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FlashGel® System: Results in 5 Minutes

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Figure 1. FlashGel® System

Figure 2.

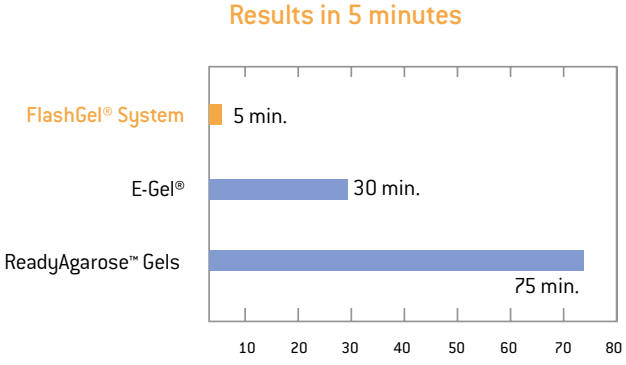


Figure 3. Run time comparisons

Introduction

The FlashGel® System is the fastest way to separate DNA and the only way to visualize DNA migration while it happens. This revolutionary new tool separates DNA in 2–7 minutes, and DNA migration may be monitored in real time, at the lab bench, without the use of harmful UV illumination. The system uses a highly sensitive proprietary stain and buffer formulation which reduces DNA load level requirements by a factor of five, saving researchers both time and money.

The FlashGel® System consists of enclosed, disposable, precast agarose gel cassettes and a combination gel runner and transilluminator unit (Figure 1). FlashGel® Cassettes contain precast, prestained agarose gels and buffer, eliminating the need for gel preparation, buffer addition, and gel staining. The FlashGel® Dock is an electrophoresis apparatus with a built-in transilluminator that provides both separation and detection. The system combines high speed separation with high sensitivity stain and visible light illumination, making it possible to watch the DNA migrate right on the benchtop under normal lab light conditions. The entire system requires less bench space than a small electrophoresis chamber (Figure 2), and requires five-fold less DNA per band than an ethidium bromide stained gel.

Five minute separation

The FlashGel® System is designed for fast, high voltage separation (2-7 minutes at 275 volts) of fragments 10 bp to 4 kb. DNA fragments separate in a fraction of the time required by competitor precast gel systems (Figure 3). Figure 4 illustrates marker separation at various run times using the recommended 275 volts. The system is flexible and conditions may be adjusted to provide the best separation for the fragments of interest.

The procedure is simple and the entire process can be completed in just 5 minutes:

1) Flood wells with water
2) Insert cassette into dock
3) Load samples
4) Plug in and turn on light and voltage
5) Watch until desired separation is achieved
6) Photograph using standard documentation systems

Real time visualization

The FlashGel® Dock utilizes visible light illumination, enabled by Dark Reader® Technology*. It is safe to view the cassette on the lighted dock without eye protection. The built-in illumination enables real time viewing of the fragments as they migrate through the gel. The run may be stopped once desired separation is achieved – in as little as 2 minutes depending upon fragments of interest. DNA bands separated on FlashGel® Cassettes are also detectable by UV light and may be photographed using standard gel documentation systems.

*Licensed from Clare Chemical Research, Inc.

Exquisitely sensitive detection

The FlashGel® System uses a proprietary stain that is 5-20 times more sensitive than ethidium bromide stain. Samples prepared at DNA concentrations one-fifth of the concentration typically required for ethidium bromide stained gels will clearly resolve on FlashGel® Cassettes. DNA levels of 5 ng per band or more are visible on the lighted FlashGel® Dock under most ambient light conditions. DNA levels as low as 0.1 ng per band can be detected on gel images and photos. DNA levels can be adjusted to provide best performance depending upon the image analysis system used (Figure 5).

Because the system is so sensitive, a load volume of 5 µl or less is recommended for best performance. Samples may be diluted with FlashGel® Loading Dye (for best results), or with water or other common buffers (e.g., TE buffer) before adding a loading dye. See the table in Figure 6 for examples of sample and marker dilutions in a FlashGel® Cassette compared to E-Gel® (Invitrogen). The E-Gel® required at least 4 times more sample than the FlashGel® Cassette. One-tenth the concentration of the FlashGel® DNA Marker and QuantLadder, and one-twentieth the concentration of the PCR products were required for good sensitivity of detection on FlashGel® Cassettes compared to E-Gel®.

Separation at various run times on the FlashGel® System

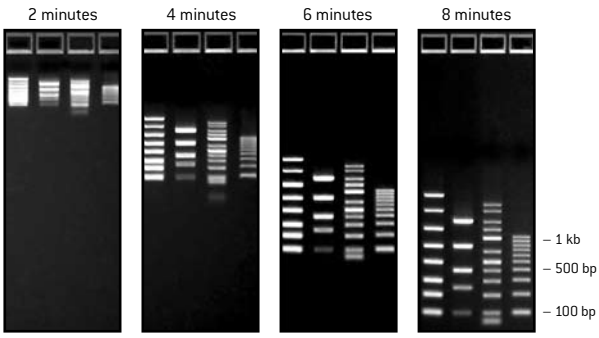


Figure 4. Markers run on a 1.2% FlashGel® Cassette, 12+1 well format, 275 V for times as shown. Sample lanes from left to right: FlashGel® DNA Marker (100 bp – 4 Kb), FlashGel® QuantLadder, Lonza 50-2500 bp Marker, Lonza 100 bp Ladder.

The high sensitivity of the FlashGel® System allows reduction of the amount of DNA and overall sample volume loaded on the gel, conserving precious samples and DNA markers. These benefits are achieved without the direct handling of hazardous staining solutions.

Superior resolution

The FlashGel® System clearly resolves fragments 10 bp to 4 kb in under five minutes, without compromising resolution. Band separation is clean and sharp, and sample lanes are straight and uniform. Figure 6 shows the resolution performance of theFlashGel® System compared to E-Gel® (Invitrogen). Voltage and run time may be adjusted on the FlashGel® System to optimize separation of the fragments of interest.

DNA concentrations detectable with the FlashGel® System

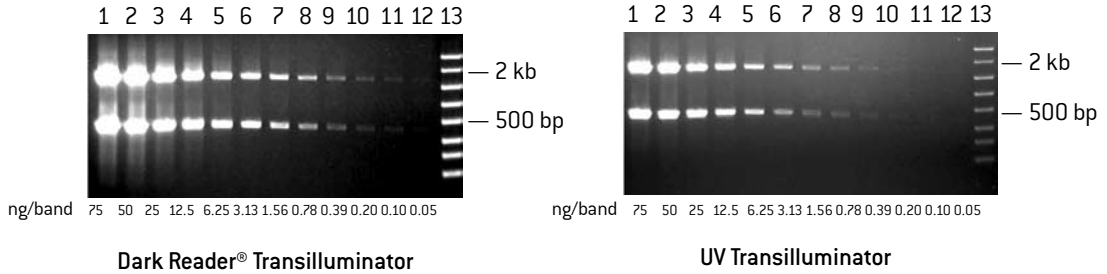
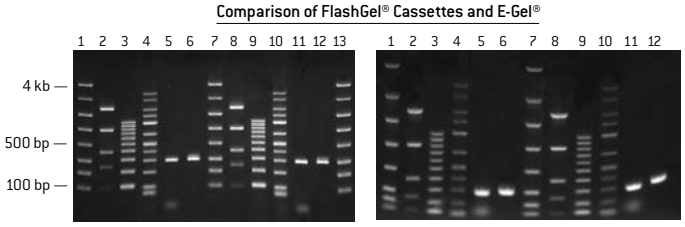


Figure 5. 1.2% FlashGel® Cassettes, 12+1 well format. 275 volts for 7 minutes. DNA concentrations are ng/band.
Lanes 1-12: Sample dilution series of 400 bp & 1,500 bp purified fragments (BioVentures) Lane 13: FlashGel® DNA Marker. Photographed on UV transilluminator or Dark Reader® Transilluminator. Dark Reader® Transilluminator: Gel illuminated on the Dark Reader® Transilluminator with orange filter in place. Photographed with CCD imager (EtBr filter in place) at 2 second exposure. UV transilluminator: Gel illuminated on UV transilluminator. Photographed with CCD imager (EtBr filter in place) at 2 second exposure.



1.2% FlashGel® Cassette, 12+1 well format. 275 V, 7 minute run on the FlashGel® Dock.

1.2% E-Gel®, 12 well format. 30 minute run on the E-Gel® PowerBase™ v.4. Pre-set voltage for E-Gel® PowerBase™ v.4

FlashGel® Loading Dye was added to all samples prior to loading.

Figure 6. Lanes 1&7: FlashGel® DNA Marker; Lanes 2&8: FlashGel® QuantLadder; Lanes3&9: Lonza 100 bp Ladder; Lanes 4&10: Lonza 50-2,500 bp Marker; Lanes 5&11: 285 bp β-Actin PCR; Lanes 6&12: 294 bp Ambion control PCR. Samples diluted with 1X FlashGel® Loading Dye prior to loading. Dilutions and load volumes optimized for each sample in each gel system.

Lane Nos.	Sample Type	Load volumes and dilutions	
		FlashGel® Cassette	E-Gel® Lanes
1 & 7	FlashGel® DNA Marker	5 µl 1:5 dilution	10 µl undiluted
Lanes 2 & 8	FlashGel® QuantLadder	5 µl 1:5 dilution	10 µl undiluted
Lanes 3 & 9	Lonza 100 bp Ladder	3 µl 1:15 dilution	12 µl 1:15 dilution
Lanes 4 & 10	Lonza 50-2500 bp Marker	3 µl 1:5 dilution	12 µl 1:5 dilution
Lanes 5 & 11	285 bp β-actin PCR	5 µl 1:50 dilution	2 µl undiluted PCR rxn
Lanes 6 & 12	294 bp control PCR (Ambion)	5 µl 1:50 dilution	2 µl undiluted PCR rxn
Lane 13	FlashGel® DNA marker	5 µl 1:5 dilution	

The ideal sample screening tool

The FlashGel® System is ideal for checking PCR or restriction fragments. Researchers no longer have to wait to confirm the quality of their samples. Now they can check samples quickly, without stopping to spend valuable time on gel preparation and then waiting 30 minutes or more for results. The FlashGel® System conserves precious DNA and markers and reduces the overall cost of reagents required for electrophoresis.

The FlashGel® System is the fastest, most sensitive, and most convenient way to separate DNA.

Product offering

The FlashGel® System is available for DNA and RNA. Components of the FlashGel® System may be purchased separately or as a Starter Kit. Components include: FlashGel® Dock, FlashGel® Cassettes, FlashGel® Marker and QuantLadder, and FlashGel® Loading Dye. The markers are in a convenient, ready-to-load format. The FlashGel® Markers and FlashGel® Loading Dye are optimized for use with the system and are recommended for best performance (Figures 4 and 6).

Specifications

Separation range: 1.2% DNA cassettes: 50 bp – 4,000 bp
2.2% DNA cassettes: 10 bp – 1 kb
Storage: Room temperature for 5 months from date of manufacture
Well volume: 5 µl per well
Gel size: 70 mm (L) x 84 mm (W) x 2 mm (H)
Cassette size: 115 mm (L) x 107 mm (W) x 17 mm (H)
Dock size: 134 mm (L) x 120 mm (W) x 54 mm (H)

Ordering Information

57023	FlashGel® DNA Cassettes	1.2% agarose, 12+1 well format 9/pk
57029	FlashGel® DNA Cassettes	1.2% agarose, 16+1 well format 9/pk
57031	FlashGel® DNA Cassettes	2.2% agarose, 12+1 well format 9/pk
57032	FlashGel® DNA Cassettes	2.2% agarose, 16+1 well format 9/pk
57027	FlashGel® RNA Cassettes	1.2% agarose, 12+1 well format 9/pk
57028	FlashGel® RNA Cassettes	1.2% agarose, 16+1 well format 9/pk
50462	FlashGel® Loading Dye (5X)	5 x 1 ml
50473	FlashGel® DNA Marker 100 bp — 4 kb	500 µl Ready-to-load: 100/200/300/ 500/800/1,250/2,000/4,000 bp bands
57033	FlashGel® DNA Marker 50 bp — 1.5 kb	500 µl Ready-to-load:50/100/150/200/ 300/ 500/800/1,500 bp bands
57034	FlashGel® DNA Marker 100 bp — 3 kb	500 µl Ready-to-load: 100/300/ 500/ 800/1,500/3000 bp bands
50577	FlashGel® RNA Marker 0.5 kb — 9 kb	50 µg (1 µg/ml)
50475	FlashGel® QuantLadder	250 µl Ready-to-load: 100 bp (3 ng)/ 250 bp (7.5 ng) / 400 bp (15 ng)/ 800 bp (21 ng) / 1,500 (30 ng)
57026	FlashGel® DNA System Starter Pack	Contains: Cassettes, Sample Buffer, DNA Marker, Dock
57025	FlashGel® Dock	

Visit **www.flashgel.com** to watch the FlashGel® System run.

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