

NucleoSpin® 96 PCR Clean-up

Automated high throughput PCR clean-up DNA using silica membrane-based kits with Waters™ liquid handling robot Andrew+™ and Extraction+™ vacuum module

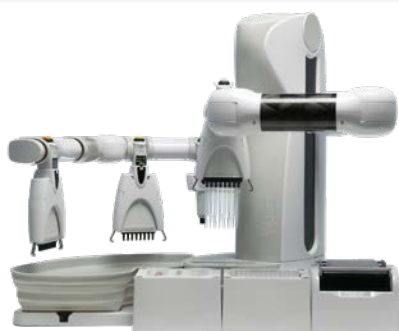
Application benefits

Elevate your nucleic acid purification processes using MACHEREY-NAGEL's DNA/RNA purification kits in conjunction with Waters Andrew+ automated liquid handling system:

- Flexible sample numbers: process up to 96 samples in parallel
- Consistent recovery of PCR products ensuring reliable reproducibility in both yield and purity
- For any questions regarding reagents or automation support please contact: support@mn-net.com

Keywords

PCR clean-up, enzymatic reaction, nucleic acid extraction, automated DNA purification, liquid handling system, molecular cloning, high recovery, high-yield



Andrew+

The Andrew+ offers versatility through the incorporation of various modules, pipettes, gripper and vacuum chamber. The configuration allows for the processing of silica-membrane-based NucleoSpin® 96 DNA/RNA as well as NucleoBond® Midi extraction kits.

Introduction

Across a wide range of scientific applications, PCR has become the gold standard for screening and detection due to its reliable results. Applications like molecular cloning, sequencing or microarrays often require PCR fragments as starting material. For most of these applications, the PCR products need to be purified.

The automation of PCR purification provides significant advances in efficiency and reliability, particularly in downstream applications where consistent, high-quality results are essential. By automating PCR purifications, researchers can considerably reduce hands-on time and increase their reproducibility.

MACHEREY-NAGEL's NucleoSpin® 96 PCR Clean-up kit offers an established method for the silica-membrane based parallel extraction of 96 samples resulting in high recoveries of DNA fragments from enzymatic reactions and PCRs. The purification procedure efficiently removes undesired components (such as detergents, primers, or PCR additives). The extracted DNA can directly be used for molecular approaches including sequencing and cloning.

In cooperation with Waters pipetting robot Andrew+ with the Extraction+ module as vacuum chamber, MACHEREY-NAGEL's NucleoSpin® 96 PCR Clean-up kit enables the automated vacuum processing of 96-well plates. This novel and optimized protocol allows high throughput PCR purifications directly suitable for cloning approaches.

Products at a glance

NucleoSpin® 96 PCR Clean-up	
Technology	Silica membrane technology
Sample material	< 100 µL PCR reaction mixture
Target molecules	DNA (PCR products)
Typical recovery	75 – 95 %
Preparation time	Approx. 90 – 100 min/plate

Andrew+

Technology	Automated liquid handling utilizing wireless connected electronic pipettes and a dynamic deck configuration consisting of up to 11 dominos on a conventional bench space. Protocol execution via the OneLab™ software.
Sample numbers	1 – 96 samples
Deck position	For vacuum applications using the Extraction+ module consisting of a remote connected vacuum pump, manifold for SPE processing and gripper.

Material and methods

The direct clean-up of PCR reaction mixtures was carried out utilizing MACHEREY-NAGEL's NucleoSpin® 96 PCR Clean-up kit on an Andrew+ platform using the vacuum module Waters Extraction+.

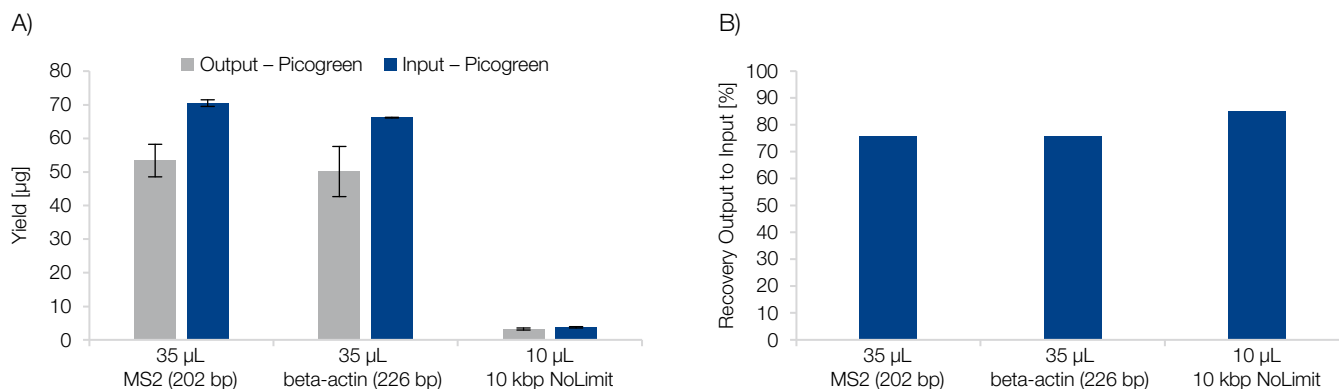
The biologically-verified protocol allows for flexibility in sample numbers, accommodating 8 – 96 purifications per run. The processing on the Andrew+ requires no manual intervention. All pipetting steps were carried out by the Andrew+, utilizing the Extraction+ module for all vacuum filtration steps.

Briefly, 200 µL Buffer NT were added to each well of the NucleoSpin® PCR Clean-up Binding Plate. The samples of the reaction mixtures were adjusted to a final volume of 100 µL, transferred to the NucleoSpin® PCR Clean-up Binding Plate, mixed by pipetting and filtered via vacuum using the Extraction+. After binding DNA to the silica membrane, high purity DNA products are achieved by complete removal of salts, proteins, or primers, primer-dimers, and nucleotides in subsequent washing steps. The highly purified DNA products are eluted under low ionic strength conditions using a slightly alkaline elution buffer

Application data

Excellent recovery of small and large PCR products

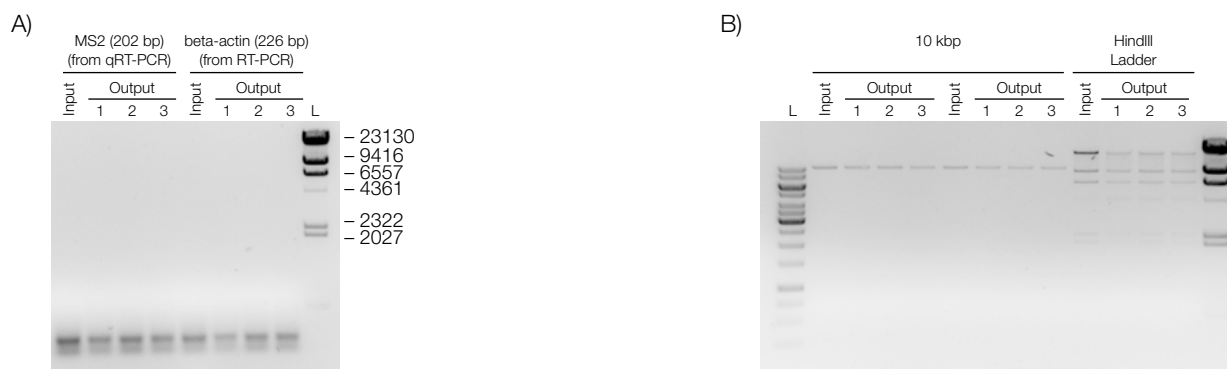
The NucleoSpin® 96 PCR Clean-up kit and the Andrew+ combine the benefits of high-quality clean-ups of DNA products from PCRs and enzymatic reactions with a user-friendly and automated system. The combination is suitable for a wide range of sizes of DNA fragments resulting in high yields and recoveries.



High recovery of small and large PCR fragments

PCR fragments were purified from MS2 RNA qRT-PCR (202 bp), beta-actin qPCR from human blood (226 bp) and 10 kb DNA (NoLimit) fragment. Automated PCR clean-up was performed on the Andrew+ using the NucleoSpin® 96 PCR Clean-up kit. DNA yield (A) from PCR input was measured using Picogreen and compared against the clean-up. DNA recovery (%) was calculated by yield of PCR input and output (B).

Reliable recovery of different fragment sizes



Reliable purification of DNA fragments of varying sizes

DNA fragments from MS2 RNA qRT-PCR (202 bp) (A), beta-actin qPCR from human blood (226 bp) (A), 10 kb DNA fragment (NoLimit) (B) and a HindIII Ladder (B) were isolated using the NucleoSpin® 96 PCR Clean-up kit on the Andrew+. DNA integrity on an agarose gel (A, B) show a reliable extraction of DNA fragments of different sizes.

Speed up and automate your PCR Clean-up

MACHEREY-NAGEL and Andrew+ deliver an automated solution for your high throughput clean-ups of DNA fragments from PCRs and enzymatic reactions. We adapted the NucleoSpin® 96 PCR Clean-up kit on the Andrew+ using the Extraction+ vacuum module to speed up your nucleic acid purification workflow.

- Flexible sample numbers (multiple of 8) and fast processing of 96 samples within 100 minutes.
- Reliable performance and excellent recoveries using NucleoSpin® 96 PCR Clean-up kit on the Andrew+ robot.

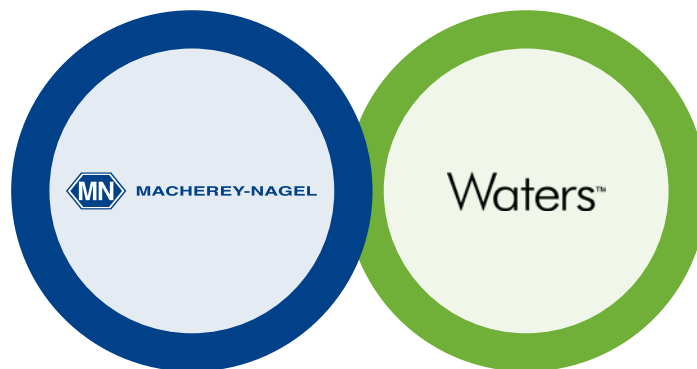
Andrew+ and MACHEREY-NAGEL as strong collaboration partners

The combined expertise of MACHEREY-NAGEL and the Andrew+ robot allowed the establishment of fully automated solutions for high-quality nucleic acid purifications. MACHEREY-NAGEL's NucleoSpin® and NucleoBond® technology enable rapid and easy nucleic acid purifications. Waters OneLab software offers a complete on-screen, step by step guide through the protocol and allows to track each protocol step. Together, we have established several solutions for fully automated genomic DNA extraction and plasmid DNA extractions from Mini to Midi formats.

For more information, please have a look at our partner pages.



www.mn-net.com/andrew



www.waters.com/labautomation

Want to schedule an e-demo?
Need additional information?
Contact the MN technical support!
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Ordering information

Product	Specifications	Pack of	REF
NucleoSpin® 96 PCR Clean-up	Silica membrane-based kit for the clean-up of DNA from PCRs and enzymatic reactions, including NucleoSpin® PCR Clean-up Binding Plate, elution plates, wash plates and buffers	1 × 96 / 2 × 96 / 4 × 96 / 24 × 96	740658.1 / .2 / .4 / .24
Andrew+ Pipetting Robot*	Automated liquid handling system for precise and reproducible pipetting workflows	1	176005081
Extraction+ module*	Vacuum-based module enabling automated filtration and nucleic acid purification	1	176005201

* For more detailed information, please visit onelab.com/library.
To contact Waters, please visit www.waters.com/labautomation.

www.mn-net.com

MACHEREY-NAGEL



Management System
EN ISO 13485:2016
ISO 9001:2015

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