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

LLG - Vials and autosamplers: compatibility chart

Agilent

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

Agilent GC Products

	Crimp Neck ND 8	Agilent Art.-No.	Screw Neck ND9	Agilent Art.-No.	Crimp Neck ND11	Agilent Art.-No.
Vials	4.001 554	5180-0841	9.003 448	5182-0714	6.291 635	5181-3375
			4.662 800	5182-0715	6.290 019	5182-0543
			4.662 801	5182-0716	6.291 636	5181-3376
			4.008 249	5183-2030	4.008 255	9301-1388
			6.266 869			
			6.260 742			
			6.260 743			
Micro-Inserts			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
Seals	9.003 444	5180-0842	4.008 228	5182-0717	6.291 637	5181-1210
			7.615 161	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	9.003 441	5181-1210

Agilent HPLC Products

	Screw Neck ND9	Agilent Art.-No.	Crimp Neck ND11	Agilent Art.-No.	Snap Ring ND11	Agilent Art.-No.
Vials	9.003 448	5182-0714	6.291 635	5181-3375	6.073 833	5182-0544
	4.662 800	5182-0715	6.290 019	5182-0543	6.270 176	5182-0546
	4.662 801	5182-0716	6.291 636	5181-3376	6.270 177	5182-0545
	6.266 869					
	6.260 742					
	6.260 743					
	4.008 249	5183-2030	4.008 255	9301-1388	4.008 255	5188-6593
Micro-Inserts	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
Seals	4.008 228	5182-0717	6.291 637	5181-1210	4.008 257	5182-3458
	7.615 161	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	9.003 441	5181-1210		
	4.008 215	5185-5824	4.001 555			
	4.001 521	5183-2076				

Agilent Headspace Products

	Headspace Screw ND 18 (Combi Pal + G 1888A)	Agilent Art.-No.	Headspace Crimp Neck ND 20	Agilent Art.-No.
Vials	9.003 466	5188-5392	7.050 285	5182-0838
	6.290 106	5188-6538	9.003 452	5182-0837
	4.008 270	5188-2753	7.401 840	5183-4474
	4.678 396	5188-6537		
	7.401 840	5183-4474		
Seals	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

C T C Analytics

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

CTC Analytics GC Products

	Crimp Neck ND 8	C T C Art.-No.	Screw Neck ND9	C T C Art.-No.	Crimp Neck ND11	C T C Art.-No.
Vials	4.001 554		9.003 448		6.291 635	
	6.235 606		4.662 800		6.290 019	
	4.001 515		4.662 801		6.291 636	
	6.902 044		4.008 249		4.008 255	
	4.008 202		6.266 869			
	4.008 203		6.260 742			
			6.260 743			
Micro-Inserts			7.401 744		7.401 744	
			6.093 247		6.093 247	
			4.008 196		4.008 196	
Seals	9.003 444		4.008 228		4.001 564	GC PAL
	4.008 198		7.615 161		9.003 446	
			4.001 521		7.050 759	
			4.008 218			
			4.008 215			

CTC Analytics HPLC Products

	Crimp Neck ND 8	C T C Art.-No.	Screw Neck ND9	C T C Art.-No.	Crimp Neck ND11	C T C Art.-No.	Snap Ring ND11	C T C Art.-No.
Vials	4.001 554		9.003 448		6.291 635		6.073 833	
	6.235 606		4.662 800		6.290 019		6.270 176	
	4.001 515		4.662 801		6.291 636		6.270 177	
	6.902 044		4.008 249		4.008 255		4.008 255	
	4.008 202		6.266 869					
	4.008 203		6.260 742					
			6.260 743					
Micro-Inserts			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	
Seals	9.003 444		4.008 228		6.291 637		4.008 258	
	4.008 198		7.615 161		9.003 446		4.008 259	
			4.001 521		7.050 759			
			4,008 218					
			4.008 215					

CTC Analytics Headspace Products

	Headspace Screw Neck ND 18 (Combi Pal)	C T C Art.-No.	Headspace Crimp Neck ND 20 (Combi Pal)	C T C Art.-No.
Vials	9.003 466		7.850 009	
	6.290 106		9.003 453	
	4.008 270			
	4.678 396			
Seals	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.

Dionex HPLC Products

	Crimp Neck ND 8	Dionex Art.-No.	Screw Neck ND8	Dionex Art.-No.	Screw Neck ND9	Dionex Art.-No.	Crimp Neck ND11	Dionex Art.-No.	Snap Ring ND11	Dionex Art.-No.
Vials	4.008 206		9.003 481		9.003 448		6.291 635		6.073 833	
	6.235 606		7.613 087		4.662 800		6.290 019		6.270 176	
	4.001 554		9.003 480		4.662 801		6.291 636		6.270 177	
			6.290 228		4.008 249		4.008 255		4.008 255	
					6.266 869					
					6.260 742					
					6.260 743					
Micro-Inserts			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	
Seals	4.008 200		4.008 209		4.008 228		6.291 637		4.008 257	
	9.003 444		9.003 484		7.615 161		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		6.291 635	N9301385
	9.003 427	N9301069	4.662 800	N9306201	7.615 715		6.290 019	N9301385
			4.008 247	N9306220	6.280 951		6.291 636	N9302680
			4.662 801	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	7.615 161	N9306202	4.008 235	N9306205	6.291 637	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		6.291 635	N9301385	6.073 833	N9303418
			4.662 800	N9306201	7.615 715		6.290 019	N9301385	6.270 176	
			4.008 247	N9306220	6.280 951		6.291 636	N9302680	6.270 177	
			4.662 801	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	7.615 161	N9306202	4.008 235	N9306205	6.291 637	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
	6.290 106		9.003 453	N6356471	7.060 463	N9306079
	4.008 270	N9306075			4.008 281	N9303349
	4.678 396					
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		6.291 635	980-01705	9.003 482	
	4.001 515		4.008 247				6.290 019		7.058 142	
	6.902 044		4.008 249				6.291 636			
	4.008 202		6.266 869				4.008 255			
	4.008 203		6.260 742							
			6.260 743							
Micro-Inserts			7.401 744	980-04987	7.401 744	980-04987	7.401 744	980-04987	7.055 486	
			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		7.615 161		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		6.291 635	980-01705	6.073 833	
			4.008 247				4.001 565			
			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		7.615 161		4.008 234		6.291 637	0980-01706	4.008 256	
	4.008 198		4.008 222		4.008 235		9.003 446		6.292 212	
	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	
	4.008 270	961-00915	9.003.453	980-00111	9.003 453	980-00111
Seals	4.008 268	961-00914	7.850 010	961-01256	9.003 460	
	6.241 111	980-01708	6.234 541	980-03372	9.003 434	
			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.
Vials	9.003 427	60180-707	9.003 481	60180-508	9.003 448	60180-723	6.291 635	60180-701
	4.001 554		7.613 087		4.662 800	60180-509	6.290 019	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	6.290 228		4.662 801	60180-561	6.291 636	
	4.001 515				6.266 869			
	6.902 044				6.260 742			
	4.008 202				6.260 743			
	4.008 203							
Micro-Inserts			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
Seals	9.003 443		4.008 209		4.008 228	60180-728	4.001 564	GC PAL
	4.008 200		9.003 484	60180-719	7.615 161	60180-729	9.003 441	
	9.003 444	60180-525	4.008 207		4.008 218		7.060 469	
	4.008 198				4.008 214		6.291 637	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.
Vials	4.001 554		9.003 481	60180-508	9.003 448	60180-723	6.291 635		6.073 833	60180-740
			7.613 087		4.662 800	60180-509	6.290 019	60180-502	6.270 176	
	4.008 206	60180-505	9.003 480	60180-560	4.008 247	60180-724	7.089 998		6.270 177	60180-711
	4.001 515		6.290 228		4.662 801	60180-561	6.291 636			
	6.902 044				6.266 869					
	4.008 202				6.260 742					
	4.008 203				6.260 743					
Micro-Inserts			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
Seals	9.003 443	60180-708	4.008 209		4.008 228	60180-728	9.003 441		4.008 256	
	4.008 200		9.003 484	60180-719	7.615 161	60180-729	7.060 469		6.242 212	
	9.003 444	60180-525	4.008 207		4.008 218		6.291 637	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.
Vials	9.003 466		7.850 009	60180-740	7.850 009	60180-504
	6.290 106		9.003.453	60180-506	9.003 453	60180-506
	4.008 270					
	4.678 396					
Seals	4.008 268		7.850 010		9.003 434	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	6.291 635	548-0003	6.073 833	548-0011	9.003 482	548-0051
	4.001 554	548-0080	7.613 087	548-0420	4.662 800	548-0029	6.290 019	548-0004	6.270 176	548-0422	6.267 117	548-0509
			9.003 480	548-0448	4.662 801	548-0030	6.291 636	548-0005	6.270 177	548-0012	9.003 549	548-0052
			6.290 228	548-0019	4.008 249	548-0081	4.008 255	548-1442	4.008 255	548-1442	9.003 549	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		
			4.001 556	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	6.291 637	548-3272	4.008 258	548-0432	7.510 053	548-0054
	4.008 198	548-0038	9.003 484	548-0024	7.615 161	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
	4.662 800	186000273	7.615 715		6.270 176	WAT094219	9.003 549	186001135	4.008 205	WAT025053C
	4.662 801	186000848	6.280 951		6.270 177	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				
	4.008 196		4.008 196		4.008 196					
Seals	4.008 214	186000274	6.291 637	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.

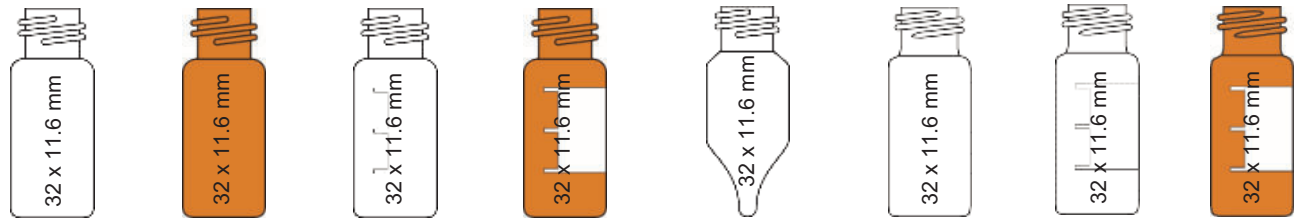
LLG - Flasks types

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	6.290 288	4.001 563	6.242 103	7.615 715	6.280 951

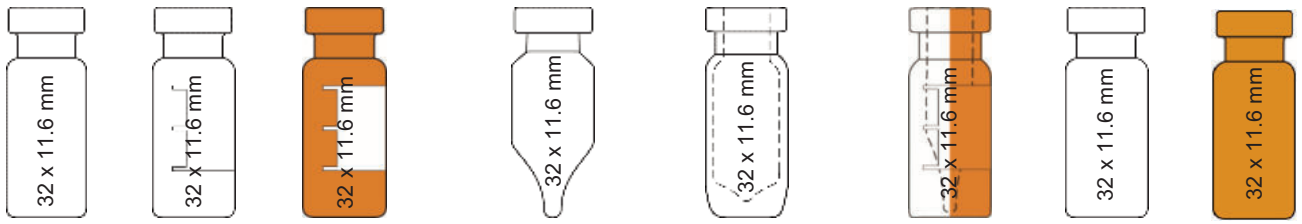
Short Thread ND9

4.008 262	9.003 448	4.662 800	4.662 801	4.008 247	4.008 249	4.008 250 4.008 252	6.266 869	6.260 742	6.260 743

Crimp / Snap Neck ND11

small opening

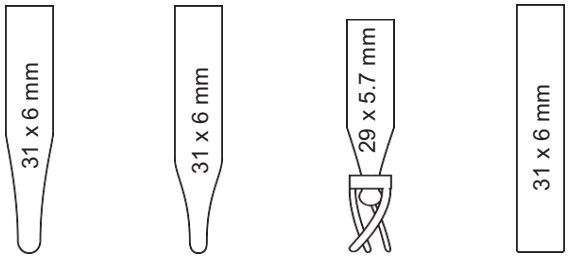
small opening



6.291 635	6.290 019	6.291 636	4.001 516	4.001 565	4.008 251 4.008 255	7.085 511	7.089 998

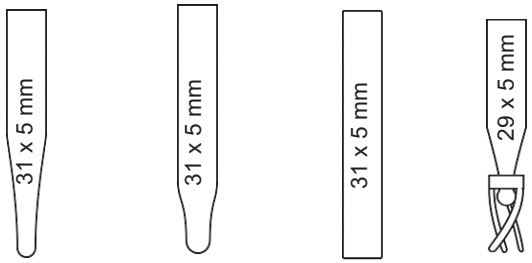
LLG - Flasks types

Micro-Inserts for wide opening



7.401 744	4.001 547	6.093 247	4.008 196

Micro-Inserts for small opening

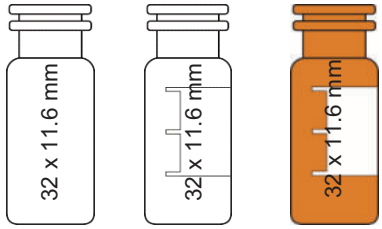


7.401 066	9.003 435	4.008 194	4.001 556

Screw Neck ND13

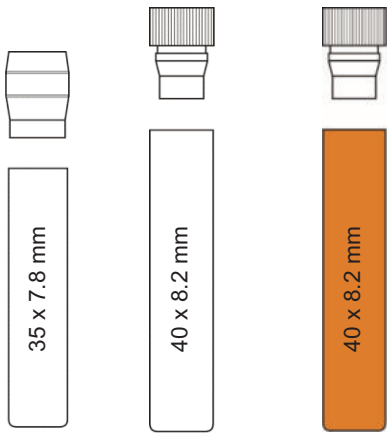
9.003 482	7.058 142	6.267 117	9.003 549	7.055 486

Snap Ring ND11



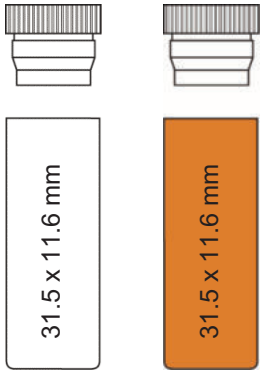
6.073 833	6.270 176	6.270 177

Shell Vials, 1 ml (Insert)



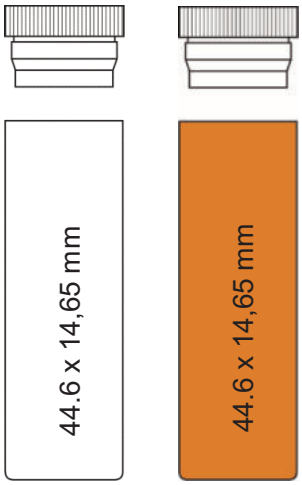
7.612 017	7.300 174	4.008 205

Shell Vials, 2 ml



4.008 248	6.226 501

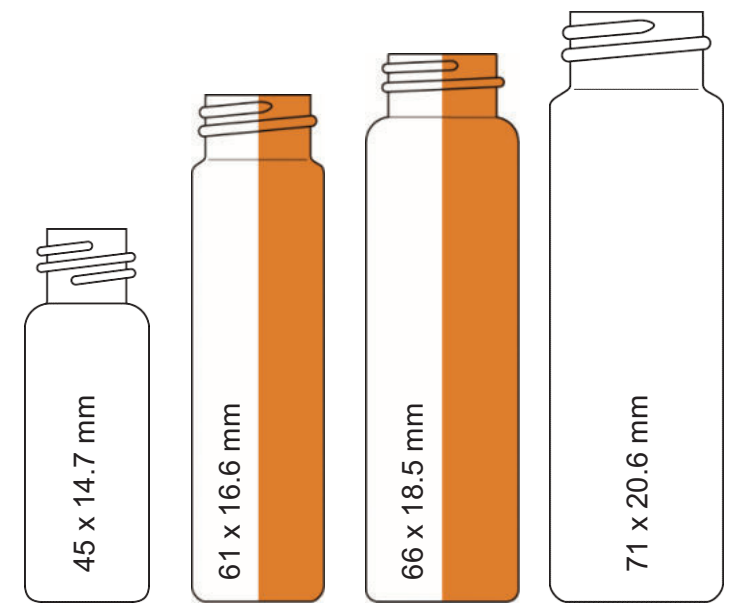
Shell Vials, 4 ml (Insert)



6.280 950	6.227 544

LLG - Flasks types

Storage Vials ND13, ND 15, ND18



9.003 482	6.280 953	6.280 952	6.280 954

Headspace ND 18

9.003 466 6.227 874	4.008 270 4.678 396

Snap Cap Vials

7.051 404	6.803 717	4.008 282	7.090 616

LLG - Flasks types

Headspace ND 20

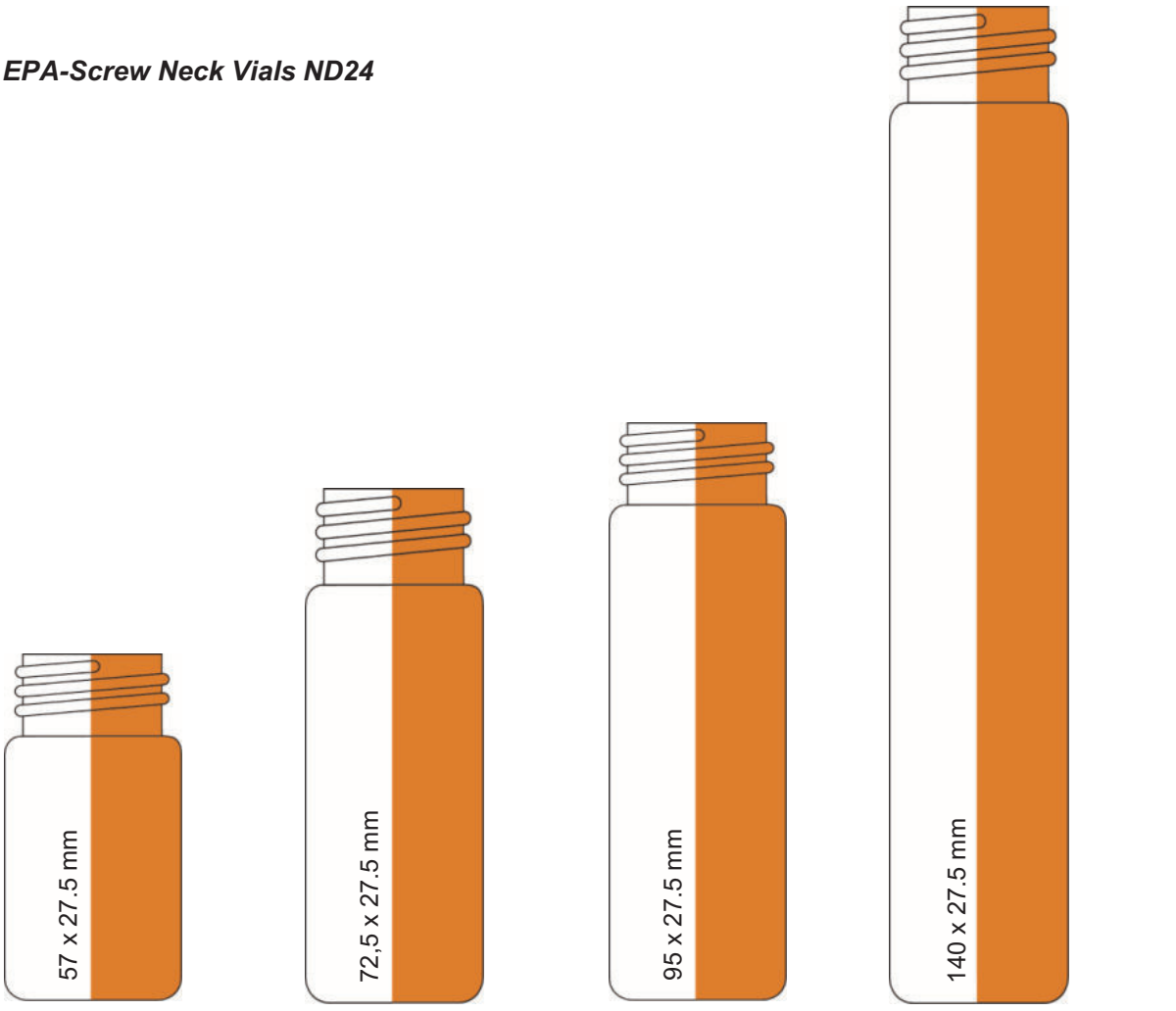
7.052 186	9.003 425	7.060 457	9.003 426	7.080 947	7.850 009 6.227 875	7.050 285

Headspace ND 20

7.080 450	7.401 840	9.003 452	9.003 453 6.231 485	7.060 463	4.008 281

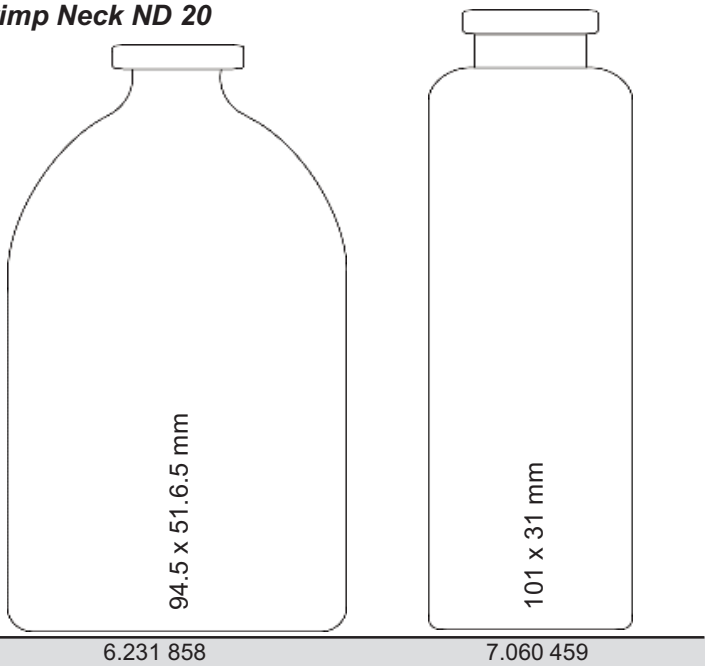
LLG - Flasks types

EPA-Screw Neck Vials ND24



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

Crimp Neck ND 20



6.231 858	7.060 459

LLG - Cap types

Aluminum Crimp Caps, centre hole

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

Special Aluminum Crimp Caps

						
Size	**11 mm**	**13 mm**	**13 mm**	**20 mm**	**20 mm**	**20 mm**
Type of Cap Material Lacqer Special features	Centre hole Cap Aluminum cear with roll grove	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

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

PE-Caps for Crimp Necks

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

				
Size	**8 mm**	**9 mm**	**10 mm**	**13 mm**
Approp. Vial Thread Cap Design Size centre hole Material, colour	Screw Neck Vials ND8 8-425 thread Closed or open top 5.5 mm centre hole PP, black or white	Short Thread Vials ND9 short thread, Closed or open top 6 mm centre hole PP, black, transparent, blue, red, yellow, green	Screw Neck Vials ND10 10-425 thread, Closed or open top 7 mm centre hole PP, black	Screw Neck Vials ND12 13-425 thread, Closed or open top 8.5 mm centre hole PP, black, white

				
Size	**15 mm**	**18 mm**	**20 mm**	**24 mm**
Approp. Vial Thread Cap Design Size centre hole Material, colour	Screw Neck Vials ND15 15-425 thread, Closed or open top, 9 mm centre hole PP, black, white	Screw Neck Vials ND18 18-400 thread, Closed or open top 12 mm 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 12.5 mm centre hole PP, white

PE-Plugs for Shell Vials

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

Snap Ring Caps

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

Snap Caps

			
Size	**18 mm**	**22 mm**	**28 mm**
Approp. Vial Cap Design Size Cap Material Colour	Snap Cap Vials ND18 closed top 19.8 x 5.2 mm PE transparent	Snap Cap Vials ND22 closed top 23.5 x 5.5 mm PE transparent	Snap Cap Vials ND28 closed top 29.7 x 5.6 mm 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	ml	0.2	0.3	0.6	0.6	1.2	1.2
o.d. x Height	mm	5.5 x 31.5	5.5 x 31.5	7 x 40	7 x 40	8.2 x 40	8.2 x 40
Colour		clear	clear	clear	amber	clear	amber
Form		conical	round bottom	conical	conical	flat bottom	flat bottom
PK		100	100	100	100	100	100
Cat. No.		**6.235 606**	**4.001 554**	**4.001 515**	**6.902 044**	**4.008 206**	**6.266 864**

LLG-Aluminium Crimp Caps ND8, ready assembled





	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	Aluminium, silver, center hole	Natural rubber, red-orange / TEF transparent	60° shore A	1.0	100	**9.003 443**
	Aluminium, silver, center hole	Red Rubber / PTFE beige	45° shore A	1.0	100	**4.008 200**
	Aluminium, silver, center hole	Silicone white / PTFE red	45° shore A	1.3	100	**9.003 444**
	Aluminium, silver, center hole	PTFE red / Silicone white, slit	45° shore A	1.3	100	**6.266 865**
	Aluminium, silver, center hole	PTFE red / Silicone white / PTFE red	45° shore A	1.0	100	**4.008 198**

LLG-Screw Neck Vials ND8, small opening




Capacity	ml	1.5	1.5	1.5	1.1
o.d. x Height	mm	11,6 x 32	11,6 x 32	11,6 x 32	11,6 x 32
Colour		clear	amber	amber, labeling field	clear
Form		flat bottom	flat bottom	flat bottom	conical
PK		100	100	100	100
Cat. No.		**9.003 481**	**9.003 480**	**6.290 228**	**4.001 563**

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




Capacity	ml	0.1	0.1	0.1	0.2
o.d. x Height	mm	5 x 31	5 x 31	5 x 29	5 x 31
Colour		clear	clear	clear	clear
Form		conical, 15mm tip	conical, 9mm tip	with plastic spring	flat bottom
PK		100	100	100	100
Cat. No.		**7.401 066**	**9.003 435**	**4.001 556**	**4.008 194**

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	1.3	100	**6.266 866**
		black, closed	Natural rubber red-orange / TEF transparent	60° shore A	1.3	100	**6.266 867**
		black, centre hole	Red Rubber / PTFE beige	45° shore A	1.0	100	**4.008 209**
		black, closed	Red Rubber / PTFE beige	45° shore A	1.0	100	**4.008 210**
		black, centre hole	Silicone white / PTFE red	45° shore A	1.3	100	**9.003 484**
		black, centre hole	Silicone white / PTFE red, slit	45° shore A	1.3	100	**6.232 178**
		black, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.0	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

1 LLG-2in1 KITs with Screw Neck Vials ND8 (small opening)

2in1 KITs contain 100 vials (1.5 ml) and 100 closures in an orange 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.

Type	Description	Capacity ml	Cover type	PK	Cat. No.
2in1 Kit	clear	1.5	Screw Cap, black, hole, Silicon white / PTFE red	100	**6.238 965**
2in1 Kit	amber	1.5	Screw Cap, black, hole, Silicon white / PTFE red	100	**9.003 557**
2in1 Kit	amber, labelling field	1.5	Screw Cap, black, hole, Silicon white / PTFE red	100	**9.003 558**
2in1 Kit	clear, labelling field	1.5	Screw Cap, black, hole, Silicon white / PTFE red	100	**9.003 559**
3in1 Kit	clear	1.5	Screw Cap, black, hole, Silicon white /PTFE blue, slitted (Septa unassembled)	100	**6.223 506**

LLG-Short Thread Vials ND9, wide opening

						
Capacity	ml	1.5	1.5	1.5	1.5	1.5
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	clear, labelling field	amber	amber, labelling field	transparent, with filling lines, PE
Form		flat bottom	flat bottom	flat bottom	flat bottom	concave bottom
PK		100	100	100	100	100
Cat. No.		**9.003 448**	**4.662 800**	**4.008 247**	**4.662 801**	**6.313 423**

LLG-Short Thread Vials economy ND9, wide opening

Hydrolytical class 1, expansion 70.

			
Capacity	ml	1.5	1.5
o.d. x Height	mm	11.6 x 32	11.6 x 32
Colour		clear	amber
Form		flat bottom	flat bottom
PK		1000	1000
Cat. No.		**6.273 634**	**6.273 635**

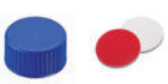
LLG-Short Thread Vials ND9, wide opening, Micro-Vials

						
Capacity	ml	1.1	0.9	0.2	0.2	0.3
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	clear	clear	clear	transparent
Form		flat bottom, 15µl funnel in solid glas bottom	flat bottom, 1µl funnel in solid glas bottom	flat bottom with integrated 0.2mL insert	TPX®, flat bottom with integrated 0.2mL insert	PP, with inner cone
PK		100	1000	100	100	100
Cat. No.		**4.008 249**	**7.970 595**	**4.008 250**	**6.266 868**	**4.008 262**

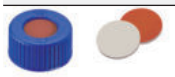
Inserts for LLG-Short Thread Vials ND9, wide opening

					
Capacity	ml	0.2	0.1	0.1	0.1
o.d. x Height	mm	6 x 31	6 x 31	6 x 31	5.7 x 29
Colour		clear	clear	clear	clear
Form		flat bottom	conical 15mm tip	conical 12mm tip	with plastic spring
PK		100	100	100	100
Cat. No.		**4.008 196**	**7.401 744**	**4.001 547**	**6.093 247**

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**
	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**
	blue, centre hole	PTFE red / Silicone white	45° shore A	1.00	100	**6.291 638**

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	1.0	100	**4.008 216**
	Ultrabond* Seal blue, center hole	Silicone beige / PTFE white	45° shore A	1.3	100	**4.008 214**
	Ultrabond* Seal blue, center hole	Silicone beige / PTFE white, slit	45° shore A	1.3	100	**4.008 215**

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

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**

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

1

2in1 KITs contain 100 vials (1.5 ml) and 100 closures in an orange 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	Cover type	PK	Cat. No.
clear	Short Thread Cap, transparent, hole, natural rubber / PP red-orange	100	**7.620 724**
clear	Short Thread Cap, blue, hole, Silicon white / PTFE red	100	**9.003 560**
clear	Short Thread Cap, blue, hole, Silicon white / PTFE blue, slitted	100	**7.621 765**
clear	Short Thread Cap, black, hole, Silicon white / PTFE blue, slitted	100	**4.663 293**
clear	Short Thread Cap, transparent, hole, Silicon white / PTFE red	100	**9.003 561**
clear, labelling field	Short Thread Cap, blue, hole, Silicon white / PTFE blue, slitted	100	**9.003 562**
clear, labelling field	UltraClean Short Thread Cap, blue, hole, Silicon white / PFE red	100	**7.970 892**
clear, labelling field	UltraBond Short Thread Cap, blue, hole, Silicon beige / PTFE white, slitted	100	**6.266 923**
amber, labelling field	UltraBond Short Thread Cap, blue, hole, Silicon beige / PTFE white, slitted	100	**9.003 563**
amber, labelling field	UltraClean Short Thread Cap, blue, hole, Silicon white / PFE red	100	**6.266 871**

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

							
Capacity	ml	0.1	0.1	0.2	1.5	1.5	1.5
o.d. x Height	mm	5.7 x 29	6 x 31	6 x 31	11.6 x 32	11.6 x 32	11.6 x 32
Colour		clear	clear	clear	clear	clear, labeling field	amber, labeling field
Form		with plastic spring	conical, 15mm tip	flat bottom	flat bottom	flat bottom	flat bottom
PK		100	100	100	100	100	100
Cat. No.		**6.093 247**	**7.401 744**	**4.008 196**	**6.242 103**	**6.285 536**	**6.280 951**

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	1.3	100	**6.267 111**
		black, closed	Natural Rubber red-orange / TEF transparent	60° shore A	1.3	100	**6.267 112**
		black, center hole	Silicone white / PTFE red	45° shore A	1.3	100	**4.008 235**
		black, center hole	Silicone white / PTFE blue, slit	55° shore A	1.5	100	**4.008 237**
		black, center hole	PTFE red / Silicone white / PTFE red	45° shore A	1.0	100	**4.008 236**

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

Capacity	ml	1.5	1.5	1.5	1.5	1.5	1.5
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	11.6 x 32
Colour		clear	clear	amber	amber	amber, labeling field	clear, labeling field
Form		small opening	wide opening	wide opening	small opening	wide opening	wide opening
PK		100	100	100	100	100	100
Cat. No.		**7.085 511**	**6.291 635**	**6.263 047**	**7.089 998**	**6.291 636**	**6.290 019**

LLG Crimp Neck Vials economy ND11, wide opening

Hydrolytical class 1, expansion 70.

Capacity	ml	1.5	1.5
o.d. x Height	mm	11.6 x 32	11.6 x 32
Colour		clear	amber
Form		flat bottom	flat bottom
PK		1000	1000
Cat. No.		**6.273 632**	**6.273 633**

LLG-Micro Inserts for Crimp Neck Vials ND11

Capacity	ml	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2
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	ml	1.1	1.1	1.1	1.1	0.3	0.2
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	11,6 x 32
Colour		clear	clear	clear	amber	clear	amber
Form		flat bottom, 15 µl funnel in solid glass bottom	conical	conical with a round pedestal glass plate	conical with a round pedestal glass plate	flat bottom, integrated 0.3mL insert	flat bottom, with integrated 0.2 mL insert
PK		100	100	100	100	100	100
Cat. No.		**4.001 565**	**4.001 516**	**4.008 253**	**4.008 254**	**4.008 255**	**4.008 251**

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	1.00	100	**9.003 441**
	aluminium, silver, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	**7.060 469**
	aluminium, green, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	**4.001 522**
	aluminium, blue, centre hole	Natural rubber / Butyl red-orange / TEF transparent	45° shore A	1.00	100	**6.900 233**
	aluminium, silver, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	**9.003 446**
	aluminium, silver, centre hole	Silicone white / PTFE blue, cross-slit	55° shore A	1.50	100	**4.001 555**
	**magnetic**, gold, centre hole	Silicone white / PTFE red	45° shore A	1.30	100	**4.001 564**
	aluminium, silver, centre hole	PTFE virginal, white	53° shore D	0.25	100	**4.001 559**
	aluminium, silver, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**7.050 759**
	aluminium, silver, centre hole	Red Rubber / PTFE beige	45° shore A	1.00	100	**6.291 637**

LLG-Septa for Crimp Caps ND11

	Septa	Hardness	Thickness mm	PK	Cat. No.
	PTFE virginal, white	53° shore D	0.25	100	**4.001 535**
	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 238**
	Silicone white / PTFE red	45° shore A	1.30	100	**7.054 037**
	PTFE red / Silicone white / PTFE red	45° shore A	1.00	100	**6.801 244**

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	ml	1.5	1.5	1.5	0.3	0.3	0.1	0.1	0.2
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	6 x 31	5.7 x 29	6 x 31
Colour		clear	clear, labeling field	amber, labeling field	clear	clear, PP	clear	clear	clear
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	100	100	100	100	100	100	100
Cat. No.		**6.073 833**	**6.270 176**	**6.270 177**	**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	Naturual Rubber red-orange / TEF transparent	60° shore A	1.0	100	**6.267 116**
	transparent, centre hole	Red Rubber / PTFE beige	45° shore A	1.0	100	**4.008 261**
	blue, centre hole	Red Rubber / PTFE beige	45° shore A	1.0	100	**4.008 257**
	transparent, centre hole	Silicone white / PTFE red	45° shore A	1.3	100	**4.001 544**
	transparent, centre hole	Silicone white / PTFE blue, cross-slit	55° shore A	1.0	100	**4.008 256**
	snap ring cap, blue, centre hole	Silicone white / PTFE blue, cross-slit	55° shore A	1.0	100	**6.242 212**
	transparent, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.0	100	**6.073 555**
	blue, centre hole	PTFE red / Silicone white / PTFE red	45° shore A	1.0	100	**4.008 259**
	transparent, PE centre hole	Red Rubber / TEF transparent	60° shore A	1.0	100	**6.291 662**

1

1 LLG-2in1 KITs with crimp neck vials ND11 (wide opening)

2in1 KITs contain 100 vials (1.5 ml) and 100 closures in an orange 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	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**
clear	Crimp Cap, silver, hole, natural rubber red-orange / TEF transparent	100	**6.282 841**

1 LLG-2in1 KITs with snap ring vials ND11 (wide opening)

2in1 KITs contain 100 vials and 100 closures in an orange 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 1.5 ml (32 x 11.6 mm) 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.

1

Description	Cover type	PK	Cat. No.
clear	Snap caps transparent, hole, Silicon white / PTFE red	100	**4.661 002**

LLG Crimp neck vials ND13

Capacity	ml	2	4
o.d. x Height	mm	16 x 32	14,7 x 45
Colour		clear	clear
Form		flat bottom	flat bottom
PK		1000	1000
Cat. No.		**6.228 969**	**9.003 535**

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

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	aluminium crimp cap, silver, centre hole	Pharma-Fix-Septa (Butyl/PTFE)	50° shore A	2	100	**7.060 475**
	aluminium tear off cap, silver	Pharma-Fix-Septa (Butyl/PTFE)	50° shore A	2	1000	**6.283 313**
	aluminium crimp cap, silver, centre hole (no liner)	-	-		100	**6.801 727**

LLG-Screw Neck Vials and appropriate Micro-Insert

Capacity	ml	4.0	4.0	4.0	4.0	2.0	0.3
o.d. x Height	mm	14,7 x 45	14,7 x 45	14,7 x 45	14,7 x 45	14,7 x 45	6 x 40
Colour		clear	clear, labelling field	amber	amber, labelling field	PP, transparente	clear
Form		flat bottom	flat bottom	flat bottom	flat bottom	flat bottom	conical, metal spring necessary (6.267 118)
PK		100	100	100	1000	100	100
Cat. No.		**9.003 482**	**6.267 117**	**7.058 142**	**9.003 549**	**6.313 424**	**7.055 486**

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

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	black, centre hole	Red Rubber / PTFE beige	45° shore A	1.0	100	**6.242 468**
	black, closed top	Red Rubber / PTFE beige	45° shore A	1.0	100	**4.008 267**
	black, centre hole	Silicone creme / PTFE red	55° shore A	1.5	100	**7.510 053**
	black, closed top	Silicone creme / PTFE red	55° shore A	1.5	100	**6.242 267**
	black, centre hole				100	**7.071 151**
	black, closed top				100	**7.060 437**
	black, closed top	Butyl red / PTFE grey	55° shore A	1.3	100	**4.678 390**

LLG-Septa for Screw Caps ND13

	Septa	Hardness	Thickness mm	PK	Cat. No.
	Red Rubber / PTFE beige	45° shore A	1.00	100	**4.008 264**
	Silicone creme / PTFE red	55° shore A	1.50	100	**4.008 263**
	PTFE virginal, white	53° shore D	0.25	100	**7.058 143**

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

				
Capacity	ml	8	12	16
o.d. x Height	mm	16,6 x 61	18,5 x 66	20,6 x 71
Colour		clear	clear	clear
Form		ND15, flat bottom	ND15, flat bottom	ND18, flat bottom
PK		100	100	100
Cat. No.		**6.280 953**	**6.280 952**	**6.280 954**

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

	Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
	ND15 cap, black, closed top	Butyl red / PTFE grey	55° shore A	1.6	100	**4.678 391**
	ND15 cap, black, 9 mm hole	Silicon white/ PTFE red	45° shore A	1.3	100	**4.678 392**
	ND18 cap, black, 12 mm hole	Butyl red / PTFE grey	55° shore A	1.6	100	**6.267 121**
	ND18 cap, black, closed top	Butyl red / PTFE grey	55° shore A	1.6	100	**6.272 871**

LLG-Shell Vials with PE cap (fire-polished neck) ND8, ND12, ND15

						
Capacity	ml	1	1	2	4	4
o.d. x Height	mm	8.2 x 40	8.2 x 40	11.6 x 31.5	14.65 x 44.60	14.65 x 44.60
Colour		clear	amber	clear	clear	PP, transparent
Form		ND8, flat bottom	ND8, flat bottom	ND12, flat bottom	ND15, flat bottom	ND15, flat bottom
PK		100	100	100	100	100
Cat. No.		**7.300 174**	**4.008 205**	**4.008 248**	**6.280 950**	**6.283 263**

LLG Plugs, PE

	For	PK	Cat. No.
	ND8	100	**7.300 175**
	ND12	100	**4.008 265**

Shell Vials, with PE lamella plug

NEW

- With 8 mm PE lamella plug, transparent
- Without insertion barrier

			
Capacity	ml	1	1
o.d. x Height	mm	8,2 x 40	8,2 x 40
Colour		clear	amber
PK		100	100
Cat. No.		**6.313 421**	**6.313 422**

LLG-Snap Cap Vials ND18 and ND22, without lid

					
Capacity	ml	5	10	15	25
o.d. x Height	mm	20 x 40	22 x 50	26 x 48	26 x 65
Colour		clear	clear	clear	clear
Form		ND18, flat bottom	ND18, flat bottom	ND22, flat bottom	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 ND18 and ND22, LDPE

For sealing of snap ring vials.

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

LLG-Headspace-Precision Thread Vials ND18




Capacity	ml	10	10	20	20
o.d. x Height	mm	22,5 x 46	22,5 x 46	22,5 x 75,5	22,5 x 75,5
Colour		clear	amber	clear	amber
Form		rounded bottom	rounded bottom	rounded bottom	rounded bottom
PK		100	100	100	100
Cat. No.		**9.003 466**	**6.290 106**	**4.008 270**	**4.678 396**

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	1.6	100	**4.008 269**
		silver, center hole	Silicone blue transparent/ PTFE white	45° shore A	1.3	100	**6.241 111**
		silver, center hole	Silicone white / PTFE blue	55° shore A	1.5	100	**4.008 268**
		silver, without hole	Butyl red / PTFE grey	55° shore A	1.6	100	**6.262 513**
		silver, without hole	Silicone white / PTFE red UltraClean	45° shore A	1.3	100	**6.267 122**

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1 LLG-Headspace wash kit with crimp neck vials

NEW

The KITs include 25 crimp neck vials (10 ml) with PE snap cap and Silikon/PTFE septum (Y-slitted), in a storage box made of PP.

Type	PK	Cat. No.
LLG-Headspace Wash Kit	25	**6.313 420**

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





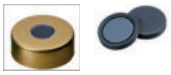



Capacity	ml	5	5	6	5	10	10	10	10
o.d. x Height	mm	20 x 38	20 x 38	22 x 38,20	21,7 x 38,20	20,0 x 54,5	20,0 x 54,5	22,5 x 46	22,5 x 46
Colour		clear	amber	clear	clear	clear	amber	clear	clear
Form		flat bottom flat DIN crimp neck	flat bottom flat DIN crimp neck	rounded bottom bevelled HS crimp neck	flat 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.		**9.003 425**	**7.060 457**	**7.052 186**	**4.008 285**	**9.003 426**	**7.080 947**	**7.050 285**	**7.850 009**

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

								
Capacity	ml	20	20	20	20	20	20	50
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.		**7.401 840**	**7.080 450**	**9.003 452**	**9.003 453**	**7.060 463**	**4.008 281**	**7.060 459**

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	3.0	100	**9.003 454**
	silver, center hole	Butyl grey / PTFE grey	50° shore A	3.0	100	**4.001 549**
	silver, center hole	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.0	100	**9.003 430**
	gold, center hole	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.0	100	**4.008 275**
	silver, center hole	Silicone blue / PTFE colourless	45° shore A	3.0	100	**9.003 434**
	silver, center hole	-	-		100	**7.060 477**
	silver, center hole	Silicone white / PTFE beige	45° shore A	3.2	100	**9.003 460**

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	3.0	100	**9.003 455**
	silver, centre hole	Butyl grey / PTFE grey	50° shore A	3.0	100	**4.001 557**
	silver, centre hole	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.0	100	**4.008 276**
	silver, centre hole	Silicone blue transp. / PTFE transparent	45° shore A	3.0	100	**7.050 286**
	silver, centre hole	Silicone white / PTFE beige	45° shore A	3.2	100	**9.003 456**
	silver, centre hole	no liner			100	**4.008 271**

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	100	**9.003 445**

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1 LLG-Crimp Seals ND20 (Center Tead Off Caps), Aluminium, unassembled

Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
silver	Butyl stopper, grey	50° shore A	3	100	**6.270 720**
silver				100	**6.270 721**

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	100	**7.060 471**

LLG-Crimp Seals ND20 (Complete Tear Off Caps), Aluminium, unassembled

		Caps	Septa	Hardness	Thickness mm	PK	Cat. No.
		silver	Butyl stopper, grey	37° shore A	3	100	**7.060 479**
		silver	-	-		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	3.0	100	**9.003 457**
		red/silver, centre hole	Silicone blue transp. / PTFE transparent	45° shore A	3.0	100	**6.234 541**
		red/silver, centre hole	Silicone white / PTFE beige	45° shore A	3.2	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 red / PTFE grey	50° shore A	3	100	**4.001 548**
		gold, center hole 8 mm	Butyl grey / PTFE grey	50° shore A	3	100	**6.229 635**
		gold, center hole 8 mm	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3	100	**6.902 419**
		gold, center hole 8 mm	Silicone blue transp./ PTFE transparent	45° shore A	3	100	**7.850 010**
		gold, center hole 8 mm (no liner)				100	**7.625 012**

LLG-PE Caps ND20, transparent and appropriate Septa

		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	1.3	1000	**9.003 543**
		PE cap, transparent 22.00 x 8.40mm for HS crimp neck 4.3mm centre hole	Butyl red / PTFE grey	55° shore A	1.3	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	1.3	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	1.3	100	**7.060 425**
			Natural rubber red-orange/ TEF transparent	45° shore A	1.3	100	**7.051 039**

LLG-Septa for Crimp Caps ND20

	Septa	Hardness	Thickness mm	PK	Cat. No.
	Butyl red / PTFE grey	50° shore A	3.0	100	**7.060 427**
	Butyl grey / PTFE grey	50° shore A	3.0	100	**4.008 273**
	Pharma-Fix-Septa Butyl/PTFE	50° shore A	3.0	100	**7.071 063**
	Silicone blue transp./ PTFE transparent	45° shore A	3.0	100	**4.008 274**
	Silicone white / PTFE beige	45° shore A	3.2	100	**7.050 202**
	Silicone white / Aluminium foil silver	50° shore A	3.0	100	**4.001 550**

LLG Stoppers ND20

	Description	PK	Cat. No.
	butyl grey	100	**7.060 433**
	Brombutyl, freeze drying stopper	100	**6.313 419**
	bromine butyl, grey	100	**6.313 445**

1 LLG-Crimp Neck Vial ND20 for the doping control

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**

LLG-Screw Neck Vials ND24 (EPA Vials)

									
Capacity	ml	20	20	30	30	40	40	60	60
o.d. x Height	mm	27.5 x 57	27.5 x 57	27.5 x 72.5	27.5 x 72.5	27.5 x 95	27.5 x 95	27.5 x 140	27.5 x 140
Colour		clear	amber	clear	amber	clear	amber	clear	amber
Form		flat bottom	flat bottom	flat bottom	flat bottom	flat bottom	flat bottom	flat bottom	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, closed	Butyl red / PTFE gray (mounted)	55° shore A	2.5	100	**4.678 395**
	Ultrabond*, white, center hole	Silicone white / PTFE beige	45° shore A	3.2	100	**4.008 293**
	Ultrabond*, white, closed top	Silicone white / PTFE beige	45° shore A	3.2	100	**4.008 292**
	white, closed	Silicone white / PTFE beige (mounted)	45° shore A	3.2	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	3.2	100	**4.008 291**
		Butyl red / PTFE gray	55° shore A	2.5	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

LLG-Crimping Tools ND8/ND11/ND13/ND20

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

1

9.003 471

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** 1
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**

2 LLG-Rack for Vials, PP

For all 1.5 and 4 ml vials. For up to 50 vials, blue, stackable.

2

For vials ml	Dimensions (W x D x H) mm	PK	Cat. No.
1.5	200 x 105 x 17	1	**7.970 861**
4.0	230 x 117 x 28	1	**6.280 873**

LLG-Storage Boxes, PP

Suitable for storage in the fridge.

3

9.405 750

For	Colour	Bottle size ml	Dimensions (l x w x h) mm	Array	PK	Cat. No.
ND8, 9, 10, 11	blue	1,5 / 2,0	130 x 130 x 45	9 x 9*	1	**9.405 750** 3
ND8, 9, 10, 11	orange	1,5 / 2,0	130 x 130 x 45	9 x 9*	1	**9.405 751**
ND8, 9, 10, 11	yellow	1,5 / 2,0	130 x 130 x 45	9 x 9*	1	**9.405 753**
ND8, 9, 10, 11	green	1,5 / 2,0	130 x 130 x 45	9 x 9*	1	**9.405 754**
ND13	red	4,0	130 x 130 x 52	7 x 7*	1	**9.405 756**
ND20	blue	5 / 10 / 20	130 x 130 x 102	5 x 5	1	**4.001 528**
ND8, 9, 10, 11	neon-green	1,5 / 2,0	67 x 67	4 x 4	1	**9.405 760**
ND8, 9, 10, 11	neon-pink	1,5 / 2,0	67 x 67	4 x 4	1	**9.405 761**
ND8, 9, 10, 11	blue	1,5 / 2,0	67 x 67	4 x 4	1	**9.405 762**
ND8, 9, 10, 11	transparent	1,5 / 2,0	67 x 67	4 x 4	1	**9.405 765**

* With alphanumeric coding on the edge and the bottom of each cavity.

4 Water, ultra pure

NEW

Water for a variety of applications in analytical chemistry.
H_2O - LF < 1 µS/cm - 0.4 µm, UV filtrated.

CHEM-LAB n.v.

4

Type	Nominal capacity ml	PK	Cat. No.
Water, ultra pure	5000	1	**4.675 028**

1

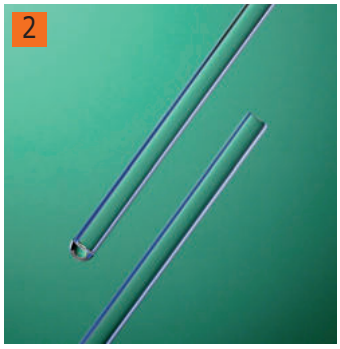
1 NMR tubes, diameter 3 and 5 mm borosilicate glass 3.3, standard

Hilgenberg

The NMR tubes are produced with high precision. They are suitable for routine measurements, high-throughput measurements or NMR systems with autosampler at measurement frequencies up to 600 MHz. The tubes are manufactured from borosilicate glass 3.3 which is conform to USP Type I and ASTM E438, Type I, Class A. Please order closing caps separately.

Outer diam. mm	Int. diam. mm	Length mm	Wall thickness mm	PK	Cat. No.
2.95 ± 0.03	2.36 ± 0.03	178	0.29	50	**6.281 792**
2.95 ± 0.03	2.36 ± 0.03	203	0.29	50	**6.281 793**
4.95 ± 0.05	4.19 ± 0.05	178	0.38	100	**9.400 310**
4.95 ± 0.05	4.19 ± 0.05	203	0.38	100	**9.400 311**

2



2 NMR Tubes, diameter 5 mm, borosilicate glass 3.3, High Precision

NEW

Hilgenberg

The High Precision NMR tubes are manufactured with high accuracy and excellent straightness and concentricity. They are particularly suitable for quantitative measurements and measurements in spectrometers with high measurement frequencies above 600 MHz up to the highest available field strengths above 1 GHz. The tubes are made of borosilicate glass 3.3, which complies with USP Type I and ASTM E438, Type I, Class A requirements. NMR tubes are supplied without caps, please order caps separately.

Outer diam. mm	Int. diam. mm	Length mm	Wall thickness mm	PK	Cat. No.
4.97 ± 0.025	4.2 ± 0.025	178	0.385	10	**4.672 069**
4.97 ± 0.013	4.2 ± 0.013	178	0.385	10	**4.672 070**

3

3 NMR tubes, diameter 3 and 5 mm, borosilicate glass 3.3, with UV protection

NEW

Hilgenberg

These tubes coloured by silver ion diffusion are particularly suitable for handling UV-sensitive substances. The tubes are manufactured from borosilicate glass 3.3 which is conform to USP Type I and ASTM E438, Type I, Class A. They are supplied with a green cap.

Outer diam. mm	Int. diam. mm	Length mm	Wall thickness mm	PK	Cat. No.
2.95 ± 0.03	2.36 ± 0.03	178	0.29	1	**4.672 071**
4.95 ± 0.05	4.19 ± 0.05	178	0.38	1	**4.672 072**

4

4 NMR Tubes, 5 mm, Wilmad®, High Throughput

Bel-Art Products

The thin-walled high-throughput Wilmad® NMR Tubes have an average camber of 60 microns to guarantee spectral quality for small molecule (MW <250) samples up to 600 MHz.. Designed for routine use in most low to mid field NMR spectrometers.

External diameter: 4.947 ±0.019 mm
Internal diameter: 4.1 mm
Wall thickness: 0.43 mm

Type	Length mm	Camber µm	PK	Cat. No.
High Throughput	178	60	100	**6.287 509**
High Throughput	178	60	50	**6.287 510**
High Throughput	203	60	100	**6.287 511**
High Throughput	203	60	50	**6.287 512**

1 NMR tubes, 5mm, DURAN®, three accuracy classes

DWK Life Sciences

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

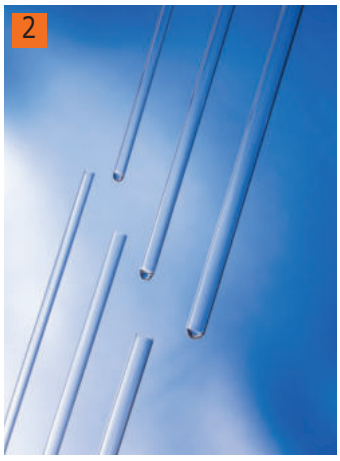
Please order closing caps separately.

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

2 EPR sample tubes, quartz glass

Hilgenberg

These EPR tubes are manufactured from upmarket quartz glass with only slightest amounts of paramagnetic trace elements. The tubes are delivered single packed and sealed in plastic foil.



Outer diam. mm	Int. diam. mm	Wall thickness mm	Length mm	PK	Cat. No.
2.95	2.35	0.30	250	10	**6.285 950**
3.95	3.35	0.30	250	10	**6.285 951**
4.95	4.19	0.38	250	10	**6.285 952**

3 NMR brushes

NEW

DWK Life Sciences

For cleaning NMR tubes.

Length mm	PK	Cat. No.
250	5	**4.669 337**

4 Closing caps for 3 and 5 mm NMR and EPR tubes

Hilgenberg

The closing caps are made of resilient plastic and are available in two sizes fitting for 3 mm and 5 mm NMR tubes as well as EPR tubes with this respective size.
Available in different colours.

For	Colour	PK	Cat. No.
3 mm tubes	red	50	**6.282 148**
3 mm tubes	green	50	**6.282 149**
3 mm tubes	yellow	50	**6.282 150**
3 mm tubes	blue	50	**6.282 151**
5 mm tubes	red	100	**9.400 312**
5 mm tubes	green	100	**9.400 313**
5 mm tubes	yellow	100	**9.400 314**
5 mm tubes	black	100	**9.400 315**
5 mm tubes	blue	100	**9.400 316**

1

1 Septum caps for 5 mm NMR tubes

NEW

Hilgenberg

The septum caps are available with slotted or unslotted septum.
This allows the addition of substances into the closed tube for titration experiments without having to open the tube.

Description	PK	Cat. No.
Septum natural rubber red / TEF transparent, 60° shore A 1.3 mm, without slot	100	**9.783 365**
Septum silicone white / PTFE blue, 55° shore A 0.9 mm, with slot	100	**4.672 073**

2

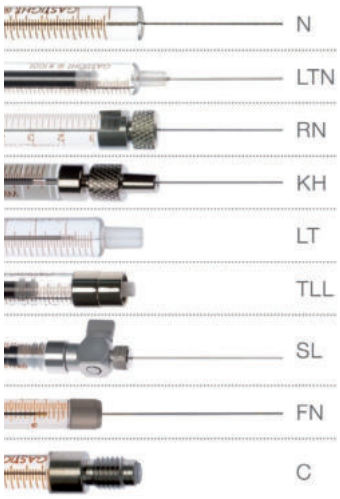
2 NMR Tube Rack, PP

A
121 °C

Polypropylene rack with carrying handles features an upper deck with holes and a lower deck support for tube ends. Stackable. For 72 (6 x 12) tubes with 3 or 5mm diameter. Autoclavable.

Type	Dimensions (W x D x H) mm	PK	Cat. No.
NMR Tube Rack	210 x 110 x 220	1	**9.301 065**

3



3 Syringe Terminations

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 and state the following details: needle length, gauge, point style, and whether they are electro-tapered. Example of a correct specification: 701 SN, 70mm, gauge 25, point style 3, not electrotapered. Without these details the corresponding standard syringe 701 N will be supplied.
RN (Removable Needle)
Removable needles sit precisely to the zero graduation mark of the syringe. Allows the use of different specification needles on the same syringe barrel.
KH (Knurled Hub)
Knurled hub is used on 7000 Series syringes. The attachment of a spacer enables repeatable depth injections.
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.
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 the attachment to drive arm mechanisms, such as on the Microlab 500 Series diluters/dispensers.
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.
FN (Fixed Needle)
Found on PALSystem C-Line and X-Type autosampler syringes.
C (ChemSeal)
1/4"-28 UNF, male fitting. Used in low volume applications where system dead volumes need to be minimized.

1 Microlitre syringes, Needle Types

Hamilton

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

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

2 Microlitre syringes, 700 series, with cemented needle (N)

Hamilton

With cemented 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. Needle length 51 mm.

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	22	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	22	3 (HPLC)	1	**9.221 016**
750 N	500	22	3 (HPLC)	1	**6.055 335**
701 N	10	26s	5	1	**6.800 518**
750 N	500	22	5	1	**6.801 651**

2

Microlitre syringes, 700 series, for removable needles (RN) or (LT)

Hamilton

With removable needles (RN), or luer tip (LT). Plungers are individually fitted, therefore cannot be interchanged and are not available as replacement parts.

Type	Capacity µl	Gauge	Point style	Needle length mm	PK	Cat. No.
75 RN	5	26s	2 (GC)	51	1	**9.221 080**
701 RN	10	26s	2 (GC)	51	1	**9.221 081** 3
701 RN	10	26s	2 (GC)	51	6	**6.059 899**
702 RN	25	22s	2 (GC)	51	1	**9.221 082**
705 RN	50	22s	2 (GC)	51	1	**9.221 083**
710 RN	100	22s	2 (GC)	51	1	**9.221 084**
725 RN	250	22s	2 (GC)	51	1	**9.221 085**
750 RN	500	22s	2 (GC)	51	1	**9.221 086**
701 LT*	10				1	**9.221 021** 4
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

9.221 081

4

9.221 021

1

1 Microlitre syringes, 1700 series, with TLLX and gas tight

NEW

Hamilton

Glass barrel with PTFE-coated plunger and seal, and Luer lock outlet. 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.

Type	Capacity µl	Grad. µl	PK	Cat. No.
1702 TLLX	25	0,25	1	**9.221 300**
1705 TLLX	50	0,5	1	**9.221 305**
1710 TLLX	100	1	1	**9.221 310**
1725 TLLX	250	2,5	1	**9.221 315**
1750 TLLX	500	5	1	**9.221 320**

2

2 Microlitre syringes, 800 series, with cemented (N) or removable needles (RN)

Hamilton

With metal handle. Plungers are individually fitted, therefore cannot be interchanged and are not available as replacement parts. Cemented needles (N) or removable needle (RN).

Type	Capacity µl	Gauge	Point style	Needle length mm	PK	Cat. No.
85 N	5	26s	2	51	1	**9.221 105**
801 N	10	26s	2	51	1	**9.221 110**
802 N	25	22s	2	51	1	**9.221 111**
805 N	50	22s	2	51	1	**9.221 112**
810 N	100	22s	2	51	1	**9.221 113**
85 RN	5	26s	2	51	1	**9.221 115**
801 RN	10	26s	2	51	1	**9.221 116**
802 RN	25	22s	2	51	1	**9.221 117**
805 RN	50	22s	2	51	1	**9.221 118**
810 RN	100	22s	2	51	1	**9.221 119**
825 RN	250	22s	2	51	1	**9.221 120**
85 RN*	5				1	**6.803 384**
801 RN*	10				1	**6.222 013**
810 RN*	100				1	**6.231 153**
85 RN B/P	5				1	**6.232 019**
801 RN B/P	10				1	**9.221 172**

* Needle - please order separately.

3

9.221 487

Microlitre syringes, 1700 series, with removable needle (RN)

NEW

Hamilton

Glass barrel with PTFE-coated plunger. Gas-tight microlitre syringes with removable needle (RN). Gaseous samples can be safely and conveniently transported and stored in sample lock (SL) syringes. Needle length: 51 mm

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1701 RN	10	26s	2 (GC)	1	**9.221 487** 3
1702 RN	25	22s	2 (GC)	1	**9.221 488**
1705 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	22	2 (GC)	1	**9.221 492**
1702 RNR	25	22s	3 (HPLC)	1	**6.090 258**
1705 N	50	22s	3 (HPLC)	1	**6.070 203**
1705 RNR	50	22s	3 (HPLC)	1	**6.053 755**
1710 N	100	22s	3 (HPLC)	1	**6.058 898**
1710 RNR	100	22s	3 (HPLC)	1	**6.800 114**
1725 N	250	22s	3 (HPLC)	1	**6.801 772**
1725 RNR	250	22	3 (HPLC)	1	**7.200 577**
1750 RNR	500	22	3 (HPLC)	1	**6.077 387**

4

9.221 470

Microlitre syringes, 1000 series, with cemented needle (N)

Hamilton

With PTFE plunger seal. Gastight microlitre syringes with cemented-in needles (N). Needle length: 51 mm

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1001 LTN	1000	22	3 (HPLC)	1	**6.800 149**
1001 LTN	1000	22	2 (GC)	1	**9.221 470** 4
1002 LTN	2500	22	2 (GC)	1	**9.221 475**
1005 LTN	5000	22	3 (HPLC)	1	**7.631 831**
1005 LTN	5000	22	2 (GC)	1	**9.221 480**
1005/RN	5000	22	2 (GC)	1	**9.221 495**
1010 LTN	10000	22	2 (GC)	1	**9.221 485**

Microlitre syringes, 1700 series, with cemented needle (N)

NEW

1

With PTFE plunger seal. Gastight microlitre syringes with cemented-in needles (N). *Hamilton*
Needle length: 51 mm

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1701 N	10	26s	2 (GC)	1	**9.221 448** 1
1702 N	25	22s	3 (HPLC)	1	**6.083 932**
1702 N	25	22s	5	1	**7.630 609**
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	22	2 (GC)	1	**9.221 465**

9.221 448

2 Microlitre syringes, 7000 series

2

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. *Hamilton*

Type	Capacity µl	Gauge	Point style	Needle length mm	PK	Cat. No.
7000.5 KH	0.5	25	2	70	1	**6.700 111**
7001 KH	1.0	25	2	70	1	**9.221 121**
7101 KH	1.0	22	2	70	1	**6.802 391**
7002 KH	2.0	25	2	70	1	**6.204 624**
7102 KH	2.0	23	2	70	1	**6.801 037**
7105 KH	5.0	24	2	70	1	**9.221 125**
7000.5OC KH	0.5	32	3	100	1	**9.221 590**
7000.5 KH	0.5	25	3	70	1	**9.221 126**
7001 KH	1.0	25	3	70	1	**6.802 598**
7101 KH	1.0	22	3	70	1	**9.221 131**
7002 KH	2.0	25	3	70	1	**9.221 122**
7102 KH	2.0	23	3	70	1	**9.221 132**
7105 KH	5.0	24	3	70	1	**6.050 160**

3 Microlitre syringes Neuros™

3

Hamilton Neuros™ syringe technology provides unprecedented functionality for controlled injections e.g. of tissues and animals. An industry first, the Neuros™ accurately dispenses 50 nL to 100 µL of liquid through an ultrafine needle protected by a custom-designed sleeve. Developed specifically for the neurosciences, the Neuros minimizes injection site damage by increasing needle rigidity and delivering a microvolume of liquid to an exact location. *Hamilton*

- Adjustable needle exposure of 0 to 20 mm
- Almost no dead volume
- Needle rigidity improves insertion path accuracy
- Minimal tissue damage reduces injection variability
- Reduced sample loss saves money and materials
- Fine gauge needle creates smaller injection sites
- Compatibility with most infusion pumps and stereotaxic holders means an easy integration into existing processes
- Also available as beveled 12° point (point style 4)

Needle length: 0 to 20 mm

Type	Capacity µl	Point style	Gauge	PK	Cat. No.
NRS7000.5 KH	0.5	3 (HPLC)	32	1	**6.287 163**
NRS7001 KH	1	3 (HPLC)	32	1	**7.671 735**
NRS7002 KH	2	3 (HPLC)	30	1	**6.287 164**
NRS75 RN	5	3 (HPLC)	33	1	**7.642 505**
NRS1701 RN*	10	3 (HPLC)	33	1	**6.258 819**
NRS1702 RN*	25	3 (HPLC)	33	1	**6.287 165**
NRS1705 RN*	50	3 (HPLC)	33	1	**6.287 166**
NRS1710 RN*	100	3 (HPLC)	33	1	**6.287 167**

*gastight syringes

Microlitre syringes for GC-autosamplers please see page 1493.

1

9.221 002

Microlitre syringes for GC-autosamplers A

With cemented needle (N) for GC-autosamplers Agilent 7670 A, 7671 A, 7672 A. *Hamilton*
With fixed needle (FN) for CTC GC PAL system autosamplers.

Syringe types with Special needle (SN) available on request.
Needle length: 51 mm

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**	1
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**	2
1750 FN CTC	500.0	26s	AS	1	**9.221 041**	

*Slim Line=Glass barrel outer diameter 6.6 mm

2

6.239 360

3

7.636 288

Microlitre Syringe for GC-Autosampler

With cemented-in needles (N) for autosamplers Agilent 7673 - 7683, 6850 ALS and with fixed needle (FN) for CTC GC PAL instruments. *Hamilton*

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

Type	Capacity µl	Needle length mm	Gauge	Point style	PK	Cat. No.	
701 FN CTC	10	51	23s	2 (GC)	1	**9.221 063**	
701 FN CTC	10	51	23s	AS	1	**7.636 288**	3
701 N	10	43	23s	AS	1	**9.221 196**	4
701 N	10	43	23s	AS	6	**6.050 224**	
701 N	10	43	26s	AS	1	**6.090 815**	
701 N	10	43	26s	AS	6	**6.072 828**	

4

9.221 196

5

5 6 GC-Syringes PAL Headspace®

HD syringe: High Dynamic plunger has been optimised for higher throughput in the headspace technique. *Hamilton*
Novel metal spring allows working with enhanced tightness over a large temperature range.
Which results in increased accuracy and reproducibility of your headspace GC analysis.

HDHT syringe: Unique cement-free snap-on connection. The syringe is chemically inert and temperature stable up to 200 °C which broadens the range of possible applications.

6

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1001 HD	1000	23	5	1	**6.200 515**
1001 HDHT	1000	23	5	1	**6.287 990**
1001 HD	1000	26	5	1	**6.303 926**
1002 HD	2500	23	5	1	**6.201 089**
1002 HD	2500	26	5	1	**6.801 137**
1002 HDHT	2500	23	5	1	**7.910 699**

7

7 Microlitre syringe X-Type for PAL autosamplers

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

Needle length: 51 mm

Type	Capacity µl	Gauge	Point style	PK	Cat. No.
1702	25	22s	3 (HPLC)	1	**6.256 766**
1705	50	22s	3 (HPLC)	1	**9.221 061**
1710	100	22	3 (HPLC)	1	**9.221 062**
1710	100	22s	3 (HPLC)	1	**6.260 430**

1 2 LLG-Glass-Syringes, borosilicate glass

With brown graduations. Sterilisable up to 134 °C.

Capacity ml	Material Cone	Nozzle type	PK	Cat. No.
1	Glass	Luer-Slip	1	**6.272 088**
2	Glass	Luer-Slip	1	**6.272 089**
5	Glass	Luer-Slip	1	**6.272 090**
10	Glass	Luer-Slip	1	**6.272 091**
20	Glass	Luer-Slip	1	**6.272 092**
50	Glass	Luer-Slip	1	**6.272 093**
1	Metal	Luer-Lock	1	**6.272 094**
2	Metal	Luer-Lock	1	**6.272 095**
5	Metal	Luer-Lock	1	**6.272 096**
10	Metal	Luer-Lock	1	**6.272 097**
20	Metal	Luer-Lock	1	**6.272 098**
50	Metal	Luer-Lock	1	**6.272 099**

1

2

3 All-glass syringes Dosys™, borosilicate glass 3.3

Socorex

A 121 °C

The reusable borosilicate glass syringes offer superior chemical and heat shock resistance. A precious, low cost alternative to disposable plastic syringes, complementing the self-refilling models in many applications.

- Precision-machined plunger and barrel,
- Excellent fitting and liquid tightness (not gas tight)
- Permanent, high visibility graduations
- Autoclavable at 121 °C/250 °F

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**

3

Syringes, FORTUNA OPTIMA®, Glass

Poulten & Graf

A 134 °C

Made of soda lime glass. With centre glass or metal luer nozzle (Luer or Luer-Lock). Only plungers and barrels with identical lot numbers are interchangeable (between identical capacity syringes). Autoclavable up to +134 °C. The amber graduation is acid and alkali resistant. Only for technical purposes.

Capacity ml	Material Cone	Nozzle type	PK	Cat. No.
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** 4
20	Metal	Luer-Lock	1	**9.222 072**
50	Metal	Luer-Lock	1	**9.222 075**
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** 5
50	Glass	Luer	1	**9.222 035**

4

9.222 070

5

9.222 032

1

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

A 134 °C

- Barrel: PP, Plunger: PP and Polyisoprene rubber
- Smooth flow, tight, high transparency barrel
- Latex-free, pyrogen-free, DEHP-free, non-toxic
- Defined safety stop to avoid accidental pull-out of plunger
- Suitable for all syringe filters with Luer connection
- Non-sterile, bulk packed in box of 500
- Luer-Lock according to DIN EN 1707
- Luer-Slip according to DIN EN 20594-1

Capacity ml	Nozzle type	PK	Cat. No.
2	Luer-Slip	500	**6.267 267**
5	Luer-Slip	500	**6.267 268**
10	Luer-Slip	500	**6.267 269**
20	Luer-Slip	500	**6.267 270**
2	Luer-Lock	500	**6.286 616**
5	Luer-Lock	500	**6.286 617**
10	Luer-Lock	500	**6.286 618**
20	Luer-Lock	500	**6.286 619**

2

4.665 978

Disposable Syringes HSW NORM-JECT®, 2-part, sterile

Disposable syringes HSW NORM-JECT® with PP barrel, and PE piston. Luer or Luer-Lock nozzle. *B.Braun Melsungen*

- Smooth flow, tight, high transparency barrel
- No rubber, styrene or DEHP, latex- and silicone-oil-free
- Sterile, individually blister strip packed
- Defined position of the plunger at volume "0" to feel when plunger is completely inserted
- According to ISO 7886-1
- Defined safety stop to avoid accidental pull-out of plunger

3

4.665 915

Capacity ml	Nozzle type	PK	Cat. No.
1	Luer-Slip	100	**4.665 985**
2	Luer-Slip	100	**4.665 978** 2
5	Luer-Slip	100	**4.665 979**
10	Luer-Slip	100	**4.665 986**
20	Luer-Slip	100	**4.665 952**
2	Luer-Lock	100	**4.665 915** 3
5	Luer-Lock	100	**4.665 947**
10	Luer-Lock	100	**4.665 916**
20 (24)	Luer-Lock	100	**4.665 917**

4

4 Disposable Syringes HSW HENKE-JECT®, 2-part, non-sterile

Disposable syringes with PP barrel, and PE piston. Luer-Slip or Luer-Lock nozzle. *Henke-Sass Wolf*

- Wipe-resistant scale
- Transparent cylinder
- Pyrogen-free, non-toxic and PVC-free

Capacity ml	Nozzle type	PK	Cat. No.
1	Luer-Slip	100	**4.669 386**
5	Luer-Slip	100	**4.669 387**
2	Luer-Slip	100	**4.669 388**
10	Luer-Slip	100	**4.669 389**
20	Luer-Slip	100	**4.669 390**
30	Luer-Slip	50	**4.669 391**
50	Luer-Slip	30	**4.669 392**
2	Luer-Lock	100	**4.669 393**
5	Luer-Lock	100	**4.669 394**
10	Luer-Lock	100	**4.669 395**
20	Luer-Lock	100	**4.669 396**
30	Luer-Lock	50	**4.669 397**
50	Luer-Lock	30	**4.669 398**

1 Disposable Syringes HSW HENKE-JECT®, 2-part, sterile

Disposable syringes with PP barrel, and PE piston. Luer-Slip or Luer-Lock nozzle. *Henke-Sass Wolf*

- Sterile, individually blister strip packed
- Wipe-resistant scale
- Transparent cylinder
- Pyrogen-free, non-toxic and PVC-free

Capacity ml	Nozzle type	PK	Cat. No.
30	Luer-Slip	50	**9.410 025**
50	Luer-Slip	30	**9.410 050**
30	Luer-Lock	50	**6.250 019**
50	Luer-Lock	30	**6.286 307**

2 Disposable syringes SOFT-JECT®, 3-part, sterile

- Barrel: PP, Plunger: PP and polyisoprene rubber *B.Braun Melsungen*
- Luer tip
- Smooth flow, tight, high transparency barrel
- Safe plunger backstop
- Latex free, pyrogen-free, DEHP free, non-toxic
- Sterile, individually blister strip packed
- According to ISO 7886-1

Capacity ml	Nozzle type	PK	Cat. No.
1	Luer	100	**4.665 988**
3	Luer	100	**4.665 990**
5	Luer	100	**4.665 991**
10	Luer	100	**4.665 953**
20	Luer	100	**4.665 981**

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

Clear barrel for perfect visualisaion of syringe contents. *Becton Dickinson*

- 2-piece syringes with Luer-Tip
- Smooth plunger movement, reduced sliding force
- Retaining ring: prevents accidential 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.

Capacity ml	Nozzle type	Grad. ml	PK	Cat. No.
2	concentric	0.1	100	**6.052 153**
5	eccentric	0.2	100	**7.619 784**
10	eccentric	0.5	100	**9.410 403**
20	eccentric	1.0	80	**6.052 157**

4 Disposable syringes, 3-piece, PP, sterile

3-part: cylinder, piston and separate seal. With Luer nozzle. Without needle.
Supplied sterile, individually pouch-sealed in outer boxes.

Volume ml	Nozzle type	Grad. ml	Description	PK	Cat. No.
30	eccentric	1.00	with Luer nozzle	60	**9.410 431**
50/60	eccentric	1.00	with Luer nozzle	60	**9.950 301**
50/60	centric	1.00	with BD Luer-Lok™ nozzle	60	**6.050 099**
50/60	centric	1.00	-	60	**6.305 235**
100	centric	2.00	Luer adapter	50	**6.287 774**
10	centric	0.50	-	100	**6.050 096**
2	centric		with Luer nozzle	100	**6.274 591**
1	centric	0.01	TBC, Luer	120	**6.280 595**

1

1 2 Disposable Syringes Omnifix® Solo, 3-piece

B. Braun Deutschland

- Material: Polypropylene, Plunger backstop: Polyisoprene
- Plunger backstop with smooth double sealing ring for slow aspiration and injection of small sample quantities
- Highly transparent barrel with black graduations (in ml) for ideal readability, permanent marking
- Safe plunger backstop for easy aspiration to the maximum volume
- Inside siliconized
- Luer Slip to put on the needle, centric or eccentric or Luer Lock conus, centric
- Latex- and PVC-free
- Sterile, single packed
- Manufactured according to EN ISO 7886-1

2

Capacity ml	Nozzle type	Grad. ml	PK	Cat. No.
3	Luer slip, centric	0.1	100	**6.238 513**
5	Luer slip, eccentric	0.2	100	**6.301 853**
10	Luer slip, eccentric	0.5	100	**7.079 506**
20	Luer slip, eccentric	1.0	100	**6.084 306**
30	Luer slip, eccentric	1.0	100	**6.303 643**
50	Luer slip, eccentric	1.0	100	**4.665 914**
3	Luer lock, centric	0.1	100	**6.238 514**
5	Luer lock, centric	0.2	100	**6.081 232**
10	Luer lock, centric	0.5	100	**6.085 753**
20	Luer lock, centric	1.0	100	**6.083 393**
30	Luer lock, centric	1.0	100	**6.300 903**
50	Luer lock, centric	1.0	100	**4.665 943**

3

3 Disposable needles, PP/Stainless steel, sterile

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

Diam. mm	Length mm	Gauge	Colour	PK	Cat. No.
0.8	40	21 x 1 1/2"**	green	100	**9.950 305**
0.6	25	23 x 1"	blue	100	**9.950 306**
0.5	16	25 x 5/8"	orange	100	**9.950 307**
0.9	25	20 x 1"**	yellow	100	**9.950 304**
1.1	40	19 x 1 1/2"	ivory	100	**9.950 303**
1.2	40	18 x 1 1/2"*	pink	100	**9.950 302**

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

4

4 Disposable needles Sterican® for neural therapy

B. Braun Deutschland

- Thin-walled needles, made of stainless, chromium-nickel steel, with smooth surface with light silicone coating
- Minimal pain upon puncture
- Transparent Luer-Lock plastic hub, made of Polypropylene (needle hub), color-coded hub conforms to ISO 6009

Gauge	Diam. mm	Length mm	Colour	PK	Cat. No.
21 x 4 3/4"	0.8	120	green	100	**6.200 419**
23 x 2 3/8"	0.6	60	blue	100	**6.053 289**
23 x 3 1/8"	0.6	80	blue	100	**7.200 183**

5

5 Single-use hypodermic needles, Sterican®

B. Braun Deutschland

- In accordance with ISO 7864 and DIN 13097
- Thin-walled needles
- Made of stainless, chromium-nickel steel
- Smooth surface with light silicone coating
- Minimal pain upon puncture
- Transparent Luer-Lock plastic hub
- Made of Polypropylene (needle hub)
- Box of 100 pieces

Gauge	Diam. mm	Colour	Length mm	PK	Cat. No.
20 x 1 1/2"	0.90	yellow	40	100	**6.080 870**
21 x 1 1/2"	0.80	green	40	100	**6.076 221**
22 x 1 1/4"	0.70	black	30	100	**6.076 115**
23 x 1 1/4"	0.60	blue	30	100	**7.079 505**
23 x 1"	0.60	blue	25	100	**6.202 748**
24 x 1"	0.55	purple	25	100	**6.070 095**
26 x 1"	0.45	brown	25	100	**6.078 182**
27 x 3/4"	0.40	grey	20	100	**6.071 758**

1 Empty columns CHROMABOND®, PP

Empty CHROMABOND® column (PP) for SPE, one PE-filter element is already inserted in the column. *MACHEREY-NAGEL*

Capacity ml	PK	Cat. No.
1	100	**4.003 522**
3	50	**7.510 238**
6	30	**7.510 090**
15	20	**4.003 555**
30	20	**4.003 592**
45	20	**4.003 584**
70	20	**4.003 521**
150	20	**4.003 631**

1

2 CHROMABOND® C_{18}

Octadecyl modified silica phase for SPE, not endcapped *MACHEREY-NAGEL*

Base material silica, pore size 60Å, particle size 45µm for C_{18}, specific surface 500m²/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

3 CHROMABOND® SiOH

Unmodified silica phase for SPE *MACHEREY-NAGEL*

Unmodified, weakly acidic silica, pore size 60Å, particle size 45µm, specific surface 500m²/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	**6.225 223**
3	200	50	**4.003 547**
3	500	50	**7.085 047**
6	500	30	**6.801 894**
6	1000	30	**4.003 481**
6	2000	30	**4.003 498**
15	2000	20	**4.003 550**
45	5000	20	**4.003 605**
70	10000	10	**6.202 850**
150	50000	10	**4.003 630**
3	500	250	**4.003 477**
6	1000	250	**4.003 482**
6	2000	250	**4.003 499**

3

4 CHROMABOND® Na_2SO_4/Florisil®

Combination phase for SPE of hydrocarbons from water acc. to DIN H53/ISO DIS 9377-4 *MACHEREY-NAGEL*

Special combination phase of sodium sulphate and Florisil®.

Recommended application: hydrocarbons from drinking, surface and waste waters.

Volume ml	Capacity ml / mg	PK	Cat. No.
6	2000 / 2000	30	**4.003 558**
6*	2000 / 2000	30	**6.900 415**
6*	2000 / 2000	250	**4.003 559**

*Glass columns

4

1

1 CHROMABOND® HR-X

Spherical, hydrophobic polystyrene-divinylbenzene resin for SPE *MACHEREY-NAGEL*

Hydrophobic polystyrene-divinylbenzene copolymer pH stability 1 to14. High-purity material with highest reproducibility and lowest blank values due to a novel manufacturing process, spherical particles 85mm; pore size 55 to 60Å. Very high surface 1000m²/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	**4.003 808**
3	60	30	**4.003 811**
1	100	30	**4.003 809**
3	200	30	**4.003 805**
6	200	30	**4.003 814**
3	500	30	**4.003 813**
6	500	30	**4.003 817**
15	500	20	**4.003 819**
15	1000	20	**4.003 820**
3	200	250	**4.003 806**
6	200	250	**4.003 815**

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

2

2 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**

*Glass columns

3

3 CHROMABOND® XTR

Kieselguhr phase for liquid-liquid extraction *MACHEREY-NAGEL*

Base material coarse-grained kieselguhr, large pore size, high pore volume, constantly high batch-to-batch quality, pH working range 1 to 13.

Application: liquid-liquid extraction of highly viscous aqueous solutions such as physiological fluids (blood, plasma, and serum) in clinical chemistry, dyes in textiles, environmental and food analysis.

Glass columns availlable on request.

Capacity ml	Capacity g	Max. load with aqueous solution ml	PK	Cat. No.
3	0.5	0.5	50	**4.003 646**
6	1.0	1.0	30	**4.003 636**
6	1.0	1.0	250	**4.003 637**
15	3.0	3.0	30	**4.003 638**
30	4.5	5.0	30	**6.205 372**
45	8.3	10.0	30	**4.003 647**
70	14.5	20.0	30	**6.225 180**
70	14.5	20.0	100	**4.003 648**
150	37.5	50.0	10	**4.003 650**

1 CHROMAFIX® C_{18}

Octadecyl modified silica phase for SPE, not endcapped *MACHEREY-NAGEL*

Base material silica, pore size 60Å, particle size 45µm for C_{18}, specific surface 500m²/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	240	50	**7.083 665**
M	480	50	**7.079 617**
L	950	50	**4.003 838**

2 CHROMABOND® C_{18} ec

Octadecyl modified silica phase for SPE, endcapped *MACHEREY-NAGEL*

Base material silica, pore size 60Å, particle size 45µm for C_{18} ec, 100µm for C_{18} ec f (for fast flow), specific surface 500m²/g, pH stability 2 to 8. Octadecyl phases, endcapped, carbon content 14% very non-polar, hydrophobic interactions with a wide variety of organic compounds. Advantageous for clean-up of samples with large structural variations (polarity differences).

Recommended applications: non-polar compounds, aflatoxins, amphetamines, antibiotics, antiepileptics, barbiturates, caffeine, drugs, preservatives, fatty acids, nicotine, PAHs, pesticides, PCBs, heavy metals, vitamins. Very well suited for desalting of samples.

Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	**4.003 442**
3	200	50	**4.003 444**
3	500	50	**4.003 448**
6	500	30	**4.003 451**
6	1000	30	**4.003 454**
6	2000	30	**6.701 243**
15	2000	20	**4.003 603**
45	5000	20	**4.003 604**
70	10000	10	**4.003 560**
3	500	250	**4.003 446**
6	500	250	**4.003 450**
6	1000	250	**4.003 452**

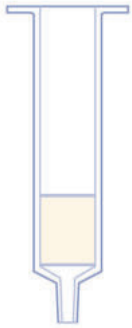
BIGpacks: 4.003 446/4.003 450/4.003 452

3 CHROMABOND® NH_2/C_{18}

Combination phase for SPE analysis of PAH from water containing humic acids *MACHEREY-NAGEL*

Special combination phase: aminopropyl phase for removal of interfering humic acids, octadecyl phase for enrichment of PAH.

Recommended application: PAH from water containing humic acids.



Capacity ml	Capacity ml / mg	PK	Cat. No.
6	500 / 500	30	**6.228 257**
6	500 / 1000	30	**4.003 675**

Glass columns available on request.

4 CHROMABOND® SB

Quaternary ammonium modified silica anion exchanger for SPE (SAX) *MACHEREY-NAGEL*

Base material silica, pore size 60Å, particle size 45µm, specific surface 500m²/g, pH stability 2 to 8. Silica modified with quaternary amine. Strongly basic anion exchanger (capacity ~ 0.3meq/g). Not suited for very strong anions such as sulphonic acids, because these are difficult to elute.

Recommended application: organic acids, caffeine, saccharin.

Capacity ml	Capacity mg	PK	Cat. No.
1	100	100	**4.003 486**
3	200	50	**4.003 580**
3	500	50	**7.075 759**
6	500	30	**4.003 614**
6	1000	30	**6.206 234**
3	500	250	**4.003 487**

BIGpacks: 4.003 487

1

1 CHROMABOND® Easy

Polar modified polystyrene-divinylbenzene copolymer with a weak anion exchanger *MACHEREY-NAGEL*

Specific surface 650 to 700 m²/g, particle size 80µm, pore size 50 Å, pH stability 1 to 14. Due to bifunctional modification much more hydrophilic than conventional polystyrene-divinylbenzene polymers and thus easily wettable with water.

Recommended applications: polar herbicides/pesticides from water (acidic, neutral, basic), polar phenols from water, polyaromatic compounds, polychlorinated biphenyls, drug analysis from urine, blood, serum, plasma pharmaceuticals/active ingredients from tablets, creams.

Due to the bifunctional modification CHROMABOND® Easy is considerably more hydrophilic than conventional polystyrene-divinylbenzene polymers and thus easily wettable with water. The Easy effect: Aqueous samples can be loaded directly without preconditioning! This means that little or even no conditioning is needed, in contrast to standard SPE materials, where recovery rates normally decrease, in the worst case down to zero! Depending on the separation task conditioning may be required and is recommended for method development. A positive side effect of the excellent wettability: there is no decrease of recovery rates, if the cartridge runs dry, therefore automation is easier or, in some cases compared to silica materials, only feasible with CHROMABOND® Easy, because a permanent vacuum can be used without supervision.

Further advantages of using a polymeric material:
- high surface, this means very high binding capacity (2 - 5 times higher than silica-based adsorbents)
- less adsorbent is needed in the cartridge (without losing sensitivity or recovery)
- faster analysis, because the height of the adsorbent bed can be reduced
- acidic or basic solvents (e. g. TFA) do not destroy the phase, or lead to unintended side products

Because of the polar modification the material is suitable for a broad range of compounds (acidic, neutral, basic, polar and nonpolar substances). Highly reproducible recovery rates can be obtained, even if the cartridge runs dry (especially advantageous when using 96-well plates, where stopcocks are not available!)

Capacity ml	Capacity mg	PK	Cat. No.
1	30	30	**4.003 719**
3	60	30	**4.003 721**
3	200	30	**6.226 452**
6	200	30	**6.234 375**
3	500	30	**4.003 728**
6	500	30	**6.224 850**
15	500	20	**4.003 726**
3	200	250	**4.003 723**
6	200	250	**4.003 724**

BIGpacks: 4.003 723/4.003 724

2

2 CHROMABOND® vacuum manifolds and accessories

For simultaneous preparation of up to 12 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.
Gaskets for lid with 12 positions	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**
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**
Drying attachment	1	**4.672 182**
Vacuum manifold for 12 columns or cartridges	1	**6.274 944**
Vacuum manifold for 24 columns or cartridges	1	**6.275 025**

1 Copure® QuEChERS extraction kits

NEW

1

Extraction and clean-up mixtures for sample preparation in the pesticide analysis of vegetable foodstuffs according to EN 15662 using GC/MS or LC/MS after acetonitrile extraction and purification using the dispersive SPE-QuEChERS method.

The samples are first extracted with Mix A. Purification is done with one of the following mixtures:
- **Mix B** (Clean-up mixture for fruits and vegetables with low fat content, e.g. apples, strawberries)
- **Mix C** (Clean-up mixture for fruits and vegetables with high fat content, containing oil/wax, e.g. avocados)
- **Mix D** (Clean-up mixture for moderately chlorophyll/carotenoid-containing fruits and vegetables, e.g. carrots, salad)
- **Mix E** (Clean-up mixture for fruits and vegetables with high chlorophyll/carotenoid content, e.g. sweet peppers, spinach)

If required, add ceramic homogenising beads for better mixing.
- **Mix A contains a bag with the required amount of mixture and a 50 ml empty tube**
- **Mix B, C, D and E are pre-weighed into a 15 ml tube**

Type	Capacity ml	Composition	PK	Cat. No.
Mix A	50	4 g $MgSO_4$, 1 g NaCl, 1 g Trisodium citrate, 0.5 g Disodium citrate	50	**4.669 294**
Mix B	15	0.15 g PSA, 0.9 g $MgSO_4$	50	**4.669 295**
Mix C	15	0.15 g PSA, 0.15 g C18, 0.9 g $MgSO_4$	50	**4.669 296**
Mix D	15	0.15 g PSA, 0.015 g GCB, 0.9 g $MgSO_4$	50	**4.669 297**
Mix E	15	0.15 g PSA, 0.045 g GCB, 0.9 g $MgSO_4$	50	**4.669 298**
Ceramic homogenising beads			100	**4.669 299**

2 SPE phases for food analysis

2

QuEChERS method and pre-mixes
Within a few years after its devleopment 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 NaCI and afterwards centrifuged. 1 ml of the supernantant 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.

3 CHROMABOND® QuEChERS extraction buffer mixes/clean-up mixes

3

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.

Description	Capacity ml	Composition	PK	Cat. No.
Mix I Citrat-Extraction-Mix	15	4g $MgSO_4$, 1g NaCl, 0.5g Na_2H citrate 1.5 H_2O, 1g Na_3 citrate, 2 H_2O	50	**4.003 824**
Mix II Acetat-Extraction-Mix	15	6g $MgSO_4$, 1.5g Na acetate	50	**4.003 825**
Mix III Diamino Clean-up Mix	15	0.15g CHROMABOND® Diamino with 0.9g $MgSO_4$	50	**4.003 826**
Mix IV Diamino/Carbon Clean-up Mix	15	0.15g CHROMABOND® Diamino with 0.9g $MgSO_4$ and 15mg Carbon	50	**4.003 827**
Mix V Diamino/Carbon Clean-up Mix	15	0.15g CHROMABOND® Diamino with 0.9g $MgSO_4$ and 45mg Carbon	50	**4.003 829**
Mix VI Diamino/C_{18} ec Clean-up Mix	15	0.15g CHROMABOND® Diamino with 0.9g $MgSO_4$ and 150mg C_{18} ec	50	**4.003 828**

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)

1 LLG-Syringe Filters SPHEROS

1

Cost-effective syringe filters for filtration of a broad variety of solvents and aqueous or inorganic solutions. These syringe filters cover most applications in HPLC, pharmaceutical, environmental, biotechnology, and food and beverage testing laboratories.

- Robust Polypropylene housing
- Multifunctional syringe filters with female Luer-Lock inlet and male Luer-Slip outlet
- Suitable for all syringes with Luer connection
- Sterile or non-sterile
- Sterile products in individual hard blister packaging and dispenser box

2 3 LLG Syringe Filters *SPHEROS*, Cellulose Acetate

2

3

Hydrophilic membrane for filtration of aqueous liquids. Low protein binding capacity. Especially suitable for biological macromolecules, water soluble oligomers and polymers. With female Luer-Lock inlet and male Luer-Slip outlet. Sterile products in individual hard blister packaging and dispenser box.

Filter diam. mm	Pore size µm	Housing	Sterile	PK	Cat. No.
13	0.22	PP, red	-	100	**6.272 802**
13	0.45	PP, red	-	100	**6.272 803**
25	0.22	PP, red	-	50	**6.272 804**
25	0.22	PP, red	-	500	**4.668 145**
25	0.45	PP, red	-	50	**6.272 805**
25	0.45	PP, red	-	500	**4.668 146**
13	0.22	PP, red	+	100	**6.272 806**
13	0.45	PP, red	+	100	**6.272 807**
25	0.22	PP, red	+	45	**6.272 808**
25	0.45	PP, red	+	45	**6.272 809**

4 LLG Syringe Filters *SPHEROS*, PES

4

Hydrophilic membrane for aqueous and polar organic solutions with low protein binding capacity. Especially saited for sterile filtration of solutions and media in cell culture as well as for ion chromatography and organic acids. With female Luer-Lock inlet and male Luer-Slip outlet. Sterile filters individually packed in a hard blister package.

Filter diam. mm	Pore size µm	Housing	Sterile	PK	Cat. No.
25	0.22	PP, green	-	50	**6.272 640**
25	0.45	PP, green	-	50	**6.272 641**
25	0.22	PP, green	+	45	**6.272 642**
25	0.45	PP, green	+	45	**6.272 643**

5 LLG Syringe Filters *SPHEROS*, Nylon

5

Hydrophilic membrane for filtration of aqueous and organic/aqueous liquids with medium polarity. Very good chemical resistance to esters, alkaline solutions and alcohols. With female Luer-Lock inlet and male Luer-Slip outlet.

Filter diam. mm	Pore size µm	Housing	Sterile	PK	Cat. No.
13	0.22	PP, pink	-	100	**6.272 810**
13	0.45	PP, pink	-	100	**6.272 811**
25	0.22	PP, pink	-	50	**6.272 812**
25	0.22	PP, pink	-	500	**4.668 147**
25	0.45	PP, pink	-	50	**6.272 813**
25	0.45	PP, pink	-	500	**4.668 148**

6 LLG Syringe Filters *SPHEROS*, PTFE

6

Hydrophobic membrane for filtration of non-polar liquids and gases. Very good chemical resistance to all kinds of solvents and alkaline solutions. With female Luer-Lock inlet and male Luer-Slip outlet.

Filter diam. mm	Pore size µm	Housing	Sterile	PK	Cat. No.
13	0.22	PP, white	-	100	**6.272 816**
13	0.45	PP, white	-	100	**6.272 817**
25	0.22	PP, white	-	50	**6.272 818**
25	0.22	PP, white	-	500	**4.668 149**
25	0.45	PP, white	-	50	**6.272 819**
25	0.45	PP, white	-	500	**4.668 150**

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 Luer-Lock connections on both sides or female Luer-Lock input and male Luer-Slip output
- Suitable for all syringes with Luer connection
- Pre-sterilised or non-sterile
- Sterile products in individual hard blister
- Superior pressure stability

1 2 3 LLG Syringe Filter CA, Cellulose acetate

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 input and Luer-Lock or Luer-Slip output.

Type	Filter diam. mm	Pore size µm	Housing	PK	Cat. No.
non sterile	13	0.20	Acrylic, blue	500	**9.055 500**
non sterile	13	0.45	Acrylic, yellow	500	**9.055 502**
non sterile	13	0.80	Acrylic, green	500	**9.055 504**
non sterile	25	0.20	Acrylic, blue	500	**9.055 501**
non sterile	25	0.45	Acrylic, yellow	500	**9.055 503**
non sterile	25	0.80	Acrylic, green	500	**7.970 389**
sterile	13	0.20	Acrylic, blue	50	**9.055 510**
sterile	13	0.45	Acrylic, yellow	50	**9.055 512**
sterile	13	0.80	Acrylic, green	50	**6.285 694**
sterile	25	0.20	Acrylic, blue	50	**9.055 511**
sterile	25	0.45	Acrylic, yellow	50	**9.055 513**
sterile	25	0.80	Acrylic, green	50	**6.285 699**
sterile	25	0.20	Acrylic, transparent*	50	**6.285 703**
sterile	25	0.45	Acrylic, transparent*	50	**6.285 704**
sterile	25	0.80	Acrylic, transparent*	50	**6.285 705**

*Luer-Slip output

1

2

3

4

4 LLG Syringe Filter NY, Nylon/Polyamide

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. With Luer-Lock input and Luer-Slip output.

Type	Filter diam. mm	Pore size µm	Housing	PK	Cat. No.
non sterile	13	0.22	PP	500	**9.055 520**
non sterile	13	0.45	PP	500	**9.055 522**
non sterile	25	0.22	PP	500	**9.055 521**
non sterile	25	0.45	PP	500	**9.055 523**
sterile	25	0.22	Acrylic	50	**6.285 707**
sterile	25	0.45	Acrylic	50	**6.285 708**

1 LLG Syringe Filter PE, Polyethylene

1

Universal filter membrane for all analytical requirements. For aqueous and aggressive organic solvent filtration. Wide application in sample preparation, Ion chromatography. With Luer-Lock input and Luer-Slip output.

Type	Filter diam. mm	Pore size µm	Housing	PK	Cat. No.
non sterile	13	0.2	PP	500	**9.055 540**
non sterile	13	0.5	PP	500	**9.055 542**
non sterile	25	0.2	PP	500	**9.055 541**
non sterile	25	0.5	PP	500	**9.055 543**

2 LLG Syringe Filter RC, Regenerated cellulose

2

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. With Luer-Lock input and Luer-Slip output.

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

3 LLG Syringe Filter PTFE, Polytetrafluorethylene

3

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

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

4 LLG Syringe Filter PVDF, Polyvinylidene fluoride

4

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. With Luer-Lock input and Luer-Slip output.

Type	Filter diam. mm	Pore size µm	Housing	PK	Cat. No.
non sterile	13	0.20	PP	500	**7.970 258**
non sterile	13	0.45	PP	500	**9.055 534**
non sterile	25	0.20	PP	500	**7.970 387**
non sterile	25	0.45	PP	500	**7.970 286**
sterile	13	0.20	Acrylic	50	**6.285 697**
sterile	13	0.45	Acrylic	50	**6.285 698**
sterile	25	0.20	Acrylic	50	**6.258 299**
sterile	25	0.45	Acrylic	50	**6.285 702**

5 LLG Syringe Filter GF, Glass-fibre

5

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.
With Luer-Lock input and Luer-Slip output.

Type	Filter diam. mm	Pore size µm	Housing	PK	Cat. No.
non sterile	25	0.7	PP	500	**9.055 550**
non sterile	25	1.0	PP	500	**9.055 551**
non sterile	25	1.2	PP	500	**9.055 552**
non sterile	25	3.1	PP	500	**9.055 553**

1

1 Preparative HPLC columns Nucleosil® 100-5 C_{18}

Grain size 5 µm, pore dia. 100 Å. Octadecyl phase, endcapped, 15% C. *MACHEREY-NAGEL*

Type	Description	Column length mm	PK	Cat. No.
2 mm i.d.	EC- column	125	1	**9.003 866**
2 mm i.d.	EC- column	250	1	**9.003 871**
3 mm i.d.	EC- column	125	1	**9.003 867**
3 mm i.d.	EC- column	250	1	**9.003 872**
4 mm i.d.	EC- column	125	1	**9.003 868**
4 mm i.d.	EC- column	250	1	**9.003 873**
4.6 mm i.d.	EC- column	125	1	**9.003 869**
4.6 mm i.d.	EC- column	150	1	**9.003 870**
4.6 mm i.d.	EC- column	250	1	**9.003 874**

Further products can be found in our online shop.

2

2 EC analytical columns NUCLEODUR® 100-3 C_{18} ec, 3 µm

Octadecyl phases, 17.5 % C, particle size 3 µm. *MACHEREY-NAGEL*

Int. diam. mm	Length mm	PK	Cat. No.
2.0	50	1	**4.004 375**
3.0	50	1	**4.004 376**
4.0	50	1	**4.004 377**
4.6	50	1	**4.004 378**
4.6	100	1	**4.006 933**
2.0	125	1	**9.003 796**
3.0	125	1	**9.003 797**
4.0	125	1	**9.003 798**
4.6	125	1	**9.003 799**
4.6	150	1	**9.003 800**
2.0	250	1	**9.003 801**
3.0	250	1	**9.003 802**
4.0	250	1	**9.003 803**
4.6	250	1	**9.003 804**

3

3 EC analytical columns NUCLEODUR® 100-5 C_8 ec, 5 µm

Octyl phases, 10.5 % C, particle size 5 µm. *MACHEREY-NAGEL*

Int. diam. mm	Length mm	PK	Cat. No.
2.0	50	1	**4.004 521**
3.0	50	1	**4.004 522**
4.0	50	1	**4.004 523**
4.6	50	1	**4.004 524**
2.0	125	1	**4.004 525**
3.0	125	1	**4.004 526**
4.0	125	1	**4.004 527**
4.6	125	1	**4.004 528**
4.6	150	1	**4.004 529**
2.0	250	1	**4.004 530**
3.0	250	1	**4.004 531**
4.0	250	1	**4.004 532**
4.6	250	1	**6.228 531**

4

4 EC analytical columns NUCLEODUR® 100-5 C_{18} ec, 5 µm

Octadecyl phases, 17.5 % C, particle size 5 µm *MACHEREY-NAGEL*

Int. diam. mm	Length mm	PK	Cat. No.
2.0	50	1	**4.004 368**
3.0	50	1	**4.004 369**
4.0	50	1	**4.004 370**
4.6	50	1	**4.004 371**
4.6	100	1	**4.006 934**
2.0	125	1	**9.003 816**
3.0	125	1	**9.003 817**
4.0	125	1	**9.003 818**
4.6	125	1	**9.003 819**
4.6	150	1	**9.003 820**
2.0	250	1	**9.003 821**
3.0	250	1	**9.003 822**
4.0	250	1	**9.003 823**
4.6	250	1	**9.003 824**

1 VarioPrep preparative columns NUCLEODUR® 100-5 C_{18} ec, 5 µm

Octadecyl phases, 17.5 % C. Particle size 5 µm — *MACHEREY-NAGEL*

Int. diam. mm	Length mm	PK	Cat. No.
10	250	1	**4.004 752**

1

2 Tubing, PEEK

For use in LC, LCMS and automation technology. The polyetheretherketone (PEEK) tubing are a flexible alternative to stainless steel tubing in high pressure applications. — *Trajan Scientific*
The tubing are color coded to industry standards for easy identification of the inner diameter.
They are inert to most commonly used solvents. Exceptions are very caustic reagents, strong acids and bases.

- Smooth inner surface
- Good chemical resistance
- Bio-inert and biocompatible
- Operating temperature up to max. 100 °C
- Pressure stable up to 480 bar (7000 psi, 48000 kPa)

2

Int. diam. mm	Ext. diam. mm	Length m	Colour	PK	Cat. No.
0.13	1.6	1.5	red	1	**4.662 782**
0.18	1.6	1.5	yellow	1	**4.662 783**
0.25	1.6	1.5	blue	1	**4.662 784**
0.13	1.6	3	red	1	**4.662 785**
0.18	1.6	3	yellow	1	**4.662 786**
0.25	1.6	3	blue	1	**4.662 787**
0.13	1.6	15	red	1	**4.662 788**
0.18	1.6	15	yellow	1	**4.662 789**
0.25	1.6	15	blue	1	**4.662 790**
0.13	1.6	30.5	red	1	**4.662 791**
0.18	1.6	30.5	yellow	1	**4.662 792**
0.25	1.6	30.5	blue	1	**4.662 793**

3 Accessories for PEEK Tubing

Fingertight fittings for HPLC tubing made of PEEK. — *Trajan Scientific*

3

Type	Pressure max. bar	PK	Cat. No.
1/16" ... 10-32 UNF	345	10	**4.664 157**
1/32" ... 10-32 UNF (long)	345	10	**4.664 158**
1/32" ... 10-32 UNF	345	10	**4.664 159**
1/32" ... 6-40 UNF	190	5	**4.664 160**

4 HPLC column thermostat Jetstream II Plus

Peltier heating/cooling thermostat with a temperature range of 5-85 °C. Big compartment room for 4-5 HPLC columns with a length of 350-400 mm as well as space for valves, precolumns and column switch valves. Programmable via alphanumeric keyboard or RS 232 interface. The temperature control allows isothermal steps and linear gradients for up to 99 temperatures. With two-way forced-air circulation and double sensor reference technology, that means very good temperature distribution, temperature stability and repeatability. — *VDS optilab*

4

- For horizontal and vertical use
- Independent from room temperature due to Peltier elements
- Autocalibration and temperature correction via keyboard
- Permanent display of set/actual temperature
- Safety switch-off for thermal protection of the columns, selectable sensitivity
- Leak detector with acoustic warning signal and device switch-off, selectable sensitivity
- Continuous monitoring of all functions with overload protection
- LCD display

Specifications

Operating temperature range:	5 ... 85 °C
Temperature accuracy:	±0.5 K
Temperature stability:	±0.15 K
Temperature gradient:	1 K/2 min
Dimensions (W x H x D):	135 x 450 x 310 mm
Weight:	11 kg
Power supply:	100 ... 245 V, 50/60 Hz

Type	PK	Cat. No.
Jetstream II Plus	1	**4.663 363**

1

1 Sample Concentrators SBHCONC/1

Stuart

A sample concentrator is a fast and convenient way of concentrating multiple samples in a block heater at once. Utilising a simple gas delivery system the sample concentrator passes an inert gas over the surface of the samples via stainless steel needles. This in combination with the heat from the block heater below produces ideal conditions for fast, efficient evaporation.

- Gas reservoir located on adjustable stand for accurate height control
- Needles available with 76 and 127 mm length
- Needles available with PTFE-coating for corrosive solutions
- Compatible with Stuart SBH130D/3 and SBH200D/3 Block heaters

Scope of supply: Gas reservoir and stand

Please order Dry block, inserts and needles separately.

Type	PK	Cat. No.
SBHCONC/1	1	**6.235 249**

Accessories for Sample Concentrators SBHCONC/1

Stuart

Description	PK	Cat. No.
Gas chamber sealing pad	1	**7.910 023**
Needles, stainless steel, 76 mm	100	**6.235 631**
Needles, stainless steel, 127 mm	100	**6.235 250**
Needles, PTFE-coated, 76 mm	100	**6.236 370**
Needles, PTFE-coated, 127 mm	100	**6.252 395**

2

2 LLG-Test tubes, soda-lime glass

Test tubes with round bottom.Hydrolytic resistance: Class HGB 3 acc. to ISO 719, Type III acc. to C - USP.

Diam. mm	Length mm	PK	Cat. No.
8	70	100	**6.201 034**
10	100	100	**6.801 073**
12	100	100	**7.607 198**
14	130	100	**6.800 620**
16	130	100	**6.800 382**
16	160	100	**7.600 405**
20	180	100	**7.607 778**
25	150	50	**6.800 621**
30	200	50	**7.600 324**
30	100	100	**6.267 806**
15	100	100	**7.651 872**
16	120	100	**7.651 871**
18	130	100	**7.652 552**

1 Chromatographic columns, PTFE-/or Valve Stopcock, borosilicate glass 3.3

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*

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

1

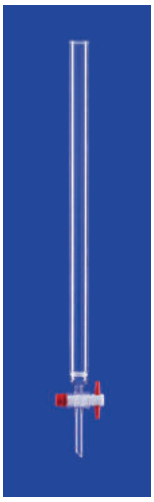
Chromatographic columns, PTFE- or Valve Stopcock, DURAN® tubing

Made of DURAN® tubing. Chromatography columns with sintered frit, porosity 0. *Lenz*

Available in three versions:
- with beaded rim and PTFE stopcock
- with NS socket and PTFE stopcock
- with NS socket and needle-valve stopcock (bore 0 - 2.5 mm)

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

2



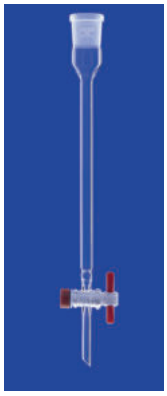
6.202 416

3 Chromatographic columns, 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*

Description	Capacity ml	Int. diam. mm	Length mm	PK	Cat. No.
with NS 14/23 socket	15	10	200	1	**9.025 932**
with NS 14/23 socket	35	15	200	1	**6.235 814**
with NS 29/32 socket	125	20	400	1	**9.025 934**
with NS 29/32 socket	430	30	600	1	**9.025 936**
with NS 29/32 socket	1000	40	800	1	**9.025 938**

3



Stands and fittings - please see page 179.

4 Seasand for Chromatographic columns

Acid washed, calcined. Pack of 1000 g. *MACHEREY-NAGEL*

Description	PK	Cat. No.
Seasand, acid washed, calcined, pack of 1000 g	1	**6.700 265**

4

5 Glass wool

Extra fine. In packs as outlined below.

Capacity g	PK	Cat. No.
1000	1	**9.114 310**

5

1

1 Quartz wool

Silica. Fibre thickness 4 µm to 12 µm. *proQuarz*

Capacity g	PK	Cat. No.
500	1	**9.114 331**

Quartz Sand

BÜCHI

Granulation	Weight kg	PK	Cat. No.
0.3 - 0.9 mm	2.5	2500	**6.059 700**

2

2 Silica adsorbents for low pressure column chromatography

Standard silica 60, pore size ~ 60 Å; pore volume ~ 0.75 ml/g; spec. surface BET ~ 500 m²/g, highly porous, amorphous silicic acid in the form of hard, opalescent particles, prepared by precipitation of water glass with sulphuric acid. 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. Further silica adsorbentson request. *MACHEREY-NAGEL*

Description	Particle size	Weight kg	PK	Cat. No.
Silica 60, 0.015 - 0.04 mm	-	1	1	**4.004 999**
Silica 60, 0.015 - 0.04 mm	-	5	1	**4.005 001**
Silica 60, 0.015 - 0.04 mm	-	25	1	**4.005 000**
Silica 60, 0.04 - 0.063 mm	230 - 400 mesh	1	1	**4.004 968**
Silica 60, 0.04 - 0.063 mm	230 - 400 mesh	5	1	**4.004 970**
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	1	1	**4.004 971**
Silica 60 M, 0.04 - 0.063 mm	230 - 400 mesh	5	1	**4.004 973**
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	1	1	**4.004 974**
Silica 60, 0.05 - 0.1 mm	130 - 270 mesh	5	1	**4.004 976**
Silica 60, 0.05 - 0.1 mm	130 - 270 mesh	25	1	**4.004 975**
Silica 60, 0. 063 - 0.2 mm	70 - 230 mesh	1	1	**4.004 957**
Silica 60, 0. 063 - 0.2 mm	70 - 230 mesh	5	1	**4.004 959**
Silica 60, 0. 063 - 0.2 mm	70 - 230 mesh	25	1	**4.004 958**
Silica 60, < 0.063 mm	+ 230 mesh	1	1	**4.004 977**
Silica 60, < 0.063 mm	+ 230 mesh	5	1	**4.004 979**
Silica 60, < 0.063 mm	+ 230 mesh	25	1	**4.004 978**
Silica 60, 0.2 - 0.5 mm	35 - 70 mesh	1	1	**4.004 962**
Silica 60, 0.2 - 0.5 mm	35 - 70 mesh	5	1	**4.004 964**
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	1	1	**4.004 965**
Silica 60, 0.5 - 1.0 mm	18 - 35 mesh	5	1	**4.004 967**
Silicia FIA fine	0.071 - 0.16 mm	1	1	**4.004 980**
Silicia FIA coarse	0.071 - 0.63 mm	1	1	**4.004 981**

3

3 Aluminium oxide adsorbents for low pressure column chromatography

Aluminium oxides produced by dehydration of different aluminium hydroxides, e. g. hydrargillite between 400 and 500°C, activity grade I, particle size 50 to 200µm, specific surface (BET) ~ 130m²/g. *MACHEREY-NAGEL*

Type	Range pH	Weight kg	PK	Cat. No.
Aluminium oxide 90 basic	9,5 ± 0,3	1	1	**4.004 934**
Aluminium oxide 90 neutral	7 ± 0,5	1	1	**6.231 726**
Aluminium oxide 90 acidic	4 ± 0,3	1	1	**4.004 939**
Aluminium oxide 90 basic	9,5 ± 0,3	5	1	**4.004 936**
Aluminium oxide 90 neutral	7 ± 0,5	5	1	**4.004 938**
Aluminium oxide 90 acidic	4 ± 0,3	5	1	**4.004 941**
Aluminium oxide 90 basic	9,5 ± 0,3	25	1	**4.004 935**
Aluminium oxide 90 neutral	7 ± 0,5	25	1	**4.004 937**
Aluminium oxide 90 acidic	4 ± 0,3	25	1	**4.004 940**

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

DWK Life Sciences

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.

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

2 HPLC reservoir bottles DURAN®, borosilicate 3.3 glass, with conical base

DWK Life Sciences

The DURAN® reservoir bottles have been designed for use in high-performance liquid chromatography (HPLC) and allows longer, uninterrupted analyses. A central cavity in the bottom of the bottle allows mobile phases and solvents to be dispensed without tilting the bottle. Side vent hole in the base for ultrasonic bath degassing, or water drainage after cleaning. Screw caps HPLC (PTFE, GL 45, 3 ports) available as accessories.

- GL 45 Thread
- ISO 3585
- Type I neutral glass, by USP/EP
- With Retrace Code and certificate for manufacturing lot traceability
- Available in four sizes: 1, 2, 5, or 10 Litres
- 5 and 10 litre bottles can accommodate magnetic stirring bars
- Durable white enamel volume graduations
- Autoclavable at 121°C or 134°C

Nominal capacity ml	Diam. mm	Height mm	Neck thread GL	PK	Cat. No.
1000	110	295	45	1	**4.665 543**
2000	145	309	45	1	**4.665 544**
5000	190	386	45	1	**4.665 545**
10000	235	481	45	1	**4.665 546**

3 4 Flexible connecting system for DURAN® GL 45 flasks

DWK Life Sciences

For safe transfer of liquid media within a closed and sterile system (evaporation is reduced).

- Screw closure GL 45 with two, three or four ports GL 14 thread
- Autoclavable
- Temperature restistant up to max. 140 °C
- Flexible modular system
- Sterile pressure equalisation is possible through use of a membrane filter
- Unused ports can be provided with a blind cap

Description	PK	Cat. No.
Scew cap GL 45, 2 ports x GL 14	1	**6.227 780**
Screw cap GL 45, 3 port x GL 14	1	**7.623 018**
Screw cap GL 45, 4 ports (4 x M8 screw caps, 12 x silicone seals)	1	**6.226 328**
Screw cap GL 14 for tubing connector	1	**6.227 781**
Screw cap, PBT with PTFE coated seal, GL 14, red	1	**7.623 838**
Liner for GL 14 screw cap, 1.6 mm i.d. hole	1	**6.229 494**
Liner for GL 14 screw cap, 3 mm i.d. hole	1	**6.229 495**
Liner for GL 14 screw cap, 3.2 mm i.d. hole	1	**6.230 213**
Liner for GL 14 screw cap, 6 mm i.d. hole	1	**6.227 782**
Pressure equalising set, for 2- and 3-Port screw cap, incl. 0.2 µm membrane filter, GL 14	1	**6.228 023**
Pressure equalising set, 4-Port screw cap, incl. 0.2 µm membrane filter	1	**6.226 915**
Spare set for HPLC screw cap	1	**6.226 329**
Membrane filter for pressure equilisation, 0,2 µm	1	**6.230 844**

1

6.313 835

b.safe-Caps, GL45, PPS

NEW

b.safe

Screw cap for thread GL 45 made of PPS, freely turnable distributor body made of PTFE with female threads UNF ¼" 28 G for connecting capillary tubing (O. D. 3.2 mm) or a b.safe air valve.

Scope of supply:
Cap A: 2 x connections, 1 x fitting (PFA), 1 x air valve
Cap B: 3 x connections, 2 x fittings (PFA), 1 x blind fitting (PFA), 1 x air valve
Cap C: 4 x connections, 3 x fittings (PFA), 2 x blind fittings (PFA), 1 x air valve

Type	Thread	PK	Cat. No.
A	GL 45	1	**6.313 834**
B	GL 45	1	**6.313 835** 1
C	GL 45	1	**6.313 836**

2

2 Air valves, PP

NEW

b.safe

Red/yellow. With connecting thread UNF ¼" 28G. Filter membrane made of PTFE/PP with a porosity of 1 µm and integrated non-return valve made of silicone. With service life indicator.

Diam. mm	Life time	PK	Cat. No.
20	6 months	2	**6.313 842**
20	6 months	10	**6.313 843**
20	6 months	50	**6.313 844**

3

6.313 837

WasteCaps, GL 45, PPS

NEW

b.safe

Screw cap for thread GL 45 made of PPS, freely turnable distributor body made of PTFE with female threads: UNF ¼" 28 G for connecting capillary tubing (O. D. 1.6, 2.3 or 3.2 mm) or NPT 1/8" for a hose connector for flexible tubing with I.D. 6.4 or 9 mm, GL 14 for connecting a b.safe exhaust filter (not included).

Scope of supply:
Cap A: Connections: 3 x UNF ¼" 28G, 1 x GL 14, Fittings: 3 x 1.6 mm, 3 x 2.3 mm, 2 x 3.2 mm, 2 x blind fittings
Cap B: Connections: 2 x UNF ¼" 28G, 1 x NPT 1/8", 1 x GL 14, Fittings: 2 x 1.6 mm, 2 x 2.3 mm, 2 x 3.2 mm, 1 x hose connector, 2 x blind fittings

Type	Thread	PK	Cat. No.
A	GL 45	1	**6.313 837** 3
B	GL 45	1	**6.313 838**

4

6.313 840

Exhaust Filter, PP

NEW

b.safe

Lid with integrated ventilation openings and service life indicator. The filling of activated carbon is protected by two porous membranes made of PE. This allows an unobstructed flow of exhaust air, solvents are adsorbed by the activated carbon and only filtered air streams out.

Type	Life time	Neck thread GL	PK	Cat. No.
SMALL	3 months	14	2	**6.313 839**
MEDIUM	6 months	14	2	**6.313 840** 4
LARGE	6 months	14	2	**6.313 841**

b.safe-Caps Starter Boxes, GL 45, PPS

NEW

b.safe

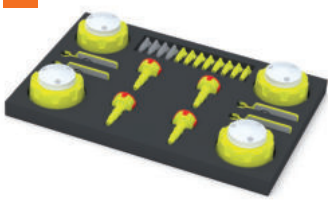
Initial equipment for HPLC with b.safe-Caps for bottles with thread GL 45. Furthermore fittings for easy connection of capillary tubing, blind fittings for closing unused connections and air valves for a trouble-free withdrawal of solvents are included.

Scope of supply:
Starter Box 1:
- 3 x b.safe-Cap GL 45 with 2 connections UNF ¼" 28G
- 1 x b.safe-Cap GL 45 with 3 connections UNF ¼" 28G
- 4 x Air valve with service life indicator
- 5 x Fittings yellow for tubing O.D. 3.2 mm
- 1 x Blind fitting

Starter Box 2:
- 4 x b.safe-Cap GL 45 with 3 connections UNF ¼" 28G
- 8 x Air valve with service life indicator
- 4 x Fittings yellow for tubing O.D. 3.2 mm
- 4 x Blind fittings

Type	Thread	PK	Cat. No.
Starter Box 1	GL 45	1	**6.313 845**
Starter Box 2	GL 45	1	**6.313 846** 1

1



6.313 846

2 3 SafetyCaps Generation 2.0 for HPLC solvent supply

S.C.A.T.

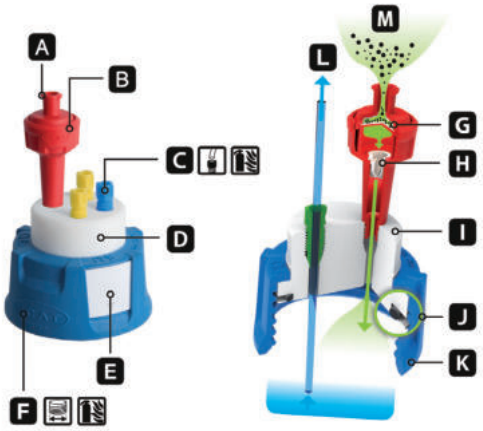
Maximum safety for HPLC solvent supply. The integrated air valve (B) blocks hazardous vapours and cleans the inflowing air (M) from dust and dirt particles.

- Protection against escaping solvent vapours
- Solvents (L) und and mixtures remain clean and stable
- No twisted tubing, easy container exchange
- No air intake in to the HPLC system
- Reproducible analytical results through stable mobile phase
- Use the supplied blind plugs to tighten connections which are temporarily inactive or not in use

- Air valve (B) with PTFE filter (G) and Luer-Lock adapter (A)
- Valve membrane (H) optimized for analytical and preparative flow rates
- Improved PFA fittings (C)
- Body (D/I) made of medical grade PTFE, food safe, FDA conform
- Screw cap (F) made of PPS, autoclavable/sterilisable up to 200 °C
- PTFE and PPS with excellent chemical resistance and flammability classification V-0 (UL-94)
- Insertion label (E) for individual inscription
- Improved FKM seal (J) for stable fit on any bottle
- Improved ergonomics and construction (K)

2

3



4 SafetyCaps Generation 2.0, GL 45

NEW

S.C.A.T.

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.

Description	Connections	Thread	PK	Cat. No.
SafetyCaps I (V 2.0)	1 capillary (3.2mm o.d.)	GL 45	1	**4.669 370**
SafetyCaps II (V 2.0)	2 capillaries (3.2mm o.d.)	GL 45	1	**4.669 371**
SafetyCaps III (V 2.0)	3 capillaries (3.2mm o.d.)	GL 45	1	**4.669 372**
SafetyCaps IV (V 2.0)	4 capillaries (3.2mm o.d.)	GL 45	1	**4.669 373**
SafetyCaps VI (V 2.0)	6 capillaries (3.2mm o.d.)	GL 45	1	**4.669 374**

4

1

1 Air valves Generation 2.0 for SafetyCaps

NEW

S.C.A.T.

- Thread size UNF 1/4" 28G
- Luer Lock adapter
- PTFE Filter
- Valve membrane blocks vapours and opens at negative pressure
- It is recommended to replace the valve every 6 months

Type	Flow rate amount ml/min	PK	Cat. No.
Air valves 2.0	400	1	**4.669 375**
Air valves 2.0 (refill pack of 10)	400	10	**4.669 376**
Air valves 2.0 (refill pack of 50)	400	50	**4.669 377**

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4.669 378

3

4.678 694

HPLC starter kits Generation 2.0, GL 45

NEW

S.C.A.T.

- Complete set for one HPLC system with up to 4 solvent reservoirs
- Price advantage compared to ordering piece by piece
- Suitable for all current HPLC systems
- Use the supplied blind plugs to tighten connectors which are temporarily inactive or not in use

Contents of the different sets:
HPLC SafetySet 1: 3 x SafetyCaps I (V 2.0), 1 x SafetyCap II (V 2.0), 1 x blind plug UNF 1/4" 28G, 4 x air valve
HPLC SafetySet 2: 4 x SafetyCaps II (V 2.0), 4 x blind plug UNF 1/4" 28G, 4 x air valve
HPLC SafetySet 3: 4 x SafetyCaps III (V 2.0), 8 x blind plug UNF 1/4" 28G, 12 x fitting 1.6 mm, 12 x fitting 2.3 mm, 12 x fitting 3.2 mm, 4 x air valve, 8 x insertion label

Type	PK	Cat. No.
HPLC safety set 1	1	**4.669 378** 2
HPLC safety set 2	1	**4.669 379**
HPLC safety set 3	1	**4.678 694** 3

4

9.139 809

7 SafetyWasteCaps for HPLC waste

S.C.A.T.

Collect fluid waste safely for protection of health and environment: SafetyWasteCaps block hazardous solvent vapours and provide safe pressure equalisation within the waste container. Due to high end materials, the caps are chemically resistant even against aggressive organic solvents.

- The exhaust filter (A) catches escaping solvent vapours (B)
- The active carbon (C) provides an active filtering surface of 1.200m²/g - optimised for solvent vapours
- Pre-filter (D) for optimised air flow
- Afterfilter (E) provides safe enclosure and keeps the filter clean
- Tubing and capillaries remain safely fixed (F)
- No twisted tubing, freely rotatable cap enables easy container exchange (G)

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9.139 867

- Body (H) made of medical grade PTFE, food safe, FDA conform
- Screw cap (G) made of PPS, autoclavable/sterilisable up to 200 °C
- PTFE and PPS material provides excellent chemical resistance and flammability classification V-0 (UL-94)
- Improved FKM seals (I) for maximum tightness
- Improved PFA fittings (F)
- Improved ergonomics, stable construction

6

6.314 960

Further thread sizes and configurations are available on demand. Fittings for capillary/tubing connections are included in delivery. Please choose a filter size and order your exhaust filter separately (see chapter "Exhaust Filters for SafetyWasteCaps").

7

Thread	Connection diam. outside	Connection diam. inside	PK	Cat. No.
S40/GL40	2 x 2,3 / 3,2 mm	1 x 6,4 ... 9,0 mm	1	**9.139 896**
S40/GL40	3 x 2,3 / 3,2 mm	-	1	**7.628 820**
GL 45	2 x 2,3 / 3,2 mm	1 x 6,4 ... 9,0 mm	1	**9.139 809** 4
GL 45	3 x 2,3 / 3,2 mm	-	1	**9.139 806**
GL 45	4 x 2,3 / 3,2 mm	1 x 6,4 ... 9,0 mm	1	**6.312 280**
S51	2 x 2,3 / 3,2 mm	1 x 6,4 ... 9,0 mm	1	**4.005 583**
S55	2 x 2,3 / 3,2 mm	1 x 6,4 ... 9,0 mm	1	**4.005 584**
S60/61	3 x 2,3 / 3,2 mm	-	1	**9.139 867** 5
S60/61	2 x 2,3 / 3,2 mm	1 x 6,4 ... 9,0 mm	1	**9.139 868**
S60/61*	3 x 1,6 / 3 x 2,3 / 3 x 3,2 mm	3 x 6,4 ... 9,0 mm	1	**6.314 960** 6
S70/71	2 x 2,3 / 3,2 mm	1 x 6,4 ... 9,0 mm	1	**4.005 585**
S90	4 x 2,3 / 3,2 mm	1 x 6,4 ... 9,0 mm	1	**9.139 870**

* contains blind plugs and tube connectors

1 2 Exhaust filters for SafetyWasteCaps 2.0

NEW

S.C.A.T.

The exhaust filter cleans the exhaust air of the HPLC waste containers. It protects operators and environment from harmful solvent vapours. The S.C.A.T. active carbon is optimised to adsorb organic solvents, and offers an active filtering surface of 1200 m²/g. The splash guard avoids contamination of the filter by dripping or spilled liquids. Depending on the required capacity, 3 different filter sizes with different service lifes are available.

Description	Filter size	Life time	Neck thread GL	PK	Cat. No.
With interchangeable label + splash guard	M	6 months	14	1	**4.669 380** 3
Supply pack with interchangeable label + splash guard	M	6 months	14	2	**4.669 381**
With change indicator + splash guard	M	6 months	14	1	**4.669 382** 4
Supply pack with change indicator + splash guard	M	6 months	14	2	**4.669 383**

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4.669 380

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4.669 382

5 Thread adapters for SafetyCaps/SafetyWasteCaps, female/male thread

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S.C.A.T.

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

Thread inside	Thread outside	Material	Colour	PK	Cat. No.
GL38	GL45	PTFE	white	1	**9.139 882**
S40/GL40	GL45	PTFE	white	1	**9.139 883**
53B	GL45	PTFE	white	1	**4.005 456**
GL45	S55	PTFE	white	1	**4.005 791**
S42	GL45	PP	clear	1	**4.005 950**

Tube fittings for the tube connector Safety Waste Caps

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7.940 304

7

4.005 793

S.C.A.T.

Connectors for variable tube connector sizes on Safety Waste Caps.
Further configurations available on request.

Description	Int. diam. mm	Material	PK	Cat. No.
Tube fitting, curved	6,4-9,0	PP	1	**7.940 304** 6
Tube fitting, straight	3,0-4,0	PP	1	**4.005 558**
Tube fitting, straight for capillary connector	6,0-8,0	PP	1	**4.005 793** 7
Tube fitting, angled	9,5-10,0	PP	1	**4.005 556**

10 SafetyWasteCaps with safety funnel for liquid waste

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6.266 051

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9.139 876

S.C.A.T.

The safety funnel with shut-off valve is operated manually during the disposal of liquids.
The safety funnel with automatic closure shuts the container 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.

Please choose a filter size and order your exhaust filter separately (see chapter "Exhaust filters for SafetyWasteCaps").

10

Thread	Connection diam. outside	Connection diam. inside	PK	Cat. No.
S50	2x 2.3/3.2 mm	-	1	**9.139 874**
S55	2x 2.3/3.2 mm	-	1	**9.139 875**
S51*	2x 2.3/3.2 mm	1x 6.4-9.0 mm	1	**6.266 051** 8
S51	2x 2.3/3.2 mm	1x 6.4-9.0 mm	1	**6.264 449**
S60/61	2x 2.3/3.2 mm	-	1	**9.139 876** 9

* with shut-off valve.

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4.005 613

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2 SafetyWasteCaps with mechanical level control

S.C.A.T.

The red floater is immediately visible when the container has reached the critical fill level. Perfect for canisters of opaque material, where the fill level is not visible from the outside.
- Approved S.C.A.T. technology of the SafetyWasteCaps
- Different thread sizes
- Connections for capillaries and tubings
- Mechanical or electronic (E) level control
- With connection for S.C.A.T. exhaust filters

Please choose a filter size and order your exhaust filter separately (see chapter "Exhaust filters for SafetyWasteCaps").
Further thread sizes are available on request.

Thread	Connection diam. outside	Connection diam. inside	PK	Cat. No.	
S55	2x 2.3/3.2 mm	1x 6.4-9.0 mm	1	**4.005 612**	
S60/61	2x 2.3/3.2 mm	1x 6.4-9.0 mm	1	**4.005 613**	1
S90	4x 2.3/3.2 mm	1x 6.4-9.0 mm	1	**4.005 616**	
B83	4x 2.3/3.2 mm	1x 6.4-9.0 mm	1	**4.005 717**	

Collectors for tube connector for SafetyWasteCaps

S.C.A.T.

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

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**	3
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**	4
3 x connectors (straight) for 3 capillaries diam. 6.4mm i.d.	PTFE/PP	1	**6.262 289**	5
2 x connectors (90°) for 3 tubings diam. 6.4-9.0mm i.d.	PTFE/PP	1	**4.005 865**	6
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**	7

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9.139 888

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4.005 859

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6.262 289

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4.005 865

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4.005 976

1 Fittings and Ferrules for capillary connector for SafetyCaps/SafetyWasteCaps

Fittings with integrated ferrule for SafetyCaps and SafetyWasteCaps. *S.C.A.T.*
Use the blind plugs to tighten connectors which are temporarily inactive or not in use.

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

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9.139 890

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4.005 504

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4.005 883

5 Inlet filter for solvents

HPLC solvent filters for 3.2mm OD tubing. *S.C.A.T.*

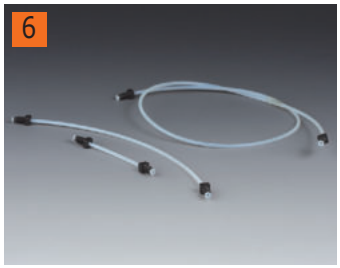
Description	PK	Cat. No.
HPLC solvent filter, PP, for 1/8" dia. (3.2mm o.d.)	5	**4.005 890**
HPLC solvent filter, PFA/PTFE, for 1/8" (3.2mm o.d.)	5	**4.005 891**

5

6 Flanged Tubing, PTFE, PA

Flanged PTFE tubing with black tube end fittings UNF ¼" 28 G made of PP and washers made of PA. The tubing is ready for use. Temperature resistant from 0 to +100 °C, pressure resistant up to 30 bar, universal chemical resistance. *BOLA*

6



Int. diam. mm	Ext. diam. mm	Overall length mm	PK	Cat. No.
0.8	1.6	100	1	**6.231 140**
0.8	1.6	250	1	**6.078 162**
0.8	1.6	750	1	**6.263 025**
0.8	1.6	1000	1	**6.801 712**
1.6	3.2	100	1	**6.262 704**
1.6	3.2	250	1	**6.237 591**
1.6	3.2	500	1	**6.071 880**
1.6	3.2	750	1	**6.258 092**

7 8 Multiple bottle distributors, HDPE

The S.C.A.T. system for solvent safety remains permanently closed, the "safety chain" is not interrupted during the rinsing process of the HPLC system. After the analysis has been completed, the system is cleanly returned to its original state. *S.C.A.T.*

- Up to 4 SafetyCaps can be installed on the rinsing bottle
- Simple and safe handling due to firmly seated capillaries
- GLS 80 (w) thread
- 4 x GL 45 (m) connections
- Electrically conductive

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Connections	Material	PK	Cat. No.
4 x GL 45	HDPE	1	**4.665 768**

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1 Hydrogen generator Precision Hydrogen SL

NEW

Peak Scientific

The smallest hydrogen generator from the Precision Hydrogen SL line, safely and continuously produces laboratory-grade hydrogen, with a purity of 99.9995 %, for GC-FID.
This generator comes in a choice of manual water fill, auto water fill or with pressurised water fill.

- Minimal hydrogen storage in the system
- Very low maintenance requirements
- Auto-shutdown fail-safe

Specifications

Purity:	99.9995 %
Max. pressure:	6.9 bar
Required water quality:	<1.0 µS/cm
Gas connection:	1 x 1/8" Swagelok compression fitting
Permissible ambient temperature:	10 ... 35 °C
Dimensions (W x D x H):	160 x 355 x 250 mm
Weigth:	8.0 kg
Power supply:	100 ... 240 V, 50/60 Hz
Warranty:	2 years

Type	Description	Flow rate L / min.	Colour	PK	Cat. No.
SL 100	With manual water fill	100	black	1	**4.678 137**
SL 100	With manual water fill	100	white	1	**4.678 138**
SL 100	With auto water fill	100	black	1	**4.678 139**
SL 100	With auto water fill	100	white	1	**4.678 140**
SL 100	With pressurised water fill	100	black	1	**4.678 141**
SL 100	With pressurised water fill	100	white	1	**4.678 142**
SL 200	With manual water fill	200	black	1	**4.678 143**
SL 200	With manual water fill	200	white	1	**4.678 144**
SL 200	With auto water fill	200	black	1	**4.678 145**
SL 200	With auto water fill	200	white	1	**4.678 146**
SL 200	With pressurised water fill	200	black	1	**4.678 147**
SL 200	With pressurised water fill	200	white	1	**4.678 148**

2

2 Hydrogen generators Precision Hydrogen

NEW

Peak Scientific

For the safe and continuous production of hydrogen with a purity of 99.9995% for GC and GC/MS.

- On-demand generation of high-purity hydrogen as detector gas for the FID
- Compact, modular and stackable system
- Hydrogen production from deionised water using proton exchange membrane
- Internal leakage detection with automatic switch-off function
- Minimal hydrogen storage in the system
- Front LED touch screen with status display
- Can be individually combined with PEAK zero nitrogen and zero air systems
- Systems are available with different flow rates
- Very low maintenance requirements
- 3 years warranty on the hydrogen cell

Scope of supply: Hydrogen generator, 1 m Tygon® tubing, Deioniser column refill, barbed hose fitting, mains power cable for EU, UK and US, 2 x transit plugs

Specifications

Purity:	99.9995 %
Max. pressure:	6.9 bar/100 psi
Required water quality:	<1.0 µS/cm
Gas connection:	1/8" Swagelok
Permissible ambient temperature:	10 ... 35 °C
Dimensions (W x D x H):	380 x 540 x 406 mm
Power supply:	110/230 V, 50/60 Hz
Warranty:	3 years (cell)/1 year (device)

Type	Flow rate L / min.	Weight kg	PK	Cat. No.
Precision Hydrogen 100	0.10	29	1	**4.669 273**
Precision Hydrogen 200	0.20	29	1	**4.669 274**
Precision Hydrogen 300	0.30	29	1	**4.669 275**
Precision Hydrogen 450	0.45	29	1	**4.669 276**
Precision Hydrogen 1200	1.20	38	1	**4.669 277**

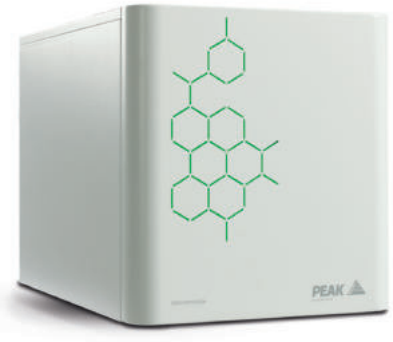
1 Nitrogen generators Precision Nitrogen

NEW

1

Peak Scientific

Nitrogen generators for the GC. For safe and continuous production of nitrogen with a purity of 99.9995%.



- On-demand generation of nitrogen as purge gas and for sample preparation in standard analyses
- Compact, modular and stackable system
- Constant and uniform supply for reliable and reproducible analyses
- Can be individually combined with PEAK hydrogen and zero air generators
- No contamination of the system
- Very fast start time and rapid achievement of the required operating purity
- Available with different flow rates
- Generator for headspace requirements available, compatible with most headspace samplers
- Very low maintenance requirements

Scope of supply: Nitrogen generator, 1 m PTFE tubing, 1/4" compression fitting, 1/8" compression fitting, mains power cable for EU, UK and US

Specifications

Purity:	99.9995 %
Gas connection:	1/4"
Permissible ambient temperature:	5 ... 35 °C
Dimensions (W x D x H):	380 x 540 x 256 mm
Power supply:	110/230 V, 50/60 Hz
Warranty:	1 year

Type	Flow rate L / min.	Pressure max. bar	Weight kg	PK	Cat. No.
Precision Nitrogen 250	0.25	5.5 (80 psi)	21	1	**4.669 267**
Precision Nitrogen 600	0.60	5.5 (80 psi)	21	1	**4.669 268**
Precision Nitrogen 1000	1.00	5.5 (80 psi)	26	1	**4.669 269**

2 Zero Air generators Precision Zero Air

NEW

2

Peak Scientific

Generates clean, dry and hydrocarbon-free air for FIDs in GC.
Also meets the purity requirements for trace analysis.

- Fail-safe, continuous generation of zero air
- Hydrocarbon content <0.05 ppm
- Modular design and combination option with other PEAK Precision devices
- Minimal maintenance
- No replacement of the catalyst chamber required
- Compatible with the Precision Air Compressor
- Status display

Scope of supply: Zero air generator, 3 m PTFE tubing, 1/4" compression fitting, 1/8" compression fitting, mains power cable for EU, UK and US

Specifications

Hydrocarbon content:	<0.05 ppm
Permissible ambient temperature:	5 ... 35 °C
Power supply:	110/230 V, 50/60 Hz
Warranty:	1 year

Type	Flow rate L / min.	Pressure max. bar	Weight kg	External dimensions (W x D x H) mm	PK	Cat. No.
Precision Zero Air 1.5L	1.5	5.5 (80 psi)	16	380 x 540 x 156	1	**4.669 281**
Precision Zero Air 3.5L	3.5	5.5 (80 psi)	16	380 x 540 x 156	1	**4.669 282**
Precision Zero Air 7L	7.0	5.5 (80 psi)	25	380 x 540 x 256	1	**4.669 283**
Precision Zero Air 18L	18.0	5.5 (80 psi)	25	380 x 540 x 256	1	**4.669 284**
Precision Zero Air 30L	30.0	6.9 (100 psi)	41	380 x 540 x 405	1	**4.669 285**

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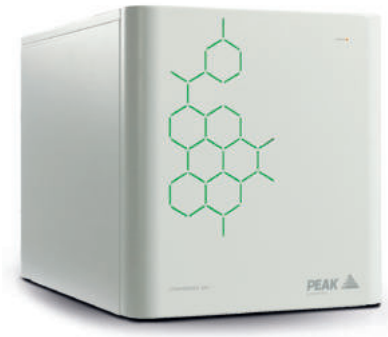


1 Air compressor for GC

NEW

For compressed air supply of Precision nitrogen and zero air generators for the GC. *Peak Scientific*

- For simultaneous supply of nitrogen and zero air generators in one stack
- Can be stacked and combined with all Precision modules
- Very quiet and low-vibration operation
- With maintenance and repair status displays

Scope of supply: 3 m PTFE tubing, 2 x 1/4" compression fitting, 1/4" tee compression fitting, 2.5 mm hex key, mains power cable for EU, UK and US

Specifications:

Max. pressure:	8.27 bar/120 psi
Gas connection:	1/4"
Permissible ambient temperature:	5 ... 35 °C
Dimensions (W x D x H):	380 x 540 x 406 mm
Weight:	42 kg
Power supply:	208 ... 230 V, 50/60 Hz
Warranty:	1 year

Type	PK	Cat. No.
Precision Air Compressor	1	**4.669 286**

2

2 Gas chromatography flow meter GF500

Convenient digital flow meter for the simple, accurate and repeatable measurement of flow in gas chromatographs. User friendly, handy design. Can be used with the carrier gases Air, Hydrogen, Nitrogen, Helium, Carbon dioxide, Argon and Argon/Methane. *Carl Stuart Limited*
OLED display shows flow rate and further information. With pressure and temperature compensation. Suitable for columns with diameters of 100, 180, 200, 250, 320, 450, 530 and 750 µm.

- Measurement of flow rate, linear velocity and split ratio
- High resolution
- 25 point calibration, traceable to National Standards
- Rechargeable battery
- Auto power off

Scope of supply: Flow meter with case, tubings, tubing adapter fittings, tubing clips, tie-wraps, universal charger with USB connector, operation manual, calibration certificate.

Please order adapters for direct connection to the detector separately.

Specifications

Range:	0…500 ml/min. (0…300 ml CO_2)
Accuracy:	0.4 ml/min./±2.5 %
Resolution:	0.1 ml/min.
Operating temperature:	15…35 °C, calibrated at 21±2 °C
Inlet pressure:	max. 175 kPa
Dimensions:	68 x 30 x 130 mm
Weight:	150 g

Type	PK	Cat. No.
GF500 flow meter set	1	**4.661 928**

3

4.661 930

Accessories for gas chromatography flow meters GF500/GF1000

Adapters for detectors and other accessories. *Carl Stuart Limited*

Type	PK	Cat. No.
Adapter for FID detectors	1	**4.661 929**
Adapter for ECD detectors	1	**4.661 930**
Adapter for TCD detectors	1	**4.661 931**
Adapter for NPD detectors	1	**4.661 932**
Split vent adapter	1	**4.661 933**
Calibration for GF500	1	**4.661 935**
Calibration for GF1000	1	**6.276 162**

1 Gas chromatography flow meter GF1000

NEW

1

Carl Stuart Limited

Very robust, portable device for measuring the flow rate of gas chromatographs and for calibrating air sampling canisters. Measurement is performed in real time, allowing simultaneous flow and pressure measurement to improve validation efficiency. Reduces downtime.

- For real-time measurement of more than 30 common gases over a wide range
- Check the volume flow, mass flow, pressure and temperature at the inlet and detector outlet of the GC
- Flow calibration with NIST-traceable accuracy
- Immediately ready for use after switching on, measurement completed within 20 seconds
- Fast response time of 10 ms
- TFT display
- RS232 interface for data transfer
- 18 hours battery life

Scope of supply: GC flow meter, hard-shell carrying case, spare tubings, tubing connector fittings, power supply with adapters for EU, UK, CH and US

Specifications

Range:	0.1 ... 1000 ml/min
Accuracy:	±0.8 % of reading, 0.2 % of full scale
Resolution:	0.1 ml/min
Turn-down Ratio:	200:1
Operating temperature:	-10 ... 60 °C
Inlet pressure:	max. 1000 kPa (145 psi)
Dimensions:	60 x 170 x 24 mm
Weight:	450 g

Type	PK	Cat. No.
GF1000 flow meter set	1	**6.276 103**

2 Gas filters

NEW

2

Trajan Scientific

Gas filters are an essential part of GC analysis as contaminants in gases can significantly impact the quality of results. Oxygen, hydrocarbons and moisture can lead to problems such as noisy baselines, moisture entering the GC column and excessive bleed.
The gas filter kit consists of a gas filter and a connection unit.

- Fast stabilization times
- The gas filter system consists of two key parts: the filters and the connecting unit
- The connecting unit has inlet and outlet connectors for the gas lines
- The connecting unit can be bench or wall-mounted
- Can be used in combination with other filters
- Indicator color change tells you when to change your filter

Type	Description	PK	Cat. No.
Gas filter carrier gas	Removes water, oxygen and organic compounds	1	**4.676 268**
Gas filter moisture	Removes water, oil and other foreign material	1	**4.676 270**
Gas filter oxygen	Removes oxygen as well as traces of sulfur and chlorine compounds	1	**4.676 271**
Kit gas filter carrier gas	Removes water, oxygen and organic compounds, incl. connection unit	1	**4.676 269**

3 Gas filters big trap

NEW

3

Trajan Scientific

Gas filters are an essential part of your GC analysis as contaminants in gases can significantly impact the quality of results. Oxygen, hydrocarbons and moisture can lead to problems such as noisy baselines, moisture entering the GC column and excessive bleed.

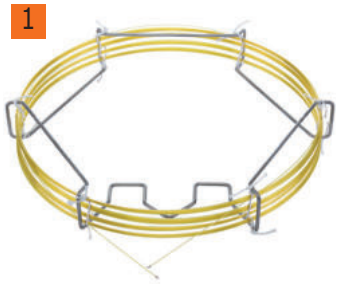
- Heavy-walled aluminium tube
- High capacity filters
- Sintered stainless steel frits prevent particulate contamination

Specifications

Volume:	750 cm³
Pessure rating:	up to 17.2 bar

Type	PK	Cat. No.
Universal	1	**4.676 267**

1



1 Optima® WAX capillary columns for GC

polyethylene glycol 20000 daltons *MACHEREY-NAGEL*

USP G16
polar phase
recommended for solvent analysis and alcohols
suitable for aqueous solutions
similar phases: Premabond® CW 20 M , DB-Wax, Supelcowax, HP-Wax, HP-INNOWAX, Rtx-Wax, CP-Wax 52 CB, Stabilwax, 007-CW, BP20, AT-Wax, ZB-Wax

max. temperature for isothermal operation 240°C, max. temperature for short isotherms in a temperature programme: 250°C, for 0.53 mm ID columns the max. temperatures are 220 and 240°C, resp.

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	0.25	25	1	**9.003 762**
0.25	0.4	0.25	30	1	**9.003 763**
0.32	0.5	0.25	30	1	**9.003 767**
0.32	0.5	0.50	30	1	**9.003 771**
0.53	0.8	1.00	25	1	**4.003 175**
0.53	0.8	1.00	30	1	**4.003 176**
0.53	0.8	2.00	30	1	**4.003 174**

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

2

2 OPTIMA® 5 MS Accent capillary columns for GC

silarylene phase *MACHEREY-NAGEL*

- With polarity similar to a 5 % diphenyl -95 % dimethylpolysiloxane phase.
- USP G27, G36
- Lowest column bleed, nonpolar phase, ideal for ion trap and quadrupol MS detectors solvent rinsing for removal of impurities applicable
- Application areas: all-round phase for environmental analyses, trace analyses, EPA methods, pesticides, PCB, food and drug analyses

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 programme: 360 °C
for cloumns with film thicknesses > 5.5 µm the max. temperatures are 320 and 340 °C

Int. diam. mm	Ext. diam. mm	Film thickness µm	Length m	PK	Cat. No.
0.25	0.4	0.25	30	1	**4.003 017**
0.25	0.4	0.50	30	1	**4.003 019**
0.25	0.4	1.00	30	1	**4.003 021**
0.32	0.5	0.25	30	1	**4.003 009**
0.32	0.5	0.50	30	1	**4.003 013**

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.

3

3 Capillary columns GC BPX70

70% Cyanopropyl Polysilphenylene-siloxane. Able to be solvent rinsed. *Trajan Scientific*
Industry standard column for fatty acid methyl esters, carbonhydrates, pharmaceuticals,
GC/MS applications. Suitable alternative to: DB-23, Rtx-2330, SP-2330, CP-Sil 88, SP2380, HP-23.

Int. diam. mm	Length m	Film thickness µm	Temp. range °C	PK	Cat. No.
0.10	10	0.20	50 °C … 250 / 260 °C	1	**6.205 237**
0.22	25	0.25	50 °C … 250 / 260 °C	1	**6.227 373**
0.22	50	0.25	50 °C … 250 / 260 °C	1	**6.205 238**
0.22	60	0.25	50 °C … 250 / 260 °C	1	**6.205 239**
0.25	60	0.25	50 °C … 250 / 260 °C	1	**7.625 713**
0.25	120	0.25	50 °C … 250 / 260 °C	1	**6.206 833**
0.32	60	0.25	50 °C … 250 / 260 °C	1	**6.205 100**

1 Capillary columns GC BP5MS

NEW

5% Phenyl Polysilphenylene-siloxane. For 5% GC-MS analysis and general purpose MS analysis. Suitable replacement for: DB-5ms, ZB-5ms, Rxi-5Sil MS, VF-5ms, CP-Sil 8 CB.

Trajan Scientific

Int. diam. mm	Length m	Film thickness µm	Temp. range °C	PK	Cat. No.
0.25	30	0.25	-40 ... 330 / 350	1	**4.676 266**

1

2 Capillary columns HT5

5% Phenyl Polycarborane siloxane. Ultra-high temperature columns for simulated distillation applications, general hydrocarbon profiles, pesticides, herbicides and for GCMS applications.

Trajan Scientific

Int. diam. mm	Length m	Film thickness µm	Temp. range °C	PK	Cat. No.
0.22	25	0.1	10 °C ... 380 / 400 °C	1	**4.667 654**
0.25	15	0.1	10 °C ... 380 / 400 °C	1	**6.205 471**
0.32	12	0.1	10 °C ... 380 / 400 °C	1	**6.234 302**

2

3 Capillary columns HT8/Fast PCB

8 % Phenyl Polycarborane-siloxane. Ultra high temperature columns for polychlorinated biphenyl compounds (PCB), nitro-substituted aromatics, polynuclear aromatic hydrocarbons, pesticides and herbicides.

Trajan Scientific

Int. diam. mm	Length m	Film thickness µm	Temp. range °C	Type	PK	Cat. No.
0.10	10	0.10	-20 °C ... 360 / 370 °C	Fast PCB	1	**6.233 627**
0.22	25	0.25	-20 °C ... 360 / 370 °C	HT8	1	**6.205 318**
0.25	30	0.25	-20 °C ... 360 / 370 °C	HT8	1	**6.207 027**
0.25	60	0.25	-20 °C ... 360 / 370 °C	HT8-PCB GC	1	**4.676 265**

3

4 Capillary columns SolGel-Wax

Polyethylene Glycol (PEG) in a SolGel matrix. Suitable replacement for: DB-Wax, Rtx- Wax, Stabilwax, HP20M, HP-Wax, HP-INNOWax, Supelcowax-10, AT-Wax, Nukol, CP, Wax 52CB, VB-WAX, ZB-WAX.

Trajan Scientific

- Robust high-temperature column.
- Polar phase
- Low bleed and inert

Int. diam. mm	Length m	Film thickness µm	Temp. range °C	PK	Cat. No.
0.25	30	0.25	30 °C ... 260 / 280 °C	1	**6.225 943**
0.32	30	0.50	30 °C ... 260 / 280 °C	1	**6.227 192**
0.53	30	0.50	30 °C ... 260 / 280 °C	1	**6.202 376**

4

5 Capillary columns GC BPX5

5% Phenyl Polysilphenylene-siloxane. General purpose GC column for routine gas chromatographic analyses. Suitable replacement for: DB-5, DB-5ms, DB-5.625, XTI-5, Rtx-5ms, Ultra-2, HP-5, HP-5MS, HP5-TA, SPB-5, MDN-5S, CP-Sil8CB, Rxt-Sil 5MS, AT-5ms, VB-5, ZB-5, VF-5ms.

Trajan Scientific

- Very low bleed
- Non-polar
- Extremely inert

Int. diam. mm	Length m	Film thickness µm	Temp. range °C	PK	Cat. No.
0.22	30	0.25	-40 °C ... 360 / 370 °C	1	**6.226 218**
0.22	50	0.25	-40 °C ... 360 / 370 °C	1	**7.639 635**
0.25	30	0.25	-40 °C ... 360 / 370 °C	1	**6.089 900**
0.25	30	1.00	-40 °C ... 360 / 370 °C	1	**6.226 546**
0.25	60	1.00	-40 °C ... 360 / 370 °C	1	**6.234 303**
0.32	12	0.25	-40 °C ... 360 / 370 °C	1	**6.204 980**
0.32	25	0.25	-40 °C ... 360 / 370 °C	1	**6.225 537**
0.32	30	0.25	-40 °C ... 360 / 370 °C	1	**6.205 532**
0.32	60	0.25	-40 °C ... 360 / 370 °C	1	**7.672 518**
0.32	50	0.50	-40 °C ... 360 / 370 °C	1	**6.205 984**
0.32	12	1.00	-40 °C ... 360 / 370 °C	1	**7.635 438**

5

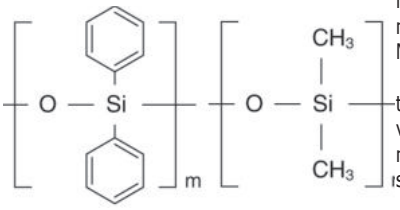
1

1 Capillary, fused silica

Trajan Scientific

Type	Column ID mm	Column OD mm	Length m	PK	Cat. No.
Phenyl deactivated fused silica	0.53	0.68	5	1	**6.260 570**
Methyl deactivated fused silica	0.53	0.68	5	1	**6.284 960**
Non deactivated fused silica	0.05	0.22	10	1	**6.225 566**
Non deactivated fused silica	0.10	0.363	10	1	**7.670 948**

2



2 Silylation reagents - MSTFA

N-methyl-N-trimethylsilyl-trifluoroacetamide *MACHEREY-NAGEL*
m.w. 199.1, Bp 70°C (75mm Hg), density d20°/4° = 1.11
MSTFA: R' = CF_3, R" = CH_3

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).

Warning

H phrases: H226|H302|H315|H319

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.

3

3 4 Silylation reagents - BSTFA, SILYL-991

N,O-bis-trimethylsilyl-trifluoroacetamide *MACHEREY-NAGEL*
m.w. 257.4, Bp 40°C (12mm Hg), density d20°/4° = 0.961
BSTFA: R = CF_3 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.

Warning

4

H phrases: H226|H315|H319

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.

5

5 Alkylation reagents for GC - Trimethylsulphonium hydroxide

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

Danger

H phrases: H225|H301|H311|H331|H370

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

1 Manual Microlitre syringes

Type A: Standard plunger protection syringe
Type B: Guided plunger syringe

Trajan Scientific

Type	Capacity µl	Needle length mm	Gauge	Needle Typ	PK	Cat. No.
A	5	50	26 (0.47)	fixed	1	**6.204 040**
B	5	50	26 (0.47)	removable	1	**6.050 958**

1

Inlet Liner and o-rings for Agilent GC

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

Trajan Scientific

- 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** 2
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** 3
Split/Splitless FocusLiner®	6.3	4.0	78.5	5	**6.223 552**
Split/Splitless FocusLiner®	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** 4
Split/Splitless Tapered Focus Liner®	6.3	4.0	78.5	25	**9.003 572**
Split/Splitless FAST FocusLiner®	6.3	2.3	78.5	5	**6.223 554**
Split/Splitless Tapered FAST FocusLiner®	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** 5
ConnecTite™ Liner Bottom Hole	6.3	4.0	78.5	5	**9.003 587**
Viton o-ring, suitable for liners with OD 6.3 mm	6.3	4.0	78.5	10	**9.221 277**
UI Liner, with Quartz wool	6.3	4.0	78.5	5	**6.287 548**

2

7.653 145

3

6.236 751

4

6.223 553

5

9.003 588

Inlet Liner for Thermo GC

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.

Trajan Scientific

Description	Ext. diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
Split FocusLiner (for use with 50 mm Needle)	8.0	5,0	105	5	**6.265 466** 6
Splitless FocusLiner (for use with 50mm Needle)	8.0	5,0	105	5	**6.265 467** 7
Splitless with Single Taper	8.0	5,0	105	5	**6.265 468** 8
Splitless, Straight-through Liner	8.0	3,0	105	5	**6.265 469**
Split, Straight-through Liner	8.0	5,0	105	5	**6.265 470** 9
Trace 2000 PTV Liner	2.7	1,75	120	5	**7.630 911**

6

6.265 466

7

6.265 467

8

6.265 468

9

6.265 470

Inlet Liner for Shimadzu GC

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.

Trajan Scientific

Description	Ext. diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
Split / Splitless Tapered FocusLiner™	5	3.4	95	5	**6.228 225** 10
Split / Splitless with middle gooseneck for GC-2010 (SPL-2010)	5	3.4	95	5	**6.265 475**
Split, Straight-through Liner	5	3.4	95	5	**6.265 473** 11
Split / Splitless with Single Taper	5	3.4	95	5	**6.265 474** 12

10

6.228 225

11

6.265 473

12

6.265 474

1 
6.206 049

2 
6.206 050

3 
9.003 568

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, individualy packed. Complete with instrument appropriate o-rings and sealing rings. Each pack supplied with quality test results.

Trajan Scientific

Description	Ext. diam. mm	Int. diam. mm	Length mm	PK	Cat. No.
Split / Splitless Focus Liner	6.2	4	92.0	5	**6.206 049** 1
Split / Splitless Tapered Focus Liner	6.2	4	92.0	5	**9.003 567**
Split straight through liner	6.2	4	92.0	5	**6.206 050** 2
Split / Splitless Focus Liner for PSS Injector	4.0	2	86.2	5	**9.003 568** 3
PTV liner with 0.25 mm ID restriction	2.0	1	88.0	5	**9.003 569**

4 

4 Ferrules for Agilent GC

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

Trajan Scientific

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)

Type	Column ID mm	Ferrule ID mm	PK	Cat. No.
A	0,1 - 0,25	0.4	10	**6.223 558**
A	0,32	0.5	10	**9.221 278**
A	0,53	0.8	10	**9.221 279**
B	0,1 - 0,25	0.4	10	**6.088 109**
B	0,32	0.5	10	**6.059 976**
B	0,53	0.8	10	**6.059 977**
C	0,1 - 0,32	0.5	10	**7.652 355**
C	0,45 - 0,53	0.8	10	**9.221 280**

5 

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

Trajan Scientific

Type	Column ID mm	Ferrule ID mm	PK	Cat. No.
A	0,1 - 0,25	0.4	10	**6.088 109**
A	0,32	0.5	10	**6.059 976**
A	0,53	0.8	10	**6.059 977**
A	0,45 - 0,53	0.8	10	**6.281 660**
C	0,1 - 0,32	0.5	10	**9.221 284**
C	0,45 - 0,53	0.8	10	**9.221 285**

6 
4.668 494

7 
4.668 495

GC Septa

High performance septa, suitable for injector temperatures up to 320 °C.

La-Pha-Pack

- Good penetration an re-sealing properties (low fragmentation)
- Long lifetime
- Ultra low bleeding
- Ready to use, no further pre-treatment necessary
- No sticking to hot surfaces, easily exchangeble
- Standard dimensions for all common gas chromatographs
- For other gas chromatography models on request

Diam. mm	For	PK	Cat. No.
	All Shimadzu models	50	**4.668 494** 6
9.5	e.g. Agilent 5700 / 5800	50	**4.668 495** 7
11.0	e.g. Agilent 5890 / 6850 / 6890, Varian 3300 / 3400	50	**4.668 496**
12.5	e.g. Tracor 220, 222	50	**4.668 497**
17.0	e.g. Thermo Trace, Fisons 8000 series	50	**4.668 498**

Consumables from other GC manufacturers on request

1 Septa for Agilent GC

All Septa are made with a high grade silicone material to minimize needle coring. *Trajan Scientific*
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.

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.
HT = BTO Silicone Septa, Bleed and temperature optimized, combined with outstanding mechanical properties.

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

Diam. mm	Temp. max. °C	Material	PK	Cat. No.
5.0	275	GP	50	**9.003 590**
5.0	350	MN	50	**9.003 591**
9.5	275	GP	50	**6.224 189**
9.5	350	EC	25	**9.003 592**
9.5	400	HT	25	**9.003 593**
11.0	275	GP	50	**6.085 419**
11.0	350	EC	25	**9.003 594**
11.0	350	MN	48	**6.255 348**
11.0	400	HT	25	**9.003 595**
12.5	275	GP	48	**6.087 242**
12.5	350	EC	25	**9.003 597**
12.5	400	HT	25	**9.003 596**

2 Syringes for GC autosampler from Agilent

GC syringes for Agilent autosampler 7673, 7683 and 6850 *Trajan Scientific*
- With fixed or removable needle
- Two different needle diameter and tapered needles
- High reproducibility, low carry-over

Capacity µl	Needle length mm	Gauge (OD) mm	Needle Typ	PK	Cat. No.
5	42	23-26s (0.63/0.47)	fixed	1	**9.221 270**
5	42	23-26s (0.63/0.47)	fixed	6	**6.204 103**
10	42	23-26s (0.63/0.47)	fixed	1	**6.226 427**
10	42	23-26s (0.63/0.47)	fixed	6	**6.254 971**
10 (Gas tight)	42	23-26s (0.63/0.47)	fixed	1	**9.221 271**
10 (Gas tight)	42	23-26s (0.63/0.47)	fixed	6	**9.221 272**
5	42	26 (0.47)	fixed	1	**6.203 350**
5	42	26 (0.47)	fixed	6	**6.205 076**
5	42	23 (0.63)	fixed	1	**9.221 273**
5	42	23 (0.63)	fixed	6	**6.072 528**
10	42	26 (0.47)	fixed	1	**9.221 274**
10	42	26 (0.47)	fixed	6	**6.206 502**
10	42	23 (0.63)	fixed	1	**6.089 587**
10	42	23 (0.63)	fixed	6	**6.050 962**
0.5	42	26 (0.47)	removable	1	**6.228 788**
0.5	42	23 (0.63)	removable	1	**9.221 275**
1	42	23 (0.63)	removable	1	**9.221 276**

3 Syringes for GC autosampler from CTC

Syringes for CTC Analytics CombiPal and GC PAL. *Trajan Scientific*
- With fixed or removable needle
- Two different needle diameters (needle tip: cone)
- High reproducibility, low carry-over

Capacity µl	Needle length mm	Gauge (OD) mm	Needle Typ	PK	Cat. No.
10	50	26 (0,47)	fixed	1	**7.671 795**

1

1 Syringes for GC autosampler from CTC/Thermo

Syringes for CTC Analytics CombiPal and GC PAL. *Trajan Scientific*
- With fixed or removable needle
- Two different needle diameters (needle tip: cone)
- High reproducibility, low carry-over
- Type A for Thermo TriPlus, Type B for Thermo TriPlus AS3000, AS2000, AS200/80

Type	Capacity µl	Needle length mm	Gauge (OD) mm	Needle Typ	PK	Cat. No.
A	5	50	23 (0,63)	fixed	1	**7.607 298**
A	5	50	26 (0,47)	fixed	1	**7.900 714**
A	10	50	23 (0.63)	fixed	1	**7.656 984**
A	10	50	23 (0,63)	fixed	1	**7.607 297**
B	10	50	26 (0.47)	fixed	1	**7.639 848**
A	10	50	23 (0,63)	fixed	6	**9.221 291**
A	10	50	26 (0.47)	fixed	1	**7.631 444**
A	10	50	26 (0.47)	fixed	6	**7.612 636**
A	10	50	26 (0.47)	removable	1	**7.628 769**
B*	10	50	26 (0.47)	removable	1	**6.269 487**
A	10 (Gas tight)	50	26 (0,47)	fixed	1	**9.221 289**
A	10 (Gas tight)	50	26 (0,47)	fixed	6	**9.221 290**
A	10 (Gas tight)	50	26 (0,47)	removable	1	**7.629 523**
A	25 (Gas tight)	50	23 (0,63)	fixed	1	**7.628 136**

*also for Bruker (Varian)

2

2 Syringes for GC autosampler from Shimadzu

For Shimadzu AOC14, AOC17 and AOC20. Needle tip: cone. *Trajan Scientific*

Capacity µl	Needle length mm	Gauge (OD) mm	Needle Typ	PK	Cat. No.
5	42	23 (0.63)	fixed	1	**6.205 990**

3

3 Syringes for GC autosampler from Perkin-Elmer

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

Capacity µl	Needle length mm	Gauge (OD) mm	Needle Typ	PK	Cat. No.
5	70	23 (0.63)	fixed	1	**9.221 282**
5	70	26 (0.47)	fixed	1	**9.221 281**
5 (Gas tight)	70	23 (0.63)	fixed	1	**6.204 955**
5 (Gas tight)	70	26 (0.47)	fixed	1	**9.221 283**

Consumables from other GC manufacturers on request

Ready-to-use layers for TLC

Support materials for TLC ready-to-use layers

Glass plates: glass, ~ 1.3 mm 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, ~ 0.2 mm 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, ~ 0.15 mm 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

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

1

Glass plates, POLYGRAM®, ALUGRAM® *MACHEREY-NAGEL*

- Silica 60
- Specific surface (BET) ~500 m²/g
- Mean pore size 60 Å
- Specific pore volume 0.75 ml/g
- Particle size 5 to 17 µm
- Standard grade
- Thickness of layer for analytical plates 0.25 mm, for preparative plates 0.5 and 1 mm
- For 2 mm preparative layers a slightly coarser material is used, indicators: manganese activated zinc silicate with green fluorescence for short-wave UV (254 nm)
- 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 with or without fluorescent indicator (UV 254)

4.004 850

Type	Plate format cm	Gel thickness mm	PK	Cat. No.
Glass plates SIL G-25 UV_{254}	2.5 x 7.5	0,25	100	**4.004 850** 1
Glass plates SIL G-25	5 x 10	0,25	50	**6.230 729**
Glass plates SIL G-25 UV_{254}	5 x 10	0,25	50	**4.004 848**
Glass plates SIL G-25	5 x 10	0,25	200	**4.004 847**
Glass plates SIL G-25 UV_{254}	5 x 10	0,25	200	**4.004 849**
Glass plates SIL G-25	5 x 20	0,25	100	**4.004 846**
Glass plates SIL G-25 UV_{254}	5 x 20	0,25	100	**6.232 660**
Glass plates SIL G-25 UV_{254}	10 x 10	0,25	25	**9.003 474**
Glass plates SIL G-25	10 x 20	0,25	50	**6.227 917**
Glass plates SIL G-25 UV_{254}	10 x 20	0,25	50	**6.230 274**
Glass plates SIL G-25	20 x 20	0,25	25	**9.003 491**
Glass plates SIL G-25 UV_{254}	20 x 20	0,25	25	**9.003 492**
Glass plates SIL G-100	20 x 20	1,00	15	**4.004 853**
Glass plates SIL G-100 UV_{254}	20 x 20	1,00	15	**7.300 555**
Glass plates SIL G-200	20 x 20	2,00	12	**6.224 417**
Glass plates SIL G-200 UV_{254}	20 x 20	2,00	12	**4.004 854**
POLYGRAM® polyester sheets SIL G	2.5 x 7.5	0,20	200	**4.004 827**
POLYGRAM® polyester sheets SIL G UV_{254}	2.5 x 7.5	0,20	200	**4.004 826**
POLYGRAM® polyester sheets SIL G	4 x 8	0,20	50	**4.004 825**
POLYGRAM® polyester sheets SIL G UV_{254}	4 x 8	0,20	50	**9.003 493**
POLYGRAM® polyester sheets SIL G	5 x 20	0,20	50	**6.803 651**
POLYGRAM® polyester sheets SIL G UV_{254}	5 x 20	0,20	50	**9.003 476**
POLYGRAM® polyester sheets SIL G	20 x 20	0,20	25	**6.202 190**
POLYGRAM® polyester sheets SIL G UV_{254}	20 x 20	0,20	25	**9.003 494**
POLYGRAM® polyester sheets SIL G	40 x 20	0,20	25	**4.004 822**
POLYGRAM® polyester sheets SIL G UV_{254}	40 x 20	0,20	25	**4.004 824**
ALUGRAM® aluminium sheets SIL G UV_{254}	2.5 x 7.5	0,20	200	**4.005 043**
ALUGRAM® aluminium sheets SIL G UV_{254}	4 x 8	0,20	50	**9.003 496**
ALUGRAM® aluminium sheets SIL G	5 x 7.5	0,20	20	**4.005 042**
ALUGRAM® aluminium sheets SIL G UV_{254}	5 x 7.5	0,20	20	**6.227 948**
ALUGRAM® aluminium sheets SIL G	5 x 10	0,20	50	**6.802 883**
ALUGRAM® aluminium sheets SIL G UV_{254}	5 x 10	0,20	50	**9.003 477**
ALUGRAM® aluminium sheets SIL G	5 x 20	0,20	50	**7.084 918**
ALUGRAM® aluminium sheets SIL G UV_{254}	5 x 20	0,20	50	**9.003 478**
ALUGRAM® aluminium sheets SIL G	10 x 20	0,20	20	**4.005 052**
ALUGRAM® aluminium sheets SIL G UV_{254}	10 x 20	0,20	20	**6.233 568**
ALUGRAM® aluminium sheets SIL G	20 x 20	0,20	25	**7.059 745**
ALUGRAM® aluminium sheets SIL G UV_{254}	20 x 20	0,20	25	**9.003 497**
ALUGRAM® aluminium sheets Xtra SIL G UV_{254}	4 x 8	0,20	50	**6.259 756**
ALUGRAM® aluminium sheets Xtra SIL G UV_{254}	5 x 10	0,20	50	**7.638 354**
ALUGRAM® aluminium sheets Xtra SIL G UV_{254}	20 x 20	0,20	25	**6.242 312**
ALUGRAM® aluminium sheets Xtra SIL G	20 x 20	0,20	25	**9.003 465**

1

1 ADAMANT unmodified standard silica layers for TLC

MACHEREY-NAGEL

Silica 60, specific surface (BET) ~ 500m²/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 distirbution. High suitability for trace analyses resulting from a UV indicator with brilliance and a low-noise background of the layer.

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

Type	Plate format cm	Gel thickness mm	PK	Cat. No.
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 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**

2

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

ALUGRAM® *MACHEREY-NAGEL*

base material: Nano-K silica 60, specific surface (BET) ~500m²/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 apppear 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 cm	Gel thickness mm	PK	Cat. No.
ALUGRAM® aluminium sheets RP-18 W UV_{254}	4 x 8	0.15	50	**7.400 375**
ALUGRAM® aluminium sheets RP-18 W UV_{254}	5 x 10	0.15	50	**6.901 143**
ALUGRAM® aluminium sheets RP-18 W UV_{254}	5 x 20	0.15	50	**4.005 046**
ALUGRAM® aluminium sheets RP-18 W UV_{254}	10 x 10	0.15	25	**4.005 047**
ALUGRAM® aluminium sheets RP-18 W UV_{254}	20 x 20	0.15	25	**6.704 046**

3

3 TLC plates, Silica gel 60 F 254

Plate format cm	Gel thickness mm	Material	PK	Cat. No.
5 x 7,5	0,25	Aluminium	20	**9.130 060**
5 x 10	0,25	Aluminium	50	**9.130 059**
20 x 20	0,25	Aluminium	25	**9.130 058**
10 x 20	0,25	Glass	50	**9.130 051**
2,5 x 7,5	0,25	Glass	100	**9.130 056**
2,5 x 7,5	0,25	Glass	500	**9.130 057**
5 x 20	0,25	Glass	100	**9.130 052**
5 x 10	0,25	Glass	200	**9.130 054**
5 x 10	0,25	Glass	25	**9.130 055**
5 x 20	0,25	Glass	25	**9.130 053**
20 x 20	0,25	Glass	25	**9.130 050**
20 x 20	0,25	Plastic	25	**9.130 063**

1 Cellulose MN 300, TLC-ready-to-use plates cellulose coated

MACHEREY-NAGEL

The primary field of application is the partition chromatography of polar substances such as amino acids, carboxylic acids or carbohydrates. The TLC-plates are available as glass plates, POLYGRAM® polyester sheets and ALUGRAM® aluminium sheets.

- Fiber length (95 %) 2-20 µm
- Average degree of polymerization 400-500
- Specific surface according to Blaine 15000 cm²/g
- ≤ 20 ppm Fe, 6 ppm Cu, 7 ppm P
- Dichloromethane extract ≤ 0.25 %
- Residue on ignition at 850 °C ≤ 1500 ppm
- Available with or without fluorescent indicator (UV 254)

1

Type	Plate format cm	Gel thickness mm	PK	Cat. No.
Glass plates CEL 300-10	20 x 20	0.10	25	**4.004 835**
Glass plates CEL 300-10 UV_{254}	20 x 20	0.10	25	**7.510 059**
Glass plates CEL 300-25	20 x 20	0.25	25	**4.004 836**
Glass plates CEL 300-25 UV_{254}	20 x 20	0.25	25	**6.231 713**
Glass plates CEL 300-50	20 x 20	0.50	20	**4.004 838**
Glass plates CEL 300-50 UV_{254}	20 x 20	0.50	20	**4.004 839**
POLYGRAM® CEL 300	4 x 8	0.10	50	**7.053 700**
POLYGRAM® CEL 300	20 x 20	0.10	25	**7.053 593**
POLYGRAM® CEL 300 UV_{254}	5 x 20	0.10	50	**4.004 804**
POLYGRAM® CEL 300 UV_{254}	20 x 20	0.10	25	**7.400 578**
ALUGRAM® CEL 300	4 x 8	0.10	50	**4.005 049**
ALUGRAM® CEL 300	20 x 20	0.10	25	**6.093 621**
ALUGRAM® CEL 300 UV_{254}	5 x 20	0.10	50	**4.005 051**
ALUGRAM® CEL 300 UV_{254}	20 x 20	0.10	25	**4.005 050**

2 3 Chromatography paper/Ion exchange papers

Whatman

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.

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 (0.34 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.

2

3

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

1

1 Chromatography paper, reels

Whatman

Chromatography Paper 1 CHR
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 electophoresis, in general chemistry and as blotting paper. Pure cellulose. Thickness 0.34mm.
Capillary rise (water) 130mm/30 min.

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

2

2 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 cm	Path length mm	PK	Cat. No.
POLYGRAM® aluminium oxide*	20 x 20	0.2	25	**9.003 495**
ALUGRAM® aluminium oxide*	20 x 20	0.2	25	**9.003 498**
POLYGRAM® polyester films	4 x 8	0.2	50	**7.079 169**

*with 254 nm UV indicator

3

3 Chromatography Paper

Hahnemühle

Recommended for chromatographic analysis and preparations.
- Made from pure linters with an α-cellulose content of > 98%
- High-performance resolution and wet strength
- The fibres are oriented in predominantly one direction
- Thicker papers allow higher sample volumes
- Lower capillary rises offer higher resolutions

Type	Description	Weight g / m²	Dimensions mm	PK	Cat. No.
2668	preparative, fast	320	580 x 600	50	**4.006 052**
2727	preparative, fast	320	190 x 190	100	**6.254 968**
2043A	analytical, fast	90	460 x 570	100	**4.006 117**
2043A	analytical, fast	90	580 x 600	100	**4.006 118**
2043B	analytical, fast	120	460 x 570	100	**4.006 119**

4

4 Standard separating chamber

Flat chamber floor with glass ridge, for all TLC plates up to 200 mm x 200 mm.
Filter paper for gas space saturation to optimize the separation results is available.

Other separating chambers available on request.

Type	PK	Cat. No.
Separating chamber 200 x 200 mm with glass lid	1	**6.311 891**
Filter paper for chamber saturation	25	**9.020 179**

1 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**

2 Nano separating chambers, with knob/ stainless lid

The nano separating chamber was developed for the preferred plate format of 100 mm highs and have all the advantages of standard separating chambers.

Type	PK	Cat. No.
Separating chamber 100 x 100 mm with glass lid	1	**6.311 892**

3 Dipping chamber, glass insert

biostep

- For TLC plates
- Highly-resistant glass
- Clear width 5 mm
- Small volume of reagent required

Type	PK	Cat. No.
For TLC plates up to 100 x 100 mm, reagent required approx. 25 ml	1	**9.022 160**
For TLC plates up to 200 x 100 mm, reagent required approx. 50 ml	1	**9.022 161**
For TLC plates up to 200 x 200 mm, reagent required approx. 100 ml	1	**9.022 162**

4 H separating chamber

biostep

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.

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**

6 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**

1

1 TLC sprayer

Haubold Technik

Versatile sprayer with gas cartridge for spraying reagents and other liquids.
Spray pressure: constant 4.4 bar. Eco-friendly propellant mixture of dimethyl ether, propane and isobutane. Sufficient for approx. 500 ml of liquid.
Easy to clean: unscrew cartridge, immerse uptake into vessel containing cleaning fluid and spray until the spray is free of residues.

Propellants: dimethyl ether, isobutane, propane.

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

Danger

H phrases: H222|H229

Description	PK	Cat. No.
TLC sprayer	1	**7.054 135**

2

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

3 UV irradiation system BIO-LINK

Vilber Lourmat

- 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

Dimensions (W x D x H)
Housing: 350 x 360 x 305 mm
Interior: 260 x 330 x 145 mm

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

Other models available on request.

4

4 TLC Viewing cabinets

Vilber Lourmat

Model CN-6:
- For one or two UV hand lamps model BVL-6; choice of combined wavelengths 254 nm, 312 nm and 365 nm
- Cabinet dimensions (W x D x H): 300 mm x 280 mm x 240 mm

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
- Cabinet dimensions (W x D x H): 505 mm x 415 mm x 280 mm

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

* Other models available on request.

5

5 Laboratory dryer HT0141

Power: approx. 2100 W. 2 speed settings, 3 temperature settings with cold air-stream button. Metallic paint housing. Air-inlet grill detachable for cleaning. cable retracts at the touch of a button. Weight: 594 g.

Type	PK	Cat. No.
HT 0141	1	**6.268 487**