

IMPORTANT:

This note is intended to provide supplemental information only.

For detailed information about a specific product, or for product specific protocols, please refer to the respective product manual.

Tip:

1. To search the note, press CTRL-F keys in combination
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ZOOM® IPGRunner™ System

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PRODUCT DESCRIPTION

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The ZOOM® IPGRunner™ System provides a convenient and quick way to perform isoelectric focusing (IEF) of proteins using immobilized pH gradient (IPG) strips for two-dimensional (2D) gel electrophoresis. This system is much faster, less messy (oil-free rehydration, no cleanup hassles as the cassettes are disposable), and is more convenient than conventional systems that are available from other vendors. In addition, our ampholytes do not bind dye and therefore provides a lower background.

This product is designed for Isoelectric focusing (IEF) of proteins for one-dimensional IEF analysis and two-dimensional (2D) gel electrophoresis. Using the ZOOM® Strips, proteins are separated based on their isoelectric point or pI. ZOOM® Strips are immobilized pH gradient polyacrylamide gels cast on a plastic backing. When an electric field is applied, proteins in the sample will equilibrate) at the pH where they have a net neutral charge or Isoelectric point (pI).

The proteins in the sample can be further analyzed based upon molecular weight by placing the IPG Strips into the large well on a NuPAGE® Bis-Tris or Tris-Glycine ZOOM® gel. The proteins separated in the second dimension can be visualized as spots by the use of SilverStaining or SimplyBlue stain, or blotted onto membranes. Protein spots can be also excised from the gel or the membranes to be further analyzed by mass spectrometry or chemical microsequencing to facilitate protein identification.

SHIPPING CONDITIONS

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ZOOM® IPGRunner™ Mini-Cell and Cassettes are shipped at room temperature. IPG strips are shipped on dry ice.

STORAGE CONDITIONS

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ZOOM® IPGRunner™ Mini-Cell and cassettes are stored at room temperature.

ZOOM® IPG strips are stored at -20°C.

ZOOM® Ampholytes are stored at 4°C. **Note:** Storing some ZOOM® Carrier Ampholytes at low temperature may result in precipitate formation. Dissolve precipitate by warming the solution to 50°C.

STABILITY

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ZOOM® Ampholytes are stable for 1 year when stored properly.

QC SPECIFICATIONS

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ZOOM® Strips are qualified by subjecting a mixture of proteins to isoelectric focusing under standard focusing conditions. The strips are stained and visualized for proper resolution and migration of protein bands.

PROTOCOL AND APPLICATION NOTES

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Sample Prep

General Notes on Sample Prep

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- Amount of protein to load on a strip: In general, to start with, 5-15 µg (for silver staining) or 20-50 µg (for Coomassie staining) of total protein per ZOOM Strip is recommended. The total protein load can be increased after optimizing the sample preparation protocol and focusing parameters. Higher amounts of sample may be loaded on narrow pH range ZOOM® Strips. For the ZOOM Strip pH 9 –12, 50 –100 µg (silver staining) or 100 –200 µg (Coomassie staining) of total protein per strip is recommended. If the sample is a fractionated or partially purified protein, up to 400 µg of total protein per strip may be loaded.
- Maximum Sample volume added to Rehydration Buffer: The maximum volume of the protein sample should at most be 1/6 of the final sample that will be added to the strip. A good general volume would be 5-10µl. 140 µl of sample diluted in sample rehydration buffer is used to rehydrate the ZOOM® Strips for the standard rehydration time of one hour. For overnight rehydration use 140-155 µl.
- Focusing of low Molecular Weight Proteins: Insulin, which is about 3kDa, can be successfully run on the system.
- Focusing of high Molecular Weight proteins: Proteins that are 175-200kD have been routinely under denaturing conditions. In fact, rat liver lysate, which contains a highly abundant protein of ~ 175kD, has focused well on the broad range and narrow range strips with no vertical streaking into the second dimension. Proteins up to 440kD have been focused under native conditions, which then ran into the second dimension denaturing gel as 220kD subunits. So it is quite possible to work with large proteins but there may be some complications depending on the properties of the proteins in question. Large proteins were run on Tris Acetate gels.
- Storing prepared samples: The sample made up in the ZOOM® 2D Protein Solubilizer or Sample Rehydration Buffer can be stored at –80. Storage at –20C is not recommended.
- Heating samples not recommended: To avoid modification of proteins, never heat a sample after adding urea. When the sample contains urea, it must not be heated over 37 °C. Elevated temperatures cause urea to hydrolyze to isocyanate, which modifies proteins by carbamylation.
- Non-reducing conditions: It is possible to run non-reduced samples in the IPGRunner™ by omitting DTT in the rehydration buffer and equilibration buffers.
- Membrane Proteins: If working with membrane proteins, the solubilizing power of 8M Urea, 2% CHAPS may not be sufficient. The ZOOM® 2D Protein Solubilizers are recommended. These will work well with membrane and all other proteins. They are rehydration buffers containing deionized urea, thiourea and proprietary detergent blends that enhance protein solubility. Buffers that include 7M Urea, 2M Thiourea, 4% CHAPS can also be used.
- pH 9-12 IPG Strips: Use the Focusing Buffers instead of the 9-11 carrier ampholytes. The amount is 1% ZOOM Focusing Buffer pH 7-12 (instead of the ampholytes).

Interfering Components

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Many components present in the sample after sample preparation may interfere with 2D electrophoresis, causing streaking, longer run times, poor focusing, high conductivity, and protein modification. To obtain good resolution, it is important to remove these interfering components prior to IEF. The most common interfering components and the recommended methods to remove these components are described below.

- **Charged Molecules:** These include salts (e.g. NaCl, KCl), buffer components (e.g. Tris, PBS), and small, charged molecules (e.g. nucleotides). Salt is the major cause of poor focusing in IEF. The presence of salt and charged molecules increases focusing time, as proteins will migrate to their pI only after the ions have moved out of the strips. Burning of strips (arcing) can occur when the salt concentration is very high. The charged molecules are easily removed by dialysis or gel filtration.
- **SDS:** Proteins form complexes with SDS. The resultant SDS-protein complexes are highly negatively charged and move towards the positive electrode. Performing acetone precipitation helps to reduce the SDS concentration in the samples. If low concentrations of SDS are used for sample preparation, dilute the SDS to a final concentration of 0.25-0.5% in the sample rehydration buffer or maintain the ratio of non-ionic/zwitterionic detergent (NP-40 recommended) to SDS between 5:1 –8:1 in the sample to minimize effects of SDS on IEF.
- **DNA:** DNA is negatively charged and binds to proteins resulting in artifacts in protein migration during IEF. Because DNA is high-molecular weight, it will decrease movement of proteins into the gel during rehydration by clogging the gel pores. If detection of 2D gel is performed using silver staining, DNA may also stain contributing to background staining. DNA is removed from the sample using DNase treatment or sonication. Remember to account for DNase spot on the 2D gel as DNase is a protein and may appear as a distinct spot on the gel.
- **Particulate material:** Remove particulate materials from the sample by high-speed centrifugation. At least a quick spin with a microfuge to remove some cellular debris.
- **Serum proteins:** Serum proteins such as albumin and immunoglobulin (IgG) constitute ~75% of total serum proteins. Removal of these abundant proteins allows detection of low abundance proteins present in serum. Albumin and IgG are removed from serum using affinity chromatography (Lollo et al., 1999) or Cibacron Blue Dye chromatography.
- **Detergent limits:** The maximum amount of Triton or NP-40 that can be used in the sample prior to running the IPG strip is 0.5-0.7% final. The maximum amount of SDS, which can be in the sample prior to running the IPG strip, is 0.2%. If the percentage is higher, all the proteins will be negatively charged and will migrate to the positive electrode.

Sample pre-fractionation methods

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Prior to 2D electrophoresis allow fractionation of complex mixture of proteins into smaller defined fractions. Sample pre-fractionation improves the detection of low abundance proteins by lowering complexity of the sample, enriching for the protein of interest, and allowing higher protein loads.

The different methods of pre-fractionation are:

- **Solution phase isoelectric focusing:** This method reproducibly fractionates cell lysates into well-resolved fractions based on the pI using solution phase isoelectric focusing (IEF) with the ZOOM® IEF Fractionator. The resolved fractions are loaded on narrow pH range IPG strips followed by 2D gel electrophoresis to obtain detailed protein profiles of various proteomes.
- **Subcellular fractionation:** Lysates are fractionated into different subcellular fractions (nuclei, lysosomes, microsomes, and membranes) using centrifugation.
- **Conventional chromatographic techniques:** Chromatographic techniques such as ion exchange chromatography, gel-filtration, or affinity chromatography are used.

Protein estimation

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Use an accurate and sensitive protein estimation method. Note that many components of the sample rehydration buffer (urea, detergent, DTT, ampholytes) may interfere with protein estimation methods. Choose a protein estimation method that is insensitive to these components. Using the Quant-iT™ Protein Assay Kit (Catalog no.Q33210) for easy and sensitive fluorescence-based quantitation of proteins is recommended if the customer is using soluble extracts, but these assays should

be used before mixing the 2-D Solubilizers. The Quant- iT is compatible with reducing agents, but not detergents. Accurate protein estimation is essential for calculating protein load and performing subsequent detection. Any error in protein estimation may result in no spots or missing spots on the second dimension SDS gel. Estimating protein concentration using UV absorption is not recommended.

Rehydration of the strips

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- Rapid Rehydration in as little as 60-90 minutes.
- Our proprietary formulation for our ZOOM® Strips has been tested and been shown to allow for a 60-90 minute rapid rehydration step. It is not necessary to go overnight, although for convenience, it can be rehydrated for 8-16 hours. ZOOM® Strip rehydration, isoelectric focusing, and 2nd dimension SDS-PAGE can be completed in a day. It is important not to exceed the 140µl sample volume. The proteins get in very quickly but the liquid may be left behind. If rehydrating overnight, use the 140-155µl sample volume.
- Rehydration at RT recommended: It is not recommended to rehydrate the strips or run the ZOOM® IPG Runner at 4°C, and additionally this should not be necessary. It can be done but be aware that rehydrating the strips at 4°C could cause the urea to come out of solution, or the proteins to precipitate out. The CHAPS may also be a problem as it may come out of solution as well.
- Saving Rehydrated Strips: IPG strips that are set-up and rehydrated can be saved if the first dimension run cannot be performed. The whole cassette can be saved in a plastic bag on the bench-top one or two days. Remove the wick before storage. This is not optimal, but if necessary, it can be done and the results should be okay. Repeat the experiment to verify results.

Ist Dimension IEF Run

Run Conditions

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- To obtain the best results, IEF is typically performed by increasing the voltage gradually and maintaining the final focusing voltage for approx 1-1/hours. It is important to have a power supply capable of operating at high voltage and low current. During IEF, proteins migrate in an electric field until the proteins reach their pI and small, charged molecules migrate to the anode/cathode based on the charge of the molecule. At the start of IEF run, the current is high due to the movement of charged molecules. As the proteins start to focus at their respective pIs, the current decreases slowly. Once the proteins have reached their pI, the resulting current is very low (usually µA) as there is minimal movement of ions. At that point, a high final voltage is applied to focus the proteins into sharp, narrow zones. Increasing the voltage slowly allows removal of any charged molecules in the protein sample from the strips and prevents the IPG strips from being exposed to very high currents that may damage the protein sample or IEF apparatus.
- Running at Room Temp: The optimal temperature for IEF using our system is room temperature (not lower). There is a lot of heat dissipation in our system due to the water in the outer chamber. Also, the cassette is designed for heat dissipation. The plastic covering the cassettes dissipates heat well, so the unit generally does not need specific temperature control. The temperature does not change more than 1 degree during the run.
- Using a Voltage higher than 2000V at the final step: Using the ZOOM® system, it is not recommended to use a voltage higher than 2000V. The ZOOM® IPG Runner™ System is rated to 3500 VDC and 3.5 Watts, but for performing IEF, the results were optimal at maximum of 2000V and 0.1 W per strip (~50uA per strip).
- Due to the electrical efficiency of the electrophoresis core, the voltage drop over the strip is closer to the readout on the power supply.
- IEF Marker: The Serva-IEF marker (cat# 39212-02) is not recommended for the ZOOM® IPGRunner™ system. It is a marker used mainly for the precast Novex IEF gels (e.g. cat# EC6644A).

Cassettes

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- Running different strips in the same cassette: pH 3-10 strips can be run along with pH 4-7 in the same cassette since the run times will be the same for both IPG strips. When running with pH 6-10 strips the issue is that the pH 6-10 strips may need to focus longer (up to an extra 30 min) than the recommended conditions depending on the type of sample. Simply run all strips for the longer time. Crude protein mixtures or samples containing high salt concentrations (>10 mM) may require longer run times or more total volt hours for optimal resolution.
- Placement of strips in the cassette: It will not matter where the strips are placed if there are less than 6 in a run, i.e. any of the available channels can be used. Running only one strip at a time is not recommended-run 2 at the very least, and it is not recommended due the inability to maintain low current with most power supplies. It is also a waste of a cassette.
- The ZOOM® IPGRunner™ Cassettes are disposable: After use, discard the cassette. Do not re-use the ZOOM® IPGRunner™ Cassettes.

Power Supply Considerations

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- Many power supplies automatically shut off when the current drops below 1 mA. A power supply capable of overriding the low current shut-off feature is needed. Contact the manufacturer for information about your power supply.
 - Invitrogen's ZOOM® Dual Power Supply makes this very easy. Before pressing "Start" on the final Running Screen, simply press the button next to the "No Load Enable" box on the display (should be button F2). This will change the setting to "No Load Disable", and you can start your run without fear of low current shutoff.
- The electrical leads of the ZOOM® IPGRunner™ Lid are recessed and may not fit into some power supply units. Contact Technical Service for an adaptor, which enables the recessed leads of the ZOOM® IPGRunner™ Lid to be connected into your power supply.
- Using the PowerEase® 500: If using the PowerEase® 500 with the ZOOM® IPGRunner™, run for 3-4 hours at 500V. The PowerEase®500 recommendations are not as strict as when using a high voltage power supply in terms of watt limits and current limits. It is necessary to have a stricter limit on the watts and current for the ramping from 500-2000V. Since the PowerEase®500 only goes to 500 V, it is not critical to set as strict parameters.
- If using the PowerEase® 500, do not use the pre-programmed IEF protocol. A custom program can be created.
- There should not be any bubbles appearing when the system is run (In contrast, one would see lots of bubbles in a regular protein gel apparatus). This is because the system operates at close to zero current but more likely because the wick covers the electrode so the bubbles are not visible. This is also why a power supply that can turn off the load check is used. In regular run mode, most power supplies (including the PowerEase®500) will shut down because it will seem that there is not enough current flowing. By turning this load check function off (appears in upper right corner of PowerEase®500 display), the machine will no longer shut down if the current is too low.
- Blue dye movement: The blue dye should all migrate to the bottom of the strip during the first 20 minutes or so of the run, showing there is current flowing. If the blue dye doesn't migrate to the bottom, it may indicate protein precipitation during the run. A different solubilization buffer can be used the next time. Running the 2nd dimension can be tried in this case in an attempt to gather at least some data.

Visualization of the pH gradients

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- For both the pH 4-7 and pH 6-10 ZOOM® IPG™ strips, the pH gradient is considered linear because when the pH is plotted as a function of the distance the protein migrated through the strip, it is a linear graph. Our current pH 3-10NL ZOOM® IPG™ strip considered non-linear because it is designed to maximize separation of proteins around neutral pH where more proteins would tend to be from a cell lysate. The 3-10L strip has a linear gradient and should be used for broad range pI assignment.
- For the pH 9-12 strips the following proteins can be run for calibration purposes:

Protein	pI	Rf (+/- 0.06)
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ribonuclease A	9.69	0.231
lysozyme	10.73	0.577
histone 3	11.53	0.842

Burning of strips

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- Setting a current limit helps in cases where some strips contain sample with different conductivity (salt or other conductive ions). It is not unusual to see some strips burn and others not because there is no way of controlling the amount of current flow through individual strips. This is the case for all IEF and electrophoresis systems currently used. Current will flow unevenly if the conductivity of various samples is different or if the resistance in a gel has changed. That's why setting a current or power limit can help. Chances of high current are lowered by using lower voltage.
- Also, the conductivity over the length of the IPG™ strips may not be uniform causing potential "hot spots" along the strip due to the buffering components in the gradient. Ampholytes are thought to aid in creating a uniform conductivity over the length of the strip and should be used.
- Salts: With salt in the sample it takes the IPG™ Systems (any instrument) a while to clear it out of the sample. So during the initial stages of the focusing run (200V) if the current was high some of the salts can be cleared to the electrodes. During the next stages of the focusing run, when voltage is increased, if all of the salts have not already cleared to the electrodes then the current will rise and can cause the strips to burn. Evidence of the burning can be first noticed by a small brown circle developing on the wick where it contacts the IPG™ gel. If this occurs, then the run will not be successful. Burning can occur in other places along the strip (it can be in the middle). This is seen often in strips that contain too high concentration of PBS.
 - The initial low voltage step of the focusing run can be extended to allow more salts to clear to the electrodes before increasing the voltage. Instead of 20 minutes at 200V, one hour at 200V can be tried.
 - Salts stuck in the electrodes may still be a problem. Therefore to get rid of the salts stuck in the wick – remove the wick. After the long initial 200V step, stop the run, remove the cassette, take of the wicks and replace the wicks with fresh wicks, wet with water as before and restart the focusing run at 200V for 20 minutes and proceed from there. Caution: when the IPGRunner™ is dismantled to remove the cassette and the wicks it is unavoidable that water will get onto the inner core. This water must be dried off before continuing. Everything in the inner portion of the IPGRunner™ other than the cassette must be dry.
 - Another possible source of high current is conductivity from the Urea. This can be significant. Old bottles of urea should not be used. Even new Urea may contain significant conductivity. Deionizing Urea solutions with AG501-X8 (D) resin, 20-50mesh, Bio-Rad cat no.142-6425 is recommended.
 - The power supply should be set so that the current is limited to 1mA.

Transfer ZOOM IPG strips

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I've seen an article describing transferring from a ZOOM strip to a membrane, and I believe it was done by passive diffusion. I haven't tried it or any other means of transferring from the strip to a membrane. I suspect it is the most straight-forward reasonable approach since one can't practically electrotransfer through the strip backing plastic nor can one easily remove the gel from the backing without destroying it. (Gavin Meredith, 11-28-06)

Here's a link to a reference, the abstract suggests that diffusion blotting is the way to go.

A somewhat detailed protocol on how to transfer immobilized IEF slab gels (not strips though) can be found in:

Harry Towbin, Özcan Özbey, and Otto Zingel. (2001), "An immunoblotting method for high-resolution isoelectric focusing of protein isoforms on immobilized pH gradients", *Electrophoresis*, 22, 1887–1893

"Blotting procedure and immunodetection

The gel was placed on a flat surface and covered with a sheet of PVDF-membrane which had been sequentially soaked in iso-propanol (for wetting), water, and a solution of 50mM Tris-HCl, pH 7.5, 4 M guanidinium chloride, 1mg/mL DTT. The membrane was covered with four layers of filter paper sheets (“3MM Chr”, soaked in the same 4 M guanidinium chloride buffer) and a plastic foil. In order to ensure good contact, the sandwich was compressed by a heavy weight (about 3 kg for a gel of 11x14 cm). After transfer (overnight) the membrane was washed with water.”

2nd Dimension Analysis

Storing the IPG Strips after the run

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After running to IPG™ Strips, the plastic film cover can be removed from the cassette and store the strips in the cassette at –80C in a Ziploc bag. It is not good to allow the other strips to thaw and then refreeze because it may cause diffusion of the bands. The strips can be removed frozen. It is also possible to put the individual strips in 15ml conical tubes and freeze them at –80C. Add the equilibration buffer directly to the tube containing the strip when ready for second dimension.

Storing the Strips after euilibration with 1X LDS buffer Not sprecifically tested. It might be ok, particularly if stored frozen (-20 or -80 C), but there may be problems due to LDS precipitation/failure to redissolve upon thawing.LDS may be problematic coming out of the <20 C.

Staining the IPG™ Strips

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- A protocol for staining the IPG Strips after the 1st dimension IEF can be found in the current version of the manual, which is available online.

ALTERNATE PRODUCTS AND COMPATIBILITY

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Both Amersham’s and BioRad’s 7cm IPG strips can be used – they are compatible with the ZOOM® IPGRunner Cassette but are not optimized for use with the ZOOM system.

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Zuo, Xun, et al. (2001). Towards global analysis of mammalian proteomes using sample prefractionation prior to narrow pH range two-dimensional gels and using one-dimensional gels for insoluble and large proteins. *Electrophoresis* 22, 1603-1615.

Zuo, Xun and Speicher, D.W. (2000). A Method for global analysis of complex proteomes using sample prefractionation by solution isoelectrofocusing prior to two-dimensional electrophoresis. *Analytical Biochemistry* 284, 266-278.

PRODUCT NAME AND CATALOG NUMBERS

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Name	Catalog Number
ZOOM® IPGRunner™ Mini-Cell	ZM0001
ZOOM® IPGRunner™ Combo Kit	ZM0002
ZOOM® IPGRunner™ Retrofit Kit	ZM0004

COMPONENTS

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ZOOM® IPGRunner™ Combo Kit

Name	Size	Part Number	Catalog Number
ZOOM® IPGRunner™ Mini-Cell	1	ZM0001	ZM0001
ZOOM® Strip pH 3-10NL	12/package	ZM0011	ZM0011
ZOOM® IPGRunner™ Cassettes (includes electrode wicks and sealing tape)	10	ZM0003	ZM0003

ZOOM® IPGRunner™ Retrofit Kit

Name	Size	Part Number
ZOOM® IPGRunner™ Core	1	449181 (for both)
ZOOM® IPGRunner™ Lid	1	449181 (for both)

Caution: The IPGRunner™ system is designed to be used only with the gel lid and buffer electrophoresis core provided. Regular XCell SureLock™ lids contain lower graded wires, which cannot handle the higher voltages that this system utilizes.

Components needed for converting IPGRunner™ Mini-cell to an XCell SureLock™:

XCell SureLock™ Lid EI0010

XCell™ Buffer Core EI9014

ASSOCIATED PRODUCTS

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Cassettes and Strips

Name	Size	Catalog Number
Cassettes	10 Cassettes, 22	ZM0003

	Sealing tapes, 22 Wicks	
ZOOM® Equilibration Tray	10/package	ZM0007
ZOOM® Strip pH 3-10NL*	12/ package	ZM0011
ZOOM® Strip pH 4-7	12/ package	ZM0012
ZOOM® Strip pH 6-10	12/ package	ZM0013
ZOOM® Strip pH 4.5-5.5	12/ package	ZM0014
ZOOM® Strip pH 5.3-6.3	12/ package	ZM0015
ZOOM® Strip pH 6.1-7.1	12/ package	ZM0016
ZOOM® Strip pH 9-12	12/ package	ZM0017
ZOOM® Strip pH 3-10L	12/ package	ZM0018

ZOOM® Strips: immobilized pH gradient gels cast on a plastic backing. The gel on each strip is 7cm long and 3.3 mm wide. *The 3-10NL contains a non-linear (NL) pH gradient. The pH gradient is expanded from 4-7 forming a sigmoidal pH gradient. This allows resolution of samples containing many proteins with pI in the range of 4-7.

ZOOM® IPGRunner™ Cassettes: used to rehydrate and perform isoelectric focusing of up to six 7-cm ZOOM® strips. Electrode Wicks and Tape come with box of cassettes.

Buffers and Carrier Ampholytes

Name	Size	Catalog Number
ZOOM® Carrier Ampholytes 3-10	10ml	ZM0021
ZOOM® Carrier Ampholytes 4-7	10ml	ZM0022
ZOOM® Carrier Ampholytes 6-9	10ml	ZM0023
ZOOM® Carrier Ampholytes 9-11	10ml	ZM0024
ZOOM® Carrier Ampholytes 4-6	10ml	ZM0025
NuPAGE® LDS Sample Buffer (4X)	250ml	NP0008
NuPAGE® Reducing Agent (10X)	10ml	NP0009
ZOOM® Urea	1kg	ZU10001
ZOOM® Thiourea	0.5kg	ZT10002
ZOOM® CHAPS	5g	ZC10003

pH 9-11 ampholytes will normally precipitate when refrigerated at 4 degrees. To dissolve precipitate, warm up solution in water bath. Higher amount of ampholytes can be used in the sample prep, up to 2%. The conductivity will change and therefore may need to have it run longer.

Because this system uses much lower voltages, higher ampholyte concentrations up to 2.0%v/v can be used if needed. In general, 0.5%v/v ampholyte concentration is recommend. If higher levels of ampholytes are used, the conductivity will change and longer run times may be necessary.

NuPAGE® LDS Sample Buffer and Reducing Agent: These are packaged in larger sizes to accommodate the extra volume needed to run the IPG system. NP0009 is 10 ml size of NuPAGE® Reducing Agent (10X) whereas NP0004 would only be 250µl. NP0008 is 250 ml size of NuPAGE® LDS sample buffer (4X) whereas NP0007 would only be 10 ml.

ZOOM® Urea: This product is used in making up rehydration buffer for the IPG strips. The urea should be deionized before use, even if it's a new bottle. This can be done using the Mixed Bed Resin.

ZOOM 2D Protein Solubilizers

Name	Size	Catalog Number
ZOOM® 2D Protein Solubilizer	4x 5 ml	ZS10001
ZOOM® 2D Protein Solubilizer	4x 5 ml	ZS10002
ZOOM® 2D Protein Solubilizer Kit	2x 5 ml (one of each Solubilizer)	ZS10003

ZOOM® Equilibration Tray: disposable trays used to perform equilibration of ZOOM Strips after first dimension IEF and prior to 2nd dimension SDS-PAGE

Name	Quantity	Catalog Number
ZOOM® Equilibration Tray	10 trays	ZM0007
ZOOM® IPGRunner™ Cassettes and Trays	10 Equilibration trays and 10 IPG Runner Cassettes	ZM0008

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