MultiCaster™ Systems

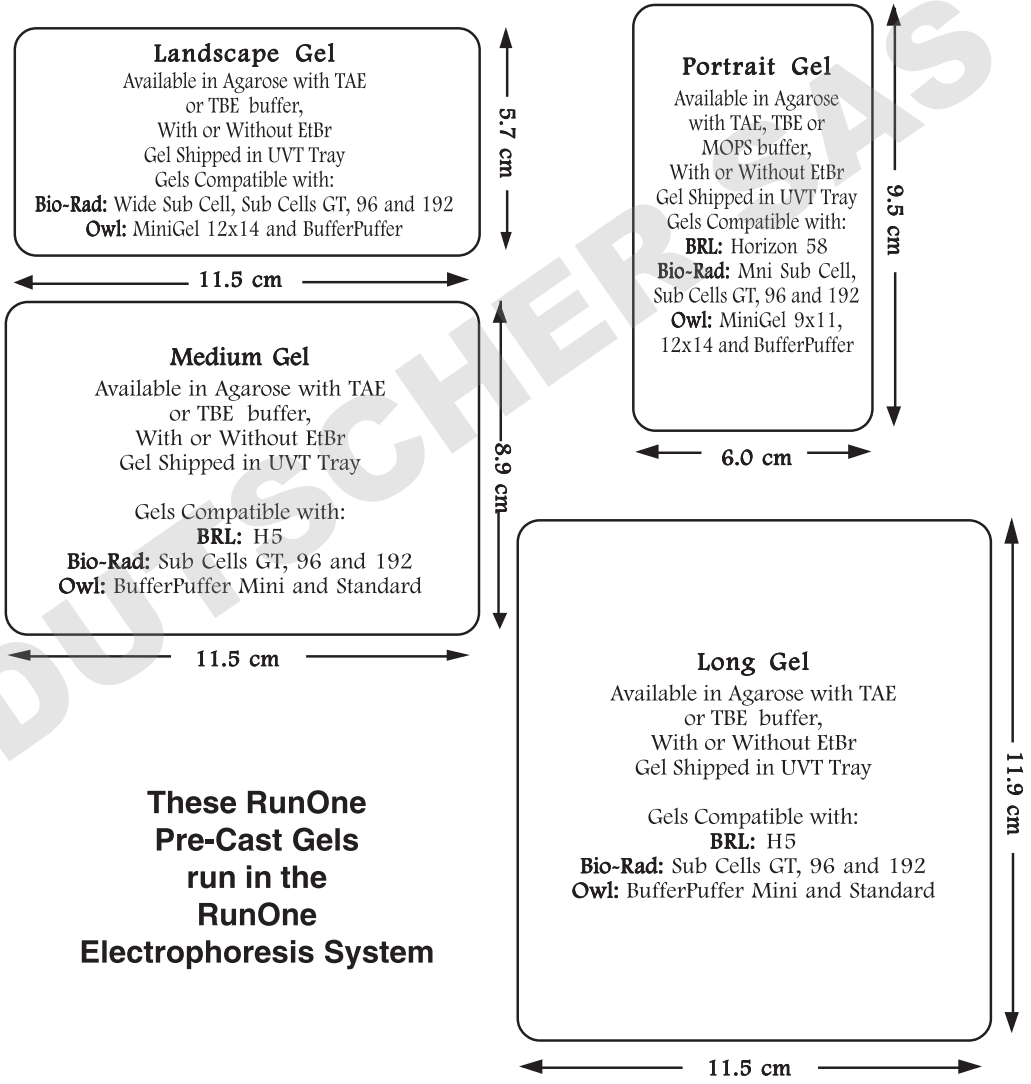
Instruction Manual

Vers. 090909

Embi Tec
Electrophoresis for Molecular Biology Innovations
1-800-255-1777 ◆ 1-858-684-3190 ◆ www.embitec.com

Embi Tec

RunOne Pre-Cast Gels



These RunOne Pre-Cast Gels run in the RunOne Electrophoresis System

Some of our Most Popular RunOne Pre-Cast Gels

GE-3560 1% Agarose TAE with EtBr Landscape Gel, 8+1 well, 10 per box
GE-3580 1% Agarose TAE with EtBr Long Gel, 3(16+2) well, 5 per box
GE-3870 1% Agarose TAE with EtBr Portrait Gel, 10 well, 10 per box
GE-4560 1% Agarose TBE with EtBr Landscape Gel, 8+1 well, 10 per box
GE-4580 1% Agarose TBE with EtBr Long Gel, 3(16+2) well, 5 per box
GE-4870 1% Agarose TBE with EtBr Portrait Gel, 10 well, 10 per box

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Ordering Information

MultiCaster Systems

EP-1019 Blue MultiCaster System
Includes: blue casting stand, long UVT tray, 6 reversible combs (8+1/16+2), and a long red plate

EP-1018 Aqua MultiCaster System
Includes: aqua casting stand, long UVT tray, 4 reversible combs (12+124+1), and a long red plate

EP-1017 Orange MultiCaster System
Includes: orange casting stand, medium UVT tray, 2 reversible combs (2+1/5+2), and a medium red plate

EP-1016 Yellow MultiCaster System
Includes: yellow casting stand, medium UVT tray, 8 reversible combs (12+1/24+1), and a medium red plate

EP-1084 White MultiCaster System
Includes: white casting stand, medium UVT tray, 2 reversible combs (12+1/24+1), and a medium red plate

Trays and Combs

EP-1026 Aqua Reversible Comb, 12+1/24+1 (30 µl/11µl), 2 ea.
EP-1027 Blue Reversible Comb, 8+1/16+2 (30 µl/11 µl), 2 ea.
EP-1028 Orange Prep Reversible Comb, 12+1/5+2 (250 µl/11 µl and 75 µl/112 µl), 2 ea.
EP-1038 Yellow Reversible Comb, 12+1/24+1 (30 µl/11 µl), 2 ea.
EP-1083 White Reversible Comb, 12+1/24+1 (30 µl/11 µl), 2 ea.
EP-1024 UVT Medium Tray for Orange/Yellow MultiCaster Systems, 9 x 11.5 cm (l x w), 2 ea.
EP-1025 UVT Long Tray for Aqua/Blue MultiCaster Systems, 11.9 x 11.5 cm (l x w), 2 ea.

Buffers

EC-1016 TAE Running Buffer (10X), 4.0 L (4 each 1.0 Liter Bottle)
EC-1017 TBE Running Buffer (5X), 4.0 L (4 each 1.0 Liter Bottle)
EC-1018 TAE Blue Sample Buffer (5X), 1 Bottle of 30 ml
EC-1019 TBE Blue Sample Buffer (5X), 1 Bottle of 30 ml
EC-1028 TE Orange Sample Buffer (5X), 6 vials of 1.5 mL

SmartMark™ Standards

EC-1010 SmartMark 20 bp DNA Ladder, 40 µg, 20-1000 bp; 50 bands in 20 bp increments
EC-1011 SmartMark 100 bp DNA Ladder, 40 µg, 100-1000 bp; 10 bands in 100 bp increments
EC-1012 SmartMark 200 bp DNA Ladder, 40 µg, 200-6000 bb; 30 bands in 200 bp increments
EC-1013 SmartMark 1 Kb DNA Ladder, 40 µg, 1 Kb - <15 Kb; 15 bands in 1 Kb increments

Well Visualization Plates

EP-1029 Red Well Visualization plate for LONG gels
EP-1048 Red Well Visualization plate for MEDIUM gels
EP-1047 Red Well Visualization plate for LANDSCAPE/PORTRAIT gels
EP-1075 Blue Well Visualization plate for LONG gels
EP-1080 Blue Well Visualization plate for MEDIUM gels
EP-1077 Blue Well Visualization plate for LANDSCAPE/PORTRAIT gels

Product Description

The MultiCaster Systems from Embi Tec give you the flexibility to easily cast 96 sample well gels, prep gels or anything in between in a matter of minutes. The best part, is the gels cast with the MultiCaster Systems are no larger than your hand and they all fit into the RunOne™ Electrophoresis System.

Casting is easy. Just place the UVT Gel Tray in the Casting Stand, pour your agarose solution into the stand, select comb type, slide the desired number of combs into the stand slots and you're ready. No gaskets, cams or tape required to create perfect agarose gels every time.

System Components

MultiCaster Systems Components

	Blue MultiCaster	Aqua MultiCaster	Orange MultiCaster	Yellow MultiCaster	White MultiCaster
Reversible Comb	8+1 well or 16+2 well	12+1 well or 24+1 well	2+1 well or 5+2 well	12+1 well or 24+1 well	12+1 well or 24+1 well
Comb Slots	12 slots	8 slots	2 slots	8 slots	2 slots
Sample Volume for 6 mm Gel	30 µL (8+1) 11µL (16+2)	30 µL (12+1) 11µL (24+1)	250 µL (2+1) 3-75µL + 2-112 µL(5+2)	30 µL (12+1) 11µL(24+1)	30 µL (12+1) 11µL(24+1)
Gel Size	11.9 x 11.5 cm (l x w)	11.9 x 11.5 cm (l x w)	8.9 x 11.5 cm (l x w)	8.9 x 11.5 cm (l x w)	8.9 x 11.5 cm (l x w)
Multi Channel Compatible	YES 8 channel	YES 12 channel	NO	YES 12 channel	YES 12 channel
System Components	Blue Casting Stand, UVT Tray, 6 reversible combs (8+1/16+2) and a long red visualization plate	Aqua Casting Stand, UVT Tray, 4 reversible combs (12+1/24+1) and a long red visualization plate	Orange Casting Stand, UVT Tray, 2 reversible combs (2+1/5+2) and a med. red visualization plate	Yellow Casting Stand, UVT Tray, 8 reversible combs (12+1/24+1) and a med. red visualization plate	White Casting Stand, UVT Tray, 2 reversible combs (12+1/24+1) and a med. red visualization plate
Catalog No.	EP-1019	EP-1018	EP-1017	EP-1016	EP-1037

Instructions for Blue and Aqua MultiCaster

Preparation of Agarose Gel

1. Place the stand on a level surface to ensure uniform gel thickness.
2. Place the UVT tray in the Blue or Aqua Casting Stand.
3. Select Gel Type - agarose concentration, buffer type *(see figure 1).*

Buffer Type

Agarose Concentration	TAE w/EtBr	TAE w/o EtBr	TBE w/EtBr	TBE w/o EtBr
1%	Agarose: 0.8 g 1x TAE Buffer: 80 ml 1% EtBr Solution: 8 µl	Agarose: 0.8 g 1 xTAE Buffer: 80 ml	Agarose: 0.8 g 1x TBE Buffer: 80 ml 1% EtBr Solution: 8 µl	Agarose: 0.8 g 1x TBE Buffer: 80 ml
2%	Agarose: 1.6 g 1x TAE Buffer: 80 ml 1% EtBr Solution: 8 µl	Agarose: 1.6 g 1 xTAE Buffer: 80 ml	Agarose: 1.6 g 1x TBE Buffer: 80 ml 1% EtBr Solution: 8 µl	Agarose: 1.6 g 1x TBE Buffer: 80 ml
3%	Agarose: 2.4 g 1x TAE Buffer: 80 ml 1% EtBr Solution: 8 µl	Agarose: 2.4 g 1 xTAE Buffer: 80 ml	Agarose: 2.4 g 1x TBE Buffer: 80 ml 1% EtBr Solution: 8 µl	Agarose: 2.4 g 1x TBE Buffer: 80 ml

All amounts based on 80 ml of gel solution

figure 1

4. Wear gloves, goggles and protective clothing. Prepare buffers according to Appendix A – Buffer Recipes.
5. Prepare the gel solution by presoaking the agarose in the desired buffer for 30 to 60 minutes to allow the beads to swell. *Use 80 ml of gel solution per tray to make a gel 6 mm thick. Use a heat stable glass container.*
6. Heat the solution. If using a microwave use EXTREME CAUTION as boiling over may occur.
7. Swirl or stir the mixture until the agarose is completely dissolved. Repeat heating if necessary. Use EXTREME CAUTION as boiling over may occur during agitation.
8. Continue heating until agarose is completely dissolved.
9. Allow the solution to cool to 60°C to 65°C before pouring.
10. Pour the solution into the tray.
11. Press down on the edges of the UVT tray to ensure tray is firmly seated in the stand.
12. Gently fit the combs into the slots in the Casting Stand.
13. Allow the solution to solidify for about 30 to 60 min.
14. Before removing the combs from the gel, wet the area around the combs with 1X running buffer. Remove the combs gently by pulling upwards.
15. Remove the gel tray from the stand by pulling on one of the vertical side walls. Remove any excess gel from the bottom of the tray. Keep the gel in the tray. Note that there are 4 locking extensions designed to hold the gel onto the tray. Since the tray is UV transparent at A_{314} nm, visualization of the fluorescently stained sample bands can be achieved with the gel in the tray. To remove the

Appendix A – Buffer Recipes

10X TAE Running Buffer Recipe

Tris-base (m.w. 121.14)	48.4 g
Glacial Acetic Acid	10.9 g
EDTA (Free Acid, f.w. 292.25)	2.92 g
DI Water	to 1.0 L
Store at Room Temperature	

5X TBE Running Buffer Recipe

Tris-base (m.w. 121.14)	54.0 g
Boric Acid	27.5 g
EDTA (Free Acid, f.w. 292.25)	2.92 g
DI Water	to 1.0 L
Store at Room Temperature	

Troubleshooting Guide

Problem	Remedy
The gel broke during removal from the tray	There are 4 locking extensions designed to hold the gel onto the tray. Make sure the gels are lifted away from the extensions (see instruction for proper gel removal, step 15).
There is a thin film of gel formed underneath the tray.	This is normal. The thin film can be removed by gently wiping with a paper towel.
The gel appears to have uneven thickness.	Make sure the casting stand is placed on a level surface.
The bands on the gel are wavy and smeary.	This may be due to incomplete dissolution of the agarose. Make sure the agarose is completely dissolved before pouring into the tray.
The bands on the gel are faint or nonexistent.	Restain the gel. Make sure the EtBr concentration is 1 µg/ml and there is enough staining buffer to fully immerse the gel.
My samples appear to float away from the wells during loading.	Make sure you have the proper density agent (e.g. glycerol, ficoll, etc.) in your sample buffer. Make sure that your sample volume does not exceed the well capacity. Try using one of our Sample Buffers. See Ordering Information, page 8.
When pouring, there are air bubbles in my 3% Gel.	Carefully remove bubbles with a spatula after pouring gel.

gel from the tray, simply turn the tray upside down and use a spatula to gently pry the gel off.

16. For long term storage, keep the gels in an airtight container lined with a paper towel saturated with the appropriate running buffer. Store at 4°C.

Running the Gel

We recommend running the gels in the RunOne electrophoresis unit. However, any horizontal gel units that can accommodate the gel can be used. Please note, the slot closest to the end of the stand is the top of the stand.

1. Place the red plate (blue visualization plate also available, see page 8 for order information) in the RunOne cell. The plate should fit snugly into the cell.
2. Place the gel attached to the tray on top of the plate. (Note that you can easily see the wells at this point). Make sure that the top row is closest to power supply side (cathode).
3. Fill the cell with about 270 ml of running buffer. Make sure that the buffer level is about 5 mm above the gel. Avoid trapping air bubbles underneath the plate.
4. Remove the air bubbles trapped in the wells by gentle flushing with the running buffer using a disposable pipet.
5. Load your samples using a micropipet. Note that for a 6 mm thick gel, the volume capacities for the comb with the 16+2 and 8+1 teeth configuration are 11 and 30 µl, respectively. Similarly, for the comb with 24+1 and 12+1 teeth configuration, the volume capacities are 11 and 30 µl, respectively.
6. Select the running voltage and start the run. We recommend running at 100 V constant.
7. After the run is complete, remove the gel from the cell.

Staining the Gel

Note: If the gel was run under pre-staining conditions, the gel can directly be visualized on the tray using A_{314} nm UV transilluminator.

1. Prepare the staining solution as follows:
   - For Ethidium Bromide, prepare 200 ml of a 1 µg/ml solution in water.
   - For SYBR Green I, prepare 200 ml of a 1 X concentration in TE buffer, pH 8.
2. Remove the gel from the tray by turning the tray upside down and use a spatula to gently pry the gel off.
3. Place the gel in the staining solution and allow to shake gently for 10 to 15 min.
4. Check for bands in the gel using the UV transilluminator. Depending on the intensity, re-stain if necessary. To reduce background, destain in water.
5. Use a Polariod 667 film with the appropriate filters to capture the image on film. Other appropriate imaging methods can also be used.

Instructions for Orange, Yellow, and White MultiCaster

Preparation of Agarose Gel

1. Place the stand on a level surface to ensure uniform gel thickness.
2. Place the UVT tray in the Orange, Yellow, or White Casting Stand.
3. Select Gel Type - agarose concentration, buffer type *(see figure 2)*.

Buffer Type

Agarose Concentration	TAE w/EtBr	TAE w/o EtBr	TBE w/EtBr	TBE w/o EtBr
1%	Agarose: 0.6 g 1x TAE Buffer: 60 ml 1% EtBr: 6 µl	Agarose: 0.6 g 1 xTAE Buffer: 60 ml	Agarose: 0.6 g 1x TBE Buffer: 60 ml 1% EtBr: 6 µl	Agarose: 0.6 g 1x TBE Buffer: 60 ml
2%	Agarose: 1.2 g 1x TAE Buffer: 60 ml 1% EtBr: 6 µl	Agarose: 1.2 g 1 xTAE Buffer: 60 ml	Agarose: 1.2 g 1x TBE Buffer: 60 ml 1% EtBr: 6 µl	Agarose: 1.2 g 1x TBE Buffer: 60 ml
3%	Agarose: 1.8 g 1x TAE Buffer: 60 ml 1% EtBr: 6 µl	Agarose: 1.8 g 1 xTAE Buffer: 60 ml	Agarose: 1.8 g 1x TBE Buffer: 60 ml 1% EtBr: 6 µl	Agarose: 1.8 g 1x TBE Buffer: 60 ml

All amounts based on 60 ml of gel solution

figure 2

4. Wear gloves, goggles and protective clothing. Prepare buffers according to Appendix A – Buffer Recipes.
5. Prepare the gel solution by presoaking the agarose in the desired buffer for 30 to 60 minutes to allow the beads to swell. *Use 60 ml of gel solution per tray to make a gel 6 mm thick. Use a heat stable glass container.*
6. Heat the solution. If using a microwave use EXTREME CAUTION as boiling-over may occur.
7. Swirl or stir the mixture until the agarose is completely dissolved. Repeat heating if necessary. Use EXTREME CAUTION as boiling over may occur during agitation.
8. Continue heating until agarose is completely dissolved.
9. Allow the solution to cool to 60°C to 65°C before pouring.
10. Pour the solution into the tray.
11. Press down on the edges of the UVT tray to ensure tray is firmly seated in the stand.
12. Gently fit the combs into the slots in the Casting Stand.
13. Allow the solution to solidify for about 30 to 60 min.
14. Before removing the combs from the gel, wet the area around the combs with 1X running buffer. Remove the combs gently by pulling upwards.
15. Remove the gel tray from the stand by pulling on one of the vertical side walls. Remove any excess gel from the bottom of the tray. Keep the gel in the tray. Note that there are 4 locking extensions designed to hold the gel onto the tray. Since the tray is UV transparent at A_{314} nm, visualization of the fluorescently stained sample bands can be achieved with the gel in the tray. To remove the gel from the tray, simply turn the tray upside down and use a spatula to gently pry the gel off.
16. For long term storage, keep the gels in an airtight container lined with a paper towel saturated with the appropriate running buffer. Store at 4°C.

Running the Gel

We recommend running the gels in the RunOne electrophoresis unit. However, any horizontal gel units that can accommodate the gel can be used. Please note, the slot closest to the end of the stand is the top of the stand.

1. Place the red plate (blue visualization plate also available, see page 8 for order information) in the RunOne cell. The plate should fit snugly into the cell.
2. Place the gel attached to the tray on top of the plate. (Note that you can easily see the wells at this point). Make sure that the top row is closest to power supply side (cathode).
3. Fill the cell with about 270 ml of running buffer. Make sure that the buffer level is about 5 mm above the gel. Avoid trapping air bubbles underneath the plate.
4. Remove the air bubbles trapped in the wells by gentle flushing with the running buffer using a disposable pipet.
5. Load your samples using a micropipet. Note that for a 6 mm thick gel, the volume capacities for the PrepComb with the 5 prep teeth are 75 and 112 µl. Similarly, for the PrepComb with 2 prep teeth , the volume capacities are 250 µl each. For the comb with 24+1 and 12+1 teeth configuration, the volume capacities are 11 and 30 µl, respectively.
6. Select the running voltage and start the run. We recommend running at 100V constant.
7. After the run is complete, remove the gel from the cell.

Staining the Gel

Note: If the gel was run under pre-staining conditions, the gel can directly be visualized on the tray using A_{314} nm UV transilluminator.

1. Prepare the staining solution as follows:
   - For Ethidium Bromide, prepare 200 ml of a 1 µg/ml solution in water.
   - For SYBR Green I, prepare 200 ml of a 1 X concentration in TE buffer, pH 8.
2. Remove the gel from the tray by turning the tray upside down and use a spatula to gently pry the gel off.
3. Place the gel in the staining solution and allow to shake gently for 10 to 15 min.
4. Check for bands in the gel using the UV transilluminator. Depending on the intensity, re-stain if necessary. To reduce background, destain in water.
5. Use a Polariod 667 film with the appropriate filters to capture the image on film. Other appropriate imaging methods can also be used.