

# GelRed™ and GelGreen™

Safe and sensitive nucleic acid gel stains

## The most safe and sensitive nucleic acid gel stains

GelRed™ and GelGreen™ are safe (cell membrane impermeable) nucleic acid gel stains designed to replace highly toxic ethidium bromide (EtBr) and other so-called safe gel stains. Ames tests have confirmed that GelRed™ and GelGreen™ are nonmutagenic at concentrations well above the concentrations used for gel staining. Furthermore, environmental safety tests showed that GelRed™ and GelGreen™ are non-toxic to aquatic life, permitting disposal down the drain or in regular trash.

For more information and references, download our white paper, Comparison of Nucleic Acid Gel Stains: Cell Permeability, Safety, and Sensitivity and the complete Safety Report of GelRed™ and GelGreen™ at [www.biotium.com](http://www.biotium.com).

### Dye Advantages

- Safer than EtBr and other so-called safe gel stain
- Easy disposal
- Superior sensitivity
- Extremely stable
- Simple to use
- Compatible with downstream applications (cloning, etc)



Figure 1. GelRed™ and GelGreen™ gel stains are safer because they cannot penetrate cell membranes to bind DNA in living cells. HeLa cells were incubated with 1X SYBR® Safe, GelGreen™ or GelRed™, respectively. Images were taken following incubation with dye for 30 min using FITC filter set for SYBR® Safe and GelGreen™, and Cy@3 filter set for GelRed™. SYBR® Safe rapidly entered cells and stained nuclei. GelRed™ and GelGreen™ were unable to cross cell membranes, demonstrated by the absence of fluorescence staining.

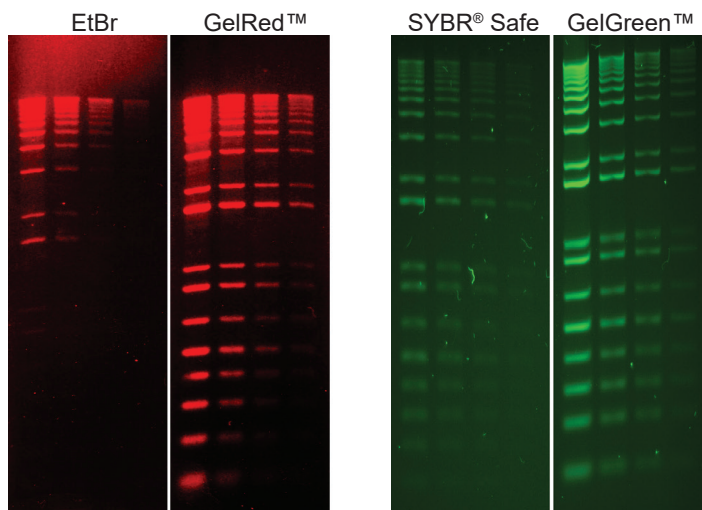


Figure 2. GelRed™ and GelGreen™ are more sensitive than EtBr and SYBR® Safe. Left: Comparison of GelRed™ and ethidium bromide (EtBr) in precast gel staining using 1% agarose gel in TBE buffer. Right: Comparison of GelGreen™ and SYBR® Safe in post gel staining using 1% agarose gel in TBE buffer.

### Ordering Information

Cat. #	Product Name
41003-T	GelRed™ Nucleic Acid Gel Stain; 10,000X in water, 0.1 mL
41003	GelRed™ Nucleic Acid Gel Stain; 10,000X in water, 0.5 mL
41003-1	GelRed™ Nucleic Acid Gel Stain; 10,000X in water, 10 mL
41002	GelRed™ Nucleic Acid Gel Stain; 10,000X in DMSO, 0.5 mL
41002-1	GelRed™ Nucleic Acid Gel Stain; 10,000X in DMSO, 10 mL
41001	GelRed™ Nucleic Acid Gel Stain; 3X in water, 4 L
41005-T	GelGreen™ Nucleic Acid Gel Stain; 10,000X in water, 0.1 mL
41005	GelGreen™ Nucleic Acid Gel Stain; 10,000X in water, 0.5 mL
41005-1	GelGreen™ Nucleic Acid Gel Stain; 10,000X in water, 10 mL
41004	GelGreen™ Nucleic Acid Gel Stain; 10,000X in DMSO, 0.5 mL

# PAGE GelRed™

# PAGE GelGreen™

## The safety and sensitivity of GelRed™ and GelGreen™ now for PAGE gels

A fundamental approach for making a gel stain safe is to minimize the chance for the dye to interact with genomic DNA in living cells. In the design of the original GelRed™ and GelGreen™ dyes, we achieved the dyes' membrane impermeability mainly by making the dyes physically large. While this produced exceptional gel staining sensitivity for agarose gels, the relatively large sizes of GelRed™ and GelGreen™ make the dyes difficult to penetrate into the more densely packed polyacrylamide gels, rendering the dyes less optimal for PAGE gel staining. In designing PAGE GelRed™ and PAGE GelGreen™ dyes, we used a novel approach to make the dyes membrane impermeable without making the dyes large. Importantly, the new design strategy still ensures that the PAGE dyes possess essential properties for gel staining, including good sensitivity, stability and compatibility with existing instruments and downstream sample analysis.

### Safer gel stains designed for use in polyacrylamide gels

- Formulated in water and impermeable to latex and nitrile gloves
- Non-toxic and non-mutagenic in AMES test
- Non-toxic to aquatic life, okay for drain disposal by EPA Title 22 hazardous waste test

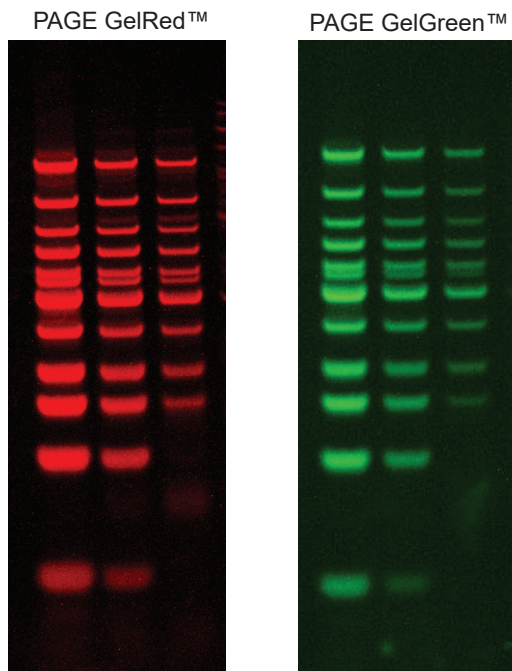


Figure 1. NEB low molecular weight ladder was separated on a 10% acrylamide TBE gel and stained with 1X PAGE GelRed™ (left) or 1X PAGE GelGreen™ (right) in water for 30 minutes.



Figure 2. PAGE GelRed™ and PAGE GelGreen™ gel stains are safer because they cannot penetrate cell membranes to bind DNA in living cells. HeLa cells were incubated with 1X SYBR Safe, 1X PAGE GelRed™, or 1X PAGE GelGreen™. SYBR® Safe rapidly penetrated cell membranes as evident from the bright green staining of nuclei and cytoplasm. However, PAGE GelRed™ and PAGE GelGreen™ were unable to cross cell membranes, as shown by the absence of fluorescence staining in healthy cells.

### Ordering Information

Cat. #	Product Name
41008-T	PAGE GelRed™ Nucleic Acid Gel Stain; 10,000X in water, 0.1 mL
41008-500uL	PAGE GelRed™ Nucleic Acid Gel Stain; 10,000X in water, 0.5 mL
41014	PAGE GelRed™ Nucleic Acid Gel Stain; 1X in water, 4 L
41007-T	PAGE GelGreen™ Nucleic Acid Gel Stain; 10,000X in water, 0.1 mL
41007-500uL	PAGE GelGreen™ Nucleic Acid Gel Stain; 10,000X in water, 0.5 mL

PAGE GelGreen and PAGE GelRed and their uses are covered by granted and pending US and international patents. SYBR is a registered trademark of Thermo Fisher Scientific. Cy® is a registered trademark of GE Healthcare.

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