

Small DNA Fragments Extraction Kit

For research use only

Sample : up to 300 mg of agarose gel up to 100 µl of PCR products

Recovery : up to 95%

Format : spin column

Operation time : 20 minutes

Elution volume : 20-50 µl



Introduction

The Small DNA Fragments Extraction Kit was designed to recover or concentrate DNA fragments (50-200 bp) from agarose gel, PCR, or other enzymatic reactions. Chaotropic salt is used to dissolve agarose gel and denature enzymes. DNA fragments in the chaotropic salt are bound by the glass fiber matrix of the spin column (1). Contaminants are removed with a Wash Buffer (containing ethanol) and the purified DNA fragments are eluted by a low salt Elution Buffer or TE. Salts, enzymes and unincorporated nucleotides can be effectively removed from the reaction mixture without phenol extraction or alcohol precipitation. Typically, recoveries are up to 90% for Gel Extraction and up to 95% for PCR Clean up. The entire procedure can be completed in 20 minutes and the eluted DNA is ready for use in PCR, Fluorescent or Radioactive Sequencing, Restriction Enzyme Digestion, DNA Labeling and Ligation.

Quality Control

The quality of the Small DNA Fragments Extraction Kit is tested on a lot-to-lot basis by isolating DNA fragments of various sizes from either aqueous solutions or agarose gel. The purified DNA is checked by electrophoresis.

Kit Contents

Name	DF001	DF101	DF301
SD Buffer	3 ml	80 ml	240 ml
W1 Buffer	2 ml	45 ml	130 ml
Wash Buffer* (Add Ethanol)	1 ml (4 ml)	25 ml (100 ml)	50 ml + 25 ml (200 ml) (100 ml)
Elution Buffer (10 mM Tris-HCl, pH 8.5 at 25°C)	1 ml	6 ml	30 ml
SD Column	4 pcs	100 pcs	300 pcs
2 ml Collection Tube	4 pcs	100 pcs	300 pcs

Order Information

Product Name	Package Size	Cat. No.
Gel/PCR DNA Fragments Extraction Kit	100/300 preps	DF100/300
Gel/PCR DNA Frag. Extraction Maxi Kit (0.5-1 ml elution volume)	10/25 preps	DM010/025
Small DNA Fragments Extraction Kit (optimized for 50-200 bp)	100/300 preps	DF101/301
Large DNA Fragments Extraction Kit (optimized for > 8 Kb)	100/300 preps	DF102/302
96-Well Gel/PCR DNA Extraction Kit	2/4/10 X 96 Wells	DFP02/04/10
Vacuum Manifold (Accessories)	1 SET	ZVF01

*Add absolute ethanol (see the bottle label for details) to the Wash Buffer prior to initial use

Caution

SD Buffer contains guanidine thiocyanate which is a harmful irritant. During operation, always wear a lab coat, disposable gloves, and protective goggles.

References

(1) Vogelstein, B., and Gillespie, D. (1979) Proc. Natl. Acad. Sci. USA 76, 615

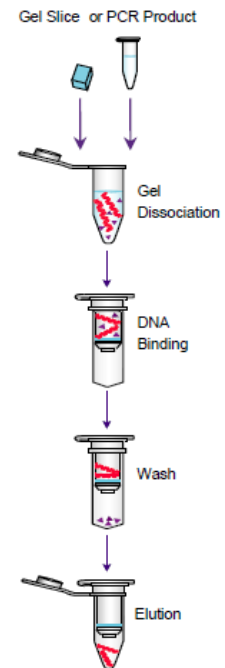
Additional requirements

microcentrifuge tubes, absolute ethanol

Small DNA Fragments Extraction Kit Gel Extraction Protocol

- Add absolute ethanol (see the bottle label for volume) to the Wash Buffer prior to initial use

Step 1 Gel Dissociation	<ul style="list-style-type: none"> ● Excise the agarose gel slice containing relevant DNA fragments and remove any extra agarose to minimize the size of the gel slice (TAE buffer is recommended for gel formation). ● Transfer up to 300 mg of the gel slice to a 1.5 ml microcentrifuge tube. ● Add 500 µl of SD Buffer to the sample and mix by vortex. ● Incubate at 55-60°C for 10-15 minutes to ensure the gel slice has been completely dissolved. During incubation, invert the tube every 2-3 minutes. ● Cool the dissolved sample mixture to room temperature.
Step 2 DNA Binding	<ul style="list-style-type: none"> ● Place the SD Column in a 2 ml Collection Tube. ● Transfer 800 µl of the sample mixture from the previous step to the SD Column. ● Centrifuge at 14-16,000 x g for 30 seconds. ● Discard the flow-through and place the SD Column back in the 2 ml Collection Tube (If the sample mixture is more than 800 µl, repeat the DNA Binding Step).
Step 3 Wash	<ul style="list-style-type: none"> ● Add 400 µl of W1 Buffer into the SD Column. ● Centrifuge at 14-16,000 x g for 30 seconds and then discard the flow-through. ● Place the SD Column back in the 2 ml Collection Tube. ● Add 600 µl of Wash Buffer (ethanol added) into the SD Column and let stand for 1 minute. ● Centrifuge at 14-16,000 x g for 30 seconds and then discard the flow-through. ● Place the SD Column back in the 2 ml Collection Tube. ● Centrifuge at 14-16,000 x g again for 3 minutes to dry the column matrix.
Step 4 DNA Elution	<ul style="list-style-type: none"> ● Transfer the dried SD Column to a new 1.5 ml microcentrifuge tube. ● Add 20-50 µl of Elution Buffer or TE into the center of the column matrix. ● Let stand for at least 2 minutes to ensure the Elution Buffer is absorbed by the matrix. ● Centrifuge at 14-16,000 x g for 2 minutes to elute the purified DNA.



Small DNA Fragments Extraction Kit Gel Extraction (Sequencing) Protocol

- Add absolute ethanol (see the bottle label for volume) to the Wash Buffer prior to initial use

Step 1 Gel Dissociation	<ul style="list-style-type: none"> ● Excise the agarose gel slice containing relevant DNA fragments and remove any extra agarose to minimize the size of the gel slice (TAE buffer is recommended for gel formation). ● Transfer up to 300 mg of the gel slice to a 1.5 ml microcentrifuge tube. ● Add 500 µl of SD Buffer to the sample and mix by vortex. ● Incubate at 55-60°C for 10-15 minutes to ensure the gel slice has been completely dissolved. During incubation, invert the tube every 2-3 minutes. ● Cool the dissolved sample mixture to room temperature.
Step 2 DNA Binding	<ul style="list-style-type: none"> ● Place the SD Column in a 2 ml Collection Tube. ● Transfer 800 µl of the sample mixture from Step 1 to the SD Column ● Centrifuge at 14-16,000 x g for 30 seconds. ● Discard the flow-through and place the SD Column back in the 2 ml Collection Tube (If the sample mixture is more than 800 µl, repeat the DNA Binding Step).
Step 3 Wash	<ul style="list-style-type: none"> ● Add 600 µl of Wash Buffer (ethanol added) into the SD Column and let stand for 1 minute. ● Centrifuge at 14-16,000 x g for 30 seconds and then discard the flow-through. ● Place the SD Column back in the 2 ml Collection Tube. ● Add 600 µl of Wash Buffer (ethanol added) into the SD Column and let stand for 1 minute. ● Centrifuge at 14-16,000 x g for 30 seconds and then discard the flow-through. ● Place the SD Column back in the 2 ml Collection Tube. ● Centrifuge at 14-16,000 x g again for 3 minutes to dry the column matrix.
Step 4 DNA Elution	<ul style="list-style-type: none"> ● Transfer the dried SD Column to a new 1.5 ml microcentrifuge tube. ● Add 20-50 µl of Elution Buffer or TE into the center of the column matrix. ● Let stand for at least 2 minutes to ensure the Elution Buffer or TE is absorbed by the matrix. ● Centrifuge at 14-16,000 x g for 2 minutes to elute the purified DNA.

Small DNA Fragments Extraction Kit PCR Clean Up Protocol

- Add absolute ethanol (see the bottle label for volume) to the Wash Buffer prior to initial use

Step 1 Sample Prep.	<ul style="list-style-type: none"> ● Transfer up to 100 µl of a reaction product to a 1.5 ml microcentrifuge tube. ● Add 5 volumes of SD Buffer to 1 volume of the sample and mix by vortex.
Step 2 DNA Binding	<ul style="list-style-type: none"> ● Place a SD Column in a 2 ml Collection Tube. ● Transfer the sample mixture from step 1 to the SD Column and centrifuge at 14-16,000 x g for 30 seconds. ● Discard the flow-through and place the SD Column back in the 2 ml Collection Tube.
Step 3 Wash	<ul style="list-style-type: none"> ● Add 600 µl of Wash Buffer (ethanol added) into the center of the SD Column and let stand for 1 minute. ● Centrifuge at 14-16,000 x g for 30 seconds. ● Discard the flow-through and place the SD Column back in the 2 ml Collection Tube. ● Centrifuge at 14-16,000 x g again for 3 minutes to dry the column matrix.
Step 4 DNA Elution	<ul style="list-style-type: none"> ● Transfer the dried SD Column to a new 1.5 ml microcentrifuge tube. ● Add 20-50 µl of Elution Buffer or TE into the center of the column matrix. ● Let stand for at least 2 minutes to ensure the Elution Buffer is completely absorbed by the matrix. ● Centrifuge at 14-16,000 x g for 2 minutes to elute the purified DNA.

Troubleshooting

Problem	Possible Reasons/Solution
Low Yield	<p>Gel slice did not dissolve completely</p> <ul style="list-style-type: none"> ● The Gel slice was too big. If using more than 300 mg of gel slice, separate it into multiple tubes. ● Raise the incubation temperature to 60°C and extend the incubation time. <p>Incorrect DNA Elution Step</p> <ul style="list-style-type: none"> ● Ensure that the Elution Buffer is completely absorbed after being added to the center of the SD Column.
Eluted DNA doesn't perform well in downstream applications	<p>Residual Ethanol contamination</p> <ul style="list-style-type: none"> ● Following the Wash Step, dry the SD Column with additional centrifugation at 14-16,000 x g for 5 minutes or incubate at 60°C for 5 minutes. <p>DNA was denatured (a smaller band appeared on gel analysis)</p> <ul style="list-style-type: none"> ● Incubate the eluted DNA at 95°C for 2 minutes, and then cool down slowly to re-anneal the denatured DNA.
Low A260/A230	<ul style="list-style-type: none"> ● In the wash step, repeat the 600 µl Wash Buffer addition and let stand for 1 minute.