



## BANDWISE SAMPLE APPLICATION IN THIN-LAYER CHROMATOGRAPHY

Sample application is the first step in the workflow of planar chromatography and it affects significantly the quality of the result. The choice of the application technique and the device depend on the requirements of precision, sample volumes, number of analyses and the desired grade of automation.

Spotwise sample application using a fixed volume capillary is the simplest way. Sample volumes of 0.5 to 5  $\mu\text{L}$  can be applied as spots onto conventional layers without intermediate drying, on HPTLC layers it is up to 1  $\mu\text{L}$  per spot.

With the Linomat 5 samples are sprayed-on as narrow bands, which allows the application of significantly larger volumes. Starting zones in the form of narrow bands ensure the best resolution that can be achieved with the chromatographic system selected.

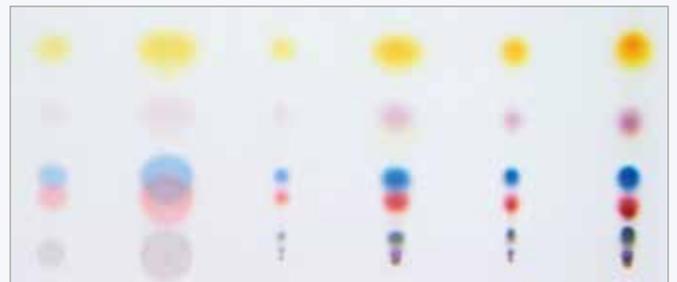
### Effect of the solvent and the technique of sample application on the chromatogram

Mobile phase: toluene; detection: white light

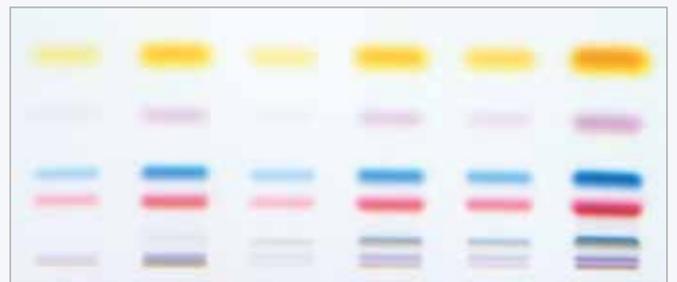
Test dye mixture (0.5 and 5  $\mu\text{L}$ ) dissolved in  
1: methanol    2: toluene    3: hexane



Contact application, prior to development



Developed plate after contact application of spots



Developed plate after spray-on application of bands



With the Linomat 5 samples are sprayed onto TLC/HPTLC plates with nitrogen or compressed air. Sample application is automatic, only changing the syringe (filling, inserting and rinsing) is manual. The Linomat is suitable for routine use.

The spray-on technique allows larger sample volumes to be applied than by contact transfer (spotting). While the solvent is almost completely evaporated in the process, the sample is concentrated on the layer surface into a narrow band of selectable length. Even if samples are dissolved in rather polar solvents (such as methanol or water) compact and narrow zones are formed.

- Because the sample is distributed uniformly over the entire length of the band, densitometric evaluation can be performed by aliquot scanning, i.e. by measuring only the center portion. This technique ensures the best quantitative accuracy.
- For multilevel calibration different volumes of the same standard solution can be applied to generate different standard levels. With only one sample to prepare considerable time is saved.
- The frequently used method of standard addition (spiking of samples) can be simplified by over-spraying the already applied sample with standard.
- In the same way pre-chromatographic in-situ derivatization can be performed if the reagent is suitable.

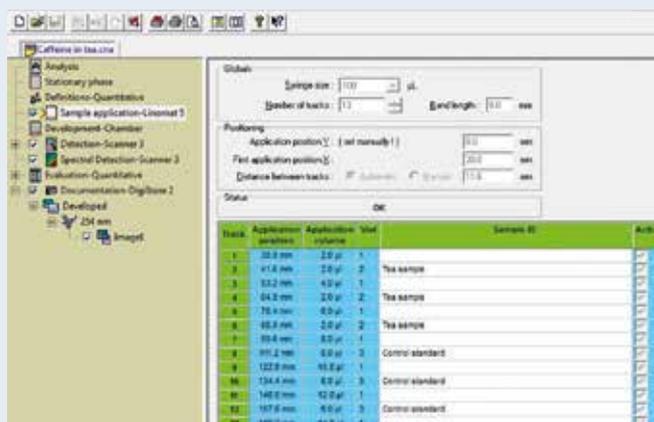


## SOFTWARE CONTROL OF THE LINOMAT 5

### Operation under winCATS

The Linomat 5 is controlled by the winCATS Planar Chromatography Manager software. Plate dimensions, number and distance of tracks, names of samples and volumes to be applied onto each track are conveniently programmed and saved in winCATS.

All information is then available for later densitometric evaluation. The CAMAG Linomat 5 can be IQ/OQ qualified and then used in a GMP/GLP environment.



From the tab "General" principal settings for the instrument are accessible as well as manual operation and method download to the instrument.

### Operation under visionCATS

Alternatively the Linomat 5 is controlled by visionCATS, the new HPTLC software. Instrument handling is now easier and more convenient. With visionCATS the Linomat 5 can be IQ/OQ qualified and used in a GMP/GLP environment. The new features and functionalities of visionCATS are fully effective in combination with the TLC Visualizer documentation system.

For operation under winCATS as well as under visionCATS, the display shows the status of the instrument or the progress of the current application.



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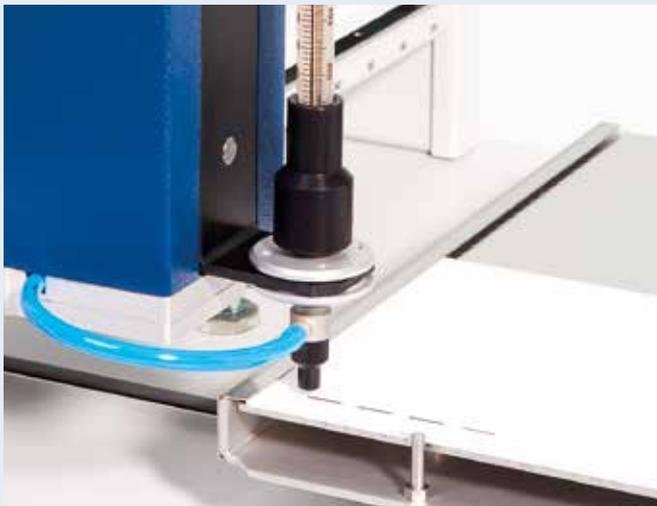
### Operation in stand-alone mode

For those who use the Linomat 5 infrequently stand-alone mode is available. Up to ten application programs (methods) can be entered either manually via the keypad or downloaded to the instrument from a computer running a licensed winCATS or visionCATS program. In stand-alone mode the keypad is used to enter sample application parameters or to select a saved method.





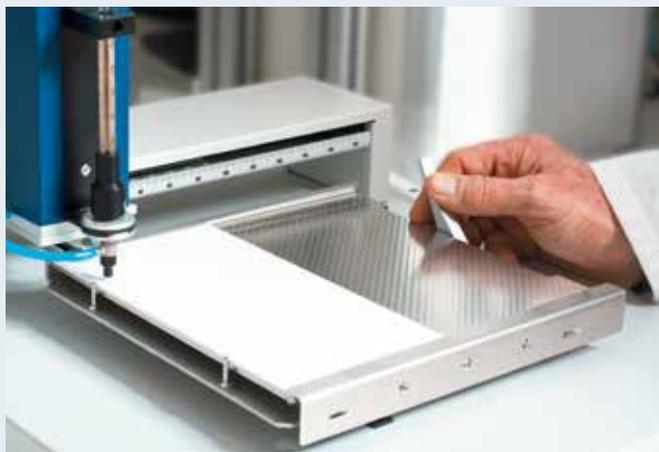
## LINOMAT 5 OPERATION DETAILS



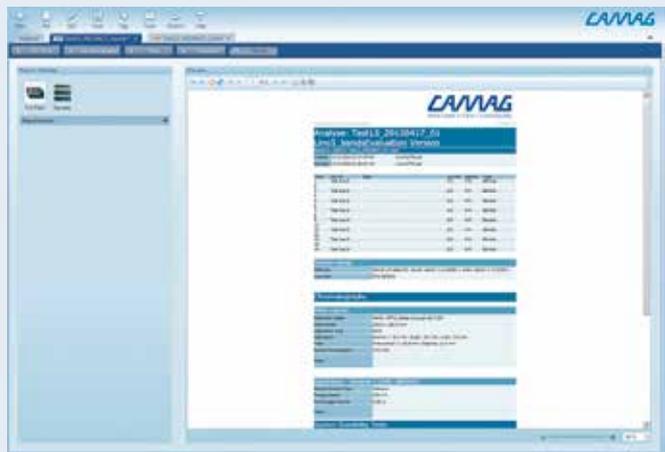
*The sample liquid is sprayed onto the layer from the tip of the syringe needle. The stage movement is controlled so that the sample is uniformly distributed over the entire length of the band. Samples can also be sprayed-on as spots.*



*The combination of the special dosage syringe with the spray nozzle of the Linomat 5 ensures the focused spraying-on of samples on very small areas.*



The self-adjusting object support enables application onto objects of variable thickness (up to 4 mm) without any adjustment to the spray nozzle. This makes it easy to change between conventional TLC and HPTLC layers (on glass plates or sheets), preparative layers and very thin objects such as membranes. The support accommodates objects up to 20 x 20 cm.



All data of the current analysis (e.g. information on the chromatogram layout, solvents used, dosage speed or application volumes) is saved by the TLC/HPTLC software in a report file.

## Technical specifications

|                       |   |
|-----------------------|---|
| Object support        | For objects up to 20 x 20 cm  |
| Stage drive           | Stepping motor 3200 steps/rotation, 8 steps = 0.1 mm<br>Band length 0 (spot) – 190 mm in steps of 0.1 mm<br>Speed approx. 10 mm/s; the speed is automatically adapted such that a whole number of passes is reached with the volume selected. |
| Dosage syringe drive  | Stepping motor 1600 steps/ rotation<br>100 nL = 120 steps with 100 µL syringe<br>100 nL = 24 steps with 500 µL syringe  |
| Sample dosage syringe | selectable 100 µL or 500 µL   |
| Memory                | 10 methods, backup min. 10 years  |
| LCD display           | 2 lines of 16 characters each   |
| Mains voltage         | 85–250 V / 47–63 Hz / 20 VA   |
| Gas supply            | 4–6 bar (60–90 PSI) preferably nitrogen; consumption approx. 1.0 L/min  |
| Dimensions            | 360 mm width, 510 mm length, 410 mm height  |
| Weight                | 12.5 kg   |



## Ordering Information

- 022.7808** **CAMAG Linomat 5**, complete with one 100 µL sample dosage syringe, standard accessories. Without winCATS / visionCATS software.  
*Note: For operation the Linomat 5 requires external supply of compressed nitrogen (or air), which is not included.*
- 027.6300** **Software winCATS** – Planar Chromatography Manager license including one year web update service.  
For minimum hardware and software requirements go to [www.camag.com/wincats](http://www.camag.com/wincats).  
*Note: Purchase of winCATS is not required if a registered winCATS license is already available on the PC workstation designated to run the Linomat or if stand-alone operation is intended.*
- 027.7000** **Software visionCATS Basic**, License for 1 server / 1 client incl. 2 years free update. IQ/OQ available from visionCATS Qualitative Package onwards.  
For minimum hardware and software requirements go to [www.camag.com/visioncats](http://www.camag.com/visioncats).  
*Note: Purchase of visionCATS Basic is not required if a registered visionCATS license is already available on the PC workstation designated to run the Linomat or if stand-alone operation is intended.*
- 695.0014** Sample dosage syringe 100 µL for Linomat  
**695.0015** Sample dosage syringe 500 µL for Linomat

# CAMAG

WORLD LEADER IN PLANAR CHROMATOGRAPHY

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