

Technical: Heat Sealing

About Heat Sealing

Heat sealing has become the preferred method of sealing MicroPlates. It creates an airtight and chemically-resistant seal without the complications of using adhesives for the application. Sealing the wells protects the contents from evaporation, condensation, oxidation and cross-contamination during transport or storage.

IST Scientific has a comprehensive range of high performance heat sealing MicroPlate films and foils to meet the needs of the life science laboratory. These are available in individual sheets (LabSheet™) or rolls (LabRoll™) for low, medium and high throughput applications.

Heat Seals

Films or foils are welded to the MicroPlates using heat-sealing devices to produce a secure and effective seal, normally to raised rims around the individual wells of the MicroPlate.

Heat seals are available in a range of materials suitable for peeling, piercing, storage, transport and temporary or long-term sealing. Seals that can withstand sub-zero or high temperatures are also available.

Specifying MicroPlates

Firstly, it is crucial to specify thermal seal-friendly MicroPlates. Seal quality depends on many factors including MicroPlate design, material, batch-to-batch consistency and various other physical features.

Only MicroPlates compliant with standards established by the Society of Bimolecular Sciences (SBS), should be used. SBS plates are STD 96, 384 and 1536 well formats, including deep well and PCR MicroPlates. **skirtless** and **half-skirted** PCR plates require plate supports. Raised rims around each well produce the best results.

MicroPlates produced from polypropylene offer the most effective and reliable heat seal. Other heat seals, however, are designed to be compatible with other specific polymer substrates such as polystyrene and COC. Avoid acrylic MicroPlates because they are not compatible with thermal MicroPlate sealing.

The Heat Sealing Process

Specifying the correct heat and dwell time ratios are critical to a good seal in order to ensure secure incubation and storage as well as easy subsequent removal (pierceable seals could have a tendency to adhere permanently to the MicroPlate) Even and complete sealing rims are a hallmark of closure integrity.

To optimise the process, start by carefully peeling off the seal material by lifting one of the corners. Inspect the underside of the removed material. If there are unbroken impressions of each well, the MicroPlate was properly sealed.

The well impression should match the thickness of the chimney wall.

If the well impressions on the seal are significantly thicker than the chimney wall, decrease the sealing temperature or the dwell time.

Thick impressions may indicate excessive melting of the seal, resulting in difficult removal and reduced resealing capacity.

Heat Sealing Devices

IST Scientific's HeatSealer is a small footprint, semi-automatic table top model designed to handle SBS format MicroPlates.

Devices for heat sealing MicroPlates are available from a number of different manufacturers. They differ from device to device: some take individual sheets whilst others use rolls; some are designed for only certain manufacturer's plates – with inserts, support frames or adapter plates required for other plates. Manual and automatic types are also available.