MICROSOLV

Zone Free Sealing Film Piercing and Resealing Behavior – Tech Information

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The Zone-Free™ sealing film is designed to improve microplate sample handling by preventing adhesive interference, enhancing chemical compatibility, and supporting automated liquid-handling workflows. When used with autosamplers, HPLC/LCMS systems, and robotic pipetting platforms, understanding how the film behaves upon needle penetration is crucial for maintaining sample quality and workflow reliability.

Film Composition and Piercing Characteristics

Zone-Free™ sealing film is constructed from a 70 µm–thick polyethylene membrane engineered for easy penetration by a variety of laboratory devices, including:

- Single- and multichannel pipettes
- Robotic probes
- Autosampler needles used in HPLC and LCMS
- General handheld pipettors

Because polyethylene is flexible and puncture-responsive, the film allows tools to pass through without excessive resistance, reducing the likelihood of bent needles or pressure-related sampling errors.

No Adhesive in the Aperture Zone

A key feature of Zone-Free™ technology is that no adhesive is applied directly over the well openings.

This design ensures:

- No adhesive contamination of samples
- Cleaner needle penetration points
- Reduced risk of adhesive residue buildup on probes, needles, or fiber assemblies

Chemical and Thermal Resistance

The polyethylene membrane demonstrates excellent inertness and chemical resistance, helping protect sample integrity when exposed to a range of solvents and laboratory atmospheres.
It is rated for operating temperature exposure from **–40 °C to 90 °C**, making it suitable for cold-storage, ambient, and moderate-temperature workflows.

Resealing Behavior After Needle Penetration

One important limitation is that **Zone-Free™** film does *not* reseal after penetration.
Once the membrane is pierced:

- The punctured well becomes open to the laboratory atmosphere.
- Evaporation control will depend on how large or ragged the puncture is.
- Repeated sample access will progressively increase exposure.

Evaporation Impact

Evaporative loss is influenced by the type of needle or tip used for penetration:

- Sharp, narrow-gauge needles leave minimal openings and therefore maintain better vapor retention.
- Larger or blunt needles create bigger puncture areas, resulting in significantly increased evaporation.

Users should evaluate needle dimensions and sampling frequency when working with volatile analytes or long autosampler queues.
Click *HERE* for U-2D™ Micro-Sample Management System ordering information

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