional strength, max. 185°C temperature stability, not susceptible to breakage, can be cut with scissors, high resistance against solvents, mineral acids and conc. ammonia, very suitable for aqueous detection reagents

**ALUGRAM®:** aluminium, ~ 0.15mm thick, low requirements for weight, packaging and storage, relatively high torsional strength, high temperature stability, not susceptible to breakage, can be cut with scissors, high resistance against solvents, low resistance against mineral acids and conc. ammonia, limited suitability for aqueous detection reagents

### ADAMANT unmodified standard silica layers for TLC

Silica 60, specific surface (BET) ~ 500m<sup>2</sup>/g, mean pore size 60Å, specific pore volume 0.75ml/g, particle size 5 to 17µm. Outstanding hardness and abrasion resistance due to an optimized binder system. Increased separation efficiency due to an optimized particle size distribution. High suitability for trace analyses resulting from a UV indicator with brilliance and a low-noise background of the layer.

MACHEREY-NAGEL

Available as glass plates with or without fluorescent indicator (UV254).

Type	Plate format	Gel thickness		PK	Cat. No.
		cm	mm		
ADAMANT UV254	2.5 x 7.5		0.25	100	4.005 060
ADAMANT	5 x 10		0.25	50	4.005 067
ADAMANT UV254	5 x 10		0.25	50	4.005 061
ADAMANT	5 x 10		0.25	200	4.005 068
ADAMANT UV254	5 x 10		0.25	200	4.005 062
ADAMANT UV254	5 x 20		0.25	100	4.005 063
ADAMANT	10 x 10		0.25	25	4.005 069
ADAMANT UV254	10 x 10		0.25	25	4.005 064
ADAMANT	10 x 20		0.25	50	6.266 605
ADAMANT UV254	10 x 20		0.25	50	4.005 065
ADAMANT	20 x 20		0.25	25	4.005 070
ADAMANT UV254	20 x 20		0.25	25	4.005 066

1



### 1 TLC plates, Silica gel 60 F 254

Merck

Material	Plate format	Gel thickness		PK	Cat. No.
		cm	mm		
Glass	20 x 20		0.25	25	9.130 050
Glass	10 x 20		0.25	50	9.130 051
Glass	5 x 20		0.25	100	9.130 052
Glass	5 x 20		0.25	25	9.130 053
Glass	5 x 10		0.25	200	9.130 054
Glass	5 x 10		0.25	25	9.130 055
Glass	2.5 x 7.5		0.25	100	9.130 056
Glass	2.5 x 7.5		0.25	500	9.130 057
Aluminium	20 x 20		0.25	25	9.130 058
Aluminium	5 x 10		0.25	50	9.130 059
Aluminium	5 x 7.5		0.25	20	9.130 060
Plastic	20 x 20		0.25	25	9.130 063

### TLC plates

 Silica gel 60 F<sub>254</sub>

Merck

Material	Plate format	Gel thickness		PK	Cat. No.
		cm	mm		
Glass backed	20 x 20		0.50	20	9.130 061
Glass backed	20 x 20		2.00	12	9.130 062

### SIL G unmodified standard silica layers for TLC, glass plates/ POLYGRAM®

glass plates, POLYGRAM®, ALUGRAM®

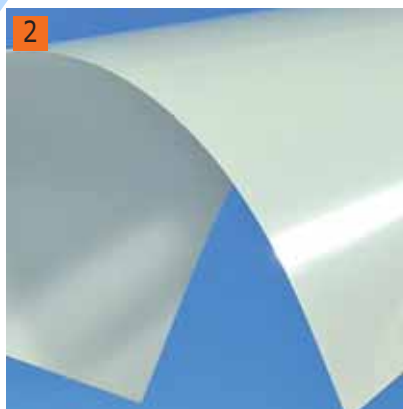
MACHEREY-NAGEL

silica 60, specific surface (BET) ~500m<sup>2</sup>/g, mean pore size 60 Å, specific pore volume 0.75 ml/g, particle size 5 to 17µm; standard grade; thickness of layer for analytical plates 0.25mm, for preparative plates 0.5 and 1mm; for 2mm preparative layers a slightly coarser material is used indicators: manganese activated zinc silicate with green fluorescence for short-wave UV (254nm); special inorganic fluorescent pigment with blue fluorescence for long-wave UV (366nm) binders: highly polymeric products, which are stable in almost all organic solvents and resistant towards aggressive visualisation reagents; binder system for Polygram® sheets is also completely stable in purely aqueous eluents available as glass plates, Polygram polyester sheets and Alugram aluminium sheets. Available as glass plates with or without fluorescent indicator (UV254).

Type	Plate format	Gel thickness		PK	Cat. No.
		cm	mm		
Glass plates SIL G-25 UV <sub>254</sub>	2.5 x 7.5		0.25	100	<b>4.004 850</b> 1
Glass plates SIL G-25	5 x 10		0.25	50	<b>6.230 729</b>
Glass plates SIL G-25	5 x 10		0.25	50	<b>4.004 848</b>
Glass plates SIL G-25	5 x 10		0.25	200	<b>4.004 847</b>
Glass plates SIL G-25	5 x 10		0.25	200	<b>4.004 849</b>
Glass plates SIL G-25	5 x 20		0.25	100	<b>4.004 846</b>
Glass plates SIL G-25 UV <sub>254</sub>	5 x 20		0.25	100	<b>6.232 660</b>
Glass plates SIL G-25 UV <sub>254</sub>	10 x 10		0.25	25	<b>9.003 474</b>
Glass plates SIL G-25	10 x 20		0.25	50	<b>6.227 917</b>
Glass plates SIL G-25 UV <sub>254</sub>	10 x 20		0.25	50	<b>6.230 274</b>
Glass plates SIL G-25	20 x 20		0.25	25	<b>9.003 491</b>
Glass plates SIL G-25 UV <sub>254</sub>	20 x 20		0.25	25	<b>9.003 492</b>
Glass plates SIL G-100	20 x 20		1.00	15	<b>4.004 853</b>
Glass plates SIL G-100 UV <sub>254</sub>	20 x 20		1.00	15	<b>7.300 555</b>
Glass plates SIL G-200	20 x 20		2.00	12	<b>6.224 417</b>
Glass plates SIL G-200 UV <sub>254</sub>	20 x 20		2.00	12	<b>4.004 854</b>
POLYGRAM® polyester sheets SIL G	2.5 x 7.5		0.20	200	<b>4.004 827</b> 2
POLYGRAM® polyester sheets SIL G UV <sub>254</sub>	2.5 x 7.5		0.20	200	<b>4.004 826</b>
POLYGRAM® polyester sheets SIL G	4 x 8		0.20	50	<b>4.004 825</b>
POLYGRAM® polyester sheets SIL G UV <sub>254</sub>	4 x 8		0.20	50	<b>9.003 493</b>
POLYGRAM® polyester sheets SIL G	5 x 20		0.20	50	<b>6.803 651</b>
POLYGRAM® polyester sheets SIL G UV <sub>254</sub>	5 x 20		0.20	50	<b>9.003 476</b>
POLYGRAM® polyester sheets SIL G	20 x 20		0.20	25	<b>6.202 190</b>
POLYGRAM® polyester sheets SIL G UV <sub>254</sub>	20 x 20		0.20	25	<b>9.003 494</b>
POLYGRAM® polyester sheets SIL G	40 x 20		0.20	25	<b>4.004 822</b>
POLYGRAM® polyester sheets SIL G UV <sub>254</sub>	40 x 20		0.20	1	<b>4.004 824</b>
ALUGRAM® aluminium sheets SIL G UV <sub>254</sub>	2.5 x 7.5		0.20	200	<b>4.005 043</b> 3
ALUGRAM® aluminium sheets SIL G UV <sub>254</sub>	4 x 8		0.20	50	<b>9.003 496</b>
ALUGRAM® aluminium sheets SIL G	5 x 7.5		0.20	20	<b>4.005 042</b>
ALUGRAM® aluminium sheets SIL G UV <sub>254</sub>	5 x 7.5		0.20	20	<b>6.227 948</b>
ALUGRAM® aluminium sheets SIL G	5 x 10		0.20	50	<b>6.802 883</b>
ALUGRAM® aluminium sheets SIL G UV <sub>254</sub>	5 x 10		0.20	50	<b>9.003 477</b>
ALUGRAM® aluminium sheets SIL G	5 x 20		0.20	50	<b>7.084 918</b>
ALUGRAM® aluminium sheets SIL G UV <sub>254</sub>	5 x 20		0.20	50	<b>9.003 478</b>
ALUGRAM® aluminium sheets SIL G	10 x 20		0.20	20	<b>4.005 052</b>
ALUGRAM® aluminium sheets SIL G UV <sub>254</sub>	10 x 20		0.20	20	<b>6.233 568</b>
ALUGRAM® aluminium sheets SIL G	20 x 20		0.20	25	<b>7.059 745</b>
ALUGRAM® aluminium sheets SIL G UV <sub>254</sub>	20 x 20		0.20	25	<b>9.003 497</b>
ALUGRAM® aluminium sheets SIL G UV <sub>254</sub>	20 x 20		0.20	25	<b>6.242 312</b>
ALUGRAM® aluminium sheets SIL G	20 x 20		0.20	25	<b>9.003 465</b>



4.004 850



4.004 827



4.005 043





### 1 ALUGRAM® Nano-SIL unmodified Nano-silica layers for HPTLC

ALUGRAM® MACHEREY-NAGEL  
 Nano silica 60, specific surface (BET) ~ 500m<sup>2</sup>/g, mean pore size 60Å, specific pore volume 0.75ml/g, particle size 2 to 10µm. Indicator: manganese activated zinc silicate with green fluorescence for short-wave UV (254nm).

Binder: highly polymeric product, which is stable in almost all organic solvents and resistant towards aggressive visualisation reagents. Narrow fractionation of the silica particles allows sharper separations, shorter developing times, shorter migration distances, smaller samples and an increased detection sensitivity compared to SIL G plates.

Available as glass plates with or without fluorescent indicator (UV254).

Type	Plate format	Gel thickness	PK	Cat. No.
	cm	mm		
ALUGRAM® NANO-SIL G	5 x 20	0.20	50	4.005 044
ALUGRAM® NANO-SIL G UV254	5 x 20	0.20	50	6.227 900
ALUGRAM® NANO-SIL G	20 x 20	0.20	25	6.227 899
ALUGRAM® NANO-SIL G UV254	20 x 20	0.20	25	4.005 045



7.400 375

### 2 RP-18 W/UV254 octadecyl-modified nano silica layers for HPTLC

ALUGRAM® MACHEREY-NAGEL

base material: Nano-K silica 60, specific surface (BET) ~500m<sup>2</sup>/g, mean pore size 60Å, specific pore volume 0.75ml/g, particle size 2 to 10 µm; for preparative plates (1 mm thickness of layer) standard silica 60, particle size 5 to 17 µm, pH stability 2 to 10 indicator: acid-resistant product with a pale blue fluorescence for short-wave UV (254nm); UV-absorbing substances appear as dark-blue to black spots on a light-blue background; partial octadecyl modification, wettable with water, carbon content 14%. 18-100 normal phase or reversed phase separation modes with eluents from anhydrous solvents to mixtures with high concentrations of water (see figure); the relative polarity of the eluent determines the polarity of the layer.

**Recommended application:** aminophenols, barbiturates, preservatives, nucleobases, polycyclic aromatic hydrocarbons, steroids, tetracyclines, plasticizers (phthalates).

Available as glass plates with or without fluorescent indicator (UV254).

**Glass plates available on request.**

Type	Plate format	Gel thickness	PK	Cat. No.
	cm	mm		
ALUGRAM® aluminium sheets RP-18 W UV <sub>254</sub>	4 x 8	0.15	50	7.400 375 2
ALUGRAM® aluminium sheets RP-18 W UV <sub>254</sub>	5 x 10	0.15	50	6.901 143
ALUGRAM® aluminium sheets RP-18 W UV <sub>254</sub>	5 x 20	0.15	50	4.005 046
ALUGRAM® aluminium sheets RP-18 W UV <sub>254</sub>	10 x 10	0.15	25	4.005 047
ALUGRAM® aluminium sheets RP-18 W UV <sub>254</sub>	20 x 20	0.15	25	6.704 046



### 3 Aluminium oxide layers for TLC

Standard, rigid TLC plates in a choice of media, backing materials, and with dimensions as outlined below.

MACHEREY-NAGEL

Type	Plate format	Path length	PK	Cat. No.
	cm	mm		
POLYGRAM aluminium oxide*	20 x 20	0.20	25	9.003 495
ALUGRAM aluminium oxide*	20 x 20	0.20	25	9.003 498

\*with 254 nm UV indicator



**1 Chromatography paper, reels**

Chromatography Paper 1 CHR

GE Healthcare

The standard chromatography paper. Good resolution for general analytical separations. Pure cellulose. Thickness 0.18mm. Capillary rise (water) 130mm/30 min.

Chromatography Paper 3MM CHR

Used in electrophoresis, in general chemistry and as blotting paper. Pure cellulose. Thickness 0.34mm. Capillary rise (water) 130mm/30 min.

Grade	Width mm	Length m	PK	Cat. No.
1Chr	10	100	1	9.950 322
1Chr	20	100	1	9.950 323
1Chr	30	100	1	9.950 324
1Chr	40	100	1	9.950 325
1Chr	50	100	1	9.950 326
1Chr	100	100	1	9.950 328
1Chr	150	100	1	9.950 329
3MMChr	20	100	1	9.950 327
3MMChr	100	100	1	9.950 330
3MMChr	150	100	1	9.950 331
3MMChr	190	100	1	9.950 332
3MMChr	230	100	1	9.950 333
3MMChr	270	100	1	9.950 334

**2 3 Chromatography paper/Ion exchange papers**

Whatman chromatography papers are the most widely used papers for chromatography worldwide. This acceptance and usage reflects the purity, high quality and consistency of Whatman papers. These qualities are relied upon by chromatographers and essential to successful reproducible chromatography. Whatman chromatography paper media are made from specially selected cotton cellulose. They are rigorously quality controlled for characteristics important to the chromatographer and to ensure uniformity within the grade.

GE Healthcare

**1 Chr** world standard chromatography paper. A smooth surface, 0.18 mm thick with a linear flow rate (water) of 130 mm/30 min. Good resolution for general analytical separations.

**3MM Chr** widely used as a blotting paper, 3MM Chr is used in both electrophoresis and for general chemistry. A medium thickness paper (0.34 mm) used extensively for general chromatography and electrophoresis. Flow rate is 130 mm/30 min.

**3 Chr** medium thickness paper (0.36 mm) with a flow rate of 130 mm/30 min. For general applications with medium/heavy solute loadings. Frequently used for separation of inorganic compounds and for electrophoresis.

**17 Chr** thick (0.92 mm) and highly absorbent paper with a very high flow rate of 190 mm/30 min. Suitable for the heaviest loadings and ideal for preparative paper chromatography and electrophoresis.

**Ion exchange paper**

**SG81:** A unique paper (0.27 mm thick) combining cellulose and large pore silica gel. Suitable for separations in which both partition and adsorption are important, including the separation of phospholipids, steroids, phenols and dyes. Flow rate is 110 mm/30 min.

Grade	Dimensions mm	PK	Cat. No.
1Chr	100 x 300	100	9.950 308
1Chr	200 x 200	100	9.950 309
1Chr	250 x 250	100	9.950 310
1Chr	460 x 570	100	9.950 311
3MMChr	200 x 200	100	9.950 312
3MMChr	315 x 355	100	9.950 313
3Chr	460 x 570	100	9.950 314
3MMChr	460 x 570	100	9.950 371
3MMChr	580 x 680	100	9.950 315
4Chr	460 x 570	100	9.950 316
17Chr	460 x 570	25	9.950 317
SG81	460 x 570	25	9.950 319

**Chromatography strips**

Divided into 12 bands, each of 15mm wide, for parallel separation of 12 samples.

GE Healthcare

Grade	Width mm	Length mm	PK	Cat. No.
1Chr CRL	110	213	100	9.950 321



### 1 Standard separating chamber with knob lid/ ground cover plate NEW!

With absolutely flat chamber floor, ground flange rim and lid for all TLC plates up to 200mm x 200mm.

Other separating chambers available on request.

Type	PK	Cat. No.
Separating chamber with knob lid	1	9.020 160
Separating chamber with glass lid	1	9.020 173
Knob lid for 9.020 160	1	9.020 163
Glass lid for 9.020 173	1	9.020 177
Filter paper for chamber saturation	25	9.020 179



### 2 Simultaneous developing chamber and DC accessories

MACHEREY-NAGEL

Type	PK	Cat. No.
DC simultaneous chamber for up to 5 plates, 20cm x 20cm	1	9.003 500
Laboratory atomiser, glass with rubber bulb	1	4.004 909
Glass capillary 1µl	150	7.056 849
Outlining templates	2	4.004 903
Chromatography Paper MN 260, 7.5cm x 17cm (for saturating)	100	4.004 907



### 3 Nano separating chambers, with knob/ stainless lid

The Nano separating chambers with 100mm x 100mm plate format have all the advantages of standard separating chambers.

Type	PK	Cat. No.
Nano separating chamber 100mm x 100mm, with knob lid	1	9.020 210
Nano separating chamber 100mm x 100mm, with stainless steel lid	1	9.020 212
Nano knob lid, 100mm x 100mm	1	9.020 211
Nano stainless steel lid, 100mm x 100mm	1	9.020 213
Nano filter paper for vapour conditioning the chamber, 210mm x 110mm, 25 sheets	25	9.020 214



### 4 H separating chamber

The H separating chambers make optimum use of HPTLC gel layer advantages. Small particle size 5µm, stringently controlled pore size and distribution, and more theoretical bases. Excellent value for money and can be supplied for time and cost saving in 50mm x 50mm plate format or traditional 100mm x 100mm format. Optimum separations are achieved even on the shortest runs.

biostep

Type	Width mm	Length mm	PK	Cat. No.
H separation chamber	50	50	1	9.023 150
H separation chamber	100	100	1	9.023 160
Frit rods		50	5	9.023 955
Cover plate	50	50	1	9.023 956
Cover plate	100	100	1	9.023 957



### 5 Chromatography sprayer SG e1

Spraying with powerful and quiet pump. The finest spray is produced even when the battery power is low. Liquids, up to the viscosity of light oil, can be finely sprayed at the touch of a button. Particle diameter 5µm to 10µm with a throughput of 20ml/min. based on water. The reservoir bottle for the spray reagent is made of borosilicate glass. The bottle is screwed into the high-grade PTFE nozzle and can be changed in seconds. With quick-charging dock as a storage base. Overload protection enables continuous storage of the sprayer in the charging station. Supplied with battery, battery charger, bottle and nozzle.

Type	PK	Cat. No.
SG e1	1	9.539 045
Reagent reservoir, 50 ml	10	9.539 046

### 1 Special atomiser, with rubber blowball

With rubber blowball for nebulising reagents. Can be connected to other compressed air supplies.

Type	PK	Cat. No.
Special atomiser	1	9.024 000



### 2 Test tube atomiser, glass

Glass atomiser for nebulising small amounts of reagents. Atomiser can be inserted in a 12ml test tube with a ground joint and held in position with a spring clip.

Type	PK	Cat. No.
Test tube atomiser	1	9.023 990



### 3 UV analysis lamp HP-UVIS®

For UV analysis without a darkroom. Inclusive UV shield. High-pressure mercury lamp emits very intense radiation at 366nm for fluorescence evaluation. Specially selected 254nm filters enable optimal contrast. Minimal footprint in spite of simultaneous observation points for two 200mm x 200mm plates. Inclined plate angle gives comfortable viewing. Dimensions (WxDxH) 325mm x 290mm x 480mm. Weight: 11.5kg. Supply requirements 230V.

Type	PK	Cat. No.
HP-UVIS®	1	9.539 360



### 4 UV irradiation system BIO-LINK, BLX 254

- Compact and powerful, ideal for a broad range of applications
- Precise measurement and control technology, non-ageing UV sensors
- Choice for irradiation parameter energy or time
- Easy operation: Programme memory, storage of the last parameters, programme resumes after opening of the door, auto-restart after power failure
- Secure and stable construction, very easy to use
- Easy exchange of the UV tubes for wavelength change

Vilber Lourmat

Dimensions (WxDxH)

Housing: 350 x 360 x 305mm  
Interior: 260 x 330 x 145mm

Type	Description	Tubes W	Wave- length nm	PK	Cat. No.
BLX-254	UV crosslinker	5 x 8	254	1	9.971 923

Other models available on request.



### 5 TLC Viewing cabinets, CN-6/ CN-15

Model CN-6:

- for one or two UV hand lamps model BVL-6; choice of combined wavelengths 254nm, 312nm and 365nm
- cabinet dimensions (WxDxH): 300mm x 280mm x 240mm

Vilber Lourmat

Model CN-15:

- integral high intensity UV lamps, extra large capacity; easy access also for large samples; white-light bulb for normal observation
- removable bottom panel for use with an BETXF Professional Line transilluminator
- cabinet dimensions (W x D x H): 505mm x 415mm x 280mm

Type	Description	Tubes W	Wave- length nm	PK	Cat. No.
CN-6	without UV handlamps	-	-	1	9.971 926
CN-15.LC*	with integrated UV tubes and white-light source	4 x 15	365 / 254	1	9.971 927

\* Other models available on request.





### 1 Universal application and evaluation template

Plexiglass. Simplifies application, marking and evaluation of thin layer chromatograms. Size 200mm x 200mm.

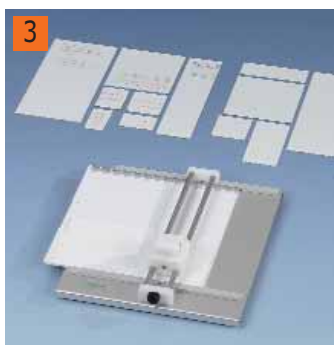
Type	PK	Cat. No.
Universal application and evaluation template	1	9.020 131



### 2 Outlining templates

With limit stops for precise positioning of the plate on the template. Provide precise pipette guidance due to triangular apertures in a 5mm spaced grid, providing 9, 19 or 39 outlining points, depending on the size of the template. A non-slip coating means that the outlining template does not slide on the bench.

Width mm	Length mm	PK	Cat. No.
100	100	1	9.020 134
50	50	1	9.020 135
200	100	1	9.020 136
200	200	1	9.020 137



### 3 TLC plate cutter

For scoring and cutting glass backed TLC plates. For cost-effectiveness in plate use, or in order to give individual plates different derivatives after separation. Supplied with cutting ring and template.

Type	PK	Cat. No.
TLC plate cutter	1	9.539 041



### 4 Laboratory dryer HT0139

Power: approx. 2100 W. 2 speed settings, 3 temperature settings with cold air-stream button. soft-touch housing. Air-inlet grille detachable for cleaning. cable retracts at the touch of a button.

Type	PK	Cat. No.
HT0139	1	9.106 788

