Radiation Resistance for Headspace Vials - Tech Information

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When considering the use of headspace autosampler vials in environments where radiation exposure is part of the process—such as short-duration sterilization, irradiation of biological materials, or similar laboratory procedures—it is important to understand the performance characteristics of borosilicate glass vials and their limitations.

Material Performance Under Radiation

MICROSOLV-brand borosilicate autosampler vials are not specifically engineered for high-radiation or industrial irradiation applications. However, in short-duration, low-to-moderate radiation exposure scenarios (such as common laboratory sterility irradiation), these vials typically retain structural integrity and do not exhibit immediate mechanical failure.

Users may expect the vials to endure:

- Brief exposures used for sterilizing samples or biologicals
- Standard laboratory radiation doses that are not prolonged or high-energy
- Minimal risk of mechanical deformation or breakage during short treatments

Potential Visual and Structural Effects

Although short irradiation periods generally do not damage vial structure, radiation may still cause:

- Discoloration
- Clouding or hazing of the glass
- Surface micro-defects that may not be visible without close inspection

These cosmetic changes do not necessarily indicate immediate failure, but they may impact suitability for optical detection methods or applications requiring clear visibility.

Not Recommended for High-Energy or Long-Duration Exposure

MICROSOLV vials **should not** be used in applications involving:

- High-energy irradiation (gamma, electron beam, etc.)
- Extended or cumulative radiation exposure
- Processes in which glass clarity, structural integrity, or chemical resistance must remain fully preserved

Under these conditions, the borosilicate glass substrate may:

- Fog or develop internal haze
- Crack or form stress fractures
- Exhibit integrity loss that may not be obvious until later handling or heating

Recommendation: Test Before Routine Use

Because radiation effects can vary by:

- dose intensity,
- exposure duration,
- wavelength/energy type, and
- application-specific conditions,

we strongly recommend:

- Testing a small quantity of vials under actual expected conditions
- Inspecting vials post-irradiation for clarity, micro-cracking, or seal degradation
- Evaluating performance in your specific analytical workflow before adopting them for routine use

This approach ensures suitability and reduces the risk of unexpected material failure.

*Click **HERE** for Headspace vial and cap ordering information and pictures*

AUTOSAMPLER
VIALS AND CAPS

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