

INSTRUCTION MANUAL

Dual Vertical Slab Gel Systems

DSG-125-02

DSG-160-02

DSG-170-02

DSG-190-02

DSG-200-02

DSG-250-02

DSG-400-02

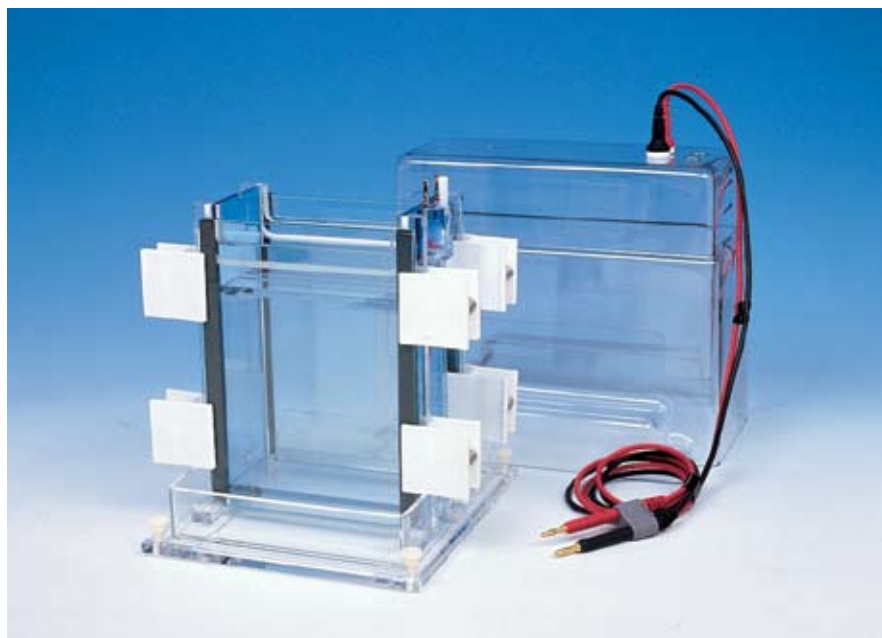


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IMPORTANT USER INFORMATION

This Instruction Manual will explain how to use this product safely and effectively. Please read and carefully follow the instruction manual in its entirety.



The triangle/exclamation mark symbol alerts the user of the product to important operational, maintenance, and/or warranty requirements.



The triangle/lightning bolt symbol alerts the user of the product to potentially hazardous electrical exposure.



Failure to adhere to the instructions could result in personal and/or laboratory hazards, as well as invalidate any warranty. Always turn off the DC power source prior to disconnecting power cords from the product. Disconnect power cords from the power source first, and then from the product. For maximum safety, always operate this system in an isolated, low traffic area, not accessible to unauthorized personnel. Never operate damaged or leaking equipment.

WARRANTY AND LIABILITY

This product was produced utilizing the highest practical standards of materials, workmanship, and design. C.B.S. Scientific warrants that the product has been tested and will meet or exceed published specifications. This warranty is valid only if the product has been operated and maintained according to the instructions provided.

C.B.S. Scientific warrants this product to be free from defects in materials and workmanship under normal service for one year from date of shipment. If the product proves defective during this period, C.B.S. Scientific will repair or replace it at our option, free of charge, if returned to us postage prepaid. This warranty does not cover: damage in transit, damage caused by carelessness, misuse or neglect, normal wear through frequent use, damage caused by solvent corrosion, damage caused by improper handling or user alteration, nor unsatisfactory performance as a result of conditions beyond our control. C.B.S. Scientific shall in no event be liable for incidental nor consequential damages, including without limitation, lost profits, loss of income, loss of business opportunities, loss of use and other related damages, however caused, nor any damage arising from the incorrect use of the product.

<p>FRANÇAIS INFORMATION IMPORTANTE À L'USAGE DES UTILISATEURS</p> <p>Le présent manuel d'utilisation explique la manière de se servir efficacement du produit en conditions de sécurité. Il est recommandé de soigneusement lire la totalité du manuel, avec ses consignes et ses instructions.</p> <p> Le triangle avec point d'exclamation est un symbole destiné à avertir l'utilisateur du produit de l'importance de certaines exigences relatives au fonctionnement, à l'entretien et/ou à la garantie.</p> <p> Le triangle avec flèche en zigzag est un symbole destiné à avertir l'utilisateur du produit de la possibilité d'exposition à des décharges avec danger de secousses électriques.</p> <p> Tout manquement à l'observation des consignes et des instructions peut exposer les personnes et les biens à des dommages corporels et/ou matériels et peut annuler toute garantie. Il faut toujours interrompre l'alimentation de courant continu avant de déconnecter les cordons d'alimentation du produit. Déconnecter d'abord les cordons d'alimentation branchés sur la source de tension (alimentation de secteur) puis ceux branchés sur le produit. Pour une sécurité maximum, il faut toujours faire fonctionner ce système dans un lieu isolé, peu fréquenté, où le personnel non autorisé n'a pas accès. Ne jamais faire fonctionner un matériel endommagé ou affecté par des fuites.</p> <p>GARANTIE ET RESPONSABILITÉ</p> <p>Le produit a été fabriqué conformément aux normes applicables les plus exigeantes en matière de matériaux, de main d'œuvre, de conception et d'ingénierie. C.B.S. Scientific garantit que le produit a subi des essais et que ses performances rempliront les conditions des spécifications publiées ou leur seront même supérieures. La présente garantie n'est valide que si le produit a fonctionné et a été entretenu conformément aux consignes et instructions fournies.</p> <p>C.B.S. 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Sírvase leerlo en su totalidad y seguir detenidamente las indicaciones que contiene.</p> <p> El símbolo del triángulo con exclamación llama la atención del usuario a requisitos importantes para el uso y mantenimiento del producto, así como para la validez de la garantía.</p> <p> El símbolo del triángulo con rayo llama la atención del usuario a la posibilidad de riesgos eléctricos.</p> <p> El incumplimiento de las instrucciones aquí señaladas podría dar lugar a riesgos a la persona, al laboratorio o a ambos y podría anular toda garantía. Siempre apague la fuente de corriente continua antes de desenchufar los cables eléctricos del producto. Primero desconecte los cables de la fuente de energía y después del producto. Para mayor seguridad, siempre use este sistema en un área aislada, de poco movimiento de personas e inaccesible a personal no autorizado. Jamás use equipo que presenta algún daño o fuga.</p> <p>GARANTÍA Y RESPONSABILIDAD</p> <p>Este producto fue fabricado de acuerdo con las normas más estrictas que sean factibles en cuanto a materiales, mano de obra y diseño. C.B.S. Scientific garantiza que se sometió el producto a pruebas y que cumplirá o excederá las especificaciones publicadas. Esta garantía será válida únicamente si se usa y se da servicio de mantenimiento al producto de acuerdo con las instrucciones señaladas.</p> <p>C.B.S. Scientific garantiza que este producto se encontrará libre de defectos de materiales y mano de obra por un periodo de servicio normal de un año a partir de la fecha de embarque. Si el producto resulta defectuoso durante este periodo, C.B.S. Scientific lo reparará o lo repondrá, a criterio de C.B.S., libre de cargos, si se devuelve el producto a C.B.S. porte pagado. Esta garantía no cubre daños sufridos en tránsito, daños provocados por descuido, mal uso o negligencia, desgaste normal como consecuencia del uso excesivo, daños atribuibles a corrosión provocada por solventes, daños causados por el uso indebido o alteraciones realizadas por el usuario ni rendimiento insatisfactorio atribuible a circunstancias fuera del control de C.B.S. Scientific. C.B.S. Scientific en ningún caso asumirá responsabilidad por daños incidentales o subsiguientes, incluyendo, en forma no limitativa, la pérdida de utilidades, de ingresos, de oportunidades comerciales o del uso del producto y otros daños afines, fuere cual fuere su origen, ni por daños derivados del uso incorrecto del producto.</p>
<p>DEUTSCH WICHTIGE INFORMATION FÜR DEN BENUTZER</p> <p>Diese Bedienungsanleitung beschreibt wie man dieses Produkt sicher und wirksam benutzt. Bitte lesen und befolgen Sie alle Anweisungen in dieser Anleitung.</p> <p> Das Dreieck mit Ausrufezeichen weist den Benutzer des Produktes darauf hin, daß wichtige Bedienungs-, Wartungs- und/oder Garantievorschriften zu beachten sind.</p> <p> Das Dreieck mit Zickzackblitz warnt den Benutzer des Produktes vor möglichen Gefahren durch elektrische Spannungen.</p> <p> Nichtbeachtung dieser Anweisungen kann zu persönlichen und/oder labortechnischen Schäden führen und gleichzeitig alle Garantien als nichtig erklären. Die DC Stromzufuhr muß immer, vor dem Entfernen der Stromkabel vom Produkt, abgeschaltet werden. Die Stromzufuhrkabel müssen zuerst von der Steckdose und erst dann vom Produkt entfernt werden. Um höchste Sicherheit zu gewährleisten sollte dieses System in einem abgesonderten und besonders ruhigen Bereich eingesetzt werden und vor Unbefugten sicher sein.</p> <p>GARANTIE UND HAFTUNG</p> <p>Dieses Produkt wurde unter Anwendung von Produkten mit höchster Qualität und aus Materialien mit bester Verarbeitung und modernstem Design hergestellt. C.B.S. Scientific garantiert, daß das Produkt getestet wurde und alle publizierten Spezifikationen übertrifft. Diese Garantie ist jedoch nur gültig, wenn das Produkt nach der beigefügten Bedienungsanleitung bedient und gewartet wurde.</p> <p>C.B.S. Scientific garantiert, daß dieses Produkt bei normaler Bedienung aus fehlerfreiem Material besteht und fehlerfrei in der Ausführung ist. Diese Garantie gilt für ein Jahr ab Lieferdatum. Sollte das Produkt in diesem Zeitraum fehlerhaft werden, bietet C.B.S. Scientific eine kostenlose Reparatur bzw. kostenlosen Ersatz, einschließlich freiem Rückporto. Diese Garantie schließt folgendes aus: Transportschäden, Schäden durch Nachlässigkeit, Mißbrauch oder Vernachlässigung, normale Abnutzung durch regelmäßigen Gebrauch, Schäden durch Säureangriff, Schäden durch falsche Handhabung, Veränderung des Produktes durch den Benutzer, oder unzureichende Leistungen die sich nicht im Verantwortungsbereich von C.B.S. Scientific befinden. C.B.S. Scientific kommt unter keinen Umständen für folgende Schäden auf: Sachschadensverlust, Einkommensverlust, Verlust von Geschäftsmöglichkeiten, Verlust der Anwendung und andere damit verbundene Schäden die auf irgend eine Art und Weise entstanden sind, oder Schäden die aus falscher Anwendung des Produktes entstanden sind.</p>	<p>ITALIANO INFORMAZIONI IMPORTANTI PER L'UTENTE</p> <p>Questo manuale spiega come utilizzare questo prodotto in maniera sicura ed efficiente. Si preghi di leggere e seguire con cautela le istruzioni di ogni parte di questo manuale.</p> <p> Il triangolo contenete il simbolo di un punto esclamativo avverte l'utente di importanti requisiti relativi al funzionamento, manutenzione e/o garanzia del prodotto.</p> <p> Il triangolo contenete il simbolo di un lampo avverte l'utente del prodotto della possibilità di pericoli dovuti a corrente elettrica.</p> <p> La mancata osservanza delle istruzioni può essere causa di pericolo alla propria persona ed al laboratorio, oltre a poter annullare la garanzia. Prima di distaccare il cordone d'alimentazione dal prodotto, spegnere sempre la sorgente di corrente continua. Distaccare i cordoni d'alimentazione prima dal lato della sorgente di tensione e poi dal lato del prodotto. Per maggior sicurezza, mettere sempre in funzione il prodotto in un'area isolata con poco traffico che non sia accessibile al personale non autorizzato. Non mettere mai in funzione un'apparecchiatura che sia danneggiata o abbia perdite.</p> <p>GARANZIA E RESPONSABILITÀ</p> <p>Questo prodotto è stato fabbricato seguendo gli standard più elevati per i materiali, la manodopera e la progettazione. La C.B.S. Scientific garantisce il prodotto è stato sottoposto a prova e raggiunge o supera i valori pubblicati per i dati tecnici. Questa garanzia è valida solo se il prodotto è messo in esercizio e soggetto a manutenzione secondo le istruzioni fornite.</p> <p>La C.B.S. Scientific garantisce che questo prodotto è libero di difetti di materiali e manodopera, in normali condizioni d'esercizio, per la durata di un anno dalla data di spedizione. Se, in questo periodo, il prodotto si dimostrerà difettoso, la C.B.S. Scientific, a suo giudizio, lo riparerà o sostituirà. 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SECTION 1 General Information

1.1 Introduction

C.B.S. Scientific offers the Dual Slab Gel Systems designed to meet a wide variety of applications. These systems are designed for separating and characterizing protein and can be adapted for short sequencing runs with the appropriate accessories. Two gels can be run simultaneously under identical buffer conditions. The cooling chamber assures constant temperature during electrophoresis. Gel casting can be accomplished using our convenient and unique Gel Wrap™, or by using our multiple gel casting chambers (see Section 6, Dual Slab Gel Kits and Accessories).

With the use of special accessories, two dimensional (2-D) gel electrophoresis can be performed the 220mm vertical system (cat. # DSG-200-02). First dimension I.E.F. tube gels are run on the unit using IEF Tube Gel Adapters (described in the catalogue). Buffer surrounds the tubes and is cooled by the internal cooling chamber for temperature-controlled runs. Second dimension separation is performed by using the standard accessories. A complete description of 2-D protocol is included when ordering the I.E.F. Tube Gel Adapters (cat. # TGA-200K).

Other applications include; mobility shift assays, antibody super shift assays, Rnase protection assays, DNA footprinting, differential display, DNA paternity testing and forensic analysis.

1.2 Specifications

Constructions:

Buffer chamber, safety cover	Acrylic
Electrodes	Platinum wire .012" diameter
Power cords	FR Urethane rated 7500VDC, 200mA, 65°C
Combs	Teflon
Glass plates	Soda-lime float glass
Spacers	PVC
Clamps	Polypropylene, stainless steel
Safety Certification	EN61010-1-1993 (IEC1010-1)

**Table 2
Specifications**

Dual Slab Gel Unit:	Shipping weight	Overall unit size cm (l) x (w) x (h)	Distance between electrodes mm	Recommended buffer volume mls	Voltage Limit VDC
145mm	12 lb.	24 x 23 x 21.91	250	300 upper 125-200 lower	725
160mm	12 lb.	24 x 23 x 23.33	265	300 upper 125-200 lower	800
170mm	12 lb.	24 x 23 x 24.29	275	300 upper 125-200 lower	850
190mm	12 lb.	24 x 23 x 26.35	295	300 upper 125-200 lower	950
220mm	12 lb.	24 x 23 x 29.12	325	300 upper 125-200 lower	1100
280mm	13 lb.	24 x 23 x 35.24	385	300 upper 125-200 lower	1400
387mm	16 lb.	24 x 23 x 45.94	480	300 upper 125-200 lower	1900

1.3 Safety



Power to the Dual Slab Gel units is to be supplied by an external DC voltage power supply that must be ground isolated so that the DC voltage output floats with respect to ground. For any power supply used, the maximum specified operating parameters for the units are:

Maximum Limits

50VDC/cm of gel

60 watts power

80mA current

55°C ambient temperature



Current to the unit, provided from the external power supply, must enter the unit through the lid assembly, providing a safety interlock to the user. Current to the unit is broken when the lid is removed. **Do not attempt to use the unit without the safety lid, and always turn the power supply off before removing the lid, or when working with the unit in any way. Follow safety precautions specified by the power supply manufacturer.**

SECTION 2

Description of Parts

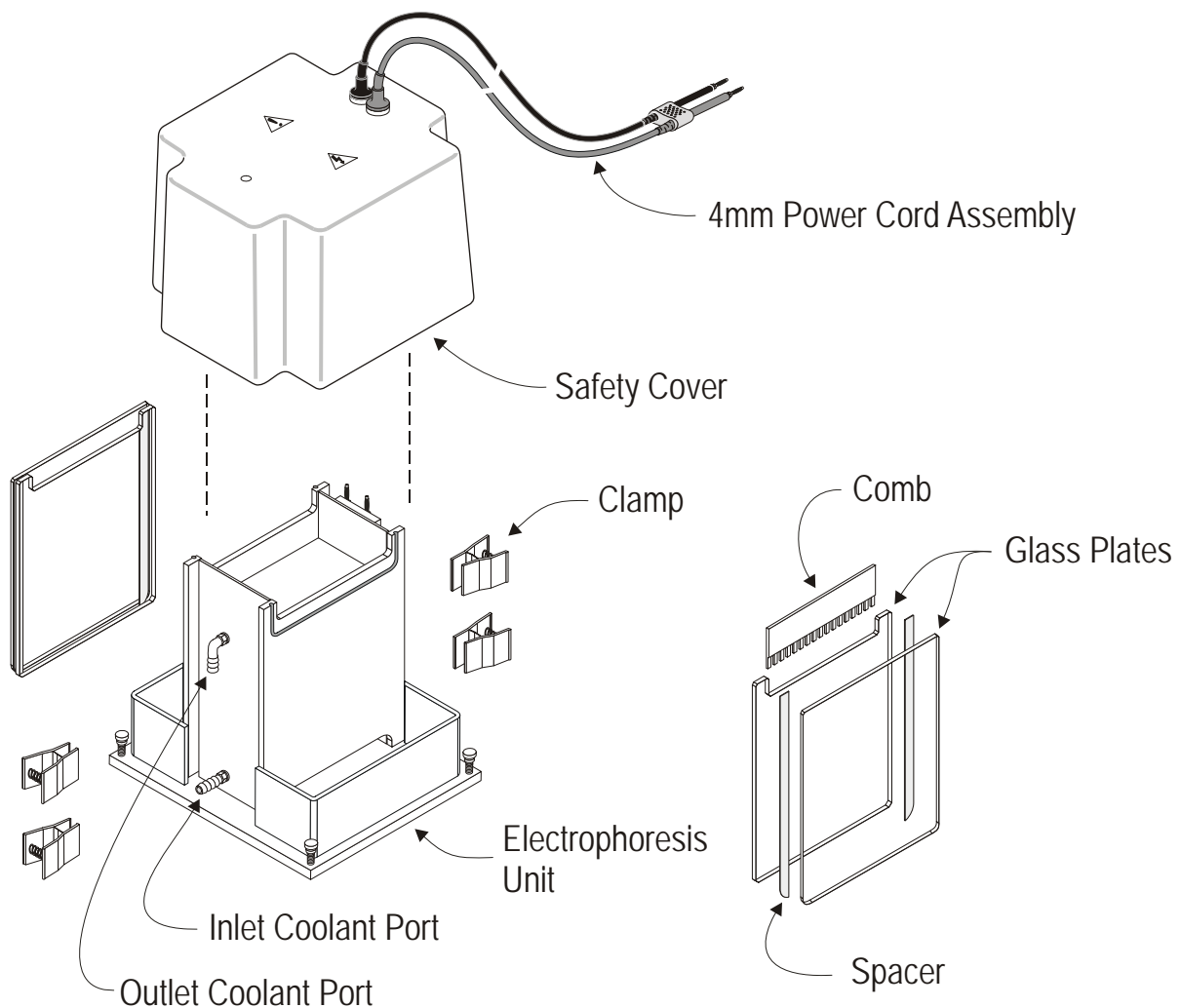
2.1 Unpacking

Please verify that your unit comes complete with the following components:

Dual Slab Gel Kit:

- Dual Slab Gel electrophoresis unit
- Safety cover with attached DC power leads
- 4 ea GPC-0001, white spring clamps
- 12 ea GPC-0002, white spring clamps
- 2 ea comb
- 2 set glass plates
- 2 set spacers
- 2 ea Gel Wrap
- Bubble level, attached to base
- 4 ea leveling screws, nylon

2.2 Components/Assembly



SECTION 3

Instructions for Use



3.1 Dual Slab Gel Unit Preparation

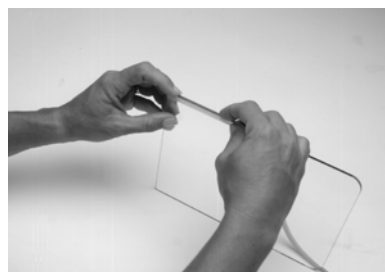
1. Place Dual Slab Gel unit on a level work surface in an authorized work area. Level the unit by adjusting the four white nylon thumbscrew until the bubble is centered in the level. Be sure that all four of the screws are touching the bench.
2. Verify that the comb, spacer set and Gel Wrap™ gasket are the same thickness, by assembling without gel casting.
3. To use the internal cooling option, attach tubing to the inlet (bottom port) and outlet coolant ports (top port) and to your pump.

3.2 Preparation/Cleaning of Glass Plates

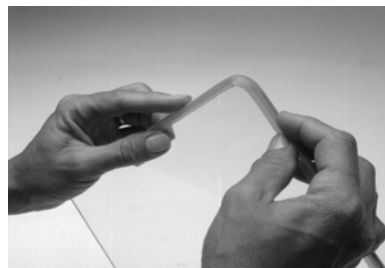
Hand wash both plates with a high quality lab detergent followed by a complete rinsing with dH₂O. Air dry or use a lint-free tissue. Spray/wipe the chosen inner surfaces of the plate set with 95% ethanol and dry with lint-free tissue.

3.3 Gel Casting Using Gel Wrap™ Gasket Casting method

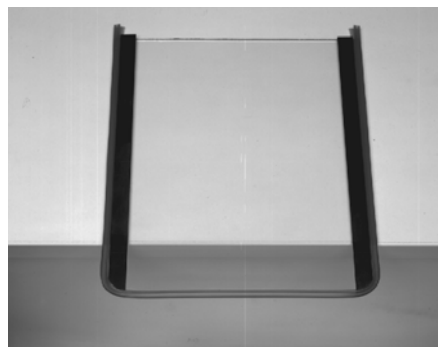
1. Start by holding the rectangular back plate with the rounded bottom corners and start applying the gasket around one side of the glass plate. Note: one side of the “U” shaped gasket is flat, and the other side has tubing that will act as a seal around the spacers.

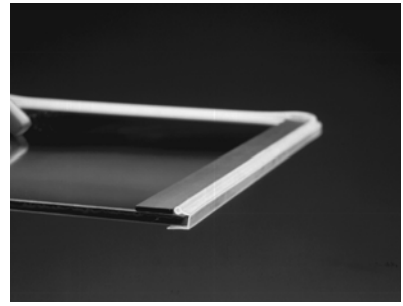


2. When applying the gasket over the rounded corners of the back glass plate, make sure the notches on the gasket align with the rounded corners of the glass plate. Once the gasket is pushed over the bottom edge and corners, work it down the remaining side.



3. Place the gasketed plate on the lab bench with the tubing side up, and extend the bottom of the plate over the edge of the bench, approximately ¾ of an inch. Place the spacers along side the inside edges of the gasket. Be sure the rounded corner end of each spacer is facing the outside bottom of the plate, following the radius of the glass.

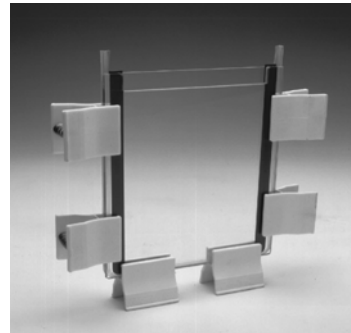




4. Place the notched plate on top of the bottom assembly, starting from the bottom edge and gently easing the plate down. Verify the gasket is smooth around the edges and then clamp along the bottom.

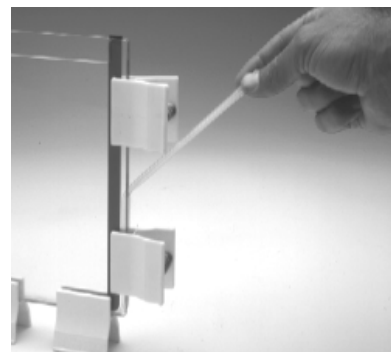


5. Lift the assembly and stand it on the base of the clamps. For leveling, push glass plate assembly down until it stops against clamp body. Clamp the sides of the assembly with additional casting clamps on either side. As each clamp is attached, be sure the gasket is aligned between the plates forming a seal.



6. Apply PAGE or agarose solution to gel plate sandwich using a syringe or pipette. If using a stacking gel, pour desired height of running gel, then overlay a small amount of dH_2O or 0.1% SDS solution to top of gel. After polymerization, rinse with buffer, add stacking gel solution and insert comb. For regular, unit percentage gels, add polyacrylamide solution to correct height, and insert comb. Allow gel to set, usually 20 minutes. Extra gel solution in pipette or syringe can be monitored to test polymerization of gel mix.

7. Disassembly. Hold the clamped plate assembly with one hand. Remove the gasket by starting at one of the top ends and pulling up and out on the gasket until it releases from the plate, up to the bottom of each of the white clamps. When each clamp is reached DO NOT remove it, instead feed the gasket down through the clamp body and repeat pulling up and out. Continue feeding until the gasket is fully detached. If gel is not to be used immediately, wrap entire plate sandwich with plastic wrap tightly to seal and store at 4°C for up to a month.

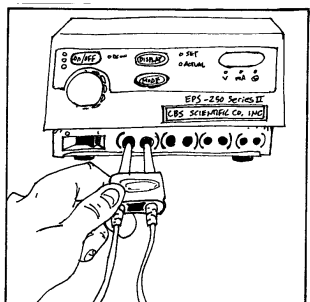
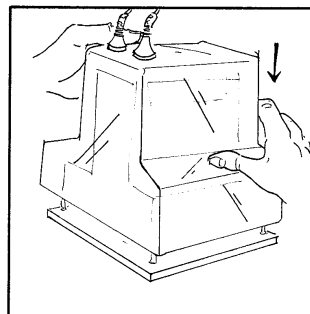
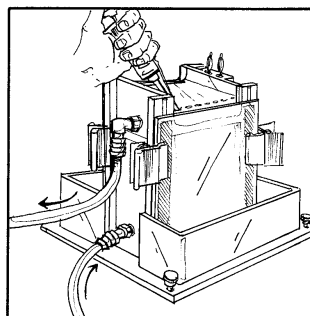
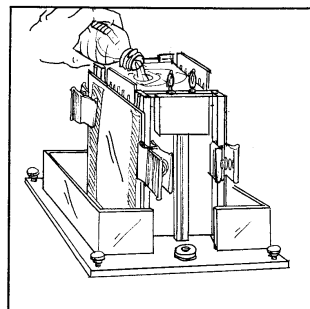
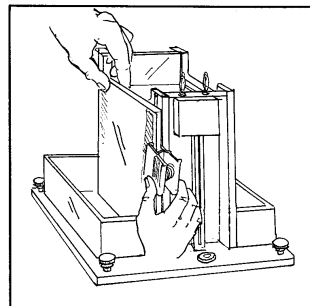


3.4 Running the Gel

1. Attach plate set(s) to unit with smaller or notched plate facing towards the upper buffer reservoir. If using a pre-cast gel stored at 4°C, allow to warm to room temperature. Use white clamps with mouth open (cat. # GPC-0001) to attach plate set to unit, clamping each side to the sandwich.
2. Pour freshly prepared buffer in upper and lower chamber. Using a pipette or syringe, thoroughly flush out the wells in the glass plate sandwich with buffer from the upper chamber. Boil or heat samples and then place immediately on ice. Load samples. If outer lanes do not contain sample, it is recommended that you run standards (Rainbow™ standards can be monitored easily during run) and/or fill outer lanes with loading buffer to reduce smiling and wrap-around effects.

3. Attach safety cover.

4. Connect the leads to the power supply matching the color-coded red to red and black to black. **See Section 4.1 for recommended power conditions.** Begin separation by electrophoresis.



3.5 Removing the Gel



1. Turn the power supply off and disconnect the leads from the power supply. Remove the safety cover from the unit, by placing thumbs on white posts next to red & black connectors, then pushing down while pulling up with fingers under lid. **DO NOT pull on power cords.**



2. Drain upper reservoir using a pipette or syringe. Detach side clamps and remove gel sandwich. Carefully separate, making sure that the gel remains attached to one plate. Stain and fix according to your preferred method. Dispose of buffer according to your institutions safety requirements.

3.6 Maximum Well/Comb Volumes

NOTE: To calculate sample well volume expressed in millimeters (mm) of height divide maximum volume by tooth depth.

TABLE 1---Combs

Overall Length 13cm	Tooth width/ mm	Tooth depth	Spacing between teeth mm	0.75mm thickness volume per tooth microliters (ul)	1.0mm thickness volume per tooth microliters (ul)	1.5mm thickness volume per tooth microliters (ul)	2.0mm thickness volume per tooth microliters (ul)	3.0mm thickness volume per tooth microliters (ul)
1	130.2	19.1	3.2	1865	2486	3729	4966	7458
2	63.5	19.1	3.2	909	1213	1819	2426	3639
3 equal	41.3	19.1	3.2	591	788	1182	1576	2364
2 w/middle marker	59.8/ 4.2	19.1	3.2	856	1142	1713	2284	3426
4	30.1	19.1	3.2	432	576	1151	1152	1728
5	23.5	19.1	3.2	336	449	673	898	1347
6	19.1	19.1	3.2	273	364	546	728	1092
8	13.5	19.1	3.2	193	257	386	514	771
10	10.1	19.1	3.2	145	194	291	388	582
12	7.9	19.1	3.2	113	151	227	302	453
14	6.4	19.1	3.2	91	121	182	242	363
15	5.7	19.1	3.2	82	109	163	218	327
16	5.2	19.1	3.2	74	98	147	196	294
20	4.2	17.7	2.4	55.72	74.3	111.45	148.7	222.9
29	2.9	17.7	1.6	38.5	51.33	77	102.66	154.0
30	2.8	17.7	1.6	37.2	49.6	74.4	99.12	148.8

SECTION 4

Running Conditions



4.1 Recommended Power

Precise electrophoresis conditions will vary according to the number and type of gels used, buffer conditions employed, power input, and the general goal of the experiment. Refer to the reference section for in depth discussions on practical and theoretical approaches to protein gel electrophoresis.

Using standard SDS-PAGE buffer systems apply 1-10 VDC/cm of gel. For sequencing applications use 50 VDC/cm. If running two gels in the Dual Units, keep the volts the same but double the mA. It is also true that if the thickness of gel increases, increase the mA proportionally.

At constant voltage, the proteins will migrate at a constant rate during electrophoresis with adequate heating appropriate for denaturing gels. Increasing the voltage/mA (for a single gel thickness and percentage) will speed mobility but increase the risk of overheating.

The sample migration rate can be increased by raising the input power. This can be done on systems which employ "active" temperature control such as Dual Slab Gel Units and Dual Mini-Vertical Gel Units. The joule heating generated by the higher input power is offset by the cooling effect of the water jacket between the gels. Exact conditions should be determined empirically but could be increased at least in the 20% range.

4.2 Recommended Buffers and Reagents

Pre-mixed acrylamide stock solutions are the method of choice. Use according to manufacturer's instructions.

Typical 'scratch' recipe for a 4% acrylamide gel:

10mls 40% acrylamide
6.6mls 2% Bis-acrylamide stock
5mls 10X TBE
78.4mls dH₂O
750ul 10% APS
50ul TEMED

1. Make up 0.5X TBE buffer
2. After gel apparatus is set-up and ready for the gel to be poured, add 750ul fresh 10% APS solution to the acrylamide solution.
3. Add 5 to 10 ul TEMED and using a 10 to 25ml pipette, quickly "pour" the gel.
4. Allow the gel to polymerize at least 60 minutes.
5. Remove the comb after polymerization and wash out wells with 0.5X TBE (acrylamide will seep into the wells).
6. Fill upper and lower chambers with 0.5X TBE.
7. Pre-electrophorese gel, if needed, 20-30 minutes.
8. Load wells with samples.
9. Monitor migration with dye markers.



4.2 Recommended Buffers and Reagents-continued

BUFFERS:

Agarose

TBE (1X solution):

0.089M Tris base

0.89M Boric acid

0.002M EDTA

pH 8.3

Protein Denaturing

TG-SDS(1X):

0.025M Tris base

0.192M Glycine

0.1%(w/v) SDS

pH3

DNA Sequencing

TTE (Tris/Taurine/EDTA)(1X):

1.78M Tris

0.57M Taurine

0.01M EDTA Na₂-2H₂O

Page/Agarose Slab

TAE (1X):

0.04M Tris-acetate

0.001M EDTA

pH 8.0

Denaturing/Non-Denaturing/ Nylon Blotting

TT (Tris-Taurine((1X):

0.1M Tris base

0.1M Tricine

TT-SDS (1X):

0.1M Tris base

0.1M Tricine

0.1%(w/v) SDS

4.3 References

Hames, B.D., Rickwood, D. (ed.) (1990). *Gel Electrophoresis of Proteins. A Practical Approach*. 2nd edn. IRL Press, Oxford. Ch.1 & 3.

Sambrook, J., Fritsch, E.F., Maniatis, T. (1989). *Molecular Cloning. A Laboratory Manual*. 2nd edn. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York. 18.47-18.61.

Ausubel, F.M., Brent, R., Kingston, R.E., Moore, D.D., Seidman, J.G., Smith, J.A., Struhl, K. (ed) (1993). *Current Protocols in Molecular Biology*. Vol. 2, Greene Publishing Associates, Inc. and John Wiley & Sons, Inc., Ch.10.

SECTION 5

Maintenance of Equipment



5.1 Care and Handling

The plastic components of the Dual Slab Gel units are fabricated from acrylic and polycarbonate. Electrodes and connectors are made from pure platinum, stainless steel, and chrome plated brass. As with any laboratory instrument, adequate care ensures consistent and reliable performance.

After each use, rinse buffer chamber, glass plates, spacers and combs with de-ionized water. Wipe dry with a soft cloth or paper towel, or allow to air dry. Whenever necessary, all components may be washed gently with water and a non-abrasive detergent, and rinsed and dried as above. *Never* use abrasive cleaners, glass cleaning sprays or scouring pads to clean the components, as these will damage the unit and components.

Additional precautions:

- Do not autoclave or dry-heat sterilize the apparatus or components.
- Do not expose the apparatus or components to phenol, acetone, benzene, halogenated hydrocarbon solvents or alcohols.
- Avoid prolonged exposure of the apparatus or components to UV light.
- Do NOT treat with diethylpyrocarbonate (DEPC)-treated water for extended periods at 37°C. A brief rinse with DEPC-water is sufficient after a thorough wash.



5.2 Maintenance

The following inspection and maintenance procedures will help maintain the safety and reliable performance of the Dual Slab Gel systems. Replacement parts can be ordered by calling 1-858-4959 or by contacting your local distributor.

- Banana plugs and power cords should be inspected regularly. If the banana plugs become loose or do not feel friction tight replace the plugs or power cords.
- Should power cord assemblies (connectors, wire or shrouds) show any signs of wear or damage (e.g. cracks, nicks, abrasions, or melted insulation), replace them immediately.
- The platinum wire is secured to the banana jack by compression between a stainless washer and the jack nut. The nut/washer interface should be tight and free of corrosion.

SECTION 6

Dual Slab Gel Kits and Accessories

Cat. #	Item
DSG-125 or DSG-125-02	Dual Slab Gel Kit , 145mm height. Includes 2 combs, 2 Gel Wrap spacer sets, 2 Gel Wrap™ Glass plate sets, 2 each Gel Wrap™ Gaskets, and 12 clamps.
DSG-160 or DSG-160-02	Dual Slab Gel Kit , 160mm height. Includes 2 combs, 2 Gel Wrap spacer sets, 2 Gel Wrap™ Glass plate sets, 2 each Gel Wrap™ Gaskets, and 12 clamps.
DSG-170 or DSG-170-02	Dual Slab Gel Kit , 170mm height. Includes 2 combs, 2 Gel Wrap spacer sets, 2 Gel Wrap™ Glass plate sets, 2 each Gel Wrap™ Gaskets, and 12 clamps.
DSG-190 or DSG-190-02	Dual Slab Gel Kit , 190mm height. Includes 2 combs, 2 Gel Wrap spacer sets, 2 Gel Wrap™ Glass plate sets, 2 each Gel Wrap™ Gaskets, and 12 clamps.
DSG-200 or DSG-200-02	Dual Slab Gel Kit , 220mm height. Includes 2 combs, 2 Gel Wrap spacer sets, 2 Gel Wrap™ Glass plate sets, 2 each Gel Wrap™ Gaskets, and 12 clamps.
DSG-250 or DSG-250-02	Dual Slab Gel Kit , 280mm height. Includes 2 combs, 2 Gel Wrap spacer sets, 2 Gel Wrap™ Glass plate sets, 2 each Gel Wrap™ Gaskets, and 12 clamps.
DSG-400	Dual Slab Gel Kit , 387mm height. Includes 2 combs, 2 Gel Wrap spacer sets, 2 Gel Wrap™ Glass plate sets, 2 each Gel Wrap™ Gaskets, and 12 clamps.

Accessories:

COMBS (Teflon)

Cat. #	Comb dimensions
VGC-7501	0.75mm x 1 well
VGC-7502	0.75mm x 2 well
VGC-7503E	0.75mm x 3 equal wells
VGC-7503M	0.75mm x 2 well + middle marker
VGC-7504	0.75mm x 4 well
VGC-7505	0.75mm x 5 well
VGC-7506	0.75mm x 6 well
VGC-7508	0.75mm x 8 well
VGC-7510	0.75mm x 10 well
VGC-7512	0.75mm x 12 well
VGC-7514*	0.75mm x 14 well
VGC-7515	0.75mm x 15 well
VGC-7516	0.75mm x 16 well
VGC-7520	0.75mm x 20 well
VGC-7529*	0.75mm x 29 well
VGC-7530	0.75mm x 30 well
VGC-1001	1.0mm x 1 well
VGC-1002	1.0mm x 2 well
VGC-1003E	1.0mm x 3 equal wells
VGC-1003M	1.0mm x 2 well + middle marker
VGC-1004	1.0mm x 4 well
VGC-1005	1.0mm x 5 well
VGC-1006	1.0mm x 6 well
VGC-1008	1.0mm x 8 well
VGC-1010	1.0mm x 10 well
VGC-1012	1.0mm x 12 well
VGC-1014*	1.0mm x 14 well
VGC-1015	1.0mm x 15 well
VGC-1016	1.0mm x 16 well
VGC-1020	1.0mm x 20 well
VGC-1029*	1.0mm x 29 well
VGC-1030	1.0mm x 30 well
VGC-1501	1.5mm x 1 well
VGC-1502	1.5mm x 2 well
VGC-1503E	1.5mm x 3 equal wells
VGC-1503M	1.5mm x 2 well + middle marker
VGC-1504	1.5mm x 4 well
VGC-1505	1.5mm x 5 well
VGC-1506	1.5mm x 6 well
VGC-1508	1.5mm x 8 well
VGC-1510	1.5mm x 10 well
VGC-1512	1.5mm x 12 well
VGC-1514*	1.5mm x 14 well
VGC-1515	1.5mm x 15 well
VGC-1516	1.5mm x 16 well
VGC-1520	1.5mm x 20 well
VGC-1529*	1.5mm x 29 well
VGC-1530	1.5mm x 30 well

COMBS (Teflon)

Cat. #	Comb dimensions
VGC-2001	2.0mm x 1 well
VGC-2002	2.0mm x 2 well
VGC-2003E	2.0mm x 3 equal wells
VGC-2003M	2.0mm x 2 well + middle marker
VGC-2004	2.0mm x 4 well
VGC-2005	2.0mm x 5 well
VGC-2006	2.0mm x 6 well
VGC-2008	2.0mm x 8 well
VGC-2010	2.0mm x 10 well
VGC-2012	2.0mm x 12 well
VGC-2014*	2.0mm x 14 well
VGC-2015	2.0mm x 15 well
VGC-2016	2.0mm x 16 well
VGC-2020	2.0mm x 20 well
VGC-2029*	2.0mm x 29 well
VGC-2030	2.0mm x 30 well
VGC-3001	3.0mm x 1 well
VGC-3002	3.0mm x 2 well
VGC-3003E	3.0mm x 3 equal wells
VGC-3003M	3.0mm x 2 well + middle marker
VGC-3004	3.0mm x 4 well
VGC-3005	3.0mm x 5 well
VGC-3006	3.0mm x 6 well
VGC-3008	3.0mm x 8 well
VGC-3010	3.0mm x 10 well
VGC-3012	3.0mm x 12 well
VGC-3014*	3.0mm x 14 well
VGC-3015	3.0mm x 15 well
VGC-3016	3.0mm x 16 well
VGC-3020	3.0mm x 20 well
VGC-3029*	3.0mm x 29 well
VGC-3030	3.0mm x 30 well
VGC-6001	6.0mm x 1 well
VGC-6002	6.0mm x 2 well
VGC-6003E	6.0mm x 3 equal wells
VGC-6003M	6.0mm x 2 well + middle marker
VGC-6004	6.0mm x 4 well
VGC-6005	6.0mm x 5 well
VGC-6006	6.0mm x 6 well
VGC-6008	6.0mm x 8 well
VGC-6010	6.0mm x 10 well
VGC-6012	6.0mm x 12 well
VGC-6014*	6.0mm x 14 well
VGC-6015	6.0mm x 15 well
VGC-6016	6.0mm x 16 well
VGC-6020	6.0mm x 20 well
VGC-6029*	6.0mm x 29 well
VGC-6030	6.0mm x 30 well

* Designed for multi-channel pipettor loading.

Gel Wrap Gasket Accessories:

SPACERS for GEL WRAP (PVC)

Cat. #	Spacer dimensions
VGS-7512R	0.75mm x 14.5cm
VGS-7516R	0.75mm x 16cm
VGS-7517R	0.75mm x 17cm
VGS-7519R	0.75mm x 19cm
VGS-7520R	0.75mm x 22cm
VGS-7525R	0.75mm x 28cm
VGS-7540R	0.75mm x 40cm
VGS-1012R	1.0mm x 14.5cm
VGS-1016R	1.0mm x 16cm
VGS-1017R	1.0mm x 17cm
VGS-1019R	1.0mm x 19cm
VGS-1020R	1.0mm x 22cm
VGS-1040R	1.0mm x 40cm
VGS-1512R	1.5mm x 14.5cm
VGS-1516R	1.5mm x 16cm
VGS-1517R	1.5mm x 17cm
VGS-1519R	1.5mm x 19cm
VGS-1520R	1.5mm x 22cm
VGS-1525R	1.5mm x 28cm
VGS-1540R	1.5mm x 40cm
VGS-2012R	2.0mm x 14.5cm
VGS-2016R	2.0mm x 16cm
VGS-2017R	2.0mm x 17cm
VGS-2019R	2.0mm x 19cm
VGS-2020R	2.0mm x 22cm
VGS-2025R	2.0mm x 28cm
VGS-2040R	2.0mm x 40cm
VGS-3012R	3.0mm x 14.5cm
VGS-3016R	3.0mm x 16cm
VGS-3017R	3.0mm x 17cm
VGS-3019R	3.0mm x 19cm
VGS-3020R	3.0mm x 22cm
VGS-3025R	3.0mm x 28cm
VGS-3040R	3.0mm x 40cm
VGS-6012R	6.0mm x 14.5cm
VGS-6016R	6.0mm x 16cm
VGS-6017R	6.0mm x 17cm
VGS-6019R	6.0mm x 19cm
VGS-6020R	6.0mm x 22cm
VGS-6025R	6.0mm x 28cm
VGS-6040R	6.0mm x 40cm

(2 sides with rounded corners, no bottom)

GEL WRAP GLASS PLATE SETS, NOTCHED*

(1/8" back plate with rounded corners)

Cat. #	Glass Plate dimensions (w x h)
NGP-125NR	16.5cm x 14.5cm
NGP-160NR	16.5cm x 16cm
NGP-170NR	16.5cm x 17cm
NGP-190NR	16.5cm x 19cm
NGP-200NR	16.5cm x 22cm
NGP-250NR	16.5cm x 28cm
NGP-400NR	16.5cm x 40cm

* **Glass plate ordering options:** To order an unnotched plate set and add a "UN" to the end of the catalog # (rubber ears included).

Note: Although glass plates are listed as sets, individual pieces can be ordered. To order a notched only plate, add a "-NO" to the end of the cat. #. To order a back only (rectangular) plate, add a "-BO" to the end of the cat. #.

Standard Accessories:**STANDARD GLASS PLATE SETS, NOTCHED***

Cat. #	Glass Plate dimensions (w x h)
NGP-125N	16.5cm x 14.5cm
NGP-160N	16.5cm x 16cm
NGP-170N	16.5cm x 17cm
NGP-190N	16.5cm x 19cm
NGP-200N	16.5cm x 22cm
NGP-250N	16.5cm x 28cm
NGP-400N	16.5cm x 40cm

* **Glass plate ordering options:** To order an unnotched plate set and add a "UN" to the end of the catalog # (rubber ears included).

Note: Although glass plates are listed as sets, individual pieces can be ordered. To order a notched only plate, add a "-NO" to the end of the cat. #. To order a back only (rectangular) plate, add a "-BO" to the end of the cat. #.

STANDARD SPACERS (PVC)

(2 side spacers, 1 bottom, + silicone tubing)

Cat. #	Spacer dimensions
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GEL WRAP™ GASKET

Cat. #	Gasket thickness x plate size
VGE-7512	0.75mm thick x 14.5cm
VGE-7516	0.75mm thick x 16cm
VGE-7517	0.75mm thick x 17cm
VGE-7519	0.75mm thick x 19cm
VGE-7520	0.75mm thick x 22cm
VGE-7525	0.75mm thick x 28cm
VGE-7540	0.75mm thick x 40cm
VGE-1012	1.0mm thick x 14.5cm
VGE-1016	1.0mm thick x 16cm
VGE-1017	1.0mm thick x 17cm
VGE-1019	1.0mm thick x 19cm
VGE-1020	1.0mm thick x 22cm
VGE-1040	1.0mm thick x 40cm
VGE-1512	1.5mm thick x 14.5cm
VGE-1516	1.5mm thick x 16cm
VGE-1517	1.5mm thick x 17cm
VGE-1519	1.5mm thick x 19cm
VGE-1520	1.5mm thick x 22cm
VGE-1525	1.5mm thick x 28cm
VGE-1540	1.5mm thick x 40cm
VGE-2012	2.0mm thick x 14.5cm
VGE-2016	2.0mm thick x 16cm
VGE-2017	2.0mm thick x 17cm
VGE-2019	2.0mm thick x 19cm
VGE-2020	2.0mm thick x 22cm
VGE-2025	2.0mm thick x 28cm
VGE-2040	2.0mm thick x 40cm
VGE-3012	3.0mm thick x 14.5cm
VGE-3016	3.0mm thick x 16cm
VGE-3017	3.0mm thick x 17cm
VGE-3019	3.0mm thick x 19cm
VGE-3020	3.0mm thick x 22cm
VGE-3025	3.0mm thick x 28cm
VGE-3040	3.0mm thick x 40cm
VGE-6012	6.0mm thick x 14.5cm
VGE-75XX	0.75mm x foot
VGE-10XX	1.0mm x foot
VGE-15XX	1.5mm x foot
VGE-20XX	2.0mm x foot
VGE-30XX	3.0mm x foot

GLASS PLATE SETS, NOTCHED & BEVELED*

(1/8" back plate with rounded corners)

Cat. #	Glass Plate dimensions (w x h)
NGP-125BR	16.5cm x 14.5cm
NGP-160BR	16.5cm x 16cm
NGP-170BR	16.5cm x 17cm
NGP-190BR	16.5cm x 19cm
NGP-200BR	16.5cm x 22cm
NGP-250BR	16.5cm x 28cm
NGP-400BR	16.5cm x 40cm

GLASS PLATE SETS, NOTCHED & BEVELED*

Cat. #	Glass Plate dimensions (w x h)
NGP-125B	16.5cm x 14.5cm
NGP-160B	16.5cm x 16cm
NGP-170B	16.5cm x 17cm
NGP-190B	16.5cm x 19cm
NGP-200B	16.5cm x 22cm
NGP-250B	16.5cm x 28cm
NGP-400B	16.5cm x 40cm

VGS-7512	0.75mm x 14.5cm	VGS-1512	1.5mm x 14.5cm
VGS-7516	0.75mm x 16cm	VGS-1516	1.5mm x 16cm
VGS-7517	0.75mm x 17cm	VGS-1517	1.5mm x 17cm
VGS-7519	0.75mm x 19cm	VGS-1519	1.5mm x 19cm
VGS-7520	0.75mm x 22cm	VGS-1520	1.5mm x 22cm
VGS-7525	0.75mm x 28cm	VGS-1525	1.5mm x 28cm
VGS-7540	0.75mm x 40cm	VGS-1540	1.5mm x 40cm
VGS-1012	1.0mm x 14.5cm	VGS-2012	2.0mm x 14.5cm
VGS-1016	1.0mm x 16cm	VGS-2016	2.0mm x 16cm
VGS-1017	1.0mm x 17cm	VGS-2017	2.0mm x 17cm
VGS-1019	1.0mm x 19cm	VGS-2019	2.0mm x 19cm
VGS-1020	1.0mm x 22cm	VGS-2020	2.0mm x 22cm
VGS-1025	1.0mm x 28cm	VGS-2025	2.0mm x 28cm
VGS-1040	1.0mm x 40cm	VGS-2040	2.0mm x 40cm
VGS-3012	3.0mm x 14.5cm	VGS-6012	6.0mm x 14.5cm
VGS-3016	3.0mm x 16cm	VGS-6016	6.0mm x 16cm
VGS-3017	3.0mm x 17cm	VGS-6017	6.0mm x 17cm
VGS-3019	3.0mm x 19cm	VGS-6019	6.0mm x 19cm
VGS-3020	3.0mm x 22cm	VGS-6020	6.0mm x 22cm
VGS-3025	3.0mm x 28cm	VGS-6025	6.0mm x 28cm
VGS-3040	3.0mm x 40cm	VGS-6040	6.0mm x 40cm

SILICONE TUBING

Cat. #	Gel Thickness
ST-0500	0.5mm
ST-7500	0.75mm
ST-1000	1.0mm
ST-1500	1.5mm
ST-2000	2.0mm
ST-3000	3.0mm

Sequencing Accessories:

COMBS (Polycarbonate)

Cat. #	Comb dimensions
VGC-0201	0.2mm x 1 well
VGC-0202	0.2mm x 2 well
VGC-0203E	0.2mm x 3 equal wells
VGC-0203M	0.2mm x 2 well + middle marker
VGC-0204	0.2mm x 4 well
VGC-0205	0.2m x 5 well
VGC-0206	0.2mm x 6 well
VGC-0208	0.2mm x 8 well
VGC-0210	0.2mm x 10 well
VGC-0212	0.2mm x 12 well
VGC-0214*	0.2mm x 14 well
VGC-0215	0.2mm x 15 well
VGC-0216	0.2mm x 16 well
VGC-0220	0.2mm x 20 well
VGC-0229*	0.2mm x 29 well
VGC-0230	0.2mm x 30 well
VGC-0501	0.5mm x 1 well
VGC-0502	0.5mm x 2 well
VGC-0503E	0.5mm x 3 equal wells
VGC-0503M	0.5mm x 2 well + middle marker
VGC-0504	0.5mm x 4 well
VGC-0505	0.5mm x 5 well
VGC-0506	0.5mm x 6 well
VGC-0508	0.5mm x 8 well
VGC-0510	0.5mm x 10 well
VGC-0512	0.5mm x 12 well
VGC-0514*	0.5mm x 14 well
VGC-0515	0.5mm x 15 well
VGC-0516	0.5mm x 16 well
VGC-0520	0.5mm x 20 well
VGC-0529*	0.5mm x 29 well
VGC-0530	0.5mm x 30 well

COMBS (Polycarbonate)

Cat. #	Comb dimensions
VGC-0401	0.4mm x 1 well
VGC-0402	0.4mm x 2 well
VGC-0403E	0.4mm x 3 equal wells
VGC-0403M	0.4mm x 2 well + middle marker
VGC-0404	0.4mm x 4 well
VGC-0405	0.4mm x 5 well
VGC-0406	0.4mm x 6 well
VGC-0408	0.4mm x 8 well
VGC-0410	0.4mm x 10 well
VGC-0412	0.4mm x 12 well
VGC-0414*	0.4mm x 14 well
VGC-0415	0.4mm x 15 well
VGC-0416	0.4mm x 16 well
VGC-0420	0.4mm x 20 well
VGC-0429*	0.4mm x 29 well
VGC-0430	0.4mm x 30 well

SHARKTOOTH COMBS

Cat. #	Comb dimensions
SK16.5-0201	0.2mm x 1 well
SK16.5-0220	0.2mm x 20 well
SK16.5-0226*	0.2mm x 26 well

SEQUENCING SPACER SETS (Polycarbonate)

Cat. #	Comb dimensions
VGS-0216	0.2mm x 16cm
VGS-0217	0.2mm x 17cm
VGS-0219	0.2mm x 19cm

SK16.5-0230	0.2mm x 30 well	VGS-0220	0.2mm x 22cm
SK16.5-0242*	0.2mm x 42 well	VGS-0225	0.2mm x 28cm
SK16.5-0258*	0.2mm x 58 well	VGS-0240	0.2mm x 40cm
SK16.5-0401	0.4mm x 1 well	VGS-0416	0.4mm x 16cm
SK16.5-0420	0.4mm x 20 well	VGS-0417	0.4mm x 17cm
SK16.5-0426*	0.4mm x 26 well	VGS-0419	0.4mm x 19cm
SK16.5-0430	0.4mm x 30 well	VGS-0420	0.4mm x 22cm
SK16.5-0442*	0.4mm x 42 well	VGS-0425	0.4mm x 28cm
SK16.5-0458*	0.4mm x 58 well	VGS-0440	0.4mm x 40cm
SK16.5-0501	0.5mm x 1 well	VGS-0516	0.5mm x 16cm
SK16.5-0520	0.5mm x 20 well	VGS-0517	0.5mm x 17cm
SK16.5-0526*	0.5mm x 26 well	VGS-0519	0.5mm x 19cm
SK16.5-0530	0.5mm x 30 well	VGS-0520	0.5mm x 22cm
SK16.5-0542*	0.5mm x 42 well	VGS-0525	0.5mm x 28cm
SK16.5-0558*	0.5mm x 58 well	VGS-0540	0.5mm x 40cm

ADDITIONAL VERTICAL GEL ACCESSORIES:

I.E.F. TUBE GEL KIT and ACCESSORIES

Cat. #	Item
TGA-200K	TUBE GEL ADAPTOR for DSG-200 System 10-place. Includes 10 grommets, 4 white clamps and safety cover.
TXA-100	TUBE GEL EXTRACTOR
GT-0520	I.E.F. Glass Tube, 0.5mm ID, pkg. 24
GT-0720	I.E.F. Glass Tube, 0.75mm ID, pkg. 24
GT-1020	I.E.F. Glass Tube, 1.0mm ID, pkg. 24
GT-1520	I.E.F. Glass Tube, 1.5mm ID, pkg. 24
TGA-SC	Safety Cover for IEF, DSG-200
TGA-G3	Tube Grommets, pkg. of 12
TGA-S3	Solid Stopper, pkg. of 12

BAR CLAMP

Cat. #	Item
GPC-1650	Bar clamp for 16.5cm wide units

MULTIPLE GEL CASTING CHAMBERS

Cat. #	Item
GCC-404	Multiple Vertical Gel Casting chamber, casts up to 4 gels simultaneously
GCC-410	Multiple Vertical Gel Casting chamber, casts up to 10 gels simultaneously

GEL CASTING STAND

Cat. #	Item
GCS-250	Gel Casting Stand, includes stand with leveling base and 4 clamps

RUBBER EARS

Cat. #	Item
VFR-1000	Adhesive rubber ears for unnotched glass plate sets

WHITE CLAMPS

Cat. #	Item
GPC-0002	Casting clamp, jaws closed
GPC-0001	Larger white clamp, jaws slightly open

POWER SUPPLY

Cat. #	Item
EPS-250	Mini Power Supply, 20-250 Volts, 300mA @ 150-250V or 500mA below 150V, 110V Input
EPS-250V	Mini Power Supply, 20-250 Volts, 300mA @ 150-250V or 500mA below 150V, 220V Input
EPS-250-II	Mini Power Supply, 10-250 Volts, 10-500mA with timer, 110V Input,
EPS-250-IIV	Mini Power Supply, 10-250 Volts, 10-500mA with timer, 220V Input
EPS-2000-II	0-2000Volt Constant Power Supply, 110V/60Hz, 300 Watts, 300mA Constant Power, CV, CC, 110V Input
EPS-2000-IIV	0-2000Volt Constant Power Supply, 220V/50Hz, 300 Watts, 300mA Constant Power, CV, CC, 220V Input
EPS-3000-II	0-3000Volt Constant Power Supply, 110V/60Hz, 300 Watts, 300mA Constant Power, CV, CC, 110V Input
EPS-3000-IIV	0-3000Volt Constant Power Supply, 220V/50Hz, 300 Watts, 300mA Constant Power, CV, CC, 220V Input
EPS-4000-II	0-4000Volt Constant Power Supply, 110V/60Hz, 300 Watts, 300mA Constant Power, CV, CC, 110V Input
EPS-4000-IIV	0-4000Volt Constant Power Supply, 220V/50Hz, 300 Watts, 300mA Constant Power, CV, CC, 220V Input

NOTES

CONTACT INFORMATION



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