EZ-Run Protein Gel Solution

EZ-Run Protein Standards

EZ-Run Gel Staining Solution

Traditional SDS-PAGE Reagents

Protein Electrophoresis
Sodium dodecyl sulfate – polyacrylamide gel electrophoresis (SDS-PAGE) is the most direct method for assessing in a fast and reproducible manner, the relative molecular weight (Mr) of denatured polypeptide chains and the purity of a protein preparation. In SDS-PAGE, the sample to be applied to the gel is first treated with the anionic detergent SDS which denatures the proteins in the sample and binds tightly to the protein molecules. The SDS molecules confer a relatively uniform negative charge to the polypeptide in proportion to its length. When an electric current is applied across the gel, all proteins will migrate through the gel matrix toward the anode. In this way, SDS-PAGE separates proteins according to size because the SDS-coated proteins have a uniform charge:mass ratio. Proteins with less mass travel more quickly through the gel than those with larger mass because of the sieving effect of the gel matrix.

The SDS-PAGE technique has been refined over the years (Table 1). For example, specialized gel systems such as porosity gradient gels and Tricine-SDS-PAGE were developed to expand the M, analysis range and to improve the resolution of small proteins, respectively. Many would agree that improvements to the technique have reached a plateau and standard protocols have been adopted in most laboratories around the world.

However, Fisher BioReagents EZ-Run Protein Gel Solution is used as a simple, continuous gel system for SDS-PAGE that provides the resolution of a gradient gel with less preparative work than the Laemmli discontinuous gel system (Table 1). It is a premixed solution of acrylamide, bis-acrylamide, buffer, and SDS that eliminates the need of a stacking gel. The gradient-like properties of the EZ-Run gel matrix slow the migration of proteins through the electrophoretic field, enabling the resolution of small peptides and large proteins on the same gel.
EZ-Run™ Protein Gel Solution

- Ready to use
- Superior resolution
- Wide separation range on same mini-gel
- No stacking gel required
- Proprietary gel chemistry
- Stable for two years at room temperature
- Compatible with all conventional staining methods
- Suitable for post-electrophoresis applications such as Western blot transfer and MALDI analysis

EZ-Run Protein Gel Solution is a unique ready-to-pour premixed solution of acrylamide, buffer, and SDS that enables superior resolution of protein bands by SDS-PAGE. The liquid blend requires only the addition of ammonium persulfate and TEMED to prepare a quality gel matrix for SDS-PAGE. The proprietary gel chemistry imparts gradient-like properties to the polymerized gel matrix, enabling the separation of small peptides and high molecular weight proteins on the same mini-gel.

EZ-Run gel matrix is used as a simple, continuous gel system and does not require a stacking gel, which saves labor and time in casting the gel. EZ-Run gel separates small proteins like Tricine-SDS-PAGE and has a wide separation range similar to gradient gels (3 to 200kDa on the same mini-gel).

EZ-Run gels are compatible with all standard electrophoresis equipment as well as common staining methods such as Coomassie blue, silver stain, and fluorescent dyes. Post-electrophoresis techniques such as Western blot transfer, protein sequencing, and MALDI analysis can also be applied to proteins separated on EZ-Run gels.

Resolution equal to or better than gradient precast gels!

EZ-Run Protein Gel Solution provides superior separation of closely spaced, small proteins (<20kDa) compared to a commercial gradient precast gel.

Separate wide range of protein sizes (3–200kDa) on the same minigel

The EZ-Run continuous gel system enables separation of small peptides and high MW proteins on the same mini-gel. For example, a commercial 12% precast discontinuous gel is not capable of resolving the 10 and 15kDa proteins compared to the 12% EZ-Run gel.

EZ-Run gel matrix compatible with common gel staining methods such as fluorescent dyes

Serial dilution of BSA (66kDa) and Ovalbumin (45kDa) are loaded in lanes 2 to 5 of an EZ-Run gel and detected with SYPRO® Ruby fluorescent protein stain. Protein standard in lane 1 is BP3602 EZ-Run Rec Protein Ladder.

EZ-Run Protein Gel Solution Separation Range:

<table>
<thead>
<tr>
<th>EZ-Run Gel %</th>
<th>MW Separation Range (kDa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10–220</td>
</tr>
<tr>
<td>12.5</td>
<td>3–200</td>
</tr>
<tr>
<td>15</td>
<td>2–100</td>
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EZ-Run Protein Gel Solution Ordering Information:

<table>
<thead>
<tr>
<th>Description</th>
<th>Size</th>
<th>Catalog No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% EZ-Run Protein Gel Solution with buffer</td>
<td>100mL</td>
<td>BP7710-100</td>
</tr>
<tr>
<td>10% EZ-Run Protein Gel Solution with buffer</td>
<td>500mL</td>
<td>BP7710-500</td>
</tr>
<tr>
<td>12.5% EZ-Run Protein Gel Solution with buffer</td>
<td>100mL</td>
<td>BP7712-100</td>
</tr>
<tr>
<td>12.5% EZ-Run Protein Gel Solution with buffer</td>
<td>500mL</td>
<td>BP7712-500</td>
</tr>
<tr>
<td>15% EZ-Run Protein Gel Solution with buffer</td>
<td>100mL</td>
<td>BP7715-100</td>
</tr>
<tr>
<td>15% EZ-Run Protein Gel Solution with buffer</td>
<td>500mL</td>
<td>BP7715-500</td>
</tr>
<tr>
<td>20x Running Buffer for EZ-Run Protein Gel Solution</td>
<td>500mL</td>
<td>BP7700-500</td>
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**EZ-Run Protein Standards**

Designed to assist in characterizing unknown proteins in polyacrylamide gels and immunoblots

- Highly purified markers and ladders provide compact and clear bands
- Prestained standards are indispensable in monitoring protein separation and transfer efficiency
- Reference bands allow quick gel progress assessment
- Unstained standards are most suitable for precise sizing of proteins
- All standards are supplied in loading buffer and are ready to use

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### Ordering Information

<table>
<thead>
<tr>
<th>Description</th>
<th>MW Range</th>
<th>No. of Bands</th>
<th>Reference Band</th>
<th>Source</th>
<th>Quantity</th>
<th>Catalog No.</th>
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</thead>
<tbody>
<tr>
<td>Unstained Protein Standards</td>
<td>14.4-116.0kDa</td>
<td>7</td>
<td>----</td>
<td>Native proteins</td>
<td>500µL</td>
<td>BP3600-500</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 x 500µL</td>
<td>BP3600-1</td>
</tr>
<tr>
<td></td>
<td>10.0-200.0kDa</td>
<td>14</td>
<td>50kDa</td>
<td>Recombinant proteins</td>
<td>500µL</td>
<td>BP3602-500</td>
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</tr>
<tr>
<td>Prestained Protein Standards</td>
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<td>6</td>
<td>----</td>
<td>Native proteins</td>
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<td></td>
<td>11.0-170.0kDa</td>
<td>10</td>
<td>72kDa</td>
<td>Recombinant proteins</td>
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<td></td>
<td>2 x 500µL</td>
<td>BP3603-1</td>
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</tbody>
</table>
**EZ-Run Protein Gel Staining Solution**

**Highly sensitive, nontoxic**
- Detects as little as 5ng protein
- Produces minimal or no background
- Permits rapid staining/destaining (30 minute staining and one hour destaining in water is sufficient for most applications)
- Contains Coomassie Brilliant Blue G-250
- Does not contain methanol or acetic acid
- Ready to use

One liter of EZ-Run Protein Gel Staining Solution is sufficient for 50 minigels.

**Additional Protein Electrophoresis Reagents from Fisher BioReagents**

### Buffers for Protein Electrophoresis

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Catalog No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein Gel-loading dye for SDS-PAGE</td>
<td>1mL</td>
<td>BP637-1</td>
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<tr>
<td>2x</td>
<td>5mL</td>
<td>BP637-5</td>
</tr>
<tr>
<td>TG Tris-Glycine</td>
<td>1L</td>
<td>BP1306-1</td>
</tr>
<tr>
<td>10X</td>
<td>4L</td>
<td>BP1306-4</td>
</tr>
<tr>
<td>10X</td>
<td>1L*</td>
<td>BP1307-1</td>
</tr>
<tr>
<td>TGS Tris-Glycine-SDS</td>
<td>1L</td>
<td>BP1341-1</td>
</tr>
<tr>
<td>10X</td>
<td>4L</td>
<td>BP1341-4</td>
</tr>
<tr>
<td>5X</td>
<td>1L*</td>
<td>BP1398-92</td>
</tr>
<tr>
<td>10X</td>
<td>1L*</td>
<td>BP1342-1</td>
</tr>
<tr>
<td>SDS Sodium Dodecyl Sulfate</td>
<td>200mL</td>
<td>BP2436-200</td>
</tr>
<tr>
<td>10%</td>
<td>1L</td>
<td>BP2436-1</td>
</tr>
<tr>
<td>20%</td>
<td>200mL</td>
<td>BP1311-200</td>
</tr>
<tr>
<td>20%</td>
<td>1L</td>
<td>BP1311-1</td>
</tr>
<tr>
<td>PBS Phosphate Buffered Saline</td>
<td>500mL</td>
<td>BP399-500</td>
</tr>
<tr>
<td>10X</td>
<td>1L</td>
<td>BP399-1</td>
</tr>
<tr>
<td>20X</td>
<td>4L</td>
<td>BP399-4</td>
</tr>
<tr>
<td>10X</td>
<td>20L</td>
<td>BP399-20</td>
</tr>
<tr>
<td>TBS Tris-Buffered Saline</td>
<td>100mL</td>
<td>BP2471-100</td>
</tr>
<tr>
<td>10X(7.4)</td>
<td>500mL</td>
<td>BP2471-500</td>
</tr>
<tr>
<td>10X(7.4)</td>
<td>1L</td>
<td>BP2471-1</td>
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*Pre-weighed powder to make 1L. Dissolve in water.

### Detergents/Denaturing Agents

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<th>Quantity</th>
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<tbody>
<tr>
<td>BRU 35</td>
<td>500g</td>
<td>BP346-500</td>
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<tr>
<td>CHAPS</td>
<td>1g</td>
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<tr>
<td>5g</td>
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<td>BP571-5</td>
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<tr>
<td>CHAPSO</td>
<td>500mg</td>
<td>BP576-500</td>
</tr>
<tr>
<td>SDS</td>
<td>100g</td>
<td>BP166-100</td>
</tr>
<tr>
<td>500g</td>
<td></td>
<td>BP166-500</td>
</tr>
<tr>
<td>5kg</td>
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<td>BP166-5</td>
</tr>
<tr>
<td>SDS 10% SOLUTION</td>
<td>500mL</td>
<td>BP2436-200</td>
</tr>
<tr>
<td>1L</td>
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<tr>
<td>SDS 20% SOLUTION</td>
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<td>BP1311-200</td>
</tr>
<tr>
<td>1L</td>
<td></td>
<td>BP1311-1</td>
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<tr>
<td>TRITON X-100</td>
<td>100mL</td>
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<tr>
<td>TWEEN 20</td>
<td>100mL</td>
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<td>TWEEN 80</td>
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<tr>
<td>N-OCTL-B-D-GLUCPYRANOSIDE</td>
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<td>1g</td>
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<tr>
<td>5g</td>
<td></td>
<td>BP585-5</td>
</tr>
<tr>
<td>25g</td>
<td></td>
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</table>
**Preparation of Polyacrylamide Stacking and Separating Gels (SDS-PAGE)**

**Separating Gel (Total Volume, 15mL)**

<table>
<thead>
<tr>
<th>Final % Acrylamide in Gel</th>
<th>Stock Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td>30% Acrylamide/0.8% Bis-Acrylamide</td>
<td>2.50mL</td>
</tr>
<tr>
<td>4X Tris•HCl, pH 8.8</td>
<td>3.75</td>
</tr>
<tr>
<td>H₂O₄</td>
<td>8.60</td>
</tr>
<tr>
<td>10% SDS</td>
<td>0.15</td>
</tr>
<tr>
<td>10% Ammonium Persulfate&lt;sup&gt;3&lt;/sup&gt;</td>
<td>0.05</td>
</tr>
<tr>
<td>TEMED</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**4% Stacking Gel (Total Volume, 5mL)**

<table>
<thead>
<tr>
<th>Stock Solution</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>30% Acrylamide/0.8% Bis-Acrylamide</td>
<td>0.65mL</td>
</tr>
<tr>
<td>4X Tris•HCl, pH 6.8</td>
<td>1.25mL</td>
</tr>
<tr>
<td>H₂O₄</td>
<td>3.00mL</td>
</tr>
<tr>
<td>10% SDS</td>
<td>50µL</td>
</tr>
<tr>
<td>10% Ammonium Persulfate&lt;sup&gt;3&lt;/sup&gt;</td>
<td>25µL</td>
</tr>
<tr>
<td>TEMED</td>
<td>5µL</td>
</tr>
</tbody>
</table>

### Procedure for Gel Preparation

In a 25mL sidearm flask, mix the given volumes of Acrylamide/Bis-Acrylamide solution, Tris•HCl buffer, and H₂O₄. Degas under vacuum 10 to 15 minutes. Add the SDS solution, Ammonium Persulfate solution, and TEMED. Swirl gently to mix. Use immediately.

<sup>1</sup> These volumes are adequate for a gel of dimensions 0.75cm x 14cm x 14cm. The recipes are based on the SDS (denaturing)-continuous buffer system of Laemmli (1970).

<sup>2</sup> The % acrylamide selected for the separating gel will depend on the molecular sizes of the proteins being separated.

<sup>3</sup> Recipes for the stock solutions appear earlier in this section.

<sup>4</sup> All reagents and solutions used in this protocol must be prepared with distilled deionized water.

<sup>5</sup> Store at 4°C (maximum 5 days).