
SAO 60 inch primary mirror coating

1 message

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SAO 60 inch primary mirror coating:

On August 12, 2016 we aluminized the SAO 60 inch primary mirror at our Sunnyside Mirror Coating Lab. The deposition material was acid etched aluminum of 99.999% purity. The maximum deposition rate was 72 angstroms per second and the total thickness was 929 angstroms. Our target deposition thickness is 900-1000 angstroms.

The coating looks very good with no blemishes. The coating passed the tape test for adhesion at one place at the edge and one place at the center of the mirror. The vacuum chamber pressure just prior to the start of deposition was 4.0×10^{-6} Torr. The reflectance and scatter numbers look normal for a fresh bare aluminum coating.

Ricardo Ortiz (MMT) measured the reflectance and scatter on a microscope slide witness sample with the MMT Minolta CM-600 spectrophotometer. The CM-600 measures both reflectance and scatter from 400-700nm at 10nm increments in a single measurement. An Excel spreadsheet is attached with the measurement data plus three plots. Rows 2-13 are calibration data. The reflectance data used for the plot (row 17) is calibrated, the scatter data (row 18) is raw un-calibrated data.

For a comparison I have included the reflectance data from the National Institute of Standards and Technology (NIST), Standard Reference Material 2003a, National Bureau of Standards Special Publication 260-75, First surface aluminum mirror for specular reflectance from 250 to 2500 nm, VR Weidner, May 1982. The aluminum coating on the NBS Standard Reference was deposited at a pressure of 5×10^{-7} Torr at a rate of 300 angstroms per second for a period of 3 seconds. The coating was aged for approximately two years prior to reflectance measurement to stabilize both the aluminum reflectance (mostly in UV) and the growth of the aluminum oxide layer so the coupon could be used as a standard reference material. The NBS standard was measured to an uncertainty of +/- 0.5% reflectance from 250 to 2500nm.

I would like to thank Joe Hoscheidt and Melanie Waidanz for their help with the coating and Ricardo Ortiz for measuring the witness sample.

Gary Rosenbaum



2016 Aug 12_SAO 60 inch primary.xlsx
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