

Approved
 ASC OP1 ASC OP/SC 1, BSR/OEOSC-OP1.002, Optics and Electro-Optical Instruments – Optical Elements and Assemblies —
 Appearance Imperfections Task Force Draft Standard Review
 Monday, October 6, 2003
 10:00 a.m. — 4:00 p.m.
 Hilton Tucson El Conquistador, Cactus Room
 10000 North Oracle Road
 Tucson, AZ 85737

Attending		Committee Members (5/17)	Representing
<input checked="" type="checkbox"/>			
<input checked="" type="checkbox"/>		David Aikens	Zygo Corporation
<input type="checkbox"/>		Sam Bailey	Davidson Optronics, Inc.
<input checked="" type="checkbox"/>		Gordon Boulton	OCLI
<input type="checkbox"/>		Walter Czajkowski	APOMA (Eastman Kodak Co.)
<input type="checkbox"/>		Frank Dombrowski	Gage-Line Technology, Inc.
<input type="checkbox"/>		Lincoln Endelman	SPIE (Endelman Enterprises)
<input checked="" type="checkbox"/>		John M. Hamilton	Northrop Grumman Corporation
<input type="checkbox"/>		Jonathan Hardis	NIST
<input type="checkbox"/>		Rudolf Hartmann	Retired
<input type="checkbox"/>		Hal Johnson	Harold Johnson Optical Lab
<input type="checkbox"/>		Yajun Li	Symbol Technologies, Inc.
<input type="checkbox"/>		Bruce Netherton	Spectra-Physics
<input type="checkbox"/>		Joseph Oberheuser	OSA (ITT)
<input checked="" type="checkbox"/>		Harvey Pollicove	COM
<input type="checkbox"/>		Kathleen Richardson	CREOL (Schott)
<input checked="" type="checkbox"/>		William Royall	Eastman Kodak Company
<input type="checkbox"/>		Peter Talke	Hikari Glass Co., LTD.
		Observers (2)	
<input checked="" type="checkbox"/>		Gene Kohlenberg	OEOSC
<input checked="" type="checkbox"/>		Alan N. Tourtlotte	OSA

Auditor’s Summary of Meeting

W. Royall rewrote the foreword of the draft and presented it for approval. It was accepted with minor modifications. Minor word-smithing of Sections 2.1 and 3.1 were accepted. The series of photo-realistic optical imperfections were examined, one-by one, and several suggestions were offered to make them more representative of what is observed on actual optical surfaces. At the end of the meeting, the completed text of the draft was ready for balloting. Ballots will be distributed with the updated draft as soon as the revised illustrations are completed.

Welcome and Introductions

J. Hamilton opened the meeting at 10:07 a.m. He dispensed with introductions because all in attendance knew each other. He thanked to OSA for providing the committee with an attendance room and refreshments.

Adoption of Agenda

G. Kohlenberg noted that Revision C of the draft standard would be reviewed at this meeting. That draft was circulated by e-mail. W. Royall moved that the draft agenda be approved as amended. G. Boulton seconded the motion. The motion carried unanimously.

Approval of the January 26, 2003, ASC OP/SC 1, BSR/OEOSC-OP1.002, Optics and Electro-Optical Instruments – Optical Elements and Assemblies — Appearance Imperfections Draft Review Minutes

The minutes had been distributed by e-mail. H. Pollicove moved that the draft minutes be approved. W. Royall seconded the motion, which carried unanimously.

Review surface imperfection standards schedule

J. Hamilton suggested that schedule become an action item list, and set an appropriate schedule. D. Aikens suggested that this item be tabled until item 7, **Re-plan experimental campaign number two, rest of project**, in the agenda. The group agreed.

Report on validation measurements

This activity is on hold.

Review experimental campaign to test magnification, lighting, and artifact

J. Hamilton stated that he is designing an experiment to determine the usability of both the army type of reference sample and the Kodak produced paddle. He stated that the project is scheduled to be completed by year-end. He asked for others to suggest additional parameters than he has already identified. The viewing station for test is complete.

Re-plan experimental campaign number two, rest of project

This item was delayed until after the review of the draft standard.

Review of BSR/OEOSC OP1.002, language

D. Aikens moved that the foreword be accepted as it appears in version 2003-4. G. Boulton seconded the motion with comments about a couple of possible typographical errors. During discussion W. Royall suggested that the third paragraph is too apologetic, and offered an alternative for the foreword.

This standard establishes uniform practices for stating, interpreting, and inspecting appearance imperfections for transmissive and reflective optical elements and assemblies. It does this by presenting the nomenclature and inspection methods of MIL-O-13830 in a voluntary standard. ~~In doing so,~~ this standard endorses methods for evaluating the appearance of these imperfections using guidelines and scales that have been used for more than half a century in the US and the world, ~~while eliminating M~~ much of the ambiguity and obsolete nomenclature of the MIL-O-13830 standard ~~has been eliminated, while retaining its scratch scale.~~

This standard will be followed by an additional standard covering the functional effects of these imperfections and the methods of specifying and evaluating them.

Suggestions for improvement...

The committee discussed leaving out the second paragraph of W. Royall's version of the foreword. The motion was defeated with one abstention.

H. Pollicove suggested that the wording in **2.1, Appearance Imperfections** be edited.

An appearance imperfection is an anomaly that appears on or in optical elements and assemblies. The four classes of appearance imperfections are area, long, ~~and~~ round, ~~and~~ edge imperfections. The following ~~is a list~~ defines of appearance imperfections pertinent to this specification:

G. Boulton moved that the edited version be adopted; W. Royall seconded the motion, which carried unanimously.

H. Pollicove also suggested rewording **3.1, General**.

Section 3 defines the requirements for specification of appearance imperfection tolerance limits ~~of appearance imperfections~~, and methods and standards for inspecting and verifying compliance with such specifications. These requirements apply to the clear aperture (ϕ_e), except for the edge specification. Where requirements are not specified on the drawing, the default limits of this standard apply.

D. Aikens moved to adopt H. Pollicove's changes; W. Royall seconded the motion. The motion was approved unanimously.

The images that appear in the annex were then evaluated image-by-image. It was noted that there is a risk of having printing imperfections in the printed image that do not appear in the electronic version of the image. The user of the standard who prints a copy from the PDF version will have to be aware that printing flaws may occur.

H. Pollicove noted that the surface chips should not be rotationally symmetric. He also suggested that the gray example should cover more of the surface of the illustrated optical element. D. Aikens asked that there be enlarged views for the coating spatter.

W. Royall suggested that the committee set a limit to the time allotted to make image modifications. After that date, we ballot the standard with the images available.

H. Pollicove suggested that some of the dig examples should be more irregular and have depth. The hairline fracture should have the same view as for the separated fracture.

The gray image should place the imperfection over a larger area nearer the edge or all over the surface. Don't show a zoomed version.

It was suggested that the Young papers be searched for images of scratches. G. Kohlenberg agreed to provide copies of the documents to D. Aikens, W. Royall, G. Boulton and H. Pollicove.

H. Pollicove suggested that **A12, Cement Bubbles, Voids, Un-dissolved Particles** and **A13, Cement Dry Spots, Blisters, Dirt** be combined. The group agreed.

J. Hamilton asked that the illustrator, Robin Pruss, be recognized for her efforts.

D. Aikens moved that J. Hamilton modify the drawings per the discussion and resubmit the drawings to the committee. W. Royall seconded the motion, which carried unanimously.

The meeting recessed at 12:33 p.m. for lunch and reconvened at 2:10 p.m.

The foreword was reviewed and edited per the marks that appear in W. Royall's version above.

G. Kohlenberg agreed to distribute the draft to the committee for balloting when the revised images are complete.

Re-plan experimental campaign number two, rest of project

There was a discussion concerning the direction that the committee should go to attack the performance spec. The problem is to determine how the imperfection affects the performance of the system being manufactured without being tied down to the mechanical characteristics of the imperfection.

- We need to determine what the optics industry needs to have standardized.
- We consider that the problem of characterization of scratches themselves is intractable.
- Look for a common language that a manufacturer and customer can use to come to agreement as to whether a part is acceptable or not.

Time and Place for next OP Meeting

The committee will attempt to complete the draft by e-mail and will meet in San Jose (two hour meeting) at the end of the week if it cannot come to agreement by e-mail. The next scheduled meeting will be in San Diego.

Adjournment

H. Pollicove moved that the meeting be adjourned. D. Aikens seconded the motion. The meeting was adjourned at 3:50 p.m.