Miles Scientific

iChromatography

ANALTECH

TLC·HPTLC·SPE·HPLC·FLASH

About Analtech

Customer Support

Analtech maintains a complete customer support and applications development laboratory at its headquarters in Newark, Delaware. Our technical staff is prepared to assist Analtech customers with questions concerning TLC methodology and may provide effective solutions to specific applications. If you have a question, contact Analtech's Technical Service at 800-441-7540 or by email at techinfo@analtech.com.

Analtech Worldwide

Analtech offers the widest selection of adsorbent layers, plate sizes, and precoated TLC plate styles available anywhere. We also offer a complete line of TLC apparatus and accessories.

Analtech UNIPLATES are routinely used in thousands of Analytical, Research, Clinical, Industrial, and Quality Control Laboratories throughout the world. As well as selling direct to customers, Analtech products are represented by over 45 distributors worldwide, including Alltech, Cole-Parmer, Fisher, Sigma-Aldrich, and VWR.

At Analtech we are committed to advancing TLC as a practical, more cost effective analytical method. All of our products are the highest quality available and our customer service is prompt and friendly.

Analtech Online

Every product we sell (many more than can fit into the catalog) is now available for viewing and purchasing from our quick searchable database online at MilesScientific.com.

Want to see a CycloGraph™ or an AutoSpotter in operation? Check out the demonstration videos on the web site.

We also have an exciting monthly e-newsletter, the Thin Layer Chronicles, featuring the latest news and developments in Thin Layer Chromatography. Just sign up at MilesScientific.com. Don't forget to check out our data sheets for select products and customer surveys to keep in touch with customer needs.

Some of our web sections are listed below:

ONLINE CATALOG

Our entire line of products is listed here in a newly formatted searchable database. This section is continually updated.

TECHNICAL CENTER

Resources here include Application Notes and Product Data Sheets. We also keep you up to date on recently published TLC abstracts while making sure to mix in some classics.

SUPPORT

This section contains TLC Fact Sheets and Technology Reports. There is helpful information here on a variety of TLC topics, including when plate activation is necessary and how a plate can be pre-developed to produce nice thin sample bands instead of circular spots.

TRAINING VIDEOS

Whether you want to see a CycloGraph™ in action or a TLC AutoSpotter's accuracy, or even see how to snap one of our scored plates, go to MilesScientific.com for the latest videos.

TLC Adsorbent Codes

TLC IN THE MODERN LABORATORY

From pharmaceutical development to quality control in soils and foods to forensic studies, Thin Layer Chromatography is used in labs around the world.

TLC is a relatively simple and established technique. First developed in the 1930s and popularized in the 1950s and 60s, TLC remains an essential technology because it is fast, economical, reliable, and has certain inherent advantages for the analyst.

Today, TLC is used in thousands of laboratories all over the world. Analtech, Inc. is proud to supply these labs with the highest quality TLC plates and accessories and to work with educational institutions to help train future generations of scientists.

> If silicon had been a gas I should have been a Major-General.
>
> James Whistler (1834-1903),
>
> US painter.
>
> Referring to his failure in a West Point chemistry examination

Analtech produces a wide range of TLC plates using a variety of adsorbents, including many types of Silica Gels, Aluminum Oxides, and Cellulosics.

Analtech uses a combination of code letters to identify the many modified adsorbent layers on a TLC plate. The list below describes the Silica Gel modifications:

H	Binder-free adsorbent
G	(Gypsum) Calcium Sulfate Hemihydrate binder
HL	Hard Layer organic binder
GHL	Hard Layer inorganic binder plus Calcium Sulfate (Gypsum)
RPS	Hydrocarbon Impregnated (Silica Gel) Reversed Phase Separation
RP2	Ethyl Bonded Silica Gel Reversed Phase for HPTLC
RP8	Octyl Bonded Silica Gel Reversed Phase for HPTLC
RP18	Octadecyl Bonded Silica Gel Reversed Phase for HPTLC
F	Fluorescent indicator UV254. (Can be added to any adsorbent.)
HPTLC	High Performance Thin Layer Chromatography
CN	Cyanoethyl Bonded Silica Gel
NH2	Aminopropyl Bonded Silica Gel

EXAMPLE:

Silica Gel G	Silica Gel containing Calcium Sulfate (Gypsum) as the binder
Silica Gel HLF	Silica Gel Hard Layer organic binder Fluorescent indicator

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Introduction to TLC

The basic principles of Thin Layer Chromatography have been around for over 100 years. It has been through many stages of development since then including Michael Tswett's work with plant pigments (1903), Izmailov and Schraiber's work resolving tinctures (1938) to Stahl's work at the University of Mainz (1956).

Over the years TLC has gained increasing popularity as a powerful analytical separation technique. It has long been one of the most useful and straightforward forms of chromatography and today, due to continued research in developing new adsorbents and supports and the overall low cost of the method, it continues to grow.

In TLC, an aliquot of sample solution is spotted on a porous layer of adsorbent material. This sample mixture is then resolved into its individual components by their differential migration as they are carried through the adsorbent by the developing solvent. The developing solvent wicks through the adsorbent by capillary action alone; no external source of pressure is required.

The best TLC separation media are produced by spreading a concentrated slurry of adsorbent particles as a layer of uniform thickness on the flat surface of an inert backing material (usually glass, but aluminum and plastic are also used). Careful evaporation of the slurry solvent produces a highly uniform adsorbent layer. In addition to providing an inert support for preparing the thin adsorbent layer, the backing material also contributes strength for ease of handling.

In principle, a wide variety of adsorbent materials can be used for the production of TLC layers. In practice, the versatility of silica gel has led to its acceptance as the adsorbent of choice for the great majority of TLC separations.

The steps in performing TLC are simple, yet can be considered fields of study by themselves. They are - sample preparation, sample application, chromatographic development, and evaluation of the chromatogram.

Sample Preparation

This step involves, in the words of Dr. Joseph Touchstone, "favorably increasing the analyte/'junk' ratio." Although the most important issue here may appear to be cleaning up your sample, it also may involve physically crushing a sample. Other processes that may occur in this step are sampling, extraction steps, and filtration or concentration of components of interest Thorough preparation of samples is an important prerequisite to a successful TLC separation.

Sample Application

The objective of the chromatographic separation will typically specify how the sample should be applied.The most common method is by way of a glass capillary. With a capillary the sample can be applied as either a circular spot or series of smaller adjacent spots creating a band. A much longer band referred to as a streak is also commonly used but only on preparative thickness TLC plates.

It is always beneficial to keep the sample spot or band as small as possible or resolution will be adversely affected.A special TLC plate option that can help with all manual sample application but especially with large volumes of very dilute samples is the concentration or preadsorbent zone (see page 7 for more info).

Chromatographic Development

The most commonly used separation technique is by way of a TLC plate standing vertically in a glass developing chamber. This is known as ascending chromatography. A separation may also be performed in a specially designed horizontal chamber. Solvent flowing across the plate is still achieved by capillary action with this

method, however, gravity does not slow the speed of the separation as much.

Another specialized method of separation is 2-dimensional development. With this a single spot is applied near a corner of the plates. After chromatography in the first direction, the plate is dried, rotated 90° and developed in the second dimension.with another mobile phase.

Evaluation of the Chromatogram

Evaluation can be as simple as a visual inspection under ultra violet light to determine the existence of a component. Or it could be as complicated as exposing the plate to a chemical spray, followed by heat charring and densitometric scanning to compare the sample to standards on the plate and achieve an accurate measurement of how much of a component is on the plate.

Anyway you look at evaluation, the one constant is the calculation of the retention factor (Rf value). This value is measured as the relative distance traveled from the spot origin to the mobile phase solvent front. As long as all other variables are kept constant, the Rf value of a sample component should remain constant and be reproducible.

Inherent Advantages of TLC

TLC permits the simultaneous analysis of many samples in the same time period required for one HPLC analysis. Samples and standards are analyzed under exactly the same conditions rather than serially as in HPLC.

TLC uses a fresh, new adsorbent for each analysis. This insures reproducible results and eliminates the HPLC problems of adsorbent contamination from previous analyses and lost efficiency from worn columns. Also, with the use of smaller developing tanks, the amount of developing solvent required is much less than with HPLC.

TLC does not require complex, costly maintained instrumentation. The investment for performing successful TLC can be ten to one hundred times less than for HPLC.

TLC simplifies methods development. Unlike chromatography performed on columns, the sample components remain in the adsorbent and can always be located and retrieved for further experimentation.

Applications of TLC

TLC is generally used for one of three purposes.

1) QUALITATIVE Analysis
To determine the presence or absence of a particular substance in a mixture. A rough estimation of the level of the substance may also be performed.

2) QUANTITATIVE Analysis
To determine, precisely and accurately, the amount of a particular substance in a sample mix.

3) PREPARATIVE Analysis
To purify and isolate a particular substance by separating it from any contaminants.

All three cases share the common procedures of sample application, chromatographic separation, and sample component visualization. The conditions under which these procedures are performed vary according to the required end result. Some typical requirements and conditions are shown below.

FACTOR	QUALITATIVE	QUANTITATIVE	PREPARATIVE
Sample Volume	2-50µL	0.1-0.5µL	50-1000µL
Sample Amount	10-200µg	50-500ng	5-500mg
Sample Appl. Precision	±10%	±1%	NA
Layer Thickness	250µm	150µm	500-2000µm
Development Distance	12 cm	5 cm	15 cm
Development Time	15-30 min	4-8 min	25-60 min
Visualization Type	Visual	Visual & Densitometric	Visual

TLC Plate Formats

Layer Thickness

Analtech UNIPLATES are 250 microns thick for regular analytical TLC and between 500 and 2000 microns for preparative TLC. Tapered preparative UNIPLATES have a wedge-shaped layer 300µm to 1700µm with a 700µm preadsorbent area (see notes on page 9). High Performance UNIPLATES have a thinner layer of adsorbent between 150-200 microns. All thickness designations are nominal. Actual thicknesses may vary but are consistent from batch to batch.

Plate Size

UNIPLATES are available in the following standard sizes: 20 x 20 cm,10 x 20 cm, 5 x 20 cm as well as 2.5 x 10 cm and 2.5 x 7.5 cm. The standard size for High Performance UNIPLATES (HPTLC) is 10 x 10 cm, although they are available in other sizes. Analtech will be happy to supply your special TLC plate requirements (such as 20 x 40 cm plates) whenever it is within our capability to do so. Please contact Technical Services for information regarding feasibility and pricing.

Call 800-441-7540 or 302-737-6960 (or email techinfo@analtech.com).

Preadsorbent UNIPLATES™

- 3cm wide sample application zone
- Concentrates sample spots on the plate
- Simplifies sample preparation and application
- Channeled version available

Preadsorbent UNIPLATES have an inert spotting zone along the bottom edge of the plate. This sample application region serves as a “holding zone” for sample spots until development of the plate is initiated. There is no significant resolution of sample components by the stationary phase in this region. All soluble components migrate with the solvent front, concentrating diffuse sample spots into vertically narrow bands.

PREADSORBENT PLATE (IN STAGES)

The adsorbent zone extends from the upper edge of the preadsorbent zone and covers the remaining area of the TLC plate. This zone exhibits the selective retention of sample components characteristic of the adsorbent employed. Separation of sample components occurs in the adsorbent zone in the same way as on a standard TLC plate.

Preconcentration of the sample results in compact zones at the beginning of the separation. Also, resolution and sensitivity are less dependent on sample application technique since all samples are concentrated to narrow bands regardless of the size or position in the zone of the sample spots.

Preadsorbent UNIPLATES are available in a variety of adsorbents and sizes throughout the catalog.

Scored UNIPLATES™

Most UNIPLATES can be supplied with the glass backing scored at specific locations to permit convenient “snapping” into smaller plates. This Analtech feature provides increased versatility and can mean cost savings over plates already cut to smaller sizes.

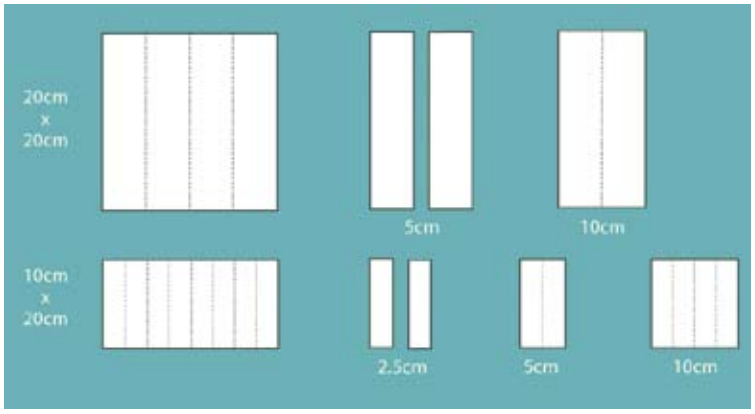
Different adsorbents, mobile phases, and analytical conditions can be tested quickly and economically. A plate can be spotted, then snapped into several smaller plates for developing in different solvent mixtures to determine the best separation.

A plate can be spotted, developed, then snapped into several smaller plates, and then subjected to different visualization techniques.

Scored UNIPLATES are available in two standard formats:

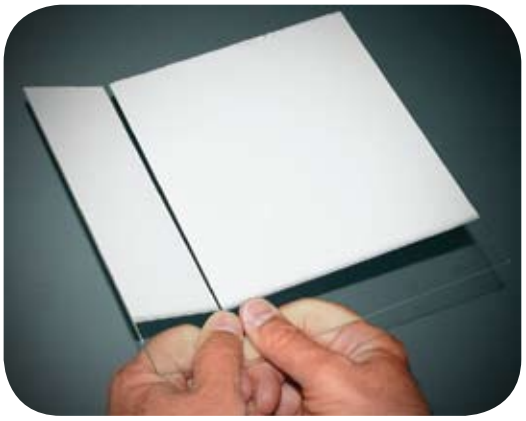
1) 20 x 20 cm scored UNIPLATES have three score marks 5 cm apart. Each plate can be snapped to produce four 5 x 20 cm plates or any multiple of 5 cm width.

2) 10 x 20 cm scored UNIPLATES have seven score marks 2.5 cm apart. Each can be snapped to produce eight 2.5 x 10 cm plates or any multiple of 2.5 cm width.

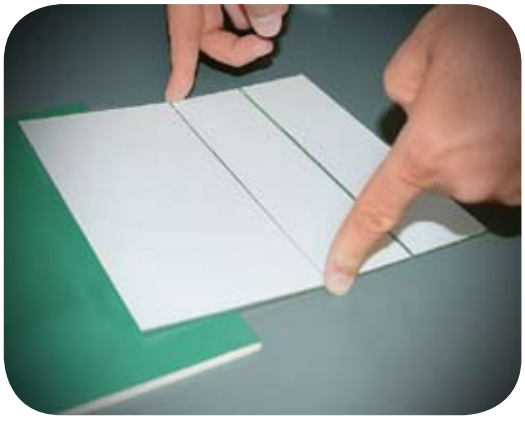


Check out a video demonstration of how to snap an Analtech scored plate at **MilesScientific.com**

- Greater flexibility in developing separations
- Reduced expense
- Provides a useful pilot technique for HPLC
- Can be developed full size



SOFT LAYERED (SCORED)



HARD LAYERED (SCORED)

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Channeled UNIPLATES™

Channeled UNIPLATES are available in a variety of adsorbents and plate sizes including the preadsorbent format. These plates have 9 mm wide adsorbent tracks which are separated by 1 mm wide channels where the adsorbent layer has been removed. Channeled plates prevent cross contamination and the spreading of the sample components during development.

Prep-Scored UNIPLATES™

Prep-Scored UNIPLATES are designed especially for preparative TLC procedures where destructive visualization techniques must be used to locate separated zones.

Prep-Scored UNIPLATES are scored 2.5 cm from each vertical edge. After developing, the 2.5 cm strips between each score mark and the edge can be easily “snapped” away from the center portion of the plate.

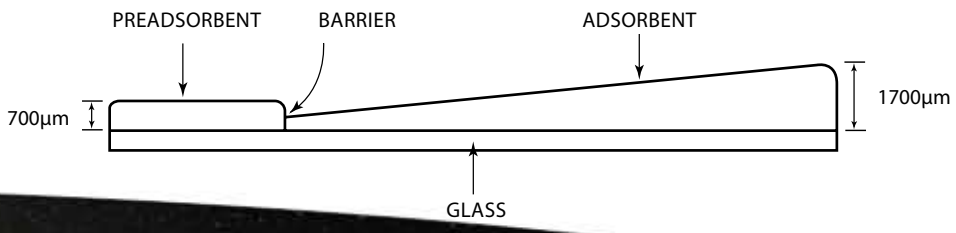
Visualization of separated zones on these 2.5 cm strips followed by realignment with the center portion provides a convenient method for locating zones to be recovered by scraping.

Tapered Uniplate-T™

The UNIPLATE-T Taper Plate, invented and patented by Analtech, is a unique preparative TLC plate that provides unusually high resolution for a preparative layer. It has a wedge-shaped adsorbent layer, progressing from 300 microns (bottom) to 1700 microns (top). Below the silica layer is a 700-micron-thick preadsorbent zone provided for easier sample application and higher sample resolution (see figure below). Sample concentration prior to separation occurs in this preadsorbent zone.

The tapered adsorbent layer causes low Rf bands to separate further than on a preparative plate of constant thickness. A more uniform developing solvent flow pattern reduces vertical band spreading. All of these factors combine to produce extraordinary resolution in preparative separations on the UNIPLATE-T Taper Plate. For additional information regarding the UNIPLATE-T Taper plate visit our Web Site.

Cross sectional view of UNIPLATE-T



Soft Layer Plates

Silica Gel G & GF UNIPLATES™

Silica Gel G & GF UNIPLATES are the most widely used silica gel TLC plates. No organic substances are added to these products, thus making them compatible with sulfuric acid charring visualization.

These plates are commonly scraped from the glass backing to isolate separated components for other analytical procedures. They are compatible with all organic solvents, however, they are not recommended for use in systems containing greater than 20% water because of the solubility of the gypsum binder in aqueous solutions (For water tolerance see the GHL & GHLF series of plates).

- G & GF layers contain no organic materials
- Soft layers with gypsum binder enable easy scraping of bands from plate
- Fluorescent indicator has green fluorescence at 254 nm

The “G” stands for Gypsum and indicates that calcium sulfate hemihydrate ($CaSO_4 \cdot 1/2H_2O$), a refined form of gypsum, has been included in the adsorbent formulation. Gypsum functions as a binder, improving the cohesion of the adsorbent particles and increasing the adhesion of the layer to the glass substrate. The “F” indicates the presence of a short wave UV indicator that is fluorescent at 254 nm.

Preparative TLC plates have adsorbent layers thicker than the 250 microns. Thus, preparative plates can be used for separation of larger quantities of materials. The loading capacity for a given degree of sample component resolution increases roughly as the square root of the adsorbent layer thickness. In preparative TLC, materials to be separated are often applied as long streaks rather than spots. After development, specific compounds may be recovered by scraping the adsorbent layers from the plate in the region of interest and eluting the separated material from the adsorbent using a strong solvent.

> In questions of science the authority of a thousand is not worth the humble reasoning of a single individual.
>
> Galileo

Silica Gel G and GF UNIPLATES

25 Plates/Box, 250µm Thickness, 10µm particle, 60Å pore

PLATE SIZE (CM)	SCORED	CHANNELED	PREADSORBENT ZONE	CATALOG NO. SILICA G	CATALOG NO. SILICA GF
20 x 20	–	–	–	01011	02011
20 x 20	Yes	–	–	01511	02511
20 x 20	–	Yes	–	01911	02911
20 x 20	–	–	Yes	31011	32011
20 x 20	Yes	Yes	–	01711	02711
20 x 20	Yes	–	–	01311*	02311*
20 x 20	Yes	–	Yes	31511	32511
20 x 20	–	Yes	Yes	31911	32911
20 x 20	Yes	Yes	Yes	31711	32711
10 x 20	–	–	–	01021	02021
10 x 20	Yes	–	–	01521	02521
10 x 20	–	Yes	–	01921	02921
10 x 20	–	–	Yes	31021	32021
10 x 20	Yes	Yes	–	01721	02721
10 x 20	–	Yes	Yes	31921	32921
5 x 20	–	–	–	01031	02031
5 x 20	–	Yes	–	01931	02931
5 x 20	–	–	Yes	31031	32031

* Specially scored to snap to eight 2.5 x 20 cm plates

Silica Gel G & GF Preparative UNIPLATES™

25 Plates/Box, 10µm particle, 60Å pore

PLATE SIZE (CM)	THICKNESS (MICRONS)	CAT. NO. SILICA G.	CAT. NO. SILICA GF
20 x 20	500	01012	02012
20 x 20	1000	01013	02013
20 x 20	1500	01014	02014
20 x 20	2000	01015	02015
SCORED			
20 x 20	500	01512	02512
CHANNELED			
20 x 20	500	01912	02912
WITH PREADSORBENT ZONE			
20 x 20	500	31012	32012
20 x 20	1000	31013	32013

Silica Gel G & GF Prep-Scored & Tapered

25 Plates/Box, 10µm particle, 60Å pore

PLATE SIZE (CM)	THICKNESS (MICRONS)	CAT. NO. SILICA G.	CAT. NO. SILICA GF
20 x 20	500	01002	02002
20 x 20	1000	01003	02003
20 x 20	1500	01004	02004
20 x 20	2000	01005	02005
TAPERED			
20 x 20	special	80013	81013
TAPERED & PREP-SCORED			
20 x 20	special	80003	81003

Silica Gel G & GF UNIPLATES™ - ICN Silica Gel

These plates are prepared the same as Analtech Silica Gel G UNIPLATES with calcium sulfate binder, however they contain silica gel supplied by ICN Biomedicals, Inc. They are intended for procedures specifying Woelm Silica.

25 Plates/Box, 250 µm Thickness, 15µm particle, 60Å pore

PLATE SIZE (CM)	CAT. NO. SILICA G	CAT. NO. SILICA GF
20 x 20	16011	26011
10 x 20	16021	26021
5 x 20	16031	26031

A tidy laboratory means a lazy chemist.

Jöns Jacob Berzelius,

Swedish chemist (1779-1848)

UNISIL™ Silica Gel G & GF UNIPLATES™

These plates are prepared using a special high purity silica gel with a calcium sulfate binder. UNISIL UNIPLATES offer exceptional discrimination for aflatoxins compared to other adsorbent layers.

25 Plates/Box, 250 µm Thickness, 10µm particle, 60Å pore

PLATE SIZE (CM)	SCORED	CAT. NO. SILICA G	CAT. NO. SILICA GF
20 x 20	–	30011	40011
20 x 20	Yes	30511	40511
10 x 20	–	30021	40021
10 x 20	Yes	30521	40521
5 x 20	–	30031	40031

PLATE SIZE (CM)	THICKNESS	CAT. NO. SILICA G	CAT. NO. SILICA GF
20 x 20	500	10012	20012

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RPS Reversed Phase Plates

The basis of retention in Reversed Phase Chromatography is just the opposite of that seen in normal phase (e.g., silica gel) chromatography.

In normal phase chromatography the adsorbent is a polar material. Adsorption occurs as a result of polar interactions. Thus, in normal phase chromatography, more polar sample components will be more tightly adsorbed and will exhibit lower Rf values than less polar sample components. Rf values can be increased by making the mobile phase more polar.

In Reversed Phase Chromatography the adsorbent is a relatively nonpolar material. Adsorption occurs as a result of nonpolar interactions. Thus, in Reversed Phase Chromatography less polar sample components will be more tightly adsorbed and will exhibit lower Rf values than more polar sample components. In Reversed Phase Chromatography Rf values can generally be increased by making the mobile phase less polar.

Analtech Reversed Phase Separation (RPS) UNIPLATES are a hydrocarbon impregnated silica gel. The hydrocarbon is adsorbed onto the silica gel surface and is not chemically anchored to the particle. The impregnated RPS UNIPLATE offers several advantages over the bonded RP18 type TLC plates along with some limitations.

The main advantages of the hydrocarbon impregnated Reversed Phase plate are compatibility with aqueous solutions and parallel behavior to most C18 HPLC packings. The RPS UNIPLATE will accept 100% water either as the mobile phase or spotting solvent. This is a great advantage when working with polar sample components such as proteins and peptides.

Reversed Phase UNIPLATES™

(Hydrocarbon Impregnated ≈ 5% carbon load)
25 Plates/Box, 15µm particle, 60Å pore, 250µm Thickness unless otherwise noted

PLATE SIZE (CM)	CAT. NO. RPS	CAT. NO. RPSF
20 x 20	50011	52011
20 x 20 (scored)	50511	52511
10 x 20	50021	52021
10 x 20 (scored)	50521	52521
5 x 20	50031	52031
PREPARATIVE (500µm)		
20 x 20	50012	52012
20 x 20 (scored)	50512	52512
10 x 20	50022	52022
5 x 20	50032	52032
PREPARATIVE (1000µm)		
20 x 20	50013	52013

HYDROCARBON IMPREGNATED

- Less expensive than bonded phase TLC plates
- Aqueous compatibility for polar samples
- Inorganic binder
- Rapid, inexpensive methods development for HPLC
- Expanded flexibility to a wide range of applications

The RPS impregnated UNIPLATE approximates the adsorption characteristics of the bonded C18 modified silica gels. Therefore, RPS Reversed Phase UNIPLATES are an excellent medium for rapid, inexpensive screening of chromatographic conditions in HPLC method development. Mixtures of water or buffers plus a polar organic modifier (eg., Methanol, acetonitrile, THF, etc.) are easily scouted with RPS UNIPLATES. However, since the hydrocarbon is adsorbed but not chemically anchored to the silica gel, the RPS UNIPLATES cannot tolerate nonpolar organic solvents. Ethyl Acetate or less polar organic solvents will strip the hydrocarbon from the silica gel support. (For organic solvent compatible plates see the UNIBOND series of HPTLC plates on page 20.)

Modified Silica Plates

Analtech manufactures a number of modified silica gels on a routine basis. Often the addition of some specific material to the base adsorbent aids in discrimination of particular analytes. The most commonly used modified plates are listed here. Modification can be accomplished in two ways. The additive material can be dissolved in the solution used to prepare the spreading slurry, or a finished TLC plate can be impregnated with the desired agent. If you have some particular requirement other than those shown, call Analtech for prices and delivery.

Sodium Hydroxide (0.1N) Modified Silica Gel G & GF UNIPLATES™

Instead of water, 0.1 N sodium hydroxide is used to prepare the slurry for these plates. This makes the plates more basic and contributes to improved separation of certain compounds, particularly organometallics and some acidic classes.

25 Plates/Box, 250µm Thickness, 10µm particle, 60Å pore

PLATE SIZE (CM)	CATALOG G	NUMBER GF
20 x 20	68011	69011
10 x 20	68021	69021
5 x 20	68031	69031

Carbomer (0.33%) Modified Silica Gel H UNIPLATES™

These very specialized plates are prepared according to several Pharmacopoeia methods. They are used in the analysis of mannitol/sorbitol.

NOTE: These plates are very fragile and will most definitely arrive with silica flaked off of the plate. This has always been the case with these very custom TLC plates. This warning is given because these plates are not returnable.

25 Plates/Box, 750µm Thickness, 20x20 cm, 19µm particle, 60Å pore

Catalog	#70019

Silver Nitrate Impregnated (%) Silica Gel UNIPLATES™ (for Argentation Chromatography)

These UNIPLATES are impregnated with between 5% and 20% silver nitrate which modifies the separation characteristics of the adsorbent layer to permit increased discrimination of certain compounds, particularly those containing carbon-carbon double bonds. They are available with or without a fluorescent indicator.

NOTE: The concentration of silver nitrate (5, 10, 15 or 20%) must be specified at the time of order.

25 Plates/Box, 10µm, 60Å pore, 250µm Thickness unless noted

PLATE SIZE (CM)	CATALOG NO. W/O F	CATALOG NO. W/ F
20 x 20	28011	29011
10 x 20	28021	29021
5 x 20	28031	29031
PREPARATIVE (500µm)		
20 x 20	28012	29012
PREPARATIVE (1000µm)		
20 x 20	28013	29013

Magnesium Acetate (%) Modified Silica Gel H & HF UNIPLATES™

These Silica Gel H UNIPLATES are prepared with 5%, 7.5%, or 10% magnesium acetate as the slurry liquid. The addition of magnesium acetate decreases the acidity of the layer and allows increased discrimination of phospholipids. The concentration of magnesium acetate added to the layer must be specified at the time of order (7.5% is most commonly used)

25 Plates/Box, 19µm, 60Å pore, 250µm Thickness unless noted

PLATE SIZE (CM)	CATALOG NO. H	CATALOG NO. HF
20 x 20	88011	89011
10 x 20	88021	89021
5 x 20	88031	89031
PREPARATIVE (500µm)		
20 x 20	88012	89012

Potassium Oxalate (1%) Modified Silica Gel H & HF UNIPLATES™

Prepared with 1% potassium oxalate during slurry preparation, these plates acquire a separation characteristic which aids in the discrimination of polyphosphoinositides.

25 Plates/Box, 250µm Thickness 19µm particle, 60Å pore

PLATE SIZE (CM)	CATALOG NO. H	CATALOG NO. HF
20 x 20	86011	87011
10 x 20	86021	87021
5 x 20	86031	87031

Ammonium Sulfate (5%) Modified Silica Gel H & HF UNIPLATES™ (Self-Charring)

A common method for visualizing organic compounds on a silica gel TLC plate is charring. This is usually accomplished by spraying the plate with dilute sulfuric acid followed by heating. Organic substances appear as brown to black spots against a white background. This method is comparable in sensitivity to the visualization of UV-absorbing compounds against a fluorescent background.

Silica Gel H UNIPLATES containing ammonium sulfate eliminate the need to use messy sulfuric acid for charring. Just evaporate the developing solvent until the plate is completely dry, then heat at 150°-200°C for 30 to 60 minutes to achieve charring. The Analtech VPF chamber is specifically designed for this application. Other percentages of ammonium sulfate may be specified.

25 Plates/Box, 250µm Thickness, 19µm particle, 60Å pore

PLATE SIZE (CM)	CATALOG NO. H	CATALOG NO. HF
20 x 20	74011	75011
10 x 20	74021	75021
5 x 20	74031	75031

Hard Layer Plates

- High performance silica gel provides faster separations, higher resolution, and improved sensitivity.
- Enhanced abrasion resistance offers easier handling.
- Harder surface simplifies sample application.
- Hard layer surface is easily written on.
- Compatible with organic solvents
- Faster development compared to silica gel 60
- Fluorescent plates are ideal for UV shadowing

Research is what I'm doing when I don't know what I'm doing.

Wernher Von Braun

Hard Layer Silica Gel HL & HLF UNIPLATES™ (Organic Binder)

These are the most rugged silica gel plates available. They not only ease handling and sample application, but also permit the use of up to 80% water in the developing solvent without loss of adherence of the adsorbent layer to the glass plate. Organic binder plates are recommended for all TLC applications except those that use vigorous charring for visualization. Virtually all other visualization methods are free from interference from the organic binder.

Hard Layer Silica Gel UNIPLATES represent an advancement in thin layer adsorbent technology. Special high performance silica gel with small average diameter and narrow particle size distribution results in separations 25% to 30% faster than with most other TLC plates. Separated spots are more compact and better resolved, which allows visualization at lower sample levels. The enhanced abrasion resistance means easier handling and sample application because plate surface gouging is virtually eliminated. Analtech Hard Layer UNIPLATES are available with either organic or inorganic binders. Binder choice has little effect on the adsorptive properties of the adsorbent layer.

Hard Layer Silica Gel HL & HLF UNIPLATES™

25 PLATES/BOX, 250 µm THICKNESS, 10µm PARTICLE, 60Å PORE

PLATE SIZE (CM)	SCORED	CHAN-NELED	PREAD-SORBENT ZONE	CAT. NO. HL	CAT. NO. HLF
20 x 20	–	–	–	46011	47011
20 x 20	Yes	–	–	46511	47511
20 x 20	–	Yes	–	46911	47911
20 x 20	–	–	Yes	43011	44011
20 x 20	Yes	Yes	–	46711	47711
20 x 20	Yes	–	–	46311*	47311*
20 x 20	Yes	–	Yes	43511	44511
20 x 20	Yes	–	Yes	43511*	44311*
20 x 20	–	Yes	Yes	43911	44911
20 x 20	Yes	Yes	Yes	43711	44711
10 x 20	–	–	–	46021	47021
10 x 20	Yes	–	–	46521	47521
10 x 20	–	Yes	–	46921	47921
10 x 20	–	–	Yes	43021	44021
10 x 20	–	Yes	Yes	43921	44921
5 x 20	–	–	–	46031	47031
5 x 20	–	Yes	–	46931	47931
5 x 20	–	–	Yes	43031	44031

* Specially scored to snap to eight 2.5 x 20 cm plates

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Hard Layer Silica Gel GHL & GHLF UNIPLATES™ (Inorganic Binder)

These plates are 100% H20 resistant and are compatible with aqueous developing solvents. They are less rugged than the plates with organic binder but still provide improved handling and sample application compared to Silica Gel G UNIPLATES and are tough enough to write on with a soft pencil, if required.

Hard Layer UNIPLATES with inorganic binder are recommended for all applications including those where visualization occurs through strong charring procedures or in any case in which reagent interaction with an organic binder occurs.

Hard Layer Silica Gel GHL & GHLF UNIPLATES

25 PLATES/BOX, 250 µm THICKNESS, 15µm PARTICLE, 60Å PORE

PLATE SIZE (CM)	SCORED	CHAN-NELED	PREAD-SORBENT ZONE	CAT. NO. GHL	CAT. NO. GHLF
20 x 20	–	–	–	11011	21011
20 x 20	Yes	–	–	11511	21511
20 x 20	–	Yes	–	11911	21911
20 x 20	–	–	Yes	41011	42011
20 x 20	Yes	Yes	–	11711	21711
20 x 20	Yes	–	–	11311*	21311*
20 x 20	Yes	–	Yes	41511	42511
20 x 20	Yes	–	Yes	41311*	42311*
20 x 20	–	Yes	Yes	41911	42911
20 x 20	Yes	Yes	Yes	41711	42711
10 x 20	–	–	–	11021	21021
10 x 20	Yes	–	–	11521	21521
10 x 20	–	Yes	–	11921	21921
10 x 20	–	–	Yes	41021	42021
10 x 20	–	Yes	Yes	41921	42921
5 x 20	–	–	–	11031	21031
5 x 20	–	Yes	–	11931	21931
5 x 20	–	–	Yes	41031	42031

* Specially scored to snap to eight 2.5 x 20 cm plates

- Layers tolerate 100% water.
- Contains no organic materials.
- Suitable for aggressive visualization procedures.
- Standard scoring for 20 x 20 cm plates yields four 5 x 20 cm plates.
- Channeled 20 x 20 cm plates have 19 channels (see channeled adapter for TLC Autospotter (page 32)
- One box of scored 10 x 20 cm plates yields two hundred 2.5 x 10 cm plates.

Non-Silica Plates

25 Plates/Box, 250µm Thickness unless noted
Nearly spherical particle shape, 50 µm mean diameter

PLATE SIZE (CM)	CAT. NO. AVICEL	CAT. NO. AVICEL F
20 x 20	05011	06011
10 x 20	05021	06021
5 x 20	05031	06031
SCORED		
20 x 20	05511	06511
10 x 20	05521	06521
PREPARATIVE (500µm)		
20 x 20	05012	06012
10 x 20	05022	06022
PREPARATIVE (1000µm)		
20 x 20	05013	06013
10 x 20	05023	06023

Avicel® UNIPLATES™ (Microcrystalline Cellulose)

These plates are coated with AVICEL microcrystalline cellulose manufactured by the American Viscose division of FMC Corp. The adsorbent consists of regenerated alpha cellulose particles of nearly spherical shape and 50 micron mean diameter. Compounds separated on this cellulose tend to form more compact spots than on fibrous cellulose layers.

25 Plates/Box, 250µm Thickness unless noted

PLATE SIZE (CM)	CATALOG NO. G	CATALOG NO. GF
20 x 20	03011	04011
10 x 20	03021	04021
5 x 20	03031	04031
PREPARATIVE (1000µm)		
20 x 20	03511	04511
10 x 20	03521	04521
PREPARATIVE (500µm)		
20 x 20	03012	04012
10 x 20	03022	04022
PREPARATIVE (1000µm)		
20 x 20	03013	04013
10 x 20	03023	04023

Alumina G & GF UNIPLATES™

Using a slurry containing calcium sulfate hemihydrate as a binder, these plates are analogous to Silica Gel G UNIPLATES, but with aluminum oxide as the adsorbent. The pH is neutral to slightly basic. Coatings are available in both analytical and preparative thicknesses.

High Performance Plates

Normal Phase

High Performance UNIPLATES provide high resolution separations in less than five minutes with migration distances as little as 5 to 7 cm. These plates are prepared with high efficiency silica gel having an 8 micron average particle diameter and narrow particle size distribution. The adsorbent layers are only 150 microns thick, resulting in more rapid solvent migration. The adsorbent capacity is more than adequate for small samples used in high performance TLC techniques. Typically, sample volumes for high performance TLC are less than one microliter. Sample spots are normally smaller than one millimeter in diameter. Samples are spotted 1.0 to 1.5 cm from the bottom edge of the plate and 0.3 to 0.5 cm apart. Since smaller samples are applied, one 10 x 10 cm plate can separate as many samples as can be separated on a 20 x 20 cm plate using standard TLC techniques.

The smooth homogeneous surface of HPTLC UNIPLATES gives high signal-to-noise ratios for densitometric scanning, thus increasing sensitivity and precision.

- High efficiency 8 micron (ave) adsorbent with narrow particle and pore size distribution
- 150 micron adsorbent layer thickness for fast separations
- Homogeneous layer allows linear or radial separations
- Smooth adsorbent surface for noise free densitometry

Silica Gel HPTLC UNIPLATES™ (Organic Binder)

25 Plates/Box, 150 µm Thickness, 8µm particle, 60Å pore

PLATE SIZE (CM)	CAT. NO. HP-HL	CAT. NO. HP-HLF
10 x 10	58077	59077
10 x 20	58027	59027
20 x 20	58017	59017
SCORED		
10 x 10 (to 5 x 5)	58377	59377
10 x 20	58527	59527
PREADSORBENT		
10 x 10	60077	61077
10 x 20 (low-form)*	60027	61027
20 x 10 (high-form)*	60127	61127
20 x 20	60017	61017

* The preadsorbent zone on HPTLC UNIPLATES is 1.5 cm high. Low-form plates have the preadsorbent zone along the 20 cm edge. High-form plates have the preadsorbent zone along the 10 cm edge.

Silica Gel HPTLC UNIPLATES (Inorganic Binder)

25 Plates/Box, 150 µm Thickness, 8µm particle, 60Å pore

PLATE SIZE (CM)	CAT. NO. HP-GHL	CAT. NO. HP-GHLF
10 x 10	56077	57077
10 x 20	56027	57027
20 x 20	56017	57017
SCORED		
10 x 10 (to 5 x 5)	56377	57377
10 x 20	56527	57527

Unibond™ Amino (NH2) & Cyano (CN) HPTLC UNIPLATES™

25 Plates/Box, 150 µm Thickness, 8µm particle, 60Å pore

PLATE SIZE (CM)	CAT. NO. HP-NH2F	CAT. NO. HP-CNF
10 x 10	22077	23077
10 x 20	22027	23027
20 x 20	22017	23017
SCORED		
10 X 20	22527	23527

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REVERSED PHASE

The availability of both normal phase and Reversed Phase HPTLC UNIPLATES™ completes HPTLC as a sensible, efficient and cost effective alternative technique for quantitative analysis. These Reversed Phase adsorbents share the features and benefits of silica gel HPTLC plates: high efficiency adsorbents, 150 µm layer thickness, and smooth surface for densitometry.

In the High Performance format, Analtech offers several varieties of supports. A hydrocarbon impregnated layer, similar to the analytical RPS UNIPLATE, offers complete aqueous solvent compatibility (see page 11 for complete details). Three nonpolar bonded supports in the UNIBOND™ series are available: RP2, RP8, and RP18.

These fully silanized silica gels share complete compatibility with all organic solvents. However, due to the extreme hydrophobic nature of the RP18 adsorbent, aqueous wettability is limited to approximately 60% water in the mobile phase. Wettability is correspondingly higher with the slightly more polar shorter chain RP series plates.

Reversed Phase Unibond™ Series HPTLC UNIPLATES

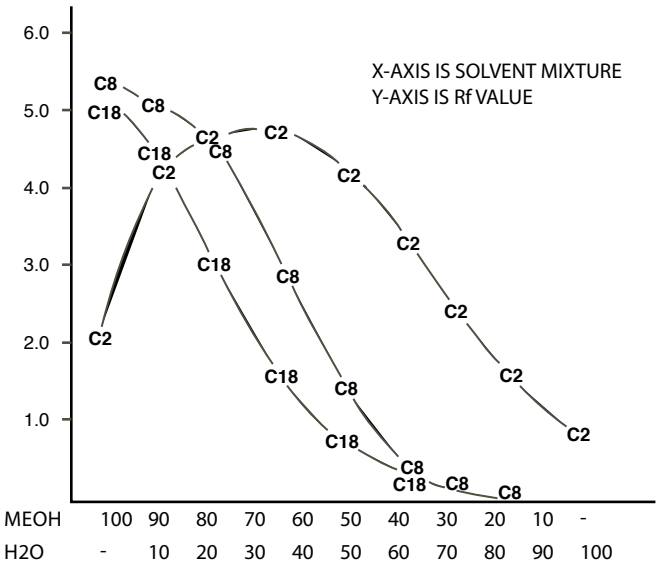
25 Plates/Box, 150µm Thickness (Organic binder)

DESCRIPTION	PLATE SIZE	CAT. NO.
HP-RP18	10 x 10	62077
HP-RP18F	10 x 10	63077
HP-RP8F	10 x 10	09077
HP-RP2F	10 x 10	08077
HP-RP18	10 x 20	62027
HP-RP18F	10 x 20	63027
HP-RP8F	10 x 20	09027
HP-RP2F	10 x 20	08027
HP-RP18	20 x 20	62017
HP-RP18F	20 x 20	63017
HP-RP8F	20 x 20	09017
HP-RP	20 x 20	08017

Reversed Phase Hydrocarbon Impregnated HPTLC UNIPLATES

25 Plates/Box, 150µm Thickness 8µm particle, 60Å pore (≈5% carbon load, Inorganic binder)

PLATE SIZE (CM)	CAT. NO. HP-RPS	CAT. NO. HP-RPSF
10 x 10	54077	55077
10 x 20	54027	55027



Selectivity can be varied for a given sample by choosing a UNIBOND Reversed Phase HPTLC plate of proper nonpolarity. The graph above illustrates Rf values for Rhodamine B, a polar dyestuff, in mixtures of methanol & water for RP2, RP8, and RP18.

Flexible-backed TLC Sheets

- Lighter and safer to handle than glass; also unbreakable
- Easy to cut with scissors to customize plate size or isolate components
- Available with Polyester or Aluminum backing
- Attach to reports for permanent record
- Minimum storage space required
- Inexpensive shipping due to weight

Flexible Backed TLC Sheets (Plastic & Aluminum Backings)

Analtech's flexible backed TLC plates offer the same exacting specifications as with the classic glass backed plates assuring batch-to-batch uniformity. Quality is controlled at each step in the manufacturing process – from incoming raw materials to outgoing packaging.

Comparison of flexible backings to glass

PHYSICAL PROPERTY	GLASS	PLASTIC	ALUMINUM
Thickness (approx)	1.6 mm	0.2 mm	0.15 mm
Weight (packaging, storage requirements	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			
Against solvents	high	high	high
Against mineral acids and conc. ammonia	high	high	low
Binder stability in water	depends	very	limited

Flexible-backed TLC Sheets

ADSORBENT LAYER	PLATE SIZE (CM)	PLATE BACKING	THICKNESS (MICRONS)	# SHEETS	CAT. NO. W/O F	CAT. NO. W/ F
Silica Gel	20 x 20	plastic	200	25	158017	159017
Silica Gel	2.5 x 7.5	plastic	200	200	158061	159061
Silica Gel	20 x 20	aluminum	200	25	156017	157017
Silica Gel	2.5 x 7.5	aluminum	200	200	156061	157061
Silica Gel HR *	20x 20	plastic	200	25	154017	155017
Diol Modified Silica Gel	20 x 20	aluminum	150	25	-	125017
Microcrystalline Cellulose	20 x 20	plastic	100	25	105016	106016
Microcrystalline Cellulose PEI	20 x 20	plastic	100	25	205016	206016
Cellulose (fibrous)	20 x 20	plastic	100	25	166016	167016
Aluminum Oxide, pH9	20 x 20	plastic	200	25	100016	101016
Aluminum Oxide, pH9	20 x 20	aluminum	200	25	102016	103016
Polyamide	20 x 20	plastic	100	25	117058	118058
Reversed Phase RP18	20 x 20	aluminum	150	25	–	350016

* Silica Gel HR is made with a higher purity silica gel and a different binder system than the regular silica plates use.

Other Coatings Available on Flexible Backings

Not all coatings or TLC sheet sizes are listed in the table above. Call Technical Support for alternative sheet sizes. Additional coatings are available as follows:

On an aluminum support - high performance silica gel, dimethyl, cyano, and amino-modified silica gel

On a plastic support - DEAE cellulose, acetylated cellulose, cation and anion exchange resins

Solid Phase Extraction

SPE Cartridges

Analtech SPE cartridges are prepacked with adsorbent and ready for use. Molded of medical grade polypropylene, each cartridge contains 1 cc of packing. A porous frit and outlet filter combination contain the packing and will remove sample particulate down to 10 microns. In normal use SPICE sample preparation cartridges are compatible with organic solvents and aqueous solutions. Precision Luer fittings provide leakproof liquid connections. The inlet is a female lock type and the outlet is a male slip. This unique design enables SPICE cartridges to be used either with a syringe or a vacuum manifold. Syringe use is ideally suited for field sampling or for intermittent laboratory requirements. Repetitive sample prep applications are conveniently performed via a vacuum manifold. Typical flow for either method is approximately one minute per 10 cc of liquid at 14psi. This insures sufficient sample residence time in the cartridge for effective adsorption/desorption.

48 cartridges/box

PACKING	MILLIGRAMS	CATALOG NO.
Silica Gel	300	01-00
UNIBOND™ C2	400	01-08
UNIBOND™ C8	400	01-09
UNIBOND™ C18	400	01-10
UNIBOND™ Amino	400	01-22
UNIBOND™ Cyano	400	01-23
Alumina (neutral)	1000	01-33
Alumina (basic)	1000	01-34
Alumina (acidic)	1000	01-35
Florisil™	500	01-96

SPICE™ Bulk Packings

SPICE Packings are available in bulk quantities of 100 grams, 500 grams, 5 kg and 10 kg. For larger quantities call for a price quote. Silica gel and bonded phases are based upon a 150Å pore silica gel, 35-75 µm particle.

PACKING AMOUNT	UNIBOND C2 CAT. NO.	UNIBOND C8 CAT. NO.	UNIBOND C18 CAT. NO.	UNIBOND AMINO CAT. NO.	UNIBOND CYANO CAT. NO.
100 grams	08010	09010	78010	22010	23010
500 grams	08050	09050	78050	22050	23050
5,000 grams	08060	09060	78060	22060	23060
10,000 grams	08070	09070	78070	22070	23070

PACKING AMOUNT	SILICA GEL CAT. NO.	ALUMINA N CAT. NO.	ALUMINA B CAT. NO.	ALUMINA A CAT. NO.	FLORISIL™ CAT. NO.
500 grams	79050	33050	34050	35050	96050

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XTRX™ Columns

Xtrx™ Extraction Columns were designed and intended for use in the extraction of analytes from liquid samples using the DuPont PREP™ Automated Sample Processor. Although the DuPont Prep system is still available for purchase, these columns may also be used on a standard vacuum manifold.

There are four components to each extraction column: a cap, extraction column, effluent cup, and recovery cup. The cartridge components are nested together so that the cap and the effluent cup seal the extraction column and preserve the activation of the resin bed. There is also a small poly ball that rests inside the column to contain the adsorbent or resin.

The extraction column contains a nominal amount of adsorbent or resin (≈ 120 mg) held by a porous bed support. The reservoir of the extraction column has a capacity of 4 mL. The effluent cup has a capacity of 6 mL and is used to collect the column effluent while the rotor of the sample processor is spinning clockwise. Typically, this is the initial sample effluent and any wash solvent.

The recovery cup has a capacity of 4 mL and its function is to collect the column effluent while the rotor is spinning counterclockwise.Typically, sample components are desorbed from the resin bed with an acidic eluting solvent and collected in the recovery cup. The cap, which is initially used to contain the adsorbent or resin, can be reused to cap the recovery cup or effluent cup.

The solid phase extraction process involves a partitioning of the sample components between a moving liquid phase (buffered aqueous sample matrix, wash solvent, or eluting solvent) and a solid stationary phase (resin bed)

The concept of solid phase extraction of materials of interest from biological matrices has a long history. There are published extraction methods for isolating drugs of abuse, analgesics, steroids, anticholinergics, amphetamines, anticonvulsants, antimicrobials, catecholamines, and urinary metabolites.

150 columns/box (including 150 Recovery Cups)

PACKING	MILLIGRAMS	CATALOG NO.
AX/S	120	11-50
AX	120	11-51
UNIBOND™ C18	120	11-52
SILICA GEL	120	11-53
RP/W	120	11-54

Other Bulk Silicas

Analtech offers a variety of adsorbents in bulk quantities for TLC, LC, and HPLC applications. These materials are used in our own manufacturing process and are guaranteed to be of the highest quality. Consider Analtech for your bulk adsorbent requirements.

Silica Gel packings for Column Chromatography

For preparative scale column chromatography and FLASH chromatography. Analtech offers silica gel in two pore sizes and particle size ranges. These materials meet the same high quality and high chemical purity levels as specified for Analtech's High Performance Silica Gel.

Silica Gel (high purity)
60Å Pore: 450m2/g Surface Area
150Å Pore: 300m2/g Surface Area

QUANTITY (GRAMS)	CATALOG NUMBER 60Å PORE 35-75 µm	75-150 µm	CATALOG NUMBER 150Å PORE 35-75 µm	75-150 µm
500	12050	13050	14050	15050
1,000	12100	13100	14100	15100
5,000	12060	13060	14060	15060
25,000	12080	13080	14080	15080

Ergosil

Ergosil is a chemically modified silica gel designed for the analysis of ergopeptine alkaloids. Ergosil will preferentially adsorb ergopeptine alkaloids such as ergotamine and ergovaline as well as pigments from plant extracts. The alkaloids may then be successively eluted in purified form for direct injection into a high pressure liquid chromatograph.

10 micron particle size, 60Å pore

QUANTITY (GRAMS)	CATALOG NO.
500	46050
1,000	46100

New ideas pass through three periods:

-- It can't be done.

-- It probably can be done, but it's not worth doing.

-- I knew it was a good idea all along!

Arthur C. Clarke

Reversed Phase Packings for Column Chromatography

Analtech offers two types of reversed phase packings for column chromatography: A C18 octadecyl bonded silica gel and a hydrocarbon impregnated silica gel.

The most common reversed phase adsorbent is the octadecyl (C18) bonded silica gel. The C18 hydrocarbon is chemically anchored to the silica gel support. This material is compatible with all aqueous and organic solvent combinations. The carbon content is about 14%. Pore size is 150 Å. Particle size is 35-75 microns.

The hydrocarbon impregnated silica gel is a column grade equivalent of Analtech's unique RPS UNIPLATE™. The long chain hydrocarbon is not chemically bonded to the silica gel but is adsorbed onto the surface. This material is compatible with classical reversed phase eluting solvents such as MeOH/Water and Acetonitrile/Water. Less polar organic solvents will solubilize the hydrocarbon.

The Reversed Phase Separation (RPS) column material is ideal for prep scale up for separations established on RPS UNIPLATES™. Carbon content is about 5%. Pore size is 60 Å. Particle size is 35-75 microns.

35-75µm particle (bonded - 150Å, Impregnated - 60Å)

QUANTITY (GRAMS)	CAT. NO. C18 BONDED	CAT. NO. RPS IMPREG.
100	78010	50010
500	78050	50050
5,000	78060	50060
10,000	78070	50070

High Efficiency TLC Adsorbents (UNISIL™)

Analtech offers adsorbents for those who wish to prepare their own TLC plates with adsorptive behavior similar to Analtech Silica Gel G and GF UNIPLATES™. This high efficiency Silica Gel G is a high purity material containing calcium sulfate hemihydrate as a binder.

10µm particle, 60Å pore

QUANTITY (GRAMS)	CAT. NO. SILICA G	CAT. NO. SILICA GF
500	30050	40050
1,000	30100	40100

Preparative Scale HPLC Adsorbents (UNISIL™)

This narrow distribution 10µ silica gel is suitable for preparative HPLC columns. Low cost makes this an attractive material when moderate efficiency is needed.

10µm particle, 60Å pore

QUANTITY (GRAMS)	CAT. NO. SILICA H	CAT. NO. SILICA HF
500	10050	20050
1,000	10100	20100

Sample Application

NANOCAP™ Kit for HPTLC

Catalog# 21-00

High Performance TLC methods require application of sub-microliter sample volumes to the TLC plate. Previously available devices for accurate measurement of such small samples have been either very expensive or severely limited in accuracy and precision. The Analtech NANOCAP Kit provides an inexpensive means of spotting sub-microliter samples for HPTLC. Accuracy and reproducibility are within 1%.

The NANOCAP Kit includes a special Applicator Clamp, complete instructions for applying sub-microliter samples, and 100 NANOCAPS of each size—100, 200, and 500 nanoliters. Also included are a TLC Spotting Guide and our Utility Rack.

MICROCAP™ Kit for TLC

Catalog# 22-00

This new addition to the family of Analtech sample application equipment is a great bargain. This kit includes a special Applicator Clamp, 100 capillaries each of three sizes (0.5µL, 1.0µL, 2.0µL), the TLC Spotting Guide, and our Utility Rack.

NOTE: Neither the NANOCAP nor the MICROCAP kit comes with TLC plates. Please look through our TLC UNIPLATES section for options.

TLC Spotting Guide

Catalog# 25-00

Transparent Spotting Guide may be used with plates up to 20 x 20 cm. The guide rests above the surface of the plate without contacting the adsorbent layer, avoiding damage to the layer. It accurately positions micropipettes and syringes, even when the plate is removed for drying between applications. The metric scale on the Spotting Guide facilitates reading of Rf values. Standard area circles of 3 to 255 mm^2 aid in estimating spot sizes.

25-00

Calibrated Disposable Micropipettes

Calibrated end to end disposable glass micropipettes provide economical, precise measurement of TLC samples with better than 1% accuracy. The tubes are quickly filled by capillary action or with the spotting bulb. One spotting bulb is supplied with each vial of 100 micropipettes.

DESCRIPTION	CATALOG NO.
Micropipettes, 0.1µL	21-01
Micropipettes, 0.2µL	21-02
Micropipettes, 0.5µL	21-05
Micropipettes, 1.0µL	20-01
Micropipettes, 2.0µL	20-02
Micropipettes, 3.0µL	20-03
Micropipettes, 4.0µL	20-04
Micropipettes, 5.0µL	20-05
Micropipettes, 8.0µL	20-08
Micropipettes, 10.0µL	20-10
Micropipettes, 16.0µL	20-16
MICROPIPETTE ACCESSORIES	
Spotting Bulb Assy. (ea.)	20-99
Applicator Clamp	21-90
Capillary Holders (pkg/20)	21-91
Applicator Clamp Set (with 21-91)	21-99

NOTE: Capillary holders cannot be used without an Applicator Clamp or Spotting Bulb

Graduated Disposable Micropipettes (pkg/250)
Catalog# 20-40

Economical capillary micropipettes with fire polished tips and calibration marks at 1,2,3,4, and 5 microliters. Accuracy is within 1%. Total length of each capillary is five inches for easy handling. A 15" aspirator tube with mouthpiece and 250 micropipettes are included with each package.

Non-Calibrated Micropipettes (pkg/300)
Catalog# 20-13

These thin-bore capillary tubes are ideal for applying TLC samples when high accuracy and precision are not required. Sample volume is estimated visually. Full volume is approximately 9µL.

Plastic Utility Rack
Catalog# 51-00A

This convenient and inexpensive plastic utility rack has 30 places to hold micropipette vials or test tubes up to 16mm in diameter. It makes storing all your micropipettes and associated applicators simple.

TLC Test Dye Mixtures
Test Dye Mixtures assist in developing sample application and chromatographic proficiency. In addition, they provide readily visible chromatographic patterns for educational demonstrations. An instruction sheet included with each dye mixture identifies components and recommends solvents and developing conditions.

DESCRIPTION	CATALOG NO.
Dye Mixture I (for Silica Gel)	30-01
Dye Mixture II (for Cellulose)	30-02
Dye Mixture III (for Reversed Phase)	30-03
Dye Mixture IV (for Silica Gel)	30-04
Dye Mixture Set (one each of dye I-IV)	30-00
Rotor Test Dye (for Silica Gel)	30-00

NOTE: Approx. 40cc per jar

51-00A

SpotOn TLC Sample Applicator

- Use of standard TLC syringes
- Conveniently located control switches/knobs
- Digital temperature read-out
- Even drive bar movement for complete dispensing of all sample
- Adjustable needle guide
- Alternative syringe templates available for use with scored and channeled plates

SpotON TLC Sample Applicator

The SpotOn is a semi-automated device used to apply samples on Thin Layer Chromatography plates. The instrument eliminates the need for manual sample application and can be used to apply up to 18 samples at a time.

The unit has been designed for use with custom made TLC syringes with blunt Teflon® tipped needles. These special needles minimize sample "creep back" and enhance reproducibility. The syringes also feature Teflon plunger tips to help eliminate the problem of metal-to-glass contamination. Syringes are available in 10, 25 and 100µl volumes.

The device can apply samples at variable rates ranging from 3 minutes (fastest speed) to 30 minutes (slowest speed). An integral heater strip runs beneath the TLC plate at the point of sample delivery to aid in solvent evaporation. By adjusting the delivery rate and temperature of the heater strip, the smallest possible sample zone can be obtained.

Syringes must be purchased separately. The unit will operate with as few as one syringe.

There's a common myth that evidence speaks for itself.

It doesn't.

It just sits there on the lab table, incapable of speaking.

DESCRIPTION	CATALOG NO.
TLC AUTOSPOTTER, 110V (w/o syringes)	A87-30
TLC AUTOSPOTTER, 230V (w/o syringes)	A87-30i
AutoSpotter Scored Adapter Kit (for use with scored TLC plates)	A87-301
AutoSpotter Channeled Adapter Kit (for use with channeled TLC plates)	A87-302
10µL Syringe (each)	A87-31
25µL Syringe (each)	A87-32
100µL Syringe (each)	A87-34

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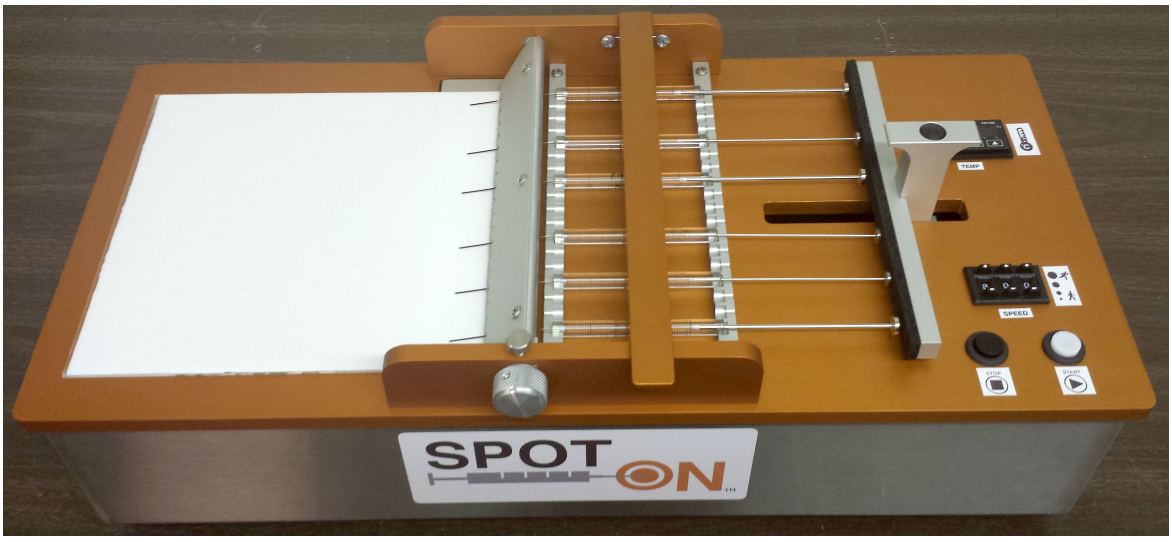

SpotON TLC Sample Applicator

Check out a video demonstration of the SpotOn at **MilesScientific.com**

Rotors and Accessories for the CycloGraph

Rotors are coated with silica gel or aluminum oxide. Both adsorbent formulations include a calcium sulfate binder for repeated use without damage, and a fluorescent indicator at UV254 for ease of sample location. These rotors replace the traditionally self-made formulations. They are overcoated and require scraping to final thickness and shape. They work with both the CycloGraph and older Chromatotron.

Silica gel is now also available in final scraped format ready for use. These new rotors eliminate the tiresome, dusty and noisy process of scraping before use. Just take them out of package and chromatograph!

Other accessories are available. The Rotor Storage Chamber holds 10 rotors securely when not in use. Test Dye can be used to fine tune operational parameters. Rotor Mix is available for those researchers wishing to coat buffer modified formulations.

PRE-SCRAPED ROTOR ADVANTAGES:

- Ready to use - just unpack and run
- No more messy silica on your lab bench
- No more hi-pitched scraping sound
- 4 sizes available
- New packaging eliminates potential damage

SYSTEMS & ACCESSORIES	CATALOG NO.
Low Flow Solvent Pump	87-42
Low Flow Solvent Pump (for dry solvent applications)	87-42c
Rotor Storage Chamber (holds 10 rotors)	50-05
Rotor Scraper - for 1000 micron Rotor	05-03
Rotor Scraper - for 2000 micron Rotor	05-02
Rotor Scraper - for 4000 micron Rotor	05-04
Rotor Scraper - for 6000 micron Rotor	05-06
Rotor Scraper - for 8000 micron Rotor	05-08
Finishing Rotor Scraper	05-09
Rotor Test Dye (≈ 40cc)	30-05

ROTORS AND ADSORBENTS	CATALOG NO.
2000 micron Pre-Scaped Silica Gel Rotor	02205p
4000 micron Pre-Scraped Silica Gel Rotor	02206p
6000 micron Pre-Scraped Silica Gel Rotor	02207p
8000 micron Pre-Scaped Silica Gel Rotor	02208p
Silica GF Rotor Mix (1kg)	02210
Silica GF Rotor Mix (5kg)	02250

Developing Chambers & Accessories

Smaller Developing Tanks For 10 x 10 cm Plates

These tanks are designed for the development of 10x10cm or smaller TLC Plates. The smaller size of the chambers significantly reduces the amount of solvent needed for development. The single molded tank design includes flat ground tops, beveled for safety on the inner and outer rims, and flat ground bottoms for stability.

Latch-Lid™ units have a unique latching device that holds the matching ground glass surfaces of the lid and tank firmly in place. Metal components of the latch-lid mechanism are made of stainless steel.

A

B

Standard Tanks

Inside Dimensions: 12cm W x 8.6cm D x 11.5cm H

DESCRIPTION	CATALOG NUMBER
Standard Latch-Lid Tank Unit with aluminum rack	70-25
Standard Latch-Lid Tank Unit	70-29
Standard Tank and Lid Unit	70-30
Aluminum Rack for 70-25 or 70-30	70-28
Aluminum Rack (Teflon coated) for 70-25 or 70-30	70-28T

A. Tank and Lid Unit

B. Standard Latch-Lid and Tank Unit with Aluminum Rack

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Analtech's glass TLC developing chambers provide optimum developing conditions for a variety of TLC plate sizes and shapes. Precision ground surfaces provide tight seals between tanks and glass covers and permit complete saturation of chambers with solvent vapor for uniform development of chromatograms.

NOTE: Each chamber is shipped with the appropriate lid.

Replacement Lids

DESCRIPTION	CATALOG NUMBER
For 70-22 & 70-21	71-22
For 75-52 (7.5 cm dia.)	76-52
For 75-12 (14.5 cm dia.)	76-12
For 70-30	76-30
For 70-36	76-36
For 70-00 (new)	71-00b
For 70-33	70-35
For 70-25 & 70-29	70-27
For 80-33 & 80-26	80-34

Developing Tanks

DIMENSIONS	INSIDE DIMENSIONS (CM)	SHIPPING WEIGHT (EACH)	CATALOG NUMBER
RECTANGULAR CHAMBERS			
For 20 x 20cm TLC plates	25 H x 28 W x 7.5 D	17 lbs.	70-22
For 10 x 20cm TLC plates (horizontal)	13 H x 28 W x 7.5 D	9 lbs.	70-21
RECTANGULAR LATCH-LID™ CHAMBERS			
For 20 x 20cm TLC plates	25 H x 28 W x 7.5 D	18 lbs.	80-33
For 10 x 20cm TLC plates (horizontal)	13 H x 28 W x 7.5 D	10 lbs.	80-26
CYLINDRICAL CHAMBERS			
For 5 x 20cm TLC plates (vertical)	21.5 H x 6.5 Dia.	4 lbs.	75-52
For 10 x 20cm TLC plates (vertical)	22.5 H x 12.5 Dia.	6 lbs.	75-12
MICRO CHAMBERS			
For 5.0 x 10cm plates (pkg of 3)	12.5 H x 5.7 Dia.	3 lbs.	70-00
For 5.0 x 10cm plates (1 each)	12.5 H x 5.7 Dia.	1 lb.	70-05

Saturation Pads

Analtech offers improved saturation pads made from a textured paper. This provides greater surface to assist in rapid vapor saturation of a TLC chamber air space. The majority of TLC separations are performed under saturated conditions in large chambers to insure even solvent migration. Also, the strategic placement of pads saturated with solvent in the developing chamber helps assure rapid and uniform saturation of the entire atmosphere with solvent vapor, thereby reducing edge effects.

Each package contains 100 saturation pads.

DESCRIPTION (100/PKG)	CATALOG NO.
TLC Saturation Pads 20 x 20 cm	81-24
TLC Saturation Pads 10 x 20 cm	81-12
TLC Saturation Pads 10 x 10 cm	81-06

SATURATION PAD BENEFITS

- Insure uniform chamber saturation by solvent vapor
- Improve Rf reproducibility
- Reduce "edge effect" on separations

Radial/Circular Developing System for HPTLC

Radial development on HPTLC plates increases separation of low Rf spots and gives better resolution than with linear development. Circular development provides a rapid means of analyzing single samples or for scouting solvent conditions in methods development.

The Analtech Radial/Circular Developing System is designed for the development of radial and circular chromatograms on 10 x 10 cm HPTLC plates.

The Radial/Circular Developing System includes the chamber, the base with solvent reservoir, two clamps, the spotting guide, 500 wicks of each type, and complete instructions.

Linear Sandwich Chamber Kit for HPTLC

The Analtech Linear Sandwich Chamber Kit is designed for linear development of 10 x 10 cm HPTLC plates in a vapor unsaturated mode. The glass-backed plate forms one wall of the chamber with the adsorbent facing inward. The solvent reservoir requires only 6 ml of solvent.

The Kit includes a one piece brace and solvent reservoir, a spacer gauge, stainless steel chamber, clamps, and instructions for use. See Web Site for image of kit.

DESCRIPTION	CATALOG NO.
Radial/Circular Developing System	60-00
Hydrophobic Wicks (500 replacements)	60-01
Hydrophilic Wicks (500 replacements)	60-02
Linear/Sandwich Chamber Kit	60-40
Linear Sandwich Adapter[1]	60-55
Radial/Linear Comb. Developing System[2]	60-60

1. Converts radial/circular system to linear sandwich mode
2. Includes 60-00, 60-55, 21-00 (NANOCAP Kit), and 59077 (a box of 25 HPTLC UNIPLATES™).

Plate Conditioning Apparatus

Catalog# 85-02

The Stainless Steel Plate Conditioning Apparatus includes glass developing chamber, a multi-plate rack for holding up to five 20 x 20cm TLC plates, plus a special lid assembly with hooks for suspending the rack above the solvent in the developing chamber. After the appropriate equilibration period, the rack can be lowered to begin developing of the TLC plates without removing the lid.

The Plate Conditioning Apparatus improves reproducibility of Rf values by assuring proper equilibration before developing begins.

The Plate Conditioning Apparatus is supplied as a complete package including a glass developing chamber. All components may be purchased individually as replacement parts.

Replacement parts for plate conditioning apparatus

DESCRIPTION	CATALOG NO.
Plate Conditioning Lid	85-00
Multi-Plate Rack	80-01
Glass Developing Chamber	70-22

85-02

PLATE CONDITIONING APPARATUS

- Holds up to 5 plates
- Lowers plates for development without opening chamber
- Improves Rf reproducibility
- Insures solvent vapor saturation

Aluminum Rack (anodized)

Catalog# A80-31

Anodized aluminum rack holds up to six 20 x 20 cm TLC plates for simultaneous development in the #A70-22 developing chamber. Also useful for activating or treating TLC plates.

80-31

HPTLC Two-Plate Rack

Catalog# A80-02

Stainless steel rack for use with glass developing chambers. Holds two 10x10 cm, 10x20 cm, or 5x20 cm TLC plates. Short replacement shaft is included for use with short chamber. Rack fits in the cylindrical chambers for 10 cm wide plates.

80-02

Desiccating Cabinet for TLC, Stainless Steel

Catalog# 50-03

50-01

Featuring a carrying handle, this 20 gauge stainless steel cabinet has a removable desiccant tray and gasketed door with positive lock door latch. This unit holds a stainless steel drying rack, Part No. 50-00 (not supplied with unit).

Cabinet weighs 12lbs (5.4kg), and measures 25cm D x 25cm W x 30cm H (9.75'' D x 9.75'' W x 11.75'' H).

TLC Plate Storage Carrier

Catalog# 50-00

50-00

This sturdy, stainless steel rack safely holds ten 20 x 20 cm TLC UNIPLATES™ (or a number of smaller plates at least 20 cm wide) for drying or storage. A backstop on each set of slides prevents plates from falling out the rear and permits vertical mounting of plates when optimum circulation is desired. Handle design tilts the rack when carried to prevent plates from sliding. Also available for 10 x 10 cm plates (CAT# 50-10)

TLC Plate Holder (plastic)

Catalog# 50-02

50-02

Lightweight and totally immune to contamination or disintegration from usual TLC solvents or chemicals. The sloping bottom grooves guide TLC plates to the vertical grooves which hold plates in an upright position. Holds up to 25 TLC plates of any size.

Adsorbent Scraper

Scraping adsorbent layers is greatly improved with this steel flat-blade scraper. Blade is 13 mm wide and tapered to a sharp edge for rapid removal of adsorbent from plate. Handle is aluminum. A good general purpose tool for the laboratory.

DESCRIPTION	CATALOG NO.
Adsorbent Scraper	05-00
Replacement Blades (pkg/5)	05-01

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TLC Reagent Sprayer
Catalog# 41-00

A glass sprayer with a specially designed head to eliminate formation of droplets and spattering. This feature assures delivery of a fine misty spray and ends problems from uneven discharge. Can be used with an air line or the rubber bulb supplied. The volume of the reagent flask is 100 ml. Replacement spray heads (Cat# 41-01) are also available.

41-00

Analtech TLC Sprayer Kit (3 units)
Catalog# 40-01

A refillable sprayer powered by its own self-contained replaceable pressure unit. Can be used with all common TLC reagents. Delivers up to 16 ounces of reagent from each pressure unit. Aspirating tube is made of polypropylene and the particulate filter is nylon. Meets EPA requirements for approved propellants (CFC Free).

Replacements for sprayer kit

DESCRIPTION	CATALOG NO.
Pressure Units (pkg/12)	40-02
Reagent Jars (pkg/12)	40-03

43-00

40-01

Spray Support
Catalog# 43-00

Stainless steel rack holds TLC plate in proper position for spraying with visualization reagents. Self-draining, no solvent feedback. Works well in combination with Analtech's Disposable Spray Booth (Cat# 42-00).

43-00

Disposable Spray Booth (pkg/5)
Catalog# 42-00

This spray booth is large enough to accommodate all standard size TLC plates. Protects other laboratory areas from contamination by TLC visualization reagents. After use, can be disposed of in ordinary waste container.

42-00

The TLC plate rests directly on the heat distributor and is enclosed within a narrow vapor space to insure maximum density of reagent vapors. A Pyrex® window allows the reaction to be followed for optimal color development. A tubular port permits the introduction or removal of vapors and doubles as a plate removal device.

90-00

Vapor Phase Fluorescence (VPF) Visualization Chamber

The Analtech Vapor Phase Fluorescence Chamber is a new advance in the fields of qualitative and quantitative TLC. Difficult-to-detect compounds, such as sugars, can now be located at the nanogram level through chemically induced fluorescence.

VPF is a general fluorogenic visualization reaction accomplished by heating the TLC plate in the presence of ammonium bicarbonate. Fluorescence is one of the most sensitive and easily quantitated TLC detection methods.

The visualization chamber is invaluable for sulfuric acid charring and other detection techniques requiring heat for the formation of derivatives. The chamber is very useful for activation and evaporation of residual mobile phase.

The unit consists of an aluminum block heat distributor surrounded by a stainless steel frame and non-asbestos insulation. The device mounts on a standard 6.5 X 6.5 inch hot plate (included in Catalog # 90-00) and insures rapid rise to the set temperature and even heat distribution. A thermometer extends from the aluminum core to allow accurate reading of temperature for reproducible analysis.

DESCRIPTION	CATALOG NO.
VPF Visualization Chamber (with hot plate & #90-99)	90-00
VPF Visualization Chamber (without hot plate, with #90-99)	90-01
Hot Plate (only) 120V or 230V	90-05
Ammonium Bicarbonate (50g)	90-99

It is a good morning exercise for a research scientist to discard a pet hypothesis every day before breakfast.

Konrad Lorenz,

Austrian zoologist

Lightweight UV Cabinet

This compact, lightweight UV cabinet will accommodate TLC plates up to 20 x 20 cm. The UV lamp is removable and may be used separately, for example, for viewing freshly sprayed plates without removing them from the fume hood.

Access to the interior of the cabinet is via a flexible, dark curtain on the front of the cabinet. The contoured viewing port contains a built-in contrast-control filter which absorbs both UV light and “blue haze” for safe viewing without eye fatigue.

This cabinet is available in two versions. The standard version (Catalog #93-06) incorporates a portable lamp containing 6 watt tubes and offers typical light intensities at the cabinet floor of 350 µW/cm2 at 365 nm and 420 µW/cm2 at 254 nm. The economy version (Catalog #93-04) uses a portable lamp containing 4 watt tubes and produces typical light intensities at the cabinet floor of 300 µW/cm2 at 365 nm and 310 µW/cm2 at 254 nm.

DESCRIPTION	CATALOG NO.
Lightweight Viewing Cabinet (with 6 watt lamp)	93-06
Lightweight Viewing Cabinet (with 4 watt lamp)	93-04
Lightweight Viewing Cabinet (no lamps included)	93-01

Available in 110V or 230V.

Portable UV Lamps

Analtech offers a full range of UV lamps with various combinations of UV wavelength, intensity, size and wattage. Each UV lamp is designed for ease of use and will provide hours of trouble-free operation. They are highly recommended as compact and economical sources for TLC and gel visualization.

All UV lamps that Analtech sells feature a silver-anodized aluminum housing that makes the lamps both attractive and durable. A corrosion-resistant, specular-aluminum reflector optimizes UV irradiance. These lamps come with integrally filtered or unfiltered UV tubes, available with or without a separate filter assembly. Unfiltered tubes provide the highest UV intensity.

Listed below are the most commonly used for TLC applications. The combination lamps incorporate separate tubes for short and long wave illumination.

DESCRIPTION	CATALOG NO.
LONG WAVE PORTABLE UV LAMP (UV-A 365nm)	
4-Watt (with Integrally Filtered Tube)	EA-140
6-Watt (with Integrally Filtered Tube)	EA-160
8-Watt (with Integrally Filtered Tube)	EA-180
16-Watt (with 2 x 8-Watt Tubes & Filter)	93-50
SHORT WAVE PORTABLE UV LAMP (UV-C 254nm)	
4-Watt (with Filter Assembly)	EF-140C
6-Watt (with Filter Assembly)	EF-160C
8-Watt (with Filter Assembly)	EF-180C
16-Watt (with 2 x 8-Watt Tubes & Filter)	93-51
MEDIUM WAVE PORTABLE UV LAMP (UV-B 312nm)	
6-Watt (with Filter Assembly)	EB-160C
8-Watt (with Filter Assembly)	EB-180C
16-Watt (with 2 x 8-Watt Tubes & Filter)	93-53
COMBO WAVE PORTABLE UV LAMP (UV-A & UV-C)	
4-Watt (2 Tubes & Filter Assembly)	93-24
6-Watt (2 Tubes & Filter Assembly)	93-26
8-Watt (2 Tubes & Filter Assembly)	93-28
Accessory Stand for Lamps	93-30

Additional UV lamps not shown in this catalog are available from ANALTECH. For a complete listing please visit our Web Site. Available in 110V or 230V.

Typical Peak Intensities at a 15 cm distance (partial list):

4 watt combo lamp: 300 µW/cm2 at 365 nm and 310 µW/cm2 at 254 nm.

6 watt combo lamp: 350 µW/cm2 at 365 nm and 390 µW/cm2 at 254 nm.

8 watt combo lamp: 470 µW/cm2 at 365 nm and 500 µW/cm2 at 254 nm.

For complete list of Peak Intensity Profiles request our UV Lamps Data Sheet.

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ChromaDoc-It TLC Imaging System

This brand new imaging system was designed specifically for TLC applications and works well with either reflected UV light (short and long wave) or white light. The ChromaDoc-It features a 12 megapixel digital camera plus overhead UV providing outstanding flexibility for color TLC documentation and imaging.

System Overview

The cabinet contains two built-in overhead UV lamps, each with a 15-watt short wave (254nm) and long wave (365nm) UV tube. The lamps are positioned equidistant from the photo platform below for uniform illumination. There is also an interior overhead white light provided for ease of setup. The camera and image capture functions are controlled by the Doc-It software by way of a USB connection between the camera and your computer. This software allows capture of quality, high resolution images and offers many features for maximizing image output.

Image Analysis Software

Since its release in 2003, the Doc-It 1D Analysis software has been upgraded to be more compliant with 21CFR Part 11. It is designed for analysis of TLC plates, gels, and other membranes. Now, you can generate easy to interpret quantitative data of lanes and bands as well as create detailed and user-configured reports showing the analysis results. For all the details visit our Web Site at MilesScientific.com.

Specifications

Digital Camera: Color Digital Camera, 12 megapixels, resolutions from 640x480 to 2592x1944, 4x optical zoom lens, UV filters and diopter, USB interface, Li-Ion rechargeable battery

Software: Many 21CFR Part 11 compliant features; Large selection of image capture and effects settings, compatible with Windows 98, ME, 2000, and XP

Cabinet: Overhead 254nm/365nm UV lamps and white light, soft rubber viewport and contrast control filter, lightweight access curtain, dimensions: 19.75W x 16.5D x 15.75"H (60.2 x 41.9 x 40 cm)

Power: Available in 110V and 230V

DESCRIPTION	CATALOG NO.
ChromaDoc-It TLC Imaging System (complete with all items listed below)	96-30
Doc-It LS Analysis Software	96-31
White Light Transilluminator	93-37

Note: The white light transilluminator is not included with the ChromaDoc-It system

SYSTEM COMPONENTS

- Darkroom Viewing Cabinet
- 16W Combination 254/365 nm UV Lamps, built-in (qty 2)
- 12 Mega Pixel Color Digital Camera
- Doc-It Imaging Software
- UV Filters and Diopter

HPLC Columns

NEW

Analtech is proud to offer, for the first time, High Pressure Liquid Chromatography Columns. Analtech is partnering with Separation Methods Technologies - another company committed to excellence in chromatography.

Separation Methods Technologies (SMT) utilizes proprietary bonding technologies that result in bonded phase coverages that approach 100%. SMT's methods of bonding allow the density of the functional ligands to be controlled with appropriate spacer molecules, a novel procedure that ensures TOTAL COVERAGE and highly cross-linked polysiloxane under layer structure. The results are bonded phases that are well protected and that show unprecedented resistance to both acid and base hydrolysis. Self-Assemled Monolayers (SAM) technology provides you with the widest range of column retention selectivities and performance benefits.

HPLC Method Development - Choosing a column

The column of choice for analytical methods development is very easy; the best column for an application is the column that gives the highest performance under the most favorable condition desired by the end-user. Most analytes are acidic, basic or neutral. The best initial approach is to use a mid-range pH, such as pH 7. The standard SMT SAM-C18 and C8 columns are the best choice for use at this pH because they provide superior column lifetime, extremely high selectivity and resolution. Acetonitrile or methanol and water are normally the first choice for mobile phase.

Another option is combination of organic solvent with phosphate buffer (with buffer range pH 6.2-8.2) or acetate buffer (with buffer range pH 3.8-5.8). Method development optimization can continue from here by changing several factors, including mobile phase, pH, column temperature (up to 95 degrees C). SMT SAM-C18 is uniquely stable to high temperatures, a characteristic that can be used as an additional tool to improve resolution.

Using a low pH mobile phase results in the best peak shapes for basic compounds because these analytes are fully protonated and exhibit low retention and tailing. SMT SAM C18 or C8 columns are the best choice providing longest available lifetime and performance at low pH.

Separations at high pH region may also be the most appropriate for certain compounds. For example, it may be possible to separate bases in their free form – where they are not charged. Here the retention increases as the chance of obtaining the desired selectivity improves. SMT SAMC18 column has highest ligand density available and offers the best protection (up to pH 12) of the silica substrate from being dissolved by the strongly basic mobile phase.

Self-Assembled Monolayers (SAM) in Separation Science

Self-Assembled Monolayers (SAM) are supramolecular organizates resembling, in some respects, the well-known Langmuir-Blodgett (LB) built-up films while displaying other distinct and rather unique features. Much of the interest in SAM stems from their potential in a wide range of scientific and technological applications. The first application of SAM in chromatographic separation science was developed at the University of Delaware by Fatunmbi and Wirth.

The bonding technique allows ordered monolayers of functional molecules to be chemically immobilized on solid substrates, such as silica and alumina. The technique of bonding was termed "horizontal polymerization" due to the fact that there is significant Si-O-Si bridging parallel to the silica substrate. This is achieved by reaction of trifunctional silanizing agent with the silica substrate under anhydrous condition, except for a monolayer of water on silica. This contrasts with conventional polymerization of trifunctional silanes, referred to as "vertical polymerization," where water is deliberately added to polymerize the reagents before attachment to the surface. The key structural difference is that horizontal polymerization provides much higher ligand density at the silica surface boundary.

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Specialty Columns and Applications

SMT has a special interest in surface modification and materials engineering. When separation is difficult with conventional bonded phases, SMT assists in method development and special column design for new applications. SMT specialty columns include special columns designed for reversed phase, normal phase, and ion exchange chromatography. These columns are specially designed for companies that are interested in having competitive advantage in separation and surface modification. The following specialty columns are currently available:

COLUMN	FUNCTION
PAH	Analysis of polyaromatic hydrocarbons
TNT	Separation of Explosives
OD-IQ and OIQ	Polar/nonpolar/basic compounds
C12	Nonpolar/Polar compounds
C30	Nonpolar compounds
Urea	Polar compounds
QuickSep	Quick screening/analysis
ChiralSep	Enantiomers
MetalSep	Metal Removal
C6F5	Separation of Taxols
USP	Regulated Analytical Methods
Micro/Narrow Bore	LC/MS, LC/GC, Drug Screening
Guard	Column Guard

Introduction to SMT SAM-C18 Columns and Packings

SMT SAM-C18 or [OD] column is usually the first column of choice for reversed-phase chromatographic separation or method development. When compared to other columns such as a C8, C4, CN, phenyl, or an amino bonded phase, C18 is the most hydrophobic.

SMT SAM-C18 column is very stable at a wide pH range and high temperatures. Separation of most basic solutes is often possible without trifluoroacetic acid (TFA) or other mobile phase additives. SMT packings enable you to achieve a broader pH range than what is accessible with other commercially available packings. SMT utilizes a novel self-assembled monolayers technology in all its bonding chemistries to achieve maximum coverage. The technique involves pre-treatment of the silica substrate including rigorous control of water molecules. A mixture of trifunctional ligands is then allowed to come in contact with the substrate. The result is an unprecedented high-density assembly of molecules on the substrate. The unique aspect of SAM is that only a monolayer of coverage is achieved when the bonding is performed accordingly. At least one of the ligands (e.g. C18) is functional for the separation while the other (e.g. C1) is used as a spacer molecule, although, it too can impact certain selectivity needed for some separation. A typical coverage achievable with SAM is 7-8 ^{o}mole/m^{2}. This coverage value is equivalent to the maximum achievable coverage on any substrate and it is about 50% higher than that achievable using the most exhaustive conventional bonding and end-capping methods available in the market today.

SMT Column Series

SMT COLUMN SERIES	DESCRIPTION
SMT-SAM-C18 [OD-Series]	**SMT-C18 phase with the highest functional ligand coverage confirmed with carbon analysis results of 24% carbon load.**
SMT-SAM-C18 [ODL-Series]	SAM-C18 phase with the lowest functional ligand coverage confirmed with carbon analysis results of 12% carbon load
SMT SAM-C18 [Elite C18 series]	SMT Elite-C18 phases is designed to have intermediate functional ligand coverage confirmed with carbon analysis results of 16% carbon load
SMT SAM-C8 [O series]	SMT SAM-C8 phase with the highest functional ligand coverage confirmed with carbon analysis results of 12% carbon load.
SMT SAM-C8 [OL series]	SMT SAM-C8 phase with the lowest functional ligand coverage confirmed with carbon analysis results of 6% carbon load
SMT SAM-C8 [Elite-C8 series]	density of the functional ligand, octyl molecule or C8, is moderated with the proprietary spacer molecule to ensure max. coverage
SMT MEB1 series	The functional ligand is methyl, C1 with carbon analysis results of about 1% carbon load
SMT MEB2 series	The functional ligand is ethyl, C2 with carbon analysis results of 2% carbon load
SMT MEB4 series	The functional ligand is butyl, C4 with carbon analysis results of about 4% carbon load
SMT-Phen1 series	contains one phenyl per ligand - provides unique selectivity for aromatic compounds
SMT-Phen2 series	contains two phenyls per ligand - ideal for the separation of proteins, peptides and other biomolecules
SMT Diol1 series	acid-catalyzed cleavage of 3-(2,3-epoxypropoxy) propyl as the functional ligand
SMT-Diol2 series	acid-catalyzed cleavage of 5,6-epoxyhexyl as the functional ligand
SMT-Aminopropyl [NH2]	recommended for the separation of polar compounds and can be used in 3 separation modes: Normal, Weak anion exchange, and RP
SMT-Cyanopropyl [CN]	When used in reversed-phase mode, with relatively polar solvents, CN-stationary phase offers complimentary selectivity that may be unattainable with traditional reversed-phase packings such as C18 and C8
SMT-SAX series	silica-based Strong Anion eXchange packing developed for separation of anionic compounds
SMT-WAX series	silica-based Weak Anion eXchange packing materials developed for separation of anionic compounds
SMT-DEAE series	[Di-Ethyl-Amino-Ethyl] columns provide a unique chemically attached hydrophilic, weak anion exchange type, functional surface desirable for the separation of many biomolecules such as proteins, nucleotides, oligonucleotides, polynucleotides, high molecular weight RNA's and plasmid DNA's
SMT-SCX series	silica-based Strong Cation eXchange packing materials developed for separation of cationic compounds. SMT-SCX consists of chemically attached hydrophilic surface derivatized to form sulfonic acid functionality
SMT-WCX series	silica-based Weak Cation eXchange packing materials developed for separation of cationic compounds. SMT-WCX consists of chemically attached hydrophilic surface derivatized to form carboxylic acid functionality
SMT PAH series	SMT PAH1 columns consist of octadecyl functional ligands and are made with silica with proprietary pore size
SMT-TNT series	specially designed C18 column for use in the reversed-phase separation of nitroaromatic and nitroamine derivatives
SMT OD-IQ series	unique reversed phase packing material designed to have both hydrophobic and truly hydrophilic spacer ligands. The mixed-phase consists of a meticulously controlled mixture of hydrophobic, C18 molecules, and proprietary hydrophilic molecules
SMT-C30 series	columns consist of Triacontyl as the functional ligand
SMT-Urea series	columns consist of Ureidopropyl as the functional ligand
SMT QuickSep series	specially designed for rapid resolution - these columns are ideal for fast analysis, drug screening, and purification
SMT ChiralSep series	chiral column may contain one form of an enantiomeric compound immobilized on the surface of a packing material
SMT MetalSep series	proprietary strong cation exchange functional ligands that are chemically attached on silica substrate using SAM technique
SMT -C6F5 series	columns consist of Pentafluorophenyl as the functional ligand
SMT Micro/Narrow Bore series	columns are nonstandard columns designed for special HPLC applications (such as LC/MS and LC/GC)

UNIQUE FEATURE
Highly versatile; strongly recommended for basic compounds
Fast mass transfer and very high efficiency for the separation of highly hydrophobic molecules
Moderately hydrophobic; Offers comparable carbon load as most other commercially available C18 columns and faster mass transfer than SAM OD-series
SMT SAM-C8 columns are designed to withstand a pH range of 1-10
The spacer molecules protect the substrate from aggressive pH conditions and impact unique selectivity compared with other C8 phases
These phases are moderately hydrophobic; nevertheless, designed to tolerate usage in very aggressive pH conditions and high temperatures
These phases are the least hydrophobic of all the MEB columns
These phases offer medium hydrophobicity when compared with all the other MEB phases
These phases offer the highest hydrophobicity when compared with all the other MEB phases
Offers preferential retention of aromatic compounds
ideal for the separation of proteins, peptides and other biomolecules
High loading capability and improved sample recovery
High reproducibility of bonded ligand resulting in consistent separation
Improved separation of polar solutes; excellent sample recovery; high loading capability
Homogeneous CN-functional surface that permits faster equilibration than unmodified hydroxyl silica surface
Superior selectivity and efficiency in the separation of proteins and biomolecules
Superior selectivity and efficiency in the separation of proteins and biomolecules
Fast reequilibration and very negligible non-specific protein interaction, High density tertiary amine functional groups that provide better selectivity and recovery compared to conventional DEAE
superior selectivity and efficiency in the separation of proteins and biomolecules with medium to high [isoelectric point] or pH values,
Superior selectivity and efficiency in the separation of proteins and biomolecules
Superior monitoring of polyaromatic hydrocarbons (PAH) - large organic compounds produced during combustion
Highly reproducible mixed bonded phase; consistent separation of analytes
Stronger retention of polar molecules in aqueous eluent, Reduced backpressure; the hydrophilic hybrid enhances the solvation of the bonded phase in an aqueous environment. Eliminates the need for ion pairing reagents
columns offer selectivities that are much different from C18 reversed-phase columns when applied to separation of carotenoid and related compounds
columns are specially designed for the separation of extremely basic analytes that are not retained in traditional reversed-phase columns
Quick screening for method development; QuickSep columns can be used to assess columns suitability for a particular analysis
At least three points of simultaneous interaction between the chiral phase and one analyte enantiomer, with at least one point of stereo-chemical dependence
strong selectivities toward heavy metal ions such as Copper, gold, nickel, silver, iron, etc. Applications include precious metal recovery and waste water purification
columns are specially designed for the separation of Taxols
greatly enhanced sensitivity, ideal for applications in genomics and proteomics

HPLC Column Selection Guide

SMT SUPERIOR COLUMN SERIES	EQUIVALENT COLUMNS	USP DESIGNATION
SMT-SAM-C18 [OD-Series]	**Luna C18; Symmetry C18; YMC ODS-AM; Xterra C18; Kromasil C18; Inersil C18**	**L1**
SMT-SAM-C18 [ODL-Series]	Luna C18; Symmetry C18; YMC ODS-AM; Xterra C18; Kromasil C18; Inersil C18; Zorbax SB C18	L1
SMT-SAM-C18 [Elite C18 series]	Luna C18; Symmetry C18; YMC ODS-AM; Xterra C18; Kromasil C18; Inersil C18	L1
SMT-SAM-C8 [O series]	Luna C8; Symmetry C8; YMC-Pack C8; Xterra C8; Kromasil C8; Inertsil C8	L7
SMT-SAM-C8 [OL series]	Luna C8; Symmetry C8; YMC-Pack C8; Xterra C8; Kromasil C8; Inertsil C8; Zorbax SB C8	L7
SMT-SAM-C8 [Elite-C8 series]	Luna C8; Symmetry C8; YMC-Basic, Pack C8; Xterra C8; Kromasil C8; Inertsil C8	L7
SMT-MEB1 series	Luna C5, Kromasil C1	L13
SMT-MEB2 series	Zorbax SB C3	
SMT-MEB4 series	Kromasil C4; Zorbax C4	L26
SMT-Phen1 series	Luna Phenyl; BetaSil Phenyl	L11
SMT-Phen2 series	YMC-Pack Phenyl; Zorbax Phenyl	L11
SMT-Diol1 series	Lichrosorb Diol; Spherex Diol	L20
SMT-Diol2 series	YMC-Pack Diol; NucleoSil Diol	L20
SMT-Aminopropyl [NH2]	Luna NH2; Kromasil NH2; YMC-Pack-NH2	L8
SMT-Cyanopropyl [CN]	Luna CN; Zorbax SB CN; YMC-Pack CN	L10
SMT-SAX series	Hypersil SAX; Vydac SAX; PureGel SAX	L12; L14
SMT-WAX series	Vydac WAX; BioSep DEAE	
SMT-DEAE series	BioSep DEAE; TSK DEAE	
SMT-SCX series	Vydac SCX; PureGel SCX; Capcell Pak SCX	L9
SMT-WCX series	PartiSphere WCX; Gammabond WCX	
SMT PAH series	Luna C18; EnviroSep PAH; Vydac PAH	
SMT QuickSep series	Luna C18; C8, C4, etc.; Symmetry C18, C8, etc.; Inertsil C18, C8, etc.	
SMT -C6F5 series	Phenomenex-Curosil; SupelcoSil LC-F	
SMT-Silica series		L3

SMT Manufactures Ion Exchange and Specialty Columns Such As:

Aminopropyl (NH2) columns, Cyanopropyl (CN) columns, DIOLS (OH) columns, Phenyl columns, DEAE columns, SAX columns, WAX columns, SCX columns, WCX columns, TSX colums

SMT manufactures columns for USP methods including:

UPSL7 and USPL1

Also available as L3, L8, L9, L10, L11, L13, L14, L20, L26, L27, and other unclassified phases, such as C12 and C30.

PHONE: 800.441.7540 • 302.737.6960 FAX: 302.737.7115
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MZ ANALYSENTECHNIK

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, www.mz-at.de

ANALTECH INC.
75 Blue Hen Dr.
Newark, DE 19714

TOLL FREE: 800.441.7540 | 302.737.6960
FAX: 302.737.7115
URL: WWW.ANALTECH.COM