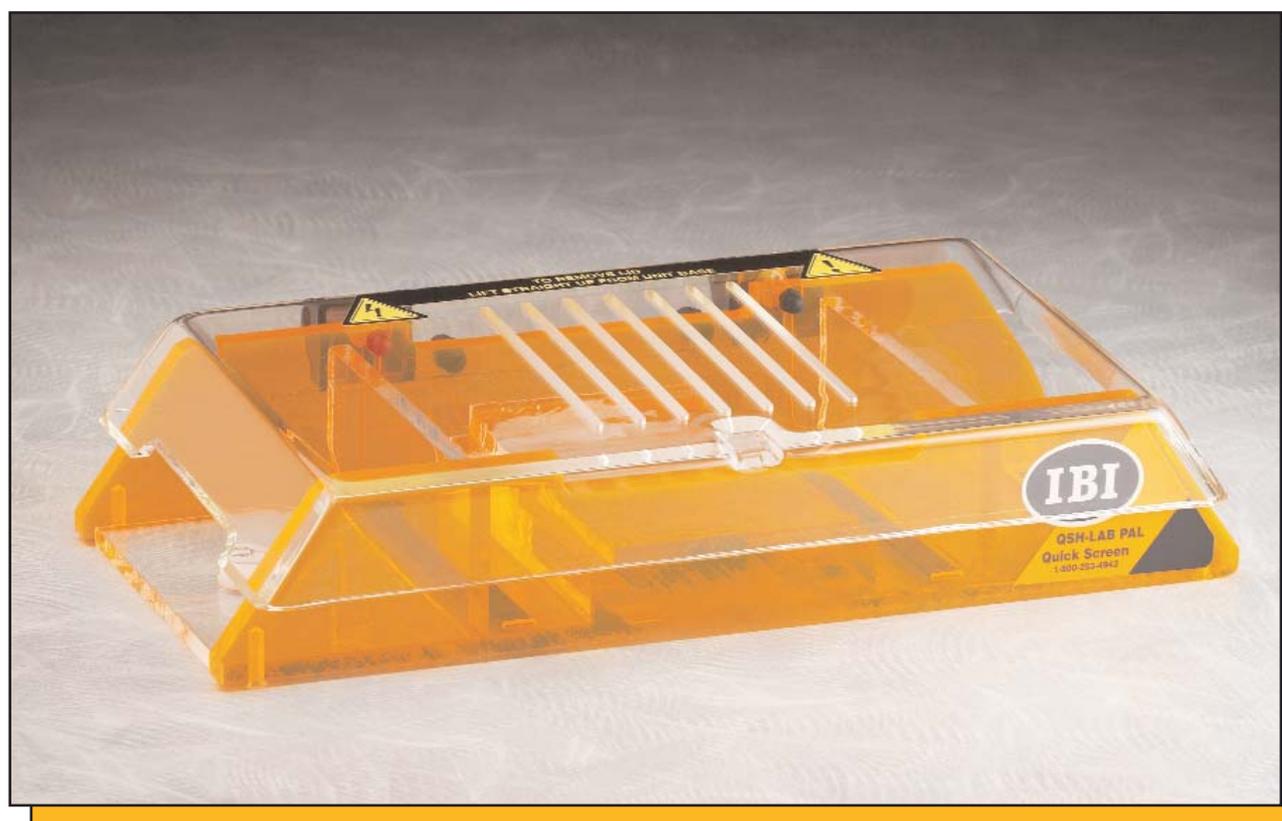


OPERATOR'S MANUAL

QSH - LAB PAL

HORIZONTAL GEL ELECTROPHORESIS UNIT

GEL SIZE: 5CM X 7CM



IBI Catalog Number: **IB50000**



IBI *SCIENTIFIC*

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A. SAFETY INFORMATION

Important Safety Information!

- ◆ Please read this manual carefully before operating your new IBI QSH-Lab Pal unit.
- ◆ This manual contains important operating and safety information.
- ◆ To best use the product, please read the entire manual carefully prior to use.
- ◆ To avoid possible injury, this product should only be used for its intended purpose.

B. PACKAGE CONTENTS

Upon receiving this product, please verify all of the noted parts and accessories are contained in this package.

- ◆ Model QSH Buffer Tank
- ◆ Patented QSH Vented Lid
- ◆ Dual Gel Casting Tray
- ◆ One Set of 1.5mm x 5 Tooth Combs (2 ea.)
- ◆ Four Glass Slides
- ◆ One Set of Power Cords (Red and Black)
- ◆ Operation Manual

NOTE: Carefully inspect all items in the package to insure no items are broken or missing. If there are items broken, please inspect the package carefully for signs of shipping damage. If there is ANY sign of shipping damage, please contact the carrier and file a claim with them immediately. Contact the distributor from which you purchased the item or IBI Scientific for assistance at (800) 253-4942 or (563) 690-0484.

C. PRODUCT SPECIFICATIONS

| | <u>Height</u> | <u>Width</u> | <u>Length</u> |
|-----------------|---------------|--------------|---------------|
| Unit Dimensions | 7.0cm | 15.0cm | 30.0cm |
| Gel Platform | | 10.0cm | 7.0cm |

Maximum Sample Capacity: 10 Samples - 1 Comb, 10 samples

Buffer Capacity: 250ml

Distance Between Electrodes: 13.0cm

D. OPERATING INSTRUCTIONS

Your new QSH-Lab Pal Horizontal Unit is cleaned and wiped prior to packaging; however, components should be washed in warm soapy water prior to use in the laboratory. A mild dish washing liquid, like Joy, works well.

Gently wash the tank, lid, dual gel casting tray, and glass slides in warm soapy water, taking care not to scratch any of the acrylic components such as the tank and UVT tray. Do NOT wash Power Cords.

NOTE: It is also recommended that the glass slides be cleaned with alcohol prior to use. Be certain the entire unit is dry prior to use.

PREPARATION OF THE AGAROSE GEL - DNA

1.) Select the percentage gel necessary to effectively resolve your sample, use Table 1 as a guide.

Table 1 Gel Concentrations and Resolving Ranges

| Concentration of Agarose in Gel (% w/V) | Efficient Range of Separation of Linear DNA (Kb) |
|---|--|
| 0.3% | 5 - 60 |
| 0.6% | 1 - 20 |
| 0.7% | 0.8 - 10 |
| 0.9% | 0.5 - 7 |
| 1.2% | 0.4 - 6 |
| 1.5% | 0.2 - 3 |
| 2.0% | 0.1 - 2 |

* Table taken from Sambrook, J., Fritsch, E.F., & Maniatis, T. (1989) Molecular Cloning, A Laboratory Manual, 1, 6. 8, 613.

2.) Weigh an appropriate quantity of agarose (0.3% means 0.3gm of agarose per 100ml of gel volume) and place it into a 250ml flask.

3.) Make up 500ml of either 1X TAE or 1X TBE electrophoresis buffer. See below:

Electrophoresis Buffers

The two most commonly used buffers for horizontal electrophoresis of double stranded DNA in agarose gels are Tris-Acetate-EDTA (TAE) [IB70160] and Tris-Borate-EDTA (TBE) [IB70150]. While the resolving powers of these buffers are very similar, the relative buffer capacities are very different, conferring different run attributes which are summarized below:

TAE (IB70160): Tris-acetate has traditionally been the more commonly used buffer. However, its relatively low buffer capacity will become exhausted during extended electrophoresis, making buffer recirculation necessary in runs exceeding 140 mA-hours. Potential advantages of using TAE buffer over TBE buffer include superior resolution of supercoiled DNA and approximately 10 % faster migration of double-stranded linear DNA fragments.

TBE (IB70150): Tris-borate's significantly greater buffering capacity and its relatively low current draw eliminates the need for recirculation in all but the most extended runs (> 300 mA-hours). TBE buffer systems are not recommended when fragments are to be recovered from the gel after electrophoresis.

- 4.) Add ethidium bromide (IB40075) to the diluted electrophoresis buffer to a final concentration of 0.5µg/ml.

NOTE: The addition of ethidium bromide to both the gel and the running buffer will result in maximum detection levels by providing high levels of sample fluorescence with an evenly low level of background.

- 5.) Add 6.6ml of the 1X electrophoresis buffer containing ethidium bromide made in step 4 per millimeter of gel thickness desired, up to a maximum to 50ml, to the flask containing the agarose (IB70035-40-42-45). A 50ml gel solution will make a 7.6mm thick gel. Thinner gels may be made, however care must be taken that the wells are deep enough to accommodate the desired sample volume.

| Catalog # | Comb Description | Well Width | Sample Volume Per mm Gel |
|-----------|---------------------------|---------------|--------------------------|
| IB50040 | 1.0mm, 5 tooth | 6.0mm | 5.0ul |
| IB50050 | 1.0mm, 10 tooth | 1.5mm | 1.0ul |
| IB50060 | 1.0mm, 0 Marker, 1 Sample | 47.0mm | 50.0ul |
| IB50070 | 1.0mm, 1 Marker, 1 Sample | 6.0mm/36.0mm | 5.0ul, 35.0ul |
| IB50080 | 1.5mm, 5 tooth | 6.0mm | 5.0ul |
| IB50090 | 1.5mm, 10 tooth | 1.5mm | 1.0ul |
| IB50100 | 1.5mm, 0 Marker, 1 Sample | 47.0mm | 50.0ul |
| IB50110 | 1.5mm, 1 Marker, 1 Sample | 6.0mm, 36.0mm | 5.0ul, 35.0ul |

- 6.) Make note of the total solution volume so that a degree of evaporation can be determined and corrected for.
- 7.) Heat the agarose slurry in a microwave oven for 90 seconds. Swirl the flask to make sure any grains sticking to the walls enter into the solution, undissolved agarose appears as small "lenses" floating in the solution. Heat the solution for an additional 30-60 seconds. Re-examine the solution and repeat the heating process until the agarose completely dissolves.
- 8.) Add deionized water to replace any volume lost through evaporation during the heating process.

Proceed to "Casting the Gel" on page 6.

PREPARATION OF THE AGAROSE GEL - RNA

RNA molecules are separated by electrophoresis through denaturing gels prior to analysis by northern hybridization. Agarose gels containing formaldehyde are commonly used for RNA electrophoresis. Presented below is a general protocol for electrophoresis of RNA using formaldehyde gels.

CAUTION! All equipment and solutions used in the following protocol should be treated with DEPC (diethyl pyrocarbonate) or acetic anhydride prior to use to inhibit RNase activity. It is recommended that dedicated solutions be made solely for RNA work to minimize the risk of sample degradation due to RNase activity.

NOTE: Staining RNA samples with ethidium bromide has been reported to reduce sample blotting efficiency. Therefore, if samples are to be analyzed by northern hybridization after electrophoresis, run a duplicate lane(s) for staining, or minimize the exposure of RNA samples to ethidium bromide by following the post-electrophoresis staining protocol on page 10.

The following protocol will make 50ml of a 1.5% agarose gel containing 1X MOPS [3-(N-Morpholino)-Propanesulfonic Acid]-Acetate-EDTA (MAE) buffer and 2.2M formaldehyde, resulting in a 7.5mm thick gel:

- 1.) Weigh 0.5gm of agarose, and place into a 125ml flask.
- 2.) Add 43.5ml of DEPC (or acetic anhydride) treated water.
- 3.) Make note of the total solution volume so that degree of evaporation can be determined and corrected for.
- 4.) Heat the agarose slurry in a microwave oven for 60 seconds. Swirl the flask to make sure any grains sticking to the walls enter into the solution. Undissolved agarose appears as small "lenses" floating in the solution. Heat for an additional 30-60 seconds. Re-examine the solution and repeat the heating process until the agarose completely dissolves.
- 5.) Add deionized water to replace any volume lost through evaporation during the heating process.
- 6.) Allow the solution to cool to 60°C. Place the flask in a hood and add 5ml of 10X MAE buffer, and 1.5ml of 37% formaldehyde.

CAUTION: Formaldehyde vapors are toxic. Gel preparation should take place in a hood and solutions and gels containing formaldehyde should be kept covered when possible.

CASTING THE GEL

- 1.) Place the gel casting fixture on a lab bench. Check to see that it is level by locating the supplied leveling bubble on the side of the platform. The bubble should appear within the center circle.

CAUTION! Cast agarose gels containing formaldehyde in a hood.

- 2.) To pour the gels, place the casting tray on top of the unit with the lid in place. Carefully, place a glass slide in each section of the casting tray (see Photo 1).
- 3.) When the gel solution has cooled to approximately 55°C, slowly pour it into the gel tray. If hotter gel solutions are routinely poured, the tray may warp over time.
- 4.) If bubbles form on the surface of the gel upon pouring, use the comb to either pop them or lightly brush them to the sides of the gel. If large bubbles are allowed to harden within the gel, they may cause artifacts to occur during electrophoresis.
- 5.) Insert one or both combs by placing them into the slots in the casting tray (see Photo 2).
- 6.) Allow the gel to harden undisturbed for at least 30 minutes.

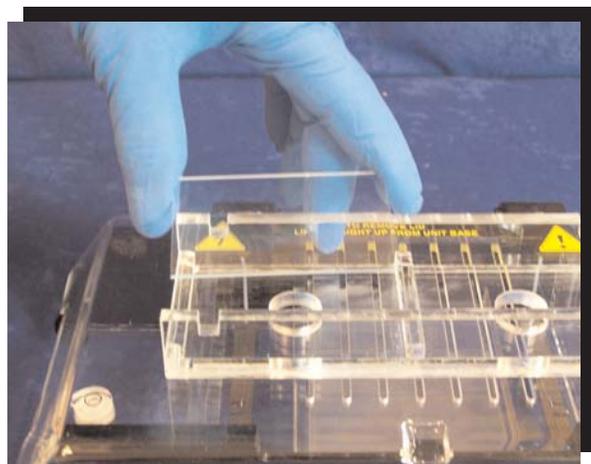


Photo 1

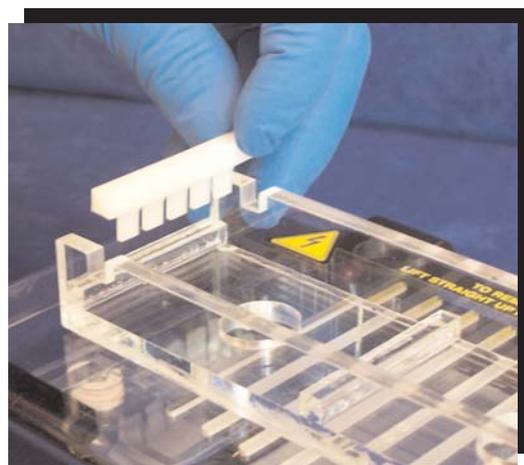


Photo 2

REMOVING THE COMB

- 1.) When the gel is solidified and fully opaque, carefully remove the comb with a gentle wiggling, upward motion. If the comb is difficult to remove or if a low percentage gel is being used, overlay the comb area with a small volume of 1X electrophoresis buffer to preserve the integrity of the wells. Check the wells to ensure their bases are intact. Lift the slide(s) from the casting tray by pushing up on the slide through the finger hole opening at the bottom of the casting tray (see Photo 3).

CAUTION: Prolonged exposure of the Delrin combs to gels containing formaldehyde will cause them to degrade. Be sure to remove the comb(s) from formaldehyde gels as soon as gel hardening is complete and rinse them well prior to storage.

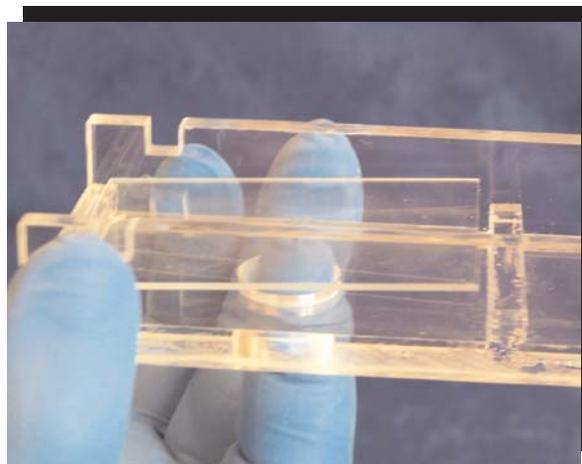


Photo 3

If a gel is not to be used immediately after preparation, remove it from the casting fixture and place it in a plastic bag or container submerged in 1X electrophoresis buffer containing 1mMNaN₃. Store at +4°C.

LOADING THE SAMPLES INTO THE GEL

- 1.) Place the slides containing the cast gels onto the platform of the unit, with the sample wells on the negative (black) end of the unit (see Photo 4).
- 2.) Fill the unit with the remaining 1X electrophoresis buffer containing ethidium bromide made previously (or 1X MAE buffer for RNA gels), covering the gel to a depth of 1-5mm. Approximately 250ml of buffer will be required.

NOTE: Use of the same batch of electrophoresis buffer for both the gel and the running buffer is very important. Slight variations in buffer composition between gel and running buffer may result in ionic or pH gradients that can significantly impact the mobility of the samples.

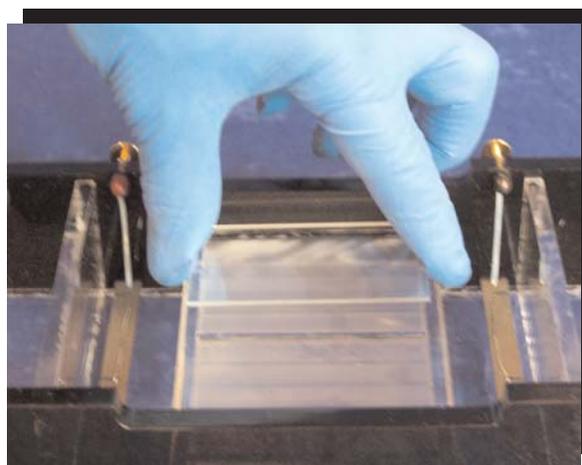


Photo 4

- 3.) Pre-run RNA gels at 100V for five minutes prior to loading the samples.
- 4.) Load the samples into the wells with a micropipette or similar device taking care not to puncture the bottom of the wells or load the sample onto the top of the gel. For improved well visualization during sample loading, be sure that the wells are positioned over the contrasting stripes located on the bottom of the buffer tanks.

ELECTRICAL CONNECTIONS TO THE SAFETY LID

CAUTION: This unit is intended to be used with a power supply which detects a no current condition and prevents a current flow unless there is a completed circuit path. Use of other power supplies may compromise the safety of this unit.

The QSH-Lab Pal can only be operated with the safety lid in place. Electrical current is supplied through the banana plugs to the lid which, in turn, connect to the gold plated tank connectors. A simple gravity connector in the cover ensures a complete current path, yet allows the lid to be removed from the unit without disturbing the loaded samples.

- 1.) Plug the female ends of the black (-) and red (+) leads into the banana jacks on the rear of the lid. Be certain that the black (-) plug is connected to the cathode end, where the samples originate (see photo 5).
- 2.) After the samples have been loaded into the gel, place the lid over the unit so that the connector covers align with the round tank connectors.
- 3.) Set the lid straight down so that the lid rests squarely on the unit and the round tank connectors are inside the connector covers.
- 4.) Make sure the power supply is turned off. Plug the male ends of the red and black leads into a corresponding set of jacks on the power supply (black - black; red - red).



Photo 5

CAUTION: Do not jar or bump the gel box once the lid is place. The electrical connection is made by gravity once the lid is in position. While this design helps to minimize sample disturbance during lid placement, it also may result in a disruption of power to the unit if the lid or unit are disturbed during the run.

SAMPLE ELECTROPHORESIS

- 1.) The QSH-Lab Pal is designed for quick screen electrophoresis. The maximum suggested applied voltage for the electrophoresis of DNA in agarose gels using the QSH-Lab Pal is 100V. In a 1% TBE gel, this translates into a run time of approximately 1/2 hour. Lower voltages may be used, of course, and as a general rule, a 50V run will take twice as long as a 100V run. Higher voltages may be used to decrease run time, however, if the unit is being operated at higher voltages than 100V, the heat generated during electrophoresis may decrease sample resolution. Such artifacts may be avoided by running the unit in a cold room or adding 1X electrophoresis buffer "ice cubes" to keep the unit properly cooled.

CAUTION: DO NOT EXCEED THE MAXIMUM OPERATING VOLTAGE OF 175 VOLTS.

The suggested run parameters for the electrophoresis of RNA in agarose gels containing formaldehyde is 60-80V. Since the QSH-Lab Pal has no capacity for buffer recirculation, the buffer from each reservoir should be collected after 1.5 hours of electrophoresis and properly discarded.

CAUTION: Formaldehyde vapors are toxic. Electrophoresis of RNA in gels containing formaldehyde should take place within a fume hood.

- 2.) Follow the sample migration into the gel using the loading dye as an indicator. (See “Choice of Buffer” for the Sample Loading Buffer recipe) Allow the samples to migrate until the fragments have separated, normally until the bromophenol blue dye front has migrated 3/4 of the way down the gel.

NOTE: If the gel contains ethidium bromide, the progress of electrophoresis may be monitored during the run by turning off the power supply, removing the lid, and shining a medium-wave UV light onto the gel. The resolved bands will appear as orange bands against a dark purple background.

DETECTION AND DOCUMENTATION OF SEPARATED FRAGMENTS

- 1.) At the completion of the run, turn off the power supply and disconnect the leads. Remove the lid (it is not necessary to remove the power leads from the lid) and remove the gel tray.
- 2.) To stain RNA gels containing formaldehyde post electrophoresis, soak the gel in 1L of DEPC-treated water overnight at room temperature. Transfer the gel to a solution of 20X SSC containing 0.5µg/ml of ethidium bromide, stain for 5 -10 minutes.
- 3.) Ethidium bromide stained samples are visualized by exposing them to medium wavelength (312nm) UV light. Because the gel casting tray is UV transmittant, the gel does not need to be removed from the tray before viewing. Place the gel casting tray containing the gel on the filter surface of a UV transilluminator for convenient viewing.
- 4.) Sample banding patterns may be documented by autoradiography.

CHOICE OF BUFFER

NOTE: Tris-borate buffer allows faster sample migration than tris-acetate buffers with no apparent loss of resolution. A tris-borate buffer is usually the choice for quick-screening. Phosphate buffers are used with glyoxal or formaldehyde gels.

The two most commonly used buffers for horizontal electrophoresis of double stranded DNA in agarose gels are Tris-Acetate-EDTA (TAE) and Tris-Borate-EDTA (TBE). While the resolving powers of these buffers are vary similar, the relative buffer capacities are very different, conferring different run attributes which are summarized below:

- ♦ **Tris-Acetate** has traditionally been the more commonly used buffer. However, its relatively low buffer capacity will become exhausted during extended electrophoresis, making buffer recirculation necessary in runs exceeding 140mA-hours. Potential advantages of using TAE buffer over TBE buffer include superior resolution of supercoiled DNA and approximately 10% faster migration of the double-stranded linear DNA fragments.
- ♦ **Tris-Borate** has a significantly greater buffering capacity and its relatively low current draw eliminates the need for recirculation in all but the most extended runs (>300mA-hours). TBE buffer systems are not recommended when fragments are to be recovered from the gel after electrophoresis.

TRIS ACETATE EDTA BUFFER (TAE) - IB70160:

1X Working Concentration:

40 mM Tris base
20 mM Glacial Acetic Acid (NaOAc)
2.0 mM EDTA
pH 8.3

10X Stock Solution:

48.4 g Tris Base
16.4 g or 11.42ml NaOAc
7.4 g EDTA or 20ml 0.5M EDTA (pH 8.0)
H₂O to 1L

TRIS BORATE EDTA BUFFER (TBE) - IB70150:

1X Working Concentration:

89 mM Tris Base
89 mM Boric Acid
2.0 mM EDTA
pH 8.0

10X Stock Solution:

108g Tris Base
55g Boric Acid
6.72g EDTA or 40ml 0.5M EDTA (pH 8.0)
H₂O to 1 liter

MOPS ACETATE EDTA (MAE) - IB70175:

Solutions containing MOPS should be wrapped in aluminum foil and stored at room temperature. The buffer tends to yellow with age. Light yellow buffer may be used, however, dark yellow solutions should be discarded.

1X Working Concentration:

20 mM MOPS (pH 7.0)
8 mM NaOAc
1 mM EDTA (pH 8.0)

10X Stock Solution:

41.8g MOPS
800 ml DEPC treated H₂O
adjust pH to 7.0 with NaOH and add:
16.6ml 3M DEPC-treated NaOAc
20.0ml 0.5 M DEPC-treated EDTA, pH 8.0
bring to 1.0 liter and filter

Solutions containing MOPS should be wrapped in aluminum foil and stored at room temperature. The buffer tends to yellow with age. Light yellow buffer may be used, however, dark yellow solutions should be discarded.

Sample Loading Buffer - DNA

10X Stock Solution:

50 % Glycerol
100mM Na₃EDTA
1% SDS
0.1% Bromophenol Blue
pH 8.0

Sample Loading Buffer - RNA

5X Stock Solution:

1 mM EDTA, pH 8.0
0.25 % Bromophenol Blue
0.25 % Xylene Cyanol
50 % Glycerol

VOLTAGE

The QSH-Lab Pal is designed for rapid electrophoresis with moderate resolution. Suggested voltage is 100V for a 20 to 25 minute run. Higher voltages may be used to decrease run time, however, the volt-hours should remain constant. One should not exceed 200 volt-hours without changing the buffer in the unit. If the unit begins to operate at voltages higher than 150V we recommend adding 1X electrophoresis buffer ice cubes to keep the unit properly cooled.

STAINING SOLUTION

The simplest staining procedure is to add 1-5g Ethidium Bromide per ml of gel solution just prior to casting the gel. Alternatively, the gel can be stained in a solution of 5uG ethidium bromide/ml of 1X gel buffer for 15 minutes. Destain in deionized water or 1mM MgSO₄ for two minutes.

E. MAINTENANCE OF UNIT

Care must be observed in the handling of this unit.

DO NOT expose the unit to temperatures above 60°C

DO NOT expose the unit to organic solvents

DO NOT clean the unit with abrasive cleaners or cleaning aids.

Use mild cleaning solution (dish soap recommended) for routine cleaning. For heavier dirt, hand wash with soft cloth. In most cases, a rinse in deionized water is sufficient to clean the unit. To remove residual Ethidium Bromide from the gel unit, soak occasionally in 1% commercial bleach solution for 16 hours, and rinse well.

NOTE: The degradation of acrylic by solvents may result in substantial discoloration, cracking, warpage or etching of the electrophoresis unit. **DO NOT** apply any of the following solvents to the unit: benzene, xylene, toluene, chloroform, carbon tetrachloride, alcohol, phenol, ketones, or esters. Do not use the Delrin combs supplied with this unit in formaldehyde for long periods of time. The formaldehyde damages these combs with long exposures.

If an electrode breaks, contact Technical Support and Information Services at (800) 253-4942 for an electrode replacement.

ELIMINATION OF RNASE CONTAMINATION

Should treatment of the unit to eliminate RNase contamination be desired, clean the unit with a mild detergent as described above, followed by soaking for 10 minutes in a solution of 3% hydrogen peroxide and then 1 hour in 0.1% DEPC (diethyl pyrocarbonate). Pour out final rinse and air dry.

CAUTION: DEPC is a suspected carcinogen, handle with care.

Alternatively, soak the unit and accessories in freshly made 2.2mM acetic anhydride treated water (200ul/liter) for at least five minutes. Solutions for RNA work (electrophoresis buffers, etc.) may be made from the same acetic anhydride treated water as well.

F. REPLACEMENT PARTS & ACCESSORIES

QSH-LAB PAL ACCESSORY ITEMS AND REPLACEMENT PARTS:

| <u>Catalog #</u> | <u>Description</u> |
|------------------|--|
| IB50500 | Replacement Power Cords |
| IB50504 | Replacement Bubble Level |
| IB50505 | Replacement Tank Connector Kit |
| IB50020 | Dual Gel Casting Tray |
| IB50140 | Casting Slides, Pack of 20 |
| IB50220 | QSH Quickloader |
| IB50200 | Replacement QSH-Lab Pal Buffer Tank |
| IB50300 | Replacement QSH-Lab Pal Lid |
| IB53305 | Replacement QSH-Lab Pal Electrode Assembly |

QSH-LAB PAL COMBS

| <u>Catalog #</u> | <u>Description</u> | <u>Well Width</u> | <u>Sample Volume per mmGel</u> |
|-------------------------|---|--------------------------|---------------------------------------|
| IB50040 | Analytical Comb, 1.0mm x 5 tooth | 6.0mm | 5.0ul |
| IB50050 | Analytical Comb, 1.0mm x 10 tooth | 1.5mm | 1.0ul |
| IB50060 | Preparative Comb, 1.0mm, 0 Marker, 1 Sample | 47.0mm | 50.0ul |
| IB50070 | Preparative Comb, 1.0mm, 1 Marker, 1 Sample | 6.0mm/36.0mm | 5.0ul/35.0ul |
| IB50080 | Analytical Comb, 1.5mm x 5 tooth | 6.0mm | 5.0ul |
| IB50090 | Analytical Comb, 1.5mm x 10 tooth | 1.5mm | 1.0ul |
| IB50100 | Preparative Comb, 0 Marker, 1 Sample | 47.0mm | 50.0ul |
| IB50110 | Preparative Comb, 1 Marker, 1 Sample | 6.0mm/36.0mm | 5.0ul/35.0ul |

G. RELATED IBI PRODUCTS

- IB51000 IBI QS-710 (7 X 10cm Horizontal Electrophoresis Unit)
Comes complete with buffer tank, vented lid, casting fixture and UVT tray, two 1.5mm by 8-tooth combs, power cords, leveling bubble and manual.
- IB53000 IBI MP-1015 (10 X 15cm Horizontal Electrophoresis Unit)
Comes complete with buffer tank, vented lid, casting fixture and UVT tray, two 2.0mm by 16-tooth combs, power cords, buffer port set, leveling bubble and manual.
- IB56000 IBI HR-2025 (20 X 25cm Horizontal Electrophoresis Unit)
Comes complete with buffer tank, vented lid, casting fixture and UVT tray, two 2.0mm by 20-tooth combs, power cords, buffer port set, leveling bubble and manual.
- IB57000 IBI HR-2525 (25 X 25cm Horizontal Electrophoresis Unit)
Comes complete with buffer tank, vented lid, casting fixture and UVT tray, four 2.0mm by 50-tooth combs, power cords, buffer port set, leveling bubble and manual.
- IB62000 IBI VCV Vertical Electrophoresis System (18 X 22cm Vertical Electrophoresis Unit)
Comes complete with main assembly, safety cover, three glass plates (inner, outer, and frosted), one 1.5mm by 12-tooth and 1.5mm by 20-tooth combs, a 1.5mm spacer set (which includes one bottom and two sided spacers as well as two spacer tabs), one set of power cords, four sandwich clips, and manual.
- IB80000 IBI STS-45i Manual Sequencer (36 X 43cm Vertical Electrophoresis Unit)
Comes complete with main assembly, aluminum thermoplate, two glass plates, one 0.4mm comb and spacer set (includes two 32-tooth and 64-tooth conventional combs, two 64-tooth sharktooth combs, one bottom and two sided spacers and four spacer tabs) one set of power cords, and manual.
- IB94000 IBI MaGELin Universal Protein System (for Cast-Your-Own or Precast Gels)
Comes complete with buffer tank, gel capture device, vented lid, vertical casting fixture, two sets of 0.8mm side spacers, three outer glass plates, three inner notched plates, two 0.8mm by 12-tooth combs, power cords, and manual
- SH-300 IBI 300V Power Supply (300V / 400mA / 120W) The SH-300 has constant voltage or constant current capability, memory settings, and a LED display. Comes complete with power supply, 120V grounded power cord, and manual.
- SH-500 IBI 500V Power Supply (500V / 300mA / 150W) The SH-500 has constant voltage or constant current capability, memory settings, gel saver feature, and a LED display. Comes complete with power supply, 120V grounded power cord, and manual.

H. RELATED IBI CERTIFIED REAGENTS

| | | |
|---------|---|---------|
| IB01010 | 6X Loading Dye | 5ml |
| IB01015 | 5X RNA Gel Loading Dye Kit | 100RxN |
| IB01020 | 10X TBE Pouch | 1 Pouch |
| IB01030 | 25X Tris-Acetate EDTA Buffer Pouch | 1 Pouch |
| IB74020 | Acridine Orange | 25gm |
| IB70016 | Acrylamide:Bisacrylamide, 29:1 | 40gm |
| IB70017 | Acrylamide:Bisacrylamide, 29:1 | 200gm |
| IB70020 | Acrylamide | 100gm |
| IB70022 | Acrylamide:Bisacrylamide, 19:1 | 40gm |
| IB70023 | Acrylamide:Bisacrylamide, 19:1 | 200gm |
| IB70024 | Acrylamide | 500gm |
| IB70026 | Acrylamide | 1.5kg |
| IB70028 | Acrylamide | 3kg |
| IB70018 | Acrylamide:Bisacrylamide, 37.5:1 | 40gm |
| IB70019 | Acrylamide:Bisacrylamide, 37.5:1 | 200gm |
| IB70010 | Acryliquid-40 (40% (w/v) Acrylamide solution) | 500ml |
| IB70035 | Agarose | 25gm |
| IB70040 | Agarose | 100gm |
| IB70041 | Agarose | 250gm |
| IB70042 | Agarose | 500gm |
| IB70045 | Agarose | 1kg |
| IB70050 | Agarose, Low Melting Point | 50gm |
| IB70051 | Agarose, Low Melting Point | 25gm |
| IB70056 | Agarose, Low Melting Point | 100gm |
| IB70057 | Agarose, Low Melting Point | 250gm |
| IB70058 | Agarose, Low Melting Point | 500gm |
| IB70059 | Agarose, Low Melting Point | 1Kg |
| IB70052 | 3:1 Super Sieve Agarose | 50gm |
| IB70053 | 3:1 Super Sieve Agarose | 250gm |
| IB70054 | Ultra Sieve Agarose | 25gm |
| IB70055 | Ultra Sieve Agarose | 250gm |
| IB70060 | Agarose, PFGE | 25gm |
| IB70061 | Agarose, PFGE | 50gm |
| IB70062 | Agarose, PFGE | 100gm |
| IB70063 | Agarose, PFGE | 250gm |
| IB70064 | Agarose, PFGE | 500gm |
| IB70065 | Agarose, PFGE | 1Kg |
| IB15720 | Alcohol-Anhydrous (Ethanol) | 500ml |
| IB15721 | Alcohol-Anhydrous (Ethanol) | 1L |
| IB15724 | Alcohol-Anhydrous (Ethanol) | 4L |
| IB15620 | Ammonium Acetate | 500gm |
| IB70080 | Ammonium Persulfate | 100gm |
| IB02040 | Ampicillin, Sodium Salt | 25gm |
| IB70100 | Bisacrylamide | 25gm |
| IB70102 | Bisacrylamide | 100gm |
| IB70096 | Boric Acid | 2.5kg |
| IB74040 | Bromophenol Blue | 25gm |
| IB02010 | Carbenicillin | 1gm |
| IB02020 | Carbenicillin | 5gm |
| IB37060 | Cesium Chloride, Optical Grade | 100gm |
| IB37062 | Cesium Chloride, Optical Grade | 1kg |
| IB37042 | Cesium Chloride, Technical Grade | 1kg |
| IB02080 | Chloramphenicol | 25gm |
| IB05040 | Chloroform | 500ml |

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|---------|---|---------|
| IB21040 | Dithiothreitol (DTT) | 5gm |
| IB21045 | Dithiothreitol (DTT) | 25gm |
| IB70180 | EDTA, disodium salt | 100gm |
| IB70182 | EDTA, disodium salt | 500gm |
| IB70184 | EDTA Solution (0.5M), pH 8 | 100ml |
| IB70185 | EDTA Solution (0.5M), pH 8 | 4x100ml |
| IB40060 | Ethidium Bromide | 5gm |
| IB40075 | Ethidium Bromide Solution, 10mg/mL | 10ml |
| IB72028 | Formamide, ACS Grade | 500ml |
| IB72020 | Formamide, Spectral Grade | 100ml |
| IB72024 | Formamide, Spectral Grade | 500ml |
| IB02030 | Gentamycin Solution | 20ml |
| IB15760 | Glycerol | 500ml |
| IB15762 | Glycerol | 1L |
| IB70194 | Glycine | 2.5kg |
| IB05080 | Guanidine Hydrochloride | 500gm |
| IB05085 | Guanidine Hydrochloride Solution (6M) | 500ml |
| IB05100 | Guanidine Thiocyanate | 500gm |
| IB01120 | HEPES, Sodium Salt | 100gm |
| IB01130 | HEPES, Free Acid | 50gm |
| IB01131 | HEPES, Free Acid | 250gm |
| IB01132 | HEPES, Free Acid | 500gm |
| IB01133 | HEPES, Free Acid | 1Kg |
| IB70012 | InstaBIS-(2% (w/v) Bisacrylamide solution) | 500ml |
| IB70000 | InstaPAGE-(30% sol., 19:1 Acrylamide:Bisacrylamide) | 500ml |
| IB70001 | InstaPAGE-(30% sol., 19:1 Acrylamide:Bisacrylamide) | 1L |
| IB70002 | InstaPAGE-(30% sol., 29:1 Acrylamide:Bisacrylamide) | 500ml |
| IB70003 | InstaPAGE-(30% sol., 29:1 Acrylamide:Bisacrylamide) | 1L |
| IB70004 | InstaPAGE-(30% sol., 37.5:1 Acrylamide:Bisacrylamide) | 500ml |
| IB70005 | InstaPAGE-(30% sol., 37.5:1 Acrylamide:Bisacrylamide) | 1L |
| IB70006 | InstaPAGE-(40% sol., 29:1 Acrylamide:Bisacrylamide) | 500ml |
| IB70007 | InstaPAGE-(40% sol., 29:1 Acrylamide:Bisacrylamide) | 1L |
| IB70008 | InstaPAGE-(40% sol., 37.5:1 Acrylamide:Bisacrylamide) | 500ml |
| IB70009 | InstaPAGE-(40% sol., 37.5:1 Acrylamide:Bisacrylamide) | 1L |
| IB70014 | InstaPAGE-(40% sol., 19:1 Acrylamide:Bisacrylamide) | 500ml |
| IB70015 | InstaPAGE-(40% sol., 19:1 Acrylamide:Bisacrylamide) | 1L |
| IB02100 | IPTG | 1gm |
| IB02105 | IPTG | 5gm |
| IB02125 | IPTG | 25gm |
| IB05120 | Isobutanol | 500ml |
| IB15730 | Isopropanol | 500ml |
| IB15735 | Isopropanol | 1L |
| IB02120 | Kanamycin Sulfate | 25gm |
| IB15750 | Methanol - HPLC Grade | 1L |
| IB15755 | Methanol - Ultra Pure Grade | 500ml |
| IB15756 | Methanol - Ultra Pure Grade | 1L |
| IB15757 | Methanol - Ultra Pure Grade | 4L |
| IB74050 | Methylene Blue, Chloride, trihydrate | 25gm |
| IB70170 | MOPS | 100gm |
| IB70175 | MOPS Decp, 10X | 100ml |
| IB05160 | Phenol - Crystalline | 100gm |
| IB05164 | Phenol - Crystalline | 500gm |
| IB05174 | Phenol Chloroform Solution | 400ml |
| IB05182 | Phenol, Buffer Saturated, pH 6.6-8.0 | 100ml |
| IB05184 | Phenol, Buffer Saturated, pH 4.3 | 100ml |
| IB05400 | Proteinase K | 100mg |
| IB05406 | Proteinase K Solution (20mg/mL) | 5ml |
| IB07080 | Sarkosyl | 100gm |

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|---------|---|-------|
| IB07060 | Sodium Dodecyl Sulfate (SDS) | 100gm |
| IB07062 | Sodium Dodecyl Sulfate (SDS) | 500gm |
| IB07064 | Sodium Dodecyl Sulfate (SDS) Solution, 20% | 100ml |
| IB72010 | SSC (20X)-Nucleid Acid Prep and Blotting Solution | 1L |
| IB72015 | SSPE (20X) - Nucleid Hybridization Solution | 1L |
| IB02180 | Streptomycin Sulfate | 25gm |
| IB37160 | Sucrose | 1kg |
| IB70120 | TEMED | 50gm |
| IB02200 | Tetracycline Hydrochloride | 25gm |
| IB70142 | Tris | 500gm |
| IB70144 | Tris | 1kg |
| IB70145 | Tris | 5kg |
| IB70150 | Tris Borate EDTA (10X TBE Buffer) | 1L |
| IB70153 | Tris Borate EDTA (10X TBE Buffer) | 4L |
| IB70154 | Tris Borate EDTA (10X TBE Buffer) | 10L |
| IB70155 | Tris Borate EDTA (20X Modified TBE Buffer) | 1L |
| IB70160 | Tris Acetate EDTA (10X TAE) Buffer | 1L |
| IB70162 | Tris-Hydrochloride | 500gm |
| IB07100 | Triton X-100 | 100ml |
| IB72060 | Urea | 500gm |
| IB72064 | Urea | 2.5kg |
| IB02260 | X-GAL | 1gm |
| IB02264 | X-GAL | 100mg |
| IB72120 | Xylene Cyanol FF | 25gm |

I. REFERENCES

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- 3.) Selden, R.F. (1988) Analysis of RNA by Northern Hybridization," in Current Protocols in Molecular Biology, F.M. Ausubel, et. al, editors, volume 1, p.4.9.1. Green Publishing Associates and Wiley-Interscience.

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