StonyLab®

Doctor Blade Coating Machine

(Wire Rod & Doctor Blade Film Coater - Vacuum Heated)

Part Number: SL002549

Operation Manual

(Please read the instruction carefully before you use the machine)

Contents

1. Preface

Thank you for choosing our product. We are committed not only to providing you with high-quality equipment, but also to offering reliable after-sales service.

To ensure user safety and maintain the integrity of the instrument, please read this operation manual thoroughly before use and pay close attention to the safety precautions and operational guidelines.

This manual provides detailed information on the design principles, structure, operating procedures, calibration, and maintenance of the instrument. Any "test specifications" or standards mentioned in this manual are provided for reference only. If you have any concerns, please consult the relevant standards or data independently.

2. Working Principle and System Structure

This product is thoughtfully designed to meet the needs of small-scale coating experiments, with an emphasis on reliable performance and ease of operation.

The basic coating principle is as follows: the coating system mainly consists of a motor, transmission mechanism, sliding shaft, handle, doctor blade, and thickness gauge.

The doctor blade coating thickness can be adjusted using micrometer fine-tuners. The wire rod coating thickness is adjusted by replacing the rod with the corresponding model. Coating speed and test distance can be precisely set via the touchscreen interface to achieve uniform and repeatable coating results.

3. Technical Specifications

1) Coating Method: Integrated wire rod and doctor blade system

2) Coating Speed: 5 - 180 mm/s (stepless speed adjustment)

3) Effective Coating Area: 400 x 300 mm (L x W) (customizable)

4) Coating Thickness Range: 1 - 10000 μm (0 - 10 mm displayed on digital gauge, resolution: 0.001 mm)

5) Coating Length Control: Digitally settable within 1 - 400 mm

6) Substrate Holding Method: Vacuum adsorption

7) Control Method: Touchscreen

8) Wire Rod Specification: Optional between 6 - 200 μm

9) Wire Rod Precision: ±0.001 mm

10) Doctor Blade Material: Stainless steel

11) Doctor Blade Precision: ±0.003 mm

12) Vacuum Adsorption Area: 280 x 400 mm

13) Vacuum Hole Diameter: φ1.2 mm

14) Hole Spacing: 20 x 20 mm

15) Heating Method: Heating tube

16) Heating Temperature Range: Room temperature to 180°C

17) Temperature Accuracy: ±5°C

18) Platform Material: Aluminum alloy

19) Platform Finish: Precision surface-ground

20) Vacuum Pump: External vacuum pump

21) Housing Material: Galvanized sheet metal with electrostatic powder coating

22) Power Supply: 220V / 50Hz (Note: Default voltage is 220V. Please use a transformer for 110V power supply.)

23) Dimensions: 620 x 410 x 460 mm (L x W x H); Weight: 65 kg

4. Installation

1) It is recommended to unpack the machine on-site. Before unpacking, please check the packaging box for any damage. After unpacking, inspect the equipment condition carefully and verify the contents against the packing list. If any damage, shortages, or discrepancies are found, please analyze the situation and immediately report it to our company in writing.

2) The machine should be installed in a location free from vibration sources.

3) Install the machine on a flat and solid platform.

4) Before powering on, switch off the main power switch of the machine. Check that the power connections are correct. Only after confirming this should the power be turned on.

5) Ensure the machine's base corners rest firmly on a stable, level surface; avoid having any corners suspended in the air.

6) Place the vacuum pump on a flat platform, connect the vacuum hose, and remove the exhaust outlet cover from the vacuum pump.

5. Debugging and Operation

When the machine starts up, the screen will display the Welcome Interface. Click the Start button to enter the Operation Interface.

5.1 Set Corresponding Parameters for Experimentation

5.1.1 Heating Operation (Note: The standard model does not include a heating unit; temperature settings are not required.)

A. **Temperature Setting**
  - Tap the Set Temperature button on the screen.
  - Enter the desired temperature value.
  - Tap OK to confirm the setting.

B. **Heating Up**
  - Tap the Heating button on the screen.
  - The Actual Temperature display will begin to fluctuate, indicating that the instrument is heating.
  - Once the temperature reaches the set point, you can tap the Heating button again to stop heating.
  - When the temperature drops below the set value, tap the Heating button again to restart automatic heating.

C. **Stopping Heating**
  - You can stop heating at any time by tapping the Heating button again.
  - The Actual Temperature display will stop fluctuating, indicating that heating has stopped.
 - Tap the Start button to begin the coating test.

Attention:

Do not touch the working surface during the heating process to avoid burns. Residual heat may cause the temperature to exceed the set value. The device will automatically stop heating and begin cooling. Once the temperature has stabilized at the set point for 5 minutes, you may begin the experiment.

5.1.2 Doctor Blade Coating Method
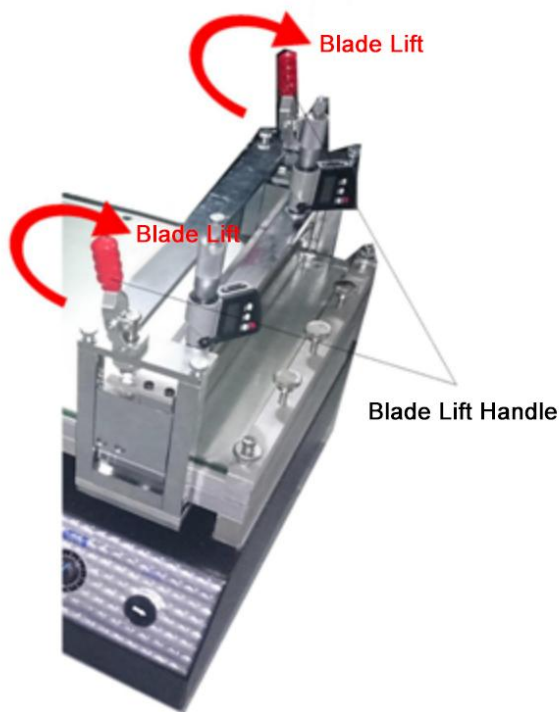
Lift the handle (approximately 90 degrees) and place the coating paper onto the platform. Then, lower the handle (do not press down); the blade will fall onto the surface by its own weight.

Note: When operating the handle, lift or lower both sides simultaneously and evenly to maintain balance.
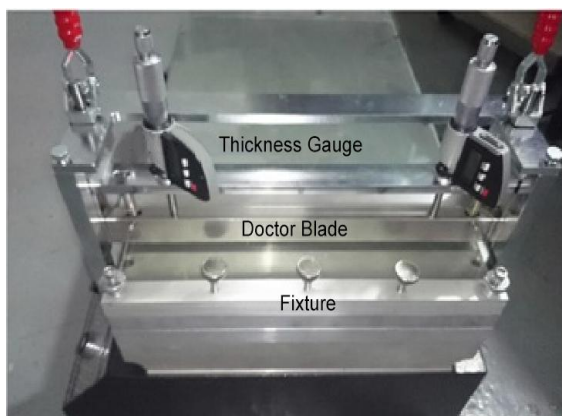
Clamp the coating material securely using the fixtures.

Adjust the blade so it makes contact with the material (ensure both sides are parallel).

Turn on the digital gauge. Zero the display first, then adjust to the desired coating thickness.

A. Zero Adjustment
- Place the substrate into the clamp and tighten both ends to secure it. Lower the handle to drop the scraper onto the substrate.
- Rotate the micrometer adjuster to lower the scraper until you hear a clicking sound. Press the zero button on the differential head to set the

zero point.

B. Set Thickness
- After zeroing, rotate the micrometer adjuster in the opposite direction to set the desired coating thickness.

C. Coating
- Upon startup, the company welcome interface will be displayed. Tap anywhere on the screen to enter the test interface.
- Tap the input box next to "Set Speed," enter the required speed for the test, and press the "OK" button to save.
- Place the coating liquid in front of the scraper, then tap the "Start" button on the screen. The scraper will coat at the set speed.

D. Return and Cleaning
- After coating is completed, lift the scraper handle and tap "Reset."
- Clean the scraper and prepare for the next coating.

5.1.3 Wire Rod Coating Test

A. Preparation and Start
- Lift the red upper handle to raise the scraper.
- Place the substrate onto the platform and lower the handle so that the wire rod rests on the substrate.
- Apply the coating liquid in front of the wire rod.
- Use the touchscreen to set the coating distance and speed, then tap [Start] to begin the experiment.

B. After Coating
- Lift the red handle to raise the wire rod.
- Tap [Reset] on the screen to return the wire rod to its initial position.

C. Cleaning
- Remove the wire rod and clean it thoroughly for future use.

6. Maintenance

1) Keep the machine clean regularly.

2) Do not use toxic chemicals, organic solvents, or similar substances to clean the equipment surface.

3) Disassembly of the machine should be performed by qualified professionals using proper tools and equipment.

4) Electronic components such as the frequency converter are pre-installed at the factory and must not be modified or replaced by the user.

5) Take precautions to prevent moisture damage.

7. Warranty

Warranty is effective from the date of purchase and is non-transferable.

For more details about the warranty, please refer to the link below:

stonylab.com/pages/warranty

For any inquiries or assistance, feel free to contact us:

Company: StonyLab Inc.

Email: support@stonylab.com

Phone: 631-406-6080

Website: stonylab.com

This instruction manual is subject to change without prior notice.