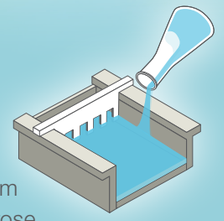
thermoscientific

Five simple wins to keep your DNA electrophoresis on track

Use these straightforward solutions to improve your results

1



Hurdle

Low DNA recovery from regular agarose.

Solution

DNA can be denatured during the melting process when using standard melting-point agarose since high temperatures are required to convert the agarose to a liquid. Use low–melting point (LMP) agarose to isolate DNA without the need for enzymes or electroelution. Thermo Scientific™ TopVision™ Agarose comes in standard– and low–melting temperature options.

2

Hurdle

Contamination or errors introduced from multiple pipetting steps.

Solution

Use products for direct gel loading to avoid repetitive addition of loading buffer to samples and ladders. This can be an ideal time-saving method for high-throughput PCR.

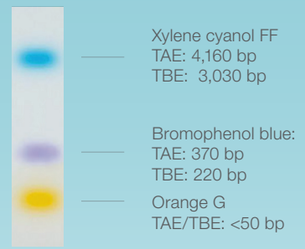
3

Hurdle

Insufficient tracking of DNA migration—DNA bands run off the gel without the visual cue of lower molecular weight tracking dye.

Solution

Most loading buffer contains two tracking dyes—bromophenol blue and xylene cyanol FF. Use Thermo Scientific™ TriTrack™ DNA Loading Dye (6X) that contains a third dye, orange G, which runs around 50 bp.



Migration of dyes in TriTrack buffer.

4

Hurdle

Smeared DNA bands or atypical band migration.

Solution

Incorrect buffer can cause bands to smear. Use Tris-acetate-EDTA (TAE) or Tris-borate-EDTA (TBE) running buffer and follow the proper condition for voltage as shown here.

Size of DNA	Voltage	Preferred buffer
<1 kb	5–10 V/cm	TBE
1–5 kb	4–10 V/cm	TAE or TBE
>5 kb	1–3 V/cm	TAE
Up to 10 kb, fast electrophoresis with DNA ladders	Up to 23 V/cm	TAE

5

Hurdle

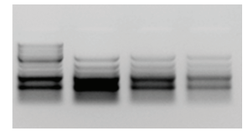
Difficulty in identifying the size of DNA fragments.

Solution

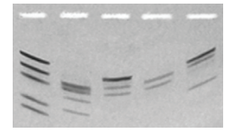
Choosing suboptimal ladders can lead to incorrect sizing of your DNA fragments. Use Thermo Scientific™ GeneRuler™ DNA ladders, which offer:

- A broad range of size options (1 kb, 100 bp, 50 bp, low range, and high range)
- Sharp and bright reference bands
- TriTrack loading buffer to easily monitor DNA migration during electrophoresis

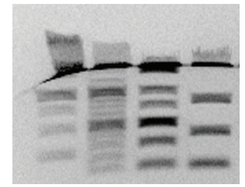
What happened to my gel?



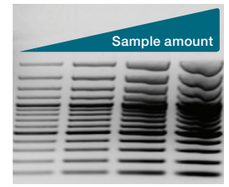
Diffused bands
Low voltage and extended run time



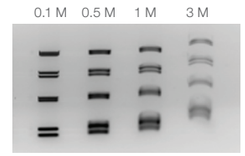
Curved bands
High voltage



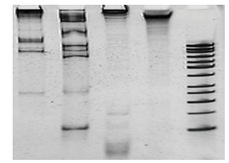
Poor separation
Unsubmerged gel and/or short run time



Smeared bands
Overloading



Unresolved bands
High salt concentration



Atypical bands
Incorrect loading dye, no denaturation of bound protein

Find out more at **thermofisher.com/dnaelectrophoresis**

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