

# CAMMAG

World Leader in Planar Chromatography

## Automatic TLC Sampler 4

Setting New Standards in Planar Chromatography



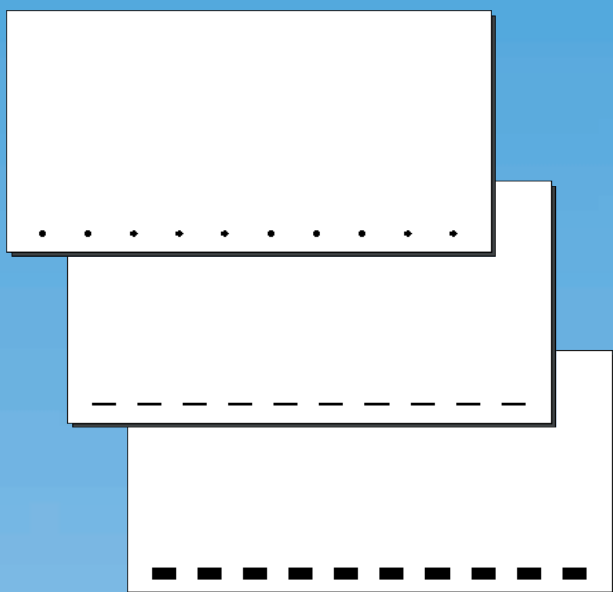
Precise, fully automatic sample application for

- qualitative analysis, screening, high throughput analyses
- quantitative analysis
- preparative separations
- application of solutions onto any planar medium

# CAMAG Automatic TLC Sampler 4 (ATS4)

Sample application is the first step of planar chromatography (instrumental TLC) and thus determines the quality of the analysis.

Automatic sample application is a key factor for productivity of the TLC-laboratory. The requirements for an instrument serving this purpose, i.e. precision, robustness during routine use and convenient handling are fully met by the CAMAG Automatic TLC Sampler 4.

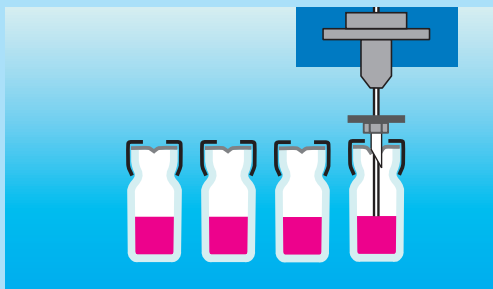


Samples can be applied spotwise by contact transfer or in the form of bands or rectangles by spraying. Narrow bands as starting zones ensure the highest resolution attainable with the planar chromatographic system selected. Sample application in the form of rectangles allows the application of large volumes or volume per time unit without washing away the layer. This is especially important when aqueous sample solutions are to be applied. Prior to chromatography, rectangles are focused into narrow bands with a solvent of high elution strength.

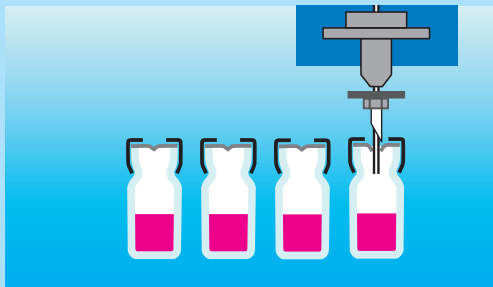
## The Automatic TLC Sampler 4 in brief

- Precise
- Reliable
- High sample throughput, suitable for routine use
- Application in the form of spots, bands or rectangles, "overspotting"
- Self-adjusting object support, suitable for all types of layers, glass, foil, preparative
- Suitable for standard sample vials and 96-well-plates
- Controlled by the winCATS Planar Chromatography Manager designed as 32 bit application for Windows™
- Operation in stand-alone mode with up to 6 stored application methods
- The CAMAG Automatic TLC Sampler 4 with winCATS is compliant with the requirements of GMP/GLP and can be IQ/OQ qualified. To use the instrument in a 21 CFR Part 11 environment, the winCATS option "21 CFR Part 11 compliance ready" is required.

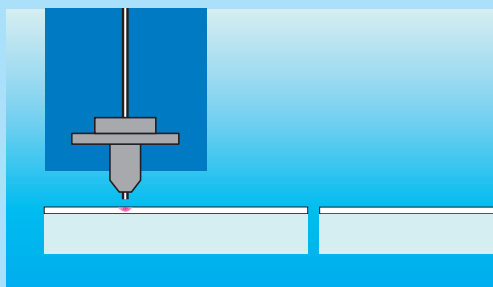
# Function of the ATS4



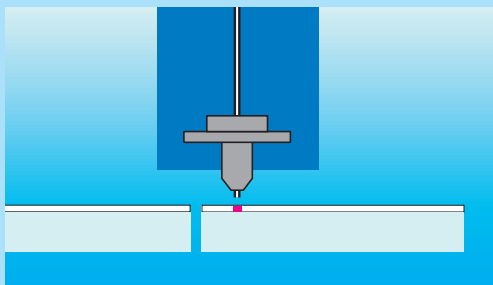
An application sequence starts with the take-up of the sample. The septum is punched and the needle lowered into the sample vial through the septum punch. Then the syringe is filled with sample solution.



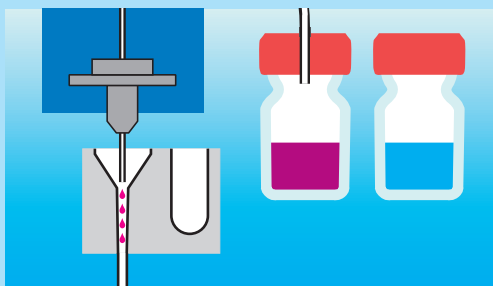
The septum punch is retracted before the needle to ensure that the outside of the needle is wiped off by the tightly closing septum.



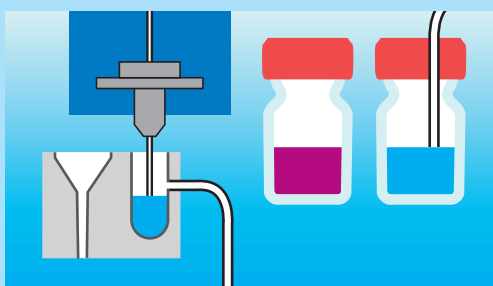
Prior to the first application from a newly filled syringe, a small sample volume is pre-dosed onto a waste plate in order to generate reproducible conditions at the needle tip. Pre-dosage is effected in the same way as intended for sample application, i.e. by contact spotting or by spray-on technique.



The syringe moves to the programmed position of the plate and starts application of the desired sample volume. If several applications of the same sample have been programmed, these are applied in sequence from the same syringe filling, provided the remaining volume is sufficient. Otherwise the syringe is automatically refilled.



After the final application of this sample solution the syringe is emptied into the waste recipient.



The syringe is filled with rinsing solvent, the plunger moved past the side connection and some additional rinsing solvent is aspirated off.

Finally the rinsing solvent is emptied into the waste recipient, and the dosing system is ready for the next application sequence.

# Features of the Automatic TLC Sampler 4

The ATS4 utilizes special syringes 10, 25 or 100  $\mu\text{L}$  made by Hamilton™ with fixed or detachable needles. There are different needles for contact and spray-on application.

Syringes with detachable needle offer the advantage that a damaged needle can be easily replaced. However, these syringes demand close monitoring of tightness of the connection between needle and syringe.

Syringes with fixed needle offer higher reliability and thus more convenient handling, i.e. in conjunction with instrument qualification. In case of damage to the needle the complete syringe has thus to be replaced.

Sample volumes of 0.1 to 5  $\mu\text{L}$  per spot can be applied by contact application. For volumes of 0.5 to >50  $\mu\text{L}$  spray-on application in the form of bands or rectangles is recommended. Rectangles allow the application of larger volumes or using a higher delivery speed without washing away the layer. This is especially important for aqueous samples.

Selection of syringe size: Since in each filling cycle the syringe is completely filled with sample solution (syringe volume plus about 10  $\mu\text{L}$ ) its size should be chosen so that in normal operation one filling is sufficient to apply the desired number of replicates or series of standards. In cases where the volume exceeds the capacity of the syringe, the ATS4 will automatically refill the syringe.

If solutions are to be applied from vials without closure or from well plates, it is recommended to cover these with the optional baffle bridge with septum foil in order to provide sufficient cleaning of the outside of the needle.

The ATS4 allows "overspotting", i.e. a sequential application of volumes from different vials onto the same position. This technique can be used e.g. for spiking or for pre-chromatographic derivatization.

## The cover

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is designed to protect the object from environmental factors during sample application. The cover can be opened on its front side for changing samples and plates or it can be fully removed.

## Waste and rinsing position

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## Exchangeable sample rack

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The standard rack has 66 positions for standard 2 mL vials (12×32 mm), e.g. Chromacol™. Sample vials can be sealed with normal rubber septa. Optional special racks hold 96-well-plates, 15 or 45 mm height respectively.





Waste and rinsing bottles

readily accessible for emptying or refilling

Spray nozzle:

Instead of a normal nozzle the ATS 4 can be equipped with an optional heated spray nozzle. Heating assists the application of large sample volumes or of solvents of low volatility (such as aqueous solutions). This option can only be factory installed.

Key pad

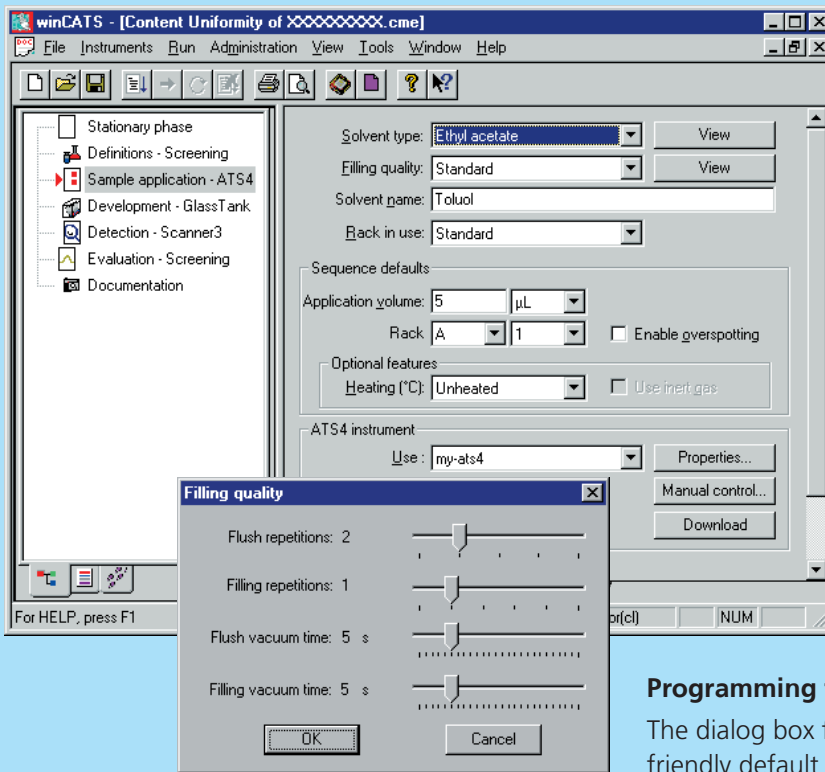
for entering instrument parameters and selecting the method in stand-alone mode

The self-adjusting object support

enables application onto objects of various thickness (up to 4 mm max.) without any adjustment to the spray nozzle. This makes changing between TLC/HPTLC glass plates, sheets, pre-coated preparative layers and thin objects such as membranes easy. The support accommodates objects up to 20×20 cm.



# Operation of the Automatic TLC Sampler 4



The ATS4 is controlled by the winCATS Planar Chromatography Manager, an easy to use Windows application designed to monitor all steps in the TLC process, from sample application via chromatogram development, etc. to evaluation and result documentation in conformity to GMP/GLP. Like other computer controlled CAMAG instruments the ATS4 communicates with winCATS via a software interface called "EquiLink"

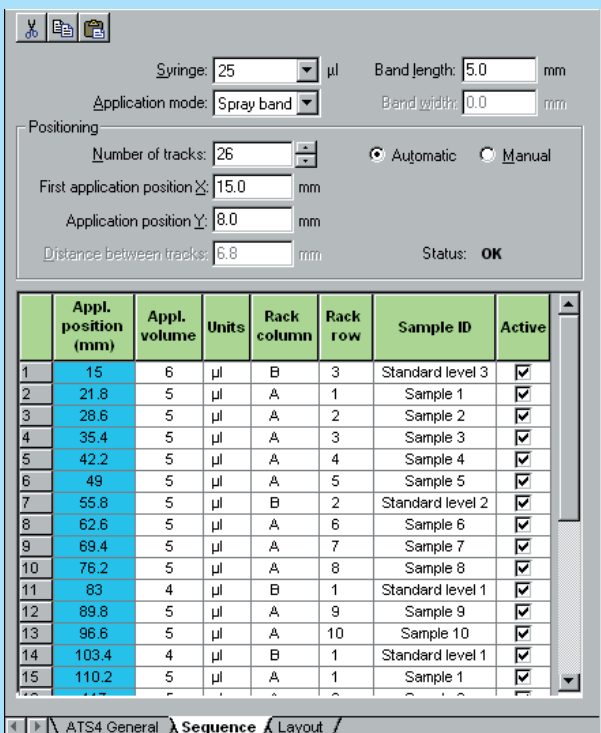
## Programming the application parameters

The dialog box for instrument parameters offers user-friendly default combinations.

For instance, from the list water, ethanol, methanol, ethyl acetate or acetone the operator can select the solvent type most similar to the solvent actually used. The software will then automatically adapt the instrument defaults to optimize its application regarding viscosity, volatility and surface tension. Another example of a pre-selected combination is the filling quality which determines how often the syringe is rinsed, the filling process repeated, etc. All these pre-selections can be individually adjusted to a specific task.

The dialog for entering the sequence of samples is clearly arranged and easy to use. Tracks can be automatically arranged evenly spaced across the plate, sample designations can be inserted from a prepared list, etc.

The program progress is displayed on screen as long as the instrument remains connected to the computer. However, the ATS 4 can also be used in stand-alone mode for which purpose up to 6 application methods can be downloaded and stored locally.



# Specifications

Positioning test	Target	Detected	?
Table backlash	<200µm	Xxx	OK
Table reproducibility	<25µm	Xxx	OK
Table leeway	Yes	Yes	OK
Tower backlash	<200µm	Xxx	OK
Tower reproducibility	<50µm	Xxx	OK
Tower leeway	Yes	Yes	OK
Rack backlash	<200µm	Xxx	OK
Rack reproducibility	<50µm	Xxx	OK
Rack leeway	Yes	Yes	OK
Syringe backlash	<100µm	Xxx	OK
Syringe reproducibility	<10µm	Xxx	OK
Syringe leeway	Yes	Yes	OK
Lift backlash	<200µm	Xxx	OK
Lift reproducibility	<50µm	Xxx	OK
Lift leeway	Yes	Yes	OK
Punch move adjustment	<200µm	Xxx	OK
Punch delay min.	>180ms	Xxx	OK
Punch delay max.	<300ms	Xxx	OK
Punch leeway	Yes	Yes	OK
<b>Syringe test (Spray)</b>	<b>Target</b>	<b>Detected</b>	<b>?</b>
Spray test	4-6	7	
Spray test (repeat)	4-6	5	OK
Leakage test 1	Yes	Yes	OK
Leakage test 2	Yes	Yes	OK
Rinsing	Yes	Yes	OK
<b>Syringe test (Contact)</b>	<b>Target</b>	<b>Detected</b>	<b>?</b>
Contact test	Yes	Yes	OK
Leakage test 1	Yes	Yes	OK
Leakage test 2	Yes	Yes	OK
Rinsing	Yes	Yes	OK

## Qualification

Integral part of the ATS4 program is the self-qualification feature. The user can determine in what intervals checks for specification compliance are effected.

## Mains voltage:

90–240 V, 50–60 Hz

## External gas supply:

compressed air or nitrogen 4–6 bar (60–90 PSI)

## Minimum PC configuration:

Pentium, 2 GHz or faster, at least 512 MB, true color 32 bit resolution, 1280 × 1024 pixel, CD-ROM

## Operating system:

MS Windows™ XP with Service Pack 2

## Recommendations

Uncertainty of volume dosage is dependent on the syringe volume: 1 nL for 10 µL syringe, 2 nL for 25 µL syringe, and 10 nL for 100 µL syringe. Therefore, a syringe of unnecessary large volume should not be chosen.

The sample delivery speed can be chosen between 10 and 1000 nL/s.

A typical rinsing cycle takes about 35 s, i.e. discharging the syringe content, filling with rinsing liquid once plus 2 seconds vacuum time, emptying the syringe and filling it with new sample.

The temperature range of the heated spray nozzle (option) is 30–60 °C. Increasing the temperature by 10 °C allows to approximately double the application speed; temperature stability of the analyte must be assured.

CAMAG pursues a policy of continuous development and technical product improvement. Specifications may be changed in this regard without notice.

# Ordering information

## **022.7400 CAMAG Automatic TLC Sampler 4**

for fully automatic application of samples as spots, bands or rectangles, complete with instrument cover, sample rack for 66 standard 2 mL vials (12 × 32 mm), ATS4 Equilink – *without* dosing syringe

## **022.7410 CAMAG Automatic TLC Sampler 4 with heated spray nozzle**

same as 022.7400 but instead of the standard spray nozzle equipped with a heated spray nozzle. *Heating assists the application of large sample volumes or of solvents of low volatility.*

## **022.7450 Dosing syringe starter kit** containing:

695.0053 25 µL Dosing syringe for ATS4 without needle

695.0046 Needle for spray-on application

695.0047 Needle for contact application

## **027.6300 Software “winCATS – Planar Chromatography Manager”**

license including one year web update service.

Instead of the dosing syringe starter kit you may order one or several of the following dosing syringes. Unless otherwise specified the ATS4 will be supplied with the dosing syringe starter kit 022.7450

### **Dosing syringe with detachable needle**

695.0043 100 µL Dosing syringe for ATS4 without needle

695.0053 25 µL Dosing syringe for ATS4 without needle

695.0042 10 µL Dosing syringe for ATS4 without needle

695.0046 Needle for spray-on application

695.0047 Needle for contact application

### **Dosing syringe with fixed needle**

695.0048 100 µL Dosing syringe for ATS4 with fixed needle for spray-on application

695.0049 25 µL Dosing syringe for ATS4 with fixed needle for spray-on application

695.0051 10 µL Dosing syringe for ATS4 with fixed needle for contact application

695.0052 25 µL Dosing syringe for ATS4 with fixed needle for contact application

### **Accessories, Consumables, Spare parts**

022.7430 Sample rack for 66 standard 2 mL vials (12 × 32 mm)

022.7464 Chromacol® sample vials 2 mL with Snapcaps®, pack of 1000

960.0064 Bottle 250 mL, burst protected, suitable as waste or rinsing bottle for ATS4

115.7434 Syringe rinsing tube

715.2254 TLC foil down-holder

715.2255 Compensation ledge for 10 × 10 cm plates

### **Options**

022.7435 Support for 96-well-plates, 15 mm depth

022.7436 Support for 96-well-plates, 45 mm depth

022.7462 Septa foil, pack of 10



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