Modern Optics Drawings

The ISO 10110 Companion

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Preface

The purpose of this book is to provide optical engineers, fabricators, and all parties in between a better understanding of the ISO 10110 drawing standard, and how to use the standard to create modern optical drawings. The authors presume that the reader has access to all parts of ISO 10110 and associated standards, and at least a basic familiarity with optics component technical drawings.

The world of standards is very small, and volunteer-based. Those who work on these committees are trying to do the right thing for our industry. Those few people are willing to take the time to draft, edit, and review these standards. Most of the time the result of their efforts is the result of compromise, and often it is far from perfect. Pursuit of an international standard that reflects the diversity of opinions, applications, and needs of the community comes at a price.

The first version of ISO 10110 was published in 1995 and has been the subject of multiple revisions, additions, and subtractions over the past 25 years. Today, there are twelve parts; 1, 5, 6, 7, 8, 9, 11, 12, 14, 17, 18, and 19. Because of this international effort over the past fifteen years, the ISO 10110 drawing standards have become a truly international standard reflecting the needs of the global optics community. It is vastly better today than in 1995 or 2005, and much more in harmony with US industry.

Even so, the standards can be difficult to read, more complex than we would like, and sometimes seem unfamiliar and unfriendly. We have written this book as a friendly guide to unfamiliar language, symbols, and a way of thinking about optics tolerances and specifications. However, the book is meant as a guide—not a replacement—for reading the standards themselves.

Additionally, there are a half-dozen other standards that are essential to using ISO 10110, and even more that can be used to make ISO 10110 more effective. As a result, this book is structured in chapters by subject, rather than by part of 10110, with related standards grouped within a chapter. Many practical examples are provided with a view toward a complete adoption of the methodology of standardized optics drawings including the drawing notation standards; and the metrology, environmental, and system performance test standards. It is the authors' hope that the book is readable enough to be read and understood by the uninitiated, and that the book serves as a useful reference or guide to users of the standard as they navigate the details of full implementation.

Acknowledgments

This book has been needed in the community for some time. It's incredibly important in the implementation of standards that people know how to use them. We'd first like to thank Bob Parks and Ron Kimmel for writing the previous iteration of this type of guide. Over the years, their book has been a great resource in learning the standards.

We want to thank the standards community, which has taken on the (often) thankless task of developing these standards and keeping them updated. The time and energy that has been put into these documents by a few hearty volunteers is a tribute to our community.

We want to thank the good people at ANSI, ISO, and DIN; without whom there would be no standards at all.

Throughout the development of this book, there were many people who assisted in discussions. We would like to thank Ray Williamson, Stan Schwartz, Michael Thomas, Dennis Leiner, and Daniel Gray; and the others we may have forgotten to mention.

We are grateful to Jeremy Govier, Cory Boone, Paul Smith, Mark Malburg, Eddie LaVilla, and Jim Wyant for assistance in providing necessary resources for us to create some of the figures in the book.

Mostly, we'd like to thank our partners for their patience and encouragement throughout the writing of this book. We wouldn't have been able to finish without their continuous encouragement.

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