

ASC OP1 'Scratch and Dig" Draft Standard Review  
Sunday May 6, 2001  
8:30 a.m. – 4:30 p.m.  
Marriott hotel Inner Harbor  
Baltimore, MD

David Aikens	Thermawave
Walt Czajkowski	APOMA
John M. Hamilton	Northrop Grumman Corporation
Jonathan Hardis	NIST
Nick Honiatt	AWE plc, UK
John Johnson	ZYGO
Gene Kohlenberg	OEOSC
Yajun Li	Symbol Technologies, Inc.
Bruce Netherton	Spectra-Physics
Vernon Payumo	INRAD
William Royall	Eastman Kodak Company
Lee. C. Shuett	Nikon Instruments, Inc.
Harvey Pollicove	COM

David Aikens opened the meeting at 8:39 a.m. by asking each person to introduce himself.

D. Aikens made opening remarks covering some of the historical documents concerning optical surface imperfections. He also described the positions stated by several optical experts. He stated that he is no longer sure that there is a middle ground that will satisfy everyone's needs. Most optical components are quickly inspected visually and require no extra effort to qualify them. How do we decide how the five percent of the product that requires more thorough evaluation be specified? He asked if anyone at the meeting could make a recommendation? J. Hardis said that he thought the original purpose of the committee is to replace the old military specification. H. Pollicove noted that MIL-PRF-13830 was a cosmetic standard, and persons get into trouble when they attempt to use it as a performance specification. Eighty percent of the industry needs a cosmetic standard. He suggests that we need to concentrate upon the 80%, and later attack the standard for the remaining 20% of product.

D. Aikens thought that MIL-PRF-13830 is an appearance standard which is not limited to cosmetic considerations. H. Pollicove said that the standard indicates that the function should be considered when accepting product.

D. Aikens asked if 80% of optical products are really limited to cosmetic specifications. H. Pollicove stated that by production volume, the percentage is correct.

J. Johnson said that ZYGO has a custom optics business on the side. It has used the MIL-O-13830 with revision H. If they were to apply an actual width standard, then they may have to begin insuring that scratches are 0.1 of the present limit. His concern for splitting cosmetic and performance specifications is that all designers will begin applying it with a potential for great industry expense.

J. Hamilton said that Northrop Grumman sets the specification depending upon where the optic is located in the system, and that means that the standard becomes a performance specification.

N. Honiatt added that he uses MIL-O-13830, rev. H successfully. He thinks that the MIL spec is used 80% of the time as an appearance specification with a performance element implied.

D. Aikens suggested that we could continue to use the notation that designers are familiar with and then develop a standard that suppliers would use. Both PH3.617 and ISO 10110 part seven require new notations that the industry has not embraced.

W. Royall thinks that the problem is that there is no entity that calibrates the reference standards. He pointed out that scratch width is not the only characteristic that effects appearance.

D. Aikens stated that he is coming to the conclusion that plastic molded references are the preferred way to make them. W. Royall noted that he cannot see any difference in the paddles molded 15 years ago to those molded today. However, the number of paddles molded has been few so the mold has not seen significant wear. If large volumes were produced, then mold wear could become a problem.

W. Czajkowski stated that the customer and the vendor will always have to sit down and agree upon what level on the reference standard the product will be inspected to.

W. Royall said that we should have a different scale for performance than for appearance to avoid confusion. H. Pollicove said that we should reduce the common practice to a standard.

J. Hamilton asked how Kodak's drawings for the paddles were specified. W. Royall said that there were no drawings, per se. Hundreds of scratches were scribed into copper. Samples were molded and RADCOM rated them. Kodak selected those that were deemed to match the standard scratch numbers. Those masters were then inserted into the paddle mold. W. Royall noted that how the paddles are made is arbitrary. J. Hamilton stated that if the paddles were chrome on glass, then reflective standards could be accommodated.

The group took a break at 10:02 a.m. and the meeting resumed at 10:20 a.m.

W. Royall stated that it would be great if we could have one reference set that satisfies both appearance and performance; however, he thinks that the standard should not define the method of production of the reference sample. He is not sure that width is sufficient for performance specifications either.

D. Aikens proposed that the group continue with items on the agenda that he distributed by e-mail. A copy of that e-mail is attached to these minutes. Please note that document numbers will be in the 1.000 series, not the 3.000 series.

W. Royall proposed that a task should be to develop an artifact and a method of calibrating it.

D. Aikens proposed that we begin with the surface imperfection portion of MIL-PRF-13830 and draft the first document. H. Pollicove proposed that the illumination section should also be included.

D. Aikens asked for a show of hands of how many persons would favor that PH3.617 be withdrawn. There was no objection to withdrawal. This recommendation will be presented at the ASC OP Business meeting.

Tasks for the new imperfection standard:

1. Artifact development for a second imperfection standard (Kodak paddle, for example), which can be used temporarily until a functional standard is completed.
2. Develop an artifact a standard that could be used as a comparative standard or metrologic standard based upon chrome on glass or an equivalent technology. This would be a task suitable for NIST to develop. H. Pollicove stated that without a national standard, we could not go to NIST to get the artifacts developed. The military handles its own artifacts. D. Aikens asked N. Honniatt if the British equivalent of NIST could be asked to develop the artifacts. N. Honniatt stated that he could make inquiries. J. Hardis said that if this becomes an international standard, then various countries' labs should be able to reproduce the standard. He suggested that the Canadian labs should be queried, too. If OEOSC writes a letter stating the need, he can shop it around. A CRDA could be written to help support the development of the standard. CCG (Combined Calibration Group?) is another army group that could help.

D. Aikens asked J. Hamilton to look into military implications of not having a metrological standard, and relying on the Picatinny solution. J. Hamilton replied that he is testing several viewing arrangements in his company to see what works for the various artifact standards.

The meeting was recessed at 12:05 p.m. for lunch, and was reconvened at 1:20 p.m.

The group decided that to address the need of the industry for an appearance based optical imperfection standard, it will release the first draft based partly on MIL-PRF-13380. This committee recognizes that there is an additional need for a performance specification, and we will begin the research for this standard.

The MIL-PRF-13830B document was then examined and edited as the 1<sup>st</sup> draft of BSR/OEOSC OP1.002, "Surface Imperfection Standard for Optical Elements." (Please note, the number has been incremented to make room for another unrelated standard so that an unbroken series of numbers may be reserved for the proposed multiple imperfection standards.)

The committee recessed at 3:00 p.m. and reconvened at 3:20 p.m.

When the edited version was completed, G. Kohlenberg was asked to create a new Word document that can be distributed for review. The committee agreed that H. Pollicove will work with G. Kohlenberg to produce a draft that can be taken to St. Gallen, Switzerland for the June ISO meeting.

The meeting was adjourned at 5:05 p.m.