

# TLC

## Thin Layer Chromatography



State-of-the-art  
TLC products

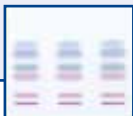


Quality  
Efficiency  
Selectivity

**MACHERY-NAGEL**

[www.mn-net.com](http://www.mn-net.com)





## MACHEREY-NAGEL – Thin Layer Chromatography for more than 5 decades

### Why 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 omitted

### 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





## Benefits of TLC

TLC does not require complex, 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.

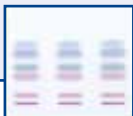
### Standard analytical TLC plates and sheets

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 ( $\geq 0.5$  mm) are only on glass plates available.





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

### 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 (PET) backing



Polyester sheets are easy to handle, lightweight and flexible. Developed **POLYGRAM®** sheets can also be stored for documentation in laboratory notebooks. Scissors cutting possible.

### ALUGRAM® TLC sheets - aluminium backing



Aluminium 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	aluminium
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

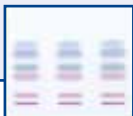
## Chemical resistance of support material

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	very suitable	
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**ALUGRAM®:**  
limited suitability  
**ALUGRAM® Xtra:**  
well suited



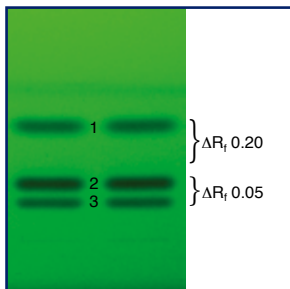
## Standard silica · TLC ready-to-use glass plates

MN offers SIL G and ADAMANT as silica coated glass plates.

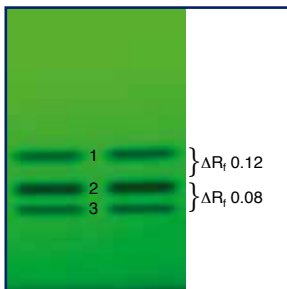
### Analytical TLC glass plates:

Silica 60, specific surface (BET) ~ 500 m<sup>2</sup>/g, mean pore size 60 Å, specific pore volume 0.75 mL/g, particle size 5–17 µm, thickness of layer 0.25 mm

**2 different selectivities for the separation of nitroanilines, separations under identical conditions**

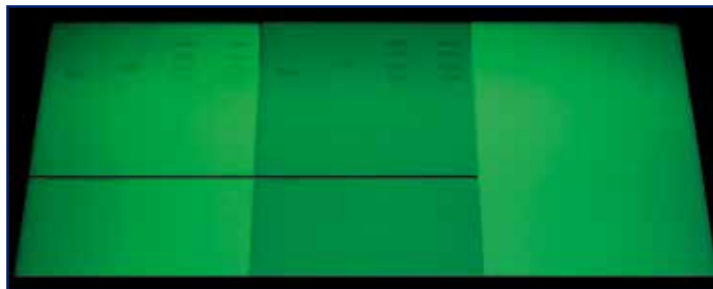


SIL G



ADAMANT

**Brilliant UV indicator on ADAMANT plates**



ADAMANT

Competitor M

ADAMANT  
without separation

Plate size [cm]	Plates per pack	SIL G*			ADAMANT	
		REF with UV 254 nm	REF with UV 254/366 nm	REF without UV indicator	REF with UV 254 nm	REF without UV indicator
2.5 x 7.5	100	809028.100				
5 x 10	200	809027.200			821010.200	
	50	809027		809017	821010	821040
5 x 20	100	809021	809121	809011	821015	
10 x 10	25	809020		809010	821020	821050
10 x 20	50	809022	809122	809012	821025	821070
20 x 20	25	809023	809123	809013	821030	821060

\*Also available as preparative plates in 0.50, 1.00 and 2.00 mm thickness.



## POLYGRAM® SIL G and SIL N-HR

### Polyester sheets for TLC

Silica 60, specific surface (BET)  $\sim 500 \text{ m}^2/\text{g}$ , mean pore size  $60 \text{ \AA}$ , specific pore volume  $0.75 \text{ mL/g}$ , particle size  $5\text{--}17 \text{ }\mu\text{m}$ ; standard grade

The binder system for **POLYGRAM®** sheets is also completely stable in purely aqueous eluents.

### POLYGRAM® SIL G

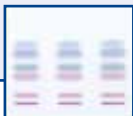
Designation	Thickness of layer	Plate size [cm]	Fluorescent indicator	Plates per pack	REF
SIL G	0.20 mm	2.5 x 7.5	–	200	805902
SIL G	0.20 mm	4 x 8	–	50	805032
SIL G	0.20 mm	5 x 20	–	50	805012
SIL G	0.20 mm	20 x 20	–	25	805013
SIL G	0.20 mm	40 x 20	–	25	805014
SIL G UV <sub>254</sub>	0.20 mm	2.5 x 7.5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

### POLYGRAM® SIL N-HR

Different binder system compared to SIL G results in different separation characteristics

Special feature of **POLYGRAM® SIL N-HR**: **higher gypsum content**

SIL N-HR UV <sub>254</sub>	0.20 mm	5 x 20	UV <sub>254</sub>	50	804022
SIL N-HR UV <sub>254</sub>	0.20 mm	20 x 20	UV <sub>254</sub>	25	804023



## ALUGRAM® Xtra SIL G

### Standard silica layers on aluminium for TLC

- ✓ Silica 60, specific surface (BET) ~ 500 m<sup>2</sup>/g, mean pore size 60 Å, specific pore volume 0.75 mL/g, particle size 5–17 µm; standard grade
- ✓ 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
- ✓ Binder: highly polymeric product, which is stable in almost all organic solvents and resistant towards aggressive visualization reagents; also completely stable in purely aqueous eluents

For applications, visit [www.mn-net.com/apps](http://www.mn-net.com/apps)



Tailored to individual requirements

### ALUGRAM® Xtra SIL G aluminium sheets

Designation	Thickness of layer	Plate size [cm]	Fluorescent indicator	Plates per pack	REF
SIL G	0.20 mm	20 x 20	–	25	818233
SIL G UV <sub>254</sub>	0.20 mm	4 x 8	UV <sub>254</sub>	50	818331
SIL G UV <sub>254</sub>	0.20 mm	20 x 20	UV <sub>254</sub>	25	818333





## Nano TLC plates

Higher efficiency on smaller particles . . .

- ✓ Sharper separations
- ✓ Shorter developing times and migration distances
- ✓ Smaller sample volumes 0.01–0.1  $\mu\text{L}$
- ✓ Minimal diffusion
- ✓ Increased detection sensitivity

## Analytical HPTLC glass plates:

Silica 60, specific surface (BET)  $\sim 500 \text{ m}^2/\text{g}$ , mean pore size  $60 \text{ \AA}$ , specific pore volume  $0.75 \text{ mL/g}$ , thickness of layer  $0.20 \text{ mm}$ , mean particle size range  $2\text{--}10 \mu\text{m}$

### Comparison of ADAMANT and Nano-ADAMANT plates

#### Separation of anthraquinone dyes

Layers: A: ADAMANT, B: Nano-ADAMANT

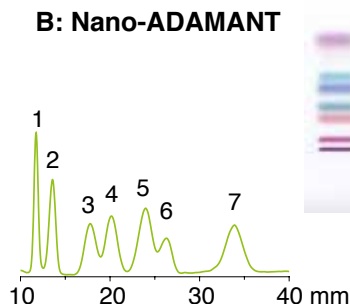
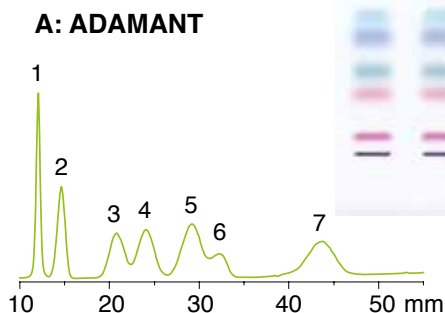
Sample:  $1 \mu\text{L}$  about 0.1 %

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



		Nano-SIL		Nano-ADAMANT	
Plate size [cm]	Plates per pack	REF with UV 254 nm	REF without UV indicator	REF with UV 254 nm	REF without UV indicator
<b>Glass plates</b>					
5 x 5	100	811021	811011	821100	821130
10 x 10	25	811022	811012	821110	821140
10 x 20	50	811023	811013	821120	821150
<b>ALUGRAM® Xtra</b>					
5 x 20	50	818342	818240		
20 x 20	25	818343	818241		

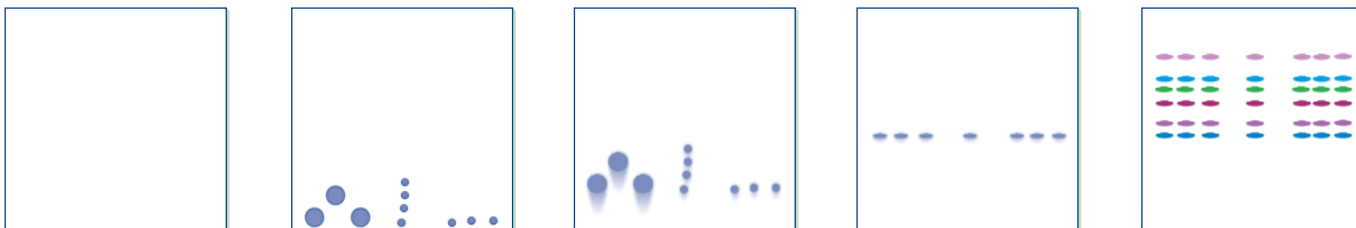


## Preadsorbent zone

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.

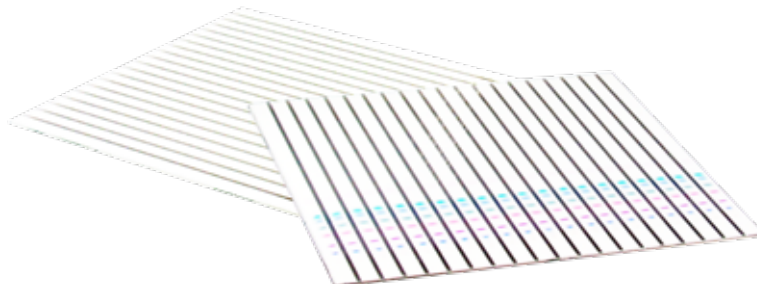
## Concentrating zone - SILGUR

- ✓ Concentrates sample spots on the plate
- ✓ Simplifies sample preparation and application



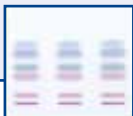
## Channeled SILGUR plates

Channel-Plates with 19 channels help to prevent cross contamination by separating several samples. More samples can be separated on a plate, and spot areas can be more easily determined.





Designation	Thickness of layer	Plate size [cm]	Fluorescent indicator	Plates per pack	REF
<b>Glass plates</b>					
SILGUR-25	0.25 mm	10 x 20	–	50	810012
SILGUR-25	0.25 mm	20 x 20	–	25	810013
SILGUR-25 UV <sub>254</sub>	0.25 mm	10 x 20	UV <sub>254</sub>	50	810022
SILGUR-25 UV <sub>254</sub>	0.25 mm	20 x 20	UV <sub>254</sub>	25	810023
<b>Glass plates – Channel Plates</b>					
SILGUR-25-C UV <sub>254</sub>	0.25 mm	20 x 20	UV <sub>254</sub>	25	810123
<b>ALUGRAM® Xtra aluminium sheets</b>					
SILGUR	0.20 mm	10 x 20	–	20	818412
SILGUR	0.20 mm	20 x 20	–	25	818413
SILGUR UV <sub>254</sub>	0.20 mm	10 x 20	UV <sub>254</sub>	20	818422
SILGUR UV <sub>254</sub>	0.20 mm	20 x 20	UV <sub>254</sub>	25	818423
<b>Glass plates</b>					
Nano-SILGUR-20	0.20 mm	10 x 10	–	25	811032
Nano-SILGUR-20 UV <sub>254</sub>	0.20 mm	10 x 10	UV <sub>254</sub>	25	811042
<b>ALUGRAM® Xtra aluminium sheets</b>					
Nano-SILGUR	0.20 mm	10 x 10	–	25	818432
Nano-SILGUR UV <sub>254</sub>	0.20 mm	10 x 10	UV <sub>254</sub>	25	818442



## TLC accessory

Description	REF
<b>Simultaneous developing chamber for TLC</b> 20 x 20 cm, for up to 5 plates	814019
10 x 10 cm, for up to 2 plates	814018
MN ALUGRAM® scissors	818666



818666



814019

814018



HPLC



GC



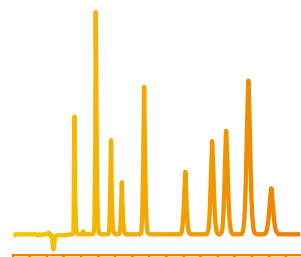
SPE and Flash



Syringe filters



Vials and caps



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