

Nucleic Acid Gel Electrophoresis

Expansive collection of tools for successful separation, detection and analysis of nucleic acids

Introduction

Electrophoresis is a method of separation and purification of macromolecules such as nucleic acids (DNA and RNA) and proteins based on the net charge, size and conformation on a matrix. Nucleic acid separation by gel electrophoresis has numerous applications for analysis in molecular biology, following PCR analysis or before cloning, sequencing, northern or Southern blotting. Covering the expansive range of nucleic acid electrophoresis applications, our products are optimized for successful separation, detection and analysis of nucleic acids, including RealPure™ Agarose (Low EEO), StaySafe™ Nucleic Acid Gel Stain, RealSharp™ 1 Kb DNA Marker, RealSharp™ 100 bp DNA Marker, StaySafe™ 6X DNA Loading Dye and 6X DNA Loading Dye. Also, gel purification kits are available to obtain the highest quality and specific fragment of electrophoresed nucleic acid. Choose from the table below for the most suitable one for your application. If none is suitable, please inquire local distributor or Real Biotech Corp.

Nucleic Acid Gel Electrophoresis		
RealPure™ Agarose (Low EEO)	For routine analytical electrophoresis of nucleic acids	Page N- 3
StaySafe™ Nucleic Acid Gel Stain	Designed to replace the toxic Ethidium Bromide (EtBr)	Page N- 4
RealSharp™ 1 Kb DNA Marker	Ready-to-use marker for accurate sizing DNA fragments from 500 bp to 10 kb	Page N- 5
RealSharp™ 100 bp DNA Marker	Ready-to-use marker for accurate sizing DNA fragments from 100 bp to 2 kb	Page N- 6
StaySafe™ 6X DNA Loading Dye	Ready-to-use, non-toxic, the most sensitive stain	Page N- 7
6X DNA Loading Dye	Ready-to-use loading dye for DNA markers or samples	Page N- 8
HiYield Plus™ Gel Extraction Kit	Rapidly recover DNA fragments (70 bp - 20 kb) from agarose gel	Page G-15
HiYield™ Gel/PCR DNA Mini Kit	Recover DNA fragments (70 bp - 20 kb) from agarose gel or PCR products	Page G-17
HiYield Plus™ Gel/PCR DNA Mini Kit	Recover DNA fragments (70 bp - 20 kb) from agarose gel or PCR products	Page G-18
HiYield™ Gel/PCR Small DNA Mini Kit	Purify DNA fragments between 40 bp and 200 bp within 10 minutes	Page G-19
HiYield™ Gel/PCR Large DNA Mini Kit	Purify DNA fragments between 100 bp and 50 kb within 20 minutes	Page G-20
HiYield™ Gel/PCR DNA Maxi Kit	Purify DNA fragments between 200 bp and 10 kb within 10 minutes	Page G-21
HiYield™ 96-Well Gel/PCR DNA Extraction Kit	Purify 96 wells of DNA fragments (100 bp -10 kb) within 40 minutes	Page G-22
HiYield™ Beta-Agarase	Up to 99% of DNA/RNA can be gently recovered from gels in 10 minutes	Page R- 3

Popular Nucleic Acid Gel Electrophoresis Kits

StaySafe™ Nucleic Acid Gel Stain

Page N-4

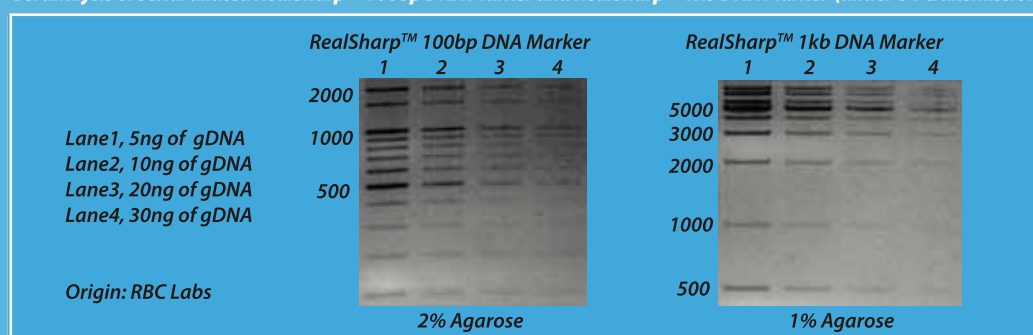


StaySafe™ Nucleic Acid Gel Stain is designed to replace the toxic Ethidium Bromide (EtBr), known as a highly mutagenic material but commonly used in gel electrophoresis for visualization of nucleic acids in agarose gels. StaySafe™ Nucleic Acid Gel Stain is non-carcinogenic by the Ames-test. The results are negative in both the mouse marrow chromophilous erythrocyte micronucleus and mouse spermary spermatocyte chromosomal aberration tests. StaySafe™ Nucleic Acid Gel Stain can largely reduce your exposure to highly mutagenic ethidium bromide.

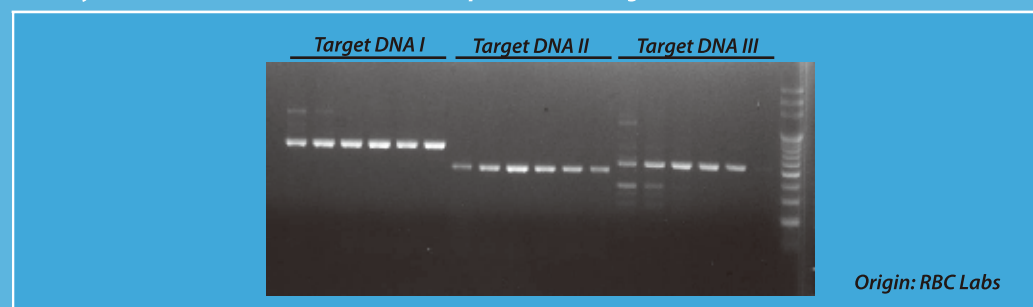
StaySafe™ Nucleic Acid Gel Stain emits green fluorescence when bound to DNA or RNA. It has two secondary fluorescence excitation peaks (≈ 309 nm, ≈ 419 nm) and one strong excitation peak centered at 514 nm. The fluorescence excitation peak is centered at 537 nm when bound to DNA.

StaySafe™ Nucleic Acid Gel Stain is quick, safe and sensitive. It's even more sensitive than Ethidium Bromide. DNA concentration as low as 5 ng can still be detected. StaySafe™ Nucleic Acid Gel Stain is an exceptionally sensitive nucleic acid gel stain that makes it ideal for detecting nucleic acid in gels using laser scanners or standard UV transilluminators. It's also compatible with a wide variety of gel reading instruments.

Gel analysis of serial diluted RealSharp™ 100bp DNA Marker and RealSharp™ 1kb DNA Marker (under UV transmission)



Gel analysis of PCR results which from different samples (under Blue light, 470nm, transmission)



StaySafe™ 6X DNA Loading Dye

Page N-7



StaySafe™ 6X DNA Loading Dye is a non-toxic fluorescent reagent supplied in loading buffer. It is used to prepare DNA markers and samples for loading on agarose or polyacrylamide gels.

StaySafe™ 6X DNA Loading Dye is the most sensitive stain available for detecting of double-stranded DNA (dsDNA), with extraordinary sensitivity for DNA at <1 ng. It contains three tracking dyes (Bromophenol Blue, Xylene Cyanol FF, and Orange G) for visually tracking of DNA migration during the electrophoresis process.

StaySafe™ 6X DNA Loading Dye produces instant visualization of DNA bands upon Blue Light or UV illumination of agarose gels. It is ideal for applications needing rapid DNA band visualization and for environments requiring a safe, non-hazardous alternative to Ethidium Bromide.

RealPure™ Agarose (Low EEO)



Cat. No. RPA100

Molecular Biology Grade
RealPure™ Agarose: 100g

Cat. No. RPA500

Molecular Biology Grade
RealPure™ Agarose: 500g

Store at
15-25°C

For routine analytical electrophoresis of nucleic acids

Highly purified agarose with very low EEO values.

Provides the sharpest resolution!

Suitable for a wide range of fragments from 50 bp to 30,000 bp.

Description

RealPure™ Agarose (Low EEO) is a highly purified agarose with very low EEO values. It provides the sharpest resolution of fragments ranging from 50 bp to 30,000 bp and it's ideal for routine nucleic acid analytical/preparative applications, blotting assays, DNA fingerprinting, PCR or restriction digest analysis. Furthermore, this high-strength agarose forms gels that are easy to handle and that remain flexible even at high gel percentages, which minimize the risk of cracking or breaking.

Features

Form: Fine white powder

Separation range : 50 bp to 30,000 bp **Wide separation range!**

Electroendosmosis (EEO), -Mr: ≤ 0.1 **Sharpest resolution!**

Gel strength : $\geq 1,200$ g/cm² (1.5%) **High gel strength!**

Melting point : $\leq 90^\circ\text{C}$ (1.5%)

Gelling point : 37-39°C (1.5%)

Sulfate(SO₄) : $\leq 0.1\%$ **High purity!**

Moisture : $\leq 10\%$

Molecular Biology Grade

DNase and RNase free!

Applications

Suitable for routine nucleic acid analytical/preparative applications, blotting assays, DNA fingerprinting, PCR or restriction digest analysis.

Quality Control

The quality of RealPure™ Agarose (Low EEO) is tested on a lot-to-lot basis by checking the product specifications and DNA separation. Also, no detectable RNase and DNase activity.

Storage Conditions

RealPure™ Agarose (Low EEO) should be stored at room temperature (15-25°C).

StaySafe™ Nucleic Acid Gel Stain



Cat. No. **RSS01**

Characteristics: 5 µl x 200 reactions

StaySafe™ Nucleic Acid Gel Stain(20,000X): 1ml



Designed to replace the toxic Ethidium Bromide (EtBr)

Highly Sensitive! DNA concentration as low as 5 ng can still be detected!

Sufficient to stain up to 200 minigel (only 5 µl required for 100 ml of agarose gel)

Description

StaySafe™ Nucleic Acid Gel Stain is designed to replace the toxic Ethidium Bromide (EtBr), known as a highly mutagenic material but commonly used in gel electrophoresis for visualization of nucleic acids in agarose gels. StaySafe™ Nucleic Acid Gel Stain is non-carcinogenic by the Ames-test. The results are negative in both the mouse marrow chromophilous erythrocyte micronucleus and mouse spermary spermatocyte chromosomal aberration tests. StaySafe™ Nucleic Acid Gel Stain can largely reduce your exposure to highly mutagenic ethidium bromide.

StaySafe™ Nucleic Acid Gel Stain emits green fluorescence when bound to DNA or RNA. It has two secondary fluorescence excitation peaks (≈ 309 nm, ≈ 419 nm) and one strong excitation peak centered at 514 nm. The fluorescence excitation peak is centered at 537 nm when bound to DNA.

StaySafe™ Nucleic Acid Gel Stain is quick, safe and sensitive. It's even more sensitive than Ethidium Bromide. DNA concentration as low as 5 ng can still be detected. StaySafe™ Nucleic Acid Gel Stain is an exceptionally sensitive nucleic acid gel stain that makes it ideal for detecting nucleic acid in gels using laser scanners or standard UV transilluminators. It's also compatible with a wide variety of gel reading instruments.

Features

Stay Safe: non-mutagenic, non-toxic, non carcinogenic.

Go Green: no hazardous waste.

Highly Sensitive: DNA concentration as low as 5 ng can still be detected.

Extremely Stable: stable at room temperature for long-term storage and microwavable.

Applications

Ideal for nucleic acids (double-strand DNA and single-stranded RNA) detection within agarose gel after electrophoresis under UV illumination.

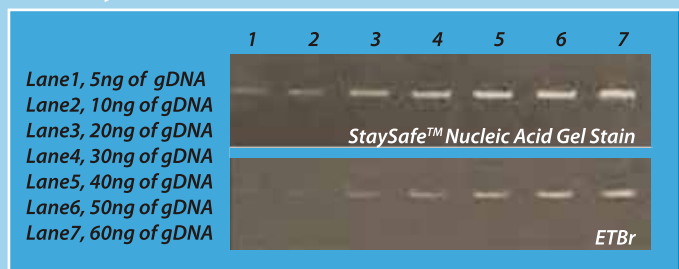
Quality Control

StaySafe™ Nucleic Acid Gel Stain is tested on a lot-to-lot basis by extracting nucleic acids from animal tissue and performing electrophoresis with the agarose gel stained with StaySafe™ Nucleic Acid Gel Stain.

Storage Conditions

StaySafe™ Nucleic Acid Gel Stain shall be shipped and stored at room temperature. (Do not freeze it!)

Gel analysis of serial diluted DNA (under UV transmission)



RealSharp™ 1 Kb DNA Marker



Store at
-20°C

Cat. No. RD001
Characteristics: 5 µl x 100 reactions
RealSharp™ 1 Kb DNA Marker: 500 µl
6X DNA Loading Dye: 1 ml

Cat. No. RD601
6X DNA Loading Dye: 1 ml

Cat. No. RD603
6X DNA Loading Dye: 3 ml

Cat. No. RD610
6X DNA Loading Dye: 10 ml

Ready-to-use marker for accurate sizing of DNA fragments

For DNA range from 500 bp to 10 kb.

Description

RealSharp™ 1 Kb DNA Marker contains 9 fragments: 500 bp, 1 kb, 2 kb, 3 kb, 4 kb, 5 kb, 6 kb, 8 kb and 10 kb.

RealSharp™ 1 Kb DNA Marker is pre-mixed with loading dye and comes with additional 6X DNA loading dye.

The ready-to-load format facilitates DNA quantification and makes it simple to determine the DNA size.

Features

Ideal for fast sizing of popular band sizes.

Publication quality (sharp and clear banding patterns).

Mass marker bands for easy DNA quantitation.

Accurate DNA migration on agarose gels.

Ideal for both DNA sizing and approximate quantification.

Applications

Suitable for size determination of dsDNA by DNA electrophoresis on agarose gels.

Quality Control

Agarose gel analysis shows that the bands between 500 bp to 10 kb are distinguishable with accurate molecular weight after 10 µl of marker is loaded.

Storage Conditions

RealSharp™ 1 Kb DNA Marker should be stored immediately upon receipt at -20°C in a constant temperature freezer.

For best results, load 5-10 µl of marker per well.

RealSharp™ 1 Kb DNA Marker (500 bp-10000 bp)		
	bp	ng/10 µl
	10000	40
	8000	40
	6000	40
	5000	80
	4000	40
	3000	40
	2000	40
	1000	40
	500	40

10 µl / well ; 0.8% 1X TAE gel

RealSharp™ 100 bp DNA Marker

Ready-to-use marker for accurate sizing of DNA fragments



Cat. No. RD002

Characteristics: 5 µl x 100 reactions
RealSharp™ 100 bp DNA Marker: 500 µl
6X DNA Loading Dye: 1 ml

Cat. No. RD601

6X DNA Loading Dye: 1 ml

Cat. No. RD603

6X DNA Loading Dye: 3 ml

Cat. No. RD610

6X DNA Loading Dye: 10 ml



For DNA range from 100 bp to 2 kb.

Description

RealSharp™ 100 bp DNA Marker contains 12 fragments: 100 bp, 200 bp, 300 bp, 400 bp, 500 bp, 600 bp, 700 bp, 800 bp, 900 bp, 1000 bp, 1500 bp, 2000 bp.

500 bp and 1000 bp are double concentrated for easier band identification of molecular weight and DNA yields.

RealSharp™ 100 bp DNA Marker is pre-mixed with loading dye and comes with additional 6X DNA loading dye.

The ready-to-load format facilitates DNA quantification and makes it simple to determine the DNA size.

Features

Publication quality (sharp and clear banding patterns).

Mass marker bands for easy DNA quantitation.

Accurate DNA migration on agarose gels.

Ideal for both DNA sizing and approximate quantification.

Applications

Suitable for size determination of dsDNA by DNA electrophoresis on agarose gels.

Quality Control

Agarose gel analysis shows that the bands between 100 bp to 2000 bp are distinguishable with accurate molecular weight after 10 µl of marker is loaded.

Storage Conditions

RealSharp™ 100 bp DNA Marker should be stored immediately upon receipt at -20°C in a constant temperature freezer.

For best results, load 5-10 µl of marker per well.

RealSharp™ 100 bp DNA Marker (100 bp-2000 bp)		
	bp	ng/10 µl
	2000	40
	1500	40
	1000	80
	900	30
	800	30
	700	30
	600	30
	500	80
	400	40
	300	40
	200	60
	100	100

10 µl / well ; 1.5% 1X TAE gel

StaySafe™ 6X DNA Loading Dye


Cat. No. RDS01

StaySafe™ 6X DNA Loading Dye: 1 ml

Cat. No. RDS03

StaySafe™ 6X DNA Loading Dye: 3 ml

Cat. No. RDS10

StaySafe™ 6X DNA Loading Dye: 10 ml



Ready-to-use, non-toxic, the most sensitive stain

For instant visualization of DNA bands upon Blue Light or UV illumination of agarose gels.

Description

StaySafe™ 6X DNA Loading Dye is a non-toxic fluorescent reagent supplied in loading buffer. It is used to prepare DNA markers and samples for loading on agarose or polyacrylamide gels.

StaySafe™ 6X DNA Loading Dye is the most sensitive stain available for detecting of double-stranded DNA (dsDNA), with extraordinary sensitivity for DNA at <1 ng. It contains three tracking dyes (Bromophenol Blue, Xylene Cyanol FF, and Orange G) for visually tracking of DNA migration during the electrophoresis process.

StaySafe™ 6X DNA Loading Dye produces instant visualization of DNA bands upon Blue Light or UV illumination of agarose gels. It is ideal for applications needing rapid DNA band visualization and for environments requiring a safe, non-hazardous alternative to Ethidium Bromide.

Features

Safe and Economical

Absence of mutagenicity and low toxicity (LC₅₀>5000mg/kg) as compared to Ethidium bromide. Non-hazardous product. No expenses required for the waste management.

Low Environmental Impact

Compliance with the Clean Water Act standards. No water pollution concern.

Fast and Sensitive

Ready to use. Apply just like a 6X Loading Dye. No de-staining required. Low background. High sensitivity just as Ethidium Bromide.

Improved Cloning Efficiency

Ethidium bromide causes strand breaks or DNA nicking. StaySafe™ 6X DNA Loading Dye does not damage or mutate DNA.

Usage

- (1) Vortex StaySafe™ 6X DNA Loading Dye for 10 seconds prior to use.
- (2) Dilute 1 part StaySafe™ 6X DNA Loading Dye with 5 parts DNA sample and mix. *Dye must be added to DNA markers in order to visualize the ladder bands simultaneously with the sample after electrophoresis.*
- (3) Load sample and run the standard procedures.
- (4) After electrophoresis, place the gel on UV transilluminator or a visible light transilluminator to immediately visualize bands.

Storage Conditions

StaySafe™ 6X DNA Loading Dye should be stored at 4 °C in a constant temperature freezer and kept away from light. For longer periods, store at -20°C.

6X DNA Loading Dye



Cat. No. **RD601**
6X DNA Loading Dye: 1 ml

Cat. No. **RD603**
6X DNA Loading Dye: 3 ml

Cat. No. **RD610**
6X DNA Loading Dye: 10 ml

Ready-to-use loading dye for DNA markers or samples

For agarose or polyacrylamide gels.

Description

6X DNA Loading Dye is a fluorescent reagent supplied in loading buffer. It is used to prepare DNA markers and samples for loading on agarose or polyacrylamide gels.

6X DNA Loading Dye contains two different dyes (bromophenol blue and xylene cyanol) for visual tracking of DNA migration during electrophoresis.

6X DNA Loading Dye produces instant visualization of DNA bands upon UV illumination of agarose gels. It is ideal for applications needing rapid DNA band visualization.

Features

Fast and Sensitive

Ready to use. No de-staining required. Low background. High sensitivity.

Improved Cloning Efficiency

No DNA masking during gel exposure to UV light.

Usage

(1) Vortex 6X DNA Loading Dye for 3 seconds prior to use.

(2) Dilute 1 part 6X DNA Loading Dye with 5 parts DNA sample and mix.

Dye must be added to DNA markers in order to visualize the ladder bands simultaneously with the sample after electrophoresis.

(3) Load sample and run the standard procedures.

(4) After electrophoresis, place the gel on UV transilluminator to immediately visualize bands.

Storage Conditions

6X DNA Loading Dye can be stored at room temperature up to 6 months, or stored at 4°C in a constant temperature freezer and kept away from light for up to 12 months. For longer periods, store at -20°C.