

Draft
Minutes
ASC OP/TF 2, Performance Based Optical Imperfections Task Force Draft Standard Meeting
August 11, 2008
Marriott Hotel and Marina, Encinitas Room
333 West Harbor Drive, San Diego, CA, 92101

Present	Attendees (10 of 17 Entities)	Representing
<input checked="" type="checkbox"/>	Committee Members	
<input checked="" type="checkbox"/>	David Aikens	Savvy Optics Corporation
<input checked="" type="checkbox"/>	Gordon Boulton	JDSU Corporation
<input checked="" type="checkbox"/>	Andrei Brunfeld	Xyrtext
<input type="checkbox"/>	Benjamin Catching (Alternate)	JDSU Corporation
<input type="checkbox"/>	David Corridon	Individual
<input checked="" type="checkbox"/>	Walter Czajkowski	APOMA (Edmund Optics)
<input checked="" type="checkbox"/>	Frank Dombrowski (by phone)	Gage-Line Technology, Inc.
<input type="checkbox"/>	Marla Dowell	IEEE/LEOS (NIST)
<input type="checkbox"/>	Lincoln Endelman	SPIE, (Endelman Enterprises)
<input checked="" type="checkbox"/>	Charles Gaugh	Davidson Optronics, Inc.
<input type="checkbox"/>	Krishna Gupta	Zygo Corporation
<input type="checkbox"/>	John Hamilton	Northrop Grumman
<input type="checkbox"/>	Hal Johnson	Harold Johnson Optical Lab
<input type="checkbox"/>	Rudolf Hartman	Retired
<input checked="" type="checkbox"/>	Alan Krisiloff	Triptar Lens Co., Inc.
<input checked="" type="checkbox"/>	Jonathan McGuire (by phone)	Northrop Grumman Laser Systems
<input type="checkbox"/>	Michael Morrill	Lockheed Martin Space Systems Company
<input type="checkbox"/>	Bruce Netherton	Lockheed Martin Coherent Technologies
<input type="checkbox"/>	Sam Richman (Alternate)	Research Electro-Optics, Inc.
<input type="checkbox"/>	William Royall (by phone)	Eastman Kodak Company, Retired
<input checked="" type="checkbox"/>	Trey Turner	Research Electro-Optics, Inc.
<input type="checkbox"/>	Steve VanKerkhove	Corning Tropel
<input checked="" type="checkbox"/>	Ray Williamson	Ray Williamson Consulting
	Observers (2)	
<input checked="" type="checkbox"/>	Gene Kohlenberg	OEOSC
<input checked="" type="checkbox"/>	Ashish Mistry	FLIR Precision Optics

Auditor's Summary of Meeting

The Task Force reviewed one of its members negative vote concerning the approval of the revised OP1.002. The ballot had been missed during the TF balloting period. The same comments appeared on the OP ballot for the standard which was submitted to the membership immediately after the close of the TF balloting period. After much discussion the Task Force accepted the changes, which were deemed to be editorial in nature, and the member changed his vote from negative with comments, to positive with comments. The ballot for the entire ASC OP would continue.

An outline of a proposed one-hour overview of the scratch and dig standard was discussed by the Task Force, and editorial changes were recommended. An updated version of the overview would be presented at the next meeting.

The Task Force agreed to meet again in San Jose, CA in January during SPIE's Photonics West conference.

1. Welcome and Introductions

G. Boulton opened the meeting at 8:40 a.m. He named each person in the room and on the phone.

2. Adoption of Agenda

G. Boulton asked to add an item to the agenda. He said that A. Krisiloff has ideas for revision three of the scratch and dig standard. G. Boulton asked for a motion to approve the draft agenda. A. Krisiloff made the motion and T. Turner seconded it. The motion carried unanimously.

3. Approval of the Monday, Sunday January 20, 2008 ASC OP/SC 1, BSR/OEOSC-OP1.002, Optics and Electro-Optical Instruments – Optical Elements and Assemblies — Appearance Imperfections Draft Review Minutes

A. Brunfeld moved that the draft minutes be approved as presented; W. Czajkowski seconded the motion, which carried unanimously.

4. Review of Revised OP1.002

G. Boulton asked if there were any comments received as a result of the TF 2 or OP ballots. The Secretary said that R. Williamson had submitted comments with his OP ballot concerning making clause 3.1.6, "Rim Edges" clearer, and about some of the computer generated lens-element images in the Annex, which he believed to be incorrect. R. Williamson said that after discussion with D. Aikens, he resubmitted his OP ballot changing his vote from "no" to "yes with editorial comments." The Secretary had not included R. Williamson's TF ballot in the original tally because he had overlooked that e-mail when examining the e-mail ballots. After receiving R. Williamson's OP ballot, he went back through the collection of e-mails and found R. Williamson's TF ballot, which had been submitted with a negative vote. The Secretary said that the TF 2 ballots must be clarified, so that he knew whether he had to recall the OP ballot.

A. Krisiloff reviewed the balloting process to clarify what would have to occur in order to approve the standard. First the Task Force votes whether to approve the standard or not. If a majority of the Task Force approves the draft standard, and there are no negative votes, then the entire ASC OP is balloted. OP is the body which has to be substantially balanced by interest group in order to comply with ANSI requirements. Since R. Williamson voted negatively for the TF 2 ballot, that issue would have to be resolved before the OP ballot could be submitted. At this point, R. Williamson has agreed that his TF 2 vote should be changed from negative to positive with editorial comments with the assumption that the editorial comments will be addressed.

The Secretary said that R. Williamson now has to give him a new copy of his TF 2 ballot with his revised vote. The TF 2 ballot period ended on July 15th. The OP ballot ends on the August 20th. With a revised R. Williamson ballot, the current OP ballot can continue without change. C. Gaugh asked if every member had to vote positively. The Secretary said that only a majority of Task Force had to vote positively, but if there is a negative vote, then the Task Force has to try to resolve the issue causing the negative vote. If it cannot, then the reason why the impasse could not be resolved has to be documented.

The Secretary continued that at this point the Task Force must decide if R. Williamson's comments are editorial in nature, or are substantive. If they are substantive, then the OP ballot will have to be recalled, and the Task Force will have to deal with the changes that R. Williamson is proposing. If they are editorial, then the Task Force can make those changes and continue the OP balloting. T. Turner asked if R. Williamson had a suggested alternative wording.

R. Williamson said that his change in clause 3.16 from

"Rim Edges. Unless otherwise specified on the drawing, rim edges of optical elements shall have a $0.50^{+0}_{-0.25}$ mm \times $45^{\circ} \pm 15^{\circ}$ chamfer-face (see Figure 2). This requirement shall not be applied to elements with edges greater than or equal to 135° , unless otherwise required."

to

"Rim Edges. Unless otherwise specified on the drawing, rim edges of optical elements shall have a $0.50^{+0}_{-0.25}$ mm \times 45° nominal chamfer-face (see Figure 2). This requirement shall not be applied to elements with edges greater than or equal to 135° , unless otherwise required."

is an editorial change. The Secretary said that if they all agree that this is an editorial change, then he can make that change without re-balloting. If the Task Force does not agree with R. Williamson's proposed change, then the reason for the rejection has to be documented in the minutes and the Task Force has to vote to override the proposed change. Any members of the Task Force who are not at the meeting would also have to be given the opportunity to vote by correspondence to override the proposed change.

At this point R. Williamson presented his comments concerning clause 3.1.6. He noted that it requires a chamfer of $45^{\circ} \pm 15^{\circ}$ for "rim" edges meeting at less than 135° . Yet a single chamfer for edges meeting at 120° would require that the chamfer meet each edge at exactly 30° with no tolerance. This specification cannot be met for edges meeting at an angle greater than 120° . He noted that this is similar to the language used ever since MIL-O-13830A, but it's not clear. Further, the word "rim" implies a circumferential chamfer. MIL-O and -PRF has no advice for chamfers of other edges (with the exception of stating that silvered surfaces should have sharp edges.)

R. Williamson suggested that it state "nominal 45° " rather than $45^{\circ} \pm 15^{\circ}$. A. Brunfeld and C. Gaugh agreed that 45° is nominal.

D. Aikens said that when he was at Lawrence Livermore, they interpreted the language of that clause to specify a default chamfer for circular optics only. They had concluded that chamfers could not be required on all optics because there are instances when a sharp edge would result. A. Krisiloff summarized the discussion by saying that the phrase “unless otherwise specified” makes the 45° a default specification.

R. Williamson continued with another comment concerning clause 3.7.2.1. The figures are reversed. The Secretary saw what happened there. The figures were linked to the page rather than a paragraph because more than one figure could not fit on one page. So when editorial changes were accepted and the deleted material was removed, one of the figures jumped to the bottom of the previous page and the figures were thus out of order. The automatic figure numbering system changed the numbers for those two figures to keep the numbers in sequence. The Secretary has already corrected that.

R. Williamson said that there is one last item, figure A13 in the Annex. The computer generated image shows a physical shift of unknown origin near the bottom of the element. A similar break appears in A2. It has always been in the standard. G. Boulton said that Northrop Grumman computer generated these images. **J. McGuire said he would contact J. Hamilton to ask about the discontinuities.**

R. Williamson said that since all of his comments have been accepted he was happy to revise his TF 2 ballot to a positive vote with editorial comments. The Secretary said that these minutes will be the documentation that R. Williamson has changed his TF 2 ballot to “yes with editorial comments.” And that the Task Force has accepted those editorial comments.

At this point J. McGuire said that he would have to leave the meeting, but that he had sent an e-mail to J. Hamilton asking about the images in the Annex. G. Boulton asked J. McGuire to e-mail the Secretary any comments that he may have concerning the draft of the one-hour overview that will be discussed later in the meeting.

D. Aikens said that while the Task Force was looking at the documents he found a typographical error in clause 3.5.5. The title should say: Specifying Imperfections Smaller Than A.

F. Dombrowski asked why the caption “Figure B1 Dimensional Comparison Plate” appeared within the comparison plate. (The caption fell within the illustration automatically. A text box would have to be created so that the caption can be moved outside of the illustration.)

A. Krisiloff asked if the plate was for sale. G. Boulton said that it is an example of an artifact that a company, such as Gage-Line Technology, Inc. could manufacture. He continued that JDSU has made a similar one out of plastic to be used as a marketing tool. He hoped that his company would make more samples after this standard is approved.

F. Dombrowski suggested that other titles for the artifact could be “Scale Comparison Plate,” “Dimensional Method Comparison Plate,” “Dimensional Comparison Plate,” “Scratch/Dig Dimensional Comparison Plate,” or “Comparison Plate.” G. Boulton said that he took the title “Scale Comparison Plate” from ISO 14997. G. Boulton preferred to eliminate the scratch/dig reference because the standard can be used for pin holes.

A. Krisiloff moved that this change be approved; C. Gaugh seconded the motion. The motion passed unanimously. The Task Force recessed until 10:10.

5. Concept for New Work Item for Rev. 3 of OP1.002

G. Boulton said that A. Krisiloff had some suggestions about improvements to the standard that fell outside of the scope of the current ballot. He suggested that the ideas would more appropriately be a New Work Item which could become Revision 3. He asked A. Krisiloff to provide a conceptual overview at the current meeting. Then there could be a more detailed discussion at the next meeting. After that would come a decision as to whether to make it a New Work Item.

A. Krisiloff had reviewed the copy of OP1.002 as if he were reading it for the first time. He found that the way that the controlled imperfections were presented was confusing. In section 3.5.3 is a table that would be clearer if the “disregard scratch widths less than” column were made positive by saying that there would be a range of classifications that would be acceptable in addition to the class that may be called out specifically. He also recommended that the table be changed slightly to include the line called A_n.

A. Brunfeld said that in Table 1 if he were to have a scratch D, he would have scratches less than 2.5 μ. How does he know that they are less than 2.5 μ? G. Boulton said if it is important that they are measured with a microscope. For anything less than 10 μ a microscope is used for inspection. This table comes out of MIL-C-48497 specification. In a previous meeting the group had discussed that the numbers are not linear, etc.

A. Krisiloff continued that the central column has a title “Scratch Width,” but that “Scratch Width Range” is what should be presented. He proposes to show the range explicitly. He also wants to change the name of the third column to “Controlled Minor Scratch Class.” He wants to shift the emphasis to what is included rather than what is excluded.

G. Boulton said that the Task Force needs some time to think about these changes before making a decision.

D. Aikens said that the first column represents both a scratch monitor, and a scratch quality notation for the drawing. In the first case it is referring to the maximum and minimum scratch widths, and in the second case it also refers to what accumulation rules apply. So it has a mixed purpose.

C. Gaugh suggested that column one should be renamed Scratch Class.

D. Aikens said that the Task Force should document common practice. What the Task Force is discussing is not too far off track since the military specification does use scratch letters, and is doing some kind of dimensional evaluation. But because the Task Force is trying to get clever, it has lost the track. Today industry writes a scratch letter for a surface specification. If the specification is D (40 μ), then scratches from 30 μ down to 10 μ need to be tracked and accumulated. Scratches less than 10 μ are ignored. He wondered how this would be used in industry. Do users talk about a D scratch or a 27 μ scratch? G. Boulton said if the users are not talking about accumulation, they would talk about a 27 μ scratch. A quality engineer would then tell the design engineer that it would have to be treated as a class D.

D. Aikens said that the title of the second column for both tables is in error, and should be renamed "Maximum Scratch Width in Microns," and "Maximum Dig Diameter in Microns." There could be two tables; one would define a Scratch Letter, such as D which would cover scratch widths from 20 μ to 40 μ . A second table would list a scratch drawing notation of D means...

T. Turner suggested that in order to make the accumulation rules in the table positive, column three should be renamed "Accumulate scratches larger than."

G. Boulton recommended that this be reserved for the next revision. D. Aikens suggested that the entire document be updated to make it more easily understood. The Task Force is also going to have to make this document consistent with ISO 10110-1 and -10.

At this point G. Boulton suggested that **A. Krisiloff should take the ideas from the current meeting and mold them into a NWIP, forward it to the Secretary, and make it an item for the next meeting.** A. Krisiloff said that he would like to collect names of those who would like to participate in the project. C. Gaugh suggested that documents could be placed on the optstd server where everyone could access them. Then e-mail would be used to notify everyone that a milestone has been achieved and the results are on the server.

At this point A. Mistry joined the meeting. He told the group that FLIR has purchased Brysen Optical, and therefore, inherited the scratch and dig visual standards. He said that the Brysen name is on the drawings that the military uses to describe the artifacts. Brysen gets calls from users of the artifacts, and Brysen has tried to contact the Picatinny Arsenal for guidance concerning the artifacts. In their last letter to Picatinny Brysen suggested that if the military has no suggestions concerning Brysen's request for guidance, then the Brysen name should be removed from the drawings.

A. Mistry asked how OEOSC had been in contact with the Arsenal. The Secretary replied that OEOSC had communicated with John Salerno who is getting copies of all meetings concerning the scratch and dig standard. OEOSC gets little feedback. G. Boulton said that he had had conversations with J. Salerno concerning the eraser test for optical coatings. The reply to requests is that they have no budget. If FLIR pulls out of the reference artifact business, that may force the issue. A. Mistry said that they are trying to get the Arsenal's attention at this point. They are continuing to make and sell the reference artifacts, but there is no coherence in what the old standard is and what the industry needs.

A. Mistry said that he has not seen the new document. He asked how much of it had been validated with industry users. G. Boulton replied that the current ANSI document closely parallels the old MIL-PRF-13830. Material concerning measured imperfections is being added from MIL-C-48497. Within the last year and a half, Northrop Grumman attempted a gauge R & R study using the Brysen standard artifacts and found a low degree of correlation. A. Mistry replied that he was not surprised.

G. Boulton had hoped that the instrumentation being developed by CCDMETRIX in cooperation with Brysen would improve gauge R & R results. A. Mistry said that program was intended to improve the internal production process. Unfortunately that project has been on hold since Rich Beall has left Brysen.

A. Mistry said that they have done their own gauge R & R studies of reference artifacts available from various manufacturers. Nothing matches.

G. Boulton said that OP has a task of writing a standard for an industry testing system that is not very good. C. Gaugh agreed that the system has some issues, but it is continuing to be used.

A. Mistry asked if after the new OP standard is released, will it be correlated with some set of reference artifacts? C. Gaugh replied that ANSI/OEOSC OP1.002 is a released standard that has been available for two years. It describes how artifacts may be used and what their appearance is, but it does not describe exactly what the artifacts are, or who provides them. It also provides a conceptual environment for using the artifacts. D. Aikens said that the standard does reference the military drawing number that specifies the artifacts, and that drawing does reference the supplier.

C. Gaugh said that it is his understanding that NIST will have a master set of scratch and dig artifacts. Then all user sets will be calibrated relative to the NIST masters. G. Boultee said that this is ASC OP's wish, but there is no concrete plan at the present time because NIST is unfunded as well. There was a proposal by Matt Young when he was at NIST, but it was not acted upon.

A. Krisiloff said that the system has been in use for over fifty years, but now that there is a desire to have traceability among different artifact manufacturers, the problem arises.

C. Gaugh asked if the OEOSC scratch-and-dig training class had been given in Portland, OR. D. Aikens said, "no."

The meeting was recessed for five minutes.

6. Review Draft of One-Hour Short Course

G. Boultee reviewed the history of the four-hour scratch-and-dig class. D. Aikens has been the principal author since 2005. It has been a popular course at Photonics West and Optifab. The class has been refined over the years based on feedback from the audience. Two years ago various educational institution that had optical technology courses began requesting a talk based on the class. So OP has been looking at a one-hour overview to be an executive summary of the scratch and dig class, which would be aimed at those managers who were responsible for sending technical personnel to the full class. A variation of this overview could acquaint college students at the University of Rochester, the University of Arizona, etc. with the subject. It could be given to student chapters of the Optical Society or SPIE.

G. Boultee said that he foolishly agreed to reduce the four-hour course to a coherent one hour overview. He removed the slides that he thought could be sacrificed and gave the result to D. Aikens at the beginning of the year. D. Aikens provided feedback in March. G. Boultee made the "no-brainer" changes that D. Aikens had suggested, and had color coded others that he felt needed further discussion. This version was uploaded to the optstd website as "One-Hour Overview on Understanding Scratch and Dig Specs 8_2_2008.pdf" as part of the documents for the 8/11/08 meeting.

G. Boultee continued that A. Krisiloff has reviewed the document; he then asked D. Aikens if he had a chance to review it. D. Aikens said that he had not, but there are a couple of overriding issues that must be addressed. 1) how to get it down to one hour; 2) more attention needs to be given to the three methods approach.

G. Boultee said that he was a little surprised about D. Aikens comment concerning the three methods approach. The overview is organized to show method one, method two, and then method three with a slide between each section. Those slides were the ones that D. Aikens suggested should be eliminated. D. Aikens agreed that the problem is how to present the three methods and that they are being renamed.

G. Boultee said that slide 15 is approach number one, visual brightness or visibility.

- Specification of "**visual appearance** of defects on optical parts"
- Use a pair of numbers, the first for scratch, the second for dig (e.g., 80-50; 40-10)
- Arbitrary numbers referenced to a set of **master scratches and digs**
- Includes methods of **illuminating and viewing** both the test optic and the "**artifact standard**"

A. Krisiloff suggested that the meeting be recessed for lunch so that he could e-mail his thoughts to those who are on the telephone so that everyone could be looking at the same thing. C. Gaugh said that he also had comments to present.

G. Boultee said that he has shown alternatives in his document and he hoped that TF 2 would decide which to use at this meeting. That is why there are still 57 slides in the presentation.

The Task Force recessed for lunch at 11:40 a.m. and reconvened at 1:17 p.m.

G. Boultee reconvened the meeting by suggesting that A. Krisiloff's material that he e-mailed during lunch be reviewed. A. Krisiloff said that he outlined the material that G. Boultee had completed, to help him understand the material. He called the Boultee material "1a." He then reassembled the outline in a short form. Following that he went back to 1a and selected slides to fit his new outline. He then created a Power Point presentation from scratch. This is the structure that he wanted to use to talk about the course.

The main outline topics are

- An Overview of Scratch and Dig Specifications 1
- Understanding Scratch and Dig Specifications 2

- Syllabus 3
- Introduction
- Concept 1: Visual Brightness or “Noticeability” 15
 - covers the MIL spec and OP1.002
 - referenced to tools and inspection methods
 - test methods
 - advantages/disadvantages
 - history
- Concept 2: Scratch Width 33
 - MIL specs
 - tools
 - artifacts
- Concept 3: Obscured Area 38
 - detour into ISO history
 - ISO 10110-7 material
- Concluding Remarks
 - idea of cosmetic vs. functional
 - disclaimer
 - bibliography
 - resources

He thought about the problem for a couple of days to see how it could be pared down to one hour, and then developed outline 1b.

- Title Slide
- Course Outline
- Administrative Issues (NO SLIDE)
 - biography of presenter
 - attendance list
- Disclaimers
- Introduction to Scratches and Digs
- The Three Methodologies for Specification
- Disclaimers (Again!) (NO SLIDE)
- OEOSC and The Process of Standards Development

He said that it is primarily the same structure with some subtle changes to put symmetry in the presentation for the three methods so that all contain items such as

- references to standards
- pros and cons

Under disclaimer, he felt that it is important to tell the audience that they are not getting legal advice in this course. If they screw up, that is their responsibility.

He tried to conceptualize each topic as a single slide. Most of the presentation would involve the three methodologies. Each discussion would start with appearance or measurement. Then there would be a slide listing the name of the pertinent standards with a verbal discussion about each. Notation would follow, and then testing methods would be covered. The presentation would conclude with a one-slide add for OEOSC and the standards development process.

A. Brunfeld concluded that this shortened presentation would still be a little longer than one hour.

A. Krisiloff created a set of schematic slides, that he calls draft 2a, to show how the presentation slides could look. This is a series of 36 slides. C. Gaugh asked if it would be a good idea somewhere at the beginning and at the end to let the audience know that there is a four-hour course giving more details. A. Krisiloff said that would be a good idea. A. Brunfeld said that the disclaimer is somewhat negative and that it would be more positive if the audience were told that they could understand the issue better if they took the full course.

Under the list of relevant standards, A. Brunfeld pointed out that OP3.001 was referenced rather than OP1.002. He also said that the audience may not be familiar with the standards, so a little explanation is advised. A. Krisiloff said that he could include a short title for each.

C. Gaugh thought that the standards should be listed in alphabetical order. A. Krisiloff said that he had grouped them as military, ANSI and ISO documents. The Secretary pointed out that ANSI OP1.002 should be listed as ANSI/OEOSC OP1.002. G. Boultee said that MIL-C-675 does not pertain to scratches and digs. A. Krisiloff said that he found it referenced in a couple of the slides. G. Boultee said that standard is for anti-reflection coatings.

While discussing the slides covering the three methodologies, G. Boultee noted that no mention was made that even with the visual method, digs have dimensions. A. Krisiloff agreed, and surmised that it should be handled as a comment.

A. Mistry asked if this presentation would replace the long course. C. Gaugh said that if anything it would be a sales pitch for the long course. A. Mistry asked who the audience would be. C. Gaugh replied that it would be presented to management in a company that is reviewing its optical production procedures, to instructors at universities that have students learning about surface quality, and anyone who needs a basic understanding of the issue without having a real proficiency. A. Mistry concluded that it would then be a traveling road show.

The Secretary said the idea was the result of a request from Irvine Valley Community College that asked if OEOSC would make a presentation to managers of employees being sent for instruction. C. Gaugh said that Irvine is still very interested in this presentation. There is a desire to move the community college program to UC Irvine because community college budgets have been cut over the past couple of years, but the University is still well funded. UC Irvine is including their optics programs in its distance learning program, where the course is given over the Internet with a live instructor. This is a good program for the optics industry in Southern California because the industry is widely disbursed in the area. This program may eventually be franchised to other regions, such as the U of A or the U of R.

D. Aikens asked what a student using distance learning should take away from this OEOSC course since they would still not understand scratch and dig. C. Gaugh replied that the participant of the overview would understand that their employees need to understand and be competent at scratch and dig testing. D. Aikens continued that he is concerned that someone could take this one-hour overview and think that he or she understands the subject, when in fact they do not. A. Krisiloff replied that in outline form, all of the information is there for the student. They see the pertinent standards, notations, artifacts, and test methods. The student would conclude that they could buy the standards and read them. D. Aikens said that the original reason for creating the course was to promulgate ANIS/OEOSC OP1.002. That does not seem to be the objective of this overview. This is more of a public service announcement. This overview is very appropriate for presentations at Tucson and the U of R. He thought that the disclaimers blind the student to the truth of the matter. OEOSC should urge the student to go learn more about these imperfection standards, and to become active in the development of better versions of these standards.

G. Boulton said that he did not think that anyone disagrees with D. Aikens comments. The Task Force has been alluding to his concern throughout the meeting. One of the possible outcomes of this presentation to executives is that they authorize attendance at the four-hour course in a central location, or by sponsoring the course in house. D. Aikens replied that he thinks that fact is missing from the current presentation. The current version is exactly what Julie Bentley at the U of R has asked OEOSC to present to her students. There should be a sales presentation involved, and OEOSC should not be ashamed to do that. We should make sure that we are leaving the audience with the message that we intend.

G. Boulton said that he likes the new outline, although there were comments concerning missing slides. So by the time the presentation is complete there will be 46 slides. He also likes the outline enough that he suggests that D. Aikens and he take a new look at the four-hour class to see if it can benefit from reorganization. D. Aikens agreed and added that there is time in the four-hour version to go into each section with some detail. The four-hour class has to be revised because there is a new section in OP1.002.

A. Krisiloff said that he is willing to put more time into this presentation. It is practice for doing the optical-glass class.

A. Mistry asked if this has to be presented by an instructor, or could it be presented as an on-line video. A. Krisiloff said that would be similar to webinars that trade magazines occasionally present.

A. Brunfeld reminded the group that they should not call this a course. It is a lecture. He did not know how much OEOSC could ask to present it. C. Gaugh said that if there was no charge, then the potential audience may think that it is worthless.

C. Gaugh said that he would like to see a title change. Much time is spent discussing scratch and dig, but the purpose is to achieve surface quality. He would rather that the overview be called "An Overview of Surface Quality Specification." Scratch and dig is the nuts and bolts of surface quality. A. Krisiloff said that he wanted to make sure that no one would assume that surface roughness would also be addressed. He suggested that the title could be "Scratch and Dig Surface Imperfections, an Overview..." It is a little long, but descriptive. It presents the idea that surfaces are being discussed. R. Williamson asked if he wanted to change the term from specifications to imperfections. The subtitle is "an overview to specifications and standards." It would be "an overview to imperfections and standards." The group suggested that A. Krisiloff think about it for a while.

A. Krisiloff asked that slide 15 be examined again. He did not see anything like this in draft 1a. Should this set the stage for what the appearance standard is all about?

<p>(A) Visual Brightness Appearance of a Surface Imperfection</p> <ul style="list-style-type: none">• A scratch or dig scatters light and therefore can be detected during visual inspection.• Usually a scratch is so thin or a dig so small that the unaided eye can not detect any structure. The only clue to its true size or shape lies in the brightness perceived by the inspector.• The angle between the eye, the optic under test, and the source of light are all important factors that determine the brightness observed by the inspector.

D. Aikens said that he did not agree with the second bullet. He wanted to know if A. Krisiloff was saying that no structure in the scratch could be detected. A. Krisiloff replied that one may see structure in a 100 μ scratch. When someone is being introduced to the concept of surface inspection, they should ask why it is still being done the way Galileo did it. The answer is that one needs some very special equipment to duplicate what the eye can easily do.

R. Williamson said that he disagrees with the second sentence in bullet 2. The only naked-eye evaluation possible is the brightness of the scratch.

D. Aikens objected to the use of the word "detect" because it implies that one cannot see anything at all, which is not true. The eye can detect the structure, but it cannot measure the structure.

A. Krisiloff concluded that he may have twisted the truth by being too specific and a little off the mark.

A. Krisiloff asked if there were issues with any of the technical slides.

R. Williamson said that he liked the clarity of the structure. That may be why A. Krisiloff moved so quickly through the slides during this review.

At this point A. Krisiloff suggested that the group review the slides again, and any appropriate slides from draft 1 should be noted.

C. Gaugh reported that A. Krisiloff went through the slides the first time in less than 20 minutes. There could be three times the elaboration in the actual presentation. W. Czajkowski asked if there was to be a question and answer session.

D. Aikens said that Julie Bentley asked for a presentation that would last approximately 1½ hours. A. Brunfeld said that the answer to many of the questions could be that the person should take the full course.

C. Gaugh suggested that the explicit references to the standards other than OP1.002 should be eliminated.

At this point D. Aikens left the meeting.

F. Dombrowski said that perhaps the overview is not a good idea because it could give partial information that encourages the participant to get into trouble. A brochure describing the full course may be a better solution. A. Krisiloff said that OEOSC has been getting requests for the overview, and there is a niche that could be well served by the overview. The brochure that F. Dombrowski was recommending could also be produced.

Slide 4

A. Mistry suggested that slide 4/5 should be a "Legal Statement" rather than a disclaimer.

Slide 5

A. Brunfeld suggested that the word "course" should be changed.

C. Gaugh asked if the disclaimers should be reviewed by an attorney? G. Boulton said that a lawyer did not review the four-hour course disclaimers.

F. Dombrowski asked if there would be a handout for the overview. A. Krisiloff said that there would be one.

R. Williamson said that the date of the presentation should appear on each slide.

Slide 7

A. Brunfeld suggested that slide 7 should be titled "Surface Imperfections, Scratches and Digs." Other imperfections could be verbally referenced.

Slide 8

F. Dombrowski said that he did not understand the second sentence on slide 8. If the parenthetical items are ignored, then the sentence says "It is typically characterized as Long, Round, Edge, or Area." R. Williamson suggested that the terms be interchanged with the terms within the parentheses.

Slide 9

A. Brunfeld suggested that slide 9 should say "...much longer than it is wide." G. Boulton said that the rule-of-thumb is that if the imperfection is at least four times longer than its width, then it is a scratch.

Slide 10

A. Brunfeld said that a pit is a dig, but a dig is not a pit. W. Czajkowski said that for molded glass optics, a dig is a mound, not a pit. G. Boulton said that he always assumed that a dig was the result of some kind of impact. W. Czajkowski agreed, but with new technology, it can be a protrusion as well as a cavity.

Slide 11

The group agreed to modify slide 11 by removing MIL-C-675, adding OEOSC to ANSI/OEOSC OP1.002. The list should be alphabetized.

Slide 12

A. Brunfeld suggested that illustrations should be added to slide 12. G. Boulton suggested that something be done to make sure that the letters on this slide not be confused with the measured imperfection letters.

Slide 15

W. Czajkowski said that slide 13 from version 1a could be used with slide 15.

Slide 16

G. Kohlenberg said that the standard should be referenced as ANSI/OEOSC OP1.002.

Slide 17

W. Czajkowski said that a 60 scratch is not hard to see as listed on slide 17. Change the 60 to a 40. It was noted that the audience has not yet been introduced to the numbering system. G. Boulton suggested that this slide should be moved to a later position. F. Dombrowski asked if this slide were referring to evaluations without magnification. W. Czajkowski said that this slide referenced evaluations with the unaided eye. R. Williamson asked if there were classifications for 120 and for 5. G. Boulton said that there is a 10 scratch for visual. C. Gaugh said that the slide should use values from the 80, 60, 40, 20, 10 series.

C. Gaugh suggested that the Brysen, Davidson and Kodak references could be shown. W. Czajkowski said the the former Kodak paddle is not a standard, but a production tool. C. Gaugh said that companies do still use it. W. Czajkowski said that the paddle is no longer manufactured by Kodak and is no longer correlated with other artifact standards.

Slide 19

R. Williamson suggested that in order to be correct, slide 19 should only say "Comparison Artifacts."
C. Gaugh concurred that "standard" has a different meaning in this slide, and should be removed to eliminate confusion.

Slide 20/21/23

The figure is the same as in the standard; however, the text needs to be enlarged so that it can more easily be seen on a screen. The Secretary said that the illustrations are standard OpenOffice drawings that can be edited.

Slide 25

C. Gaugh said that there is a problem identifying the edge of a scratch. A. Brunfeld asked why the question was being raised. Some of his customers describe the width of the scratch as full-width-half-depth. C. Gaugh said that there are a lot of Gaussian contoured scratches. This slide needs to make clear the definition of the edge position. The wording can be handled outside of the meeting.

Measurement of scratches is usually a home-grown technique, which can cause an issue. The fact that there is no standard measurement method needs to be indicated.

Slide 26

ANSI/OEOSC OP1.002-2009 will have to be added when it is released.

Slide 27

G. Boulton said that the range for each notation could be used here. C. Gaugh said that if the chart from OP1.002 is used in this overview, then credit should be given to the standard as a marketing tool.

Slide 28

Is the method "louping?"

Slide 30

A. Krisiloff said that he will list "Relevant Standards" rather than "Relevant ISO and ANSI Standards."

C. Gaugh said that "Standard" should be removed from the line indicating "Comparison Artifacts."

C. Gaugh suggested that F. Dombrowski could provide guidance on the topic of obscuration.

G. Boulton said that ISO 10110-7 covers notation, and ISO 14997 covers the measurement method. That should be emphasized.

Slide 31

W. Czajkowski said that myths and legends from the original course could be added here.

Slide 35

Everyone agreed that there needs to be a discussion about how the listener can help bring some sense to this subject.

C. Gaugh said that ASC OP needs to get the military out of the standards specification business and simply reference OP standards, and NIST needs to develop a reference standard to which all commercial reference artifacts can be traced. Until these happen, then there will be references to the old MIL specifications on drawings. R. Williamson said that C. Gaugh is urging ASC OP to be a leader, which is difficult if you are so far ahead of where the flock is going. However, if you are behind the flock taking consensus polls, you are not leading either. OP needs to urge the optics community to follow it, but it has to reflect current practice.

A. Mistry asked if the group could influence the military and NIST to adopt the OEOSC imperfection standards.

A. Brunfeld said that we have to get NIST to be more active in providing reference standards. He said that these are voluntary standards, and OP cannot go to the President of the US and urge that these standards be mandatory. C. Gaugh suggested that OEOSC should urge the management of its member organizations to contact the leadership of the Department of Commerce to insist that NIST take ownership of the optical surface reference artifacts. A. Brunfeld said that in the past, OP did not have the standard in place so that it could bring pressure on NIST. Now it does.

G. Boulton asked the Secretary if the Glass Standard has now been accepted by the military. The Secretary said that the acceptance process took about four years to complete, but OP 3.001 now is an acceptable standard for military procurement. That process has not yet been completed for OP1.002, but they seem to be strapped for a budget now, and not much is happening. G. Boulton said that the second edition of OP1.002 combines three of the best military specifications into one, which should give the military an incentive to recognize it.

A. Mistry asked what FLIR could do to move this process along. The Secretary said that if FLIR were an official member of ANS OP then that would add more pressure on the military. A. Mistry continued that he had written several forceful letters to the Picatinny Arsenal recently. The Secretary replied that if FLIR has asked the military to remove the Bryson name from the drawings, the military should give some kind of response.

7. Time and Place of next TF 2 Meeting

A. Krisiloff moved to meet in San Jose, CA during Photonics West. A. Brunfeld seconded the motion, which carried unanimously.

8. Adjourn

R. Williamson moved that the meeting be adjourned; C. Gaugh seconded the motion, which carried unanimously. The meeting adjourned at 3:31 p.m.