

Automated Thermal Sealer – General Guidance

This document aims to provide general guidance to aid thermal sealing. More specific information on using the Automated Thermal Sealer can be found in the X-Seal Automated Thermal Sealer Operating Instructions.

GETTING THE BEST QUALITY THERMAL SEAL

There are many elements to consider, including the types of seal and plate used.

- Optimal sealing is obtained when using microplates specifically designed for thermal sealing and automated use. Plates with raised chimneys (the top of the well rises above the plate surface) work particularly well.
- Contact between the sealer and the wells can be compromised if the plate has an elevated rim, higher than the chimneys
- Although differing types of microplates can be used, those manufactured from polypropylene tend to produce the most reliable seal. Do not use acrylic versions.
- The Automated Thermal Sealer is able to automatically adjust to accommodate plates of differing heights; however adapters are available to support pliable microplates (traditional frameless PCR plates, for example).
- Comparable microplates sourced from different manufacturers may perform differently. Some molding techniques can result in gaps, ridges, and minor imperfections that could impact on the sealing process and increase the chance of sample contamination.
- Altering the sealing temperature and time according to the type of plate and seal used can help to obtain the best seal quality. (See FluidX Technical Bulletin - DMSO Resistant Peel-Seal Data - for examples).



CHECKING SEAL INTEGRITY

- After the test microplate has been sealed, wait until the seal has cooled so that it is safe to handle. However, some seals are designed to create a permanent seal; these should be checked as soon as possible as the seal could prove difficult to remove if left.
- Remove the seal. To demonstrate an effective seal, there will be imprints from the wells on the bottom of the seal. Look for complete even imprints on every well. Any gaps in the imprints would indicate a potential site for leakage.
- If gaps are seen then the seal quality should be improved by increasing either the seal temperature or seal time.
- Many new users start off with the sealing temperature or duration set too high which can lead to microplate damage and prevent successful resealing in the future. Excessive seal temperature or time is indicated when the well imprints are considerably wider than the chimneys. The seal temperature or time should be reduced as these seals can prove difficult to remove and reseal at a later stage.

FURTHER INFORMATION

- The amount of times a microplate can be sealed and resealed can be increased by using the minimal amount of temperature and seal time to prevent chimney damage.
- Sealed microplates that have been stored in a fridge or freezer do not always have to be brought back to room temperature before peeling e.g. FluidX EZ Peel, a peelable heat seal for polypropylene plates. (See the complete FluidX range for more information).
- FluidX has not yet tested seals from alternative suppliers and therefore is unable to make recommendations regarding their usage..
- To prevent the risk of cross-contamination between wells when removing a peelable seal, consider using one that can be pierced. Centrifuging before removal may also be beneficial.



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