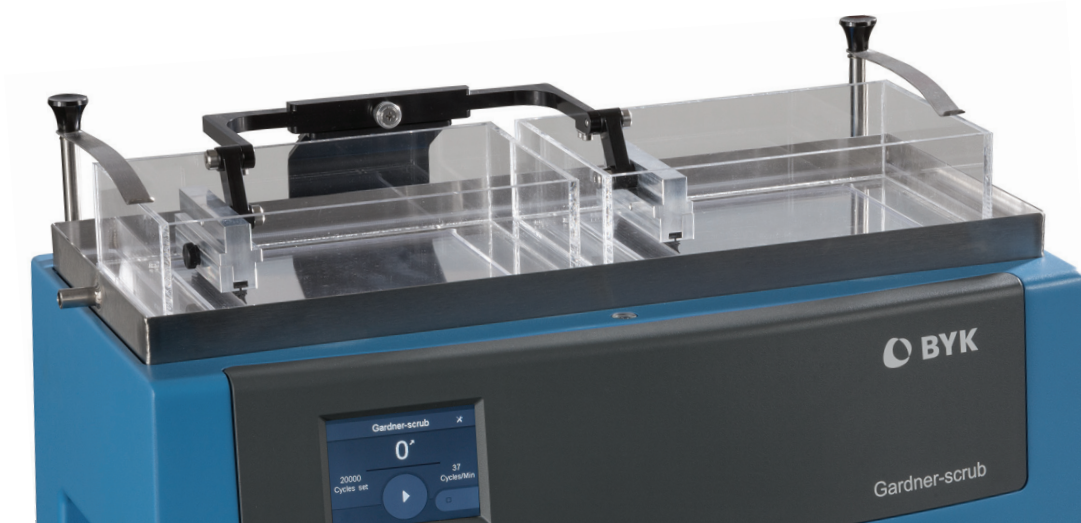


Measure what you see.

Gardner-scrub ECE 43 Abrasion Tester



Manual

Gardner-scrub ECE 43

Wiper Abrasion Tester

Instruction Manual



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Applicable Standards

- | | |
|-----------|---|
| UN ECE 43 | Uniform provisions concerning the approval of safety glazing materials and their installation on vehicles |
| DIN 52353 | Testing the abrasion resistance of automotive glazing with the windscreen wiper test |

1 Safety Information



Caution!

Read Instruction Manual before using this instrument.



Warning!

This manual cannot address all of 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 Gardner-scrub Wiper Abrasion Tester is designed and intended for the use described in this manual. Using the Abrasion Tester 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 Gardner-scrub Wiper Abrasion Tester works with a moving traverse carriage. No parts of the carriage may be touched or held during operation. Once the Run button is pressed, no work should be carried out within the travel area of the carriage.

Please note the following points:

- During testing operation the carriage oscillates across the top surface of the instrument.
- Familiarize yourself with the layout and operation of the controls.
- Pressing anywhere on the screen while the instrument is running 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.

2 Preparations

Unpack the unit being careful to check all packaging for items. Some accessories required for specific tests may be found in a separate box within the main box.

Within the package are the following standard items:

Quantity	Description
1	Gardner-scrub main unit
1	Power Supply
1	Power Cord
1	Sample Pan
2	Sample Clamp springs
1	Acrylic Box Locator
1	Wiper Holder Assembly
2	Acrylic Sample Box
2	Spacer Plates, 2 mm
2	Spacer Plates, 4 mm
4	Pre-cut wiper blade
1	200 gm Scale

Find a suitable location free from obstructions and clutter. The Gardner-scrub should be at a convenient height for the operator.

Plug the power supply into the DC input jack on the left 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~ at 50-60 Hz.

Using the bubble level on the top of the cover, adjust the 4 feet on the bottom of the unit to level the instrument to the work surface.

Place the Sample Pan in the provided indentation on top of the unit.

Insert the Acrylic Box Locator into the Sample Pan. Insert the Acrylic Boxes into the cutout portions of the Locator.

There are two sample clamp springs provided with the unit. Screw the knobs into the shafts located at the back corners of the unit until you can lift the shaft to its full extension. Then tighten the knob fully.

Install the Wiper Holder Assembly onto the Rear Support Arm using the captive thumb screw. Allow the Wiper Holders to drop down into the Acrylic Boxes.



Push the knob into the spring



Screw the knob into the shaft



Pull out the shaft by lifting the spring



Grasp the shaft and tighten the knob fully

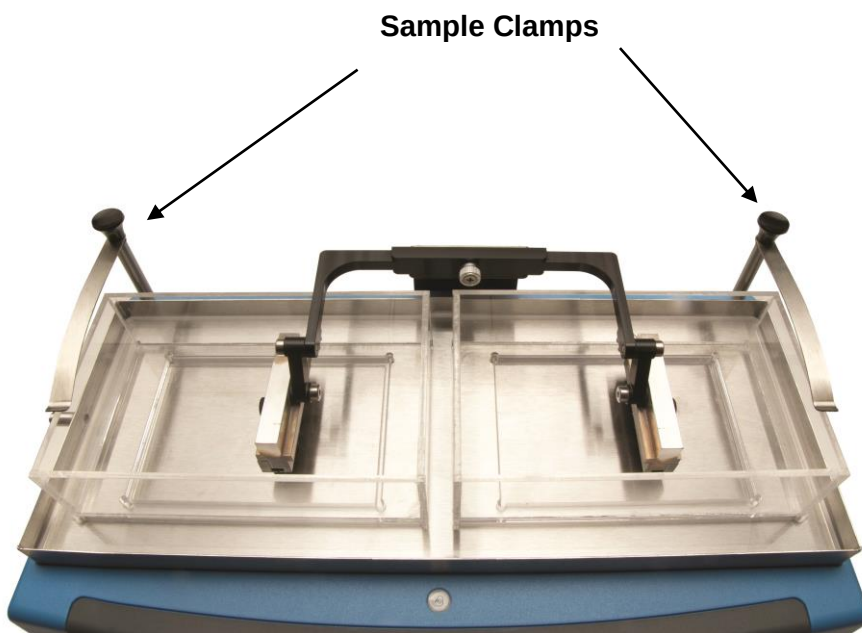


Screw the wiper arm assembly to the rear support arm

3 System Description

The Gardner-scrub Wiper Abrasion Tester helps evaluate the abrasion resistance of windshields and other clear glass and polymer products by simulating wiper blade action in a controlled manner while allowing the addition of abrasive materials to accelerate the testing.

Two sample clamps slide on shafts at the rear of the instrument hold the sample boxes in place during testing.



The Gardner-scrub incorporates a precise speed control to maintain a constant speed for the test. The instrument is preset at 37 strokes per minute to coincide with most standardized tests, but may be adjusted within the range of 6 to 60 strokes per minute. Unlike some other instruments on the market, the Gardner-scrub maintains a linear speed over its travel length. The result is a more consistent and repeatable test.

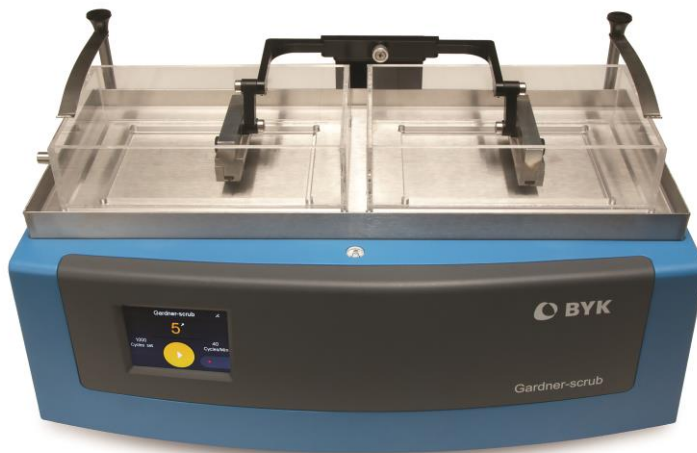
A front mounted, color touch screen is provided for user interaction. All adjustments are available in the setup screen to provide a flexible interaction with the user.

The instrument is setup at the factory for a center-to-center stroke length of 130 mm to comply with the test specifications. This is fixed and not adjustable.

4 Start Up

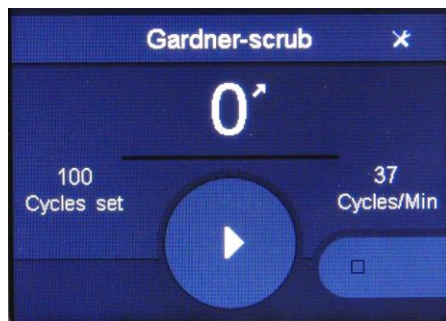
Plug the external power supply into the connector on the rear of the instrument near the power switch. Plug the other end into an appropriate electrical outlet as described in Section 2.

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



The front LCD display will illuminate, the instrument is now ready to operate.

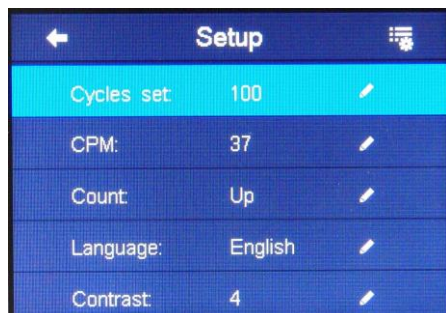
All user interaction is through the touch screen LCD.



screen.

The Home screen

The large number in the center indicates number of counts, the small arrow indicates whether the unit is counting up or down from the Cycles set number. The Cycles Set indicates how many cycles the instrument is programmed to run. The Cycles/Min indicates the programmed speed. The large round button in the middle is the Start button to begin the test. The small icon in the upper right corner is the tool icon to get to the Setup



The Setup screen

Press the tool icon on 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. Press the Cycles set area to access this screen.



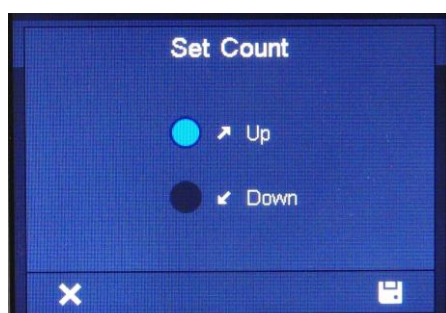
Set cycles screen

Adjust the number of cycles that will be run without stopping on this screen. Press the appropriate up or down arrow to adjust each digit. The instrument will run up to 100,000 cycles. Once the desired number of cycles is set, press the Save icon in the lower right of the screen to return to the Setup screen. The X in the lower left will exit the screen with no changes saved.



Set CPM screen

This screen allows you to adjust the cycles per minute or speed of the instrument. All current test methods use 37 CPM however, you can change this number for using the instrument for non-standard accelerated or other special testing. The maximum speed allowed is 60 CPM. Touch save or exit to return to the Home screen.



Set Count screen

This setting allows the instrument to count up or down from the number of cycles set previously. The default is counting up from zero. If you would like the system to count down from the set point select Down. Touch save or exit to return to the Home screen.



Set Language screen

Touch the language you wish to use. There are 8 languages to choose from. Touch save or exit to return to the Home screen.



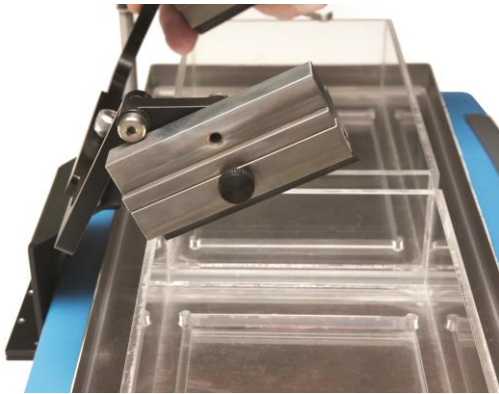
Set VCOM (Contrast) screen

Touch the button up and down to view the different contrast settings available.

5 Operation

Specific operational procedures are covered in the individual standards. The following steps are a general guide and not intended to cover any one specific standardized test.

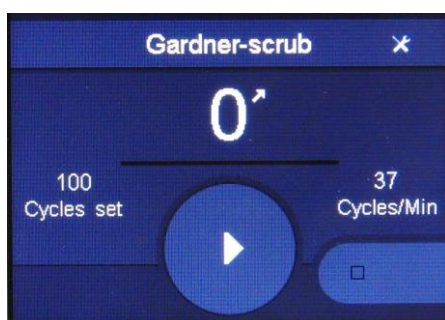
Raise the Wiper Holder Assembly and let it fall against the back stop. Loosen the Thumb Screw on each Wiper Holder and install a Wiper Insert pre-cut to 80 mm. Tighten the Thumb Screw.



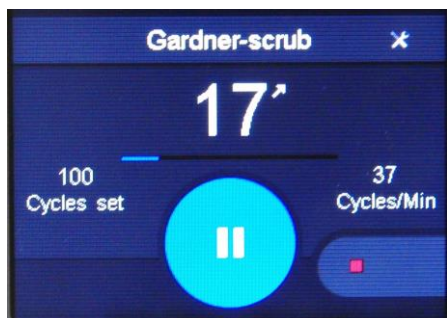
The individual test method may require the weight of the wiper arm to be verified. Place the 200 gm scale in the sample area and lower the wiper arm carefully onto the scale plate. The weight should be 120 ± 4 gm. Both wiper arms should be checked.

Insert the sample to be tested in the bottom of the Acrylic Sample Box. The test sample must be $150\text{mm} \times 100\text{mm} \pm 1\text{mm}$ to properly fit the Sample Box. Use an appropriate Spacer Plate to bring the test sample as close to flush to the inside bottom of the sample box. Two each of two thickness of Spacer Plates are provided with the instrument, 2 mm and 4 mm.

Apply tape to seal the edges of the test sample to the Sample Box. The tape will help to contain the abrasive material in the Sample Box. Choose a tape that is resistant to the abrasive material and any liquid you are using.



From the Home screen press the large Start button to begin testing. Once you press this button the screen will change to the Run Screen.



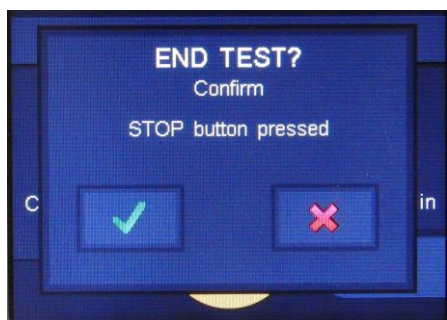
When the Start button is pressed, the screen changes to Run mode. The Start button turns blue and is now a Pause button. The Stop button is now active and is indicated by the red square. The Progress bar is in blue to help indicate how far along the test has run. To pause operation without resetting the counter, press the large blue Pause button. To stop operation and reset the counter, press the red square area Stop button.



When the pause button is pressed (or anywhere except the Stop button area) This Pause screen will appear. To resume the test just press the yellow Run button. In our example the counter is stopped at 20 cycles on its way to a total of 100 cycles. Note the progress bar is also yellow. Pressing the Start button will continue from where the test was stopped. Pressing the Stop button will stop the test and reset the counter.



As a safety measure, the instrument will stop and be placed in Pause mode if the screen is touched anywhere except the Stop button area. This is an Emergency Stop feature. As described above, the count will reset and the system will stop if the Stop button is pressed.



Pressing the Stop button also erases the current number of counts and resets the counter to zero (in count up mode) or to cycles set (in count down mode). A confirmation screen asks to confirm the Stop and reset operation.

6 Maintenance and Repair

Cleaning and Routine Maintenance

Care should be taken to avoid letting abrasion materials spill from the pan. If spillage occurs, clean the covers with mild soap and water as soon as practical. If abrasive substances are spilled on the LCD display clean it with mild soap and water. This includes

a glass surface so take care not to use excessive force. Avoid solvents on the cover and the LCD as they may be seriously damaged by strong solvents.

Troubleshooting

If the carriage becomes jammed the instrument will stop and report an error message. If this occurs, turn off the power, remove the power connector from the rear of the unit and clear any visible jams. Once cleared, replace the power connector and turn on the instrument. If a jam is still indicated, contact your local BYK-Gardner office for assistance.

Service and Spare Parts

For all service and spare parts requirements, please contact your local BYK-Gardner office.

Components

Ordering Information

Part Number	Description
5097	Gardner-scrub Abrasion Tester ECE 43 Wiper Method

Recommended Accessories

Part Number	Description
5098	Replacement wiper refills, 25 pcs - 650 mm length
5099	ISO abrasive material, 1 gallon container

Replacement Parts

Part Number	Description
100861357	Power supply
100862065	Acrylic Sample Box
150000098	Spacer plate kit, 2 – 2mm plates, 2 – 4mm plates
5041	Sample pan with drain outlet

7 Technical Data

Weight	25 pounds	11.3 kg
Height	7.7 inches	196 mm
Width	19.1 inches	485 mm
Depth	11.0 inches	279 mm
Temperature - Storage	0° – 150° F	-18° – 66° C
Temperature - Operating	35° - 100° F	1° - 38° C
Power	Power supply input: 100-240V ~ 50-60 Hz	

	Power supply output: 24V --- 4.0 Amp
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All technical data is subject to change.



EC – Declaration of Conformity

We BYK-Gardner USA
 9104 Guilford Road
 Columbia, MD 21046 USA

herewith declare the product:

Type: **Gardner-scrub Abrasion Tester**

comply with the requirements of the following EC directives:

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

The following harmonized standards were applied:

EN 61010-1:2010
EN 61326-1:2013

Columbia, January 2, 2017

Technical documentation is available

A handwritten signature in black ink, reading 'Michael J. Gogoel'.

Mr. Michael J. Gogoel
V.P. General Manager

298 025 293 E 1808