

# Fast and precise Thin Layer Chromatography by Merck Millipore.



# Traditionally innovative. Unique quality from the pioneer in thin layer chromatography

**Ahead of the times** Merck Millipore and thin layer chromatography go back a long way. Several decades ago, we revolutionized the industry by introducing the first ready-to-use, pre-coated plates to the market. Today, our TLC portfolio comprises over 60 high-quality products – each setting new standards in quality, efficiency and utility. And our journey of innovation continues year after year. What drives us? First and foremost, it is our dedication to our customers. Because when our shared challenges are turned into mutual achievements, we both stay ahead of our fields.

**Quality makes all the difference** Thin layer chromatography is one of the most versatile methods of chromatographic analysis for the separation and identification of chemical substances. Fast and inexpensive, the technique enables both qualitative and quantitative analysis. As the world leader in TLC, Merck Millipore offers plates of unparalleled robustness and surface homogeneity, thus ensuring the highest reliability. Our comprehensive range includes various chemistries, sizes and backings to suit even the most demanding applications. And when it comes to quality, our TLC plates are second to none – as documented by countless published studies.



- Disposable plates ensure simplified sample preparation
- Direct visualization of results by UV or derivatization
- Analysis of many samples under identical conditions simultaneously
- Easy two-dimensional separations
- Thin layer chromatography is suitable for many applications, such as screening, rapid identity tests in drug synthesis, as pilot method for flash and preparative chromatography and for quantitative analysis.

## Thin layer chromatography – numerous fields of application

### Pharma and herbal medicine

#### **R&D / Synthesis labs:**

- Stability testing
- Uniformity testing
- Sub-component evaluation

#### **Quality control / Analytical labs:**

- In-process control
- Identity testing

### Food

#### **Quality control:**

- Stability testing
- Drug residue testing
- Testing for additives
- Mycotoxins (including aflatoxins)

### Environmental analysis

- Water and soil analysis
- Residue analysis

### Clinical labs

- Drug monitoring
- Metabolism studies

### Forensic

- Drug abuse
- Poisons
- Alkaloids



[www.merckmillipore.com/thin-layer-chromatography](http://www.merckmillipore.com/thin-layer-chromatography)

# Choose the best plate for your separation

Technologies	Sorbents Type				
	Silica (unmodified)	Spherical silica LiChrospher®	Aluminium oxide	Modified silica	Cellulose
Thin layer chromatography <b>TLC</b>	page 04		page 12	page 13	page 16
High performance silica plates <b>HPTLC</b>	page 06	page 08		page 13	page 16
Preparative layer plates <b>PLC</b>	page 10		page 10	page 10	
<b>Special plates</b>					
Concentrating zone plates					page 18
Kieselguhr and mixed layer plates					page 20
GLP plates					page 21
Multiformat plates					page 22
ProteoChrom® HPTLC plates for peptide analysis					page 23
TLC silica gel 60G plates					page 26
Loose sorbents for the preparation of TLC plates					page 29
Accessories					page 31

**Information:** 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)

## Reliable routine analysis of a broad range of substances

4

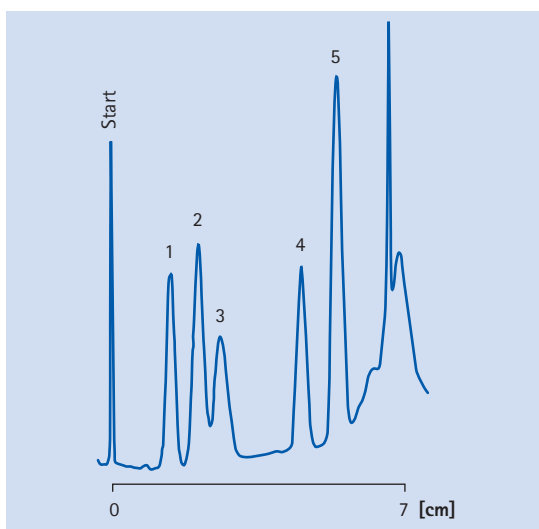
**Trust your test** Unmodified silica is the most widely used sorbent in TLC. There's a good reason for this: when combined with a suitable mobile phase, it allows you to analyze almost any substance. The smooth and extremely dense plate coating ensures narrow bands and maximum separation efficiency with lowest background noise. Our silica plates offer all these advantages and more. They utilize the well-established Merck Millipore silica gel 60 together with a unique polymeric binder, which results in a uniform, hard surface that will not crack or blister.

**Pick your plate** Glass, aluminium or plastic? You have the choice with our classical silica TLC plates. Each is available in a broad range of sizes from 20 x 20 cm down to 2.5 x 7.5 cm. They offer a layer thickness of 250 µm for glass plates and 200 µm for aluminium or plastic, with a mean particle size of 10 - 12 µm. What's more, our flexible aluminium or plastic plates can easily be cut with scissors to match your individual separation requirements. We also provide two kinds of inorganic fluorescent indicators for UV detection of colorless substances: the green fluorescing F<sub>254</sub> or the blue fluorescing, acid-stable F<sub>254s1</sub>, both of which 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. For superior identification of separated substances, our exceptional high-fluorescent LuxPlates® contain a higher amount of fluorescent indicator.

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

**Applications** Unmodified silica gel covers nearly 80% of both adsorption and partition TLC applications. It enables separation of a large range of diverse substances, such as alkaloids, anabolics, carbohydrates, fatty acids, glycosides, lipids, mycotoxins, nucleotides, peptides, pesticides, steroids, sulfonamides, surfactants, tetracyclines and many others. This makes 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



### Analysis of a sulfonamide mixture

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

*Analysis of a sulfonamide mixture on a classical TLC silica gel 60 F<sub>254</sub> reveals clear separation of five different isomers*

## TLC unmodified silica gel 60

Packing Material	Format [cm]	Content	Backing	Ord. 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 <sub>254</sub>	20 x 20	25 plates	glass	1.05715.0001
	10 x 20	50 plates	glass	1.05729.0001
	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 W F <sub>254s</sub>	20 x 20	25 plates	glass	1.16485.0001
LuxPlate® silica gel 60 F <sub>254</sub>	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 <sub>254</sub> *	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 W F <sub>254s</sub> *	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 <sub>254</sub> *	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 | \* = 200 µm | W: water resistant | F<sub>245</sub>: fluorescent indicator | F<sub>254s</sub>: 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.merckmillipore.com/chromatography](http://www.merckmillipore.com/chromatography)

Aluminium and plastic backed plates can be cut to smaller size to reduce the cost of analysis.

Ordering information





# High performance silica plates (HPTLC)

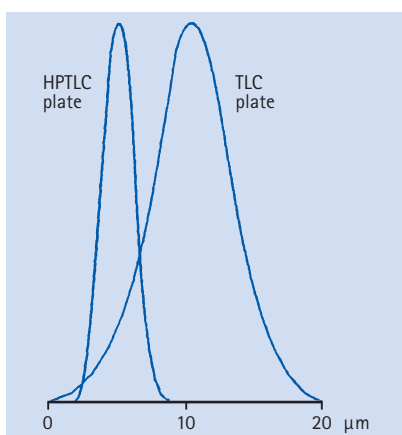
## Fast and quantitative analysis of complex samples for both manual and automated use

6

**Greater efficiency** Need higher efficiency and sensitivity? Merck Millipore HPTLC plates are the answer. They use an optimized silica 60 sorbent with a significantly smaller particle size: just 5 – 6  $\mu\text{m}$  compared to 10 – 12  $\mu\text{m}$  used for classical TLC. This enables a higher packing density and hence a smoother surface. Band diffusion is also reduced, producing very compact sample bands or spots. These features and the thinner layer (200  $\mu\text{m}$  or 100  $\mu\text{m}$ ) ultimately lead to highly increased sensitivity and faster analysis.

**Greater choice for greater efficiency** Just as for classical TLC, Merck Millipore HPTLC silica plates are available with either glass or aluminium backing in a variety of formats to suit many separation needs. Here too, the fluorescent indicators offered 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.

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



Comparison of the particle size distribution of TLC and HPTLC plates

Features of HPTLC versus classical TLC	HPTLC	Classical TLC
Mean particle size	5 – 6 $\mu\text{m}$	10 – 12 $\mu\text{m}$
Particle size distribution	4 – 8 $\mu\text{m}$	5 – 20 $\mu\text{m}$
Layer thickness	200 $\mu\text{m}$ (100 $\mu\text{m}$ )	250 $\mu\text{m}$
Plate height	12 $\mu\text{m}$	30 $\mu\text{m}$
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 $\mu\text{l}$	1 – 5 $\mu\text{l}$
Detection limits: absorption	100 – 500 pg	1 – 5 ng
Detection limits: fluorescence	5 – 10 pg	50 – 100 pg

**HPTLC AMD Plates** **HPTLC AMD Plates** with extra thin layers of 100  $\mu\text{m}$  are intended for automated multiple development and best suited for qualitative and quantitative detection of pesticides.

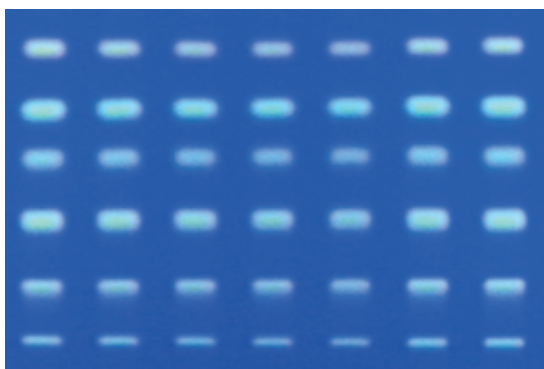
**HPTLC Premium Purity Plate** The new **HPTLC Premium Purity Plate** is especially designed for demanding pharmacopoeia applications. It is carefully wrapped in a special aluminium foil. This prevents any deposition of plasticizers from the wrapping material that could appear as an unknown extra zone 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

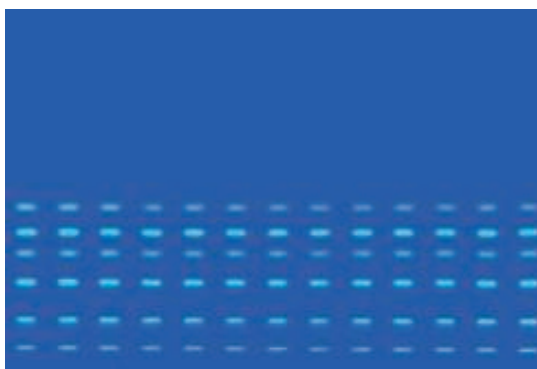


Comparison of classical TLC versus HPTLC plates		A. TLC	B. HPTLC	
Sample	1. N-alpha-dansyl-L-asparagine	Mobile phase Ethyl acetate/methanol/propionic acid (20/10/3)		
	2. alpha-dansyl-L-arginine			
	3. Dansyl-L-cysteic acid	Detection UV 366		
	4. N-Dansyl-L-serine			
	5. Dansyl-glycine	Sample volume	4 µm	0.3 µm
	6. N-N-Didansyl-L-tyrosine	Migration distance	10 cm	5 cm
		Analysis time	42 min	13 min 45 sec

Comparison of the separation of dansyl amino acids under identical conditions. The comparison clearly demonstrates that the HPTLC plate delivers sharper zones with shorter migration distances and faster analysis times. In addition the HPTLC plate allows the separation of twice the number of samples simultaneously.



A. Classical TLC silica gel 60 plate



B. HPTLC silica gel 60 plate

### HPTLC unmodified silica gel 60

Packing Material	Format [cm]	Content	Backing	Ord. 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 <sub>254s</sub>	20 x 10	25 plates	glass	1.15696.0001
HPTLC silica gel 60 F <sub>254</sub>	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 <sub>254</sub>	20 x 20	25 plates	aluminium	1.05548.0001
	5 x 7.5	20 plates	aluminium	1.05556.0001
HPTLC silica gel 60 WR F <sub>254s</sub>	20 x 10	25 plates	glass	1.15552.0001
HPTLC silica gel 60 F <sub>254</sub> AMD, extra thin*	20 x 10	25 plates	glass	1.11764.0001
HPTLC silica gel 60 WR F <sub>254s</sub> AMD, extra thin*	20 x 10	25 plates	glass	1.12363.0001
HPTLC silica gel 60 F <sub>254</sub> premium purity plate	20 x 20	25 plates	glass	1.05648.0001

Layer thickness: 200 µm | \* Layer thickness: 100 µm | WR: water resistant and higher purity

Ordering information

# LiChrospher® HPTLC plates with spherical particles

## For high-throughput separations with optimal performance

### Race through running times

To help you save precious laboratory time, we created the world's first thin layer chromatography plates based on spherical silica particles: HPTLC LiChrospher® plates. Compared to standard HPTLC, these unique plates offer the ultimate in performance and speed, enabling high-throughput analyses of complex samples.

8

### Step up performance

HPTLC LiChrospher® plates are based on spherical shaped silica 60 with a particle size of 7 µm and narrow particle size distribution similar to what is generally used in HPLC. LiChrospher® HPTLC plates possess selectivity that is comparable to the respective HPTLC plates, however plate height and separation numbers are further improved – resulting in shorter analysis times and improved detection limits.

### Your benefits

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

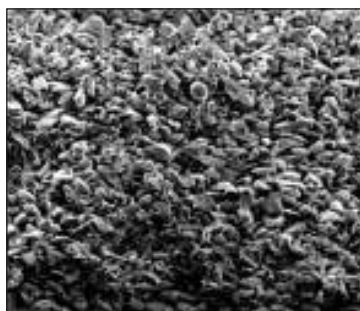
Comparison of detection limits on HPTLC LiChrospher® Si 60 F<sub>254s</sub> plates and normal HPTLC Si 60 F<sub>254</sub> plates (Detection Limits, UV 254 nm, ng/spot)

Substance	Visually		Spectrophotometrically	
	Silica gel 60 F <sub>254</sub>	LiChrospher® Si 60 F <sub>254s</sub>	Silica gel 60 F <sub>254</sub>	LiChrospher® Si 60 F <sub>254s</sub>
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

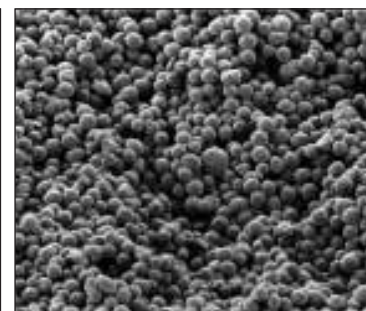
Scanning electron pictures of the cross-section



(A) classical silica TLC plate



(B) high performance silica HPTLC plate

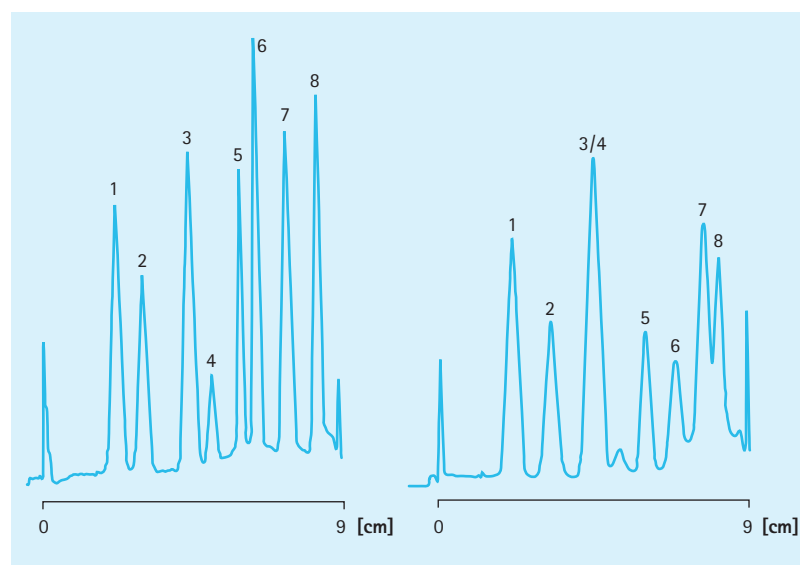


(C) HPTLC LiChrospher® plate

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

- Analysis of pesticide mixtures
- Assaying pharmaceutical compounds

## Applications



A. HPTLC LiChrospher® Si 60 plate

B. Conventional HPTLC Si 60 plate

### Pesticide separation

<b>Sample</b>	1. Hexazinone 2. Metoxuron 3. Monuron 4. Aldicarb 5. Azinphos-methyl 6. Prometryn 7. Pyridate 8. Trifluralin
<b>Sample volume</b>	50 nl
<b>Mobile phase</b>	Petroleum benzene 40 - 60°C / acetone 70/80
<b>Detection</b>	5 - 10 pg

### HPTLC LiChrospher® unmodified silica gel 60

Packing Material	Format [cm]	Content	Backing	Ord. No.
HPTLC LiChrospher® silica gel 60 F <sub>254s</sub>	20 x 10	25 plates	glass	1.15445.0001
HPTLC LiChrospher® silica gel 60 F <sub>254s</sub>	20 x 20	25 plates	aluminium	1.05586.0001
HPTLC LiChrospher® silica gel 60 WR F <sub>254s</sub> AMD extra thin*	20 x 10	25 plates	glass	1.05647.0001

Layer thickness: 200 µm | \* Layer thickness: 100 µm | WR: wettable with water and pure silica gel 60

## Ordering information

### HPTLC LiChrospher® RP-modified silica gel 60

Packing Material	Format [cm]	Content	Backing	Ord. No.
HPTLC LiChrospher® silica gel 60 RP-18 W F <sub>254s</sub>	20 x 10	25 plates	glass	1.05646.0001

Layer thickness: 200 µm | W: fully wettable with water

# Preparative layer plates (PLC)

## For enrichment and purification of analytes in mg quantities

### Heavier loads, lighter analyses

When your application involves higher sample quantities, our PLC plates are the optimal solution. They are based on the same proven Merck Millipore silica-binder technology as analytical TLC plates, however they allow loads of up to gram amounts. 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 scraped from the layer.

### Further flexibility

Depending on your application, you can choose between preparative layer plates 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.

### Your benefits

- Separation and purification of mg up to g samples
- Enables high sample loading
- Purification up to g quantities

### 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	Ord. 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 <sub>254</sub>	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 <sub>254 + 366</sub>	20 x 20	2 mm	12 plates	glass	1.05637.0001
PLC silica RP-18 F <sub>254s</sub>	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	Ord. No.
PLC aluminium oxides 60 F <sub>254</sub>	20 x 20	1.5 mm	12 plates	glass	1.05788.0001
PLC aluminium oxides 150 F <sub>254</sub>	20 x 20	1.5 mm	12 plates	glass	1.05726.0001

## PLC concentrating zone plates

Packing Material	Format [cm]	Layer thickness	Content	Backing	Ord. No.
Silica gel 60 F <sub>254</sub> 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

Ordering information

► For our wide range of loose sorbents and bulk materials, please have a look on page 29.

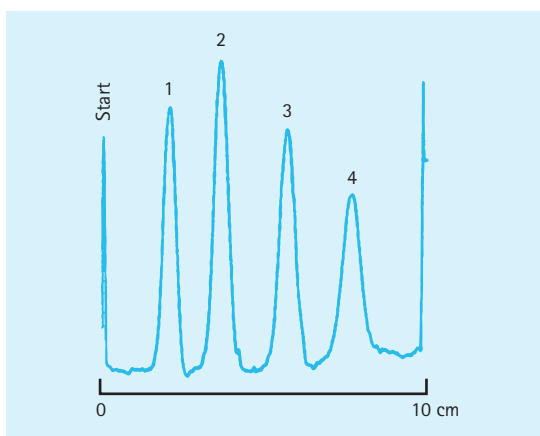


# Aluminium oxide plates (TLC)

## For basic and neutral compounds using different pH conditions

Plate and pH:  
the perfect match

Merck Millipore TLC aluminium oxide plates are designed to optimally complement the pH value of your compounds. This provides you with distinct separation advantages: under aqueous conditions, basic compounds can be best separated on basic aluminium oxide plates, while neutral compounds are best separated on neutral plates. To suit different application needs, the plates utilize neutral or basic aluminium oxide with 60 Å or 150 Å pore size, with or without fluorescent indicator.



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

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

### Ordering information

#### TLC aluminium oxide 60

Packing Material	Format [cm]	Layer thickness	Content	Backing	Ord. No.
Aluminium oxide 60 F <sub>254</sub> basic	20 x 20	250 µm	25 plates	glass	1.05713.0001
Aluminium oxide 60 F <sub>254</sub> basic	5 x 20	250 µm	100 plates	glass	1.05731.0001
Aluminium oxide 60 F <sub>254</sub> neutral	20 x 20	200 µm	25 plates	aluminium	1.05550.0001
Aluminium oxide 60 F <sub>254</sub> neutral	20 x 20	200 µm	25 plates	plastic	1.05581.0001

#### TLC aluminium oxide 150

Packing Material	Format [cm]	Layer thickness	Content	Backing	Ord. No.
Aluminium oxide 150 F <sub>254</sub> neutral	20 x 20	200 µm	25 plates	aluminium	1.05551.0001

# Modified silica plates (TLC and HPTLC)

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

When separation challenges cannot be adequately resolved with standard silica, you can count on our modified silica plates to facilitate your application. The system offers a free choice of solvents, so you can be sure that they meet your particular separation requirements.

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 specially developed HPTLC RP-18 W plate, with a defined lower degree of surface modification, can even be used with pure water.

The CN and Diol modified silica plates are moderately polar and suited for both normal phase and reversed phase systems. The amino modified NH<sub>2</sub> 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 colorless, the majority of Merck Millipore's modified silica plates contain the blue fluorescent, acid-stable UV indicator F<sub>254s</sub>. Samples which absorb shortwave UV at 254 nm are detected due to fluorescence quenching.

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

Modified silica plates (TLC and HPTLC) provide additional selectivities and significantly broaden TLC applications

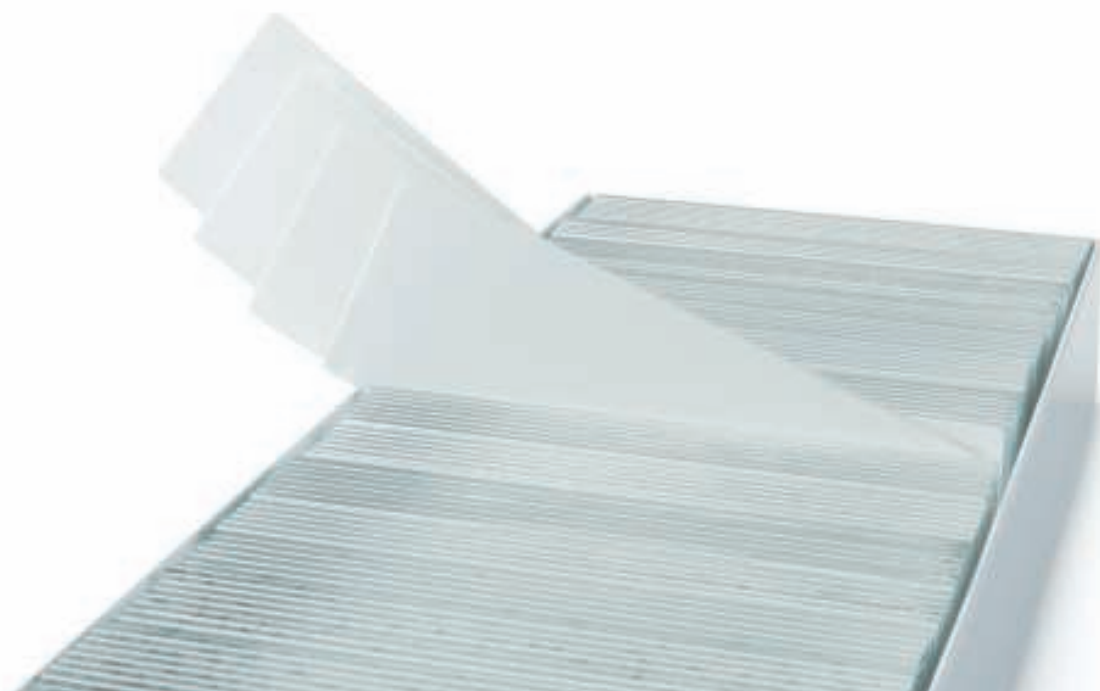
Problem solved

RP-modified silica plates

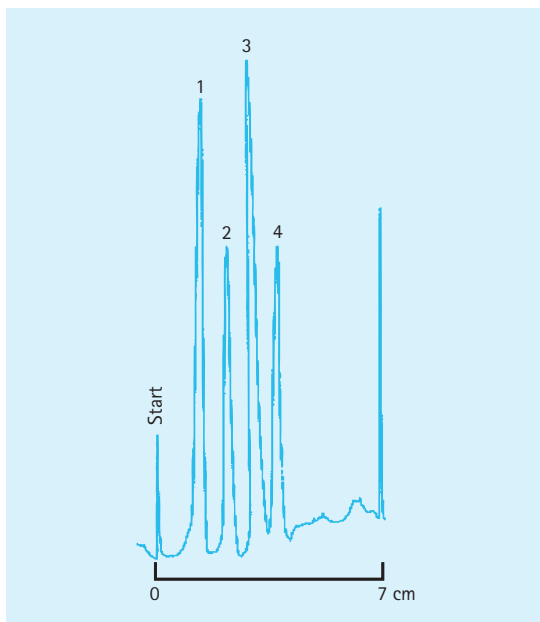
CN, Diol, NH<sub>2</sub> modified silica plates

Your benefits

Applications

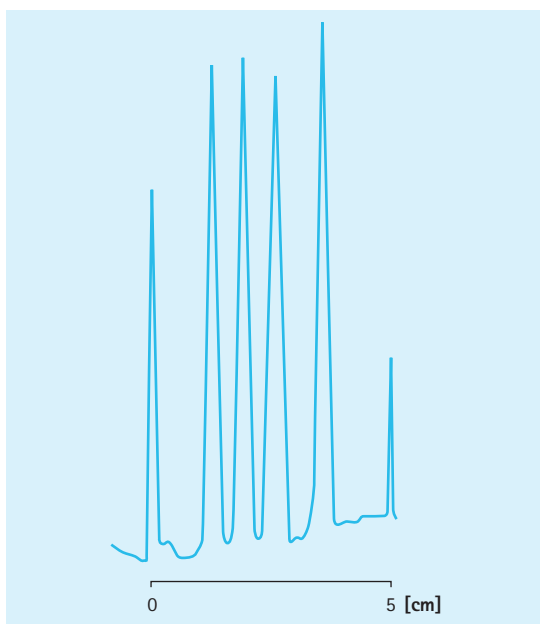






**Separation of oligonucleotides on a HPTLC NH<sub>2</sub>-modified silica gel 60 plate**

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



**Separation of gallic acid and esters on HPTLC silica RP-18 WF<sub>2545</sub>**

<b>Sample</b>	1. Dodecyl gallate 2. Butyl gallate 3. Ethyl gallate 4. Methyl gallate 5. Gallic acid
<b>Sample volume</b>	200 nl
<b>Mobile phase</b>	1 N acetic acid / methanol (70+30)
<b>Migration distance</b>	5 cm
<b>Detection</b>	UV 265 nm (TLC/HPTLC Scanner, Camag)

*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<sub>2545</sub>*

## RP-modified silica plates (TLC and HPTLC)

Packing Material	Format [cm]	Content	Backing	Ord. No.
Silica gel 60 RP-2 (silanized)*	20 x 20	25 plates	glass	1.05746.0001
Silica gel 60 RP-2 F <sub>254s</sub> (silanized)*	20 x 20	25 plates	glass	1.05747.0001
Silica gel 60 RP-8 F <sub>254s</sub> *	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 <sub>254s</sub> *	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 <sub>254s</sub>	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 <sub>254s</sub>	10 x 10	25 plates	glass	1.13726.0001
HPTLC silica gel 60 RP-8 F <sub>254s</sub>	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 <sub>254s</sub>	20 x 10	25 plates	glass	1.16225.0001
	10 x 10	25 plates	glass	1.13724.0001
HPTLC silica gel 60 RP-18 W F <sub>254s</sub>	10 x 10	25 plates	glass	1.13124.0001

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

CN, Diol, NH<sub>2</sub> modified silica plates (TLC and HPTLC)

Packing Material	Format [cm]	Content	Backing	Ord. No.
Silica gel 60 NH <sub>2</sub> F <sub>254s</sub>	20 x 20	20 plates	aluminium	1.05533.0001
HPTLC silica gel 60 CN F <sub>254s</sub>	10 x 10	25 plates	glass	1.16464.0001
HPTLC silica gel 60 Diol F <sub>254s</sub>	10 x 10	25 plates	glass	1.12668.0001
HPTLC silica gel 60 Diol F <sub>254s</sub>	20 x 10	25 plates	glass	1.05636.0001
HPTLC silica gel 60 NH <sub>2</sub>	20 x 10	25 plates	glass	1.12572.0001
HPTLC silica gel 60 NH <sub>2</sub> F <sub>254s</sub>	20 x 10	25 plates	glass	1.13192.0001
HPTLC silica gel 60 NH <sub>2</sub> F <sub>254s</sub>	10 x 10	25 plates	glass	1.15647.0001

Layer thickness: 200 µm

Ordering information



# Cellulose plates (TLC and HPTLC)

## Analysis of polar substances

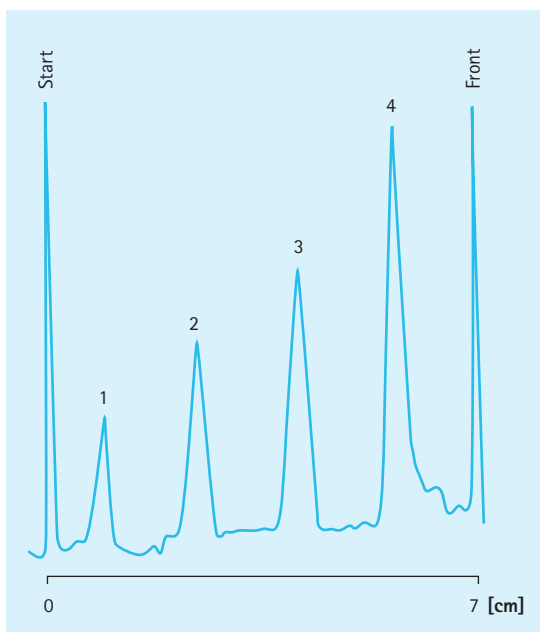
**For water lovers** Hydrophilic substances present their own challenges during separation. That's why we offer a particularly suitable solution: partition chromatography using the organic sorbent cellulose. The range includes classical TLC grade or the more sensitive HPTLC plates. TLC cellulose layers are based on microcrystalline cellulose for standard separations. In contrast, HPTLC cellulose layers utilize a high-purity, rod-shaped microcrystalline cellulose, resulting in highly reduced diffusion of analytes for critical high performance separations.

**For more options** Merck Millipore 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 reemission at long wave UV light of 366 nm and at short wave UV light of 254 nm.

The special PEI cellulose is polyethylenimine-modified, and 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 acid derivatives for:

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



### Separation of oligo-nucleotides

<b>Sample</b>	1. $(\text{NaPO}_3)_3$ 2. $\text{Na}_5\text{P}_3\text{O}_{10}$ 3. $\text{Na}_4\text{P}_2\text{O}_7$ 4. $\text{Na}_2\text{HPO}_4$
<b>Sample volume</b>	250 nl
<b>Mobile phase</b>	16% trichloroacetic acid dioxane sol. ammonia in 1 l water; 70/30
<b>Migration distance</b>	7 cm
<b>Detection</b>	586 nm (TLC/HPTLC Scanner, Camag)

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



#### Separation of amino acids

**Sample** Amino acid-mixture

**Detection** Ninhydrin spray

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

17

### Cellulose plates (TLC and HPTLC)

Packing Material	Format [cm]	Content	Backing	Ord. 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 F	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

### Ordering information

PEI cellulose plates should be stored cold and dry to reduce deterioration. As plates become old they might take a yellow coloration and should be discarded. F: fluorescence indicator with excitation wavelength 254/366 nm

# Concentrating zone plates (TLC, HPTLC, PLC)

## Quick and easy application of small to large volumes of diluted samples

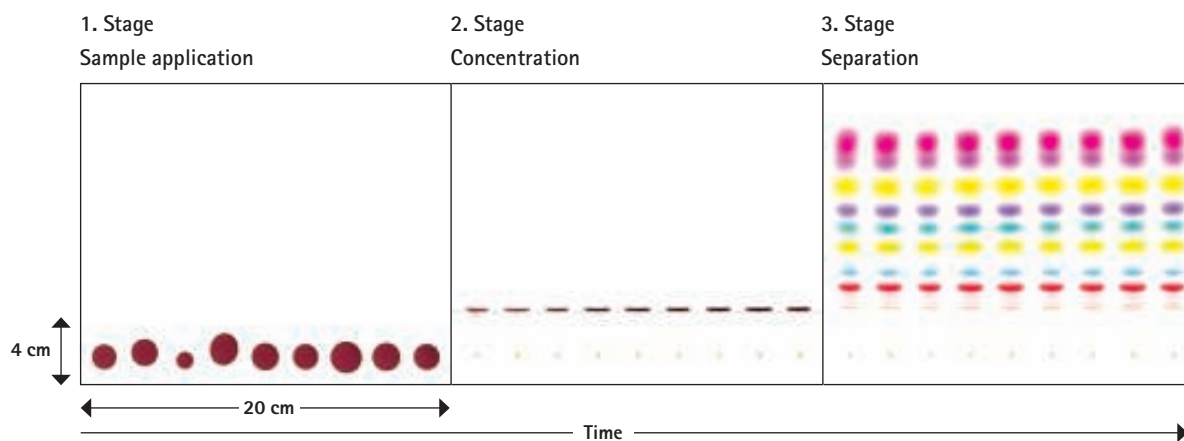
**A matter of seconds** Manual sample application need not be labor intensive or time consuming. Merck Millipore's concentrating zone plates are made to make your daily work easy. They are based on different adsorption properties of two silica adsorbents: an inert large pore concentrating adsorbent where the samples are applied, and a selective separation layer for the separation. Regardless 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.

**A quicker clean up** In addition, the concentrating zone can serve as a clean-up step for analytes in 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.

- Your benefits**
- Quick and easy sample application
  - Highly facilitated sample loading
  - Better resolution due to sharp bands
  - Includes a purification and concentration step

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

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



## TLC concentrating zone plates

Packing Material	Format [cm]	Content	Backing	Ord. 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 <sub>254</sub> concentrating zone 2.5 x 20 cm	20 x 20	25 plates	glass	1.11798.0001
Silica gel 60 F <sub>254</sub> concentrating zone 2.5 x 10 cm	10 x 20	50 plates	glass	1.11846.0001
Silica gel 60 F <sub>254</sub> concentrating zone 2.5 x 20 cm*	20 x 20	25 sheets	aluminium	1.05583.0001

Layer thickness: 250 µm | \* Layer thickness: 200 µm

Ordering information

## HPTLC concentrating zone plates

Packing Material	Format [cm]	Content	Backing	Ord. 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 <sub>254</sub> concentrating zone 2.5 x 20 cm	20 x 10	50 plates	glass	1.13728.0001
HPTLC silica gel 60 F <sub>254</sub> concentrating zone 2.5 x 10 cm	10 x 10	25 plates	glass	1.13727.0001
HPTLC silica gel 60 F <sub>254</sub> 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 <sub>254s</sub> concentrating zone 2.5 x 20 cm	20 x 10	25 plates	glass	1.15498.0001

Layer thickness: 200 µm

## PLC concentrating zone plates, glass backed

Packing Material	Format [cm]	Layer thickness	Content	Ord. No.
Silica gel 60 F <sub>254</sub> 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

# Kieselguhr and mixed layer plates

## For specific applications

### Nature's filter

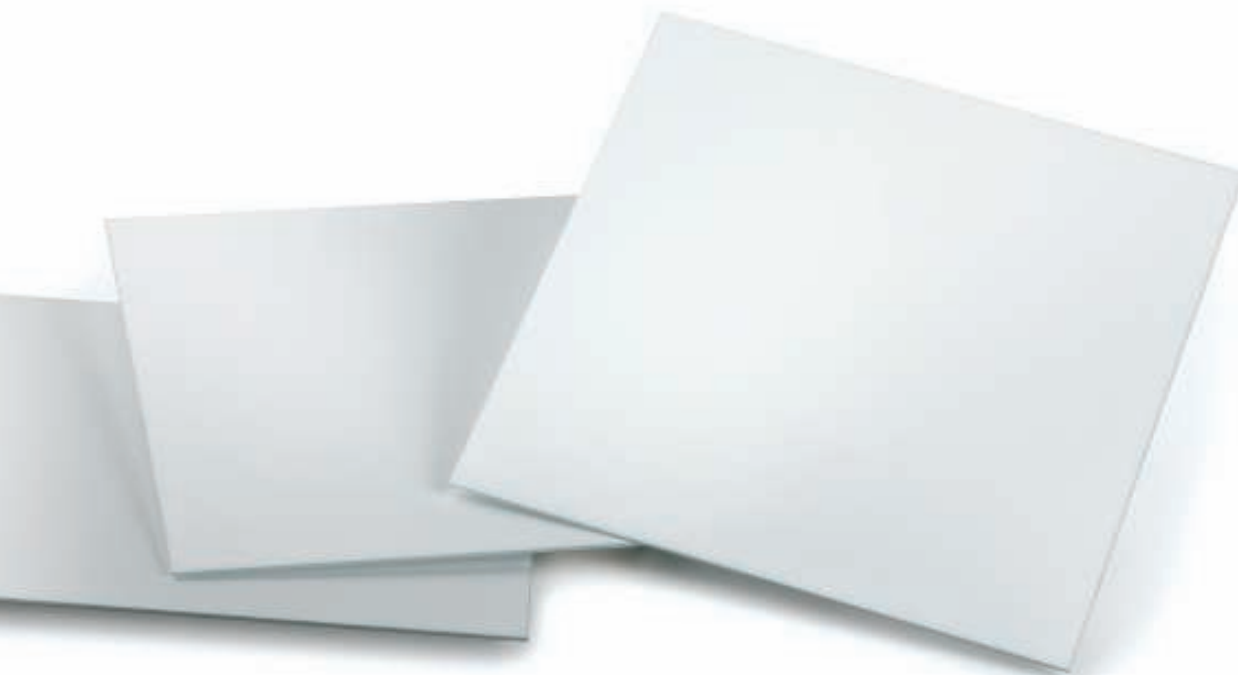
Kieselguhr is a natural diatomaceous earth that can be used for the separation of polar or moderately polar compounds. For the mixed layer plates a combination of classical silica gel 60 and kieselguhr is utilized, providing favorable properties for certain applications such as separations of inorganic ions, herbicides or steroids.

20

### Ordering information

#### TLC plates kieselguhr, silica gel / kieselguhr

Packing Material	Format [cm]	Layer thickness	Content	Backing	Ord. No.
Kieselguhr F <sub>254</sub>	20 x 20	200 µm	25 plates	glass	1.05738.0001
Kieselguhr F <sub>254</sub>	20 x 20	200 µm	25 sheets	aluminium	1.05568.0001
Silica gel 60 / Kieselguhr F <sub>254</sub>	20 x 20	200 µm	25 sheets	aluminium	1.05567.0001





# GLP plates (TLC and HPTLC)

## With individual laser coding for GLP applications

Laser coded GLP plates make documentation, archiving and back tracing of your separations simpler than ever before. All plates are marked with item, batch and individual plate number, which makes them great for GLP. Based on the same proven Merck Millipore silica 60, our GLP plates perform exactly as the corresponding TLC or HPTLC plates. The plates are available in various formats, with or without fluorescence indicator  $F_{254}$ , which is stimulated to green emission at 254 nm.

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

Great laboratory practices (GLP)

21

Your benefits



GLP-Plate with additional information

### GLP plates

Packing Material	Format [cm]	Content	Backing	Ord. 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

Ordering information

# Multiformat plates (TLC and HPTLC)

## Multiple sizes in one single plate

**Snap to size** One size fits all with Merck Millipore Multiformat plates. That's because the glass is pre-scored for easy breaking to various sizes. The plates utilize the same silica coating as the corresponding TLC or HPTLC plate, thus deliver chromatograms that are identical to those of the non-scored plates. Depending on the scoring, up to 7 different formats are possible: 20 x 20 cm, 15 x 20 cm, 10 x 20 cm, 5 x 20 cm, 10 x 15 cm, 10 x 10 cm and 5 x 10 cm.

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



*Note: To prevent the glass backing from uncontrolled and irregular breaking avoid putting plates directly on hot metal plates, drying cabinets or plate heaters after development or staining. When heat drying is necessary, use distance holders of low thermal conductivity between glass and hot metal plate i.e. glass rods or similar.*

### Multiformat plates

#### Ordering information

Packing Material	Scored [cm]	Content	No. of plates possible	Ord. No.
Multiformat silica gel 60 F <sub>254</sub> 20 x 20	5 x 10	25 plates	200	1.05620.0001
Multiformat silica gel 60 F <sub>254</sub> 20 x 20	5 x 20	20 plates	80	1.05608.0001
HPTLC Multiformat silica gel 60 F <sub>254</sub> 10 x 10	5 x 5	25 plates	100	1.05635.0001
HPTLC Multiformat silica gel 60 10 x 10	5 x 5	100 plates	400	1.05644.0001

# ProteoChrom® HPTLC plates

## For peptide analysis

To support the increasing importance of proteomics in the pharmaceutical industry, we offer our latest breakthrough: ProteoChrom® HPTLC plates. Optimized for highly efficient separation, these plates are especially suitable for the analysis of peptides and protein digests.

For ProteoChrom® HPTLC Silica gel 60 F<sub>254s</sub> plates, an extra thin layer of high performance Merck Millipore silica gel is used, providing highly efficient separation characteristics for 1-D analysis of peptides and protein digests. Up to 20 peptides can be resolved and as little as 1 - 2 ng per band can be visualized.

For ProteoChrom® HPTLC Cellulose sheets, an extra thin layer of optimized microcrystalline cellulose is utilized. Specially developed protocols for development and staining enable a straightforward 2-D analysis in just 4 hours.

- Highly reproducible: optimized separation and staining procedures
- Convenient, easy to follow, detailed protocols included
- Sensitive: extra thin layers of 100 µm
- Highly stable in water, ideal for use with aqueous solvent systems

The new ProteoChrom® plates open a new application field for thin layer chromatography.

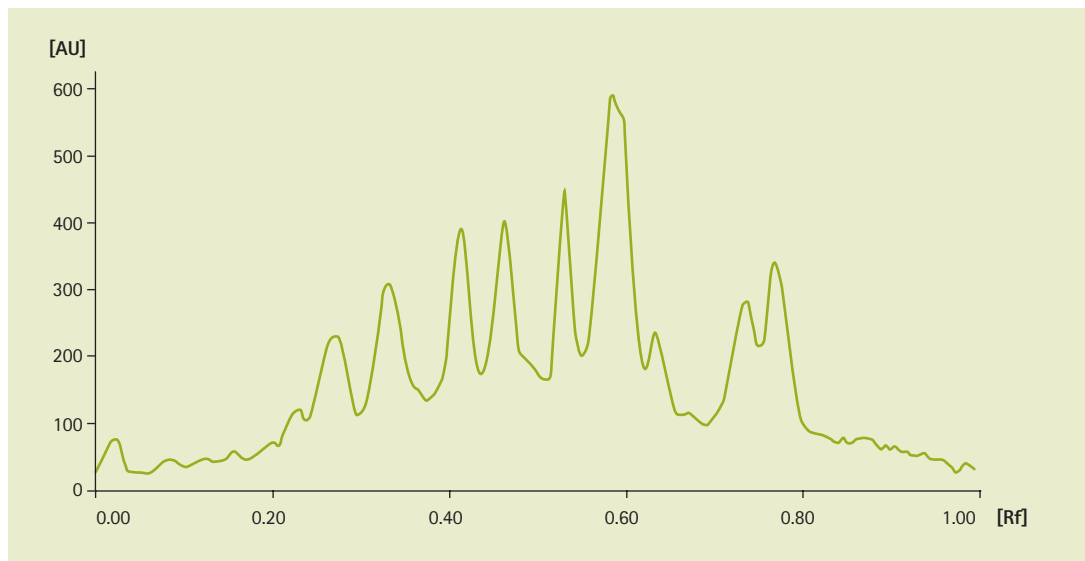
Innovate with  
our latest innovation

Highly sensitive

Your benefits

Applications

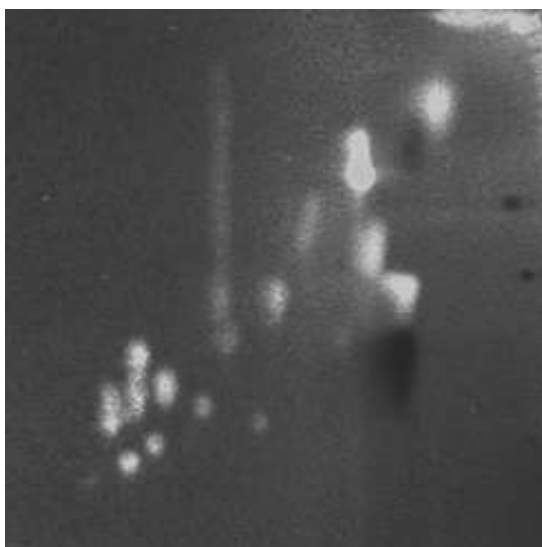
23



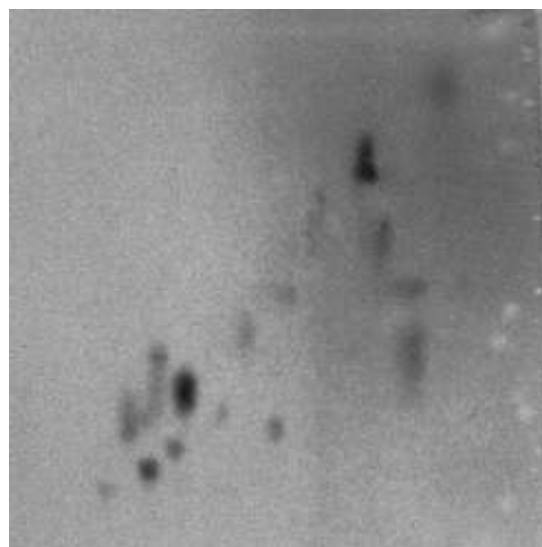
Densitogram of a tryptic digest of b-Casein. A tryptic digest of b-Casein was separated on a ProteoChrom® HPTLC Silica gel 60 F<sub>254s</sub> plate followed by fluorescamine staining and scanned with a CAMAG TLC Scanner III in fluorescence mode at UV 366.

## Applications

Cytochrome C tryptic digests were 2-D separated on ProteoChrom® HPTLC Cellulose sheet followed by either (chromaticity of the pictures was modified):



(A) fluorescamine staining, or

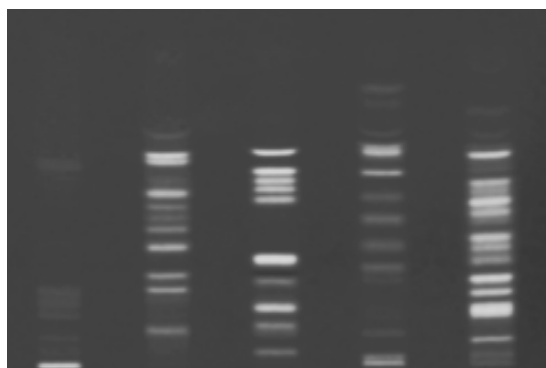


(B) staining with ninhydrin.

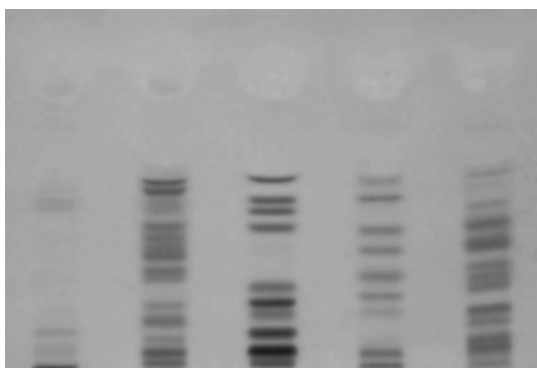
#### 2-dimensional HPTLC of single protein digests on a ProteoChrom® HPTLC Cellulose sheet

Sample volume	5 µl
Concentration	2 mg/ml
Application system	Automatic TLC Sampler 4 (CAMAG)
Mobile phases	1st dimension: 2-butanol/pyridine/acetic acid/water (30/20/6/24), 1D 2nd dimension: 2-butanol/pyridine/ammonia (25%) / water (39/34/10/26), 2D
Migration distance	5 cm
Migration time	1st dimension: 44 min 2nd dimension: 50 min
Staining/detection	A: Fluorescamine      B: Ninhydrin

Tryptic digests of various proteins were separated on a ProteoChrom® HPTLC Silica gel 60 F<sub>254s</sub> plate followed by either (chromaticity of the pictures was modified):



(A) fluorescamine staining, or



(B) staining with ninhydrin.

#### 1-dimensional separation of single protein digests on a ProteoChrom® HPTLC Silica gel 60 F<sub>254s</sub> plate

Sample volume	A: 1.5 µl	B: 4 µl
Concentration	2 mg/ml	
Application system	Automatic TLC Sampler 4 (CAMAG)	
Mobile phases	2-butanol/pyridine/ammonia (25%) / water (39/34/10/26)	
Migration distance	5 cm	
Migration time	45 min	
Staining/detection	A: Fluorescamine	B: Ninhydrin

#### ProteoChrom® HPTLC plates

Packing Material	Format [cm]	Layer thickness	Content	Backing	Ord. No.
ProteoChrom® HPTLC silica gel 60 F <sub>254s</sub>	20 x 10	100 µm	25 plates	glass	1.05650.0001
ProteoChrom® HPTLC Cellulose	10 x 10	100 µm	25 sheets	aluminium	1.05651.0001

#### Ordering information

Each ProteoChrom® package includes an insert sheet with detailed instructions for solvent systems, running conditions and staining solution, enabling straightforward experiments without time-consuming optimization work.

# TLC silica gel 60G plates

## Highly robust plates with gypsum as binder, fully compliant with international pharmacopoeia

**The status quo** Traditionally, TLC monographs in pharmacopoeia refer to products using silica G, containing gypsum as binder, or silica H with no foreign binder. There are about 200 monograph methods in the European Pharmacopoeia (Ph Eur) referring to these plates\*.

**Ph Eur and USP** Fully compliant with international pharmacopoeia

These new TLC silica gel 60G plates are recommended for customers in QA/QC labs using older Ph Eur monograph methods, which require TLC plates with gypsum binder, and who do not wish to switch to classical Merck Millipore TLC plates with organic binders.

Merck Millipore's classical TLC plates fulfill the performance test requirements of Ph Eur for G plates with gypsum, even though they use modern organic binders. Today, many customers routinely use these classical TLC plates in place of gypsum plates, and indeed several monographs have been updated to officially confirm this change.

### **Additional information about Ph Eur**

The following publications (german only) feature monographs of Ph Eur on pre-coated TLC plates:  
*P. Pachaly: DC-Atlas-Dünnschicht-Chromatographie in der Apotheke, Wissenschaftliche Verlagsgesellschaft Stuttgart 1999, ISBN 3-8047-1623-7.* Includes many documented monographs of Ph Eur on Merck Millipore TLC plates.

*Jürgen Wolf: Mikro-DC, PZ-Schriftenreihe: Vorschriften auf Basis des Ph Eur, DAB und DAC. Govi-Verlag, Eschborn 1999, ISBN 3-7741-0736-X.* This book features a broad range of monographs of the Ph Eur evaluated on Merck Millipore TLC aluminium sheets Si 60.

\* The United States Pharmacopoeia (USP) does not distinguish between TLC plates with gypsum or organic binder, thus Merck Millipore standard plates can always be used.



In addition to the standard Merck Millipore QC test, the new TLC silica gel 60G plates are tested using the TLC performance test described by Ph Eur.

Ph Eur  
performance test for  
TLC/HPTLC plates

27

**Description:** Chromatographic separation. Apply to the plate an appropriate volume (10 µl for a normal TLC plate and 1 µl to 2 µl for a fine particle size plate) of TLC performance test solution R (Reagent 1116600). Develop over a path length two-thirds of the plate height, using a mixture of 20 volumes of methanol R and 80 volumes of toluene R. The plate is not satisfactory, unless the chromatogram shows four clearly separated spots, the spot of bromocresol green with an  $R_f$  value less than 0.15, the spot of methyl orange with an  $R_f$  value in the range of 0.1 to 0.25, the spot of methyl red with an  $R_f$  value in the range of 0.35 to 0.55 and the spot of Sudan red G with an  $R_f$  value in the range of 0.75 to 0.98.



The chromatogram shows four clearly separated spots under Ph Eur test conditions and fulfils Ph Eur requirements (see  $R_f$  values).

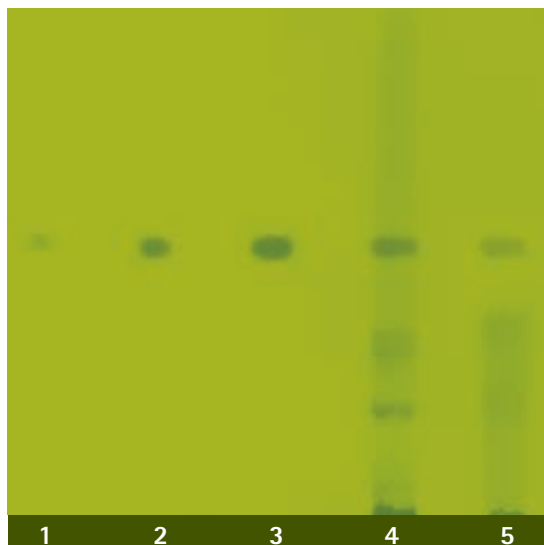
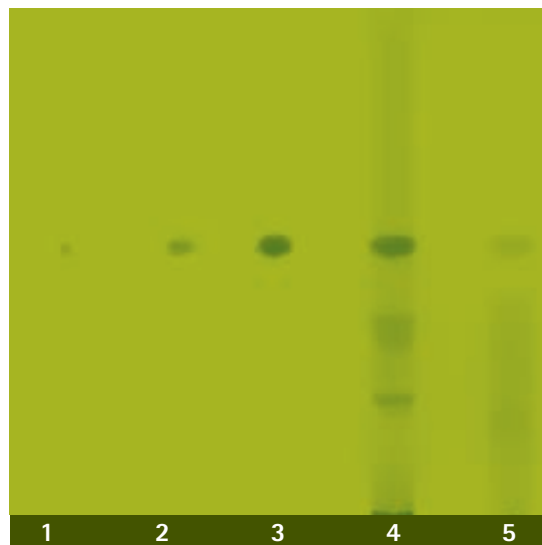
#### Ph Eur performance test on Merck Millipore TLC silica gel 60G plate

Parameter	Specification [h $R_f$ values*]	Typical value
Separation	4 clearly separated spots	passed
Bromocresol green	< 15	5
Methyl orange	10 – 25	10
Methyl red	35 – 55	38
Sudan red G	75 – 98	82

\*h $R_f$  =  $R_f \times 100$



## Applications

A.\*Silica Gel 60G F<sub>254</sub> (chromaticity of the picture was modified)B.\*Silica Gel 60 F<sub>254</sub> (chromaticity of the picture was modified)

Samples	Track	Application volume
	1: Coffeine	0.5 µl (0.1 mg/ml)
	2: Coffeine	1.0 µl (0.1 mg/ml)
	3: Coffeine	2.0 µl (0.1 mg/ml)
	4: Coffee	2.0 µl
	5: Coca-Cola	2.0 µl
Sample application	Capillaries 0.5 µl, 1 µl and 2 µl	
Stationary phase	A. TLC plates silica gel 60 G F <sub>254</sub> (Ord. No. 1.00390.0001) B. TLC plates silica gel 60 F <sub>254</sub> (Ord. No. 1.05715.0001)	
Chromatography	In the normal flat bottom chamber 20x20 cm with Isopropanol/ n-Heptan/ water 7:3:1	
Migration distance	100 mm	
Migration time	145 min	
Documentation	UV 254nm	

## TLC silica gel 60G, glass backed

## Ordering information

Packing Material	Format [cm]	Content	Backing	Ord. No.
TLC Silica gel 60G F <sub>254</sub>	20 x 20	25 plates	glass	1.00390.0001
TLC Silica gel 60G	20 x 20	25 plates	glass	1.00384.0001

Both new plates have similar separation performance to our classical TLC plates; the only difference is that gypsum is used as binder.

# Loose sorbents for the preparation of TLC plates

## Standardized sorbents for reliable results

Silica gel 60 sorbent is the most versatile and most widely used material in TLC. To suit a broad range of TLC and PLC needs, Merck Millipore offers various silica gel 60 sorbents with a particle size distribution of 5 - 40  $\mu\text{m}$ : silica with gypsum as binder, silica with no foreign binder, and silica gel with fluorescence indicator. In addition, high quality aluminium oxide, cellulose microcrystalline and kieselguhr are offered.

Self-coating of layers is time consuming and requires experimental experience for high quality results. For analytical TLC, particularly for quantitative work we highly recommend the use of pre-coated plates.

Unique quality,  
unlimited flexibility



Ordering information

Loose sorbents for TLC and PLC plates (particle size 5 – 40 µm)

Packing Material	Method	Package	Contents of one package	Ord. No.
Silica gel 60 G	Classical TLC	Plastic	1 kg	1.07731.1000
		Tin	5 kg	1.07731.5000
		Tin	25 kg	1.07731.9025
		Tin	20 kg	1.11763.9020
Silica gel 60 special for LMC				
Silica gel 60 G F <sub>254</sub>	Classical TLC	Plastic	1 kg	1.07730.1000
		Tin	5 kg	1.07730.5000
		Tin	25 kg	1.07730.9025
Silica gel 60 G F <sub>254</sub> *	TLC	Plastic	1 kg	1.11678.1000
Silica gel 60 H	TLC	Plastic	1 kg	1.07736.1000
		Tin	2.5 kg	1.07736.2500
		Tin	25 kg	1.07736.9025
Silica gel 60 H*	TLC	Plastic	1 kg	1.11695.1000
Silica gel 60 H F <sub>254</sub>	TLC	Plastic	1 kg	1.07739.1000
		Tin	2.5 kg	1.07739.2500
		Tin	25 kg	1.07739.9025
Silica gel 60 H F <sub>254+366</sub>	TLC	Plastic	1 kg	1.07741.1000
Silica gel 60 P F <sub>254</sub>	PLC	Plastic	1 kg	1.07747.1000
		Tin	2.5 kg	1.07747.2500
		Tin	25 kg	1.07747.9025
Silica gel 60 P F <sub>254+366</sub>	PLC	Plastic	1 kg	1.07748.1000
		Tin	2.5 kg	1.07748.2500
Silica gel 60 P F <sub>254</sub> with gypsum	PLC	Plastic	1 kg	1.07749.1000
		Tin	2.5 kg	1.07749.2500
		Tin	25 kg	1.07749.9025

\* Mean particle size 15 µm | G: with gypsum | H: without foreign binder | P: for preparative work

Aluminium oxides for TLC and PLC (particle size 5 – 40 µm)

Packing Material	Method	pH of 10% aqueous suspension	Package	Contents of one package	Ord. No.
Aluminium oxide 60 G neutral	TLC	7.5	Plastic	2.5 kg	1.01090.2500
		7.5	Plastic	25 kg	1.01090.9025
Aluminium oxide 60 G F <sub>254</sub> neutral	TLC	7.5	Plastic	500 g	1.01092.0500

Other sorbents for TLC

Packing Material	Particle size	Package	Contents of one package	Ord. No.
Cellulose microcrystalline	< 20 µm	Plastic	500 g	1.02330.0500

# Accessories

We think of every detail of your analysis and equip you with all the tools you need to ensure that your work is a success.

To visualize colorless substances, an even and very finely divided spray solution is essential for optimal staining of TLC plates. Merck Millipore's TLC sprayer allows you to spray derivatization reagents homogeneously onto the developed chromatograms. It is equipped with two different spray heads (white and black) of 1.5 mm (i.d.), optimized for both low- and high-viscosity solutions. 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 onto the sprayer, eliminating cumbersome pouring of the solutions.

The three most common spray solutions used in TLC are offered in a ready-to-use format with optimized packing that fits directly onto the sprayer.

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

Well-equipped

TLC sprayer

Spray solutions

UV lamp

## Accessories and auxiliaries

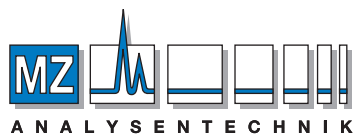
Product	Contents of one package	Ord. No.
Micro capillaries 2.0 µl	50 capillaries	1.10290.0001
UV lamp 254 nm	1 unit	1.12537.0001
UV lamp 366 nm	1 unit	1.13203.0001
TLC sprayer with two spray heads	1 unit	1.08540.0001
Spray heads for TLC sprayer	5 pieces (0.8 mm); 1 piece (1.25 mm)	1.08541.0001
Glass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

Ordering information

## Ready-to-use spray solutions

Product	Solvent	Package	Contents of one package	Ord. No.
Dragendorff-Reagent	Acetic acid / ethyl acetate / water	Glass	100 ml	1.02035.0100
Molybdato-phosphoric acid	2-propanol	Glass	100 ml	1.00480.0100
Ninhydrin	2-propanol	Glass	100 ml	1.06705.0100

We provide information and advice to our customers on application technologies and regulatory matters to the best of our knowledge and ability, but without obligation or liability. Existing laws and regulations are to be observed in all cases by our customers. This also applies in respect to any rights of third parties. Our information and advice do not relieve our customers of their own responsibility for checking the suitability of our products for the envisaged purpose. LiChrospher®, LuxPlates® and ProteoChrom® are trademarks of Merck KGaA, Darmstadt, Germany.



**AUTHORIZED DISTRIBUTOR**

MZ-Analysentechnik GmbH, Barcelona-Allee 17• D-55129 Mainz  
Tel +49 6131 880 96-0, Fax +49 6131 880 96-20  
e-mail: [info@mz-at.de](mailto:info@mz-at.de), [www.mz-at.de](http://www.mz-at.de)

For further information on Merck Millipore  
and our products contact:

Merck KGaA  
64271 Darmstadt, Germany  
Fax +49 (0) 61 51 / 72-60 80  
E-mail: [contact@merckgroup.com](mailto:contact@merckgroup.com)  
[www.merckmillipore.com/chromatography](http://www.merckmillipore.com/chromatography)