



VWR ShiroGel

Horizontal Electrophoresis Gel Boxes

INSTRUCTION MANUAL

European Catalogue Number(s):

7x10cm	700-0250
15x10cm	700-0253
15x15cm	700-0255

Version: 1
Issued: 08.04.2010



Legal Address of Manufacturer

United States

VWR International
1310 Goshen Parkway
West Chester, PA 19380
800-932-5000
<http://www.vwr.com>

Europe

VWR International bvba
Researchpark Haasrode 2020
Geldenaaksebaan 464
B-3001 Leuven
+ 32 16 385011
<http://be.vwr.com>

Country of origin

UK

Table of Contents

	Page
Warning	4
Safety information	4
Package Contents	5
Unpacking	5
Installation	6
Intended Use	7
Symbols and conventions	7
Description of Buttons and Switches	7
Instructions for use	8
Troubleshooting	10
General maintenance	11
Technical Service	12
Warranty	12
Disposal	13
Appendix	14
Accessories	15

Warning

When used correctly, these units pose no health risk. However, these units can deliver dangerous levels of electricity and are to be operated only by qualified personnel following the guidelines laid out in this instruction manual.

Anyone intending to use this equipment should read the complete manual thoroughly.

Safety Information



To avoid electrical shock:

The unit must never be used without the safety lid correctly in position.



To avoid electrical shock:

The unit should not be used if there is any sign of damage to the external tank or lid.

These units comply with the statutory CE safety directives:

Low Voltage Directive: 2006/95/EC	RoHS Directive: 2002/95/EC
EMC Directive: 2004/108/EC	WEEE 2006/96/EC
EN 61010-1:1993/BS EN 61010-1:1993	



Avoiding Damage to the Instrument

The units should never come into contact with the following cleaning agents, these will cause irreversible and cumulative damage:-

Acetone, Phenol, Chloroform, Carbon tetrachloride, Methanol, Ethanol, Isopropyl alcohol Alkalis.

Rnase Decontamination

This can be performed using the following protocol:-

Clean the units with a mild detergent as described above.

Wash with 3% hydrogen peroxide (H₂O₂) for 10 minutes.

Rinsed with 0.1% DEPC- (diethyl pyrocarbonate) treated distilled water,

Caution: DEPC is a suspected carcinogen. Always wear gloves and safety glasses.

RNaseZAP™ (Ambion) can also be used. Please consult the instructions for use with acrylic gel tanks.

Package Contents

VWR ShiroGel 7x10cm

Units include tank, lid and electrodes and include the following accessories:-

Buffer Volume 225 ml

	Tray	Tray Dams	Combs	Loading Guides	Cables
VWR ShiroGel 7x10cm	7 x 10cm (W x L)	Pack of 2	3 x 1.5mm, 8 sample	Well Visualization Strips	Black Red

VWR ShiroGel 15x10cm and 15x15cm

Units include tank, lid and electrodes and include the following accessories:-

Buffer volume 500 ml

	Tray	Tray Dams	Combs	Loading Guides	Cables
VWR ShiroGel 15x10cm	15 x 10cm (W x L)	Pack of 2	1 x 1.5mm, 20 sample, 1 x 1.5mm, 16 sample (Multichannel)	Well Visualization Strips	Black Red
VWR ShiroGel 15x15cm	15 x 15cm (W x L)	Pack of 2	1 x 1.5mm, 20 sample, 1 x 1.5mm, 16 sample (Multichannel), 1 x 1.5mm, 28 sample (Multichannel)	Well Visualization Strips	Black Red

Unpacking

These product descriptions and included component information should be referred to as soon as the units are received to ensure that all components have been included. The unit should be checked for damage when received. Please contact your supplier if there are any problems or missing items.

Installation

Usage Guidance and restrictions:

- Maximum altitude 2,000m.
- Temperature range between 4°C and 60°C.
- Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
- Not for outdoor use.

This apparatus is rated POLLUTION DEGREE 2 in accordance with IEC 664. POLLUTION DEGREE 2, states that: "Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected."

Setting up the ShiroGel Gel Tanks:-

Instructions for attaching Electrode Leads

1. Note the position of the lid on the unit. This shows the correct polarity and the correct orientation of the cables, black is negative and red positive.
2. Remove the lid from the unit. Note if the lid is not removed, fitting the cables may result in un-tightening of the gold plug and damage to the electrode.
3. Screw the cables into the tapped holes as fully as possible so that there is no gap between the lid and the leading edge of the cable fitting.
4. Refit the lid.

Instructions for using Gel Visualization Strips

These can be fitted to enhance visibility of the wells if desired. They can be fitted to the unit.

1. Seat the tray in the unit and note the position of the comb grooves. The samples run black to red but the trays can be used frontward or backwards so ensure that the comb grooves closest to the black electrode are marked.
2. Remove the tray.
3. Peel the back off of the loading guide and carefully apply the loading guide directly to the gel box.

The unit is now ready for use.

Intended use

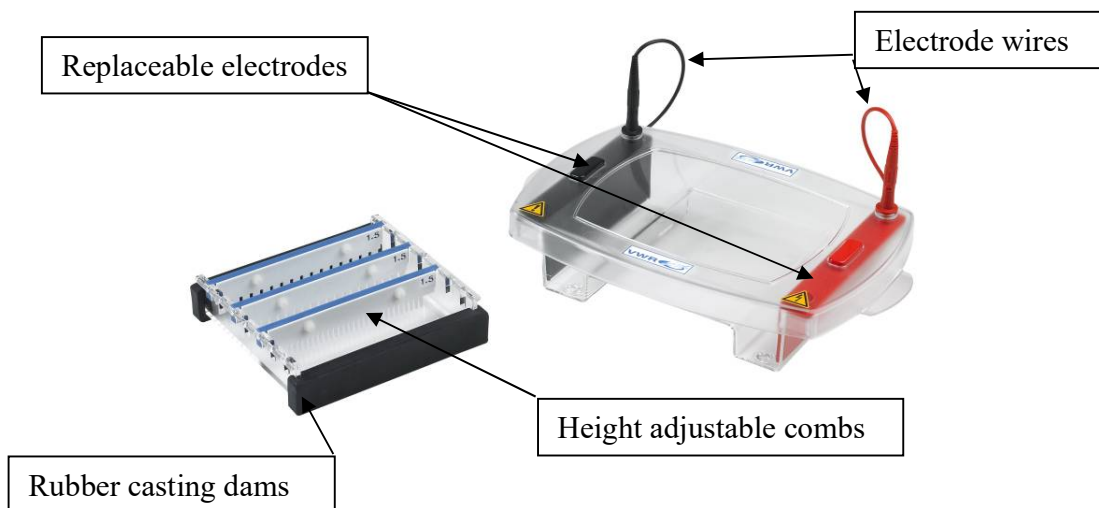
For research use only. Not intended for any animal or human therapeutic or diagnostic use.

Symbols and conventions

The following chart is an illustrated glossary of the symbols that are used in this manual.

	CAUTION This symbol indicates a potential risk and alerts you to proceed with caution
	CAUTION This symbol indicates the presence of high voltage and warns the user to proceed with caution

Description of Buttons and Switches



Getting Started

Gel Preparation:-

1. Table 1 shows the volume of agarose solution required to make the desired agarose gel for each unit tray size. For a standard 0.7% agarose gel, add 0.7 grams of agarose to 100 ml of 1x TAE or TBE solution. The same 1 x solution should be used in the tank buffer solution.

Table 1.

VWR ShiroGel 7x10cm		VWR ShiroGel 15x10cm		VWR ShiroGel 15x15cm	
Tray	Gel volume for a 1mm thick gel	Tray	Gel volume for a 1mm thick gel	Tray	Gel volume for a 1mm thick gel
7 x10cm	70ml	15 x 10cm	150ml	15 x 15cm	225ml

2. Add the agarose powder to a conical flask.
3. Add the appropriate amount of 1x TAE or TBE solution from the table above. To prevent evaporation during the dissolving steps below, the conical flask should be covered.
4. Dissolve the agarose powder by heating the agarose either on a magnetic hot plate with stirring bar or in a microwave oven. If using the microwave method, mark the level of the solution on the container. The microwave should be set at around a 400 watt or medium setting and the flask swirled every minute. The solution should be heated until all crystals are dissolved. This is best viewed against a light background. Crystals appear as translucent crystals. These will interfere with sample migration if not completely dissolved. Once the agarose is completely dissolves add ddi water to the solution to the marked level.

The gel must be cooled to between 50°C and 60°C degrees before pouring.

Gel Pouring:-

The VWR systems allow two different methods of gel casting:-

Casting Dams and Traditional Tape

Using trays with Casting Dams

1. Fit the casting dams over each end of the tray and place onto a level surface. The dams should be fitted so that there is no gap between the sides of the tray and the groove in the dams. This will ensure that there is no possibility of gel leakage.

2. Place the comb(s) in the grooves. Each tray has more than one comb groove so that multiple combs can be used. Using multiple combs increases sample number available per gel but decreases run length and care must be taken to ensure that samples from the first wells do not migrate into the lanes of the second comb wells.
3. Pour in the agarose carefully so as not to generate bubbles. Any bubbles that do occur can be smoothed to the edge of the gel and dispersed using a pipette tip.
4. Allow the agarose to set, on a flat surface; the agarose will become opaque once solidified.
5. Carefully remove the gel casting gates and comb and transfer the gel including tray to the main tank.

Using Traditional tape method:-

1. Autoclave or plastic backed general tape should be used. A length 5cm longer than the width of each end of the tray should be cut. One length should be placed over one end of the tray and stuck 1cm in from the tray edge. This should then be folded and the edges sealed securely. Repeat for the other end and place onto a level surface for gel pouring.
2. Place the comb(s) in the grooves. Each tray has more than one comb groove so that multiple combs can be used. Using multiple combs increases sample number available per gel but decreases run length and care must be taken to ensure that samples from the first wells do not migrate into the lanes of the second comb wells.
3. Pour in the agarose carefully so as not to generate bubbles. Any bubbles that do occur can be smoothed to the edge of the gel and dispersed using a pipette tip.
4. Allow the agarose to set, on a flat surface; the agarose will become opaque once solidified.
5. Carefully remove the gel casting gates and comb and transfer the gel including tray to the main tank.

Running the Gel:-

1. Mix the sample to be loaded with sample buffer – see page 9 solutions for common sample buffers. Usually 3ul of sample buffer is adequate but less may be used with sample volumes of less than 10ul.

2. Fill the unit with buffer until the gel is just flooded with buffer. This will give the fastest resolution times. For enhanced quality of resolution of sample, fill the unit to 5mm above the gel.

Note: DNA, RNA have a net negative charge and will migrate towards the anode.

3. Load the samples into the wells using pipettes. Multi-channel pipettes can be used for loading samples with MC compatible combs, see listing in accessories for identification of these.

4. Carefully place the lid on the tank and connect to a power supply.
5. Typically gels are run at between 90 and 150 volts. However, maximum voltages are indicated on the serial badge of each unit. It should be noted that higher voltages generally give faster but poorer quality sample resolution.

NOTE: Use only power supplies equipped with no-load and ground fault detection

Gel Staining and Viewing:-

1. Transfer the gel to a vessel containing the appropriate volume of 0.5 µg/ml ethidium bromide stain for 15–30 minutes, see solutions for stock stain concentration and adjust to the volume used accordingly. The entire gel should be covered.

NOTE: Ethidium bromide is a suspected carcinogen and the necessary safety precautions should be undertaken. Always wear protective clothing, gloves and safety glasses

2. De-stain the gel for 10–30 minutes in distilled water again ensuring the gel is completely immersed.
3. Rinse the gel twice for a couple of seconds with distilled water.
4. Transfer the gel to a UV Transilluminator.
5. The samples will often appear as brighter, clearer bands when photographed or viewed using a gel documentation system. However if the gel bands are too faint then the staining procedure should be adjusted so that there is less de-staining. If there is too much background then the staining procedure should be adjusted so that there is more de-staining.

Troubleshooting

Review the information in the table below to troubleshoot operating problems.

Problem	Cause	Solution
No bands visible on gel	Poor staining, insufficient sample amount	Check concentration of dye, be sure that enough sample has been loaded onto gel (>5ng).
Excessive background	Unbound ethidium bromide	Destain to wash out excess dye
Streaked bands	Overloading of gel	Dilute sample and rerun gel
Poorly resolved bands	Electrophoresis time too short, wrong agarose concentration	Increase run time and/or agarose concentration
Slanted lane	Agar not completely solidified	Allow gels to solidify for at least 30 minutes
Distorted lane	Bubble in lane	Avoid bubbles when pouring gels
Ragged band	Sample well deformed, excessive power	Be sure gel has solidified before removing comb, reduce power
Smeared band	Salt concentration too high, incomplete digest, nuclease contamination, sample overload	Reduce salt concentration, check enzyme activity, heat sample before run, dilute sample
Crushed gel	Voltage too high, electrophoresis too long	Reduce voltage, reduce electrophoresis time

Repair and maintenance of ShiroGel units

Cleaning ShiroGel Units

Units are best cleaned using warm water and a mild detergent. **Water at temperatures above 60° C can cause damage to the unit and components.** The tank should be thoroughly rinsed with warm water and distilled water to prevent build up of salts but care should be taken not to damage the enclosed electrode. Vigorous cleaning is not necessary or advised. Air drying is recommended before use.

The units should only be cleaned with the following:-

Warm water with a low concentration of soap or other mild detergent. Compatible detergents include dishwashing liquid. The units should not be left in detergents for more than 30 minutes.

Technical service

Web Resources

Visit the VWR's website at www.vwr.com for:

- Complete technical service contact information
- Access to VWR's Online Catalogue, and information about accessories and related products
- Additional product information and special offers

Contact us For information or technical assistance contact your local VWR representative or visit. www.vwr.com.

Warranty

VWR International warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of purchase. If a defect is present, VWR will, at its option, repair, replace, or refund the purchase price of this product at no charge to you, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. For your protection, items being returned must be insured against possible damage or loss. This warranty shall be limited to the replacement of defective products.

IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

Equipment disposal



This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.

Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.

For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you

APPENDIX

Solutions

1x TAE 40 mM tris (pH 7.6), 20 mM acetic acid, 1 mM EDTA.

50x (1L) dissolve in 750 ml distilled water:

242 g tris base (FW = 121)

57.1 ml glacial acetic acid

100 ml 0.5 M EDTA (pH 8.0).

Fill to 1 litre with distilled water.

1x TBE 89 mM tris (pH 7.6), 89 mM boric acid, 2 mM EDTA

10x (1L) dissolve in 750 ml distilled water:

108 g tris base (FW = 121)

55 g boric acid (FW = 61.8)

40 ml 0.5 M EDTA (pH 8.0)

Fill to 1 litre with distilled water.

Sample Loading Dye

10x sample buffer stock consists of 50% glycerol, 0.25% bromophenol blue, and 0.25% xylene cyanole FF in 1x TAE buffer. Only 1–10 ml of the 10x loading dye should be prepared.

Ethidium Bromide Solution 10mg/ml

Add 10 mg of Ethidium Bromide to 1 ml distilled water.

shiroGel Accessories

Accessories for 7x10cm shiroGel		
700-0251		Tray gel 7x10cm shiroGEL UV transparent
700-0252		Dam casting for 7cm gel tray shiroGEL
700-0258		Comb 10 sample wells 1,5mm for 7cm gel tray shiroGEL
700-0259		Comb MC 12 sample wells 1,0mm for 7cm gel tray shiroGEL
700-0260		Comb MC 12 sample wells 1,5mm for 7cm gel tray shiroGEL
700-0261		Comb 16 sample wells 1,0mm for 7cm gel tray shiroGEL
700-0262		Comb 16 sample wells 1,5mm for 7cm gel tray shiroGEL
700-0263		Comb 5 sample wells 1,5mm for 7cm gel tray shiroGEL
700-0264		Comb 8 sample wells 1,0mm for 7cm gel tray shiroGEL
Accessories for 15x10cm and 15x15cm shiroGel		
700-0254		Tray gel 15x10cm shiroGEL UV transparent
700-0256		Tray gel 15x15cm shiroGEL UV transparent
700-0257		Dam casting for 15cm gel tray shiroGEL
700-0265		Comb 10 sample wells 1,0mm for 15cm gel tray shiroGEL
700-0266		Comb 10 sample wells 1,5mm for 15cm gel tray shiroGEL
700-0267		Comb 12 sample wells 1,0mm for 15cm gel tray shiroGEL
700-0268		Comb 12 sample wells 1,5mm for 15cm gel tray shiroGEL
700-0269		Comb MC 14 sample wells 1,0mm for 15cm gel tray shiroGEL
700-0270		Comb MC 14 sample wells 1,5mm for 15cm gel tray shiroGEL
700-0271		Comb MC 14 sample wells 2,0mm for 15cm gel tray shiroGEL
700-0272		Comb 16 sample wells 1,0mm for 15cm gel tray shiroGEL
700-0273		Comb MC 16 sample wells 1,0mm for 15cm gel tray shiroGEL
700-0274		Comb MC 16 sample wells 1,5mm for 15cm gel tray shiroGEL
700-0275		Comb MC 16 sample wells 2,0mm for 15cm gel tray shiroGEL
700-0276		Comb MC 18 sample wells 1,0mm for 15cm gel tray shiroGEL
700-0277		Comb MC 18 sample wells 1,5mm for 15cm gel tray shiroGEL
700-0278		Comb 20 sample wells 0,75mm for 15cm gel tray shiroGEL
700-0279		Comb 20 sample wells 1,0mm for 15cm gel tray shiroGEL
700-0280		Comb 20 sample wells 1,5mm for 15cm gel tray shiroGEL
700-0281		Comb 20 sample wells 2,0mm for 15cm gel tray shiroGEL
700-0282		Comb MC 28 sample wells 0,75mm for 15cm gel tray shiroGEL
700-0283		Comb MC 28 sample wells 1,0mm for 15cm gel tray shiroGEL
700-0284		Comb MC 28 sample wells 1,5mm for 15cm gel tray shiroGEL
700-0285		Comb MC 30 sample wells 1,0mm for 15cm gel tray shiroGEL
700-0286		Comb MC 30 sample wells 1,5mm for 15cm gel tray shiroGEL
700-0287		Comb 35 sample wells 1,5mm for 15cm gel tray shiroGEL
700-0288		Comb 8 sample wells 1,0mm for 15cm gel tray shiroGEL
700-0289		Comb 8 sample wells 1,5mm for 15cm gel tray shiroGEL

Local VWR offices in Europe and Asia Pacific

Austria

VWR International GmbH
Graumannsgasse 7
1150 Wien
Tel.: 01 97 002 0
Fax: 01 97 002 600
E-mail: info@at.vwr.com

Belgium

VWR International bvba
Researchpark Haasrode 2020
Geldenaaksebaan 464
3001 Leuven
Tel.: 016 385 011
Fax: 016 385 385
E-mail:
customerservice@be.vwr.com

China

VWR International China Co., Ltd
Suite 1802 - 1803,
Xing Ye Bank Mansion, No 168,
168 Jiangning Road
Shanghai 200041, China
Tel.: +86- 21 521 388 22
Fax: +86- 21 521 33 933
E-mail: sales_china@vwr.com

Denmark

VWR - Bie & Berntsen
Transformervej 8
2730 Herlev
Tel.: 43 86 87 88
Fax: 43 86 87 90
E-mail: info@dk.vwr.com

Finland

VWR International Oy
Pihatörmä 1 C 1
FI - 02240 Espoo
Tel.: +358 9 80 45 51
Fax: +358 9 80 45 52 00
E-mail: info@fi.vwr.com

France

VWR International S.A.S.
Le Périgares – Bâtiment B
201, rue Carnot
94126 Fontenay-sous-Bois cedex
Tel.: 0 825 02 30 30 (0,15 EUR TTC/min)
Fax: 0 825 02 30 35 (0,15 EUR TTC/min)
E-mail: info@fr.vwr.com

Germany

VWR International GmbH
Hilpertstrasse 20a
D - 64295 Darmstadt
Tel.: 0180 570 20 00*
Fax: 0180 570 22 22*
E-mail: info@de.vwr.com
*0,14 €/Min. aus d. dt. Festnetz,
Mobilfunk max. 0,42 €/Min.

Hungary

Spektrum-3D Ltd.
A VWR International Company
Simon László u. 4.
4034 Debrecen
Tel.: (52) 521-131
Fax: (52) 470-069
E-mail: info@spektrum-3d.hu

India

VWR Lab Products Pte Ltd
2nd Floor, Front Wing, 135/12, Brigade
Towers
Brigade Road
Bangaluru 560025 India
Tel: +91-2522-277876 (Mumbai)
Tel: +91-80-41117124 (Bangalore)
Fax +91-80-41117120
E-mail: vwr_india@vwr.com

Ireland

VWR International Ltd
Orion Business Campus
Northwest Business Park
Ballycoolin
Dublin 15
Tel.: 01 88 22 222
Fax: 01 88 22 333
e-mail sales@ie.vwr.com

Northern Ireland

VWR International Ltd
A10 Harbour Court, 7 Heron Rd
Sydenham Business Park
Belfast BT3 9HB
Tel.: 028 9058 5800
Fax: 028 9080 7812
e-mail sales@ie.vwr.com

Italy

VWR International s.r.l.
Via Stephenson 94
20157 Milano (MI)
Tel.: 02 332 03 11
Fax: 800 152 999
E-mail: info@it.vwr.com

The Netherlands

VWR International B.V.
Postbus 8198
1005 AD Amsterdam
Tel.: 020 4808 400
Fax: 020 4808 480
E-mail: info@nl.vwr.com

Norway

VWR International AS
Haavard Martinsensvei 30
0978 Oslo
Tel.: 02290
Fax: 815 00 940
E-mail: info@no.vwr.com

Portugal

VWR International - Material de
Laboratório, Lda
Edifício Neopark
Av. Tomás Ribeiro, 43- 3 D
2790-221 Carnaxide
Tel.: 21 3600 770
Fax: 21 3600 798/9
E-mail: info@pt.vwr.com

Singapore

VWR Singapore Pte Ltd
18 Gul Drive
Singapore 629468
Tel: +65 6505 0760
Fax: +65 6264 3780
E-mail: sales@sg.vwr.com

Spain

VWR International Eurolab S.L.
Ronda Can Fatjó, nº 11
Edifici Tecnopark, 3
Parc Tecnològic del Vallés
08290 Cerdanyola del Vallés
(Barcelona)
Tel.: 902 222 897
Fax: 902 430 657
E-mail: info@es.vwr.com

Sweden

VWR International AB
Fagerstagatan 18a
163 94 Stockholm
Tel.: 08 621 34 00
Fax: 08 621 34 66
E-mail: info@se.vwr.com

Switzerland

VWR International AG
Lerzenstrasse 16/18
8953 Dietikon
Tel.: 044 745 13 13
Fax: 044 745 13 10
E-mail: info@ch.vwr.com

UK

VWR International Ltd
Customer Service Centre
Hunter Boulevard
Magna Park
Lutterworth
Leicestershire
LE17 4XN
Tel.: 0800 22 33 44
Fax: 01455 55 85 86
E-mail: uksales@uk.vwr.com