

Electrophoresis + Blotting + Imaging



V3 Western Workflow™
Visualize. Verify. Validate.

BIO-RAD

Why choose the **V3** Western Workflow™ from Bio-Rad?



Separate Proteins

Visualize Separation

Transfer Proteins



Speed

Rapid, high-quality separation of proteins in as little as 15 minutes.

Efficient protein transfer in as little as 3 minutes.



Confidence

Confirmation of protein separation and transfer without staining and destaining provides checkpoints throughout a western blot.



Quantitation

Quantitation and normalization made simple with stain-free technology.

3



Verify Transfer

4



Validate Western Blot

5



V3 Western Workflow

Separate Proteins

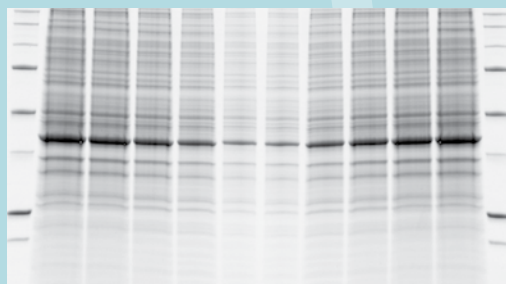
1

Criterion™ and Mini-PROTEAN® TGX Stain-Free™ precast gels — rapid separation of proteins in as little as 15 minutes.

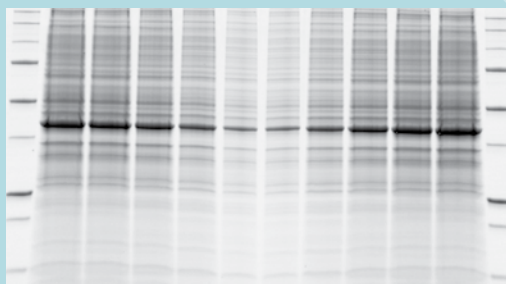
TGX chemistry offers superior protein separation with fast run times and a one year shelf life and uses standard Tris-glycine running buffers.

Stain-free technology is a sensitive, time-saving alternative to traditional Coomassie staining and is compatible with western blotting. No staining or destaining is required, offering a streamlined workflow.

Protein separation at 300 V



Protein separation at 200 V



Typical run times

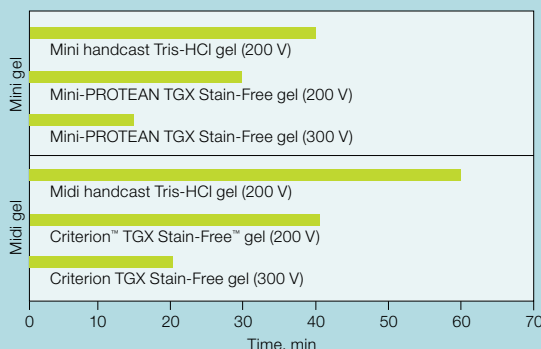
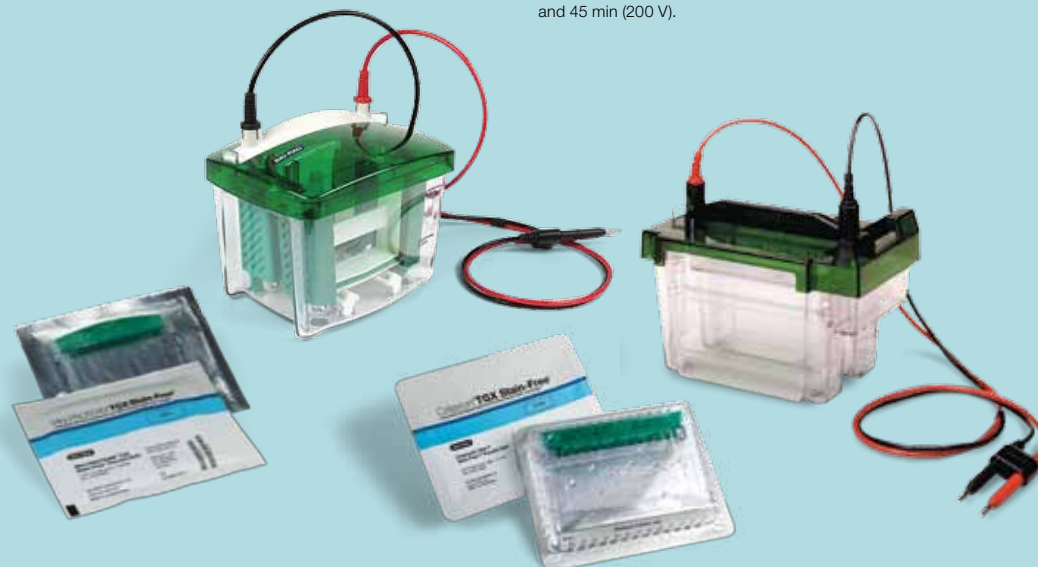


Fig. 1. Protein separation at 300 V or 200 V yields similar results. Criterion™ TGX Any kD Stain-Free™ precast gel run for 30 min (300 V) and 45 min (200 V).



Visualize. Verify. Validate.

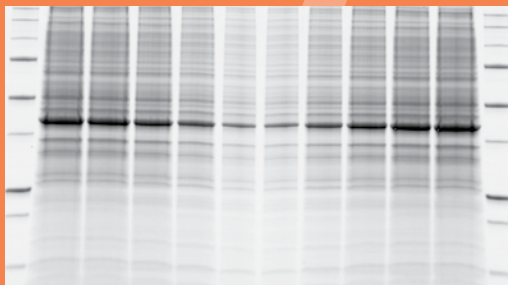
Visualize Separation

TGX Stain-Free™ precast gels and the ChemiDoc™ MP imager — immediate visualization of protein separation in 1 minute using 1 easy step.

Combined with stain-free precast gels, the ChemiDoc MP imaging system allows rapid visualization of electrophoretic separation prior to protein transfer.

2

Stain-free gel activation and imaging (1 min)



Coomassie-stained gel (overnight staining)



Fig. 2. Results using a stain-free gel are similar to those using a Coomassie-stained gel. Criterion TGX Any kD Stain-Free precast gel run at 200 V for 45 min. Stain-free technology is visualized on the ChemiDoc MP imaging system and compared with a gel stained overnight with Bio-Safe™ Coomassie stain.



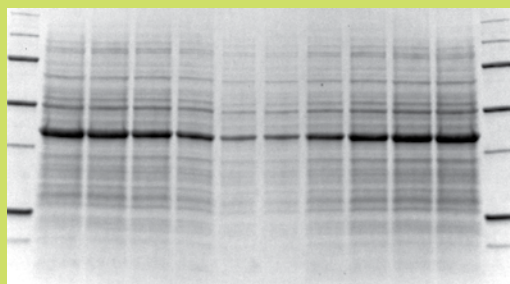
Transfer Proteins

3

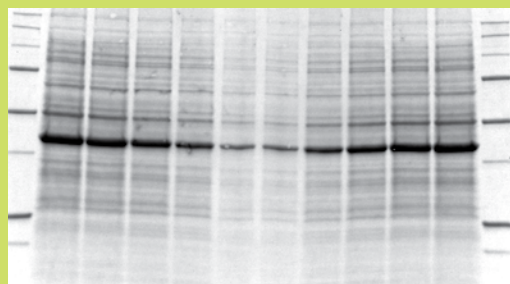
The Trans-Blot® Turbo™ system enables rapid and efficient transfer of proteins across a wide range of molecular weights.

The Trans-Blot Turbo system offers rapid protein transfer efficiency — achieved in as little as 3 minutes — compared to tank blotting.

Trans-Blot Turbo system (7 min)



Semi-dry blotting (30 min)



Tank blotting (60 min)

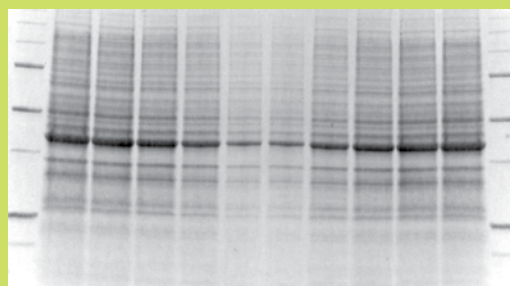


Fig. 3. Transfer efficiencies are comparable between the Trans-Blot Turbo system and tank blotting. Transfers were performed with the Trans-Blot Turbo system (7 min), the Trans-Blot SD semi-dry transfer cell (30 min), or by tank transfer (60 min).



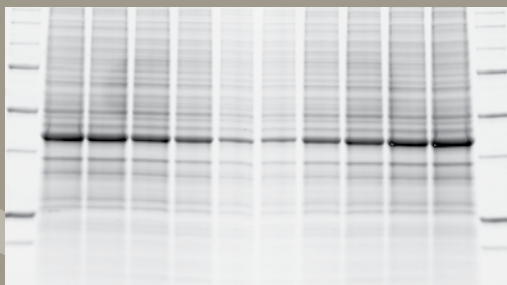
Verify Transfer

4

The ChemiDoc MP imager paired with stain-free technology enables instant verification of protein transfer in under 1 minute.

Once stain-free technology is activated during gel imaging, proteins can be visualized on the membrane, allowing instant verification of protein transfer. Ponceau S staining and destaining of the membrane are no longer required.

Stain-free technology



Ponceau S stain

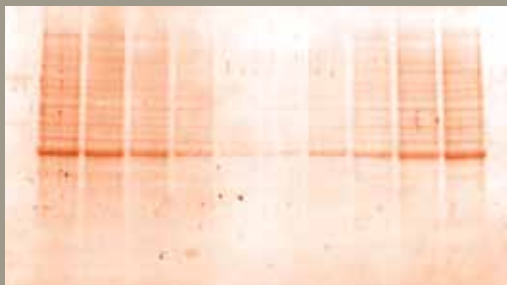


Fig. 4. Stain-free technology has a higher protein staining efficiency compared to Ponceau S stain. Visualization of the previously activated stain-free technology for total protein on a blot compared with a membrane stained with Ponceau S for 1–2 min.



Validate Western Blot

5

The ChemiDoc MP imager and Image Lab™ software enable validation of western blotting results using total protein normalization.

Stain-free technology gives results comparable to those obtained using housekeeping proteins when normalizing western blot data.

Total protein analysis using stain-free technology gives linear results

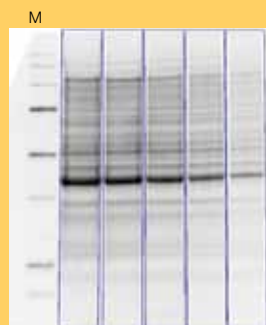


Fig. 5. Stain-free image of a serial dilution. A serially diluted LCL cell lysate was run on a Criterion TGX Any kD Stain-Free precast gel (50–10 µg of protein per lane was loaded). M, Precision Plus Protein™ Unstained standard.

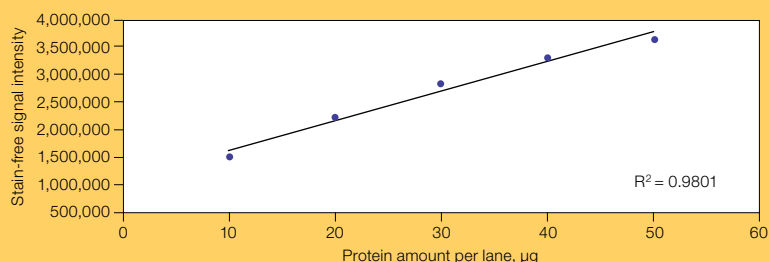


Fig. 6. Stain-free gels give linear results in a serial dilution. A standard curve showing the linearity of stain-free technology with protein loads in the range of 10 to 50 µg.

Stain-free total protein normalization gives similar results when compared to a housekeeping protein (GAPDH); stripping and reprobing can be avoided

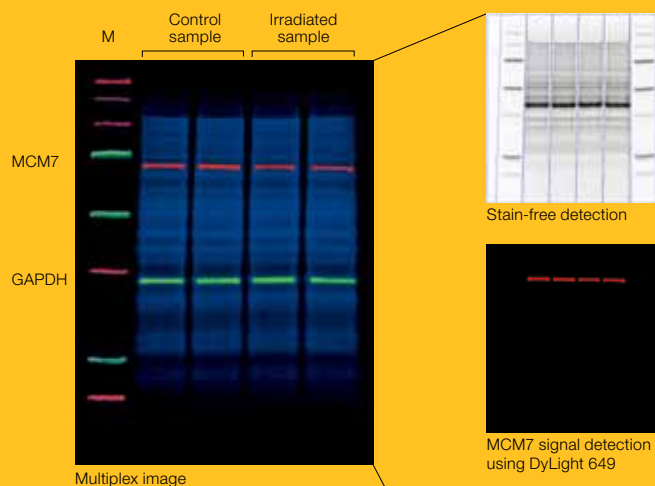


Fig. 7. Total protein quantitation by immunofluorescent detection of the target protein MCM7 (red) and the housekeeping protein GAPDH (green). LCL cell lysates (30 µg of total protein per lane) were separated on a Criterion TGX Any kD Stain-Free precast gel and blotted on an Immobilon-P™ low fluorescence (LF) PVDF membrane. Monoclonal antibodies against MCM7 (mouse) and GAPDH (rabbit) were diluted 1:1,000 and 1:2,500 respectively. Secondary antibodies from Rockland Immunochemicals Inc. were anti-rabbit DyLight 549 (1:20,000) and anti-mouse DyLight 649 (1:10,000). M, Precision Plus Protein Unstained standard.

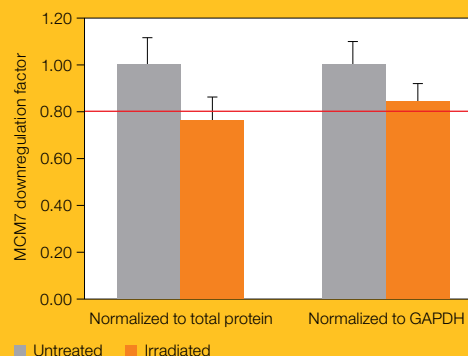








Fig. 8. Expression of MCM7 normalized for total protein analysis using stain-free technology and the housekeeping protein GAPDH. Normalization with stain-free technology and GAPDH give comparable results, consistent with 2-D PAGE (data not shown). Normalization factors were calculated from three independent western blotting experiments. Expression of MCM7 after irradiation is expected to be 0.8 (as indicated by the red line).






Ordering Information

Mini-PROTEAN TGX Stain-Free Precast Gels

Description	 8+1-Well 30 µl	 10-Well 30 µl	 10-Well 50 µl	 12-Well 20 µl	 15-Well 15 µl	 IPG/prep 450 µl
7.5%	456-8029	456-8023	456-8024	456-8025	456-8026	456-8021
10%	456-8039	456-8033	456-8034	456-8035	456-8036	456-8031
12%	456-8049	456-8043	456-8044	456-8045	456-8046	456-8041
Any kD™	456-8129	456-8123	456-8124	456-8125	456-8126	456-8121

All formats are available as both ten packs (catalog numbers listed) and two packs. To order as a two pack, add an "S" to the end of the catalog number for the corresponding ten pack.

Criterion TGX Stain-Free Precast Gels*

Description	 12+2*-Well 45 µl	 18-Well 30 µl	 26-Well 15 µl	 Prep+2**-Well 800 µl	 IPG+1**-Well 11 cm IPG Strip
7.5%	567-8023	567-8024	567-8025	—	—
10%	567-8033	567-8034	567-8035	—	—
12%	567-8043	567-8044	567-8045	—	—
18%	567-8073	567-8074	567-8075	567-8072	567-8071
4–15%	567-8083	567-8084	567-8085	567-8082	567-8081
4–20%	567-8093	567-8094	567-8095	567-8092	567-8091
8–16%	567-8103	567-8104	567-8105	567-8102	567-8101
10–20%	567-8113	567-8114	567-8115	567-8112	567-8111
Any kD	567-8123	567-8124	567-8125	567-8122	567-8121

* Criterion TGX Stain-Free gels are sold as a single gel.

** Reference well accommodates 15 µl of markers/standards.

Catalog # Description

V3 Western Workflow

170-8292 **V3 Western Workflow Complete System for Mini Gels**, ChemiDoc MP imager with LEDs and Image Lab software, 50 Mini-PROTEAN TGX Any kD Stain-Free 10-well precast gels with SDS-PAGE accessories, Mini-PROTEAN Tetra cell, Trans-Blot Turbo starter kit, 50 Trans-Blot Turbo PVDF transfer packs for mini gels

170-8293 **V3 Western Workflow Complete System for Midi Gels**, ChemiDoc MP imager with LEDs and Image Lab software, 50 Criterion TGX Stain-Free 4–20% 18-well precast gels with SDS-PAGE accessories, Criterion cell, Trans-Blot Turbo starter kit, 50 Trans-Blot Turbo PVDF transfer packs for midi gels

Protein Standards

161-0373 **Precision Plus Protein All Blue Standards**, 500 µl, 50 applications

161-0363 **Precision Plus Protein Unstained Standards**, 1 ml, 100 applications

161-0385 **Precision Plus Protein™ WesternC™ Pack**, 50 applications

Buffers

161-0732 **10x Tris/Glycine/SDS**, 1 L

161-0737 **Laemmli Sample Buffer**, 30 ml

Electrophoresis Cell

165-6001 **Criterion Cell**, includes electrophoresis buffer tank, lid with power cables, 3 sample loading guides (12+2-well, 18-well, 26-well), instructions

165-8004 **Mini-PROTEAN Tetra Cell for Mini Precast gels**, 4-gel vertical electrophoresis system, includes electrode assembly, companion running module, tank, lid with power cables, mini cell buffer dam

Catalog # Description

Power Supplies

164-5050 **PowerPac Basic Power Supply**, 100–120/220–240 V

164-5070 **PowerPac Universal Power Supply**, 100–120/220–240 V

Blotting System

170-4155 **Trans-Blot Turbo Starter System**, Trans-Blot Turbo transfer system and starter kit, includes Precision Plus Protein WesternC standards, variety transfer pack

170-4156 **Trans-Blot Turbo Mini PVDF Transfer Packs**, pkg of 10

170-4157 **Trans-Blot Turbo Transfer Pack, Midi, PVDF**, pkg of 10

170-4158 **Trans-Blot Turbo Mini Nitrocellulose Transfer Packs**, pkg of 10

170-4159 **Trans-Blot Turbo Transfer Pack, Midi, Nitrocellulose**, pkg of 10

Imaging Systems

170-8280 **ChemiDoc MP System**, gel imaging system, PC or Mac, includes darkroom, UV transilluminator, epi-white illumination, camera, power supply, cables, Image Lab software

170-8283 **Red LED Module Kit**

170-8284 **Green LED Module Kit**

170-8285 **Blue LED Module Kit**

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