EZ Vision® DNA Dye as Loading Buffer, 6X

Code	Description	Size
N472-KIT	**EZ-Vision® One DNA Dye as Loading Buffer, 6X**	5 x 1.0 mL
N472- SAMPLE	**EZ-Vision® One DNA Dye as Loading Buffer, 6X**	0.3 mL
N472-Q-0.5ML	**EZ-Vision® One DNA Dye as Loading Buffer, 6X**	0.5 mL
N650-KIT	**EZ-Vision® Two DNA Dye as Loading Buffer, 6X**	5 x 1.0 mL
N650-Q-SAMPLE	**EZ-Vision® Two DNA Dye as Loading Buffer, 6X**	0.3 mL
N313-KIT	**EZ-Vision® Three DNA Dye as Loading Buffer, 6X**	5 x 1.0 mL
N313-Q-SAMPLE	**EZ-Vision® Three DNA Dye as Loading Buffer, 6X**	0.3 mL
N473-2PK	**EZ-Vision® Sample Kit**	1 x N472-1ML 1 x N313-1ML
N473-3PK	**EZ-Vision® Sample Kit**	1 x N472-1ML 1 x N650-1ML 1 x N313-1ML

General Information

EZ-Vision® is a non-toxic, non-mutagenic DNA visualization dye that eliminates hazardous ethidium bromide use in DNA gels and running buffer. It is supplied in 6X loading buffer as EZ-VIsion® One, EZ-VIsion® Two, or EZ-VIsion® Three, which differ only in the tracking dyes included (Figure 1). EZ-VIsion® One contains a single, fast-running tracking dye that migrates at approximately 10 bp in a 1% agarose gel. EZ-VIsion® Two contains two tracking dyes that migrate at 4,000 bp and 400 bp. EZ-VIsion® Three contains three tracking dyes that migrate at 4,000 bp, 400 bp and 10 bp. DNA samples mixed with any of the three EZ-Vision® DNA Dye Loading Buffers may be applied to agarose or polyacrylamide gels. The EZ-Vision® dye instantly forms a complex with the DNA and co-migrates with it during electrophoresis. The samples are visualized immediately after electrophoresis with standard UV illumination and a green filter (500 – 600 nm) for gel documentation. There is no need to perform post-staining or

destaining. Senisitivity of EZ-Vision® staining is similar to that obtained using ethidium bromide (Figure 2).

EZ-Vision® One. –Two and –Three DNA Dyes as Loading Buffer are convenient for rapid DNA detection in gels, with the stained DNA being compatible with typical downstream applications. As an ethidium bromide alternative, EZ-Vision® reduces hazardous exposure for laboratory personnel and the environment, and also reduces expenses as there is no hazardous shipping, handling or disposal required.

- Fluorescent DNA dye supplied in convenient 6X loading buffer
- Non-mutagenic and non-toxic alternative for ethidium bromide
- Visualize DNA instantly with a standard UV transilluminator
- Requires no post-electrophoresis staining or destaining

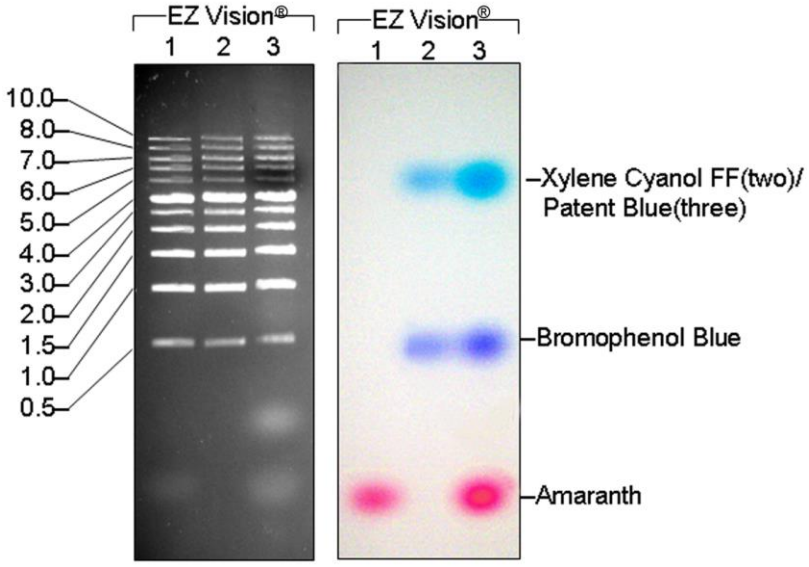

Figure 1. Example of EZ-Vision®-stained DNA and tracking dye migration on a single 1% TAE agarose gel. Left: DNA fluorescently stained with EZ-Vision® One, -Two and –Three DNA Dyes as Loading Buffer as observed by UV. Right: The same gel imaged with visible light to show the tracking dye migration.

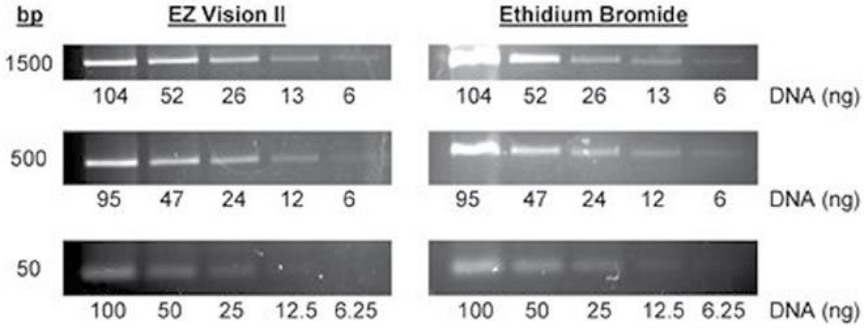

Figure 2. EZ-Vision® sensitivity compared to ethidium bromide. DNA MW Marker, 1 KB Ladder (K181) was mixed with EZ-Vision® Two DNA Dye as Loading Buffer, 6X or a loading buffer containing 0.5 µg/mL ethidium bromide. EZ-Vision® is sensitive to approximately 6 ng DNA for a 500 bp fragment.

Further information regarding EZ-Vision®, including safety testing, may be accessed on the AMRESCO website at www.amresco-inc.com. Below is a summary of the information available.

- The mutagenicity of EZ-Vision® was determined by Ames testing of *S. typhimurium* with and without metabolic activation with an S-9 activation system. No increase in His+ revertants was obtained compared to controls.
- EZ-Vision® environmental hazard testing was determined by the CCR Title 22 Fathead Minnow Hazardous Waste Screen Bioassay. Both EZ-Vision® Two and EZ-Vision® Three were determined non-hazardous with LC50 > 750 mg/L.

Storage/Stability

Store cold (4 – 8°C), protected from light. EZ-Vision® DNA Dyes as Loading Buffer are stable for at least one year. Normal usage can be carried out under ambient light.

Product Use Limitations

For research use only. Not for therapeutic or diagnostic use.

Spectral Information

EZ-Vision® One, –Two and –Three DNA Dyes as Loading Buffer, 6X each contain the same fluorescent DNA dye.

Emission: 364 nm
Excitation: 454 nm

Protocol/Procedure:

Prepare DNA samples in EZ-Vision® DNA Dye as Loading Buffer, 6X

Note: Although testing for EZ-Vision® indicates there are no mutagenic or genotoxic effects, standard handling precautions are advised for all nucleic acid binding reagents. All local regulations should be followed when using and disposing of this reagent.

1. Vortex EZ-Vision® DNA Dye as Loading Buffer, 6X for 30 seconds prior to use.
2. Dilute 1 part EZ-Vision® DNA Dye as Loading Buffer, 6X with 5 parts DNA sample and mix. **Note:** EZ-Vision® must be added to DNA markers in order to visualize the ladder bands simultaneously with the sample after electrophoresis.
3. Load the sample on an agarose or polyacrylamide gel and perform electrophoresis according to standard procedure.
4. After electrophoresis, place the gel on a UV transilluminator to immediately visualize DNA bands, which will emit a whitish-blue fluorescence against a dark background. If necessary, the gel may be wrapped in plastic wrap and stored cold with the fluorescence still visible for at least 24 hours post-electrophoresis (if the gel has not been photobleached by previous UV exposure).
5. EZ-Vision®-stained gels may be post-stained with ethidium bromide, if desired.

Gel documentation

- **Digital gel imaging systems:** EZ-Vision®-stained gels are compatible with digital imaging systems. Please contact your system manufacturer with the spectral information provided on page 3 to obtain information on appropriate filters.
- **Black and white polaroid photography:** EZ-Vision®-stained gels can be photographed with a standard UV transilluminator, Polaroid #667 film and filters used to photograph green dyes, such as SYBR® Green. Longer exposure times are required for EZ-Vision®-stained gels since Polaroid #667 film is not optimized for sensitivity in the blue emission range. Filters typically used to photograph ethidium bromide-stained gels may also be used, but the exposure times should be doubled or tripled to obtain sufficient contrast to represent the image that is visually perceived.

Downstream applications

DNA stained with EZ-Vision® is compatible with standard downstream applications including ligation reactions, transformation procedures and PCR amplification.

- **Recovery from gel slices:** The EZ-Vision® DNA Dye does not interfere with recovery of DNA fragments from agarose gels.
- **Ligation and transformation efficiency:** EZ-Vision®-stained DNA that is gel purified and subsequently used in ligation and transformation yields a comparable number of positive transformants to that obtained for ethidium bromide-stained DNA used in the same procedure.
- **PCR amplification:** Amplification efficiency and yield are comparable for EZ-Vision®- and ethidium bromide-stained DNA.
- **Sequencing:** EZ-Vision® stained DNA may be used for sequencing after extraction from agarose gels following conventional procedures. In some cases, read lengths may be shorter than typically obtained with ethidium bromide staining.
- **Restriction digests:** EZ-Vision®-stained DNA recovered from gel slices performs comparably to unstained DNA in restriction digests.

Frequently Asked Questions

Does EZ-Vision® affect DNA migration?

- DNA fragments stained with EZ-Vision® DNA Dyes as Loading Buffer are not impeded and migrate at a rate similar to DNA that is unstained until after electrophoresis. Migration data is available on the AMRESCO website.

What is the duration of EZ-Vision® fluorescence emission upon UV illumination?

- The fluorescent signal intensity of EZ-Vision® stained DNA decreases to 50% upon 45 minutes of continuous UV illumination.

Which filter is recommended for visualizing DNA stained with EZ-Vision® DNA Dye?

- A SYBR® Green filter is optimal (500 – 600 nm), although an ethidium bromide filter (550 – 640 nm) may also be used with a slight reduction in sensitivity.

How sensitive is EZ-Vision® DNA Dye?

- EZ-Vision® DNA Dyes as Loading Buffer can detect 6 ng of DNA for a fragment that is 500 bp and 12 ng DNA for a 50 bp fragment.

Does loading buffer need to be added to a DNA sample containing one of the EZ-Vision® DNA Dyes as Loading Buffer?

- No additional reagents are necessary. EZ-Vision® DNA Dyes are supplied in a convenient 6X loading buffer.

Why is the DNA not detected on the gel?

- An EZ-Vision® DNA Dye as Loading Buffer was not added to the sample.
  - Add 1 µL EZ-Vision® One, -Two or –Three DNA Dye as Loading Buffer, 6X
- The incorrect filter was used to capture the gel image.
  - A SYBR® Green filter is optimal (500 – 600 nm), although an ethidium bromide filter (550 – 640 nm) may also be used with a slight reduction in sensitivity. Contact the digital imaging system manufacturer for a filter recommendation using the spectral information provided on page 3.
- Insufficient DNA was loaded on the gel.
  - Load at least 100 ng of DNA per lane. You may need to optimize loading amounts for small fragments (< 100 bp), for which EZ-Vision® is slightly less sensitive than ethidium bromide.
- Gel running conditions were not optimized.
  - Gel running at 8 V/cm for 20 minutes is recommended for optimal results. Long run-times may result in dissociation of EZ-Vision® from DNA.

For Technical Support

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