Task Force for the development of a US standard on surface form and wavefront

Summary from October 7th Meeting:
The task force determined that a purpose statement should be created prior the formation of a scope statement.
The task force will determine what the purpose of BSR/OEOSC OP1.005 will be.

Purpose Statement:
The Wavefront draft minutes from the meeting on 10-8-06 contains a list that was created to define the purpose of the two US draft standards, OP1.004 and OP1.005

I have summarized the list to provide a starting point for the meeting in San Jose on 1/20/07. My interest is to achieve a unanimous consensus for the purpose of the US standard, then begin the definition of scope for the standards.

Proposed Purpose Statement (Draft 1):

BSR/OEOSC OP1.004

Create a concise and unambiguous statement of requirements for a US standard to define the ~~limits of~~ surface ~~texture and mid-spatial frequency ripple~~and wavefront errors in terms of a statistical framework. This ~~—~~standard ~~can~~will be offered as a replacement to the~~serve as a stand-alone US standard and/or possibly replace the~~ existing ISO 10110-8, ISO 14999 1 thru 5.

The standard should provide optical engineers, lens designers and all persons ~~creating~~ specifying ~~surface texture~~ tolerances with a standardized means of stating and communicating requirements of optical surfaces and ~~propagating~~ wavefronts to persons ~~of~~in manufacturing, assembling, testing, selling and buying.

The standard should contain notation clearly specifying measurement method requirements as well as use fundamental, traceable, scientific units.

The proposed US draft standard will be limited in scope to contain ~~accepted~~ practices and nomenclature for achieving a unified "industry standard" that will be widely accepted and used.

BSR/OEOSC OP1.005

~~Create a concise and unambiguous statement of requirements for a US standard to define the limits of surface form, reflective wavefront, and transmissive wavefront.~~Create a concise and unambiguous statement of requirements for a US standard to define the surface and wavefront errors in terms of a deterministic framework. This standard can serve as an alternative to ISO 10110-5, -14, ISO 14999~~-~~-1 thru -5.

The standard should provide optical engineers, lens designers and all persons ~~creating surface form and wavefront~~specifying tolerances with a standardized means of ~~——~~stating and communicating requirements of optical surfaces and~~and propagating ————~~wavefronts to persons ~~of~~ in manufacturing, assembling, testing, selling and buying.

The standard should contain notation clearly specifying measurement method requirements as well as use fundamental, traceable, scientific units.

The proposed US draft standard will be limited in scope to contain ~~accepted~~ practices and nomenclature for achieving a unified "industry standard" that will be widely accepted and used.

	Low	MID	HIGH
SURF	ISO 10110-5		ISO 10110-8
TRANS	ISO 10110-14		
	ANSI/OEOSC OP1.005	ANSI/OEOSC OP1.004	ANSI/OEOSC OP1.004

Notation/Measurement	Deterministic	Statistical
Physical Surface	ANSI/OEOSC OP1.005	ANSI/OEOSC OP1.004
Phase Wavefront	ANSI/OEOSC OP1.005	ANSI/OEOSC OP1.004

Scope Definition:

I have attached the scope statements from ISO 10110-5; -14 as well as ISO 14999-4.2

These scope statements can serve as a starting point for our scope definition which will also include adherence to our purpose state (once agreed upon).

10110-5 Surface Form Tolerances

Scope

ISO 10110 specifies the presentation of design and functional requirements for optical elements and systems in technical drawings used for manufacturing and inspection.

This part of ISO 10110 specifies rules for indicating the tolerance for surface form.

Note 1: The terminology of interferometry is used for the specification of tolerances, and in particular, for the units in which the tolerances are to be specifies; however, this does not stipulate that only

interferometric methods may be used for the actual testing of optical parts. Other, non-interferometric methods may be used if the results are converted to the units specified here.

This part of ISO 10110 applies to surfaces of both spherical and aspheric form.

Note 2: ISO 10110-12 allows the surface form tolerance for aspheric surfaces to be specified without reference to this part of ISO 10110.

10110-14 Wavefront Deformation Tolerance

Scope
International Standard ISO 10110 applies to the presentation of design and functional requirements for optical elements and assemblies in technical drawings used for manufacturing and inspection.

This part of ISO 10110 gives rules for the indication of the allowable deformation of a wavefront transmitted through - or, in the case of reflective optics, reflected from – an optical element or assembly.

The deformation of the wavefront refers to its departure from the desired shape. The tilt of the wavefront with respect to a given reference surface is excluded from the scope of this part of ISO 10110.

There is no requirement that a tolerance for transmitted wavefront deformation be indicated. If such a tolerance is specified, it does not take precedence over a tolerance for the surface form according to ISO 10110-5. If tolerances for both the surface form and the transmitted wavefront deformation are given, they must both be upheld.

ISO/DIS 14999-4.2

Optics and Photonics - Interferometric measurement of optical elements and optical systems – Part 4: Application to the evaluation of tolerances specified in ISO 10110

Scope:
This international standard applies to the interpretation of interferometric data relating to the measurement of optical elements.

This part of ISO 14999 gives definitions and rules for determining whether a test object is in compliance with specifications made according to ISO 10110-5 “Surface form tolerances” and/or ISO 10110-14 “Wavefront deformation tolerances”.