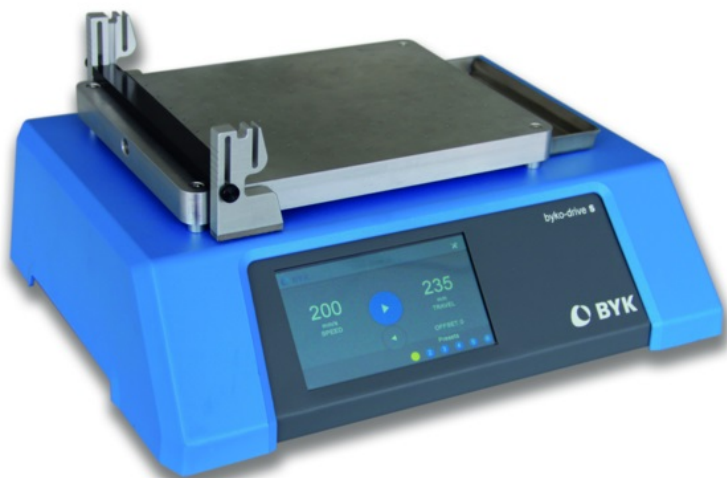




byko-drive S

Automatic Film Applicator

Operating Manual

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1 Introduction

Dear customer,

thank you for having decided for a BYK-Gardner product. BYK-Gardner is committed to providing you with quality products and services. We offer complete system solutions to solve your problems in areas of color, appearance and physical properties. As the basis of our world-wide business, we strongly believe in total customer satisfaction.

Therefore, in addition to our products, we offer many VALUE-ADDED services:

- Technical Sales Force
- Technical and Application Support
- Application and Technical Seminars
- Repair and Certification Service

BYK-Gardner is part of Altana AG and a direct subsidiary of BYK-Chemie GmbH, a leading supplier of additives for coatings and plastics. Together, we offer complete and unique solutions for you, our customer

Thank your for your trust and confidence. If there is anything we can do better to serve your needs, do not hesitate to let us know.

Your BYK-Gardner Team

- <https://www.byk-instruments.com>

1.1 About this Document

This instruction manual is an important part of this instrument. It contains essential information about setting up, placing in service and use. If you pass the device on to another user, please ensure that the instruction manual is included with the instrument. The manual must be studied carefully before working with the equipment. Please contact your regional service office if you have any questions or require additional information about the device:

- <https://www.byk-instruments.com/contact-infos>

The technology and fittings are based on state-of-the art optic and electronic technology. New developments and innovations are constantly being integrated into the equipment. Thus, the diagrams, dimensions, and technical data used in this manual may have changed as a result of adapting the device to new information and improvements.

1.2 Safety Information

1.2.1 Safety Instructions

**CAUTION**

Read this instruction manual completely before using the instrument.

**WARNING**

This manual cannot address all the safety considerations associated with its use. It is the responsibility of the user to consult this manual and establish appropriate safety practices for use with this equipment and the individual material being tested.

**WARNING**

The **byko-drive S** Automatic Film Applicator is designed and intended for the use described in this manual. Using the Automatic Film Applicator for other purposes for which it was not designed may reduce or eliminate the protection offered by the features of the applicator. Serious injury may result.

**WARNING**

Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

**WARNING**

Ultimate disposal of this product should be handled according to all national laws and regulations.

**ATTENTION**

The **byko-drive S** Automatic Film Applicator works with a moving traverse carriage. No parts of the carriage may be touched or held during operation. Once the **Forward** key is pressed no work should be carried out within the travel area of the carriage.

1.2.2 General Information

Please note the following points for handling the device:

- Please unpack the device carefully.
- Retain the packaging in case you want to ship the device at a later date.
- It is a stationary device - it must not be transported or moved during operation.

1.2.3 Operation Information

Please note the following points for operating the device:

- During the film application process the applicator is driven from left to right.
- Familiarize yourself with the layout and operation of the controls.
- During movement, pressing anywhere on the screen will immediately stop the carriage at any point of its travel.
- Ensure the operator has no loose clothing or jewelry which could become caught in the moving parts.

1.3 Declaration of Conformity

We,

BYK-Gardner GmbH

Lausitzer Strasse 8

D-82538 Geretsried

herewith declare, that the product **byko-drive S Automatic Film Applicator** complies with the requirements of the following EU directives:

- 2014/30/EU - Electromagnetic Compatibility
- 2014/35/EU - Low Voltage

The following harmonized standards were applied:

- EN 61010-1:2010/A1:2019 - Safety Requirements
- EN 61326-1:2013 - EMC Requirements

Geretsried, June 25, 2024



Dr. Jörg Krames

President • BYK-Gardner GmbH

1.4 Copyright Information

No portion of the software, documentation or other accompanying materials may be translated, modified, reproduced, copied, or otherwise duplicated (with the exception of a backup copy), or distributed to a third party, without prior written authorization from BYK-Gardner.

In any cases, this requires the prior written consent of BYK-Gardner.

BYK-Gardner offers no guarantee that the software will function without error or that the functions incorporated therein can be executed on all applications and combinations selected by you.

No liability other than as provided by law as assumed for direct or indirect damage sustained in association with the use of the instrument, the software or documentation.

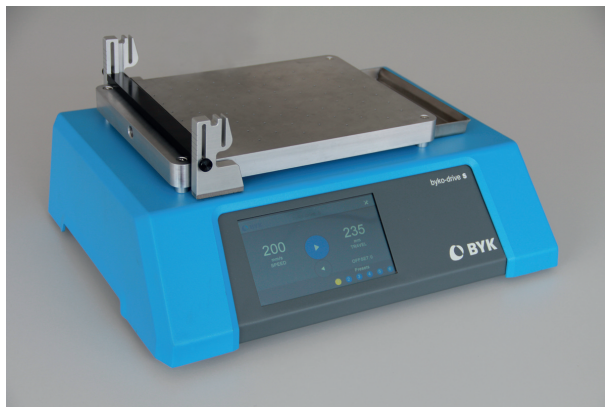
BYK-Gardner reserves the right to update the software and written documentation without prior notice.

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2 System Description

The **byko-drive S** is an automatic film applicator. It is designed to assist the user in achieving consistent film application by maintaining a consistent speed and drawdown pressure. Manual drawdowns are often inconsistent, especially between operators. This makes test comparisons between samples either difficult or unreliable.



Some of the factors affecting the drawdown are the shear rate and the pressure placed on the applicator tool. The **byko-drive S** employs a precise speed control along with a consistent weight to suit the particular material being applied.

The **byko-drive S** is compatible with most applicators, both bar and wire types. The applicator is placed in front of the pushbar so that the applicator is pushed along the test surface once the **byko-drive S** is started. With both the speed and weight controlled, a consistent and uniform film is produced.

The **byko-drive S** is equipped with either a vacuum plate or a glass plate with clamp. The vacuum plate requires an external vacuum pump to hold a test sample in place. The glass plate model uses a spring-loaded clamp to hold the sample.

A wide variation in speeds is available, from 2 mm/sec to 200 mm/sec (0.5 in/sec to 7.9 in/sec). The micro-controller electronics of the **byko-drive S** ensures accurate speed control under all operating conditions.

A drying time mode is available to allow the instrument to perform a drying time test immediately after a drawdown is performed. The optional drying time accessory attaches to the pushbar.

The start and length of drawdown may be modified by the operator to speed repetitive drawdowns that use smaller sizes test samples.



NOTICE

The vacuum pump is available as an accessory, see for example:
<https://www.byk-instruments.com/p/3877>.

3 System Preparation

3.1 Delivery Content

Unpack the unit being careful to check all packaging for items. Some accessories may be found in a separate box within the main box. Within the package are the following standard items.

Quantity	Description
1	Applicator unit byko-drive S with: • Vacuum plate or • Glass plate
1	Power supply
1	Power cord
1	Weight 500 g
1	Drip pan
1	Safety instructions
1	Short instructions

3.2 Commissioning

Locate a suitable location free from obstructions and clutter. The **byko-drive S** should be at a convenient height for the operator.

Plug the power supply into the DC input jack on the rear side, next to the power switch. A power cord appropriate for your area's power connector is supplied to connect the power supply with AC power. The system will operate on power from 100 - 240 V AC ~ at 50 - 60 Hz.

Place the drip pan in the provided indentation on the right of the vacuum plate.

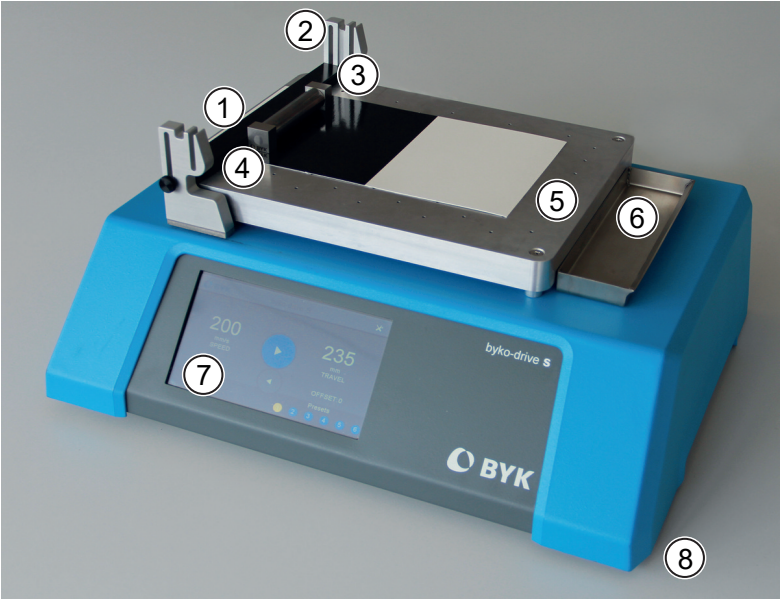
The 500 g weight is used to provide additional pressure on an applicator or hold a wire-wound rod in the proper position. If needed, place the weight in the slots of the pusher bar.



NOTICE

In case of using the vacuum plate: Vacuum pumps vibrate during operation, make sure not to place the pump right next to the applicator.

3.3 Control Elements



1 Push-bar	2 Weight guide slot
3 Wire rod clearance slot	4 Push-bar weight 500 g / 1.1 lbs
5 Vacuum plate	6 Drip pan
7 Touchscreen display	8 Adjustable feet (underneath)

4 System Operation

4.1 Start Up

Plug the external power supply into the connector on the rear of the instrument near the power switch. Plug the other end into an appropriate electrical outlet as described in section [System Preparation](#) [► 9].

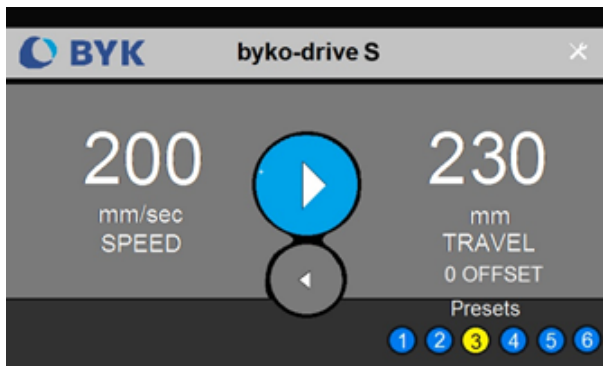
Turn on the power switch. The power switch is located on the rear of the instrument, near the power cord.

The display will turn on and if not already there, the carriage will move to the start point; the instrument is now ready to operate.

4.2 User Interface

All user functions are operated through a touchscreen interface.

4.2.1 Home Screen



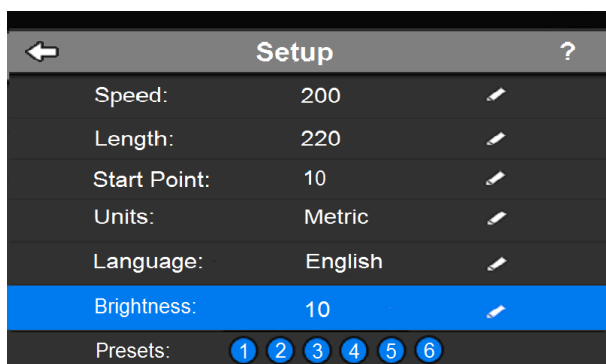
The large **Play** button in the center starts the carriage moving with the speed, travel, and offset options as indicated on the display. The settings may be changed by pressing the **Setup** icon in the upper right corner.

The six **Presets** buttons allow saving of six different setup combinations. The settings are first changed within the **Setup** screen and then saved by pressing and holding the **Presets** button where you would like to store the settings. There are six setups stored from the factory, press each of the buttons to review the settings before changing them.

The factory stored settings are as follows:

1. Speed - 100 mm/sec, Length - 235mm, Offset - 0 mm
2. Speed - 200 mm/sec, Length - 215mm, Offset - 20 mm
3. Speed - 450 mm/hr, Length - 235mm, Offset - 0 mm (drying time setup)
4. Speed - 1.0 in/sec, Length - 9.2 in, Offset - 0 in
5. Speed - 7.9 in/sec, Length - 9.2 in, Offset - 0 in
6. Speed - 5.0 in/sec, Length - 8.5 in, Offset - 0.7 in

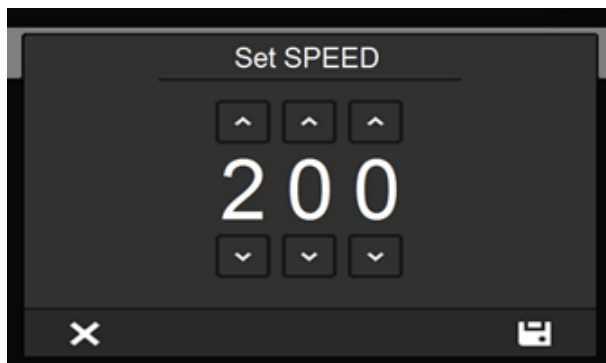
System Setup



Press the **Tool** icon in the upper right corner of the home screen to access the **Setup** screen. Note the current settings. Press the band you wish to change, and it will turn blue. Press once more to access the screen to change the setting.

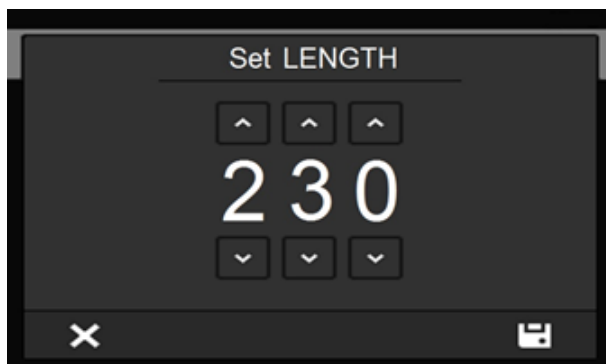
Note that once you start making changes to the settings, the **Preset** you are changing will change from yellow to blue with a white ring. This is to remind you of the preset that is being changed. You do not have to save the changes if you want to make a temporary change. If not saved, the changes made will be lost if the unit is turned off or another preset is selected. To save the changes, press and hold the button where you would like to store the settings for at least 3 seconds. When you release the button, it will be yellow, and the settings will be stored and able to be recalled on the run screen by pressing the appropriate **Preset** button.

4.2.2 Set Speed



Adjusts the speed that the carriage will move. Press the appropriate **Up** or **Down** arrow to adjust each digit. The first press will turn the button blue and subsequent press will increase or decrease the number. The settings here are also dependent on the selections made on the **Units** screen. The instrument may be set to operate between 2 and 200 mm per second for standard mode **Application**. Speeds from 50 to 3600 mm per hour may be selected in mode **Drying Time**. Once the desired speed is set, press the **Save** icon in the lower right of the screen to return to the **Setup** screen. The **Close** icon in the lower left will exit the screen with no changes saved.

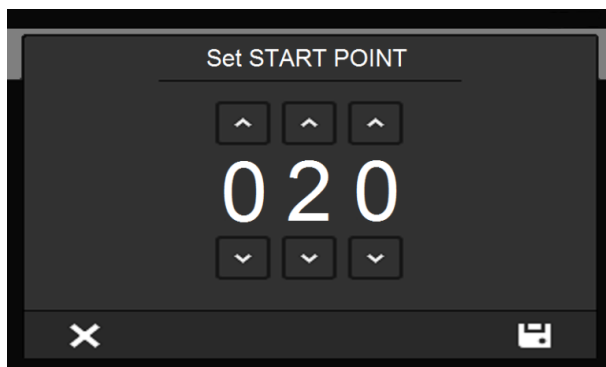
4.2.3 Set Length



Adjusts the length of carriage travel. This is the length the carriage will move from the **Start Point**. Press the appropriate **Up** or **Down** arrow to adjust each digit. The first press will turn the button blue and subsequent press will increase or decrease the number. The instrument may be set to operate between 0 and 235 mm.

Note that the maximum travel TOTAL is 235 mm. If you set a start point at somewhere other than 0 the length will be reduced by the start point setting. An example would be if you set the start point to 20 mm, the maximum draw-down length would be 215 mm ($235 - 20 = 215$). Once the desired length is set, press the **Save** icon in the lower right of the screen to return to the **Setup** screen. The **Close** icon in the lower left will exit the screen with no changes saved.

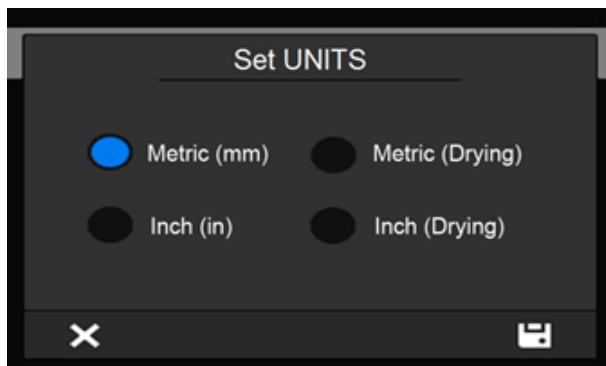
4.2.4 Set Start Point



Adjusts the place the carriage will begin the drawdown. Press the appropriate **Up** or **Down** arrow to adjust each digit. The first press will turn the button blue and subsequent press will increase or decrease the number. The instrument may be set to start from 0 and 225 mm.

Note that the maximum travel TOTAL is 235 mm. If you set a start point at somewhere other than 0 the length will be reduced by the start point setting. An example would be if you set the start point to 20 mm, the maximum draw-down length would be 215 mm ($235 - 20 = 215$). Once the desired start point is set, press the **Save** icon in the lower right of the screen to return to the **Setup** screen. The **Close** icon in the lower left will exit the screen with no changes saved.

4.2.5 Set Units



Changes the units in which the system operates. Press the button to the left of the desired units to turn it blue. This also sets the instrument into mode **Drying Time** if desired.

- Selecting units from the left column sets units for standard mode **Application** speed in *units/second*.
- Selecting from the right column with the **Drying** indication sets units for mode **Drying Time** speed in *units/hour*.

In drying time mode, the speed range is 50 to 3600 mm/hr (2.0 to 141.7 in/hr). The drying time accessory can be ordered separately – see Accessory Parts.

Screens for **Length**, **Start Point** and **Speed** will display in the units selected. Once the desired units are selected, press the **Save** icon in the lower right of the screen to return to the **Setup** screen. The **Close** icon in the lower left will exit the screen with no changes saved.



NOTICE

It is possible to save both application setups and drying setups to different radio buttons. For example, save a drawdown setup in mm/sec to radio button **1** and a drying time setup in mm/hour to radio button **2**.

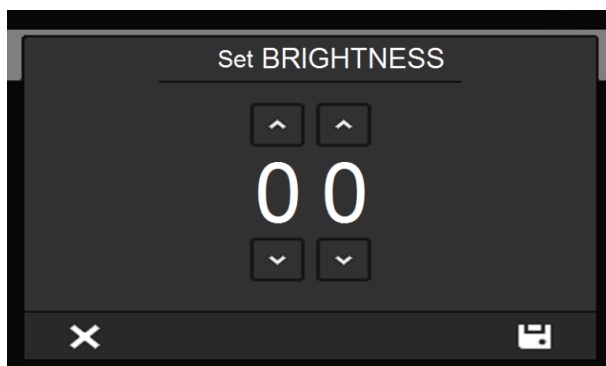
Then select radio button 1 to make the drawdown, follow the process for a drawdown and when finished, press the **Reverse** button, select radio button **2** and start the drying time process without removing the drawdown.

4.2.6 Set Language



Changes the language for all screens. Press the appropriate **Up** or **Down** arrow to adjust each digit. Press the button to the left of the desired language to turn it blue. Once the desired language is selected, press the **Save** icon in the lower right of the screen to return to the **Setup** screen. The **Close** icon in the lower left will exit the screen with no changes saved.

4.2.7 Set Brightness



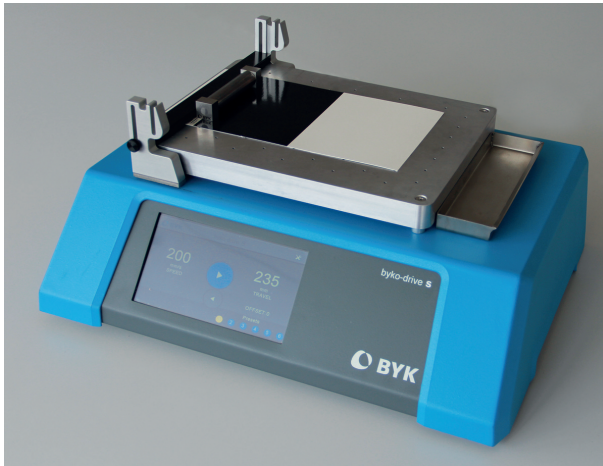
Adjusts the brightness of the screen. Press the appropriate **Up** or **Down** arrow to adjust each digit. The first press will turn the button blue and subsequent press will increase or decrease the number. The brightness may be set between 0 and 10. Once the desired brightness is set, press the **Save** icon in the lower right of the screen to return to the **Setup** screen. The **Close** icon in the lower left will exit the screen with no changes saved.

4.3 Film Application

In **Set Units** [▶ 15] select an option on the LEFT side to activate the **Film Application** mode.



There are two different plates available to hold the drawdown substrates. For vacuum plate models the chart or substrate is held in place with vacuum. Vacuum must be provided from an external source. The fitting for the vacuum line is attached on the left side of the plate.



Place a chart that will be used on the vacuum plate. If any holes are uncovered they must covered with paper or tape to allow the vacuum to properly secure the chart. Post-it® brand Labeling & Cover-up Tape (part number 658) has been shown to work effectively for this purpose and can easily be removed without leaving residue on the vacuum plate. *

Place a test chart or other substrate material on the vacuum plate. Turn on the vacuum source. (For models with the glass plate, simply place the substrate on the glass, under the sample clamp.)

Once the substrate is held in place, position an appropriate Bird applicator, wire rod, square applicator, or other applicator bar in front of the push-bar.

**NOTICE**

Note that the push-bar is adjustable to the height needed for different applicators. Adjust the height by loosening the two thumbscrews and move the bar to the appropriate height for your applicator.

To keep wire rods from rotating and when additional weight is needed for other applicators, set the additional weight into the slots of the push-bar allowing the rubber strips to hold the applicator in place. Most rods may be accommodated, as longer rods will extend through the notches provided in the push-bar.

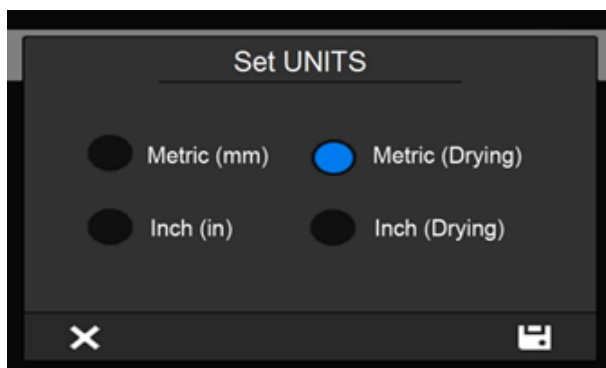
Apply an appropriate amount of coating immediately in front of the applicator. Press the **Forward** button and the application will begin.

At the end of the travel, the applicator will stop automatically. Remove the applicator for cleaning and press the **Reverse** button. Once the carriage has returned to the start position, turn off the vacuum and remove the coated substrate.

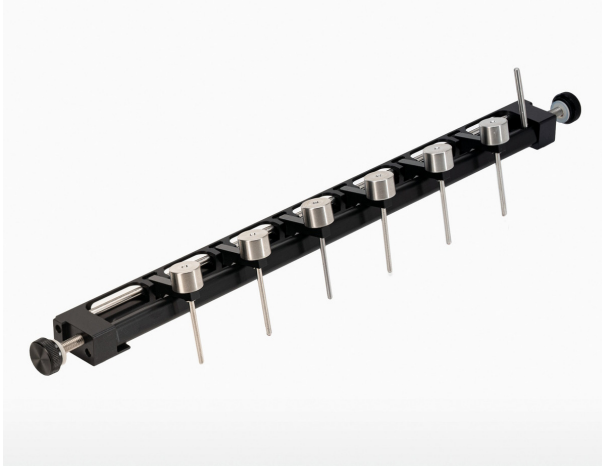
* Post-it® brand is a registered trademark of 3M.

4.4 Drying Time

In [Set Units](#) [▶ 15] select an option on the RIGHT side to activate the **Drying Time** mode.

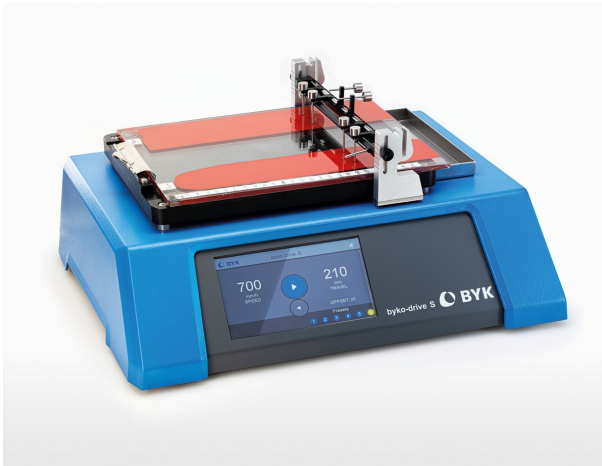


Attach the drying time accessory to the pushbar using the two thumbscrews provided. Select the number of needles desired and position them in the holders. Note that the needle holders pivot up and out of the way for a drawdown to be performed without the need to remove the drying time accessory. The needles are 2 mm in diameter.



It is most helpful to pre-program the desired drying time and store it to a radio button so as soon as the drawdown is complete the drying time program can be selected and started.

Make a drawdown as explained under the [Film Application](#) [▶ 17] section.



Remove the applicator and reverse the carriage to return it to the start position.

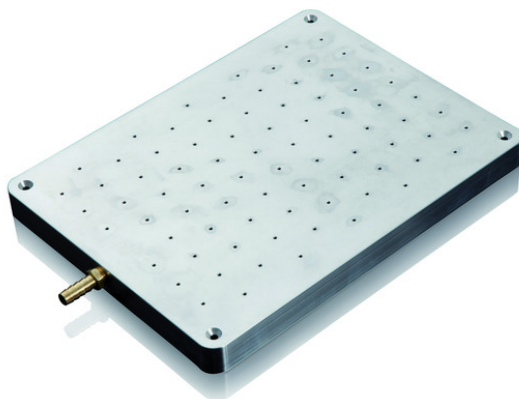
Flip the needle(s) over onto the wet drawdown. Select the radio button with the drying time setup that you pre-programmed.

Press the **Forward** button. The needle(s) will move at the programmed pace. The needle(s) will mark the coating until the drying has been accomplished and will cease to mark the film. Measure the distance from the start to calculate the drying time.

5 Maintenance and Repair

5.1 Exchanging Glass Plate with Vacuum Plate

The factory installed glass plate may be replaced in the field with an optional vacuum plate (accessory #3876, see "[Service and Spare Parts](#) ▶ 22").



To exchange the plates, follow these instructions:

1. Remove the glass by lifting on the right-hand edge. It will release with firm, even force.
2. Remove the weight and the push-bar.
3. There are 4 screws, one at each corner of the glass plate support. Remove these screws. These same screws will be used with the new plate.
4. Lift off the glass plate support. Note the position of the 4 aluminum spacers.
5. The vacuum plate accessory comes with 2 vacuum fittings. Select a fitting appropriate to the size of the tubing that will be used.
6. Set the glass plate support on the spacers.
7. Install the 4 screws to hold the plate. Start each screw in the threads, then tighten all four.
8. Reinstall the weight and the push-bar.
9. Set the removed plate and glass aside. Be sure to protect the glass from breakage.

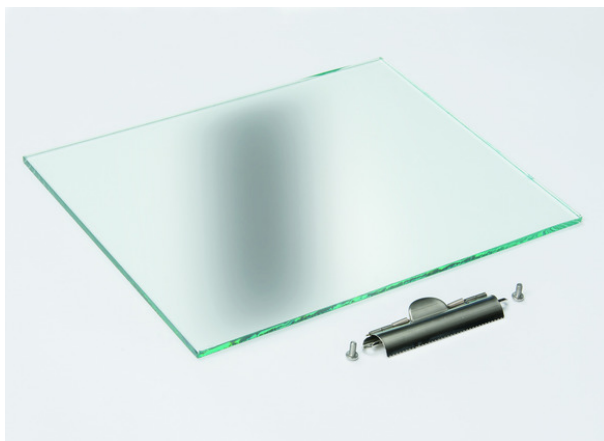


NOTICE

Installing a vacuum plate requires an external vacuum source - see "[Service and Spare Parts](#) ▶ 22".

5.2 Exchanging Vacuum Plate with Glass Plate

The factory installed vacuum plate may be replaced in the field with an optional glass plate (accessory #2127, see "Accessory Parts").



To exchange the plates, follow these instructions:

1. Remove the weight and the push-bar.
2. There are 4 screws, one at each corner of the plate. Remove these screws. These same screws will be used with the new plate.
3. Lift off the plate. Note the position of the 4 aluminum spacers.
4. Set the glass plate support on the spacers.
5. Install the 4 screws to hold the plate. Start each screw in the threads, then tighten all four.
6. For the glass plate support, make sure the corner pads are clean of dirt and dust, then place the glass in position under the paper clamp.
7. Reinstall the weight and the push-bar.
8. Set the other plate aside. Store the plate in such a way as to protect the surface of the plate.

5.3 Cleaning and Routine Maintenance

Care should be taken to avoid letting coating materials into the vacuum plate holes. If cleaning is needed the holes can be cleaned with a solvent appropriate for the coating material and a wooden toothpick.

Metal tools should be avoided as they may damage the aluminum vacuum plate. Clean the rest of the instrument with a mild commercial cleaning solution or plain soapy water.

Avoid solvents on the cover and the keyboard area as they may be discolored or otherwise damaged by strong solvents.

5.4 Service and Spare Parts

For all service and spare parts requirements, please contact your local BYK-Gardner office. You can find your nearest service point in section "Service Points" and on our webpage:

- <https://www.byk-instruments.com/contact-infos>

5.5 Ordering Information

For the **byko-drive S** the following components can be ordered separately.

Basic Device

Catalog No.	Description
2139	Automatic film applicator byko-drive S with vacuum plate
2140	Automatic film applicator byko-drive S with glass plate

Accessory Parts

Catalog No.	Description
2124	Power supply with adapters
2125	Drip pan, small
2127	Glass plate accessory (replaces vacuum plate)
2141	Drying time accessory
2142	Push-bar weight, 500 g / 1 lbs (one is included with device)
2143	Push-bar weight, 1000 g / 2 lbs
3875	Vacuum pump, 230 V (UK plug)
3876	Vacuum plate accessory (replaces glass plate)
3877	Vacuum pump, 230 V (Schuko plug)
3879	Vacuum pump, 115 V

6 Technical Data

Drawdown speed	2 - 200 mm/sec (0.8 - 7.9 in/sec)
Drawdown length	25 - 235 mm (1.0 - 9.2 in)
Drying time speed	50 to 3600 mm/hr (2.0 to 141.7 in/hr)
Drying time needles	2 mm in diameter
Starting point offset	0 - 210 mm (0 - 8.2 in)
Units	Metric (mm) / Inch (in)
Languages	Chinese, English, French, German, Italian, Japanese, Russian, Spanish
Display brightness	0 - 10
Presets	1 - 6
Temperature range	1° C to 38° C (35° F to 100° F) for operation -18° C to 66° C (0° F to 150° F) for storage
Relative humidity	Up to 85% non-condensing at 35° C (95° F)
Operation altitude	Up to 2000 m (6561 ft)
Dimensions (LxWxH)	470 x 356 x 203 mm (18.5 x 14.0 x 8.0 in)
Weight	13.2 kg (29 lbs)
Power supply device	Input: 24 V  ; max. 3.75 A
External power supply	Input: 100 - 240 V  ; 50 - 60 Hz ; max. 1.3 A Output: 24 V  ; max. 3.75 A

Technical data are subject to change.

7 Service Points



Global service centers with ISO / IEC 17025 accredited laboratories

Headquarter

BYK-Gardner GmbH

Lausitzer Strasse 8, 82538 Geretsried, Germany

Service Point USA

c/o BYK-Gardner USA
9104 Guilford Road,
Suite H, Columbia, MD
21046, USA

Service Point Austria, Hungary, Slovenia

c/o Friedrich W. Bloch
GmbH
Wagramerstrasse 201,
1210 Vienna, Austria

Service Point France

c/o Eckart France S.A.S.
31 Rue Amilcar Cipriani
93400, Saint Ouen,
France

Service Point Spain

c/o Actega Artística
S.A.U.
Calle Balmes 8, Suite: 3º
2ª, 08291 Ripollet, Spain

Service Point China

c/o BYK (Tongling) Co.
Ltd. Shanghai Branch
Block 6A, Building A, No
88 Hong Cao Road,
Xuhui District, Shanghai
200233, P.R. China

Service Point India

c/o IMCD India
Private Limited
1101-03, B-Wing, ONE
BKC, Bandra Kurla Com-
plex, Bandra East, Mum-
bai, MH. Pin.: 400 051.
India

Service Point Japan

c/o Tetsutani Co. Ltd.
Chuo-ku, Osaka, Tokui
cho 2-2-2, Japan

Service Point South Latin America

c/o MAST Comercial e Importadora LTDA
Rua Itaporanga, 340-B, Bairro Paraíso,
Santo André - SP, 09190-640, Brazil

Complete list: <https://www.byk-instruments.com/global-service-centers>

Authorized agents: <https://www.byk-instruments.com/contact-infos>

Notes

[illegible]

Notes

[illegible]

Notes

[illegible]

A member of  **ALTANA**

Download your manuals from:
<https://www.byk-instruments.com/p/2139>

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