Chromatography

MACHEREY-NAGEL

Thin layer chromatography

State-of-the-art products for TLC and HPTLC

- Quality
- Efficiency
- Selectivity

Thin layer chromatography

MACHEREY-NAGEL – TLC for more than 5 decades

MN ready-to-use layers for TLC and HPTLC

- Comprehensive range of plate sizes, surface chemistries and backings
- Pre-coated plates ready for immediate use
- Homogeneous, smooth and well adhering layers
- Available with UV indicator or non-impregnated
- Consistent high quality from batch-to-batch and from plate-to-plate

Reasons for using TLC

- Fast and cost-saving separation technique
- Multiple sample application possible
- Developed plate serves as analytical documentation media
- Time consuming sample preparation steps can be obmitted

Benefits of TLC

TLC does not require complex or costly maintained instrumentation. The investment for performing successful TLC can be hundred times less than for HPLC. Since the separated compounds remain on the plate, they can be used for further experiments. Method development is simplified by TLC. The amount of solvents required for development is much less than with HPLC.

Thin layer chromatography

Standard analytical TLC plates and sheets

Thin layer chromatography can be used for both qualitative and quantitative analysis. Standard analytical TLC plates typically have adsorbent layers that are nominally between 0.20–0.25 mm in thickness.

Preparative TLC plates

Preparative TLC is used for purification and isolation of analytes from impurities. Preparative TLC layers (≥ 0.5 mm) are available on glass plates only.

Thin layer chromatography

In order to meet your individual application requirements three different types of backings are available.

TLC / HPTLC backings

TLC plates – glass backing

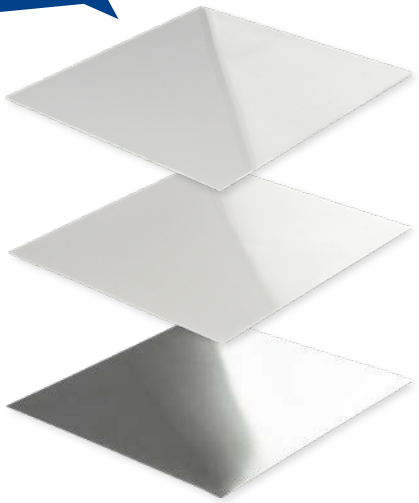
Glass plates are robust, heat proof and chemically resistant to all common mobile phases and visualization reagents.

POLYGRAM® TLC sheets – polyester backing

Polyester sheets are easy to handle, lightweight and flexible. Can be cut with scissors. Developed POLYGRAM® sheets can also be stored for documentation in laboratory notebooks.

ALUGRAM® TLC sheets – aluminum backing

Aluminum sheets are easy to handle, lightweight and flexible. High performance silica on ALUGRAM® Xtra sheets provides outstanding wettability for precise colorization results, even with 100 % aqueous detection reagents. Moreover ALUGRAM® Xtra sheets are easy to cut with scissors. No flaking of silica occurs!



Physical properties of backing materials

Material	glass	polyester	aluminum
Thickness (approx.)	1.3 mm	0.2 mm	0.15 mm
Weight, packing and storage requirement	high	low	low
Torsional strength	ideal	low	relatively high
Temperature stability	high	max. 185 °C	high
Susceptible to breakage	yes	no	no
Can be cut with scissors	no	yes	yes
Chemical resistance of support material			
Against solvents	high	high	high
Against mineral acids and conc. ammonia	high	high	low
Stability of the binder system of NP plates in water			
Suitability for aqueous detection reagents	depends on phase	good	ALUGRAM®: low to moderate ALUGRAM® Xtra: moderate to high

Thin layer chromatography

Most commonly used silica gel layers

SIL G

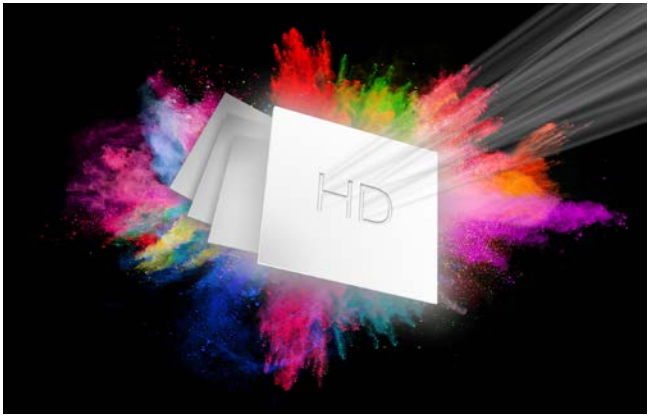
- Standard layer (soft)
- Available on glass plates, polyester and aluminum sheets
- Thicker layers for preparative TLC (PLC) on glass plates

ADAMANT

- Outstanding hardness and abrasion resistance
- Excellent separation efficiency
- Low-noise background of the layer
- Available on glass plates

SIL HD

- Hard layer with good abrasion resistance
- High luminosity
- Brilliant staining properties (e.g., with potassium permanganate - $KMnO_4$)
- Excellent separation efficiency
- Good wettability for precise colorization results – even with 100 % aqueous detection reagents
- Low-noise background of the layer
- Available on glass plates



Further layer materials

- Modified silica gel
- Cellulose
- Aluminum oxide
- Polyamide
- Special materials

Several layers on glass plates...

SIL G
smooth surface · easy to „scrape off“ · low polarity binder

ADAMANT
hardest surface · can be pen labeled

SIL HD
hard surface · excellent UV indicator system · brilliant staining properties

Plate size*	Plates per pack	SIL G**	REF	ADAMANT	REF	SIL HD	REF
TLC glass plates							
5 x 10 cm	50	SIL G-25	809017	ADAMANT	821040	SIL HD	809217
10 x 10 cm	25			ADAMANT	821050	SIL HD	809210
10 x 20 cm	50	SIL G-25	809012			SIL HD	809212
20 x 20 cm	25	SIL G-25	809013	ADAMANT	821060	SIL HD	809213
5 x 10 cm	50			ADAMANT UV_{254}	821010	SIL HD UV_{254}	809227
10 x 10 cm	25	SIL G-25 UV_{254}	809020	ADAMANT UV_{254}	821020	SIL HD UV_{254}	809220
10 x 20 cm	50	SIL G-25 UV_{254}	809022	ADAMANT UV_{254}	821025	SIL HD UV_{254}	809222
20 x 20 cm	25	SIL G-25 UV_{254}	809023	ADAMANT UV_{254}	821030	SIL HD UV_{254}	809223

* Further plate sizes available
** Also available as preparative TLC glass plates (PLC) with 0.50, 1.00 and 2.00 mm layer thickness

Nano TLC glass plates for HPTLC

Higher efficiency on smaller particles provide

- Sharper separations
- Shorter developing times and migration distances
- Smaller sample volumes 0.01–0.1 µL
- Minimal diffusion
- Increased detection sensitivity

Analytical HPTLC glass plates

- Silica 60, mean pore size 60 Å
- Specific pore volume 0.75 mL/g
- Thickness of layer 0.20 mm
- Mean particle size range 2–10 µm

Comparison of TLC and HPTLC glass plates for separation of anthraquinone dyes

Layers: A) TLC
B) HPTLC
Sample: 1 µL, about 0.1 %
Eluent: toluene – cyclohexane (4:3, v/v)
Migration time: A) 30 min, B) 15 min

Peaks:
1. Blue 3
2. Violet 2
3. Red
4. Green
5. Blue 1
6. Greenish blue
7. Violet 1

Plate size*	Plates per pack	Nano-SIL HD UV_{254}**	Nano-SIL HD	Nano-ADAMANT UV_{254}**	Nano-ADAMANT
HPTLC glass plates					
5 x 5 cm	100	811221	811211	821100	821130
10 x 10 cm	25	811222	811212	821110	821140
10 x 20 cm	50	811223	811213	821120	821150

* Further plate sizes available
** Contains fluorescent indicator

Thin layer chromatography

Polyester sheets for TLC

- Silica 60, mean pore size 60 Å
- Specific pore volume 0.75 mL/g
- Particle size 5–17 µm
- Standard grade
- The binder system for POLYGRAM® sheets is also completely stable in purely aqueous eluents

POLYGRAM® SIL G

Designation	Thickness of layer	Plate size*	Fluorescent indicator	Plates per pack	REF
SIL G	0.20 mm	2.5 x 7.5 cm	–	200	805902
SIL G	0.20 mm	4 x 8 cm	–	50	805032
SIL G	0.20 mm	5 x 20 cm	–	50	805012
SIL G	0.20 mm	20 x 20 cm	–	25	805013
SIL G	0.20 mm	40 x 20 cm	–	25	805014
SIL G UV_{254}	0.20 mm	2.5 x 7.5 cm	UV_{254}	200	805901
SIL G UV_{254}	0.20 mm	4 x 8 cm	UV_{254}	50	805021
SIL G UV_{254}	0.20 mm	5 x 20 cm	UV_{254}	50	805022
SIL G UV_{254}	0.20 mm	20 x 20 cm	UV_{254}	25	805023
SIL G UV_{254}	0.20 mm	40 x 20 cm	UV_{254}	25	805024
SIL G UV_{254}	0.20 mm	500 x 20 cm	UV_{254}	1 roll	805017

* Further plate sizes available

POLYGRAM® SIL N-HR

- Different binder system compared to SIL G results in different separation characteristics
- Higher gypsum content

Designation	Thickness of layer	Plate size*	Fluorescent indicator	Plates per pack	REF
SIL N-HR UV_{254}	0.20 mm	5 x 20 cm	UV_{254}	50	804022
SIL N-HR UV_{254}	0.20 mm	20 x 20 cm	UV_{254}	25	804023

* Further plate sizes available

Silica layers on aluminum sheets

ALUGRAM® Xtra SIL G (TLC) and ALUGRAM® Xtra Nano-SIL G (HPTLC)

- Silica 60, mean pore size 60 Å
- Specific pore volume 0.75 mL/g
- Particle size 5–17 µm (TLC), 2–10 µm (HPTLC)
- Outstanding wettability for precise colorization results, even with 100 % aqueous detection reagents
- Excellent separation efficiency and reproducibility from lot to lot
- Easy and reliable cutting due to an optimized binder system, no flaking of silica

Tailored for individual requirements

Designation	Thickness of layer	Plate size*	Fluorescent indicator	Plates per pack	REF
ALUGRAM® Xtra aluminum sheets					
SIL G	0.20 mm	20 x 20 cm	–	25	818233
SIL G UV_{254}	0.20 mm	4 x 8 cm	UV_{254}	50	818331
SIL G UV_{254}	0.20 mm	20 x 20 cm	UV_{254}	25	818333
HPTLC ALUGRAM® Xtra aluminum sheets					
Nano-SIL G	0.20 mm	20 x 20 cm	–	25	818241
Nano-SIL G UV_{254}	0.20 mm	20 x 20 cm	UV_{254}	25	818343

* Further plate sizes available

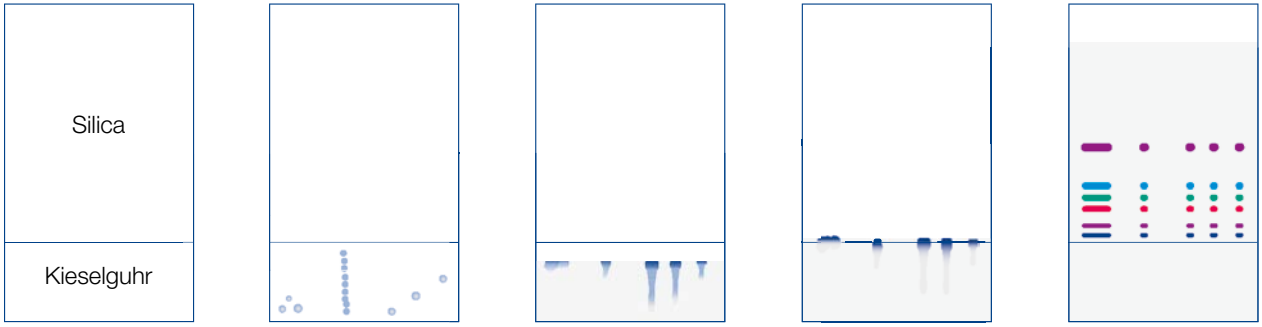
Thin layer chromatography

Preadsorbent zone

SILGUR and Nano-SILGUR with concentrating zone

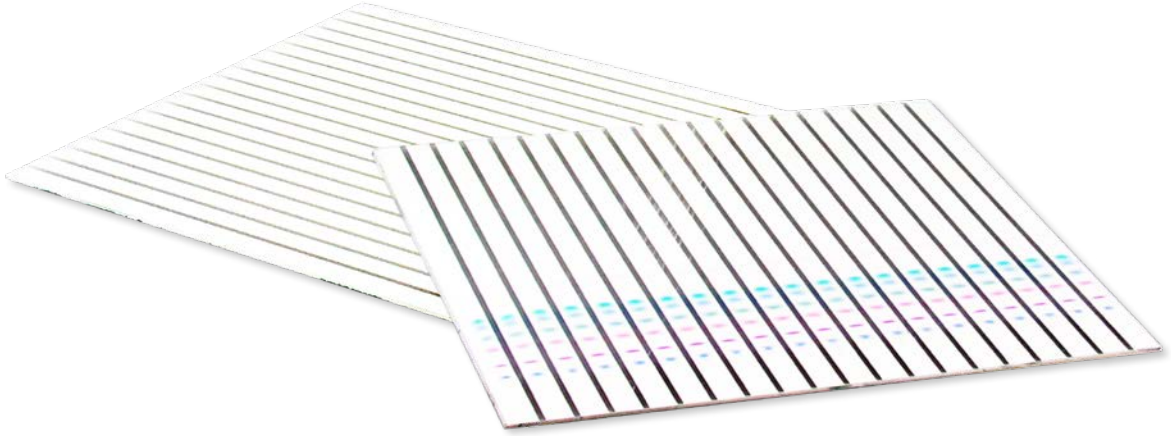
After sample application in the kieselguhr layer the spots migrate to the kieselguhr/silica interface forming narrow bands. Separation then takes place in the silica layer.

- Concentrates sample spots on the plate
- Simplifies sample application



Channeled SILGUR plates

TLC plates with 19 channels help to prevent cross contamination by separating several samples. Spot areas can be determined more easily.



Thin layer chromatography

Designation	Thickness of layer	Plate size*	Fluorescent indicator	Plates per pack	REF
Glass plates					
SILGUR-25	0.25 mm	10 x 20 cm	–	50	810012
SILGUR-25	0.25 mm	20 x 20 cm	–	25	810013
SILGUR-25 UV_{254}	0.25 mm	10 x 20 cm	UV_{254}	50	810022
SILGUR-25 UV_{254}	0.25 mm	20 x 20 cm	UV_{254}	25	810023
Glass plates – Channel plates					
SILGUR-25-C UV_{254}	0.25 mm	20 x 20 cm	UV_{254}	25	810123
ALUGRAM® Xtra aluminum sheets					
SILGUR	0.20 mm	10 x 20 cm	–	20	818412
SILGUR	0.20 mm	20 x 20 cm	–	25	818413
SILGUR UV_{254}	0.20 mm	10 x 20 cm	UV_{254}	20	818422
SILGUR UV_{254}	0.20 mm	20 x 20 cm	UV_{254}	25	818423
HPTLC glass plates					
Nano-SILGUR-20	0.20 mm	10 x 10 cm	–	25	811032
Nano-SILGUR-20 UV_{254}	0.20 mm	10 x 10 cm	UV_{254}	25	811042
HPTLC ALUGRAM® Xtra aluminum sheets					
Nano-SILGUR	0.20 mm	10 x 10 cm	–	25	818432
Nano-SILGUR UV_{254}	0.20 mm	10 x 10 cm	UV_{254}	25	818442

* Further plate sizes available

TLC accessories

Description	REF
Simultaneous developing chamber for TLC	
for up to 5 plates in format 20 x 20 cm	814019
for up to 2 plates in format 10 x 10 cm	814018
MN ALUGRAM® scissors	818666

Similar to illustration

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