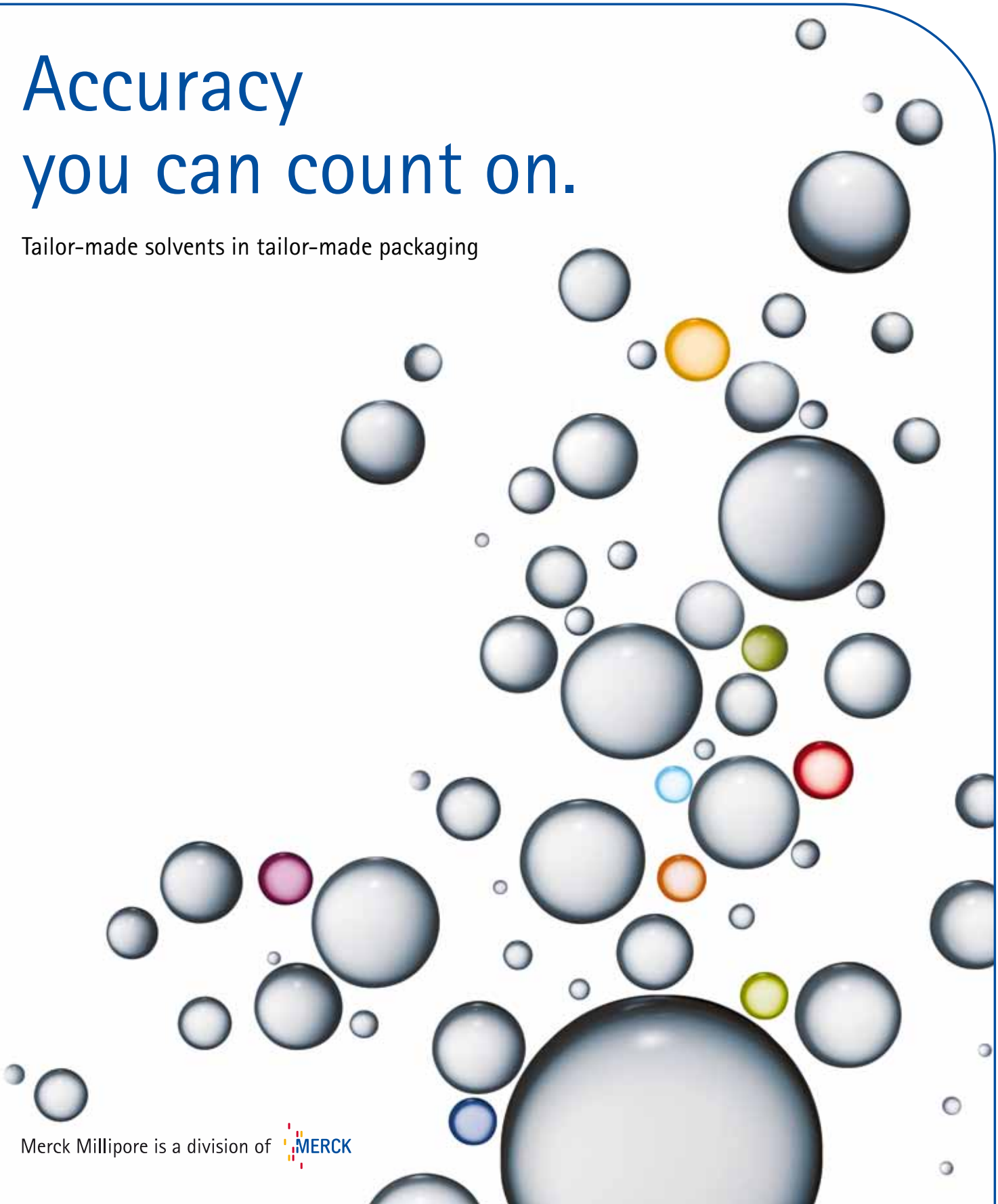
MERCK MILLIPORE

Accuracy you can count on.

Tailor-made solvents in tailor-made packaging



Merck Millipore is a division of MERCK

Tailor-made solvents

For over 150 years, our chemicals have been synonymous with dependable quality. To keep pace with the latest quality requirements, we develop all our products continually and progressively. As a result, they help you solve problems efficiently and economically in the laboratory, pilot plant and production.

As your reliable partner and one-stop supplier, Merck Millipore offers a comprehensive range of quality products and services. To make them better still, we listen carefully to our customers worldwide – then integrate the ideas, suggestions and feedback you provide. Building on this unique partnership of trust, we are already developing the products and services you will need tomorrow.

Merck Millipore protects you and the environment with solutions that stand for high quality and high safety; with products, packaging and extensive documentation, too. You benefit from the synergies when products and packaging match perfectly. That way, you are always well provided for.

Instrumental analysis

Classical analysis and synthesis

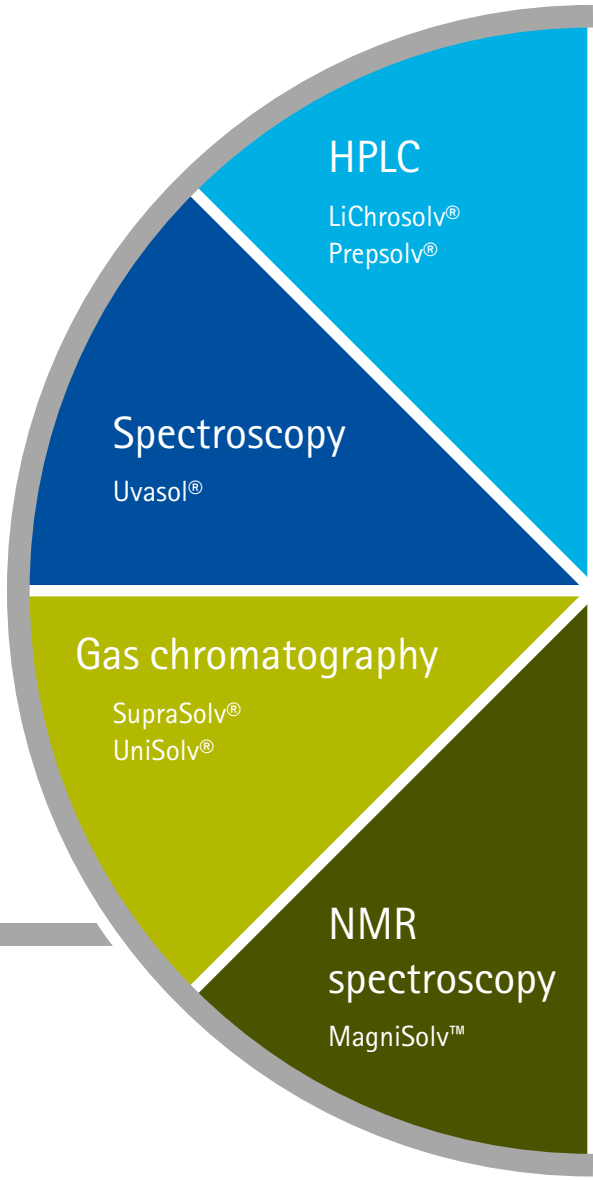
Instrumental analysis

HPLC
High performance liquid chromatography

Spectroscopy
IR, UV & fluorescence spectroscopy

Gas chromatography
Organic trace analysis

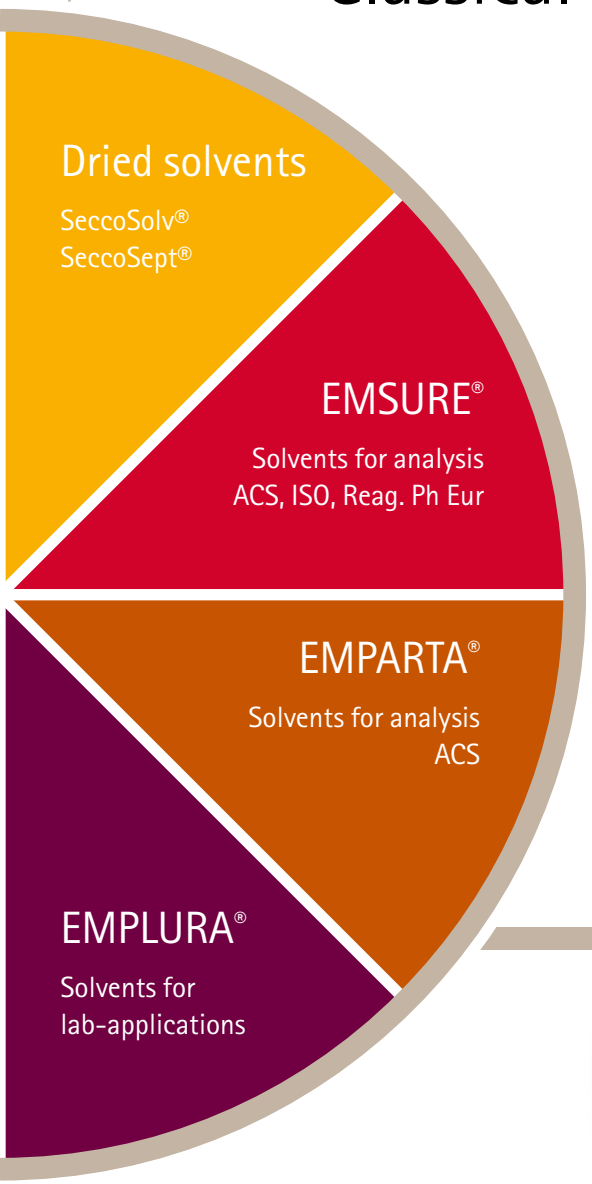
NMR
Nuclear magnetic resonance spectroscopy



Packaging and withdrawal systems

- Glass bottles
- Aluminium bottles
- Septum seal bottles
- Stainless steel barrels
- Barrels and containers
- Withdrawal systems and safety accessories

Classical analysis and synthesis



Dried solvents
DNA-/RNA-synthesis, peptide and organic synthesis

EMSURE®
Regulated and highly demanding lab applications

EMPARTA®
Classical analytical lab applications

EMPLURA®
Production, preparative laboratory work and cleaning purposes

Packaging and withdrawal systems

- Glass bottles
- PE bottles
- Septum seal bottles
- Stainless steel drums
- Barrels and containers
- Withdrawal systems and safety accessories

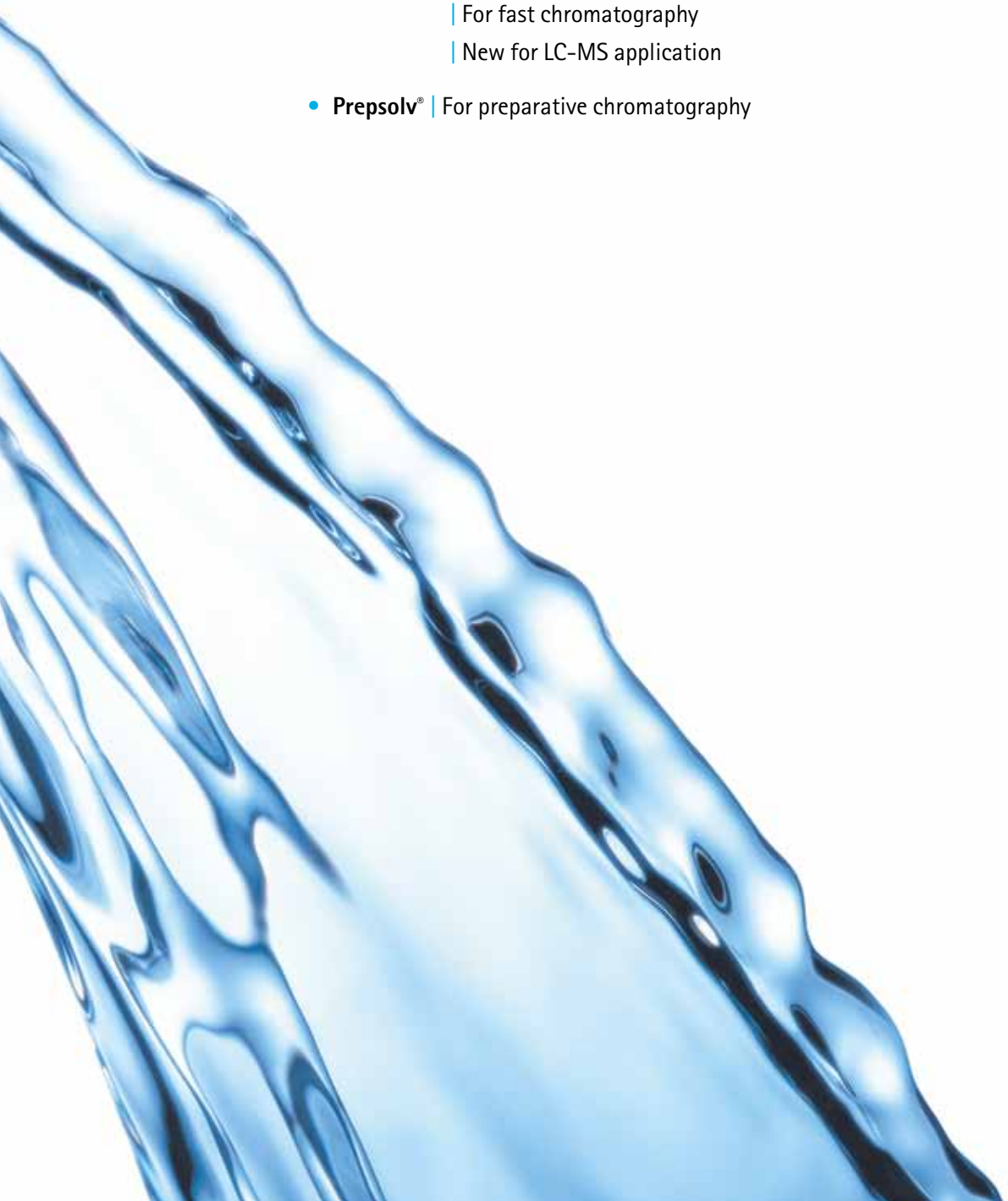
HPLC High performance liquid chromatography

LiChrosolv® | Prepsolv®

HPLC is now a key technique in research and development, pharmaceutical quality control and environmental analysis. Due to the various tasks involved, high-performance solvents are a must.

Merck Millipore offers:

- **LiChrosolv®** | For analytical HPLC
  | For fast chromatography
  | New for LC-MS application
- **Prepsolv®** | For preparative chromatography



Isocratic and gradient elution

With their high degree of UV transmittance, low particle count, low acidity and alkalinity and low evaporation residue level, **LiChrosolv®** solvents are ideal for reproducible separations. They are produced from specially selected raw materials, and undergo a number of purification steps prior to final packaging. Since separations are normally carried out under gradient conditions in analytical HPLC, we offer solvents in 'gradient grade' as well as 'isocratic grade'. This enables you to minimize the gradient effect of the solvent involved – for example in enantiomeric separations on chiral phases.

Preparative chromatography

Prepsolv® solvents are tailored to the requirements of preparative HPLC to facilitate scale-up from analytical to preparative separations. With their extremely low evaporation residue (< 1 mg/l) and low water content, they ensure optimal protection for columns. In preparative chromatography installations that use significant quantities of high quality solvents, optimum separation results depend on solvents being delivered and used correctly; this is why Merck Millipore packs all solvents under inert gas.

Fast chromatography / LC–MS detection

With their ultra low detection limits and their ability to provide valid molecular structure analyses of substances like proteins, peptides or oligonucleotides, these techniques are becoming increasingly popular in the pharmaceutical and biotechnical industries. Now Merck Millipore presents a new generation of LC-MS **LiChrosolv® hypergrade** which have been accurately tested for LC-MS suitability, and meet all the requirements of modern LC-MS ionization methods (ESI/APCI - positive and negative mode). Thanks to their low level of ionic background and low ion suppression, they ensure high reproducibility and high ionization efficiency. The packaging material has been improved to meet LC-MS quality requirements perfectly. A new standard for the unlimited application of high performance chromatography has been set.

Your benefits

LiChrosolv®

- High quality gains time, gives trust
- Documented as being suitable for UV analysis, fluorescence and mass detection
- Optimized peak baseline separation
- High resolution and sensitivity
- Convenience – all solvents are microfiltered at 0.2 µm

Prepsolv®

- High quality reputations and low levels of evaporation residue
- Best reproducibility of final results
- High flexibility in packsize and supply concepts
- Improved shelf life

HPLC

LiChrosolv® | Prepsolv®

HPLC packaging

Merck Millipore provides all relevant solvents for large-scale application in returnable stainless steel barrels preferentially in 30 l and 185 l or 400 l, 1,000 l and 1,400 l stainless steel containers. This helps to improve profitability and reduces packaging waste. The packaging is definitely inert to the chemical contents, strong for repeated transport and are provided complete with two types of opening for versatility of connection. The extensive range of withdrawal systems ensure that the solvents can always be safely and easily used without any risk of contamination. If desired Merck Millipore will supply tailor-made volumes and concepts to fit the need of the individual customer. Ask Merck Millipore first.

▶ **Additional information is available in the chapter: Packaging and withdrawal systems (see page 38).**

Ordering information

LiChrosolv® A-B

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/l]	Water max. [%]	Acidity max. [meq/g]	Alkalinity max. [meq/g]	UV-transmission at [nm]	Content / Packaging	Ord. No.
A	**Acetone**	99.8	2	0.05	0.0002	0.0002	335 (50 %), 340 (80 %), 350 (98 %)	1 l GL	**1.00020.1000**
								2.5 l GL	**1.00020.2500**
								4 l GL	**1.00020.4000**
				Details see page 16				5 l AL	**1.00020.5000**
								10 l ST	**1.00020.9010**
								30 l ST	**1.00020.9030**
New extended specification NEW	**Acetonitrile hypergrade, LC-MS suitability**	99.9	1	0.01	0.0001	0.0002	191 (25 %), 195 (85 %), 200 (96 %), 215 (98 %), 230 (99 %)	1 l GL	**1.00029.1000** *
								2.5 l GL	**1.00029.2500** *
				Details see page 11				10 l ST	**1.00029.9010**
								30 l ST	**1.00029.9030**
	Acetonitrile gradient grade, UPLC | UHPLC suitability. Reag. Ph Eur, ACS conform	99.9	2	0.02	0.0002	0.0002	193 (60 %), 195 (80 %), 230 (98 %)	1 l GL	**1.00030.1000**
								2.5 l GL	**1.00030.2500**
								4 l GL	**1.00030.4000**
				Details see page 11, 13 and 16				5 l AL	**1.00030.5000**
								10 l ST	**1.00030.9010**
								30 l ST	**1.00030.9030**
								185 l ST	**1.00030.9185**
	Acetonitrile isocratic grade	99.8	4	0.05	0.0005	0.0002	195 (70 %), 200 (90 %), 240 (98 %)	1 l GL	**1.14291.1000**
								2.5 l GL	**1.14291.2500**
								4 l GL	**1.14291.4000**
								5 l AL	**1.14291.5000**
								10 l ST	**1.14291.9010**
								30 l ST	**1.14291.9030**
								185 l ST	**1.14291.9185**
B	**1-Butanol**	99.8	2	0.05	0.0002	0.0002	230 (75 %), 240 (85 %), 310 (99 %)	1 l GL	**1.01988.1000**
				Details see page 16				2.5 l GL	**1.01988.2500**

All solvents are filtered through 0.2 µm. | GL = glass bottle | AL = aluminium bottle | ST = stainless steel returnable barrel | * = special treated amber glass bottle

Ordering information
LiChrosolv® B-H

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/l]	Water max. [%]	Acidity max. [meq/g]	Alkalinity max. [meq/g]	UV-transmission at [nm]	Content / Packaging	Ord. No.
B	tert-Butyl methyl ether	99.8	2	0.02	0.0002	0.0002	240 (60 %), 255 (85 %), 280 (98 %)	1 l GL	1.01845.1000
								2.5 l GL	1.01845.2500
				Details see page 16				10 l ST	1.01845.9010
								30 l ST	1.01845.9030
								185 l ST	1.01845.9185
C	1-Chlorobutane	99.8	2	0.01	0.0002	0.0002	227 (60 %), 232 (80 %), 250 (98 %)	1 l GL	1.01692.1000
				Details see page 16					
	Chloroform stabilized with 2-methyl-2-butene and methanol	99.8	5	0.01	0.0002	0.0002	255 (70 %), 260 (85 %), 300 (98 %)	1 l GL	1.02444.1000
								2.5 l GL	1.02444.2500
				Details see page 16				4 l GL	1.02444.4000
								10 l ST	1.02444.9010
	Cyclohexane	99.9	2	0.01	0.0002	0.0002	230 (75 %), 240 (90 %), 260 (99 %)	1 l GL	1.02827.1000
				Details see page 16				2.5 l GL	1.02827.2500
								30 l ST	1.02827.9030
D	1,2-Dichloro-ethane	99.8	2	0.02	0.0002	0.0002	240 (85 %), 245 (90 %), 270 (99 %)	1 l GL	1.13713.1000
				Details see page 16					
	Dichloro-methane stabilized	99.9	5	0.01	0.0002	0.0002	240 (70 %), 245 (90 %), 260 (99 %)	1 l GL	1.06044.1000
								2.5 l GL	1.06044.2500
								4 l GL	1.06044.4000
				Details see page 16				10 l ST	1.06044.9010
								30 l ST	1.06044.9030
								185 l ST	1.06044.9185
	1,4-Dioxane	99.8	2	0.02	0.0002	0.0002	245 (50 %), 270 (80 %), 300 (98 %)	1 l GL	1.03132.1000
				Details see page 16				2.5 l GL	1.03132.2500
E	Ethanol gradient grade, UPLC | UHPLC suitability	99.9	2	0.1	0.0002	0.0002	225 (60 %), 240 (85 %), 260 (98 %)	1 l GL	1.11727.1000
								2.5 l GL	1.11727.2500
								4 l GL	1.11727.4000
				Details see page 11 and 16				30 l ST	1.11727.9030
								185 l ST	1.11727.9185
	Ethyl acetate	99.8	2	0.05	0.0002	0.0002	260 (50 %), 265 (80 %), 270 (98 %)	1 l GL	1.00868.1000
								2.5 l GL	1.00868.2500
				Details see page 16				4 l GL	1.00868.4000
								10 l ST	1.00868.9010
H	n-Heptane	99.3	2	0.005	0.0002	0.0002	210 (50 %), 220 (80 %), 245 (98 %)	1 l GL	1.04390.1000
								2.5 l GL	1.04390.2500
				Details see page 16				10 l ST	1.04390.9010
								30 l ST	1.04390.9030
								185 l ST	1.04390.9185
	n-Hexane	98.0	1	0.01	0.0002	0.0002	210 (50 %), 220 (85 %), 245 (98 %)	1 l GL	1.04391.1000
								2.5 l GL	1.04391.2500
								4 l GL	1.04391.4000
				Details see page 16				5 l AL	1.04391.5000
								10 l ST	1.04391.9010
								30 l ST	1.04391.9030
								185 l ST	1.04391.9185

All solvents are filtered through 0.2 µm. | GL = glass bottle | AL = aluminium bottle | ST = stainless steel returnable barrel

Ordering information
LiChrosolv® I-W

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/l]	Water max. [%]	Acidity max. [meq/g]	Alkalinity max. [meq/g]	UV-transmission at [nm]	Content / Packaging	Ord. No.
I	Isohexane (C_6H_{14} Isomere)	99.0	2	0.005	0.0002	0.0002	210 (60 %), 220 (80 %), 245 (98 %)	2.5 l GL	**1.04335.2500**
				Details see page 16					
	Isooctane	99.0	2	0.01	0.0002	0.0002	210 (50 %), 220 (80 %), 245 (98 %)	1 l GL	**1.04717.1000**
				Details see page 16				2.5 l GL	**1.04717.2500**
M	Methanol hypergrade, LC-MS suitability	99.9	1	0.01	0.0002	0.0002	210 (35 %), 220 (60 %), 230 (75 %), 260 (98 %)	1 l GL	**1.06035.1000 ***
								2.5 l GL	**1.06035.2500 ***
	Methanol gradient grade, UPLC | UHPLC suitability. Reag. Ph Eur, ACS conform	99.9	2	0.02	0.0002	0.0002	210 (20 %), 220 (60 %), 230 (75 %), 235 (83 %), 250 (95 %), 260 (98 %)	1 l GL	**1.06007.1000**
								2.5 l GL	**1.06007.2500**
								4 l GL	**1.06007.4000**
				Details see page 11 and 16				5 l AL	**1.06007.5000**
								10 l ST	**1.06007.9010**
								30 l ST	**1.06007.9030**
								185 l ST	**1.06007.9185**
	Methanol isocratic grade	99.8	3	0.03	0.0002	0.0002	225 (50 %), 240 (80 %), 265 (98 %)	1 l GL	**1.06018.1000**
								2.5 l GL	**1.06018.2500**
								4 l GL	**1.06018.4000**
								5 l AL	**1.06018.5000**
								10 l ST	**1.06018.9010**
								30 l ST	**1.06018.9030**
								185 l ST	**1.06018.9185**
P	1-Propanol	99.8	2	0.02	0.0002	0.0002	230 (70 %), 240 (80 %), 270 (98 %)	1 l GL	**1.01024.1000**
								2.5 l GL	**1.01024.2500**
	2-Propanol gradient grade, UPLC | UHPLC suitability	99.9	2	0.05	0.0002	0.0002	220 (80 %), 230 (90 %), 250 (99 %)	1 l GL	**1.01040.1000**
								2.5 l GL	**1.01040.2500**
								4 l GL	**1.01040.4000**
				Details see page 11 and 16				5 l AL	**1.01040.5000**
								10 l ST	**1.01040.9010**
								30 l ST	**1.01040.9030**
								185 l ST	**1.01040.9185**
T	Tetrahydro-furane not stabilized	99.9	1	0.02	0.0002	0.0002	218 (30 %), 230 (35 %), 250 (65 %), 280 (95 %)	1 l GL	**1.08101.1000**
								2.5 l GL	**1.08101.2500**
				Details see page 16				4 l GL	**1.08101.4000**
								10 l ST	**1.08101.9010**
								30 l ST	**1.08101.9030**
	Toluene	99.9	2	0.05	0.0002	0.0006	300 (70 %), 310 (80 %), 350 (98 %)	1 l GL	**1.08327.1000**
				Details see page 16				2.5 l GL	**1.08327.2500**
								4 l GL	**1.08327.4000**
W	Water gradient grade, LC-MS and UPLC | UHPLC suitability	–	5	–	–	–	–	1 l GL	**1.15333.1000 ***
								2.5 l GL	**1.15333.2500 ***
								4 l GL	**1.15333.4000 ***
				Details see page 11, 14 and 16				10 l ST	**1.15333.9010**
								30 l ST	**1.15333.9030**

New extended specification

New for LC-MS application

All solvents are filtered through 0.2 µm. | GL = glass bottle | AL = aluminium bottle | ST = stainless steel returnable barrel | * = special treated amber glass bottle

Detailed information
LiChrosolv® gradient grade | For UPLC and UHPLC

	Product	Evap. residue max. [mg/l]	Gradient max. [mAU] at 210 nm	235 nm	254 nm	Fluorescence[1] max. [ppb] at 254 nm	365 nm	Content / Packaging	Ord. No.
A	**Acetonitrile gradient grade UPLC | UHPLC suitability. Reag. Ph Eur, ACS conform**	2	1.0	0.5	–	1.0	0.5	1 l GL	**1.00030.1000**
								2.5 l GL	**1.00030.2500**
								4 l GL	**1.00030.4000**
								5 l AL	**1.00030.5000**
								10 l ST	**1.00030.9010**
								30 l ST	**1.00030.9030**
								185 l ST	**1.00030.9185**
E	**Ethanol gradient grade UPLC | UHPLC suitability**	2	–	5.0	2.0	–	–	1 l GL	**1.11727.1000**
								2.5 l GL	**1.11727.2500**
								4 l GL	**1.11727.4000**
								30 l ST	**1.11727.9030**
								185 l ST	**1.11727.9185**
M	**Methanol gradient grade UPLC | UHPLC suitability. Reag. Ph Eur, ACS conform**	2	2.0	1.0	1.0	0.5	–	1 l GL	**1.06007.1000**
								2.5 l GL	**1.06007.2500**
								4 l GL	**1.06007.4000**
								5 l AL	**1.06007.5000**
								10 l ST	**1.06007.9010**
								30 l ST	**1.06007.9030**
								185 l ST	**1.06007.9185**
P	**2-Propanol gradient grade UPLC | UHPLC suitability**	2	–	1.0	1.0	–	–	1 l GL	**1.01040.1000**
								2.5 l GL	**1.01040.2500**
W	**Water for chromatography LC-MS and UPLC | UHPLC suitability**	5	5.0	–	0.5	1.0	0.5	1 l GL	**1.15333.1000 ***
								2.5 l GL	**1.15333.2500 ***
								4 l GL	**1.15333.4000 ***
								10 l ST	**1.15333.9010**
								30 l ST	**1.15333.9030**

New for LC-MS application

All solvents are filtered through 0.2 µm. | 1 = calculated as Quinine in 0.05 mol/l H_2SO_4 | GL = glass bottle | AL = aluminium bottle | ST = stainless steel barrel | * = special treated amber glass bottle

Ordering information
Ready to use | Blends

	Product	Assay TFA	Assay ACN	Content / Packaging	Ord. No.
A	**Acetonitrile + 0.05 % TFA (v/v)**	0.045 - 0.055 %		2.5 l GL	**4.80672.2500**
	Acetonitrile + 0.1 % TFA (v/v)	0.095 - 0.105 %		2.5 l GL	**4.80448.2500**
				30 l ST	**4.80448.9030**
	Acetonitrile + Water 60:40 (v/v)		59.0 - 61.0	4 l GL	**4.80853.4000**
	Acetonitrile + Water 80:20 (v/v)			2.5 l GL	**4.80159.2500**
M	**Methanol + Water 30:70 (v/v)**			30 l ST	**4.80508.9030**
W	**Water + 0.05 % TFA (v/v)**	0.045 - 0.055 %		2.5 l GL	**4.80170.2500**
	Water + 0.1 % TFA (v/v)	0.095 - 0.105 %		2.5 l GL	**4.80112.2500**
				30 l ST	**4.80112.9030**

GL = glass bottle | ST = stainless steel returnable barrel

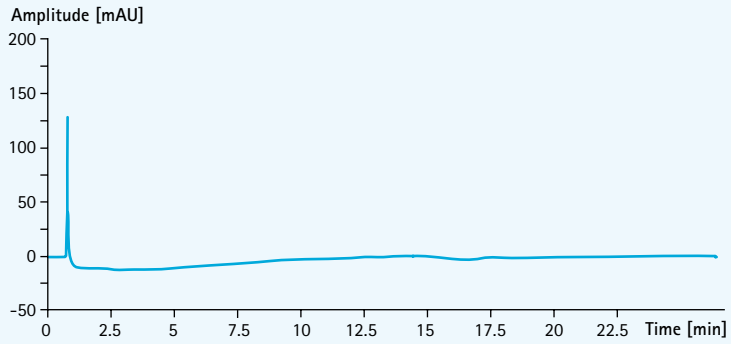


Fig. 1 *Batch chromatogram (gradient profile) of LiChrosolv® Acetonitrile gradient grade (100030).*

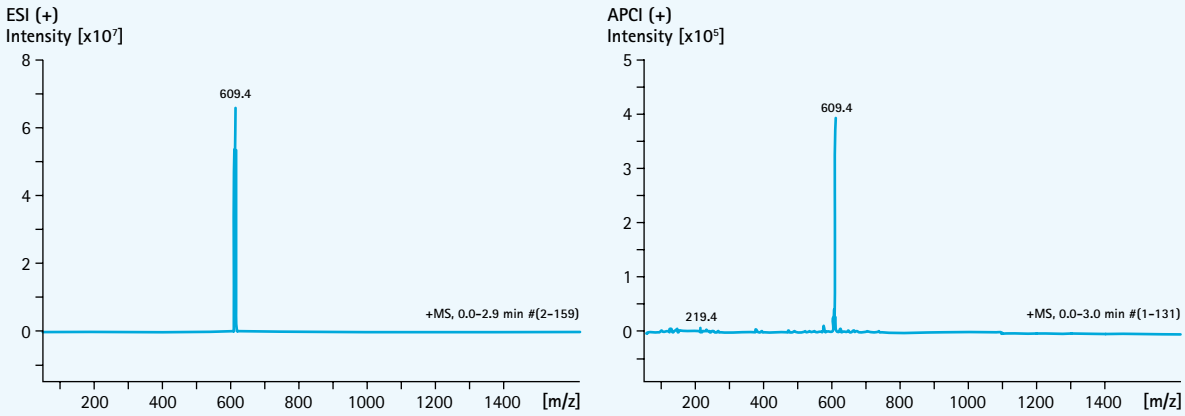


Fig. 2 *Mass spectrum of LiChrosolv® Acetonitrile hypergrade (100029). Mobile phase Acetonitrile special LC-MS grade. Intensity of single background mass peak based on reserpine standard (m/z 609.4) in e.g. ESI (+) and APCI (+) mode.*

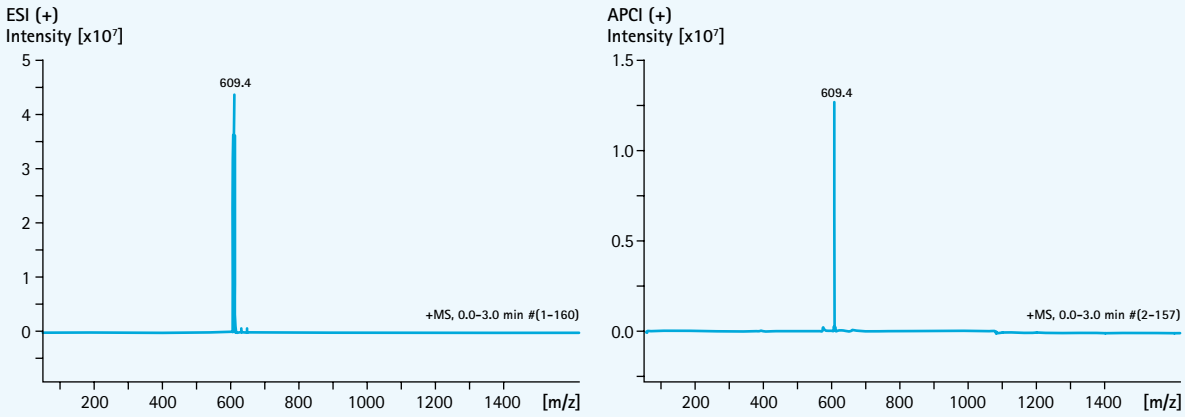


Fig. 3 *Mass spectrum of LiChrosolv® Methanol hypergrade (106035). Mobile phase Methanol special LC-MS grade. Intensity of single background mass peak based on reserpine standard (m/z 609.4) in e.g. ESI (+) and APCI (+) mode.*

Detailed information

LiChrosolv® hypergrade
NEW for LC-MS method ESI (+)(-) and APCI (+)(-)

Acetonitrile hypergrade LC-MS suitability	Cat. No. 100029 Spec. values
Purity (GC)	≥ 99.9 %
Identity (IR)	conforms
Residue on evaporation	≤ 1.0 mg/l
Water	≤ 0.01 %
Color	≤ 10 Hazen
Acidity	≤ 0.0001 meq/g
Alkalinity	≤ 0.0002 meq/g
Na (Sodium)	≤ 100 ppb
K (Potassium)	≤ 10 ppb
Gradient grade	
at 210 nm	≤ 1.0 mAU
at 254 nm	≤ 0.5 mAU
Transmission	
at 191 nm	≥ 25 %
at 195 nm	≥ 85 %
at 200 nm	≥ 96 %
at 215 nm	≥ 98 %
from 230 nm	≥ 99 %
Suitability for PAH analysis (HPLC fluorescence-detection)	conforms
At an excitation between 240 and 600 nm (with t ΔΔλ = 10 nm) the emission intensity in the range of 250 - 700 nm is smaller then the following standards: Chinin-Standard (1 ng/ml; 0.05 mol/l H_2SO_4), PAH Standard (1:100,000, Acetonitrile; NIST SRM 1647B)	
Suitability for pesticide analysis (HPLC UV-detection)	conforms
Suitability for LC-MS (tested with ion trap MS); Intensity of background mass peak based on reserpine:	
Mode: ESI 200 µl pos | APCI 200 µl pos	≤ 2 ppb
Mode: ESI 200 µl neg | APCI 200 µl neg	≤ 20 ppb

Filtered by 0.2 µm filter | Suitable for UPLC | UHPLC | Ultra Fast HPLC-instruments

Methanol hypergrade LC-MS suitability	Cat. No. 106035 Spec. values
Purity (GC)	≥ 99.9 %
Identity (IR)	conforms
Residue on evaporation	≤ 1.0 mg/l
Water	≤ 0.01 %
Color	≤ 10 Hazen
Acidity	≤ 0.0002 meq/g
Alkalinity	≤ 0.0002 meq/g
Na (Sodium)	≤ 100 ppb
K (Potassium)	≤ 10 ppb
Gradient Grade	
at 220 nm	≤ 5.0 mAU
at 235 nm	≤ 2.0 mAU
Transmission	
at 210 nm	≥ 35 %
at 220 nm	≥ 60 %
at 230 nm	≥ 75 %
from 260 nm	≥ 98 %
Suitability for LC-MS (tested with ion trap MS); Intensity of single background mass peak based on reserpine:	
Mode: ESI 200 µl pos | APCI 200 µl pos	≤ 2 ppb
Mode: ESI 200 µl neg | APCI 200 µl neg	≤ 20 ppb

Filtered by 0.2 µm filter | Suitable for PAH-analysis | Suitable for UPLC | UHPLC | Ultra Fast HPLC-instruments

LiChrosolv® Acetonitrile hypergrade for LC-MS suitability in 1 and 2.5 l special treated amber glass bottles.

Detailed information

Water for chromatography
NEW: Now also suitable for LC-MS | UPLC | UHPLC

Water for chromatography LC-MS and UPLC | UHPLC suitability	Cat. No. 115333 Spec. values
Spec. conductance at 25 °C (at the time of manufacturing)	≤ 1 µm/cm
Colony count	≤ 25 CFU/g
Residue on evaporation	≤ 5 mg/l
Fluorescence	
as quinine at 254 nm	≤ 1 ppb
as quinine at 365 nm	≤ 0.5 ppb
Gradient grade	
at 210 nm	≤ 5 mAU
at 254 nm	≤ 0.5 mAU
Suitability for LC-MS (tested with ion trap MS); Intensity of single background mass peak based on reserpine:	
Mode: ESI 200 µl pos | APCI 200 µl pos	≤ 1 ppb
Mode: ESI 200 µl neg | APCI 200 µl neg	≤ 20 ppb

Filtered by 0.2 µm filter | Suitable for Ultra Fast HPLC-instruments

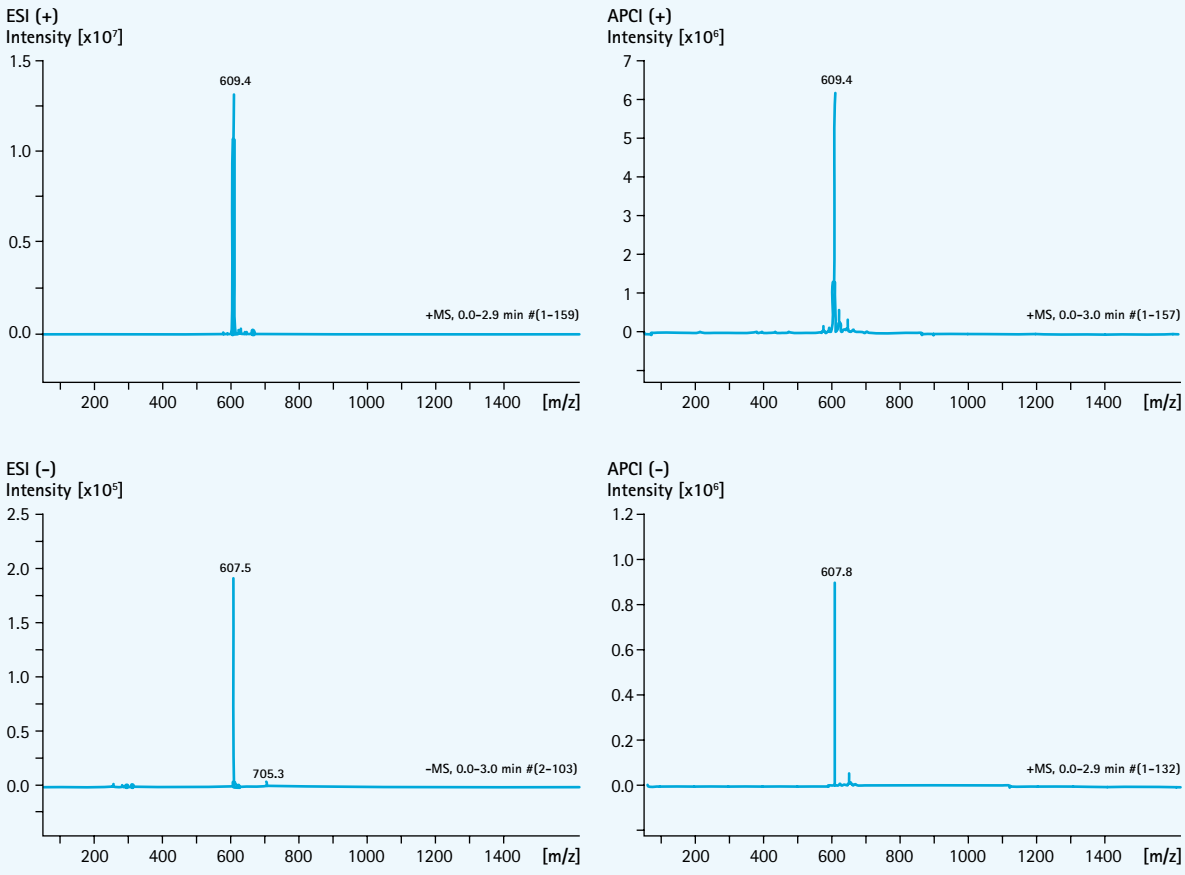


Fig. 4 *Mass spectrum of LiChrosolv® Water (115333). Intensity of single background mass peak based on reserpine standard in ESI (+) and APCI (+) mode; ESI (-) and ACPI (-) mode.*

Ordering information

Prepsolv® | For preparative chromatography

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/l]	Water max. [%]	Acidity max. [meq/g]	Alkalinity max. [meq/g]	UV-transmission at [nm]	Content / Packaging	Ord. No.
A	**Acetonitrile**	99.8	1	0.05	0.0005	0.0002	220 (90 %), 240 (98 %)	2.5 l GL	**1.13358.2500**
								30 l ST	**1.13358.9030**
								185 l ST	**1.13358.9185**
E	**Ethylacetate**	99.8	5	0.05	0.0002	0.0002	270 (50 %), 300 (98 %)	30 l ST	**1.13353.9030**
H	**n-Hexane**	95.0	5	0.01	0.0002	0.0002	220 (50 %), 250 (98 %)	30 l ST	**1.04394.9030**
M	**Methanol**	99.8	1	0.05	0.0002	0.0002	225 (50 %), 265 (98 %)	2.5 l GL	**1.13351.2500**
								4 l GL	**1.13351.4000**
								30 l ST	**1.13351.9030**
								185 l ST	**1.13351.9185**
P	**2-Propanol**	99.8	1	0.05	0.0002	0.0002	220 (50 %), 260 (98 %)	2.5 l GL	**1.13350.2500**

GL = glass bottle | ST = stainless steel returnable barrel

Specially these items are also available in tailor-made volumes, preferentially in 400 l, 1,000 l and 1,400 l stainless steel containers with rental contracts.

Detailed information
LiChrosolv® | Solvents for chromatography

Elutropic series	Total polarity index acc. to Snyder [1]	Molar mass	Refractive index	Boiling point	Vapor pressure	Dynamic viscosity		Dielectric constant
		[g/mol]	[n 20°/D]	[°C]	[hPa] 20 °C	[mPa · s] 22 °C	40 °C	[DK] 20 or 25 °C
n-Heptane	–	100.21	1,388	98.4	48	0.40	0.33	1.9
n-Hexane	0.0	86.18	1,375	68.9	160	0.31	0.26	1.9
Cyclohexane	0.0	84.16	1,427	80.7	104	0.94	0.71	2.0
Isohexane	0.0	86.18	1,376	55 - 62	160 - 190	0.32 (20 °C)	0.27	2.0
Isooctane	0.4	114.23	1,392	99.2	51	0.51	0.50	1.9
Toluene	2.3	92.14	1,496	110.6	29	0.58	0.47	2.4
tert-Butyl methyl ether	2.9	88.15	1,369	55	268	0.36 (20 °C)	–	–
Benzene	3.0	78.12	1,501	80.0	101	0.65 (20 °C)	–	2.28
1-Chlorobutane	–	92.57	1,402	78	110	0.47 (20 °C)	–	7.15
Chloroform	3.4	119.38	1,446	61.7	210	0.56	0.47	4.8
Dichloromethane	3.4	84.93	1,424	40.0	453	0.43	0.36	9.1
1,2-Dichloroethane	3.7	98.97	1,445	83.4	87	0.80	0.65	10.6
1-Butanol	3.9	74.12	1,399	117.2	67	2.95	1.78	17.8
Tetrahydrofuran	4.2	72.11	1,405	66.0	200	0.47	0.38	7.4
2-Propanol	4.3	60.10	1,378	82.4	43	2.27	1.35	18.3
Ethylacetate	4.3	88.10	1,372	77.1	97	0.44	0.36	6.0
1,4-Dioxane	4.8	88.11	1,422	101.0	41	1.21	0.92	2.2
Ethanol	5.2	46.07	1,361	78.5	59	1.20	0.83	24.3
Acetone	5.4	58.08	1,359	56.2	233	0.32	0.27	20.7
Acetonitrile	6.2	41.05	1,344	81.6	97	0.39	–	37.5
Methanol	6.6	32.04	1,329	65.0	128	0.52	0.45	32.6
Water	9.0	18.01	1,333	100.0	23	0.95	0.65	80.2

LD = median lethal dose | LC = median lethal concentration | No responsibility is taken for the correctness of the details provided.

(1) L.R. Snyder, J.J. Kirkland; Introduction to Modern Liquid Chromatography, John Wiley & Sons. Inc., New York, (1979)
(2) Detailed solvents tables acc. to H. Halpaap can be found in: Einführung in HDPE, ed. R.E. Kaiser, (1979); HPTLC, ed. A. Zlatkis, R.E. Kaiser Elsevier and IfC (1977)
(3) Detailed information: Material Safety Data Sheets (MSDS) provided by Merck Millipore

Dipole moment acc. to Snyder	ε° against Al_2O_3 acc. to Snyder [1]	Flow coefficient [2] x [mm²/s] DC-(silica gel 60 precoated plate) 22 °C			UV cut-off	Acute orale toxicity [3]	Acute inhalation toxicity [3]	Acute dermal toxicity [3]	Cat. No.
		Migration distance 50 mm	70 mm	100 mm	[nm]	LD_{50} rat [mg/kg]	LC_{50} rat (4 h) [mg/l]	LD_{50} rabbit [mg/kg]	
0	0.01	9.2	10.6	11.4	200	> 2,000	103 g/m³	3,400	**104390**
0	0.01	12.5	13.9	14.6	195	25,000	171.6	> 2,000	**104391**
0	0.04	5.4	6.3	6.7	200	> 5,000	14	> 2,000	**102827**
0	0.09	12.5	13.9	14.6	195	> 2,000	> 5	> 2,000	**104335**
0	0.01	7.9	8.3	8.7	215	> 2,500	37.5	–	**104717**
0.36	0.29	8.3	9.3	11.0	284	636	28.1	12,124	**108327**
–	0.2	–	–	–	210	> 2,000	85	> 2,000	**101845**
0	0.32	–	–	–	280	930	44	> 8,260	**101768**
1.74	0.26	–	–	–	220	2,200	> 8,000	–	**101692**
1.01	0.40	9.0	10.5	11.6	245	695	47.7	–	**102444**
1.60	0.42	10.1	11.8	13.2	232	1,600	88,000 mg/m³ (30 min)	> 2,000 (LD_{50} rat)	**106044**
1.75	0.44	7.6	8.4	8.9	230	670	7.2	2,800	**113713**
1.66	0.7	–	–	–	265	790	>18	3,400	**101988**
1.63	0.57	10.9	11.9	12.6	212	1,650	53.9	–	**108101**
1.66	0.82	2.1	2.3	2.5	205	5,045	46.5	12,800	**101040**
1.78	0.59	9.2	10.9	12.1	256	5,620	5.86 (8 h)	> 18,000	**100868**
0.40	0.56	5.2	6.0	6.5	215	5,200	48.5 - 54.3	7,600	**103132**
1.70	0.88	3.4	3.9	4.2	210	6,200	95.6	–	**111727**
2.88	0.56	12.7	14.7	16.2	330	5,800	76	20,000	**100020**
3.92	0.65	12.6	14.0	15.4	190	2,730 - 3,800	27.3	988	**100030**
1.70	0.95	5.6	6.5	7.1	205	5,628	85.26	–	**106007**
1.85	–	5.1	5.7	5.8	–	–	–	–	**115333**

LiChrosolv® Acetonitrile gradient grade for liquid chromatography in 1, 2.5 and 4 l glass bottles.

Spectroscopy

Uvasol®

UV/VIS and infrared spectroscopy are reliable and accurate methods used in modern analytical laboratories. Their versatility makes them indispensable for numerous analytical problems, and the wide variety of sample types reflects their value as an analytical tool.

Two important applications for spectroscopy are the identification of unknown substances, and the determination of concentrations of known substances.
In both cases, accurate analytic results depend on the use of very pure solvents for sample preparation.

Merck Millipore **Uvasol®** solvents are specially designed for spectroscopy and other applications that demand solvents of the highest spectral purity. To ensure consistent product quality, **Uvasol®** solvents are made from premium quality raw materials, and are subjected to stringent purification procedures. The refinement process permits higher levels of security in applications, and prevents misinterpretation of analytical results caused by traces of UV, IR and fluorescence contamination.

Your benefits

Uvasol®

- Best optical purity and widest specification of UV range
  (highest UV-transmittance, specified for minium 5 typical wavelengths)
- Best chemical purity (fluorescence, water, evaporation residue)
- No repeat analysis because of high batch to batch consistency

Spectroscopy
Uvasol®

Best chemical purity

The quality of Uvasol® solvents is documented by e.g. minimal inherent fluorescence. This can be demonstrated by the comparison of the fluorescence spectrum of Isooctane Uvasol® (Fig. 2) and the fluorescence spectrum of Isooctane Uvasol® including a Quinine standard of 1 ppb (Fig. 1). This application points out that the fluorescence of Uvasol® is free of any impurities.

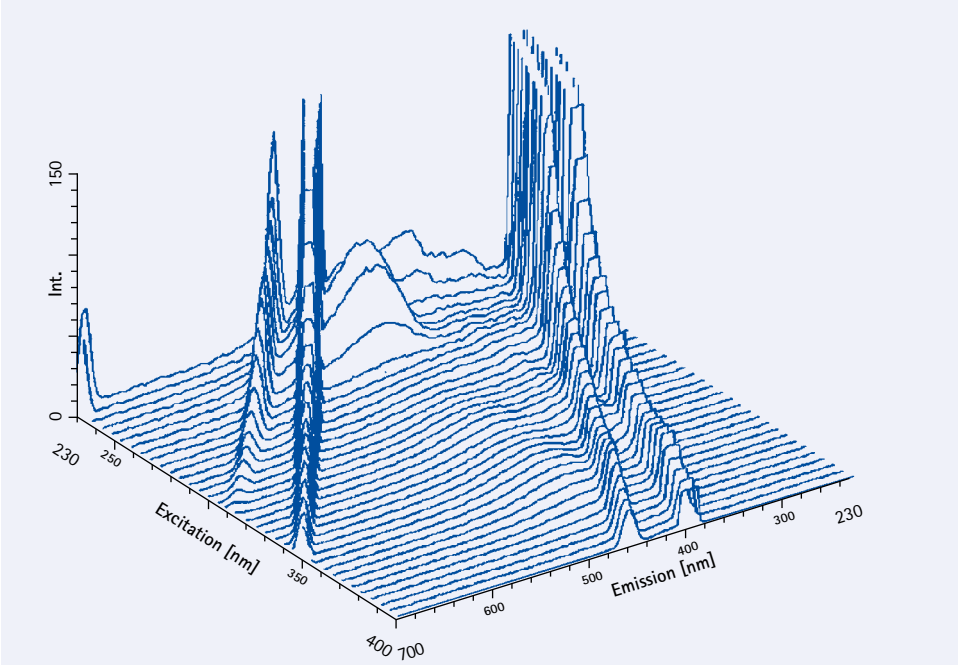


Fig. 1 *Isooctane Uvasol®, fluorescence spectrum, Quinine standard, 1 ppb.*

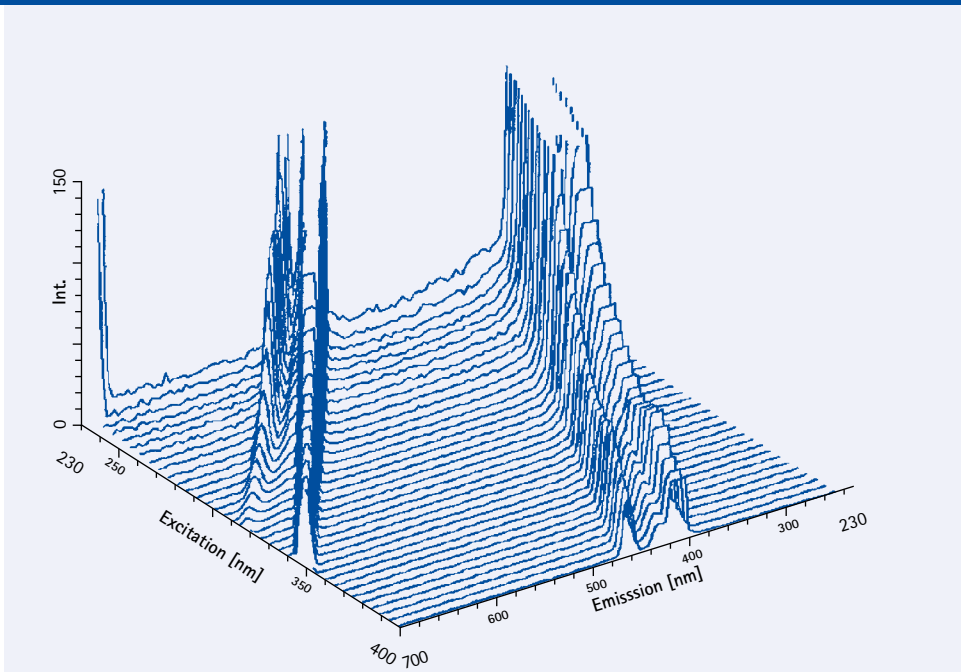


Fig. 2 *Isooctane Uvasol®, fluorescence spectrum, batch I208518.*

Uvasol® for UV- and infrared spectroscopy – best optical purity

Uvasol® solvents have the highest and widest specification of the UV range in the market. In all specifications the minimum transmittance for 5 typical wavelengths are specified. Figure 4 shows the high UV-transmittance of Isooctane Uvasol. It has a very high transmittance even in low wavelengths areas, resulting in accurate and reliable analytical results. Figure 3 shows the low infrared absorbance of Isooctane Uvasol® in the relevant wavenumbers > 4,500 for this application. The lower the absorbance is, the more precise are your analytical results. Costly repeat analysis or even the loss of valuable samples can thus be prevented.

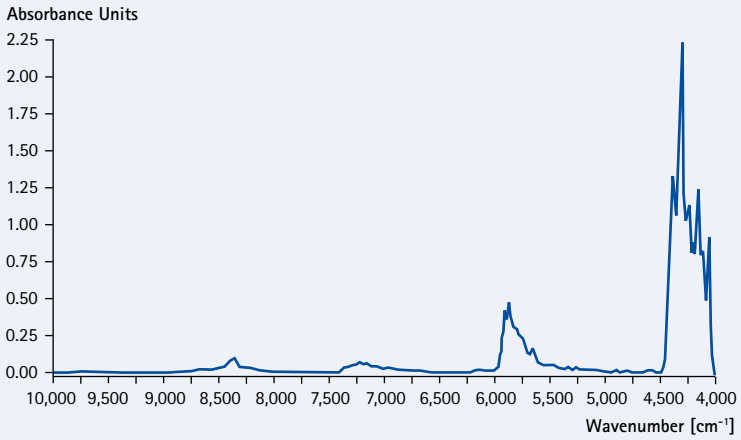


Fig. 3 *Isooctane Uvasol®, IR spectrum, batch I208518.*

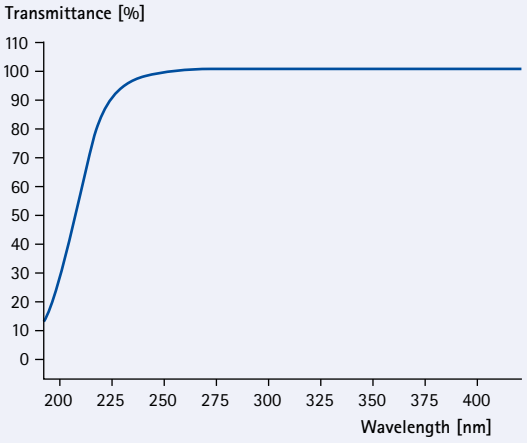
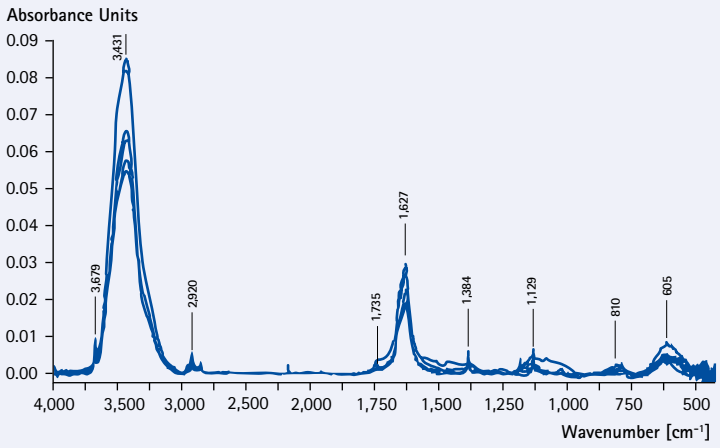


Fig. 4 *Isooctane Uvasol®, UV spectrum, batch I208518.*

Potassium bromide Uvasol® for infrared spectroscopy



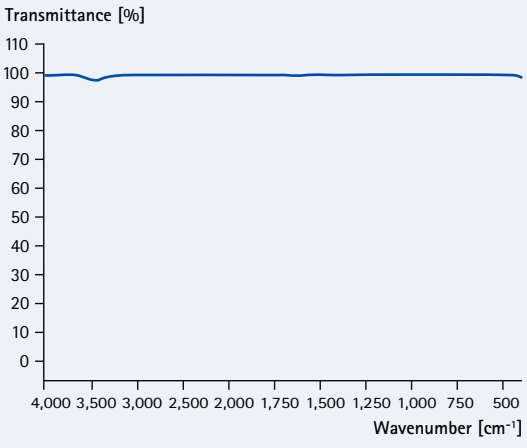


Fig. 5 *FT-IR absorbance spectra of representative batches of Uvasol® potassium bromide at 5 mm path length and transmittance spectra (blank) at 0.7 mm path length (32 scans, 2 cm⁻¹ resolution, DTGS detektor, Bruker IFS-48).*

The technique of potassium bromide pelletising for infrared spectroscopy has a high quality demand of the used potassium bromide. Potassium bromide Uvasol®, prepared by a special method of purification and subsequent treatment, is adjusted to a mean particle size of 150 µm. This is sufficient for the preparation of perfectly good pellets without the need for further pre-treatment and the associated risk of contamination. It also retains its powdery form over a period of years if stored in an air-tight condition. Its physical suitability for pelletising is checked by a special application test and its chemical purity established by full spectrum FT-IR analysis. The intensities for the OH- and CH-bands in particular are indicated as these occur frequently in critical applications (see Fig. 5).

Ordering information
Uvasol® A-M

	Product	Purity (GC) min. [%]	Evap. residue max. [%]	Water max. [%]	Fluorescence max. [ppb] (254 nm)	(365 nm)	UV-transmission at [nm]	Content / Packaging	Ord. No.
A	Acetone	99.9	0.0002	0.05	–	1.0	330 (15 %), 335 (60 %), 340 (85 %), 345 (95 %), 350 (99 %)	500 ml GL	**1.00022.0500**
								2.5 l GL	**1.00022.2500**
	Acetonitrile	99.9	0.0002	0.01	0.5	0.5	190 (20 %), 195 (60 %), 200 (90 %), 215 (95 %), 230 (98 %)	1 l GL	**1.00016.1000**
								2.5 l GL	**1.00016.2500**
B	1-Butanol	99.9	0.0002	0.03	1.0	1.0	210 (25 %), 220 (60 %), 230 (70 %), 240 (85 %), 245 (90 %), 270 (98 %)	500 ml GL	**1.01989.0500**
	tert-Butyl methyl ether	99.9	0.0002	0.01	1.0	1.0	215 (40 %), 235 (55 %), 240 (60 %), 255 (85 %), 260 (90 %), 280 (98 %)	1 l GL	**1.01984.1000**
C	Carbon disulfide	99.9	0.001	0.01	–	–	–	1 l GL	**1.02210.1000**
	Carbontetra-chloride	99.9	0.0005	0.005	–	1.0	265 (10 %), 270 (50 %), 277 (80 %), 282 (90 %), 290 (98 %)	1 l GL	**1.02209.1000**
								2.5 l GL	**1.02209.2500**
	Chloroform, stabilized	99.0	0.0002	0.01	1.0	1.0	245 (15 %), 250 (50 %), 255 (60 %), 260 (85 %), 270 (98 %)	500 ml GL	**1.02447.0500**
								2.5 l GL	**1.02447.2500**
	Cyclohexane	99.9	0.0002	0.005	1.0	1.0	208 (20 %), 220 (55 %), 230 (80 %), 240 (90 %), 250 (98 %)	500 ml GL	**1.02822.0500**
								2.5 l GL	**1.02822.2500**
D	Dichloro-methane, stabilized	99.9	0.0002	0.01	1.0	1.0	235 (30 %), 240 (70 %), 245 (85 %), 250 (95 %), 255 (98 %),	500 ml GL	**1.06048.0500**
								2.5 l GL	**1.06048.2500**
	Diethyl ether, stabilized	98.0	0.0003	0.03	1.0	1.0	220 (30 %), 235 (55 %), 250 (80 %), 270 (90 %), 300 (98 %)	1 l GL	**1.00930.1000**
	N,N-Dimethyl-formamide	99.9	0.0002	0.02	–	1.0	270 (25 %), 275 (60 %), 290 (80 %), 300 (90 %), 330 (98 %)	500 ml GL	**1.02937.0500**
								2.5 l GL	**1.02937.2500**
	Dimethyl sulfoxide	99.8	0.0004	0.05	–	7.0	270 (35 %), 280 (50 %), 310 (80 %), 330 (90 %), 350 (97 %)	500 ml GL	**1.02950.0500**
								2.5 l GL	**1.02950.2500**
E	Ethanol	99.9	0.0002	0.05	1.0	1.0	207 (20 %), 220 (55 %), 235 (80 %), 240 (85 %), 245 (90 %), 260 (98 %)	500 ml GL	**1.00980.0500**
								2.5 l GL	**1.00980.2500**
	Ethyl acetate	99.9	0.0002	0.01	2.0	1.0	255 (20 %), 260 (75 %), 263 (80 %), 265 (90 %), 270 (98 %)	500 ml GL	**1.00863.0500**
								2.5 l GL	**1.00863.2500**
H	n-Heptane	99.3	0.0002	0.005	1.0	1.0	200 (20 %), 210 (55 %), 220 (80 %), 228 (90 %), 245 (98 %)	500 ml GL	**1.04366.0500**
								2.5 l GL	**1.04366.2500**
	n-Hexane	99.0	0.0002	0.005	1.0	1.0	195 (10 %), 210 (60 %), 217 (80 %), 225 (90 %), 245 (98 %)	500 ml GL	**1.04372.0500**
								2.5 l GL	**1.04372.2500**
I	Isooctane	99.8	0.0002	0.005	1.0	1.0	205 (30 %), 215 (65 %), 220 (80 %), 225 (85 %), 235 (90 %), 245 (98 %), 255 (99 %)	500 ml GL	**1.04718.0500**
								2.5 l GL	**1.04718.2500**
M	Methanol	99.9	0.0002	0.01	1.0	1.0	205 (10 %), 210 (30 %), 220 (60 %), 230 (80 %), 240 (90 %), 250 (95 %), 260 (98 %)	500 ml GL	**1.06002.0500**
								2.5 l GL	**1.06002.2500**
	2-Methyl-butane	99.8	0.0005	0.005	1.0	1.0	190 (50 %), 200 (65 %), 210 (85 %), 215 (90 %), 240 (98 %)	1 l GL	**1.06056.1000**
P	Potassium bromide	–	–	–	–	–	–	100 g GL	**1.04907.0100**
								500 g GL	**1.04907.0500**
	n-Pentane	99.5	0.0002	0.005	1.0	1.0	200 (50 %), 210 (70 %), 215 (85 %), 225 (95 %), 240 (98 %)	1 l GL	**1.07179.1000**
	2-Propanol	99.9	0.0002	0.05	1.0	1.0	210 (30 %), 220 (65 %), 230 (80 %), 240 (90 %), 250 (95 %), 260 (98 %)	1 l GL	**1.00993.1000**
								2.5 l GL	**1.00993.2500**

All solvents are filtered through 0.2 µm. | Color: max. 10 Hazen | Acidity: max. 0.0002 meq/g | Alkalinity: max. 0.0002 meq/g | GL = glass bottle

Ordering information
Uvasol® P-T

	Product	Purity (GC) min. [%]	Evap. residue max. [%]	Water max. [%]	Fluorescence max. [ppb] (254 nm)	(365 nm)	UV-transmission at [nm]	Content / Packaging	Ord. No.
T	**Tetrachloro-ethylene**	99.9	0.0005	0.01	–	1.0	290 (20 %), 295 (65 %), 300 (80 %), 305 (85 %)	500 ml GL	**1.00965.0500**
								2.5 l GL	**1.00965.2500**
	Tetrahydro-furane	99.9	0.0002	0.01	1.0	1.0	215 (30 %), 245 (50 %), 265 (80 %), 275 (90 %), 310 (98 %)	500 ml GL	**1.08110.0500**
								2.5 l GL	**1.08110.2500**
	Toluene	99.9	0.0002	0.01	–	1.0	285 (15 %), 290 (60 %), 300 (80 %), 310 (90 %), 335 (96 %), 350 (98 %)	1 l GL	**1.08331.1000**
	1,1,2-Trichloro-trifluoro ethane	99.9	0.0005	0.005	–	–	–	500 ml GL	**1.08239.0500**
								2.5 l GL	**1.08239.2500**
	Trifluoro acetic acid	99.8	0.005	0.1	–	–	265 (10 %), 305 (50 %), 320 (80 %), 325 (90 %)	25 ml GL	**1.08262.0025**
								100 ml GL	**1.08262.0100**
								1 l GL	**1.08262.1000**
								2.5 l GL	**1.08262.2500**

All solvents are filtered through 0.2 µm. | Color: max. 10 Hazen | Acidity: max. 0.0002 meq/g | Alkalinity: max. 0.0002 meq/g | GL = glass bottle

► **Packaging and withdrawal systems see page 38**

Gas chromatography

SupraSolv® | UniSolv®

SupraSolv® and **UniSolv®** solvent qualities are ideal for all gas chromatography laboratory applications, such as highly sensitive pesticide and dioxin analysis. To ensure cutting-edge performance, we manufacture these solvents within special distillation cuts using the latest production processes. Only highly enriched solvents are used for the suitability test with various detection methods.

Merck Millipore is committed to developing solvents with the highest possible degree of purity. This is why we tailor our solvent specifications to your individual areas of application.

Security and reliability for gas chromatography

SupraSolv® and **UniSolv®** provide the analyst with the necessary security and reliability for today's applications, especially when monitoring and determining environmentally relevant substances in soil and water samples, e.g. polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), polychlorinated dibenzodioxins (PCDD), pesticides, but also highly volatile chlorinated hydrocarbons present in ppb trace amounts only.

SupraSolv® solvents for headspace gas chromatography

SupraSolv® solvents for headspace gas chromatography are developed particularly for the analysis of residual solvents in drug substances, excipients, and drug products according to Ph Eur and USP. Their high purity is provided by special designed production processes – for correct, reliable and reproducible results of analysis.

UniSolv® – a universal solvent for every application

Special clean-up procedures facilitate the production of unique high-performance **UniSolv®** solvents suited equally to the determination of components in the medium- and high-boiling range and even in the low-boiling range. No other solvent on the market is able to cover such an extensive detection range. Our customers just need one solvent quality – independent of the sample (e.g. water or soil) and independent of the detection method (GC-ECD, GC-FID, GC-MS).

Your benefits

SupraSolv®

- Accurate, reliable and reproducible results
- Time and cost savings due to the best possible batch consistency, thus avoiding analysis repetition

UniSolv®

- Better cost efficiency – applicable for all main GC-detection methods (GC-ECD, GC-FID, GC-MS)
- High application security

Suitability test SupraSolv® for gas chromatography

Developed especially for GC-ECD detection, SupraSolv® solvents offer the largest ECD retention time window and a minimal signal-to-noise ratio. Fig. 1 shows a GC-ECD reference chromatogram from Trichlorobenzene to Decachlorobiphenyle (internal standard Lindane = 3 pg/ml) and Fig. 2 shows a typical GC-ECD batch chromatogram of n-Hexane SupraSolv®. SupraSolv® has minimal interference signals in the relevant retention time (Fig. 1); thus results of analysis are reliable, reproducible and accurate.

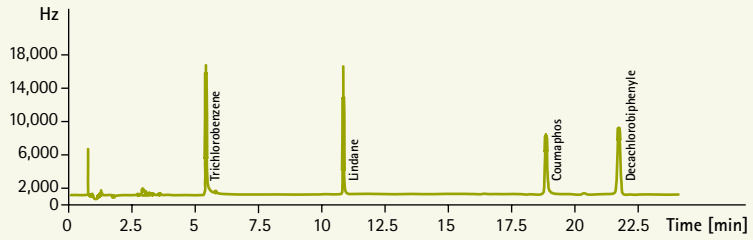


Fig. 1 *GC-ECD, reference chromatogram, Lindane = 3 pg/ml.*

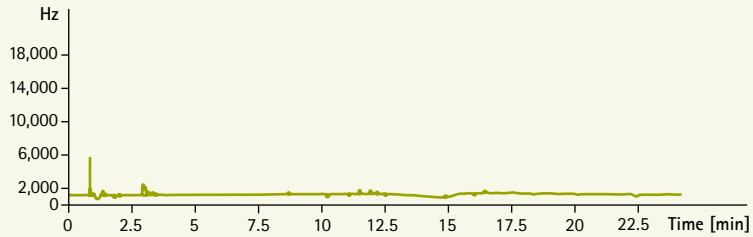
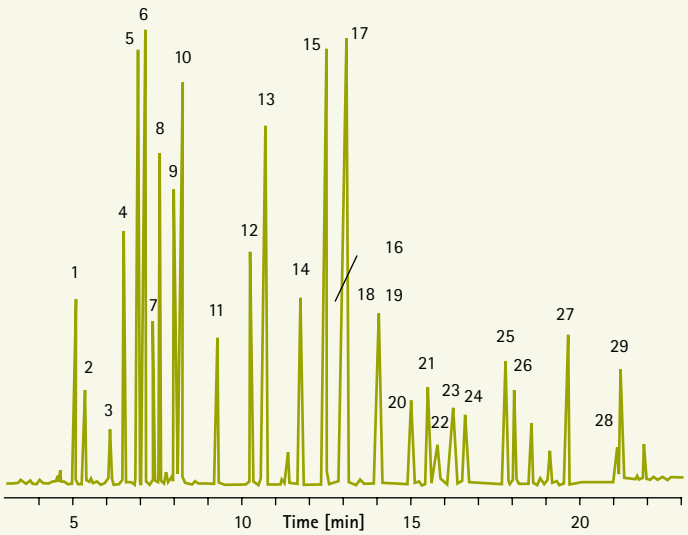


Fig. 2 *GC-ECD, batch chromatogram, n-Hexane SupraSolv® (104371).*

Typical application: classical pesticide analysis

The specified retention time range of SupraSolv® covers all analytes of interest for EPA method 508. This makes SupraSolv® perfectly suitable for this application.



1. Etridiazole
2. Chloroneb
3. Propachlor
4. Trifluralin
5. α-BHC
6. Hexachlorobenzene
7. β-BHC
8. Ω-BHC
9. γ-BHC
10. Chlorothalonil
11. Heptachlor
12. Aldrin
13. DCPA
14. Heptachlor epoxide
15. γ-Chlordane
16. Endosulfan I
17. α-Chlordane
18. Dieldrin
19. 4,4'-DDE
20. Endrin
21. Endosulfan II
22. Chlorobenzilate
23. 4,4'-DDD
24. Endrin aldehyde
25. Endosulfan sulfate
26. 4,4'-DDT
27. Methoxichlor
28. cis-Permethrin
29. trans-Permethrin

Fig. 3 *Chlorinated pesticides: EPA Method 508, GC-ECD.*

Gas chromatography
SupraSolv® headspace

SupraSolv® solvents for the analysis of residual solvents according to Ph Eur and USP

The headspace gas chromatography is a very precise and well accepted method for the analysis of residual solvents in drug substances, excipients, and drug products. Permissible maximum values for these residual solvents are defined in the ICH guideline, to which both the European and the United States Pharmacopoeia refer. They are divided into three different classes according to their toxicity. For accurate analysis with headspace gas chromatography very pure solvents are needed, with extremely low concentrations of the defined residual solvents.

We achieve these high requirements through special designed production processes. Our solvents for headspace gas chromatography are developed according to this application and in close cooperation with experienced laboratories.

Extract of specification

Every residual solvent of **class 1** acc. ICH	≤	1	µg/g
Every residual solvent of **class 2** acc. ICH	≤	10	µg/g
Every residual solvent of **class 3** acc. ICH	≤	50	µg/g

ICH = International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use

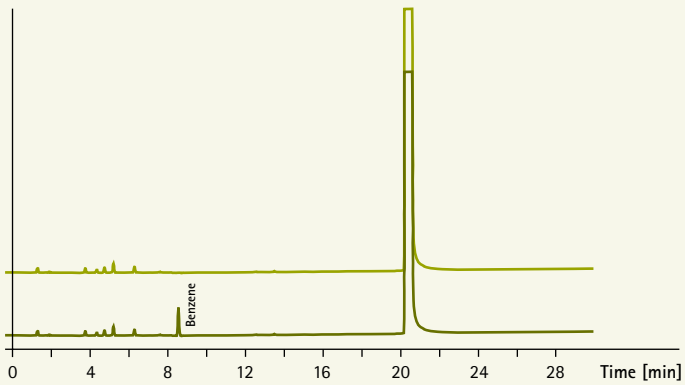


Fig. 4 *Chromatogram of DMSO Headspace SupraSolv® 101900 without addition compared to a chromatogram of DMSO Headspace SupraSolv® 101900 with 0.8 ppm benzene.*

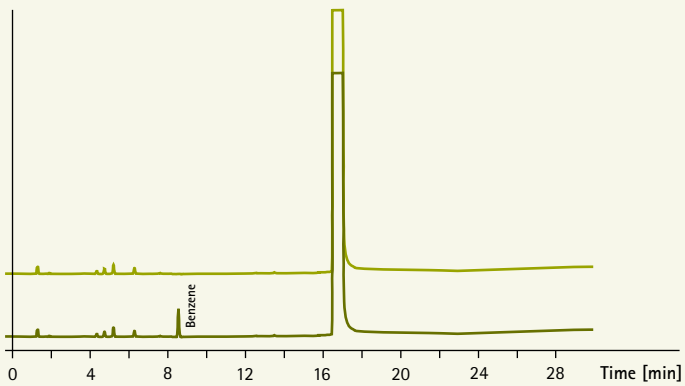


Fig. 5 *Chromatogram of DMF Headspace SupraSolv® 100202 without addition compared to a chromatogram of DMF Headspace SupraSolv® 100202 with 0.8 ppm benzene.*

Unique and universal

UniSolv® is specified for all three main GC detection methods (GC-ECD, GC-FID, GC-MS).

Reference chromatogram
Batch chromatogram

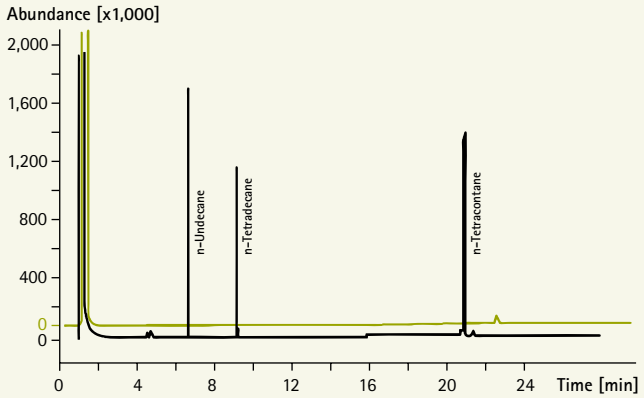


Fig. 6 *GC-FID, n-Hexane UniSolv® (104369).*

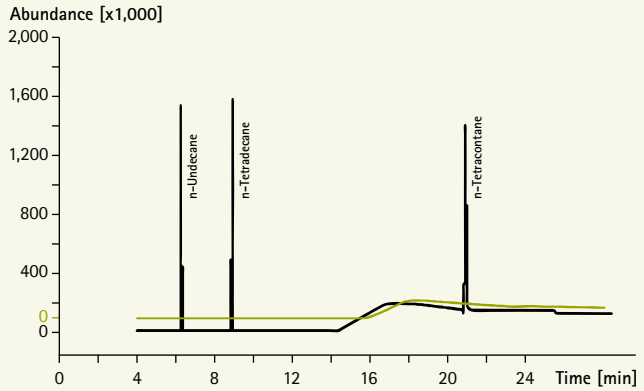


Fig. 7 *GC-MS, n-Hexane UniSolv® (104369).*

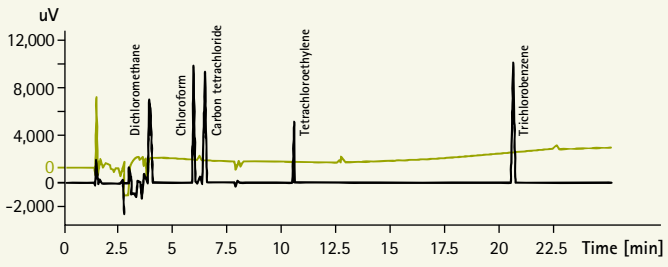


Fig. 8a *GC-ECD, n-Hexane UniSolv® (104369), low boiling range.*

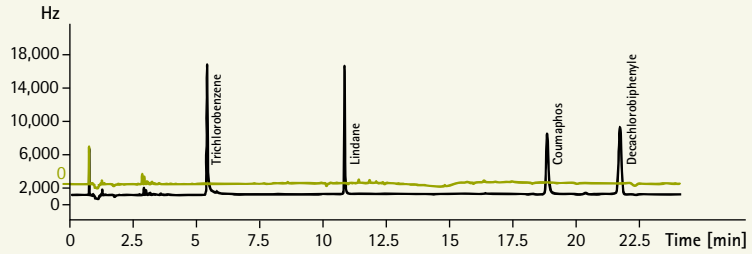


Fig. 8b *GC-ECD, n-Hexane UniSolv® (104369), medium- and high boiling range.*

SupraSolv® and UniSolv® | What is the difference?

	Applications	Detection methods	GC-ECD highly volatile chlorinated hydrocarbons	GC-ECD pesticide analysis	GC-MS	GC-FID
			Dichloromethane to 1,2,4-Trichlorobenzene (Carbon tetrachloride standard)	1,2,4-Trichlorobenzene to Decachlorobiphenyle (Lindane standard)	n-Undecan to n-Tetracontane; scanning area 30-600 amu (n-Tetra-decane standard)	n-Undecan to n-Tetracontane (n-Tetradecane standard)
SupraSolv®	• Sample preparation • Analysis of medium to high boiling substances (e.g. pesticides analysis)	GC-ECD	–	max. 3 pg/ml	–	–
UniSolv®	• Sample preparation • Analysis of low to high boiling substances (e.g. waste water and/or soil analysis)	GC-ECD GC-FID GC-MS	max. 1ng/ml	max. 2 pg/ml	max. 2 ng/ml	max. 2 ng/ml

Features UniSolv®

- The specified retention time range is larger than that for SupraSolv®. Even low-boiling substances can be reliably detected.
- The permissible concentration of interference signals within the retention time range is lower than that for SupraSolv®.

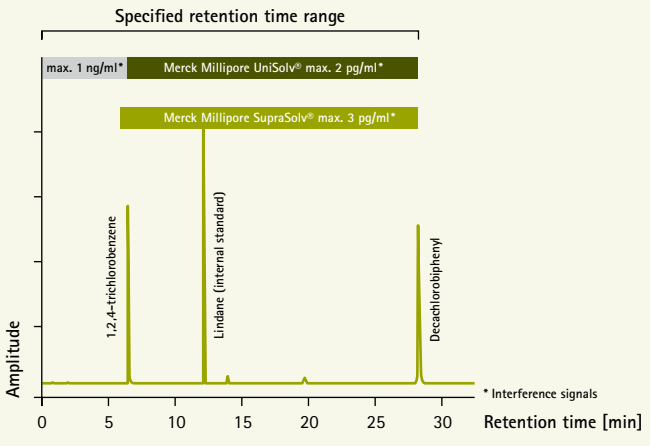


Fig. 9 *SupraSolv® and UniSolv® in comparison.*

▶ **Detailed brochure: Naturally pure (W 282144)**
▶ **Packaging and withdrawal systems see page 38**

Ordering information
SupraSolv® A-P

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/l]	Water max. [%]	Color max. [Hazen]	Content / Packaging	Ord. No.
A	Acetone	99.8	3.0	0.05	10	1 l GL	1.00012.1000
						2.5 l GL	1.00012.2500
						4 l GL	1.00012.4000
						30 l ST	1.00012.9030
	Acetonitrile	99.8	3.0	0.05	10	1 l GL	1.00017.1000
						2.5 l GL	1.00017.2500
						4 l GL	1.00017.4000
B	tert-Butyl methyl ether	99.8	3.0	0.02	10	1 l GL	1.01995.1000
						2.5 l GL	1.01995.2500
C	Chloroform, stabilized	99.8	5.0	0.01	10	1 l GL	1.02432.1000
						2.5 l GL	1.02432.2500
	Cyclohexane	99.8	3.0	0.01	10	1 l GL	1.02817.1000
						2.5 l GL	1.02817.2500
						4 l GL	1.02817.4000
						10 l ST	1.02817.9010
D	Dichloromethane	99.8	5.0	0.01	10	1 l GL	1.06054.1000
						2.5 l GL	1.06054.2500
						4 l GL	1.06054.4000
						10 l ST	1.06054.9010
	Diethyl ether, stabilized	98.0	3.0	0.05	10	1 l GL	1.00931.1000
						2.5 l GL	1.00931.2500
						4 l GL	1.00931.4000
	N,N-Dimethylformamide	99.8	3.0	0.05	10	1 l GL	1.10983.1000
						2.5 l GL	1.10983.2500
E	Ethyl acetate	99.8	3.0	0.02	10	1 l GL	1.10972.1000
						2.5 l GL	1.10972.2500
						4 l GL	1.10972.4000
						10 l ST	1.10972.9010
						30 l ST	1.10972.9030
H	n-Hexane	98.0 *	3.0	0.01	10	1 l GL	1.04371.1000
						2.5 l GL	1.04371.2500
						4 l GL	1.04371.4000
						10 l ST	1.04371.9010
						30 l ST	1.04371.9030
I	Isohexane	99.8	3.0	0.01	10	2.5 l GL	1.04340.2500
	Isooctane	99.8	3.0	0.01	10	1 l GL	1.15440.1000
						2.5 l GL	1.15440.2500
M	Methanol	99.8	3.0	0.1	10	1 l GL	1.06011.1000
						2.5 l GL	1.06011.2500
						4 l GL	1.06011.4000
P	Petroleum benzine (40 - 60 °C)	-	3.0	0.01	10	1 l GL	1.01772.1000
						2.5 l GL	1.01772.2500
						4 l GL	1.01772.4000
						10 l ST	1.01772.9010
						30 l ST	1.01772.9030

GL = glass bottle | ST = stainless steel barrel | * = sum of hexane isomers + methyl cyclopentane (GC) ≥ 99.8 %

Ordering information
SupraSolv® P-T

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/l]	Water max. [%]	Color max. [Hazen]	Content / Packaging	Ord. No.
P	**2-Propanol**	99.8	3.0	0.1	10	1 l GL	**1.00998.1000**
						2.5 l GL	**1.00998.2500**
T	**Toluene**	99.8	3.0	0.03	10	1 l GL	**1.08389.1000**
						2.5 l GL	**1.08389.2500**
						4 l GL	**1.08389.4000**
						10 l ST	**1.08389.9010**

GL = glass bottle | ST = stainless steel barrel

Ordering information
SupraSolv® Headspace For the analysis of residual solvents according to Ph Eur and USP

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/l]	Water max. [%]	Color max. [Hazen]	Content / Packaging	Ord. No.
NEW D	**N,N-Dimethylacetamide**	99.8	3.0	0.05	10	1 l GL	**1.00399.1000**
	N,N-Dimethylformamide	99.8	3.0	0.05	10	1 l GL	**1.00202.1000**
						2.5 l GL	**1.00202.2500**
	Dimethyl sulfoxide	99.8	3.0	0.05	10	1 l GL	**1.01900.1000**
						2.5 l GL	**1.01900.2500**
NEW W	**Water**	–	5.0	–	–	1 l GL	**1.00577.1000**
						2.5 l GL	**1.00577.2500**

GL = glass bottle

Ordering information
UniSolv®

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/l]	Water max. [%]	Color max. [Hazen]	Content / Packaging	Ord. No.
D	**Dichloromethane**	99.9	3.0	0.005	10	1 l GL	**1.06454.1000**
H	**n-Hexane**	99.0 *	3.0	0.005	10	1 l GL	**1.04369.1000**
						2.5 l GL	**1.04369.2500**
						10 l ST	**1.04369.9010**
P	**n-Pentane**	99.9	3.0	0.01	10	1 l GL	**1.07288.1000**
						2.5 l GL	**1.07288.2500**
	Petroleum benzine (40 - 60 °C)	-	3.0	0.005	10	1 l GL	**1.16740.1000**
						2.5 l GL	**1.16740.2500**
T	**Toluene**	99.9	3.0	0.005	10	1 l GL	**1.08388.1000**
						2.5 l GL	**1.08388.2500**

GL = glass bottle | ST = stainless steel barrel | * = sum of hexane isomers + methyl cyclopentane (GC) ≥ 99.8 %

Deuterated solvents are required wherever chemical research is carried out. And when it comes to NMR spectroscopy – the most important method in the structural analysis of organic molecules – they are indispensable.

NMR is a non-destructive, information-rich analytical technique which helps researchers to understand molecular structure and dynamics. NMR experiments provide information on connectivity – i.e., which atoms are attached to each other in a molecule, their spatial orientation, and how molecules move in their natural environment. This kind of structural information is particularly important in proteomics / genomics and drug discovery applications, where scientists desire a deeper understanding of protein target molecules and their spatial relationships with synthetic drug candidates.

Wide range of highest quality

A wide range of **MagniSolv™** deuterated solvents with extremely low residual water, excellent chemical purity, and the highest isotopic enrichment available can satisfy the most demanding requirements of researchers. In this solvent range the "classical" standard products and "exotic" specialities are represented.

Reliability

Depending on application and sensitivity of the NMR spectrometer Merck Millipore offers solvents with deuteration degrees between 98 % and 99.96 %. In case of all the water soluble deuterated standard products, water content is specified according to both Karl Fischer and NMR. This is unique amongst our competitors and underpins the leading position of Merck Millipore as a supplier of chemicals of the highest quality and reliability.

Optimized packaging

Merck Millipore provides a wide range of different packaging types (bottles, practical ampoules and septum bottles) and packaging sizes. Concerning the septum bottles we have the broadest range of deuterated solvents in this customer friendly packaging material. Here Merck Millipore's vast experience in the optimization of packaging is a unique benefit that we can fully utilize. We are also prepared to offer large volumes of **MagniSolv™** deuterated compounds. This also applies to special package sizes and other grades.

Your benefits

NMR spectroscopy

- Reliable results in NMR-spectra by
  - Excellent chemical purity and highest isotopic enrichment
  - Reliable deuteration degrees
  - Determination of water content in two ways (Karl Fischer and NMR)
- Easy and safe handling with septum bottles and glass ampoules
- Flexibility: broad packaging variety

NMR Nuclear magnetic resonance
MagniSolv™ | Deuterated solvents

Whatever you require! Merck Millipore's deuterated solvents!

We provide a wide range of products in different packaging types and -sizes.

► Other brochure: Attractive, MagniSolv™ deuterated solvents from Merck Millipore (W 284110)
► LabTool: NMR chemical shifts (W 284109)

Ordering information
MagniSolv™ | Deuterated solvents A-D

	Product	Deuteration degree [%]	H_2O+D_2O (KF) [%]	H_2O (NMR) [%]	Density at 20 °C [g/ml]	Quantity / Packaging	Content [g]	Ord. No.
A	**Acetic acid-D1 99.5 % D**	> 99.5	–	–	1.06	25 ml GL	26.50	**8.15035.0025**
	Acetic acid-D4 99.5 %	> 99.5	< 0.05	–	1.12	10 x 0.75 ml GA	8.40	**8.15036.0009**
					1.12	10 ml GA	11.20	**8.15036.0010**
	Acetone-D6 99.9 % D	> 99.9	< 0.03	< 0.02	0.87	10 x 0.5 ml GA	4.35	**1.00021.0005**
						10 x 0.75 ml GA	6.53	**1.00021.0009**
						10 ml SB	8.70	**1.00021.0010**
						25 ml GL	21.75	**1.00021.0025**
						100 ml GL	87.00	**1.00021.0100**
	Acetone-D6 99.96 % D	> 99.96	< 0.03	< 0.02	0.87	10 x 0.75 ml GA	6.53	**1.11969.0009**
	Acetonitrile-D3 99 % D	> 99	< 0.10	< 0.05	0.84	10 ml SB	8.40	**1.02904.0010**
	Acetonitrile-D3 99.8 % D	> 99.8	< 0.10	< 0.05	0.84	10 ml SB	8.40	**1.00220.0010**
	Acetonitrile-D3 99.96 % D	> 99.96	< 0.02	< 0.01	0.84	1 ml GA	0.84	**1.13753.0001**
						10 x 0.75 ml GA	6.30	**1.13753.0009**
	Acetonphenone-D8 98 % D	> 98	–	–	1.10	10 ml GA	11.00	**8.15006.0010**
	Ammonia-D3 26 wt % in D_2O	> 99.5	–	–	1.06	10 ml GA	10.60	**8.15008.0010**
						25 ml GL	26.50	**8.15008.0025**
B	**Benzene-D6 99.6 % D**	> 99.6	–	< 0.02	0.95	10 x 0.75 ml GA	7.13	**1.01789.0009**
						10 ml SB	9.50	**1.01789.0010**
						100 ml GL	95.00	**1.01789.0100**
	Benzene-D6 99.96 % D	> 99.96	–	–	0.95	10 x 0.75 ml GA	7.13	**1.01766.0009**
						10 ml GA	9.50	**1.01766.0010**
	tert-Butanol (ol-D) 99 % D	> 99	–	–	0.80	25 ml GL	20.00	**8.15014.0025**
C	**Chloroform 99.5 % D; 1 vol. % TMS stabilized with silver**	> 99.5	–	< 0.02	1.50	25 ml GL	37.50	**1.13359.0025**
						100 ml GL	150.00	**1.13359.0100**
	Chloroform-D1 99.8 % D not stabilized	> 99.8	–	< 0.01	1.50	25 ml GL	37.50	**1.02450.0025**
						100 ml GL	150.00	**1.02450.0100**
						500 ml GL	750.00	**1.02450.0500**
	Chloroform-D1 99.8 % D stabilized with silver	> 99.8	–	< 0.01	1.50	25 ml GL	37.50	**1.03420.0025**
						100 ml GL	150.00	**1.03420.0100**
						500 ml GL	750.00	**1.03420.0500**
	Chloroform 99.8 % D; 0.03 % TMS stabilized with silver	> 99.8	–	< 0.01	1.50	25 ml GL	37.50	**1.03296.0025**
						100 ml GL	150.00	**1.03296.0100**
						500 ml GL	750.00	**1.03296.0500**
	Chloroform-D1 99.96 % D	> 99.96	–	< 0.005	1.50	10 x 0.75 ml GA	11.25	**1.02446.0009**
						10 ml GA	15.00	**1.02446.0010**
	25 ml stabilized with silver					25 ml GL	37.50	**1.02446.0025**
	100 ml stabilized with silver					100 ml GL	150.00	**1.02446.0100**
	Cumene (Isopropylbenzene)-D12 99 % D	> 99	–	–	0.95	1 ml GA	0.87	**8.15023.0001**
	Cyclohexane-D12 99.5 % D	> 99.5	< 0.05	< 0.03	0.89	10 x 0.5 ml GA	4.45	**8.15024.0005**
						10 x 0.75 ml GA	6.68	**8.15024.0009**
						5 ml GA	4.45	**8.15024.0006**
D	**n-Decane-D22 99 % D**	> 99	–	–	0.85	1 ml GA	0.85	**8.15027.0001**
	Deuterium chloride 20 wt % in D_2O 99.5 % D	> 99.5	–	–	1.19	25 ml GL	29.75	**8.15016.0025**
						50 ml GL	59.50	**8.15016.0050**
	Deuterium chloride 20 wt % in D_2O 99.95 % D	> 99.95	–	–	1.19	10 ml GA	11.90	**8.15017.0010**

GA = glass ampoule | SB = septum bottle | GL = glass bottle

Ordering information
MagniSolv™ | Deuterated solvents D-L

	Product	Deuteration degree [%]	H_2O+D_2O (KF) [%]	H_2O (NMR) [%]	Density at 20 °C [g/ml]	Quantity / Packaging	Content [g]	Ord. No.
D	**Deuterium chloride 38 wt % in D_2O 99.5 % D**	> 99.5	–	–	1.26	10 ml GA	12.60	**8.15018.0010**
						50 ml GL	63.00	**8.15018.0050**
	Deuterium oxide 99.9 % D	> 99.9	–	–	1.11	10 x 0.75 ml GA	8.33	**1.13366.0009**
						10 ml SB	11.10	**1.13366.0010**
						25 ml GL	27.75	**1.13366.0025**
						100 ml GL	111.00	**1.13366.0100**
						500 ml GL	555.00	**1.13366.0500**
	Deuterium oxide 99.96 % D	> 99.96	–	–	1.11	10 x 0.5 ml GA	5.55	**1.03428.0005**
						10 x 0.75 ml GA	8.33	**1.03428.0009**
						10 ml SB	11.10	**1.03428.0010**
						100 ml GL	111.00	**1.03428.0100**
	1.2-Dichlorobenzene-D4 99 % D	> 99	–	< 0.03	1.34	5 ml GA	6.70	**8.15029.0005**
	Dichloromethane-D2 99.8 % D	> 99.8	–	< 0.01	1.36	10 x 0.75 ml GA	10.20	**1.13720.0009**
						10 ml GA	13.60	**1.13720.0010**
	Dichloromethane-D2 99.96 % D	> 99.96	–	< 0.005	1.36	10 x 0.5 ml GA	6.80	**1.04200.0005**
						10 x 0.75 ml GA	10.20	**1.04200.0009**
						10 ml GA	13.60	**1.04200.0010**
	Diethylether-D10 99 % D	> 99	–	–	0.78	1 ml GA	1.00	**8.15031.0001**
	Dimethylacetamide-D9 99 % D	> 99	–	–	1.03	1 ml GA	1.03	**8.15032.0001**
	Dimethylformamide-D7 99.5 % D	> 99.5	< 0.05	< 0.03	1.05	1 ml GA	1.05	**1.11656.0001**
						10 x 0.75 ml GA	7.88	**1.11656.0009**
	Dimethylsulfate-D6 99.5 % D	> 99.5	–	–	1.40	5 ml GA	7.00	**8.15034.0005**
	Dimethylsulfoxide-D6 99.8 % D	> 99.8	< 0.03	< 0.02	1.19	10 x 0.5 ml GA	5.95	**1.03424.0005**
						10 x 0.75 ml GA	8.93	**1.03424.0009**
						10 ml SB	11.90	**1.03424.0010**
						10 ml GA	11.90	**1.03424.0011**
						25 ml GL	29.75	**1.03424.0025**
						50 ml SB	59.5	**1.03424.0050**
						100 ml GL	119.00	**1.03424.0100**
	Dimethylsulfoxide-D6 99.9 % D; 0.1 vol. % TMS	> 99.9	< 0.03	< 0.02	1.19	NEW 10 x 0.6 ml GA	7.14	**1.03587.0006**
						25 ml GL	29.75	**1.03587.0025**
						NEW 25 ml SB	29.75	**1.03587.0026**
						100 ml GL	119.00	**1.03587.0100**
	Dimethylsulfoxide-D6 99.8 % D; 0.03 vol. % TMS	> 99.8	–	–	1.19	50 ml SB	59.5	**1.03591.0050**
						100 ml GL	119.00	**1.03591.0100**
	Dimethylsulfoxide-D6 99.96 % D	> 99.96	< 0.02	< 0.01	1.19	10 x 0.5 ml GA	5.95	**1.03562.0005**
						10 x 0.75 ml GA	8.93	**1.03562.0009**
						10 ml GA	11.90	**1.03562.0010**
						25 ml GL	29.75	**1.03562.0025**
	Dimethylsulfoxide-D6 99.96 % D; 0.03 vol. % TMS	> 99.96	< 0.02	< 0.01	1.19	5 ml GA	5.95	**1.03592.0005**
						25 ml GL	29.75	**1.03592.0025**
E	**Ethanol-D6 99 % D**	> 99	< 0.10	< 0.05	0.90	1 ml GA	0.90	**1.03450.0001**
	Ethanol (ol-D) abs. 99.5 % D	> 99.5	–	–	0.80	50 ml GL	40.00	**8.15037.0050**
F	**Formic acid-D2 97 wt % in D_2O**	> 99.5	–	–	1.27	10 ml GA	12.70	**1.13365.0010**
H	**Hexafluoro-2-propanol-D2 99.5 % D**	> 99.5	–	–	1.65	1 ml GA	1.65	**8.15041.0001**
						5 ml GA	8.25	**8.15041.0005**
	n-Hexane-D14 99 % D	> 99	–	–	0.77	1 ml GA	0.77	**8.15043.0001**
L	**Lithiumaluminiumdeuterid 98 %**	> 98	–	–	–	5 g GL	5.00	**8.15048.0005**

GA = glass ampoule | SB = septum bottle | GL = glass bottle

Ordering information
MagniSolv™ | Deuterated solvents M-X

	Product	Deuteration degree [%]	H_2O+D_2O (KF) [%]	H_2O (NMR) [%]	Density at 20 °C [g/ml]	Quantity / Packaging	Content [g]	Ord. No.
M	**Methylcyclohexane-D14 99.5 % D**	> 99.5	–	–	0.88	5 ml GA	4.40	**8.15053.0005**
	Methanol (ol-D) 99.5 % D	> 99.5	–	–	0.81	50 ml GL	40.50	**8.15051.0050**
						100 ml GL	81.00	**8.15051.0100**
	Methanol-D4 99.8 % D	> 99.8	< 0.03	–	0.89	1 ml GA	0.89	**1.06028.0001**
						10 x 0.5 ml GA	4.45	**1.06028.0005**
						10 x 0.75 ml GA	6.68	**1.06028.0009**
						10 ml SB	8.90	**1.06028.0010**
						25 ml GL	22.25	**1.06028.0025**
					NEW	25 ml SB	22.25	**1.06028.0026**
						100 ml GL	89.00	**1.06028.0100**
	Methanol-D4 99.95 % D	> 99.95	< 0.02	–	0.89	10 x 0.5 ml GA	4.45	**1.06025.0005**
						10 x 0.75 ml GA	6.68	**1.06025.0009**
	Methanol-D3 99.5 % D	> 99.5	–	–	0.87	1 ml GA	0.87	**8.15052.0001**
						5 ml GA	4.35	**8.15052.0005**
N	**Naphthalene-D8 98 % D**	> 98	–	–		1 g GL	1.00	**8.15000.0001**
	Nitrobenzene-D5 99.5 % D	> 99.5	–	–	1.25	10 ml GA	12.53	**8.15001.0010**
	Nitromethane-D3 99 % D	> 99	< 0.10	< 0.05	1.18	2 x 0.75 ml GA	1.77	**1.02914.0002**
O	**n-Octane-D18 99 % D**	> 99	–	–	0.82	1 g GA	0.82	**8.15002.0001**
P	**Phenol-D6 98 % D**	> 98	–	–	–	5 g GL	5.00	**8.15003.0005**
	Phosphoric acid-D3 85 wt % in D_2O 99 % D	> 99	–	–	1.74	10 ml GA	17.40	**8.15058.0010**
	2-Propanol (ol-D) 98 % D	> 98	–	–	0.79	25 ml GL	19.75	**8.15044.0025**
	2-Propanol-D8 99.5 % D	> 99.5	–	–	0.89	5 ml GA	4.45	**8.15045.0005**
	Pyridine-D5 99.8 % D	> 99.8	< 0.03	< 0.02	1.05	10 x 0.75 ml GA	7.88	**1.07475.0009**
						10 ml SB	10.50	**1.07475.0010**
S	**Sodium deuterium oxide 30 wt % in D_2O 99.5 % D**	> 99.5	–	–	1.46	25 ml GL	36.50	**8.15055.0025**
	Sulfuric acid-D2 96 - 98 wt % in D_2O	> 99.5	–	–	1.88	25 ml GL	47.00	**8.15060.0025**
						50 ml GL	94.00	**8.15060.0050**
	Styrene-D8 98 % D	> 99	–	–	0.98	1 ml GA	0.98	**8.15061.0001**
						10 ml GA	9.80	**8.15061.0010**
T	**Tetrachloroethane-D2 99.5 % D**	> 99.5	–	< 0.02	1.62	10 x 0.75 ml GA	12.15	**1.03495.0009**
						25 ml GL	40.50	**1.03495.0025**
	Tetramethylsilane	> 99.7	–		0.64	100 ml GL	64.00	**1.08183.0100**
	TMS-Propionic acid-D4-Na 98 % D	> 98	–	–	–	1 g GL	1.00	**1.08652.0001**
	Tetrahydrofuran-D8 99.5 % D	> 99.5	< 0.05	< 0.03	0.99	1 ml GA	0.99	**1.13364.0001**
						10 x 0.75 ml GA	7.43	**1.13364.0009**
						10 ml SB	9.90	**1.13364.0010**
	Toluene-D8 99.5 % D	> 99.5	–	< 0.02	0.94	10 ml SB	9.40	**1.13368.0010**
	Trifluoroacetic acid-D1 99.5 % D	> 99.5	< 0.05	< 0.03	1.50	10 ml GA	15.00	**1.13363.0010**
X	**o-Xylene-D10 99.5 % D**	> 99.5	–	–	0.95	10 ml GA	9.50	**8.15004.0010**
	p-Xylene-D10 99.5 % D	> 99.5	–	–	0.95	10 ml GA	9.50	**8.15005.0010**

GA = glass ampoule | SB = septum bottle | GL = glass bottle

Easy and safe handling:
Safety by one point cut (OPC).

Packaging and withdrawal systems

Merck Millipore has a strong track record in developing practical packaging concepts and chemical packaging that preserve the high quality of our solvents. We have been authorized as an official inspection authority by the Federal Institute for Material Research and Testing of Germany (BAM).

Merck Millipore offers a unique variety of packaging sizes and types for **LiChrosolv®, Prepsolv®** (high performance liquid chromatography), **Uvasol®** (spectroscopy), **SupraSolv®, UniSolv®** (gas chromatography) and **SeccoSolv®** (dried solvents):

- Glass bottles
- Aluminium bottles
- Septum seal bottles (see page 46)
- Stainless steel barrels
- Other barrels and containers

For many years, Merck Millipore has worked closely with customers to develop solvent withdrawal systems that are tailor-made for our packaging types. Today, our broad range of withdrawal systems and containers is unrivalled in the industry. As a result, customers can rest assured that whatever the application, we can always supply the right container and the right withdrawal system. And since we provide a fully integrated system that includes solvent, container and withdrawal equipment, all components are perfectly matched for optimal results.

Your benefits

Packaging and withdrawal systems

- Easy, safe and contamination-free solvent handling
- Central storage and supply possible
- Individual user installation or other customized solutions possible
- Application and demand orientated packaging sizes
- Ecological and economical benefit by using returnable containers
- Direct connection to laboratory equipment possible (e.g. HPLC-instruments)

Packaging overview

Instrumental analysis

Glass bottles


500 ml


1 liter


2.5 liter


4 liter

- **Optimum characteristics for handling, storage and transport**
- **Safe footprint**
- **Low center of gravity**
- **Optimum emptying**
- **Safety screw cap S40 (Polypropylene) with a circlip as an originality device and a PTFE-insert for highest closeness**
- **High pressure resistance**
- **Special pouring lip for non-drip pouring**
- **Level sensors available**

To comply with transport regulations the glass bottles must be protected by pads of polystyrene. Such polystyrene packages are dispatched as packages of 6 x 1 l or 4 x 2.5 l in a special folding corrugated cardboard box that has been approved for transport purposes. For daily lab handling of glass bottles we recommend to use the safety carriers 9.20078.0001 for 0.5 l to 2.5 l or 1.20080.0001 for 4 l glass bottles.

Aluminium bottle


5 liter

- **Optimum characteristics for handling, storage and transport**
- **Safety screw cap S40 (Polypropylene) with a circlip as an originality device and a PTFE-insert for highest closeness**
- **UN certification to be sent without polystyrene outer packaging**
- **Optimum material characteristics (avoidance of interactions between solvents and packaging material)**
- **Low weight (easy handling and low transport costs)**
- **No risk of fracture**
- **Level sensors available**

Stainless steel barrels


10 liter


30 liter


185 liter

- **Optimum material characteristics (avoidance of interactions between solvents and packaging material)**
- **Use as returnable barrels**
- **Can be combined with a variety of withdrawal systems and level sensors**
- **Optimum emptying**
- **Stackable**

Stainless steel, due to its properties (e.g. its inertness), is an ideal packaging material, particularly with regard to the maintenance of the quality of solvents. Merck Millipore has thus been using stainless steel barrels for various types of highly purified solvents for many years. The range of stainless steel barrels currently comprises 10 liter, 30 liter and 185 liter volumes.

▶ **For more details please have a look on page 42.**

NEW

Closed system *For extremely water-sensitive applications Merck Millipore provide specially designed 10 l and 30 l stainless steel barrels which are dedicated to the product and completely closed.*

Other barrels and containers


400 liter


1,000 liter


1,400 liter

For applications with a high demand for high purity solvents – especially in preparative work – the use of specific packaging could be required. Also for this demands we offer different types of containers, which are designed especially for the use of high quality solvents. Our standard range includes 400 liter, 1,000 liter and 1,400 liter stainless steel pressure containers, which are employed customer- and product specific. If technical possible and allowed, we also fill other packaging that you provide.

Stainless steel barrels

Instrumental analysis

Safety & environment

In the development of barrels for safe use with our highly purified solvents, a number of design improvements have been made on the standard stainless steel barrel:

- Design improvements in the top and bottom sections combined with the Merck Millipore withdrawal systems allow safe withdrawal and optimal removal of any residual quantities – minimization of the handling risk even of the "empty" barrels (e.g. in case of leakage, hazardous explosive atmospheres).
- Identifiable, in order to facilitate logistics, each barrel is provided with a unique identity number for a complete traceability and documentation of each barrel.
- Each barrel is strictly safety tested by the Federal Institute for Material Research and Testing of Germany (BAM) and designated as suitable for the transport of hazardous materials.
- Safe storage and handling due to its stability and stackable shape.

The Merck Millipore barrels are developed to meet main environmental issues:

- Design improvements in the top and bottom sections combined with the Merck Millipore withdrawal systems allow optimal removal of any residual quantities – minimization of the environmental pollution risk, even of the "empty" barrels.
- The usage of Merck Millipore withdrawal systems (e.g. direct connections to instruments, central lab supply) reduce the solvent vapors emitted to the environment during solvent usage.
- Unbreakable properties of the container minimize the environmental pollution risks.
- Returnable barrels reduce the packaging waste and save raw materials.

The barrels are part of a returnable process. During their useful life they remain the property of Merck KGaA Darmstadt. After consumption of the solvents on customer site the empty barrels have to be returned to Merck Millipore. On their return, we will ensure that they are properly cleaned, checked and refilled.

Quantity guidelines

Requirement in excess	Recommendation
100 liter per year (10 x 10 liter)	10 liter barrel
300 liter per year (10 x 30 liter)	30 liter barrel
200 liter per month	185 liter barrel

The barrel volume can be chosen to correspond to actual use.

These quantities enable the prescribed cycles of 4 – 6 weeks for such stainless steel barrels to be achieved. The reuse of the barrels makes it possible to conform to packaging regulations that require packaging waste to be reduced or even avoided. In this way supplier and user act together in partnership in reducing packaging waste.

We recommend using the original Merck Millipore withdrawal systems that are exactly adapted to the barrels, in order to ensure:

- Safe and easy solvents handling
- Contamination-free withdrawing of solvents
- Trouble-free running of your application
- No damage to the barrels

Technical data

Parameter	10 l barrel	30 l barrel	185 l barrel
Height	31 cm	44 cm	97 cm
Diameter	28 cm	37 cm	58 cm
Wall thickness	1.5 mm	1.5 mm	1.5 mm
Volume	12 l	33.5 l	206 l
Filling quantity	10 l	30 l	185 l
Weight (empty)	5.5 kg	9.6 kg	31 kg
Number per pallet	11	6	2
Openings	2" centrally and 3/4" decentrally located		
Material	stainless steel 1.4301		

Important safety advice

Withdrawal of flammable liquids should only be made from vessels that have been properly earthed as well as the withdrawal system itself. This can be done e.g. using the Merck Millipore antistatic device (Ord. No. 1.07070.0001).

Withdrawal systems overview

Instrumental analysis

New packaging systems and concepts demand practical, user-friendly withdrawal aids that are tailored to individual demand. Most of the withdrawal systems shown here were developed at Merck Millipore, and are fully compatible with all stainless steel returnable barrels. All components and accessories are easily interconnectable, thanks to a comprehensive selection of reducers, adapters and couplings that covers virtually all application scenarios.

Safety & environment

- Design improvements in the top and bottom sections combined with the Merck Millipore withdrawal systems allow safe withdrawal and optimal removal of any residual quantities – minimization of the handling risk even of the "empty" barrels (e.g. in case of leakage, hazardous explosive atmospheres).
- Special developed high quality materials (e.g. stainless steel, sealing) avoid contact erosion caused by solvents and develop the safety for the customer to the maximum.
- The broad product range includes all relevant safety items, e.g. gas reducing valve, anti-static device, level sensors, and clamps for maximum withdrawal safety.
- Direct connections of the solvent to the appropriate instrument or product line allow for maximum customer safety and environmental protection (closed system) due to avoidance of e.g. solvent vapours.
- The Merck Millipore system includes solvent, container and withdrawal equipment (withdrawal systems, special reducers, adapters, couplings and safety items), all of which are optimally matched to one another. This means safe installations for the customer and environmental friendly installations due to extensive assembling options.
- Merck Millipore withdrawal systems are developed to meet all the relevant safety regulations, e.g. self-closing nozzles and pressure relief mechanisms for maximum customer safety.

Benefits

- Safe, easy and flexible one-stop solutions for daily solvent handling
- Cost-effective solvent usage due to work-process optimization
- Ecological and cost benefits of returnable containers

Important safety advice

Our withdrawal systems have been developed and optimized for the use with containers and solvents from Merck Millipore. Merck Millipore therefore disclaims any warranty or liability for the operability of its withdrawal systems in connection with containers or solvents from other manufacturers.

Merck Millipore reserves the right to refrain from the delivery of withdrawal systems if the respective order does not indicate that each withdrawal system will be used in combination with appropriate solvents and containers from Merck Millipore.

We inform and advise our customers to the best of our knowledge and ability but without any engagement or liability on our part. Our customers must obey all existing laws and regulations. This also applies in respect of any protected rights of third parties. Our information and advice does not eliminate the need for our customers to check, on their own responsibility, that our products are suitable for the purpose envisaged.

Withdrawal system for manual pressure build-up in barrels

1.01123.0001

- For 10 l and 30 l stainless steel returnable barrels
- Manual pressurizing
- Gas pressurizing possible
- Includes exchangeable dip tubes, clamp for outlet tube, ball valve, pump ball with rapid action connector, 3-way-stopcock

Ordering information

- **Ord. No. 1.01123.0001 – Withdrawal system** for solvents with manual pressure build-up for 10 l and 30 l stainless steel barrels with 2" opening

Withdrawal system for inert gas pressurizing in barrels

1.06710.0001

- For 10 l and 30 l stainless steel returnable barrels
- Gas pressurizing
- Includes threaded adapter, spiral gas feeding tube, stainless steel coated PTFE-tube, self closing filling nozzle
- Dip tube in addition necessary

Ordering information

- **Ord. No. 1.06710.0001 – Withdrawal system** for stainless steel barrels and drums with threaded adapter, gas feeding tube and filling nozzle with flexible line (necessary in addition: dip tube suit the particular type of container)
- **Ord. No. 9.67100.1040 – Dip tube for 10 l** stainless steel barrel for withdrawal systems with 2" threaded adapter
- **Ord. No. 9.67100.1041 – Dip tube for 30 l** stainless steel barrel for withdrawal systems with 2" threaded adapter
- **Ord. No. 9.67100.1185 – Dip tube for 185 l** stainless steel barrel for withdrawal systems with 2" threaded adapter

► **Accessories see page 76**

Dried solvents

SeccoSolv® | SeccoSept®

Dried solvents of highest purity and with lowest water content are essential for many laboratory applications – and here SeccoSolv® ready-to-use solvents fulfill even the most stringent requirements. They are produced using specially selected distillation methods that ensure consistently high dryness and batch-to-batch consistency. SeccoSolv® dried solvents are available in 500 ml bottles and also in 1 l and 2.5 l bottles with a standard Merck Millipore S40 cap.

To protect the quality of these products even better from potential contaminants, our new SeccoSept® septum seal cap provides multiple layers of protection to keep solvents in flawless condition before, during, and after removal. These innovative caps are available on 150 and 1,000 ml packaging sizes, and complement our existing product line perfectly.

SeccoSolv® dried solvents are also available in returnable stainless steel containers from 10 l up to 1,400 l, and in fully-sealed container systems for extremely water-sensitive applications. Tailor-made solutions are available on request.

Safety – double tamper evidence closure and SeccoSept®, the innovative septum seal cap

A security ring on the screw closure and the seal on the cap opening remove any doubt as to whether the product has been opened previously. The septum is a PTFE-coated silicon sealing disk that fits precisely into the cap, while a safety lip in the cap keeps it securely in place. As a result, the septum can be punctured multiple times without losing stability or becoming porous.

The special silicon has outstanding self-sealing properties that enable rapid sealing of the puncture site. Properties of the septum exclude the possibility of it interacting with the solvent.

Simple handling – five extra-large septum surfaces and rotating cap

Only the septum circle currently in use is exposed to the environment. After removing the solvent, the user turns the cap to the sealing position – now the fresh puncture site is immediately protected from potential contaminants. When needed, the bottle's rotating cap enables one-handed operation for practical and safe handling during your applications.

Flexibility – with and without septum cap

If you need to withdraw larger quantities of solvent, simply take off the septum cap entirely. Or remove the yellow cap for access to all five septum circles.

Your benefits

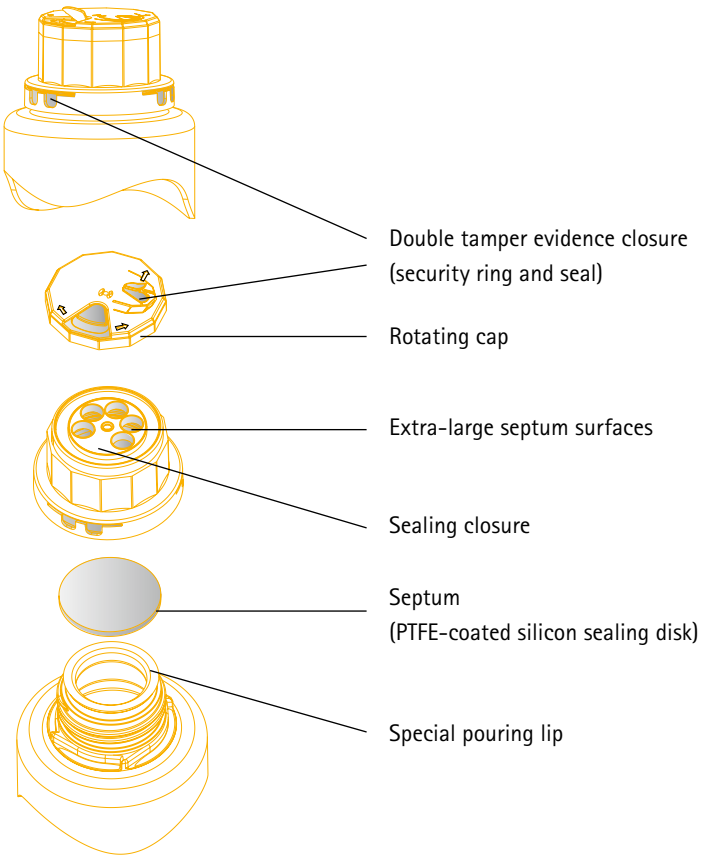
SeccoSolv® | SeccoSept®

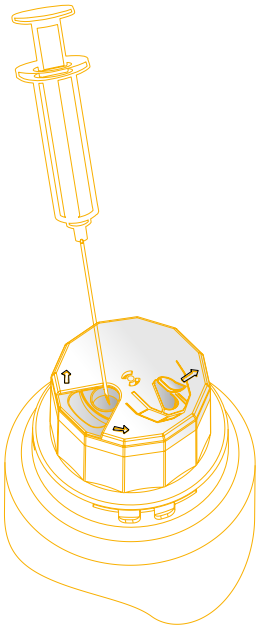
- Reliable results by
  - Highest quality
  - Constant and high level of dryness
  - SeccoSept®, best protection for keeping solvent quality
- Flexibility by broadest packaging offer
- Time-saving compared to self-dried solvents

Dried solvents

SeccoSolv® | SeccoSept®

SeccoSept® the septum-innovation!





More service for your daily lab work

Take advantage of our "Care-Free Service Package" for your solvent needs. In addition to reliable quality, we will provide you with comprehensive technical support, helpful documentation, rapid delivery times, wide variety of packaging and practical withdrawal systems!

Do you need large quantities, different packaging sizes, new products, or modified product specifications? Please contact your local Merck Millipore representative directly for individual inquiries.

▶ **Packaging and withdrawal systems see page 38 and 68**

Ordering information
SeccoSolv® | SeccoSept®

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/l]	Water max. [%]	Content / Packaging	Ord. No.	Content / Packaging	Ord. No. SeccoSept®
A	**Acetone**	99.9	10	0.0075	500 ml GL	**1.00299.0500**	150 ml SB	**1.00299.0161**
					30 l ST	**1.00299.9030**	1 l SB	**1.00299.1001**
	Acetonitrile	99.9	10	0.005	500 ml GL	**1.00004.0500**	150 ml SB	**1.00004.0161**
							1 l SB	**1.00004.1001**
	Acetonitrile for DNA synthesis (≤ 10 ppm water content)	99.9	1	0.001	50 ml GL	**1.12636.0050**		
					2.5 l GL	**1.12636.2500**		
					4 l GL	**1.12636.4000**		
				NEW	30 l FST	**1.12636.9033**		
					185 l ST	**1.12636.9185**		
	Acetonitrile for DNA synthesis (≤ 30 ppm water content)	99.9	1	0.003	2.5 l GL	**1.13212.2500**		
					4 l GL	**1.13212.4000**		
					185 l ST	**1.13212.9185**		
C	**Chloroform**	99.9	10	0.003			1 l SB	**1.02395.1001**
D	**Dichloromethane**	99.9	10	0.004	500 ml GL	**1.06051.0500**	150 ml SB	**1.06051.0161**
							1 l SB	**1.06051.1001**
	Diethyl ether	99.9	10	0.005	500 ml GL	**1.00929.0500**	150 ml SB	**1.00929.0161**
					1 l GL	**1.00929.1000**	1 l SB	**1.00929.1001**
	Dimethylformamide	99.9	10	0.003	2.5 l GL	**1.02375.2500**	150 ml SB	**1.02375.0161**
							1 l SB	**1.02375.1001**
NEW	**Dimethylformamide for peptide synthesis** (Free Amines ≤ 10 ppm)	99.9	10	0.03	2.5 l GL	**1.00397.2500**		
					4 x 4 l GL	**1.00397.4004**		
					10 l ST	**1.00397.9010**		
					30 l ST	**1.00397.9030**		
	Dimethyl sulfoxide	99.9	10	0.025	500 ml GL	**1.02931.0500**	150 ml SB	**1.02931.0161**
					1 l GL	**1.02931.1000**	1 l SB	**1.02931.1001**
					2.5 l GL	**1.02931.2500**		
				NEW	30 l FST	**1.02931.9033**		
	1,4-Dioxane	99.9	10	0.005	500 ml GL	**1.03110.0500**	150 ml SB	**1.03110.0161**
							1 l SB	**1.03110.1001**
E	**Ethanol**	99.9	10	0.01	500 ml GL	**1.00990.0500**	150 ml SB	**1.00990.0161**
							1 l SB	**1.00990.1001**
	Ethyl acetate	99.9	10	0.003			1 l SB	**1.02396.1001**
H	**n-Hexane**	99.0	10	0.004	500 ml GL	**1.04373.0500**		
I	**Isooctane**	99.8	10	0.003	500 ml GL	**1.04715.0500**		
M	**Methanol**	99.9	10	0.003	500 ml GL	**1.06012.0500**	150 ml SB	**1.06012.0161**
					1 l GL	**1.06012.1000**	1 l SB	**1.06012.1001**
					2.5 l GL	**1.06012.2500**		
					10 l STD	**1.06012.6010**		
NEW	**n-Methyl-2-pyrrolidone for peptide synthesis** (Free Amines ≤ 5 ppm)	99.7	–	0.05	2.5 l GL	**1.00574.2500**		
					4 l GL	**1.00574.4000**		
P	**2-Propanol**	99.9	10	0.005	500 ml GL	**1.00994.0500**	150 ml SB	**1.00994.0161**
							1 l SB	**1.00994.1001**
	Pyridine	99.9	10	0.0075	500 ml GL	**1.07463.0500**	150 ml SB	**1.07463.0161**
							1 l SB	**1.07463.1001**
T	**Tetrahydrofuran**	99.9	10	0.005	500 ml GL	**1.08107.0500**	150 ml SB	**1.08107.0161**
					1 l GL	**1.08107.1000**	1 l SB	**1.08107.1001**
				NEW	10 l FST	**1.08107.9013**		
	Toluene	99.9	10	0.005	500 ml GL	**1.08326.0500**	150 ml SB	**1.08326.0161**
							1 l SB	**1.08326.1001**
	Trifluoroacetic acid for protein sequencing	99.7 (acidimetric)	–	0.01	50 ml GL	**1.08178.0050**		
	Trifluoroacetic acid (25 % solution in water) **for protein sequencing**	24.5 - 25.5 (acidimetric)	–	74.5 - 75.5	50 ml GL	**1.08218.0050**		

All solvents filtered through 0.2 µm. | GL = glass bottle | FST = Fully-sealed stainless steel barrel | SB = septum seal bottle | ST = stainless steel barrel | STD = stainless steel drum

EMSURE®

Solvents for analysis | ACS, ISO, Reag. Ph Eur

EMSURE® grade solvents are suitable for a broad spectrum of classical lab applications, and are frequently used in regulated and highly demanding lab applications. By improving the values for purity, water content and evaporation residue – and adding more additional metals and secondary components – we have updated our EMSURE® range to create a unique specification scope with the highest quality compared to other suppliers.

Laboratory use

EMSURE® – EMPARTA® – EMPLURA® | The new trade names of Merck Millipore classical solvents

Whenever you want to use a solvent, you have to consider your requirements, your application and of course your budget. Each application is different and the range of solvents you choose should be perfectly adapted to your application. This was exactly our motivation when we readjusted our product portfolio. No matter what your application is (cleaning your bench, doing an extraction, performing a highly critical analysis) – no matter if you have to follow international standards, ensure safety regulations or require both bulk and small quantities – the new basic solvents product range has the product that perfectly fits to your needs. And to underline this new approach, it comes along with the launch of three new trade names.

Laboratory use	Cleaning	Synthesis R&D	Analysis QC	Other critical or demanding lab applications with specific requirements
Pharma industry and regulated applications				
Less-regulated applications				
Science, research, contract labs				
Schools, education				

EMPLURA®
▸ page 62

EMPARTA®
▸ page 58

EMSURE®
▸ page 50

Reliability

For our customers, this means proven safety, maximum reliability and an extraordinarily wide range of potential applications.

For example, the documented values for metals use for flame photometric measurements. The inclusion of organic parameters also enables the classification of unwanted side reactions.

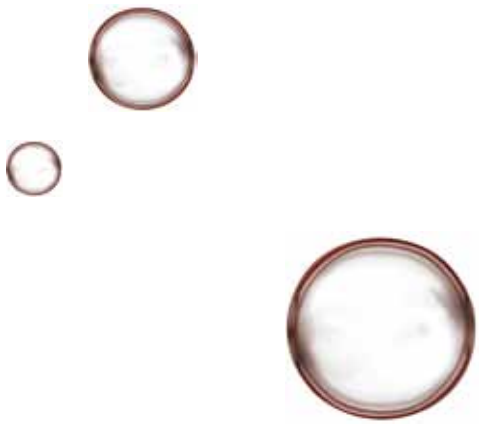
Regulations

International rules and regulations are becoming increasingly important. In particular the codes of the pharmaceutical industry prescribe a high and defined purity for reagents, for example, for use in pharmaceutical quality control. We declare our solvents to be in compliance with the ACS and also with the reagent part of the European Pharmacopoeia (Reag. Ph Eur). We exclusively use the latest and validated analysis methods for this purpose.

Requirements

Thus, for users in the quality control, solvents for analysis from Merck Millipore are the safest choice – also with regard to compliance with international audit requirements.

Nowadays, the requirements made of a solvent are much higher than its actual product characteristics. In addition to analytical purity, factors such as handling, safety and documentation all play an increasingly important role. An unparalleled range of packaging, withdrawal systems and services adds the finishing touch to what we have to offer: an all-inclusive package in which components are finely tuned down to the very last detail.



Your benefits

EMSURE®

- Our premium grade for all regulated and highly demanding lab applications
- Worldwide best and most extensive product specifications
- Widest range of pack sizes and packaging materials

Ordering information
EMSURE® | Solvents for analysis A-B

	Product	Purity (GC) min. [%]	Evap. residue max. [%]	Water max. [%]	Content / Packaging	Ord. No.
A	**Acetone for analysis EMSURE® ACS, ISO, Reag. Ph Eur**	99.8	0.0005	0.05	1 l GL	**1.00014.1000**
					1 l PE	**1.00014.1011**
					2.5 l GL	**1.00014.2500**
					2.5 l PE	**1.00014.2511**
					4 l GL	**1.00014.4000**
					5 l PE	**1.00014.5000**
					10 l ST	**1.00014.6010**
					25 l ST	**1.00014.6025**
					25 l ME	**1.00014.9025**
					180 l ME	**1.00014.9180**
					190 l ME	**1.00014.6190**
	Acetonitrile for analysis EMSURE® ACS, Reag. Ph Eur	99.5	0.001	0.1	1 l GL	**1.00003.1000**
					2.5 l GL	**1.00003.2500**
					4 l GL	**1.00003.4000**
					25 l ST	**1.00003.6025**
					25 l ME	**1.00003.9025**
	Acetylacetone for analysis EMSURE®	99.0	0.005	0.3	100 ml GL	**1.09600.0100**
					500 ml GL	**1.09600.0500**
	n-Amyl alcohol (Pentan-1-ol) for analysis EMSURE®	98.5	0.005	0.1	1 l GL	**1.00975.1000**
					2.5 l GL	**1.00975.2500**
	Aniline for analysis EMSURE®	99.5	-	0.1	1 l GL	**1.01261.1000**
B	**Benzene for analysis EMSURE® ACS, ISO, Reag. Ph Eur**	99.7	0.001	0.03	1 l GL	**1.01783.1000**
					2.5 l GL	**1.01783.2500**
	Benzyl alcohol for analysis EMSURE®	99.5	-	0.1	1 l GL	**1.09626.1000**
					2.5 l GL	**1.09626.2500**
					25 l ST	**1.09626.6025**
	1-Butanol for analysis EMSURE® ACS, ISO, Reag. Ph Eur	99.5	0.001	0.1	1 l GL	**1.01990.1000**
					2.5 l GL	**1.01990.2500**
					10 l ST	**1.01990.6010**
					25 l ST	**1.01990.6025**
	2-Butanol for analysis EMSURE®	99.0	0.001	0.2	1 l GL	**1.09630.1000**
					2.5 l GL	**1.09630.2500**
					25 l ME	**1.09630.9025**
	tert-Butanol for analysis EMSURE® ACS, Reag. Ph Eur	99.5	0.001	0.1	500 ml GL	**1.09629.0500**
					5 l AL	**1.09629.5000**
					25 l ME	**1.09629.9025**
	n-Butyl acetate for analysis EMSURE®	99.5	0.001	0.1	1 l GL	**1.09652.1000**
					2.5 l GL	**1.09652.2500**
					10 l ST	**1.09652.6010**
	tert-Butyl methyl ether for analysis EMSURE® ACS	99.5	0.001	0.03	1 l GL	**1.01849.1000**
					2.5 l GL	**1.01849.2500**

GL = glass bottle | PE = polyethylene bottle | AL = aluminium bottle | ST = stainless steel drum | ME = one-way vessel

- **Other brochure: EMSURE® | EMPARTA® – Solvents for analysis (W 282143)**
- **Packaging and withdrawal systems see page 68**

Ordering information
EMSURE® | Solvents for analysis C-D

	Product	Purity (GC) min. [%]	Evap. residue max. [%]	Water max. [%]	Content / Packaging	Ord. No.
C	Carbon disulfide for analysis EMSURE® ACS, Reag. Ph Eur	99.9	0.001	0.01	1 l GL	1.02214.1000
	Carbon tetrachloride for analysis EMSURE®	99.8	0.001	0.02	1 l GL	1.02222.1000
					2.5 l GL	1.02222.2500
	Chloroform for analysis EMSURE® ACS, ISO, Reag. Ph Eur	99.0 - 99.4	0.001	0.01	250 ml GL	1.02445.0250
					1 l GL	1.02445.1000
					2.5 l GL	1.02445.2500
					4 l GL	1.02445.4000
					25 l ST	1.02445.6025
					190 l ME	1.02445.9190
	Cyclohexane for analysis EMSURE® ACS, ISO, Reag. Ph Eur	99.5	0.001	0.01	1 l GL	1.09666.1000
					2.5 l GL	1.09666.2500
					2.5 l PE	1.09666.2511
					10 l ST	1.09666.6010
					25 l ST	1.09666.6025
					190 l ME	1.09666.9190
D	1,2-Dichlorobenzene for extraction analysis EMSURE®	99.0	-	0.01	2.5 l GL	1.02930.2500
	Dichloromethane for analysis EMSURE® ACS, ISO, Reag. Ph Eur	99.8	0.001	0.01	1 l GL	1.06050.1000
					2.5 l GL	1.06050.2500
					10 l ST	1.06050.6010
					25 l ST	1.06050.6025
					25 l ME	1.06050.9025
					190 l ST	1.06050.6190
					190 l ME	1.06050.9190
	Diethanolamine for analysis EMSURE®	99.5	-	0.25	1 l PE	1.16205.1000
	Diethyl ether for analysis EMSURE® ACS, ISO, Reag. Ph Eur	99.7	0.0005	0.03	1 l GL	1.00921.1000
					2.5 l GL	1.00921.2500
					5 l AL	1.00921.5000
					10 l ST	1.00921.6010
					25 l ST	1.00921.6025
					25 l ME	1.00921.9025
					190 l ST	1.00921.6190
					190 l ME	1.00921.9190
	Diisopropyl ether for analysis EMSURE® ACS, Reag. Ph Eur	99.0	0.005	0.05	1 l GL	1.00867.1000
					2.5 l GL	1.00867.2500
					10 l ST	1.00867.6010
					190 l ST	1.00867.6190
	N,N-Dimethylformamide for analysis EMSURE® ACS, ISO, Reag. Ph Eur	99.8	0.001	0.1	1 l GL	1.03053.1000
					1 l PE	1.03053.1011
					2.5 l GL	1.03053.2500
					2.5 l PE	1.03053.2511

GL = glass bottle | PE = polyethylene bottle | AL = aluminium bottle | ST = stainless steel drum | ME = one-way vessel

Ordering information
EMSURE® | Solvents for analysis D-E

	Product	Purity (GC) min. [%]	Evap. residue max. [%]	Water max. [%]	Content / Packaging	Ord. No.
D	**Dimethyl sulfoxide for analysis EMSURE® ACS**	99.9	0.001	0.1	1 l GL	**1.02952.1000**
					1 l PE	**1.02952.1011**
					2.5 l GL	**1.02952.2500**
					2.5 l PE	**1.02952.2511**
					25 l ME	**1.02952.9025**
	1,4-Dioxane for analysis EMSURE® ACS, ISO	99.5	0.001	0.05	250 ml GL	**1.09671.0250**
					1 l GL	**1.09671.1000**
					2.5 l GL	**1.09671.2500**
					25 l ST	**1.09671.6025**
E	**Ethanol absolute for analysis EMSURE® ACS, ISO, Reag. Ph Eur**	99.9	0.0005	0.1	1 l GL	**1.00983.1000**
					1 l PE	**1.00983.1011**
					2.5 l GL	**1.00983.2500**
					2.5 l PE	**1.00983.2511**
					5 l PE	**1.00983.5000**
					10 l ST	**1.00983.6010**
					25 l ST	**1.00983.6025**
					25 l ME	**1.00983.9025**
					180 l ME	**1.00983.9180**
					190 l ST	**1.00983.6190**
	Ethanol denatured with about 1 % methyl ethyl ketone for analysis EMSURE®	99.5	0.001	0.1	1 l PE	**1.00974.1011**
					2.5 l PE	**1.00974.2511**
					25 l ST	**1.00974.6025**
					25 l ME	**1.00974.9025**
					180 l ME	**1.00974.9180**
	Ethanolamine for analysis EMSURE®	99.5	-	0.2	1 l PE	**1.00845.1000**
					2.5 l PE	**1.00845.2500**
	Ethyl acetate for analysis EMSURE® ACS, ISO, Reag. Ph Eur	99.5	0.001	0.05	1 l PE	**1.09623.1000**
					2.5 l GL	**1.09623.2500**
					2.5 l PE	**1.09623.2511**
					10 l ST	**1.09623.6010**
					25 l ST	**1.09623.6025**
					25 l ME	**1.09623.9026**
					180 l ME	**1.09623.9181**
	Ethylene glycol for analysis EMSURE® Reag. Ph Eur, Reag. USP	99.5		0.1	1 l PE	**1.09621.1000**
					2.5 l PE	**1.09621.2500**
					10 l ST	**1.09621.6010**
					25 l ST	**1.09621.6025**
					180 l ME	**1.09621.9180**
	Ethylene glycol monomethyl ether for analysis EMSURE® ACS, Reag. Ph Eur	99.5	0.003	0.1	1 l GL	**1.00859.1000**
					2.5 l GL	**1.00859.2500**
					25 l ST	**1.00859.9025**
	Ethyl methyl ketone for analysis EMSURE® ACS, Reag. Ph Eur	99.5	0.001	0.05	1 l GL	**1.09708.1000**
					2.5 l GL	**1.09708.2500**
					25 l ST	**1.09708.6025**
					190 l ME	**1.09708.9190**

GL = glass bottle | PE = polyethylene bottle | ST = stainless steel drum | ME = one-way vessel

Ordering information
EMSURE® | Solvents for analysis F–I

	Product	Purity (GC) min. [%]	Evap. residue max. [%]	Water max. [%]	Content / Packaging	Ord. No.
F	**Formamide for analysis EMSURE® ACS, Reag. Ph Eur**	99.5	-	0.1	1 l GL	**1.09684.1000**
					2.5 l GL	**1.09684.2500**
G	**Glycerol 85 % for analysis EMSURE® Reag. Ph Eur**	84.5 - 85.5	-	14.5 - 15.5	500 ml PE	**1.04094.0500**
					1 l PE	**1.04094.1000**
					2.5 l PE	**1.04094.2500**
					25 l PE	**1.04094.9026**
	Glycerol for analysis EMSURE® ACS, Reag. Ph Eur	99.5	-	0.5	1 l PE	**1.04092.1000**
					2.5 l PE	**1.04092.2500**
					10 l PE	**1.04092.9010**
H	**n-Heptane for analysis EMSURE® Reag. Ph Eur**	99	0.001	0.01	1 l GL	**1.04379.1000**
					2.5 l GL	**1.04379.2500**
					2.5 l PE	**1.04379.2511**
					10 l ST	**1.04379.6010**
					25 l ST	**1.04379.6025**
					190 l ME	**1.04379.9190**
	n-Hexane for analysis EMSURE® ACS	99.0	0.001	0.005	1 l GL	**1.04367.1000**
					2.5 l GL	**1.04367.2500**
					2.5 l PE	**1.04367.2511**
					10 l ST	**1.04367.6010**
					25 l ST	**1.04367.6025**
					190 l ST	**1.04367.6190**
					190 l ME	**1.04367.9190**
	n-Hexane for analysis EMSURE® ACS, Reag. Ph Eur	96.0	0.001	0.01	1 l GL	**1.04374.1000**
					2.5 l GL	**1.04374.2500**
					2.5 l PE	**1.04374.2511**
					4 l GL	**1.04374.4000**
					10 l ST	**1.04374.6010**
					25 l ST	**1.04374.6025**
I	**Isoamyl alcohol for analysis EMSURE® ACS, Reag. Ph Eur**	99	0.002	0.2	1 l GL	**1.00979.1000**
					2.5 l GL	**1.00979.2500**
					25 l ME	**1.00979.9025**
	Isobutanol for analysis EMSURE® ACS, Reag. Ph Eur	99	0.001	0.05	1 l GL	**1.00984.1000**
					2.5 l GL	**1.00984.2500**
	Isobutyl methyl ketone for extraction analysis EMSURE® ACS, Reag. Ph Eur	99.0	0.001	0.1	1 l GL	**1.06146.1000**
					2.5 l GL	**1.06146.2500**
					25 l ST	**1.06146.6025**
	Isohexane for analysis EMSURE®	95.0	0.001	0.01	1 l GL	**1.04333.1000**
					2.5 l GL	**1.04333.2500**
					190 l ME	**1.04333.9190**
	Isooctane for analysis EMSURE® ACS, Reag. Ph Eur	99.5	0.001	0.01	1 l GL	**1.04727.1000**
					2.5 l GL	**1.04727.2500**
					10 l ST	**1.04727.6010**
					25 l ST	**1.04727.6025**
					190 l ST	**1.04727.6190**

GL = glass bottle | PE = polyethylene bottle | ST = stainless steel drum | ME = one-way vessel

Ordering information
EMSURE® | Solvents for analysis M-P

	Product	Purity (GC) min. [%]	Evap. residue max. [%]	Water max. [%]	Content / Packaging	Ord. No.
M	**Methanol for analysis EMSURE® ACS, ISO, Reag. Ph Eur**	99.9	0.0005	0.05	1 l GL	**1.06009.1000**
					1 l PE	**1.06009.1011**
					2.5 l GL	**1.06009.2500**
					2.5 l PE	**1.06009.2511**
					5 l PE	**1.06009.5000**
					10 l ST	**1.06009.6010**
					25 l ST	**1.06009.6025**
					25 l ME	**1.06009.9025**
					180 l ME	**1.06009.9180**
					190 l ST	**1.06009.6190**
P	**n-Pentane for analysis EMSURE®**	99.0	0.001	0.01	1 l GL	**1.07177.1000**
					2.5 l GL	**1.07177.2500**
					10 l ST	**1.07177.6010**
					190 l ME	**1.07177.9190**
	Petroleum benzine boiling range 30 – 50 °C for analysis EMSURE®	-	0.003	0.01	2.5 l GL	**1.01786.2500**
	Petroleum benzine boiling range 40 – 60 °C for analysis EMSURE® ACS, ISO	-	0.001	0.01	1 l GL	**1.01775.1000**
					2.5 l GL	**1.01775.2500**
					5 l AL	**1.01775.5000**
					10 l ST	**1.01775.6010**
					25 l ST	**1.01775.6025**
					25 l ME	**1.01775.9025**
	Petroleum benzine boiling range 60 – 80 °C for analysis EMSURE®	-	0.001	0.01	1 l GL	**1.01774.1000**
					2.5 l GL	**1.01774.2500**
					5 l AL	**1.01774.5000**
					10 l ST	**1.01774.6010**
					25 l ST	**1.01774.6025**
	Petroleum benzine boiling range 80 – 100 °C for analysis EMSURE®	–	0.001	0.01	1 l GL	**1.01777.1000**
	Petroleum benzine boiling range 100 – 120 °C for analysis EMSURE® Reag. Ph Eur	-	0.001	0.01	1 l GL	**1.01781.1000**
	Petroleum for analysis EMSURE®	-	-	0.01	1 l GL	**1.09718.1000**
					2.5 l GL	**1.09718.2500**
	Piperidine for analysis EMSURE®	99	0.01	0.3	500 ml GL	**1.09724.0500**
	1-Propanol for analysis EMSURE® ACS, Reag. Ph Eur	99.5	0.001	0.05	1 l GL	**1.00997.1000**
					2.5 l GL	**1.00997.2500**
					25 l ST	**1.00997.6025**
	2-Propanol for analysis EMSURE® ACS, ISO, Reag. Ph Eur	99.8	0.001	0.05	1 l GL	**1.09634.1000**
					1 l PE	**1.09634.1011**
					2.5 l GL	**1.09634.2500**
					2.5 l PE	**1.09634.2511**
					5 l PE	**1.09634.5000**
					10 l ST	**1.09634.6010**
					25 l ST	**1.09634.6025**
					25 l ME	**1.09634.9025**
					180 l ME	**1.09634.9180**
					190 l ST	**1.09634.6190**

GL = glass bottle | PE = polyethylene bottle | AL= aluminium bottle | ST = stainless steel drum | ME = one-way vessel

Ordering information
EMSURE® | Solvents for analysis P-X

	Product	Purity (GC) min. [%]	Evap. residue max. [%]	Water max. [%]	Content / Packaging	Ord. No.
P	Pyridine EMSURE® ACS, Reag. Ph Eur	99.5	0.002	0.1	500 ml GL	1.09728.0500
					1 l GL	1.09728.1000
					2.5 l GL	1.09728.2500
					25 l ST	1.09728.6025
					190 l ME	1.09728.9190
T	Tetrahydrofuran for analysis EMSURE® ACS, Reag. Ph Eur	99.8	0.0005	0.03	1 l GL	1.09731.1000
					2.5 l GL	1.09731.2500
					10 l ST	1.09731.6010
					25 l ST	1.09731.6025
					190 l ME	1.09731.9190
					190 l ST	1.09731.6190
	Toluene for analysis EMSURE® ACS, ISO, Reag. Ph Eur	99.9	0.0005	0.03	1 l GL	1.08325.1000
					2.5 l GL	1.08325.2500
					2.5 l PE	1.08325.2511
					4 l GL	1.08325.4000
					10 l ST	1.08325.6010
					25 l ST	1.08325.6025
					190 l ME	1.08325.9190
	1,1,1-Trichloroethane for analysis EMSURE®	99.5	0.001	0.01	2.5 l GL	1.08749.2500
	Trichloroethylene for analysis EMSURE® ACS, Reag. Ph Eur	99.5	0.001	0.01	1 l GL	1.11872.1000
					2.5 l GL	1.11872.2500
	1,1,2-Trichlorotrifluoroethane for analysis EMSURE® Reag. Ph Eur	99.8	0.0005	0.005	1 l GL	1.08440.1000
					2.5 l GL	1.08440.2500
U	n-Undecane for analysis EMSURE®	99	-	0.01	100 ml GL	1.09795.0100
W	Water for analysis EMSURE®	-	0.0001	-	5 l PE	1.16754.5000
					10 l PE	1.16754.9010
X	Xylene for analysis EMSURE® ACS, ISO, Reag. Ph Eur	99.8	0.001	0.03	1 l GL	1.08661.1000
					2.5 l GL	1.08661.2500
					2.5 l PE	1.08661.2511
					10 l ST	1.08661.6010
					25 l ST	1.08661.6025
					25 l ME	1.08661.9025
					190 l ME	1.08661.9190
	p-Xylene for analysis EMSURE® ISO	99.0	0.001	0.01	1 l GL	1.08684.1000
					2.5 l GL	1.08684.2500
					2.5 l PE	1.08684.2511
					25 l ME	1.08684.9025

GL = glass bottle | PE = polyethylene bottle | ST = stainless steel drum | ME = one-way vessel

EMPARTA®

Routine labs have different requirements than laboratories that perform pharmaceutical quality control. So in keeping with our policy of tailoring products to customer requirements, we offer **EMPARTA®** grade solvents for routine tasks in analytical laboratories. **EMPARTA®** grade solvents offer fewer test parameters than **EMSURE®**, yet are still of high quality. **EMPARTA®** solvents meet ACS requirements, making them ideal for a wide range of analytical applications.

Specifications cover all important parameters, and ensure reliable, reproducible results. From raw materials to packaging and certification, every aspect of **EMPARTA®** solvents is designed to make analytical lab applications efficient and cost effective.

Laboratory use

EMSURE® – EMPARTA® – EMPLURA® | The new trade names of Merck Millipore classical solvents

Whenever you want to use a solvent, you have to consider your requirements, your application and of course your budget. Each application is different and the range of solvents you choose should be perfectly adapted to your application. This was exactly our motivation when we readjusted our product portfolio. No matter what your application is (cleaning your bench, doing an extraction, performing a highly critical analysis) – no matter if you have to follow international standards, ensure safety regulations or require both bulk and small quantities – the new basic solvents product range has the product that perfectly fits to your needs. And to underline this new approach, it comes along with the launch of three new trade names.

Laboratory use	Cleaning	Synthesis R&D	Analysis QC	Other critical or demanding lab applications with specific requirements
Pharma industry and regulated applications				
Less-regulated applications				
Science, research, contract labs				
Schools, education				

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EMSURE®
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Your benefits

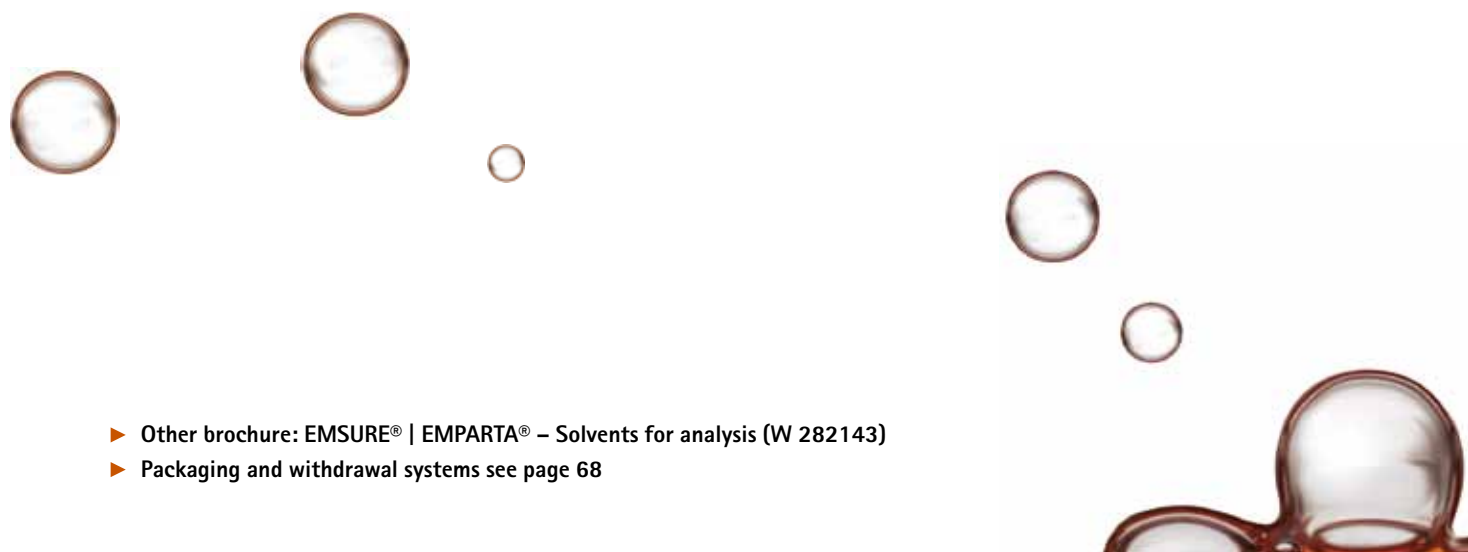
EMPARTA®

- The right grade for your analytical lab applications
- Specifications according the ACS
- Packaged in 2.5 liter bottles and 25 liter drums

Ordering information
EMPARTA® | Solvents for analysis

	Product	Purity (GC) min. [%]	Evap. residue max. [%]	Water max. [%]	Content / Packaging	Ord. No.
A	Acetone for analysis EMPARTA® ACS	99.5	0.001	0.5	2.5 l PE	**1.07021.2511**
					25 l ME	**1.07021.9026**
C	Chloroform for analysis EMPARTA® ACS	99.0 - 99.4	0.001	0.01	2.5 l GL	**1.07024.2500**
D	Dichloromethane for analysis EMPARTA® ACS	99.5	0.002	0.02	2.5 l GL	**1.07020.2500**
	Diethyl ether for analysis EMPARTA® ACS	99.5	0.001	0.01	2.5 l GL	**1.07026.2500**
	N,N-Dimethylformamide for analysis EMPARTA® ACS	99.5	0.001	0.1	2.5 l GL	**1.03034.2500**
					2.5 l PE	**1.03034.2511**
E	Ethanol absolute for analysis EMPARTA® ACS	99.5	0.001	0.2	2.5 l PE	**1.07017.2511**
					25 l ME	**1.07017.9026**
H	n-Hexane for analysis EMPARTA® ACS	98.5	0.001	0.02	2.5 l PE	**1.07023.2511**
					25 l ST	**1.07023.6025**
M	Methanol for analysis EMPARTA® ACS	99.8	0.001	0.1	2.5 l ME	**1.07018.2511**
					25 l ME	**1.07018.9026**
P	2-Propanol for analysis EMPARTA® ACS	99.5	0.001	0.2	2.5 l PE	**1.07022.2511**
					25 l ME	**1.07022.9026**
T	Tetrahydrofuran for analysis EMPARTA® ACS	99.5	0.03	0.05	2.5 l GL	**1.07025.2500**
					4 l GL	**1.07025.4000**
	Toluene for analysis EMPARTA® ACS	99.5	0.001	0.03	2.5 l GL	**1.07019.2500**
					2.5 l PE	**1.07019.2511**

GL = glass bottle | PE = polyethylene bottle | ME = one-way vessel



- Other brochure: EMSURE® | EMPARTA® – Solvents for analysis (W 282143)
- Packaging and withdrawal systems see page 68

Detailed information
EMPARTA® | Solvents for analysis

Acetone for analysis EMPARTA® ACS	Cat. No. 107021 Spec. values
Purity (GC)	≥ 99.5 %
Identity (IR)	conforms
Solubility in water	conforms
Color	≤ 10 Hazen
Titrable acid	≤ 0.0003 meq/g
Titrable base	≤ 0.0006 meq/g
Methanol (GC)	≤ 0.05 %
2-Propanol (GC)	≤ 0.05 %
Aldehydes (as formaldehyde)	≤ 0.002 %
Substances reducing potassium permanganate (as O)	≤ 0.0003 %
Evaporation residue	≤ 0.001 %
Water	≤ 0.5 %

Chloroform for analysis EMPARTA® ACS	Cat. No. 107024 Spec. values
Purity (GC)	99.0 - 99.4 %
Assay (according to ACS)	≥ 99.8 %
Identity (IR)	conforms
Appearance	clear
Color	≤ 10 Hazen
Acid and chloride	conforms
Free chlorine	≤ 0.00003 %
Carbonyl compounds (as CO)	≤ 0.005 %
Readily carbonizable substances	conforms
Aldehydes and ketones (C_3H_6O)	≤ 0.001 %
Suitability for determination with dithizone	conforms
Pb	≤ 0.000005 %
Evaporation residue	≤ 0.001 %
Water	≤ 0.01 %

Ethanol absolute for analysis EMPARTA® ACS	Cat. No. 107017 Spec. values
Purity (GC)	≥ 99.5 %
Identity (IR)	conforms
Color	≤ 10 Hazen
Solubility in water	conforms
Titrable acid	≤ 0.0005 meq/g
Titrable base	≤ 0.0002 meq/g
Acetone (GC)	≤ 0.001 %
Methanol (GC)	≤ 0.1 %
2-Propanol (GC)	≤ 0.003 %
Substances reducing potassium permanganate (as O)	≤ 0.0002 %
Readily carbonizable substances	conforms
Evaporation residue	≤ 0.001 %
Water	≤ 0.2 %

n-Hexane for analysis EMPARTA® ACS	Cat. No. 107023 Spec. values
Purity ∑ hexane isomers + methylcyclopentane (GC)	≥ 98.5 %
Identity (IR)	conforms
Color	≤ 10 Hazen
Water-soluble titrable acid	≤ 0.0003 meq/g
Thiophene	conforms
Sulfur compounds (as S)	≤ 0.005 %
Evaporation residue	≤ 0.001 %
Water	≤ 0.02 %

Tetrahydrofuran for analysis EMPARTA® ACS	Cat. No. 107025 Spec. values
Purity (GC)	≥ 99.5 %
Identity (IR)	conforms
Appearance	clear
Color	≤ 10 Hazen
Peroxide (as H_2O_2)	≤ 0.01 %
Evaporation residue	≤ 0.03 %
Water	≤ 0.05 %

EMPLURA®

Solvents for lab-applications

EMPLURA® solvents are a low-cost alternative to high purity qualities. They are tested mainly for preparative purposes or for standard production processes. The minimum assay generally exceeds 98 %, and in most cases even 99 %.

Laboratory use

EMSURE® – EMPARTA® – EMPLURA® | The new trade names of Merck Millipore classical solvents

Whenever you want to use a solvent, you have to consider your requirements, your application and of course your budget. Each application is different and the range of solvents you choose should be perfectly adapted to your application. This was exactly our motivation when we readjusted our product portfolio. No matter what your application is (cleaning your bench, doing an extraction, performing a highly critical analysis) – no matter if you have to follow international standards, ensure safety regulations or require both bulk and small quantities – the new basic solvents product range has the product that perfectly fits to your needs. And to underline this new approach, it comes along with the launch of three new trade names.

Laboratory use	Cleaning	Synthesis R&D	Analysis QC	Other critical or demanding lab applications with specific requirements
Pharma industry and regulated applications				
Less-regulated applications				
Science, research, contract labs				
Schools, education				

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EMPARTA® ▸ page 58

EMSURE® ▸ page 50

Parameters

We check only for those parameters which are important in the described application, i.e. the minimum assay, the identity using IR-spectroscopy, the density, many times the water content and for ethers also the content of peroxides.

Packaging

The pack sizes vary from 1 liter up to 190 liter drums. Bulk-quantities and packaging on request.

Your benefits

EMPLURA®

- The right grade for preparative lab applications and cleaning purposes
- Adequate specifications with the most important parameters
- Available in small packs as well as in bulk packaging

Ordering information
EMPLURA® | Solvents for lab-applications A-D

	Product	Content	Packaging	Ord. No.
A	Acetone EMPLURA®	1 l	PE	8.22251.1000
		2.5 l	PE	8.22251.2500
		25 l	ME	8.22251.9025
	Acetonitrile EMPLURA®	1 l	GL	1.15500.1000
		2.5 l	GL	1.15500.2500
		25 l	ST	1.15500.6025
		190 l	ME	1.15500.9190
	n-Amyl acetate EMPLURA®	1 l	GL	8.18700.1000
	tert-Amyl alcohol EMPLURA®	1 l	GL	8.06193.1000
B	Benzene EMPLURA®	1 l	GL	1.01782.1000
		2.5 l	GL	1.01782.2500
	1-Butanol EMPLURA®	2.5 l	PE	8.22262.2500
		25 l	ME	8.22262.9025
	2-Butanol EMPLURA®	2.5 l	PE	8.22263.2500
	tert-Butanol EMPLURA®	1 l	PE	8.22264.1000
		5 l	PE	8.22264.5000
		25 l	ME	8.22264.9025
	n-Butyl acetate EMPLURA®	2.5 l	GL	1.01974.2500
		25 l	ST	1.01974.6025
		190 l	ME	1.01974.9190
	tert-Butyl methyl ether EMPLURA®	2.5 l	GL	1.01843.2500
		10 l	ST	1.01843.6010
		25 l	ST	1.01843.6025
		190 l	ST	1.01843.6190
		200 l	ME	1.01843.9200

GL = glass bottle | PE = polyethylene bottle | AL = aluminium bottle | ST = stainless steel drum | ME = one-way vessel

	Product	Content	Packaging	Ord. No.
C	Carbon disulfide EMPLURA®	1 l	GL	1.02211.1000
	Chloroform EMPLURA®	1 l	GL	8.22265.1000
		2.5 l	GL	8.22265.2500
		25 l	ME	8.22265.9025
	Cyclohexane EMPLURA®	1 l	GL	1.02832.1000
		2.5 l	GL	1.02832.2500
		25 l	ST	1.02832.6025
		190 l	ST	1.02832.6190
		190 l	ME	1.02832.9190
	Cyclohexanone EMPLURA®	1 l	GL	1.02888.1000
		2.5 l	GL	1.02888.2500
		10 l	ST	1.02888.6010
		25 l	ST	1.02888.6025
		190 l	ME	1.02888.9191
D	1,2-Dichloroethane EMPLURA®	1 l	GL	1.00955.1000
		2.5 l	GL	1.00955.2500
		25 l	ST	1.00955.6025
		190 l	ME	1.00995.9190
	Dichloromethane EMPLURA®	1 l	GL	8.22271.1000
		2.5 l	GL	8.22271.2500
		25 l	ME	8.22271.9025
		190 l	ME	8.22271.9190
	Diethyl ether EMPLURA®	1 l	GL	1.00923.1000
		5 l	AL	1.00923.5000
		25 l	ST	1.00923.6025
	N,N-Dimethylformamide EMPLURA®	1 l	PE	8.22275.1000
		2.5 l	PE	8.22275.2500
		25 l	ST	8.22275.6025
	Dimethyl sulfoxide EMPLURA®	1 l	GL	1.16743.1000
		25 l	ST	1.16743.6025
		190 l	ME	1.16743.9210
	1,4-Dioxane EMPLURA®	1 l	GL	1.03115.1000
		2.5 l	GL	1.03115.2500
		25 l	ST	1.03155.6025
		190 l	ME	1.03155.9191

Ordering information
EMPLURA® | Solvents for lab-applications E-O

	Product	Content	Packaging	Ord. No.
E	Ethanol absolute EMPLURA®	1 l	GL	8.18760.1000
		2.5 l	GL	8.18760.2500
		25 l	ME	8.18760.9025
		180 l	ME	8.18760.9180
	Ethyl acetate EMPLURA®	2.5 l	PE	8.22277.2500
		5 l	PE	8.22277.5000
	Ethyl methyl ketone (2-butanone) EMPLURA®	1 l	GL	1.06014.1000
		2.5 l	GL	1.06014.2500
		10 l	ST	1.06014.6010
		25 l	ST	1.06014.6025
		190 l	ME	1.06014.9190
	Ethylene glycol EMPLURA®	1 l	GL	1.00949.1000
		2.5 l	GL	1.00949.2500
		25 l	ST	1.00949.6025
		190 l	ST	1.00949.6190
F	Formamide EMPLURA®	1 l	GL	1.04008.1000
		2.5 l	GL	1.04008.2500
H	n-Heptane EMPLURA®	1 l	GL	1.04365.1000
		2.5 l	GL	1.04365.2500
		2.5 l	PE	1.04365.2511
		10 l	ST	1.04365.6010
		25 l	ST	1.04365.6025
		190 l	ST	1.04365.6190
	n-Hexane EMPLURA®	1 l	GL	1.04368.1000
		2.5 l	GL	1.04368.2500
		2.5 l	PE	1.04368.2511
		10 l	ST	1.04368.6010
		25 l	ST	1.04368.6025
		190 l	ST	1.04368.6190
		190 l	ME	1.04368.9190
I	Isoamyl acetate EMPLURA®	1 l	GL	1.01231.1000
		25 l	ST	1.01231.6025
	Isoamyl alcohol (mixture of isomers) EMPLURA®	2.5 l	PE	8.22255.2500
	Isobutanol (isobutyl alcohol) EMPLURA®	2.5 l	GL	1.00985.2500
		25 l	ST	1.00985.6025
		190 l	ME	1.00985.9190
	Isobutyl methyl ketone EMPLURA®	2.5 l	GL	8.20820.2500
		10 l	ST	8.20820.6010
		25 l	ST	8.20820.6025
		190 l	ME	8.20820.9190
M	Methanol EMPLURA®	1 l	PE	8.22283.1000
		2.5 l	PE	8.22283.2500
		5 l	PE	8.22283.5000
		25 l	ME	8.22283.9025
	1-Methoxy-2-propanol EMPLURA®	1 l	GL	1.16738.1000
		25 l	ST	1.16738.6025
		190 l	ME	1.16738.9190
	Methyl benzoat EMPLURA®	1 l	GL	1.06059.1000
		2.5 l	GL	1.06059.2500
		25 l	ST	1.06059.6025
	1-Methyl-2-pyrrolidone EMPLURA®	1 l	GL	8.06072.1000
		2.5 l	GL	8.06072.2500
		10 l	ST	8.06072.6010
		25 l	ME	8.06072.9025
		210 kg	ME	8.06072.9210
O	1-Octanol EMPLURA®	1 l	GL	1.00991.1000
		25 l	ST	1.00991.6025

GL = glass bottle | PE = polyethylene bottle | ST = stainless steel drum | ME = one-way vessel

Ordering information
EMPLURA® | Solvents for lab-applications P-X

	Product	Content	Packaging	Ord. No.
P	n-Pentane about 95 % EMPLURA®	1 l	GL	1.07176.1000
		5 l	AL	1.07176.5000
		25 l	ST	1.07176.6025
		190 l	ME	1.07176.9190
	n-Pentane EMPLURA®	1 l	GL	8.20957.1000
		2.5 l	GL	8.20957.2500
		25 l	ME	8.20957.9025
	Petroleum benzine boiling range to about 40 °C EMPLURA®	5 l	AL	1.00915.5000
		25 l	ST	1.00915.6025
	Petroleum benzine boiling range 40 – 80 °C EMPLURA®	5 l	AL	1.01773.5000
	Petroleum benzine boiling range 50 – 70 °C EMPLURA®	1 l	GL	1.00910.1000
		5 l	AL	1.00910.5000
		25 l	ST	1.00910.6025
	Petroleum benzine boiling range 100 – 140 °C (Naphtha Benzine) EMPLURA®	1 l	GL	1.01770.1000
		5 l	AL	1.01770.5000
		25 l	ST	1.01770.6025
	Petroleum benzine boiling range 140 – 180 °C EMPLURA®	1 l	GL	8.14563.1000
	1,2-Propanediol EMPLURA®	1 l	PE	8.22324.1000
		5 l	PE	8.22324.5000
	1-Propanol EMPLURA®	1 l	GL	1.00996.1000
		2.5 l	GL	1.00996.2500
		25 l	ST	1.00996.6025
		190 l	ME	1.00996.9190
	2-Propanol EMPLURA®	1 l	PE	8.18766.1000
		2.5 l	PE	8.18766.2500
		5 l	PE	8.18766.5000
		25 l	ME	8.18766.9025
		180 l	ME	8.18766.9180
	Pyridine EMPLURA®	1 l	GL	1.07462.1000
		2.5 l	GL	1.07462.2500
		25 l	ST	1.07462.6026
		190 l	ME	1.07462.9190

GL = glass bottle | PE = polyethylene bottle | AL = aluminium bottle | ST = stainless steel drum | ME = one-way vessel

	Product	Content	Packaging	Ord. No.
T	Tetrachloroethylene EMPLURA®	1 l	GL	1.00964.1000
		2.5 l	GL	1.00964.2500
		25 l	ST	1.00964.6025
		190 l	ME	1.00964.9190
	Tetrahydrofuran EMPLURA®	1 l	GL	1.08114.1000
		2.5 l	GL	1.08114.2500
		25 l	ST	1.08114.6025
		190 l	ST	1.08114.6190
		190 l	ME	1.08114.9190
	Toluene EMPLURA®	1 l	GL	1.08323.1000
		2.5 l	GL	1.08323.2500
		10 l	ST	1.08323.6010
		25 l	ST	1.08323.6025
		190 l	ME	1.08323.9190
	Trichloroethylene EMPLURA®	1 l	GL	1.00958.1000
		2.5 l	GL	1.00958.2500
		25 l	ST	1.00958.6025
	Triethanolamine EMPLURA®	5 l	PE	8.22341.5000
		25 l	PE	8.22341.9026

► Packaging and withdrawal systems see page 68

Packaging and withdrawal systems

Merck Millipore has a strong track record in developing practical packaging concepts and chemical packaging that preserve the high quality of our solvents. We have been authorized as an official inspection authority by the Federal Institute for Material Research and Testing of Germany (BAM).

Merck Millipore offers a unique variety of packaging sizes and types for solvents **EMSURE®, EMPARTA®, EMPLURA®** and **SeccoSolv®**:

- Glass bottles
- HDPE bottles
- Septum seal bottles (see page 46)
- Stainless steel drums
- Other drums and containers
- Aluminium bottles

For many years, Merck Millipore has worked closely with customers to develop solvent withdrawal systems that are tailor-made for our packaging types. Today, our broad range of withdrawal systems and containers is unrivalled in the industry. As a result, customers can rest assured that whatever the application, we can always supply the right container and the right withdrawal system. And since we provide a fully integrated system that includes solvent, container and withdrawal equipment, all components are perfectly matched for optimal results.

Your benefits

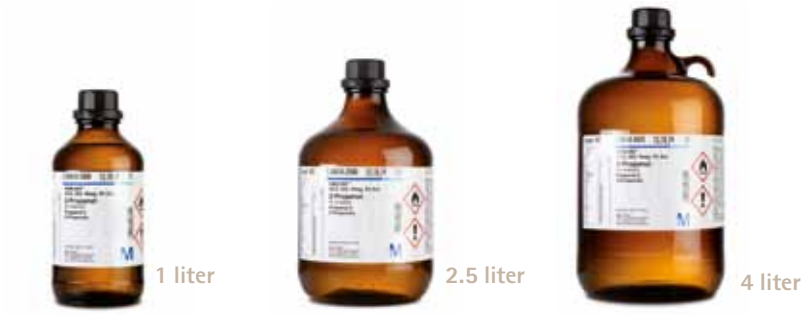
Packaging and withdrawal systems

- Easy, safe and contamination-free solvent handling
- Central storage and supply possible
- Individual user installation or other customized solutions possible
- Application and demand orientated packaging sizes
- Ecological and economical benefit by using returnable containers

Packaging overview

Classical analysis

Glass bottles



- **Optimum characteristics for handling, storage and transport**
- **Safe footprint**
- **Low center of gravity**
- **Optimum emptying**
- **Safety screw cap S40 (Polypropylene) with a circlip as an originality device and a PTFE-insert for highest closeness**
- **High pressure resistance**
- **Special pouring lip for non-drip pouring**
- **Level sensors available**

To comply with transport regulations the glass bottles must be protected by pads of polystyrene. Such polystyrene packages are dispatched as packages of 6 x 1 l or 4 x 2.5 l in a special folding corrugated cardboard box that has been approved for transport purposes. For daily lab handling of glass bottles we recommend to use the safety carriers 9.20078.0001 for 0.5 l to 2.5 l or 1.20080.0001 for 4 l glass bottles.

HDPE bottle

- **Made from HDPE (no risk of fracture), outstanding handling characteristics due to integrated handle for 2.5 and 5 liter bottles**
- **Small footprint (optimum for storage) and low weight (easy to handle and low transport costs)**
- **Tested for blisters and particles**
- **UN certification to be sent without polystyrene outer packaging**
- **Safety screw cap S40 (Polypropylene) with a circlip as an originality device and a PTFE-insert for highest closeness**
- **High pressure resistance**
- **Level sensors available**

Aluminium bottle

5 liter

- **Optimum characteristics for handling, storage and transport**
- **Optimum material characteristics (avoidance of interactions between solvents and packaging material)**
- **Safety screw cap S40 (Polypropylene) with a circlip as an originality device and a PTFE-insert for highest closeness**
- **UN certification to be sent without polystyrene outer packaging**
- **Low weight (easy handling and low transport costs)**
- **No risk of fracture**
- **Level sensors available**

Stainless steel drums

10 liter

25 liter

190 liter

- **Optimum material characteristics (avoidance of interactions between solvents and packaging material)**
- **Use as returnable drums**
- **Can be combined with a variety of withdrawal systems and level sensors**
- **Optimum emptying**
- **Stackable**

▶ **For more details please have a look on page 72**

Other drums and containers

25 liter

180/190 liter

In addition to conventional packaging we also implement quite specific solutions especially for production use. This range includes steel drums (25 and 180/190 liter – depending on the solvent with a PE-inliner), 1,000 liter Intermediate Bulk Container (IBCs) and up to tank container or tank trucks. If technical possible and allowed, we also fill other packaging that you provide.

Stainless steel drums

Classical analysis

Safety & environment

Returnable drums

The use of such returnable drum means that the user no longer has to cope with the problems of emptying the drums completely, rinsing, disposing of the rinsing liquid and even disposing of the drum itself in the proper manner. The cost factor is of course also an important consideration in addition to the time involved. In contrast to stainless steel barrels, there is no limit on how long the drums remain with the user. They should, however, be returned unrinsed, and with their original labels still attached.

The Merck Millipore barrels are developed to meet main environmental issues:

- The Merck Millipore withdrawal systems allow optimal removal of any residual quantities – minimization of the environmental pollution risk, even of the "empty" barrels.
- The usage of Merck Millipore withdrawal systems (e.g. direct connections to instruments, central lab supply) reduce the solvent vapours emitted to the environment during solvent usage.

Dimensions

Parameter	10 l drum	25 l drum	190 l drum
Height	35 cm	52 cm	88 cm
Diameter	23.5 cm	29 cm	58.6 cm
Wall thickness	0.5 mm	0.7 mm	1.0 mm
Drum volume	13 l	28 l	215 l
Filling volume	10 l	25 l	190 l
Weight (empty)	1.8 kg	3.8 kg	22 kg
Number per pallet	15	11	2

Important safety advice

Withdrawal of flammable liquids should only be made from vessels that have been properly earthed as well as the withdrawal system itself. This can be done e.g. using the Merck Millipore antistatic device (Ord. No. 1.07070.0001).

Withdrawal systems overview

Classical analysis

New packaging systems and concepts demand practical, user-friendly withdrawal aids that are tailored to individual demand. Most of the withdrawal systems shown here were developed at Merck Millipore, and are fully compatible with solvents for classical analysis in appropriate drums. All components and accessories are easily interconnectable, thanks to a comprehensive selection of reducers, adapters and couplings that covers virtually all application scenarios.

Safety & environment

- Design improvements in the top and bottom sections combined with the Merck Millipore withdrawal systems allow safe withdrawal and optimal removal of any residual quantities – minimization of the handling risk even of the "empty" barrels (e.g. in case of leakage, hazardous explosive atmospheres).
- Special developed high quality materials (e.g. stainless steel, sealing) avoid contact erosion caused by solvents and develop the safety for the customer to the maximum.
- The broad product range includes all relevant safety items, e.g. gas reducing valve, anti-static device, level sensors, and clamps for maximum withdrawal safety.
- Direct connections of the solvent to the appropriate instrument or product line allow for maximum customer safety and environmental protection (closed system) due to avoidance of e.g. solvent vapours.
- The Merck Millipore system includes solvent, container and withdrawal equipment (withdrawal systems, special reducers, adapters, couplings and safety items), all of which are optimally matched to one another. This means safe installations for the customer and environmental friendly installations due to extensive assembling options.
- Merck Millipore withdrawal systems are developed to meet all the relevant safety regulations, e.g. self-closing nozzles and pressure relief mechanisms for maximum customer safety.

Benefits

- Safe, easy and flexible one-stop solutions for daily solvent handling
- Cost-effective solvent usage due to work-process optimization
- Ecological and cost benefits of returnable containers

Important safety advice

Our withdrawal systems have been developed and optimized for the use with containers and solvents from Merck Millipore. Merck Millipore therefore disclaims any warranty or liability for the operability of its withdrawal systems in connection with containers or solvents from other manufacturers.

Merck Millipore reserves the right to refrain from the delivery of withdrawal systems if the respective order does not indicate that each withdrawal system will be used in combination with appropriate solvents and containers from Merck Millipore.

We inform and advise our customers to the best of our knowledge and ability but without any engagement or liability on our part. Our customers must obey all existing laws and regulations. This also applies in respect of any protected rights of third parties. Our information and advice does not eliminate the need for our customers to check, on their own responsibility, that our products are suitable for the purpose envisaged.

Withdrawal system for manual pressure build-up in drums

1.01114.0001

- For 10 l and 25 l drums
- For 25 l combi drums (metal drum with PE-inliner), special dip tupe necessary
- Manual pressurizing
- Includes exchangeable dip tubes, clamp for outlet tube, ball valve, pump ball, 3-way-stopcock

Ordering information

- **Ord. No. 1.01114.0001 – Withdrawal system** for solvents with manual pressure build-up for 10 l and 25 l stainless steel drums with 2" connection
- **Ord. No. 9.67100.1026 – Dip tube for 25 l** composite drum (steel/PE) for withdrawal system Ord. No. 1.01114.0001

Withdrawal system for manual pressure build-up in 200 l barrels and drums

- For one-way-barrels and stainless steel drums of 180 l or 190 l filling volume
- Manual pressurizing
- Includes an integrated, adaptable dip tube, fixed outlet tube, 3-way-stopcock and foot pump ball

Ordering information

- **Ord. No. 1.19171.0001 – Withdrawal system** for solvents in 200 l barrels and drums with manual pressure build-up

Withdrawal system for inert gas-pressurizing

1.06710.0001

- For all stainless steel returnable barrels and drums
- Gas pressurizing
- Includes threaded adapter, spiral gas feeding tube, stainless steel-coated PTFE-tube, self closing filling nozzle
- Dip tube in addition necessary

Ordering information

- **Ord. No. 1.06710.0001 – Withdrawal system** for stainless steel barrels and drums with threaded adapter, gas feeding tube and filling nozzle with flexible line (necessary in addition: dip tube suit the particular type of container)
- **Ord. No. 9.67100.1010 – Dip tube for 10 l** stainless steel drum for withdrawal system with 2" threaded adapter
- **Ord. No. 9.67100.1025 – Dip tube for 25 l** stainless steel drum for withdrawal system with 2" threaded adapter
- **Ord. No. 9.67100.1190 – Dip tube for 190 l** stainless steel drum for withdrawal system with 2" threaded adapter

► **Accessories see page 76**

Accessories

Our wide range of withdrawal accessories includes all the safety items you need for maximum withdrawal safety – for example, gas reducing valve or anti-static device. All components and accessories are easily interconnectable, thanks to a comprehensive selection of reducers, adapters and couplings that covers virtually all application scenarios.

When large amounts of solvents are used regularly in the lab, we recommend installing a complete supply system. This can be fitted in the lab safety cabinet, and provides a convenient, highly efficient system where solvent withdrawal takes place directly in the fume hood. We also offer accessories for connecting barrels in series to ensure uninterrupted solvent delivery (please contact us for details). When withdrawing high purity solvents from horizontal vessels, self-closing stainless steel nozzles must be specified.

Safe and easy handling

In close consultation with our customers for many years now, we have been engaged in a development program for withdrawal systems that are tailor-made for our solvents containers with main focus on customer's safety. Merck Millipore withdrawal systems include all the relevant safety features, e.g. self-closing nozzles, pressure relief mechanisms and anti-static devices.

For easy handling the withdrawal system components are ergonomically shaped (e.g. filling nozzle) and easily interconnectable by a broad range of connectors (e.g. quick connectors) and adapters.

Contamination free withdrawal

The way in which the withdrawal systems are perfectly matched to the various containers and to the special needs of certain grades of solvent, ensures that withdrawal occurs without solvent contamination for safe and reproducible customer results.

Application orientated material developments as well as the optimally match of solvent, container and withdrawal system to one another provide perfect suitability to a contamination free solvents handling.

By using e.g. 10-l-barrels with the appropriate withdrawal system, the customer is able to minimize the solvents contamination with air humidity. The customer just needs to open the 10-l-barrel once in comparison to 4 times opening a 2.5 l glass bottle for 10-l-needs.

Special system for dried solvents

For maximum dryness of our SeccoSolv® range we provide these solvents in special designed stainless steel barrels with integrated dip tube. By using the appropriate withdrawal system, it is possible to prevent the solvent from becoming contaminated with moisture from the atmosphere. These specially tailored systems safeguard solvent quality and keep your analyses safe and dependable.

Your benefits

Accessories

- Easy, safe and contamination-free solvent handling
- Central storage and supply possible
- Individual user installation or other customized solutions possible
- Direct connection to laboratory equipment possible (e.g. HPLC-instruments)

Ordering information
Withdrawal systems

Product	Ord. No.
Withdrawal system for solvents with manual pressure build-up for 10 l and 30 l stainless steel barrels with 2" opening	**1.01123.0001**
Withdrawal system for solvents with manual pressure build-up for 10 l and 25 l stainless steel drums with 2" opening	**1.01114.0001**
Withdrawal system for solvents with manual pressure build-up for 200 l barrels and drums	**1.19171.0001**
Withdrawal system for stainless steel barrels and drums with threaded adapter, gas feeding tube and filling nozzle with flexible line (necessary in addition: dip tube suit the particular type of container)	**1.06710.0001**

Safety items

Product	Ord. No.
Antistatic device for earthing metal containers when dispensing and filling with flammable solvents (set of 3 cables)	**1.07070.0001**
Cabinet wall duct 55 mm with 10 mm tubing connections on both sides, 22 mm diameter	**9.67100.1067**
Hood wall duct with tube connector (O.D. 10 mm) for G3/8 internal thread	**9.67100.1069**
Pressure safety device 0.5 bar with 2 tube connections (6 x 8 mm)	**9.67100.9004**
Reducing valve 0.2 bar with integrated excess pressure safety device 0.5 bar	**9.67100.9100**
Safety carrier for Merck Millipore 2.5 l glass bottles	**9.20078.0001**
Safety carrier for Merck Millipore 4 l glass bottles	**1.20080.0001**
Stainless steel clamp for filling nozzles for drums	**9.67106.0001**
Stainless steel clamp for filling nozzles for wall attachment	**9.67107.0001**

Adapters and level sensors for bottles

Product	Ord. No.
Adapter S40 for the direct aspiration of solvents through tubes of 3 mm O.D. from bottles with S40 thread	**1.09996.0001**
HPLC bottle adapter with 3 tube connections ID 3.2 mm, solvents supply by Merck Millipore bottles	**1.03830.0001**
HPLC bottle adapter S40 with 3 tube connections and 1 connection for exhaust air filter, solvents disposal	**1.03831.0001**
Air valve for HPLC bottle adapter S40	**1.03832.0001**
Exhaust air filter for HPLC bottle adapter S40, disposal	**1.03833.0001**
Fittings for capillaries with 3.2 mm O.D., for HPLC bottle adapter S40 (pack of 10)	**1.03834.0001**
PTFE-ferrule for capillaries with 3.2 mm A.D., for HPLC bottle adapter S40 (pack of 10)	**1.03835.0001**
Blanking plug for capillariy connections with 3.2 mm I.D., for HPLC bottle adapter S40	**1.03836.0001**
Adapter with S40 thread with level sensor for emptying Merck Millipore solvents in bottles (pack of 10)	**9.67100.2001**
Adapter with S40 thread with sensor for filling Merck Millipore bottles (waste solvent)	**9.67100.2002**
Display and alarm device for bottle level sensor	**9.67100.2004**

Ordering information
Adapters and reducers

Product	Ord. No.
Coupling part between tube (6 x 8 mm) and pipe (O.D. 10 mm)	**9.67100.1055**
Rapid-action connection nipple (product side) with G3/8 thread	**9.67100.1051**
Rapid-action connector for gas feed tube (8 x 6 mm) or for system venting	**9.67100.1052**
Rapid-action connector for product tube 3 x 1.5 mm	**9.67100.1076**
Rapid-action connector (gas side) with G3/8 thread	**9.67100.1050**
Rapid-action nipple for product tube 8 x 6 mm	**9.67100.1061**
Rapid-action nipple with tube connection 6 x 4 mm	**9.67100.1064**
Reducer (PE) from S40 to GL45	**9.67206.0001**
Reducer (PE) from S56 x 4 to 2" thread (2" coarse to 2" fine thread)	**9.67202.0000**
Reducer (stainless steel) from 2" to 3/4" thread	**9.67204.0000**
Reducer (stainless steel) from 2" to S40 thread	**1.01111.0001**

Dip tubes

Product	Ord. No.
Dip tube for 10 l stainless steel drum for withdrawal system Ord. No. 1.01114.0001	**9.67100.1012**
Dip tube for 25 l stainless steel drum for withdrawal system Ord. No. 1.01114.0001	**9.67100.1028**
Dip tube for 25 l combi container for withdrawal system Ord. No. 1.01114.0001	**9.67100.1026**
Dip tube for 10 l stainless steel barrel for withdrawal system Ord. No. 1.01123.0001	**9.67100.1011**
Dip tube for 30 l stainless steel barrel for withdrawal system Ord. No. 1.01123.0001	**9.67100.1029**
Dip tube for 10 l stainless steel drum for withdrawal system with 2" threaded adapter	**9.67100.1010**
Dip tube for 25 l stainless steel drum for withdrawal system with 2" threaded adapter	**9.67100.1025**
Dip tube for 190 l stainless steel drum for withdrawal system with 2" threaded adapter	**9.67100.1190**
Dip tube for 10 l stainless steel barrel for withdrawal system with 2" threaded adapter	**9.67100.1040**
Dip tube for 30 l stainless steel barrel for withdrawal system with 2" threaded adapter	**9.67100.1041**
Dip tube for 185 l stainless steel barrel for withdrawal system with 2" threaded adapter	**9.67100.1185**

Filling nozzles

Product	Ord. No.
Filling nozzle (stainless steel) self-closing, with stainless steel-coated PTFE-tube (80 cm) with rapid-action connector	**9.67100.9090**
Filling nozzle (stainless steel) with stainless steel-coated PTFE-tube with larger rapid-action connector (type 25) for threaded adapter 9.67100.9006	**9.67100.9065**
Filling nozzle (tap), self closing, with G3/8 thread	**9.67100.1090**
Filling nozzle (tap), self closing, with G3/8 thread for wall attachment	**9.67100.1084**
Tap (stainless steel) attachable, self closing, for vessels with 3/4" internal thread	**1.09070.0001**

Opening aids

Product	Ord. No.
Bottle key for opening an closing bottles with S40 and S28 screw caps	**1.08801.0001**
Drum key for opening and closing containers with 2" and 3/4" screw caps	**1.08803.0001**

Replacement parts

Product	Ord. No.
Hand pump ball for withdrawal system Ord. No. 1.01114.0001 and 1.01123.0001	**9.67114.0000**
Hand pump with rapid-action connector	**9.67100.1079**
Seal (O-Ring, 14 x 2.5 mm) for withdrawal systems Ord. No. 1.01114.0001 and 1.01123.0001	**9.67100.1048**
Seal (O-Ring, 56 x 3.6 mm) for withdrawal systems Ord. No. 1.01114.0001 and 1.01123.0001 and threaded adapter	**9.67100.1047**

Threaded adapter

Product	Ord. No.
Threaded adapter 2" (stainless steel) with 2 horizontal rapid-action connectors	**9.67100.9003**
Threaded adapter 2" (stainless steel) with 2 vertical rapid-action connectors	**9.67100.9002**
Threaded adapter 2" (stainless steel) with 2 rapid-action nipples and 1 rapid-action connector	**9.67100.9005**

Tubings

Product	Ord. No.
Spiral gas feeding tube (Nylon) with rapid-action connector (length: 180 cm)	**9.67100.9051**
Stainless steel-coated PTFE-tube (80 cm) with 2 rapid action connectors	**9.67100.9058**
Stainless steel-coated PTFE-tube (80 cm) with rapid action connector and pipe connector (O.D. 10 mm)	**9.67100.9062**
Stainless steel-coated PTFE-tube (80 cm) with rapid action nipple and pipe connector (O.D. 10 mm)	**9.67100.9057**
Stainless steel-coated PTFE-tube (80 cm) with rapid action nipple and threaded connector G3/8	**9.67100.9052**
Stainless steel-coated PTFE-tube (100 cm) with pipe connector (O.D. 10 mm) on both sides	**9.67100.9061**

Overview
Packaging and withdrawal systems

Withdrawal system	Stainless steel barrels			Stainless steel drums			Metal drums		Combi drums with PE-Inliner		Accessories	Ord. No.
	10 l	30 l	185 l	10 l	25 l	190 l	25 l	190 l	25 l	180 l		
Withdrawal system for solvents with manual pressure build-up for 10 l and 30 l returnable barrels	■	■									–	**1.01123.0001**
Withdrawal system for solvents with manual pressure build-up for 10 l and 25 l returnable drums				■	■		■		□		–	**1.01114.0001**
											Dip tube for 25 l combi drum	**9.67100.1026**
Withdrawal system for inert gas pressurizing	□	□	□	□	□	□					Dip tube required:	**1.06710.0001**
											Dip tube for 10 l barrel	**9.67100.1040**
											Dip tube for 30 l barrel	**9.67100.1041**
											Dip tube for 185 l barrel	**9.67100.1185**
											Dip tube for 10 l drum	**9.67100.1010**
											Dip tube for 25 l drum	**9.67100.1025**
											Dip tube for 190 l drum	**9.67100.1190**
Withdrawal system for solvents with manual pressure build-up for 200 l barrels and drums			■			■		■		■	–	**1.19171.0001**
											Adapter 2" coarse to 2" fine thread for combi drum (drum with PE-inliner)	**9.67202.0000**

■ **suitability |** □ **installation possible, the appropriate dip tube has to be ordered separately**

Please contact your local agent for further information for your individual installation.

Stainless steel clamp (9.67106.0001) for filling nozzles for drums

Important safety advice

Our withdrawal systems have been developed and optimized for the use with containers and solvents from Merck Millipore. Merck Millipore therefore disclaims any warranty or liability for the operability of its withdrawal systems in connection with containers or solvents from other manufacturers.

Merck Millipore reserves the right to refrain from the delivery of withdrawal systems if the respective order does not indicate that each withdrawal system will be used in combination with appropriate solvents and containers from Merck Millipore.

We inform and advise our customers to the best of our knowledge and ability but without any engagement or liability on our part. Our customers must obey all existing laws and regulations. This also applies in respect of any protected rights of third parties. Our information and advice does not eliminate the need for our customers to check, on their own responsibility, that our products are suitable for the purpose envisaged.

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