

# Automation of the Macherey-Nagel NucleoFast 96 PCR Cleanup Kit on the Zephyr Genomics Workstation

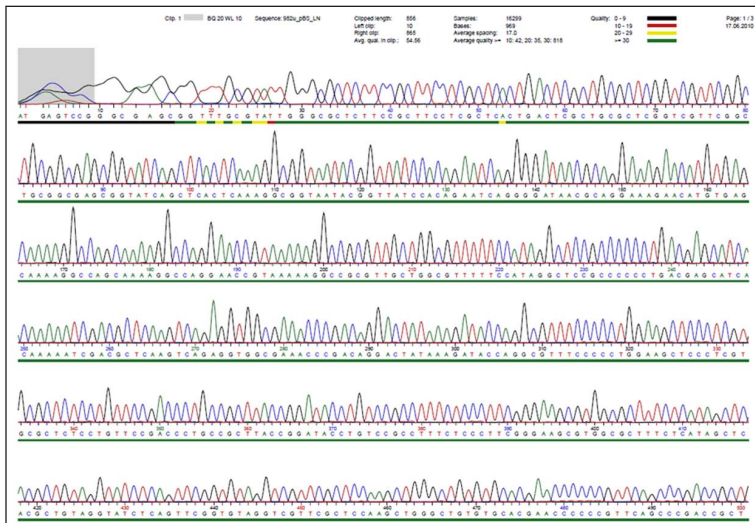
## Introduction

Here, we describe validation using Caliper's Zephyr Genomics Workstation to automate PCR cleanup with the Macherey-Nagel NucleoFast 96 PCR Cleanup Kit (REF# 743500.4). Using this system, high quality PCR products are quickly purified with good yields by ultrafiltration on the Zephyr Genomics Workstation.

## DNA Yield and Quality

### Method

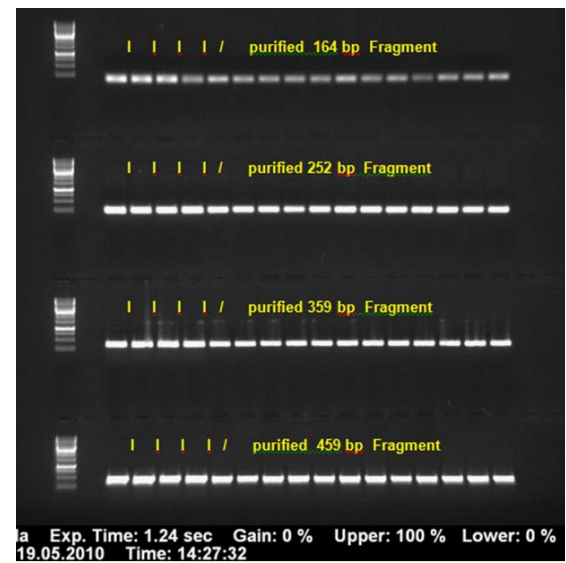
25  $\mu$ L of a PCR reaction (PCR fragments sizes as indicated from 164 bp to 1484 bp) were diluted to 100  $\mu$ L, loaded on NucleoFast 96 Plate. DNA was recovered in 100  $\mu$ L nuclease free water. Unpurified or purified samples were dried in a Speedvac and dissolved in 15  $\mu$ L loading buffer. Samples were analyzed on a 1 % agarose gel and by microfluidic capillary electrophoresis (CE).



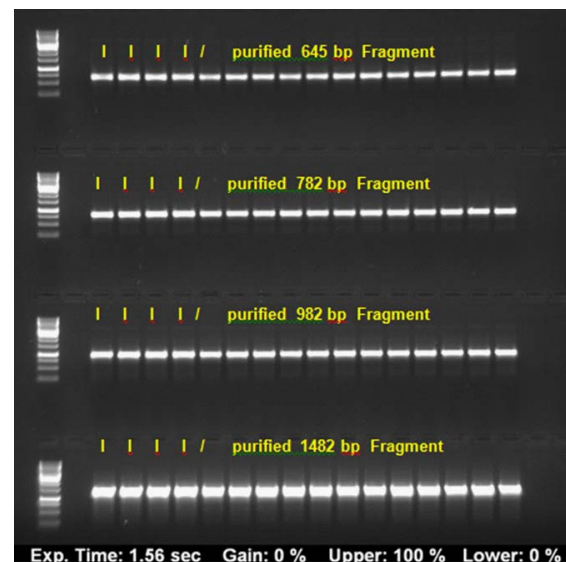
**Figure 1.** DNA Sequencing (982bp Fragment Shown): PCR fragments of 359bp, 459bp, 982bp and 645 bp were purified using the NucleoFast method. These PCR fragments are originally amplified from pBluescript DNA. For this we use a fixed forward primer (pBS\_LN) and variable reverse primer to generate the products with different lengths in individual singleplex PCR reactions.

Fragment	ng/ $\mu$ L input/ no purification	ng/ $\mu$ L purified	% recovery
164 bp	2.35	1.66	70
252 bp	3.47	3.28	95
459 bp	5.9	4.87	83
782 bp	7.6	7.29	96

**Table 1.** Tabulated Microfluidic CE Yield Analysis of Selected Samples.



**Figure 2.** Agarose Gel Analysis of purified PCR products of 164, 252, 359 and 459 bp. (Tick marks indicate unpurified input samples)



**Figure 3.** Agarose Gel Analysis of purified PCR products of 645, 782, 982 and 1482 bp. (Tick marks indicate unpurified input samples)

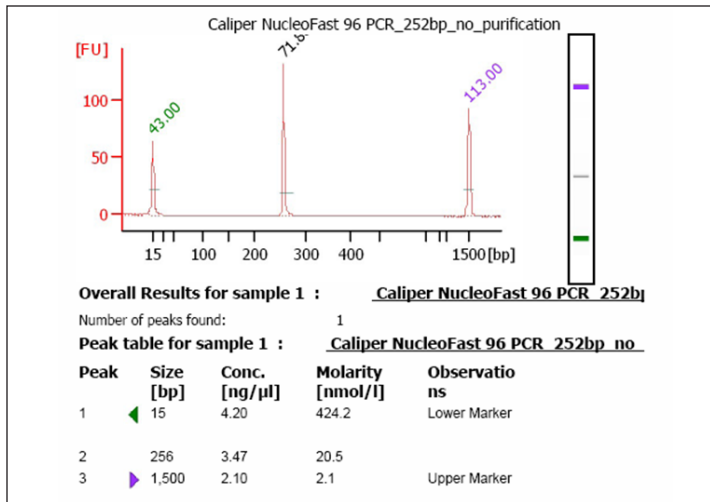


Figure 4. Microfluidic CE Analysis of Typical Unpurified 252bp PCR Product Sample

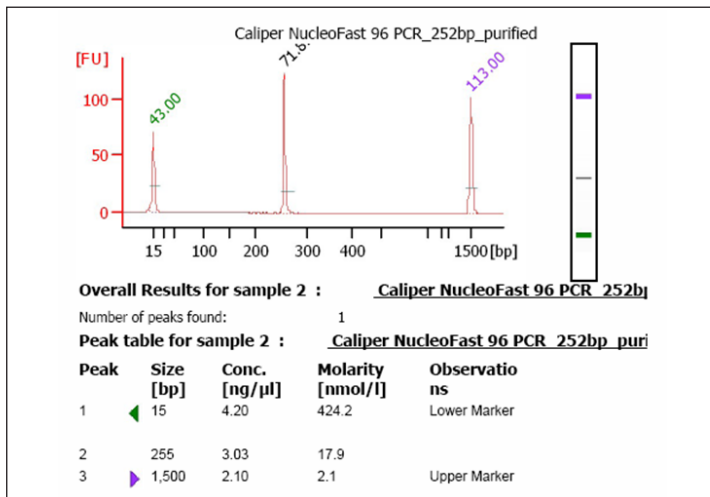


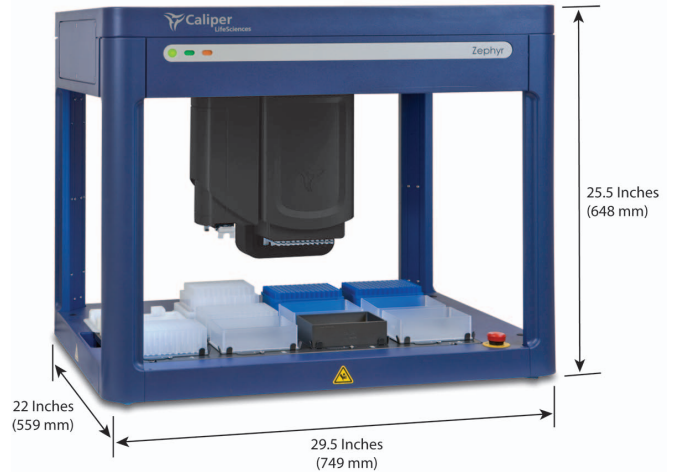
Figure 5. Microfluidic CE Analysis of Typical Purified 252bp PCR Product Sample

## Conclusion

The Zephyr Genomics Workstation from Caliper Life Sciences can be used to automate PCR product purification with the Macherey-Nagel NucleoFast 96 PCR Cleanup Kit (REF# 743500.4). The process produces good yields of high purity DNA fragments, suitable for downstream applications (DNA sequence data not shown). The Zephyr Genomics Workstation intuitive, user friendly interface enables automated increased productivity with pre-programmed kits, requiring minimal training.

**Zephyr's small foot print fits on to a standard lab bench, requiring no special table, while offering flexibility for molecular biology applications:**

- DNA extraction
- RNA extraction
- Plasmid isolation
- PCR purification
- Sequencing reaction clean-up
- PCR setup
- Sequencing reaction setup
- DNA and RNA normalization



## Performance

### Volume Range:

High Volume Head (HVH) 1 - 200 μL

### Precision:

High Volume Head (HVH) 1 - 5 μL: CV <5%

5 - 200 μL: CV <2%

2 - 25 μL or 50 μL: CV 5%

### Weight:

75 kg (185 lbs) Base Unit

### Operating Temperature:

15 - 35 °C (59 - 95 °F)

### Operating Humidity:

0 - 85% RH, non condensing

### Air Supply:

Regulated 35 - 65 psi

### Power Input:

115 VAC, 50/60 Hz, 1000 VA max. or

230 VAC, 50/60 Hz, 1000 VA max.

## Caliper Life Sciences

Part No.	Description
125282	Zephyr Genomics Workstation with HV Head - 110V
125283	Zephyr Genomics Workstation with HV Head - 220V
119728	Optional Zephyr Environmental Enclosure
122000	LabChip GX Analyzer

## What's included with your Zephyr GW

- PC controller and monitor
- Vacuum filtration station and pump
- Waste bottle
- Plate/lid gripper
- Ultrasonic detector
- Genomics Workstation GUI and Maestro software
- Startup Kit