Technical: Microplate Sealing

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About Microplate Sealing

A Microtitre plate or MicroPlate (sometimes referred to as a MicroWell plate) is a flat plate with multiple wells used as small test tubes. MicroPlates have become a standard tool in analytical research and clinical diagnostic testing laboratories, which comply with standards established by the Society of Bimolecular Sciences (SBS). They are used in virtually every Life Sciences application involving filtration, separation, optical detection, storage, reaction, mixing, incubation or cell culture, as they simplify the handling of large numbers of samples and enable automation.

A MicroPlate typically has 6, 24, 96, 384 or even 1536 sample wells arranged in a 2:3 rectangular matrix. Depending on the application, different types of plates are available which differ in volume, base shape and material. Typically, each well holds between tens of nanolitres to several millilitres of liquid.

Since practically every experiment includes incubation or and/or necessitates sample storage, it is essential that plates can be securely sealed in order to avoid contamination and evaporation. Several types of sealing systems are available and different techniques used including heat sealing, adhesive closure, sealing mats and lids.

Compatibility between MicroPlate and sealing process and materials is paramount, therefore the appropriate parameters must be understood and the limitations of both sealing options and the plates themselves appreciated.

IST Scientific provides expert advice in effectively helping you choose the right seal for the right plate in the right application, in the most cost effective way.

MicroPlate Materials

The material from which MicroPlates are made differs according to their application.

Polypropylene is favoured for incubation and sample storage because of its high resilience to chemicals and temperature, particularly thermo cycling. Different sealing options can also be used with polypropylene – especially heat sealing.

Polystyrene is used for most optical detection MicroPlates. Polycarbonate is inexpensive, generally used for disposable MicroPlates for PCR (polymerase chain reaction) – a method of DNA amplification. Cyclo-olefin copolymers (COC) are now being used to transmit UV light.

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MicroPlate Materials

Different sizes and types of plate bases, coupled with the correct selection of purity of plastic grades, including 'low binding' variants, influence the type of application and ultimately, the seal that will be achieved.

Useful tips

- Only MicroPlates that comply with standards established by the Society of Bimolecular Sciences (SBS) should be used.
- Raised chimneys around each well produce the best results.
- MicroPlates that have a raised rim close to the perimeter of the wells should be avoided. This can prevent uniform contact between the hot plate and the wells.
- For flexible MicroPlates which could bend and move during the sealing process, adapter trays to stabilise the MicroPlate position on the plate stage should be used. For example, a flexible 96-well polypropylene MicroPlate can be placed on top of a 96-well polystyrene MicroPlate to provide positional support.

PCR Adapter Plate

Because of the rigorous nature of the PCR process, we offer an adapter tray for PCR MicroPlate support. This ensures integrity and supports optimum results during denaturation, annealing and extension, which are carried out 20-35 times in a thermal cycler to produce replicates of the DNA template.

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