

1 Purpose

Not many professional scientific articles or research papers dealing with the durability of optical coatings have been published. Some of them were published years ago and basically referred to the military specifications (MIL-Specs), which were the first to deal with the durability of optical coatings (see references in Sec. 11). MIL-Specs dealing with the durability of optical coatings were cancelled for use in 1997. For example, the “Notice 1 of Inactivation for a New Design” for MIL-C-48497A, dated March 14, 1997, says: “MIL-C-48497A, dated September 8, 1980, with amendment 3, dated February 21, 1995, is inactive for new designs and is no longer used, except for replacement purposes.” Those MIL-Specs dealing with the durability of optical coatings were replaced in the same year (January 9, 1997) by Appendix C and Appendix D in MIL-PRF-13830B. An announcement about the replacement was not formally declared, but even so the cancelled specifications are still frequently used.

But other available standards or specifications dealing with the same, similar, or additional durability tests that followed the MIL-Specs should not be ignored. The most important others are the International Organization of Standardization (ISO) standards: ISO 9211-3, ISO 9211-4, and ISO 9022-1, 2, 4, 6, 9, 11, 12, and 14 (see references in Sec. 11).

Thus, this report gives a general overview and useful information about the durability of optical coatings, and greater information about different durability tests for the applicable civilian and military standards and specifications. This report will allow for the quick detection of coating testing durability requirements and test conditions in MIL-Specs, military standards (MIL-STDs), ISO standards, and other standards or specifications according to the requirements defined in the relevant drawings or coating specifications.

This Spotlight is a useful tool for optical designers selecting the required coating durability properties for optical elements (Fig. 1). It is also useful for a manufacturer’s optical coating inspectors and a customer’s inspectors at all stages: development, production, and incoming inspection.

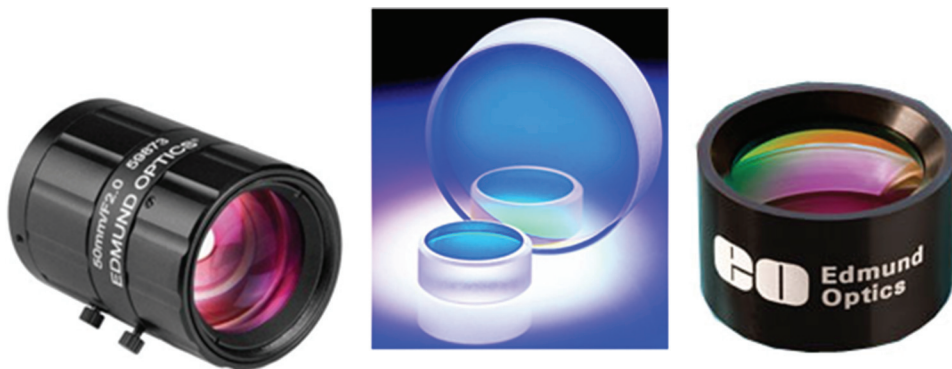


Figure 1 Optical coated elements and assembled coated optical elements. Image courtesy of Edmund Optics. All rights reserved.