

# Guidance on the use of UVC Sterilization Techniques with Optics

A Report from the ASC's UVC Initiative, a subcommittee of the ASC Future Practices Committee

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The ASC's UVC Initiative, in coordination with the ASC's MITC Lens Committee, has conducted research on the potential use of UVC sterilization techniques (also known as UVGI) on lenses and other optical devices. Formed shortly after the shutdown of production due to the global pandemic, the UVC Initiative has been studying the manufacturing of UVC lighting equipment and its potential use by film and television productions to sterilize equipment and sets.

The experts consulted during this research on optics included representatives from ARRI, Duclos Lenses, Panavision, and Zeiss. All of these experts concur that no optical surfaces (lenses, viewfinders, etc.) should ever be exposed to UVC irradiation for two reasons:

- 1) Glass which contains thorium or lead can be affected by UVC light. Lenses made in many decades have the potential to contain elements with thorium or lead in them. It is not viable to easily determine exactly which optical devices do or do not use these types of elements, as any given lens has the potential to contain multiple types of glass.
- 2) As thin-film anti-reflective coatings are made from a large variety of materials, and each manufacturer has their own recipe which has changed over time, it is impossible to know the exact effects of UVC exposure on all optical coatings. Because UVC light is filtered by the atmosphere and does not reach the surface of the earth, none of these coatings were specifically formulated to be UVC resistant, and its effects on them (and more broadly, most all materials) has had very little study. It is possible that UVC may have detrimental effects on some coatings, which would thereby permanently and irreparably alter the performance and character of the lens.

In addition - ARRI, Duclos, and Zeiss have issued a more stringent recommendation to refrain from exposing ANY part of a lens to UVC light, as over time it will likely degrade the paint, fluorescent markings, and potentially other optomechanical components of a lens or optical device.

Furthermore, none of these manufacturers nor members of these committees see any need to risk UVC damage to optical components since isopropyl alcohol is an EPA List-N approved disinfectant. A lens solution with 70% isopropyl is sufficient enough for sterilization, and is well-known to be safe and effective for all optical components when properly used.

The manufacturers and committees recommend that in the event that a lens should be exposed to UVC light, the lens caps should remain firmly in place, and viewfinder eyepieces (or any other optical surfaces) be protected with light-proof tape or other material to prevent exposure.

The only caveat to this broad consensus came from the Zeiss service department, who indicated that they do perform a one-time short UVC disinfection cycle before lenses leave service for their customers peace of mind. However, they were clear that while a short exposure by them to UVC every 1-2 years during regular servicing has a low risk of being harmful to their lenses, their end users should *not* attempt exposing the lenses to UVC themselves.

The UVC Initiative and Future Practices Committee both remain committed to being a resource to cinematographers and the industry at large as we all navigate the many challenges imposed by the global COVID-19 pandemic.

Authors:

Craig Kief, ASC and Al DeMayo (ASC Associate Member)  
co-chairs of the ASC UVC Initiative Subcommittee

With support and contributions from:

Jay Holben (ASC Associate Member) and Christopher Probst, ASC  
co-chair and vice chair of the ASC MITC Lens Committee

Amy Vincent, ASC and Erik Messerschmidt, ASC  
co-chairs of the ASC Future Practices Committee

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