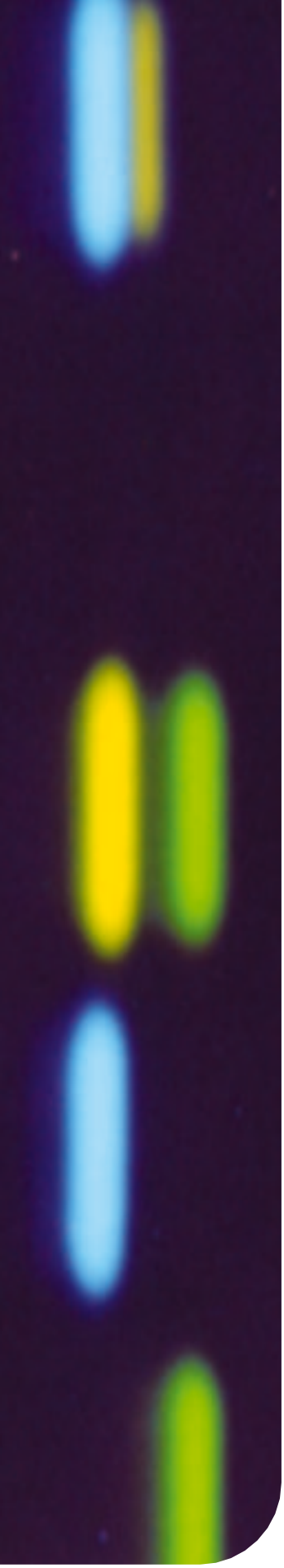
Unique

Thin layer chromatography by Merck –
traditionally innovative.

MERCK



TLC by Merck

Unique quality from the pioneer in thin layer chromatography

Thin layer chromatography is one of the most versatile methods of chromatographic analysis for the separation and identification of chemical substances. It provides an inexpensive, fast method for both qualitative and quantitative analysis offering:

- Simplified sample preparation because plates are disposable
- Direct visualization of results by UV or derivatization
- Simultaneous analysis of many samples under identical conditions
- Easy two dimensional separations

Thin layer chromatography is suitable for many applications:

- Screening
- Rapid identity tests in drug synthesis
- As pilot method for HPLC
- For quantitative analysis

Reliable and efficient to streamline your work

Merck always pioneered thin layer chromatography: we introduced the first pre-coated plates and we regularly add innovative new products in order to meet the needs of today's demanding TLC applications.

Merck provides you with reliable plates in a wide range of chemistries, sizes and backings to suit many application needs. Our thin layer plates combine robustness with surface homogeneity, giving unsurpassed separation performance.

Merck's HPTLC plates for automatisation have set the standard for reliable and quantitative analysis in quality control. Merck's quality is famous, proven by countless TLC applications on Merck plates in the literature.

Choose the best plate for your separation

Technologies / Sorbents Type	Silica (unmodified)	Spherical silica LiChrospher®	Monolithic silica	Modified silica	Cellulose	Aluminium oxide
TLC	page 04			page 12	page 14	page 15
HPTLC	page 06	page 08		page 12	page 14	
UTLC			page 10			
PLC	page 11					page 11

Special plates	
Concentrating zone plates	page 16
GLP plates	page 18
Multiformat plates	page 18
Accessories	page 19

These products are not intended for use as medical devices for in vitro diagnostic testing of human specimens within the meaning of European Directive 98/79/EC.
They are for research purposes only, for investigating in vitro samples without any medical objective.

Classical silica plates (TLC)

For reliable routine analysis of a broad range of substances

Unmodified silica is the most widely used sorbent in TLC enabeling the analysis of nearly every substance by suitable choice of the mobile phase.

- **Highest quality**
- **Most reliable batch-to-batch consistency**
- **Unsurpassed robustness**

Merck silica plates utilize proven Merck silica gel 60 combined with a unique polymeric binder resulting in a uniform and hard surface that will not crack or blister. The smooth and extremely dense plate coating ensures narrow bands and maximum separation efficiency with lowest background noise. Classical silica TLC plates have a layer thickness of 250 µm for glass or 200 µm for aluminium or plastic plates and a mean particle size of 10-12 µm. Glass, aluminium or plastic backings are available in a broad range of different sizes ranging from 20x20 cm down to 2.5x7.5 cm. The flexible aluminium or plastic plates can easily be cut with scissors to match individual separation requirements.

For UV detection of colourless substances, two kinds of inorganic fluorescent indicators are available: the green fluorescencing F_{254} or the blue fluorescencing, acid-stable F_{254s}. Both indicators fluoresce in UV light at an excitation wavelength of 254 nm. Samples which absorb shortwave UV at 254 nm are detected due to fluorescence quenching. The special high-fluorescent LuxPlates® contain a higher amount of fluorescent indicator for further improved identification of separated substances.

Applications

Unmodified silica gel covers nearly 80 % of thin layer applications for both adsorption- and partition thin layer chromatography. It enables separation of a large range of very different substances such as alkaloids, anabolics, carbohydrates, fatty acids, glycosides, lipids, mycotoxins, nucleotides, peptides, pesticides, steroids, sulfonamides, surfactants, tetracyclines and many others, making it suitable for:

- **In-process control in drug synthesis**
- **Identity-and stability testing of drugs**
- **Quality control of pharmaceuticals, food and environmental samples**
- **Residue analysis in food and environmental samples**

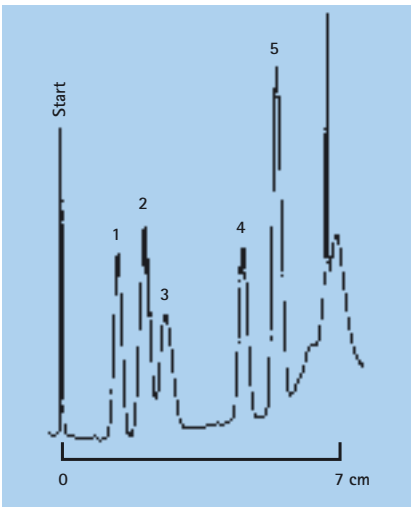


Fig. 1 *Analysis of a sulfonamide mixture on a classical TLC silica gel 60 F_{254} reveals clear separation of five different isomers.*

Compounds:	*1. Sulfadiazine*
	2. Sulfamerazine
	3. Sulfisoxalozole
	4. Sulfapyridine
	5. Sulfanilamide (all 0.1%)
Sample volume:	*0.75 µl*
Mobile phase:	*Ethyl acetate/methanol/ ammonia solution 25% (60/20/2 (v/v/v)*
Detection:	*UV 254 nm (TLC/HPTLC Scanner 2 CAMAG)*

Ordering Information

TLC unmodified silica gel 60

Packing Material	Format (cm)	Content	Backing	Cat. No.
Silica gel 60	20 x 20	25 plates	glass	1.05721.0001
	10 x 20	50 plates	glass	1.05626.0001
	5 x 20	100 plates	glass	1.05724.0001
	2.5 x 7.5	100 plates	glass	1.15326.0001
Silica gel 60 F_{254}	20 x 20	25 plates	glass	1.05715.0001
	5 x 20	100 plates	glass	1.05714.0001
	5 x 20	25 plates	glass	1.05808.0001
	5 x 10	200 plates	glass	1.05719.0001
	5 x 10	25 plates	glass	1.05789.0001
	2.5 x 7.5	100 plates	glass	1.15327.0001
	2.5 x 7.5	500 plates	glass	1.15341.0001
Silica gel 60 WF_{254s}	20 x 20	25 plates	glass	1.16485.0001
LuxPlate® silica gel 60 F_{254}	20 x 20	25 plates	glass	1.05805.0001
	10 x 20	50 plates	glass	1.05804.0001
	5 x 20	100 plates	glass	1.05803.0001
	5 x 10	25 plates	glass	1.05802.0001
	2.5 x 7.5	100 plates	glass	1.05801.0001
Silica gel 60*	20 x 20	25 plates	aluminium	1.05553.0001
	5 x 10	50 plates	aluminium	1.16835.0001
Silica gel 60 W*	20 x 20	25 plates	aluminium	1.16487.0001
Silica gel 60 F_{254}*	20 x 20	25 plates	aluminium	1.05554.0001
	10 x 20	25 plates	aluminium	1.05570.0001
	5 x 10	50 plates	aluminium	1.16834.0001
	5 x 7.5	20 plates	aluminium	1.05549.0001
	500 x 20	1 roll	aluminium	1.05562.0001
Silica gel 60 WF_{254s}*	20 x 20	25 plates	aluminium	1.16484.0001
Silica gel 60*	20 x 20	25 plates	plastic	1.05748.0001
Silica gel 60 F_{254}*	20 x 20	25 plates	plastic	1.05735.0001
	4 x 8	50 plates	plastic	1.05750.0001
	500 x 20	1 roll	plastic	1.05749.0001

Layer thickness: 250 µm
** Layer thickness: 200 µm*

TLC unmodified silica gel 40

Packing Material	Format (cm)	Content	Backing	Cat. No.
Silica gel 40 F_{254}	20 x 20	25 plates	glass	1.05634.0001

Layer thickness: 250µm

W: wettable with water
F_{245}: fluorescent indicator
F_{254s}: acid stable fluorescent indicator

For our wide range of loose sorbents and bulk materials, please refer to the Chrombook or visit our web page under **www.chromatography.merck.de**

High performance silica plates (HPTLC)

For fast and quantitative analysis of complex samples both for manual- and automated use

HPTLC plates offer higher efficiency and higher sensitivity than classical TLC combined with faster analysis.

- **Faster analysis, only 3–20 min for optimal separations**
- **5–10 fold increased sensitivity compared to classical TLC**
- **Highly reproducible, sharp bands for quantitative analysis**
- **Gold standard for automated use**

Merck's HPTLC plates utilize an optimized silica 60 sorbent with a particle size of only 5-6 µm compared to 10-12 µm used for classical TLC. This results in a higher packing density and hence a smoother surface. Band diffusion is reduced producing very compact sample bands or spots. These features and the thinner layer (200 µm or 100 µm) ultimately result in highly increased sensitivity and faster analysis.

Just as for classical TLC, Merck HPTLC silica plates are available either glass or aluminium backing in a variety of different formats to suit many separation needs. Fluorescent indicators are: green fluorescent F_{254} or the blue fluorescent acid-stable F_{254s}. Both indicators fluoresce in UV light at an excitation wavelength of 254 nm.

Features of HPTLC versus classical TLC plates

		HPTLC	Classical TLC
Mean particle size		5–6 µm	10–12 µm
Particle size distribution		4–8 µm	5–20 µm
Layer thickness		200 µm (100 µm)	250 µm
Plate height		12 µm	30 µm
Typical migration distance		3–6 cm	10–15 cm
Typical separation time		3–20 min	20–200 min
Number of samples per plate		< 36 (72)	< 10
Sample volume		0.1–0.5 µl	1–5 µl
Detection limits:	absorption	100–500 pg	1–5 ng
	fluorescence	5–10 pg	50–100 pg

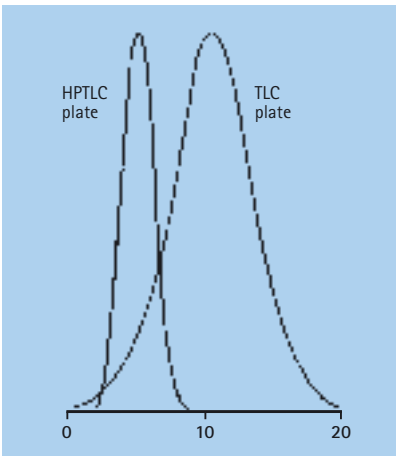


Fig. 2 *Comparison of the particle size distribution of TLC and HPTLC plates.*

HPTLC AMD Plates with extra thin layers of 100 µm have been developed for automated multiple development that is best suited for qualitative and quantitative detection of pesticides.
The new **HPTLC Premium Purity Plate** is especially designed for demanding pharmacopoeia applications. It is carefully wrapped in a special plastic coated aluminium foil to prevent any deposition of plasticizers from the wrapping material that could appear as an unknown extra zone when using middle-polar solvent systems such as toluene/ethyl acetate (95/5).

Applications

HPTLC plates offer unsurpassed separation performance and are therefore ideal for quantitative thin layer analysis including:

- Automated applications for quantitative separations
- Quality control of drugs
- Medicinal plant and herbal analysis

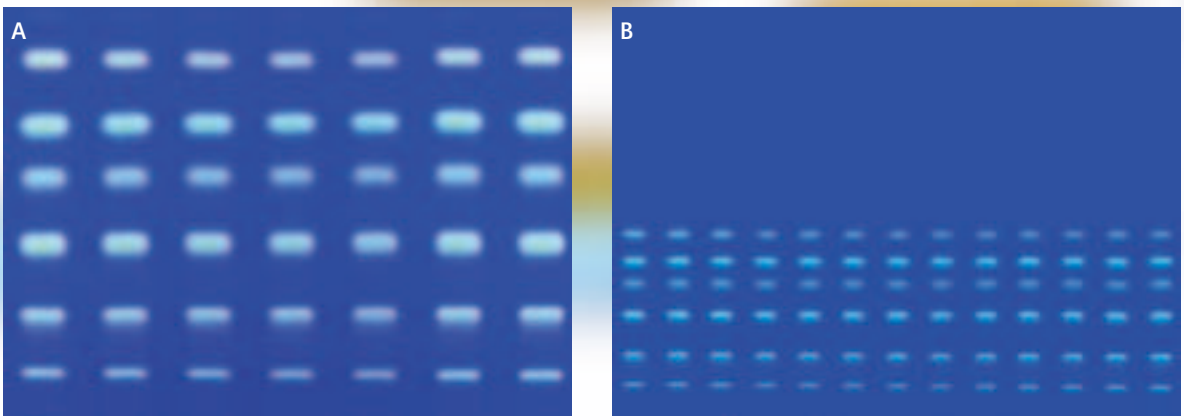


Fig. 3 *Comparison of the separation of dansyl amino acids on a* **(A)** *classical TLC silica gel 60 plate or* **(B)** *HPTLC silica gel 60 plate under identical conditions. The comparison clearly demonstrates that the HPTLC plate delivers sharper zones with shorter migration distances and hence running times. In addition the HPTLC plate allows the separation of twice the number of samples simultaneously.*

Compounds:
1. N-alpha-dansyl-L-asparagine
2. alpha-dansyl-L-arginine
3. Dansyl-L-cysteic acid
4. N-Dansyl-L-serine
5. Dansyl-glycine
6. N-N-Didansyl-L-tyrosine

Sample volume: *TLC 4 µl; HPTLC 0,3 µl*
Mobile phase: *Ethyl acetat/methanol/propionic acid (22/10/3)*
Migration distance: *TLC 10 cm; HPTLC 5 cm*
Analysis time: *TLC 42 min; HPTLC 13 min 45 sec*
Detection : *UV 366*

Ordering Information

HPTLC unmodified silica gel 60

Packing Material	Format (cm)	Content	Backing	Cat. No.
HPTLC silica gel 60	20 x 10	50 plates	glass	1.05641.0001
	10 x 10	25 plates	glass	1.05631.0001
	10 x 10	100 plates	glass	1.05633.0001
HPTLC silica gel 60 F_{254s}	20 x 10	25 plates	glass	1.15696.0001
HPTLC silica gel 60 F_{254}	20 x 10	50 plates	glass	1.05642.0001
	10 x 10	25 plates	glass	1.05628.0001
	10 x 10	100 plates	glass	1.05629.0001
	5 x 10	25 plates	glass	1.05616.0001
HPTLC silica gel 60	20 x 20	25 plates	aluminium	1.05547.0001
HPTLC silica gel 60 F_{254}	20 x 20	25 plates	aluminium	1.05548.0001
	5 x 7.5	20 plates	aluminium	1.05556.0001
HPTLC silica gel 60 WRF_{254}	20 x 20	25 plates	glass	1.15556.0001
HPTLC silica gel 60 F_{254} AMD, extra thin*	20 x 10	25 plates	glass	1.11764.0001
HPTLC silica gel 60 WRF_{254} AMD, extra thin*	20 x 10	25 plates	glass	1.12363.0001
New HPTLC Premium Purity Plate	20 x 20	25 plates	glass	1.05648.0001

Layer thickness: 200 µm
**Layer thickness: 100 µm*

LiChrospher® HPTLC plates with spherical particles

High-throughput separations combined with optimal performance

Merck's unique HPTLC LiChrospher® plates are the first thin layer chromatography plates based on spherical silica particles. Compared to standard HPTLC they offer the ultimate in thin layer chromatography performance and speed enabling high-throughput analysis of complex samples.

- 20 % reduced running times
- Highly compact spots or zones
- Low detection limits

HPTLC LiChrospher® plates are based on spherical shaped silica 60 with a particle size of 3-5 µm and narrow particle size distribution of 6-8 µm similar to what is generally used in HPLC. LiChrospher® HPTLC plates posses selectivity that is comparable to the respective HPTLC plates, however plate height and separation numbers are further improved ultimately resulting in shorter analysis times.

Comparison of detection limits on HPTLC LiChrospher® Si 60 F_{254s} plates and normal HPTLC Si 60 F_{254} plates (Detection Limits (UV 254 nm) ng/spot)

Substance	Visually		Spectrophotometrically	
	Silica gel 60 F_{254}	LiChrospher® Si 60 F_{254s}	Silica gel 60 F_{254}	LiChrospher® Si 60 F_{254s}
Ascorbic acid	100	100	100	25
Cortisone	50	25	25	10
Atrazine	50	25	10	5
Prometryne	25	10	10	5
Theophylline	50	25	25	10
o-Aminophenol	50	25	25	5
m-Aminophenol	10	5	10	5
p-Aminophenol	> 100	50	50	25

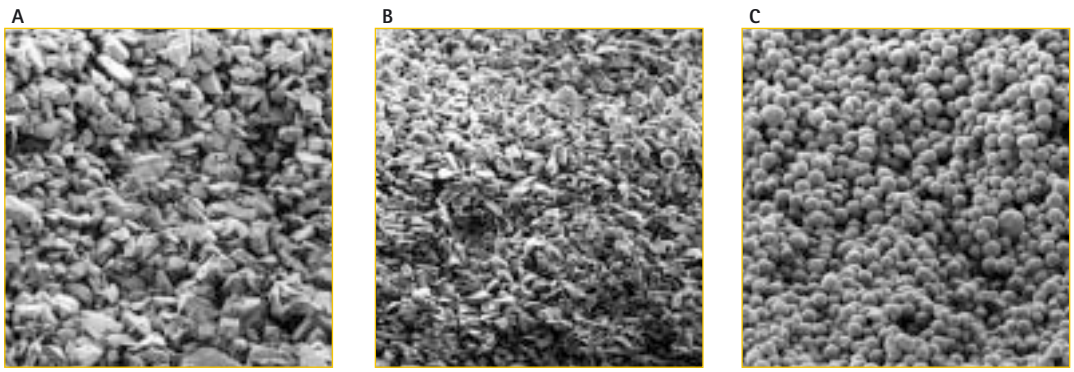


Fig. 4 *Scanning electron pictures of the cross-sections of a* **(A)** *classical silica TLC,* **(B)** *high performance silica HPTLC and a* **(C)** *HPTLC LiChrospher® plate.*

Applications

LiChrospher® HPTLC plates are especially suitable for the analysis of highly complex low concentration samples for example:

- Analysis of pesticide mixtures
- Assaying pharmaceutical compounds

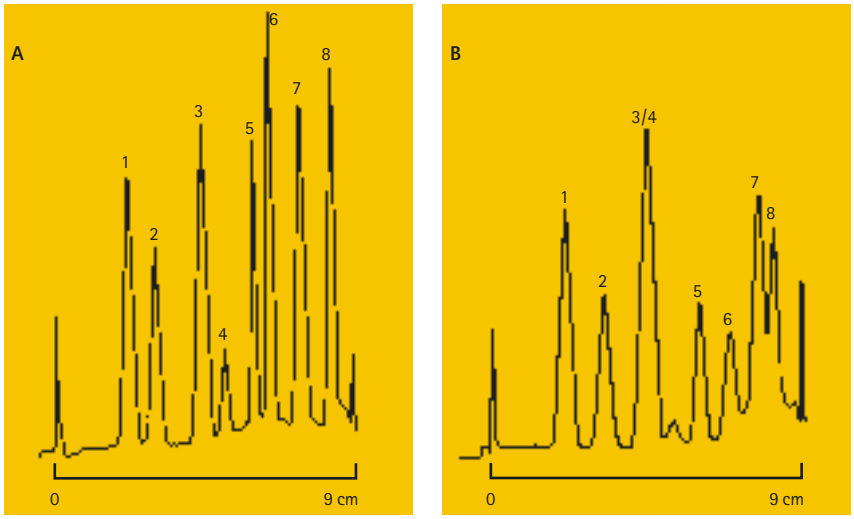


Fig. 5 *Scans of a pesticide separation on a* **(A)** *HPTLC LiChrospher® Si 60 and on a* **(B)** *conventional HPTLC Si 60 plate.*
Sample: *1| Hexazinone 2| Metoxuron 3| Monuron 4| Aldicarb 5| Azinphos-methyl 6| Prometryn 7| Pyridate 8| Trifluralin*
Sample volume: *50 nl*
Mobile phase: *Petroleum-ether 40-60°C/acetone 70/30*
Detection: *UV 254 nm*

Ordering Information

HPTLC LiChrospher® unmodified silica gel 60

Packing Material	Format (cm)	Content	Backing	Cat. No.
HPTLC LiChrospher® silica gel 60 F_{254s}	20 x 10	25 plates	glass	1.15445.0001
HPTLC LiChrospher® silica gel 60 F_{254s}	20 x 20	25 plates	aluminium	1.05586.0001
HPTLC LiChrospher® silica gel 60 WRF_{254} AMD extra thin*	20 x 10	25 plates	glass	1.05647.0001

HPTLC LiChrospher® RP-modified silica gel 60

Packing Material	Format (cm)	Content	Backing	Cat. No.
HPTLC LiChrospher® silica gel 60 RP-18 WF_{254s}	20 x 10	25 plates	glass	1.05648.0001

Layer thickness: 200 µm
**Layer thickness: 100 µm*

Ultra thin monolithic silica plate (UTLC)

Ultra fast and extremely sensitive analysis of samples in the nanoliter range

Merck's unique UTLC plate is the first TLC plate with only 10 µm layer thickness. It combines the advantages of standard thin layer chromatography techniques with the sensitivity and speed of ultra-thin monolithic technology.

- **Ultra fast**
- **Very low sample volumes for precious samples**
- **Increased sensitivity due to significantly reduced layer thickness**
- **Binder free and stable in pure water**

UTLC plate is based on the proprietary Merck monolithic silica technology. The monolithic SiO_2-layer of only 10 µm provides a 25-fold increased sensitivity compared to HPTLC and therefore enables detection of analysis in the pg range. UTLC brings miniaturization in thin layer chromatography.

Specifications

Plate format:	60 x 36 mm
Layer thickness:	10 µm
Stationary phase	Silica SiO_2 monolithic
Additions:	No binder
Sample volume:	Spot wise: 5–20 nl
	Band wise: up to 100 nl
Detection limit:	10 pg
Migration distance:	1–3 cm
Analysis time:	1–6 min

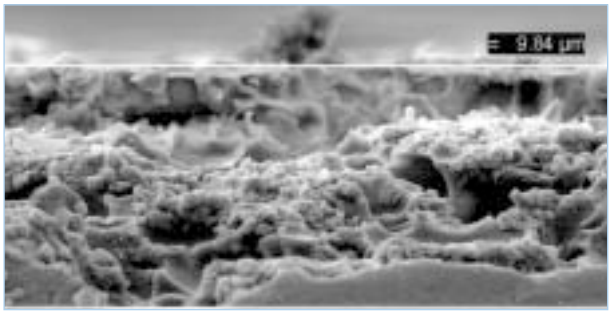


Fig. 6 *Scanning REM picture of an UTLC plate.*

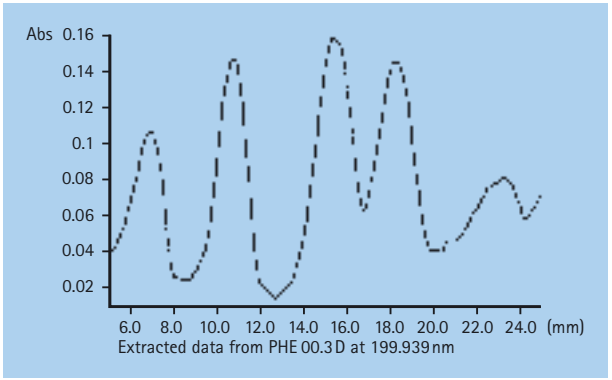


Fig. 7 *UTLC plate reveals excellent separation of substances such as phenols in only 4 minutes.*

Compounds:	*1: 4-Aminophenol*
	2: 2-Aminophenol
	3: Biphenyldiol-(2,2')
	4: 2-Benzene-4-chlorophenol
Solvent:	*0,2 % acetonitril*
Sample volume:	*10 nl (spotwise, ATS4, CAMAG)*
Mobile phase:	*toluene / chloroform / methanol (80/10/13)*
Migration distance:	*2 cm*
Detection:	*200 nm (Diode Array Scanner, J&M, Aalen, Germany)*

Applications

Merck´s UTLC is the first plate that allows separations in only 5 minutes and detection in the pg range. It is highly suited for small, simplier samples with low analyte concentration. Applications include steroids, azepams, amino acids, phthalates and phenols.

Ordering Information

UTLC monolithic silica plate

Packing Material	Format (cm)	Layer thickness	Content	Backing	Cat. No.
UTLC monolithic silica	6 x 3.6	10 µm	25 plates	glass	1.05007.0001

Preparative layer plates (PLC)

For enrichment and purification of analytes in mg quantities

Preparative thin layer plates allow the separation and purification of mg up to g samples.

- **Enables for high sample loading**
- **Purification up to g quantities**

PLC plates are based on the same proven Merck silica-binder technology as analytical TLC plates. The preparative plates are available with layers of unmodified silica gel, RP18-modified silica gel or aluminium oxide in several layer thicknesses ranging from 0.5 mm up to 2 mm, with or without fluorescent indicator.
In PLC, samples are typically applied as a band across the whole width of the plate and substances are detected almost exclusively by UV detection. The substances can be isolated by extraction after the spot has been scrapped from the layer.

Applications

PLC plates are perfectly suited for cleaning up synthetic reaction mixtures, natural products, plant extracts and biotechnical products.

Ordering Information

PLC silica gel 60

Packing Material	Format (cm)	Layer thickness	Content	Backing	Cat. No.
PLC silica gel 60	20 x 20	0.5 mm	20 plates	glass	1.13894.0001
	20 x 20	2 mm	12 plates	glass	1.05745.0001
PLC silica gel 60 F_{254}	20 x 20	0.5 mm	20 plates	glass	1.05744.0001
	20 x 20	1 mm	15 plates	glass	1.13895.0001
	20 x 20	2 mm	12 plates	glass	1.05717.0001
PLC silica gel 60 $F_{254+366}$	20 x 20	2 mm	20 plates	glass	1.05637.0001
PLC silica RP-18 F_{254s}	20 x 20	1 mm	15 plates	glass	1.05434.0001

PLC aluminium oxide 60 and 150

Packing Material	Format (cm)	Layer thickness	Content	Backing	Cat. No.
PLC aluminium oxides 60 F_{254}	20 x 20	1.5 mm	12 plates	glass	1.05788.0001
PLC aluminium oxides 150 F_{254}	20 x 20	1.5 mm	12 plates	glass	1.05726.0001

PLC concentrating zone plates

Packing Material	Format (cm)	Layer thickness	Content	Backing	Cat. No.
Silica gel 60 F_{254} concentrating zone 4 x 20 cm	20 x 20	0.5 mm	20 plates	glass	1.13794.0001
	20 x 20	1 mm	15 plates	glass	1.13792.0001
	20 x 20	2 mm	12 plates	glass	1.13793.0001

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Modified silica plates (TLC and HPTLC)

Free choice of solvent system for special separations and as pilot method for HPLC

Modified silica layers are well suited for many separation problems that cannot be adequately solved by unmodified silica.

- **Results less dependent on atmospheric humidity**
- **Allows use of aqueous solvent systems**
- **RP-modified silica provides ready correlation with HPLC**
- **No catalytic activity for instable substances (e.g. oxidative degradation)**

RP-modified silica plates

RP-2, RP-8 and RP-18 are based on silica gel 60 modified with aliphatic hydrocarbons. The chain length in combination with the degree of modification defines the ability to tolerate the water of the solvent system and strongly affects retention. Migration time increases in the order RP-2, RP-8, RP-18 using the same solvent composition. The HPTLC RP-2 sorbent exhibits higher polarity and high affinity of aqueous solutions tolerating up to 80% water while the longer carbon chains RP-8 and R-18 can be run with up to 60% water in the solvent system. The special developed **HPTLC RP18W** plate with a defined lower degree of surface modification can be used even with pure water.

CN, Diol, NH_2 modified silica plates

The CN and diol modified silica plates are moderately polar and suited for both, normal phase and reversed phase systems. The amino modified NH_2 plate provides weak basic ion exchange characteristics with special selectivity for charged compounds. For many applications it offers an alternative to PEI cellulose.

Since most substances separated on modified plates are colourless the majority of Merck´s modified silica plates contain the blue fluorescent, acid stable UV indicator F_{254s}. Samples which absorb shortwave UV at 254 nm are detected due to fluorescence quenching.

Applications

Modified silica plates provide additional selectivities and significantly broaden thin layer chromatography applications.

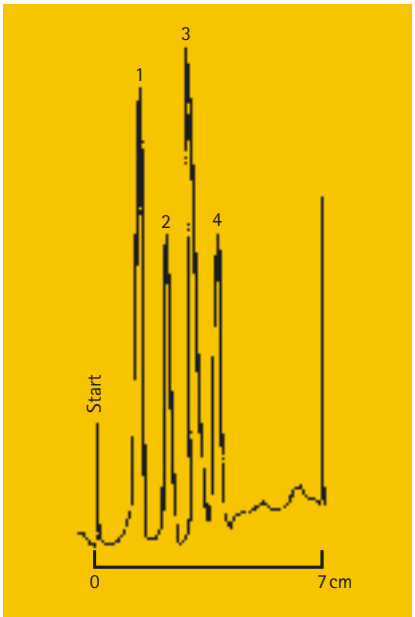


Fig. 8
Separation of oligo nucleotides on a HPTLC NH_2-modified silica gel 60 plate.

Compounds:	*1. ApUpG*
	2. ApApU
	3. ApApC
	4. ApApA all 0.1%
Sample volume:	*200 nl*
Mobile phase:	*Ethanol-water (60 : 40 v/v) plus 0.2 mM lithium chloride*
Detection:	*UV 254 nm (TLC/HPTLC Scanner 2)*

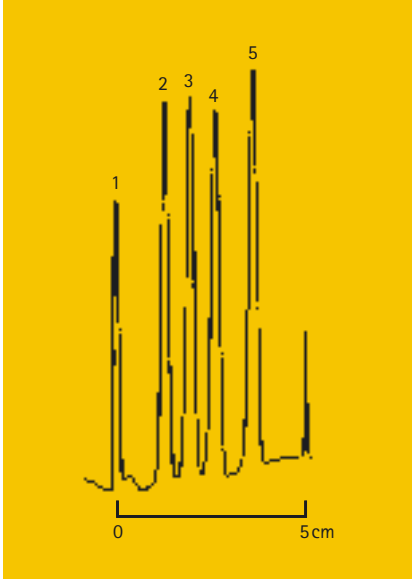


Fig. 9
RP-modified silica plates are especially suited for analysis of basic or acid substances as demonstrated by the good separation of gallic acid and its esters on HPTLC silica RP-18 WF_{254s}

Compounds:	*1| dodecyl gallate, 2| butyl gallate, 3| ethyl gallate, 4| methyl gallate, 5| gallic acid,*
Sample volume:	*200 nl*
Mobile phase:	*1 N acetic acid / methanol (70+30)*
Migration distance:	*5 cm*
Detection:	*UV-254 nm (TLC/HPTLC Scanner, Camag)*

Ordering Information

RP-modified silica plates (TLC and HPTLC)

Packing Material	Format (cm)	Content	Backing	Cat. No.
Silica gel 60 RP-2 (silanized)	20 x 20	25 plates	glass	1.05746.0001
Silica gel 60 RP-2 F_{254} (silanized)	20 x 20	25 plates	glass	1.05747.0001
Silica gel 60 RP-8 F_{254s}	20 x 20	25 plates	glass	1.15388.0001
	10 x 20	50 plates	glass	1.15424.0001
	5 x 20	50 plates	glass	1.15682.0001
	5 x 10	25 plates	glass	1.15684.0001
Silica gel 60 RP-18 F_{254s}	20 x 20	25 plates	glass	1.15389.0001
	10 x 20	50 plates	glass	1.15423.0001
	5 x 20	50 plates	glass	1.15683.0001
	5 x 10	25 plates	glass	1.15685.0001
Silica gel 60 RP-18 F_{254s}*	20 x 20	20 plates	aluminium	1.05559.0001
	5 x 7.5	20 plates	aluminium	1.05560.0001
HPTLC silica gel 60 RP-2 F_{254s}	10 x 10	25 plates	glass	1.13726.0001
HPTLC silica gel 60 RP-8 F_{254s}	10 x 10	25 plates	glass	1.13725.0001
HPTLC silica gel 60 RP-18	20 x 10	25 plates	glass	1.05914.0001
HPTLC silica gel 60 RP-18 W	20 x 10	25 plates	glass	1.14296.0001
HPTLC silica gel 60 RP-18 F_{254s}	10 x 10	25 plates	glass	1.13724.0001
HPTLC silica gel 60 RP-18 W F_{254s}	10 x 10	25 plates	glass	1.13124.0001

CN, Diol, NH_2 modified silica plates (TLC and HPTLC)

Packing Material	Format (cm)	Content	Backing	Cat. No.
Silica gel 60 NH_2 F_{254s}*	20 x 20	20 plates	aluminium	1.05533.0001
HPTLC silica gel 60 CN F_{254s}	20 x 10	25 plates	glass	1.12571.0001
HPTLC silica gel 60 CN F_{254s}	10 x 10	25 plates	glass	1.16464.0001
HPTLC silica gel 60 Diol F_{254s}	10 x 10	25 plates	glass	1.12668.0001
HPTLC silica gel 60 Diol F_{254s}	20 x 10	25 plates	glass	1.05636.0001
HPTLC silica gel 60 NH_2	20 x 10	25 plates	glass	1.12572.0001
HPTLC silica gel 60 NH_2 F_{254s}	20 x 10	25 plates	glass	1.13192.0001
HPTLC silica gel 60 NH_2 F_{254s}	10 x 10	25 plates	glass	1.15647.0001

Layer thickness: 250 µm
** Layer thickness: 200 µm*
W: fully wettable with water

Cellulose plates

For analysis of polar substances

The organic sorbent cellulose is particularly suitable for separation of hydrophilic substances by partition chromatography.

Merck cellulose plates include classical TLC grade or HPTLC plates for demanding high-performance separations: TLC cellulose layers are based on microcrystalline cellulose for standard separations, whereas HPTLC cellulose layers utilize a high purity rod-shaped microcrystalline cellulose resulting in highly reduced diffusion of analytes for critical high performance separations.

Cellulose plates are available with or without fluorescent indicator. The fluorescent indicator used is a special fluorescent pigment that is stimulated to intense blue fluorescent remission at long wave UV light of 366 nm and at short wave UV light at 254 nm.

The special PEI cellulose is a polyethylenimine modified cellulose, which acts as a strongly basic anion exchanger. Due to these special characteristics it is mainly useful for analysis of substances with exchange-active groups such as amino acids, peptides and nucleotides or nucleosides.

Applications

Typical applications of cellulose plates include the analysis of amino acids, carbohydrates, phosphates, nucleic acids and nucleic acids derivatives for:

- 2-dimensional separations such as amino acid "fingerprints"
- Metabolic studies

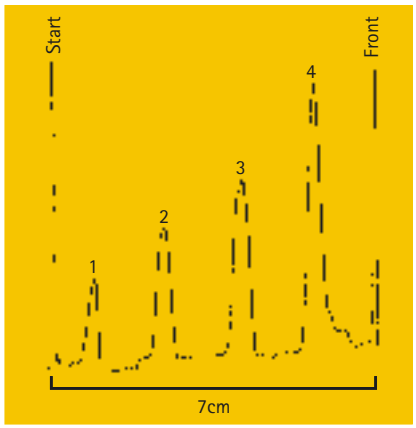


Fig. 10 *HPTLC cellulose plate is highly suited to separate polar compounds as demonstrated by the separation of phosphates.*

Compounds: $(NaPO_3)_3$, $2\,Na_5P_3O_{10}$, $3\,Na_4P_2O_7$, $4\,Na_2HPO_4$, *all 0.2%*
Sample volume: *250 nl*
Mobile phase: *16% trichlor acetic acid dioxane sol. ammonia in 1 l water; 70/30*
Migration distance: *7 cm*
Detection: *586 nm, TLC/HPTLC Scanner, Camag*

Ordering Information

Cellulose plates (TLC and HPTLC)

Packing Material	Format (cm)	Content	Backing	Cat. No.
Cellulose	20 x 20	25 plates	glass	1.05716.0001
	10 x 20	50 plates	glass	1.05730.0001
	10 x 10	100 plates	glass	1.05632.0001
Cellulose F	20 x 20	25 plates	glass	1.05718.0001
	10 x 20	50 plates	glass	1.05728.0001
Cellulose	20 x 20	25 plates	aluminium	1.05552.0001
	500 x 20	1 roll	aluminium	1.05563.0001
Cellulose	20 x 20	25 plates	aluminium	1.05574.0001
Cellulose	20 x 20	25 plates	plastic	1.05577.0001
Cellulose F	20 x 20	25 plates	plastic	1.05565.0001
HPTLC cellulose	20 x 10	50 plates	glass	1.05786.0001
	10 x 10	25 plates	glass	1.05787.0001
HPTLC cellulose F	20 x 10	50 plates	glass	1.15036.0001
	10 x 10	25 plates	glass	1.15035.0001
HPTLC cellulose	20 x 20	25 plates	aluminium	1.16092.0001
PEI* cellulose F	20 x 20	25 plates	glass	1.05725.0001
PEI* cellulose F	20 x 20	25 plates	plastic	1.05579.0001

** PEI cellulose plates should be stored at 0-4° C to reduce deterioration. As plates become old the might take a brown coloration and should be discarded.*
F: fluorescence indicator with exitation wavelength 254/366

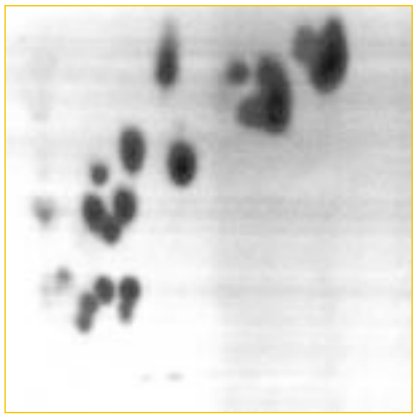


Fig. 11 *2-dimensional separation of amino acids on a HPTLC cellulose plate.*

Sample: *Amino acid-mixture*
Detection: *Ninhydrin spray*

Aluminium oxide plates (TLC)

For basic and neutral compounds using different pH conditions

Aluminium oxide plates provide distinct separation advantages with regard to the pH: under aqueous conditions basic compounds can be best separated on basic aluminium oxide plates, while neutral compounds are best separated on neutral plates.

Merck TLC aluminium oxide plates utilize neutral or basic aluminium oxide with 60 Å or 150 Å pore size with or without fluorescent indicator to suit different application needs.

Applications

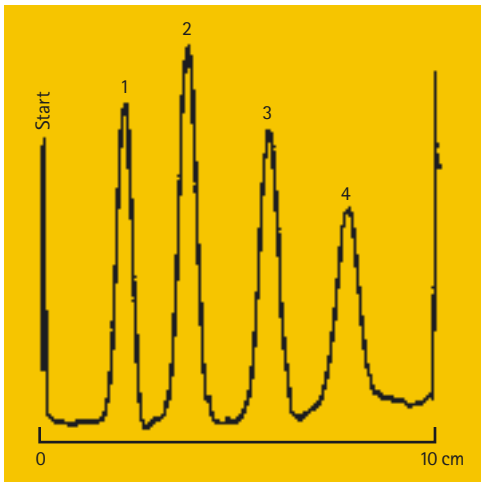


Fig. 12 *Separation of m-oligophenylenes on a TLC aluminium oxide plate.*

Compounds:	*1. m-Quinquephenyl*
	2. m-Quarterphenyl
	3. m-Terphenyl
	4. Biphenyl
Sample volume:	*200 nl*
Mobile phase:	*n-heptane*
Migration distance:	*10 cm*
Detection:	*UV 254 nm, TLC/HPTLC Scanner, Camag*

Ordering Information

TLC aluminium oxide 60

Packing Material	Format (cm)	Layer thickness	Content	Backing	Cat. No.
Aluminium oxide 60 F_{254} basic	20 x 20	250 µm	25 plates	glass	1.05713.0001
Aluminium oxide 60 F_{254} basic	5 x 20	250 µm	100 plates	glass	1.05731.0001
Aluminium oxide 60 F_{254} neutral	20 x 20	200 µm	25 plates	aluminium	1.05550.0001
Aluminium oxide 60 F_{254} neutral	20 x 20	200 µm	25 plates	plastic	1.05581.0001

TLC aluminium oxide 150

Packing Material	Format (cm)	Layer thickness	Content	Backing	Cat. No.
Aluminium oxide 150 F_{254} basic	20 x 20	250 µm	25 plates	glass	1.05727.0001
Aluminium oxide 150 F_{254} neutral	20 x 20	200 µm	25 plates	aluminium	1.05551.0001

Concentrating zone plates (TLC, HPTLC, PLC)

Quick and easy sample application from small to large volumes of diluted samples

Concentrating zone plates allow for easy application of large volumes of diluted samples.

- **Quick and easy sample application**
- **Includes a purification and concentration step**
- **Better resolution due to sharp bands**

Merck's concentrating zone plates are based on different adsorption properties of two silica adsorbents: an inert large pore concentrating adsorbent where the samples are applied and a selective separation layer for the separation. Independent of the shape, size or position of the spots the sample always concentrates within seconds as a narrow band at the interface of the two adsorbents, where the separation starts.

In addition, the concentrating zone can serve as a clean-up step for complex matrices.

Analytical TLC and HPTLC concentration zone plates provide concentrating areas of 2.5 cm, whereas the concentrating zone of preparative plates (PLC) is 4 cm in length.

The special RP-18 silica concentrating zone plate is optimized for the high-resolution separation of polycyclic aromatic hydrocarbons (PAH) according to DIN 38409-H13. These samples are derived from organic material by pyrolysis or incomplete combustion.

Applications

Concentrating zone plates make sample application easy, whenever manual sample application has to be used.

Fig. 13 *Stages of the development of a PLC concentrating zone plate silica gel 60. Separation of lipophilic dyes with toluene as mobile phase. Dot-like sample application.*

A: *Sample application*
B: *Concentration*
C: *Separation*

Ordering Information

TLC concentrating zone plates

Packing Material	Format (cm)	Content	Backing	Cat. No.
Silica gel 60 concentrating zone 2.5 x 20 cm	20 x 20	25 plates	glass	1.11845.0001
Silica gel 60 concentrating zone 2.5 x 10 cm	10 x 20	50 plates	glass	1.11844.0001
Silica gel 60 concentrating zone 2.5 x 20 cm*	20 x 20	25 sheets	aluminium	1.05582.0001
Silica gel 60 F_{254} concentrating zone 2.5 x 20 cm	20 x 20	25 plates	glass	1.11798.0001
Silica gel 60 F_{254} concentrating zone 2.5 x 10 cm	10 x 20	50 plates	glass	1.11846.0001
Silica gel 60 F_{254} concentrating zone 2..5 x 20 cm*	20 x 20	25 sheets	aluminium	1.05583.0001

Layer thickness: 250 µm
** Layer thickness: 200 µm*

HPTLC concentrating zone plates

Packing Material	Format (cm)	Content	Backing	Cat. No.
HPTLC silica gel 60 concentrating zone 2.5 x 20 cm	20 x 10	50 plates	glass	1.13749.0001
HPTLC silica gel 60 concentrating zone 2.5 x 10 cm	10 x 10	25 plates	glass	1.13748.0001
HPTLC silica gel 60 F_{254} concentrating zone 2.5 x 20 cm	20 x 10	50 plates	glass	1.13728.0001
HPTLC silica gel 60 F_{254} concentrating zone 2.5 x 10 cm	10 x 10	25 plates	glass	1.13727.0001
HPTLC silica gel 60 F_{254} concentrating zone 2.5 x 5 cm	5 x 10	25 plates	glass	1.13187.0001
HPTLC silica gel 60 RP-18 PAH concentrating zone 2.5 x 20 cm	20 x 10	25 plates	glass	1.15037.0001
HPTLC silica gel 60 RP-18 F_{254s} concentrating zone 2.5 x 20 cm	20 x 10	25 plates	glass	1.15498.0001

Layer thickness: 200µm

PLC concentrating zone plates, glass backed

Packing Material	Format (cm)	Layer thickn.	Content	Cat. No.
Silica gel 60 F_{254} concentrating zone 4 x 20 cm	20 x 20	0.5 mm	20 plates	1.13794.0001
	20 x 20	1 mm	15 plates	1.13792.0001
	20 x 20	2 mm	12 plates	1.13793.0001

GLP plates

With individual laser coding for GLP applications

Laser coded GLP plates are marked with item, batch and individual plate number on the top of every single plate providing:

- **Convenient back tracing of article, batch, and individual plate number**
- **Every plate can easily be documented and archived**
- **Same reliable performance as other Merck plates**

Based on the same proven Merck silica 60, GLP plates perform exactly as the corresponding TLC or HPTLC plates. GLP coded plates are available as TLC or HPTLC grade in various formats, with or without fluorescence indicator F_{254} that is stimulated to green emission at 254 nm.

Ordering Information

Packing Material	Format (cm)	Content	Backing	Cat. No.
TLC GLP silica gel 60 F_{254}	20 x 20	25 plates	glass	1.05566.0001
	10 x 20	25 plates	glass	1.05702.0001
HPTLC GLP silica gel 60	10 x 20	25 plates	glass	1.13326.0001
HPTLC GLP silica gel 60 F_{254}	10 x 20	25 plates	glass	1.05613.0001
	10 x 10	25 plates	glass	1.05564.0001

Multiformat plates

Multiple sizes in one single plate

Merck Multiformat plates are pre-scored glass plates for easy breaking to various sizes.

- **Easy snapping with the fingers to smaller sizes**
- **Up to 7 formats in one plate**

Multiformat plates utilize the same silica coating as the corresponding TLC or HPTLC plate delivering chromatograms that are identical to those of the non-scored plates. Depending on the scoring up to 7 different formats are possible: 20 cm x 20 cm, 15 cm x 20 cm, 10 cm x 20 cm, 5 cm x 20 cm, 10 cm x 15 cm, 10 cm x 10 cm, 5 cm x 10 cm.

Ordering Information

Packing Material	Scored (cm)	Content of one package (20x20 cm)	No. of plates possible	Cat. No.
Multiformat silica gel 60 F_{254} 20 x 20	5 x 10	25 plates	200	1.05620.0001
Multiformat silica gel 60 F_{254} 20 x 20	5 x 20	20 plates	80	1.05608.0001
HPTLC Multiformat silica gel 60 F_{254} 10 x 10	5 x 5	25 plates	100	1.05635.0001

Accessories

TLC sprayer

Even and very finely divided spray solution is a prerequisite for optimal staining of TLC plates to visualize colourless substances.

The Merck TLC sprayer allows spraying derivatization reagents homogenously onto the developed chromatograms. It is equipped with two different spray heads of 0.8 and 1.25 mm optimized for low – and for high viscosity solutions respectively. The electro-pneumatically operated sprayer uses compressed air driven by accumulator power and inductive charging.

Our ready-to-use spray solutions can be screwed directly to the sprayer eliminating cumbersome pouring of the solutions.

Spray solutions

The three most common spray solutions used in TLC are offered as ready-to-use solution in optimised packing to fit directly onto the sprayer.

UV lamp

Two UV lamps, powered by five 1.5V baby cells (8UM2) are intended for the quick detection of substances under short- or long-wavelength UV light.

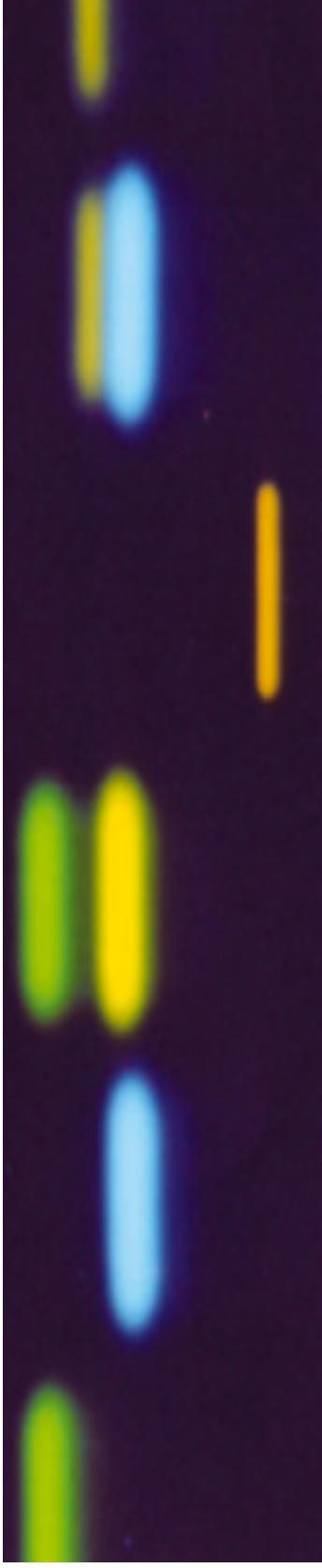
Ordering Information

Accessories and auxiliaries

Product	Contents of one package	Cat.No.
Micro capillaries 2.0 µl	50 capillaries	1.10290.0001
UV lamp 254 nm	1 unit	1.12537.0001
UV lamp 366 nm	1 unit	1.13203.0001
TLC sprayer with two spray heads	1 unit	1.08540.0001
Spray heads for TLC sprayer	5 pieces (0.8 mm); 1 piece (1.25 mm)	1.08541.0001
Glass bottles 50 ml	10 bottles	1.10647.0001
Glass bottles 100 ml	10 bottles	1.10646.0001

Ready-to-use spray solutions

Product	Solvent	Package	Contents of one package	Cat.No.
Dragendorff-Reagent	Acetic acid/ ethyl acetate/water	glass	100 ml	1.02035.0100
Molybdatophosphoric acid	2-propanol	glass	100 ml	1.00480.0100
Ninhydrin	2-propanol	glass	100 ml	1.06705.0100



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For further information on Merck
and our products contact

Merck KGaA
64271 Darmstadt, Germany
Fax: 0049 (0) 6151 72-60 80
E-mail: chromatography@merck.de
www.merck.de
chromatography.merck.de