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FAQ - Filter Plates

What Thermo Fisher Scientific products do you recommend for high-throughput, plate-based DNA plasmid minipreps?

- 2mL DeepWell sterile (growth plate), Cat. No. 278743
- 96 well Lid (cover plate during growth), Cat. No. 264122
- Polyolefin Sealing Tape (cover plate during mixing), Cat. No. 232701
- Fritted Filter Plate (lysate clarification), Cat. No. 278011
- Glass Fibre Filter Plate (DNA binding), Cat. No. 278010
- 1mL DeepWell (reception plate), Cat. No. 260252

Where can I get the protocol for Plasmid DNA Purification using Thermo Scientific Nunc DeepWell Filter Plates?
It comes with every case of Thermo Scientific Nunc Glass Fibre Filter Plates, Cat. No. 278010. It can also be obtained on www.thermoscientific.com.

Do I have to follow the recommended Thermo Fisher Scientific protocol exactly?
The protocol is designed to be flexible, depending on customer needs and instrumentation. For example, certain steps can be performed with vacuum filtration, centrifugation, or positive pressure, with similar results. We do recommend that customers use our formulas for buffers and solutions, since they were maximized to produce superior results.

I assume the plates can be used for applications other than plasmid preps. Any examples?
Yes, the plates will find multiple uses.

The Unfritted plate can be customized for a wide variety of column or filter applications. For instance, end users may insert their own filters or packing material. In one case, an academic customer told us he'd like to pack small plugs of cotton in the bottom if each well, then layer Sephadex over the top. This is a filtration material that can be used to filter out unincorporated radio nucleotides from labeled probes. To make such columns cheaply, researcher sometimes put the filtration material inside a syringe, which is then spun in a centrifuge. For high-throughput applications, the researcher can now make multiple homemade columns in a frit plate, and spin the plate to filter out free radioactivity from multiple labeled nucleotides.

Others may wish to filter out crude lysate or precipitate in the Fritted plate. We already had requests from customers wishing to perform such operations using a number of different samples and a variety of liquids. For general removal of crude material, we suggest the customer start with the Fritted plate and perform some evaluation studies. Likely, the customer can use the plate directly, with some protocol optimization.

Our R&D team is looking at new protocols to promote in our standard plate offering. We will promote and help support those protocols once the technique is tested and proved by R&D, and we have supporting documents, literature, and training to support those protocols.

Are the plates chemically resistant?
Yes. The polypropylene plate naturally resists chemicals and organic solvents, as does the polyethylene frit and glass fiber filter. For very strong chemicals, prolonged exposure times, and/or higher temperatures, we recommend that the customer test the plates with the chemical or solution in question.

What centrifuges can be used? Are any of them robotic-compatible?
Several manufacturers make microplate DeepWell rotors, which can hold tall microplate filter systems or stacks of microplates:

- Kendro (Sorvall) Legend RT with Highplate rotor
- Beckman
- IEC
- Jouan
- And others

What vacuum device can be used?
R&D reports that any vacuum manifold (for 96 well microplates) with 4cm depth or more inside should be OK.

What are the names of some equipment companies that offer automation, vacuum filtration or positive pressure devices for processing filter plates?

- Apricot Designs
- Beckman
- Brooks-PRI Automation
- CyBio
- Eppendorf
- Flushtec
- Genomic Solutions, Inc.
- Hamilton
- Mettler Toledo
- MWG Biotech
- PION
- Protedyne
- Sias
- Tecan
- TekCel
- Titertek
- Zymark

Most of the above companies have been notified of our new Nunc™ Filter Plates, and many of them were approached to test our Filter Plates on their systems. Some have already reported that automation will not be a problem. The overall feedback is that the Filter Plates are automation-friendly because of their standard footprint. Also, the plates can be processed with vacuum filtration of positive pressure with little or no modification of existing instrumentation.

What advantages do Thermo Fisher Scientific have over other Filter Plate suppliers?
Our advantages include:

- **Polypropylene (PP):** Chemical resistant versus polystyrene. Also, PP resists binding sample – in other words, sample binds to the filter, where it should, and not to the sides of the wall. Or, in cases where precipitant is being removed, the clarified sample passes through the filter and plate with little or no sticking to the walls.
- **Round well design**: Inherently stronger than square wall design.
- **Shared wall technology:** Wider wells mean more sample in small footprint, and also wider diameter filters that are faster flowing and slower to clog. The filter plates are also compatible with our DeepWell™ Plates, which also use shared wall technology.
- **Price:** Unlike some others, we do not force customers to purchase expensive buffers and reagents that they can make inexpensively and easily in the lab. In comparison to competitors, which also offers stand-alone product (not in a kit), our Glass Fibre Plate is competitive with their price, and we are substantially below the price of their lysate clarification plate.
- **Commitment to customization:** The Unfritted plate is unique, and it speaks to our desire to promote customization. The resources in place at Thermo Fisher Scientific to address new applications and filter/frit materials also attest this.

In the protocol the vacuum pressure is measured by in. HG. How do I convert that to mbar?
29,936 in. HG equals to 1,013 bars. That means, that -5 to -10 in. Hg equals to -170 to -340 mbar and -15 to -20 in. Hg equals to -500 to -680 mbar low pressure.

Is this product more suitable for academics than for pharma/biotech, or vice versa?
The Filter Plates will find applications in academia, government institutions, pharma/biotech, and other research labs. Academic labs will be happy to replace manual DNA plasmid mini-preps. Buying the plates and filter plates in bulk will save much money, and academics will be happy to prepare the reagents and buffers in the lab, saving much extra money. The Filter Plates can also be used in high-throughput, are stackable, robotic-friendly, and feature a standard footprint, for pharma/biotech customers.

What are some key qualifying questions to see if the plates fit my applications?

1. **Are you currently using expensive DNA plasmid prep filter plate kits that force you to pay for buffers and reagents?**
   As a former researcher, I routinely used filter kits for DNA plasmid preps. My lab could make stock solutions of the buffers and reagents cheaply from common ingredients, but when I tried to buy just the filters, the companies said I had to buy the reagents as well! I knew they were charging a premium for the buffers and solutions, so I felt "hand-cuffed" into paying more than I wanted. By offering customers the ability to buy the Filter Plates and plates outside a kit, labs can make stock solutions of the reagents, saving much money.

2. **Do you perform lots of manual plasmid DNA mini-preps, for instance, using 1.5mL flipcap micro-centrifuge tubes?**
   This method, using micro-centrifuge tubes and "home-made" ingredients, is relatively inexpensive. However, it is very manual and time-consuming. Also, repetitive injury can result from continuous pipetting and opening/closing of micro-centrifuge tubes. 1mL Filter Plates process 96 samples in much less time, without micro-centrifuge tubes.

3. **Do you use phenol/chloroform extractions and ethanol precipitation for your plasmid DNA minipreps?**
   For many "home-made" systems, phenol/chloroform is used to remove protein and contaminants from the plasmid DNA. However, phenol is caustic, can cause serious skin lesions and eye damage, and must be disposed of properly. Chloroform is also dangerous and flammable. Finally, ethanol precipitations are cumbersome and time-intensive. If residual ethanol remains, it can hamper downstream applications. 1mL Filter Plates avoid these chemicals. Bacterial Lysate clarification using the Fritted Plate replaces phenol/chloroform extraction, while DNA binding and elution on the Glass Fibre Filter Plate replaces ethanol precipitation.

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