

LOW DNA BINDING PRODUCTS



Low DNA Binding Products

Azenta Life Sciences offer low binding products as the recommended plates for sensitive applications including Next Generation Sequencing (NGS) sample prep. Manufactured using selected low-bind polymers, DNA loss is minimized during incubation and sample transfer, making it the ideal solution for use in applications with low DNA input.

Smarter Plastics For Advanced Applications

Polypropylene (PP) is the ideal plastic material for PCR tubes as PP is chemically inert, resistant to solvents, and well suited for injection moulding - allowing for production of thin-walled tubes for optimum PCR results.

DNA has been shown to bind to PP tubes especially at high ionic strength, despite the very hydrophobic nature of this material. Different PP polymers are used for the production of PCR consumables and as they differ in their characteristics including surface charges, they consequently bind DNA in varying amounts.

DNA binding to PP surfaces has typically only been an issue for reaction tubes and storage vessels but not for PCR/qPCR tubes. DNA sticking to tube walls is either released during denaturation steps and/or remains accessible for amplification. Nevertheless, due to an increase in volume miniaturisation and with innovative technologies such as NGS, PCR/qPCR tubes are increasingly recommended for other applications which may require ultra-low DNA binding.

- Maximum nucleic acid sample recovery after incubation
- No chemical additives or coatings used to achieve low binding characteristics
- Better plastic consumables for wider use in more applications
- Several suitable plate formats available (other formats available on request)

Quality Standard

Azenta performs visual, physical and biological tests to ensure the integrity of our consumables and that they are contamination free at all times.

- Consumables are certified free from human genomic DNA, nucleases and pyrogens
- Skirted microplates and PCR plates meet the SBS standard footprint
- PCR inhibition tests are performed on polymers used
- Leak tests are performed on every well of every PCR plate
- White-well plates are checked for background fluorescence

Experimental Data

Tenfold dilution series of a 1.1 kb linear DNA fragment (Fig. 1) and mouse genomic DNA (Fig. 2) were applied to a PCR plate and incubated for 30 minutes. The DNA was afterwards transferred to the next row of the plate for additional 30 minute incubation. This procedure was repeated seven times so that the DNA was consecutively incubated in 8 different tubes for a total of 240 minutes.

The DNA was subsequently subjected to qPCR analysis and compared to the original dilution series. Average Ct values obtained from the different DNA concentrations are shown.

Fig. 1 Binding of linear DNA to different PP polymers - qPCR comparison

Result:

Azenta low binding material showed no significant loss of DNA after incubation while alternative materials and low binding plates from competitors revealed a loss of DNA at low DNA starting concentration, indicated by a delayed Ct value.

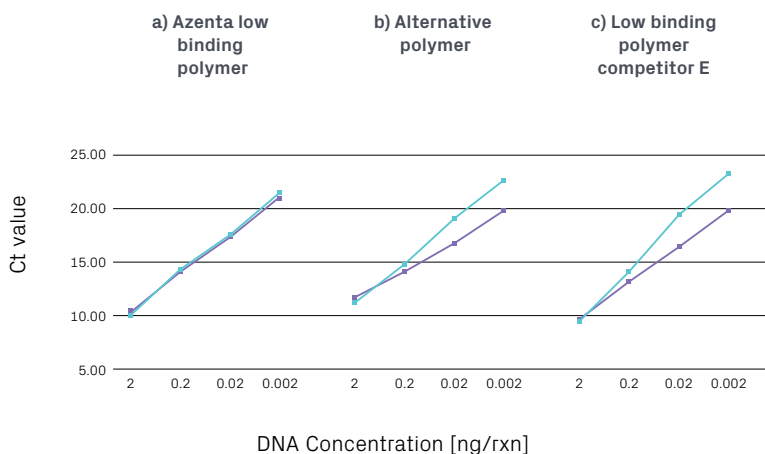
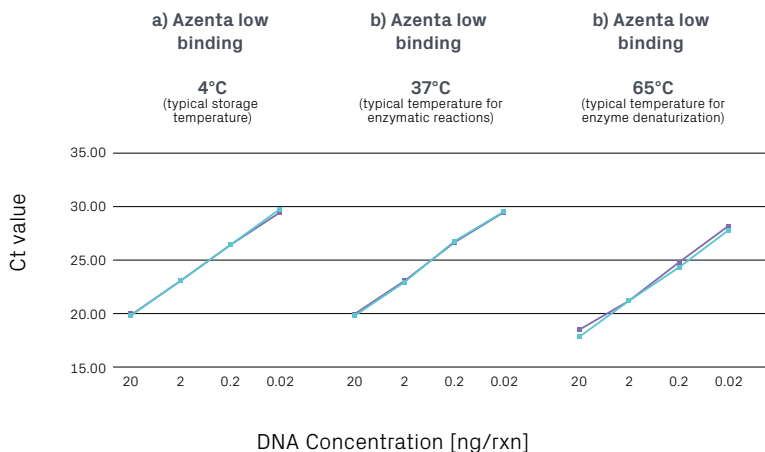


Fig. 2 Binding of genomic DNA to Azenta low binding PP polymer at different temperatures - qPCR comparison

Result:

Azenta low binding material showed no significant DNA loss after incubation at three different temperatures.



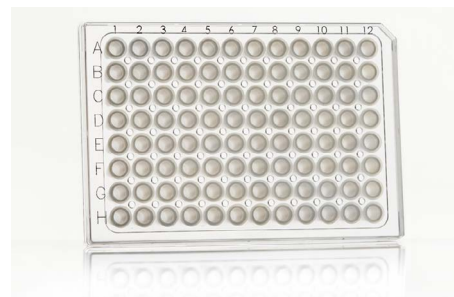
Azenta low binding products are perfectly suited for sensitive applications with low DNA input such as NGS sample preparation.

FrameStar Low Binding Plates

Select FrameStar® plates frequently used for NGS sample prep applications are available as low binding plates.

FrameStar 96 Well Semi-Skirted PCR Plate, ABI® Style, Low Binding (AF4ti-LB0770/C)

- Designed for use on standard thermal cyclers including ABI® instruments.
- Standard profile, 0.25 ml clear polypropylene wells, clear polycarbonate frame, cut corner at A12.
- Designed for use with this plate: FrameStar 96 Lid (4ti-0289) to efficiently protect samples from contamination and evaporation.



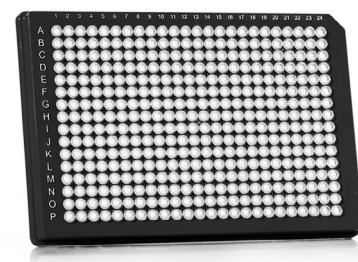
FrameStar 96 Well Skirted PCR Plate, Extra Rigid, Low Binding (AF4ti-LB0960/RIG)

- Popular fully skirted plate with broad instrumentation compatibility, especially suitable for use in plate handling robots, tested on PerkinElmer® automation systems.
- Low profile, 0.15 ml clear polypropylene wells, black polycarbonate frame with extra rigid skirt, cut corner at H1.
- Designed for use with this plate: FrameStar 96 NGS Lid (4ti-0287) to efficiently protect samples from contamination and evaporation.



FrameStar 384 Well Skirted PCR Plate, Extra Rigid, Low Binding (AF4ti-LB0384/RIG)

- Low profile, clear polypropylene wells, black polycarbonate frame with extra rigid skirt, cut corner at A24.
- Compatible with various seals including Azenta Clear Heat Seal, PCR clear adhesive Seal and Thermal Bond Heat Seal.



Ordering Information

| AF4ti-LB0770/C | FrameStar 96 Well Semi-Skirted PCR Plate , ABI style, clear PP wells, clear PC frame, low binding, high profile, cut corner A12, 50 plates per case |
|-------------------------|---|
| AF4ti-LB0960/RIG | FrameStar 96 Well Skirted PCR Plate , clear PP wells, black PC frame, extra rigid, low binding, low profile, cut corner H1, 50 plates per case |
| AF4ti-LB0384/RIG | FrameStar 384 Well Skirted PCR Plate , clear PP wells, black PC frame, extra rigid, low binding, low profile, cut corner A24, 50 plates per case |
| Related Products | |
| AF4ti-0289 | FrameStar 96 Lid , without condensation rings, clear, low profile, cut corner A12, for use with 4ti-0770, 50 lids per case |
| AF4ti-0287 | FrameStar 96 Next Generation Sequencing Lid , with condensation rings, clear, low profile, cut corner H12, for use with 4ti-0960/RIG, 50 lids per case |

Features of FrameStar Two-Component PCR Plates

FrameStar PCR plates prevent sample loss by minimising thermal expansion during PCR, enabling reductions in PCR volumes and cost savings on reagents.

Their two-component design combines the advantages of thin-walled polypropylene (PP) tubes, for optimum PCR results, with a rigid polycarbonate skirt and deck for highest thermal stability and rigidity making them the plates of choice for any robotic workflows.

- Seven frame colors with clear, frosted or white tubes available - Flexible solutions for every application
- Stable polycarbonate frame - Reliable use with stackers and liquid handlers
- Minimized thermal expansion - Reduced evaporation for improved consistency of PCR

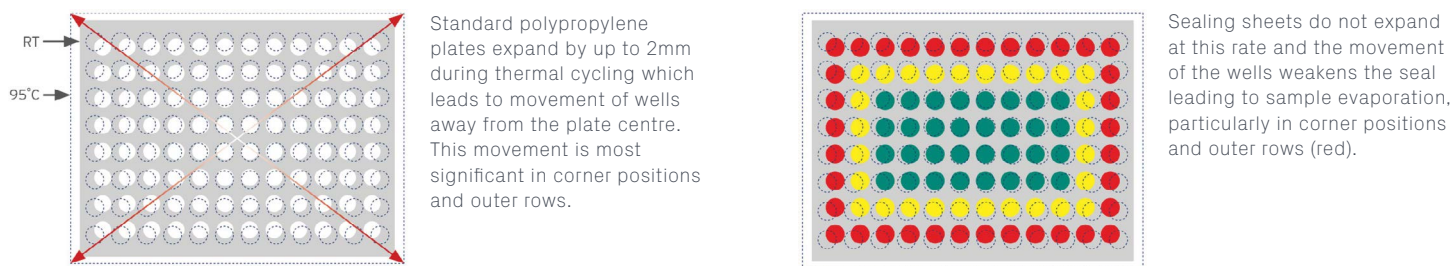


Fig. 3 Evaporation from standard one-component polypropylene PCR plates

Our FrameStar two-component technology reduces evaporation from PCR plates, improving your results and allowing you to reduce the volume of expensive reagents to save you money.

Low Binding Microplates

The 96 Deep Well Storage Microplate is optimized for use with magnetic separators which can be a crucial step for DNA loss and maximum recovery of nucleic acids.

96 Deep Well Storage Microplate, for use with magnetic separators, Low Binding (AF4ti-LB0125)

- Designed for use with magnetic separators for bead separation protocols
- 1.0 ml round wells, V-shaped base, clear polypropylene
- Replaces the "96-well storage plates, round well, 0.8 ml (MIDI plate, Thermo Scientific™ Abgene™ part number AB0859)", in e.g. Illumina® protocols
- Designed for use with this plate: 96 Round Well Sealing Cap Mat, clear silicone (4ti-0124) to efficiently protect samples from contamination and evaporation

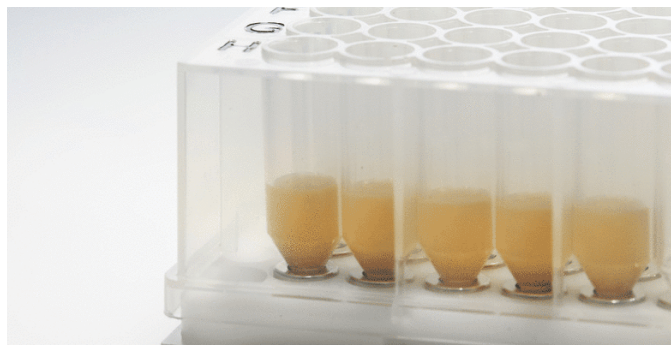
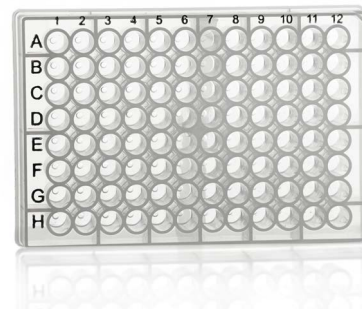
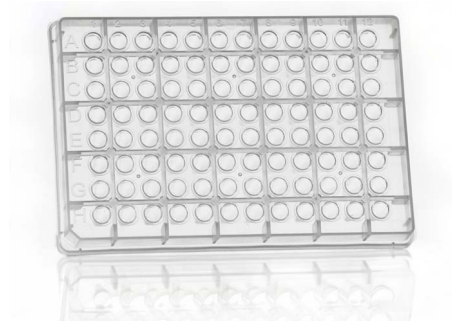


Fig. 4 Special shape of the stacking ribs - the plate sits much lower on the magnetic separator than standard round well plates thus facilitating the speed and efficiency of the separation process.

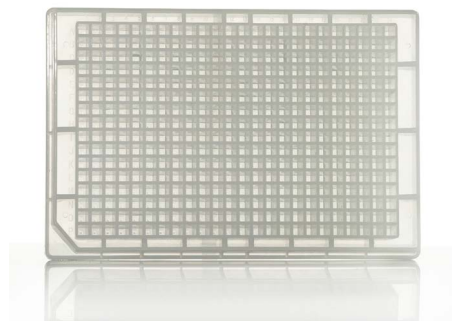
96 Round Well Microplate, low binding, (AF4ti-LB0109)

- 0.2 ml round wells, conical V-shaped base
- Clear polypropylene, low binding
- Suitable for adhesive and heat sealing



384 Square Deep Well Storage Microplate (AF4ti-LB0147)

- 0.19 ml square wells, V-shaped base
- Clear polypropylene, low binding
- Designed for high density sample collection and storage
- Suitable for adhesive and heat sealing



Ordering Information

| | |
|-------------------------|---|
| AF4ti-LB0125 | 96 Round Deep Well Storage Microplate , for magnetic separators, low binding, 1.0ml round wells, V-shaped bottom, clear PP, 50 plates per case |
| AF4ti-LB0109 | 96 Round Well Microplate , low binding, 200ul round wells, V-shaped bottom, clear PP, 50 plates per case |
| AF4ti-LB0147 | 384 Square Deep Well Storage Microplate , 190ul square wells, V-shaped bottom, clear PP, 100 plates per case |
| Related Products | |
| AF4ti-0124 | 96 Round well Sealing Cap Mat , clear silicone, for use with 4ti-0125, 50 mats per case |

Next Generation Sequencing

Sample preparation for Next Generation Sequencing (NGS) requires a variety of different strips, plates and seals. Suppliers of NGS sample prep kits typically have recommendations for these items in their manuals. Azenta supply researchers worldwide with perfect solutions especially for fully automated workflows requiring additional storage and reagent plates.

4ti-0960/RIG and 4ti-0125 are frequently part of consumable solutions we offer for NGS workflows. The low binding versions offer advantages especially for this sensitive workflow.

Sealing Solutions

Azenta Life Sciences offer a wide range of plate sealing solutions, allowing choice between sealing with individual caps, strip caps, lids, mats, adhesive seals and heat seals.

Within both our adhesive seal and heat seal ranges we offer a wide selection of materials to choose from, dependant on the application requirements. Choose your seal based on a wide variety of properties offered, including gas permeability, optical clarity, temperature stability, solvent resistance as well as being peelable or pierceable.

Most seals are available in both sheet and roll format for manual, semi-automated and automated heat sealer use.



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