

**Transmission Measurements
Of Open Skies
Wratten 12, Wratten 25, &
0.6 Neutral Density Coated Optical Filters**



July 1998

Inconel Filter Material Coating Process

Inconel neutral density filter material was applied to a level of 0.60 density on Open Skies Wratten 12 and Wratten 25, 6 inch KS-87, and 18 inch KA-91, focal length camera filters. Spectral transmission measurements were taken on each filter before and after the inconel neutral density coating was applied. Results of those measurements are noted in the body of this report. After the initial spectral measurements were taken, the filter(s) glassware was removed from the filter assemblies, inspected, cleaned and coated to a level of 0.60 density. The coating process used is referred to as physical vapor deposition, or thermal evaporation. The filters were placed within a vacuum chamber along with a "blank" piece of glass. The inconel neutral density coating material was injected within the vacuum chamber and thereby deposited on the filter(s) and blank glass. The blank glass was used to measure the resultant density of the material deposited and the process was continued until the required density was achieved.

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Test Report #985799

All filters were measured for percent transmission before and after a neutral density optical coating was applied. The filters were measured on a Perkin-Elmer Lambda 19 Spectrophotometer. The average transmission of 5 areas on each filter after coating, was plotted along with the transmission before coating. The density difference of each filter before and after coating was plotted on a separate graph. The density difference was calculated as follows: $Density = \text{LOG}(1/(\text{trans. after coating}/\text{trans. before coating}))$.

Example:

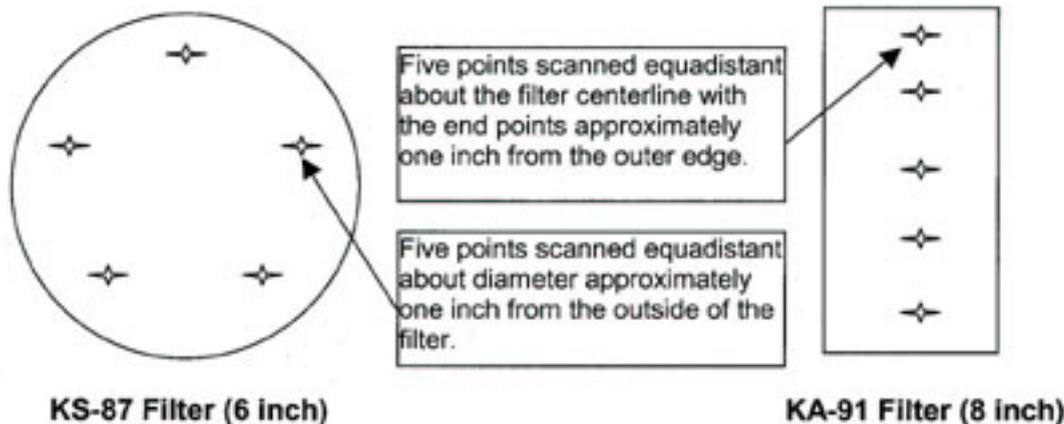
Trans. @ 900nm before coating = 92% Trans. @ 900nm after coating = 24%

Difference in transmission = $24/92$
= 0.26

Density = $\text{LOG}(1/\text{transmission})$
Density Dfference = $\text{LOG}(1/0.26)$
Density Difference = 0.58

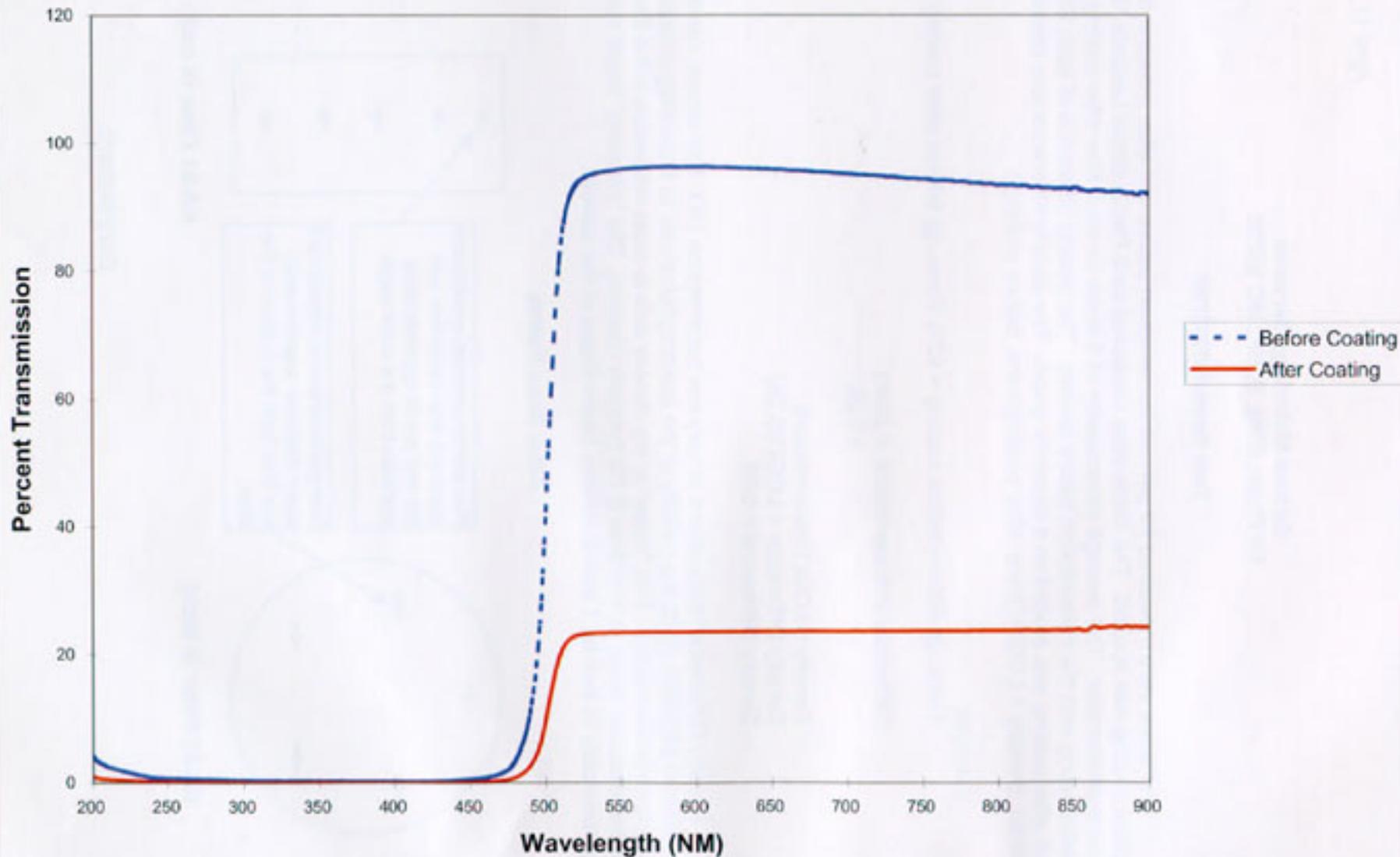
The "Density Difference" calculations at very low transmission (<0. 1%) values, cannot be considered accurate, do to the inability of the spectrophotometer to accurately measure very low transmission values. This "noise" in the density data is most noticeable in the filters where the transmission drops to less than 0.1% (virtually opaque). The "sampling" beam measures approximately 1/2 inch by 1 inch in relative beam shape at the sample.

Filter Scan Points

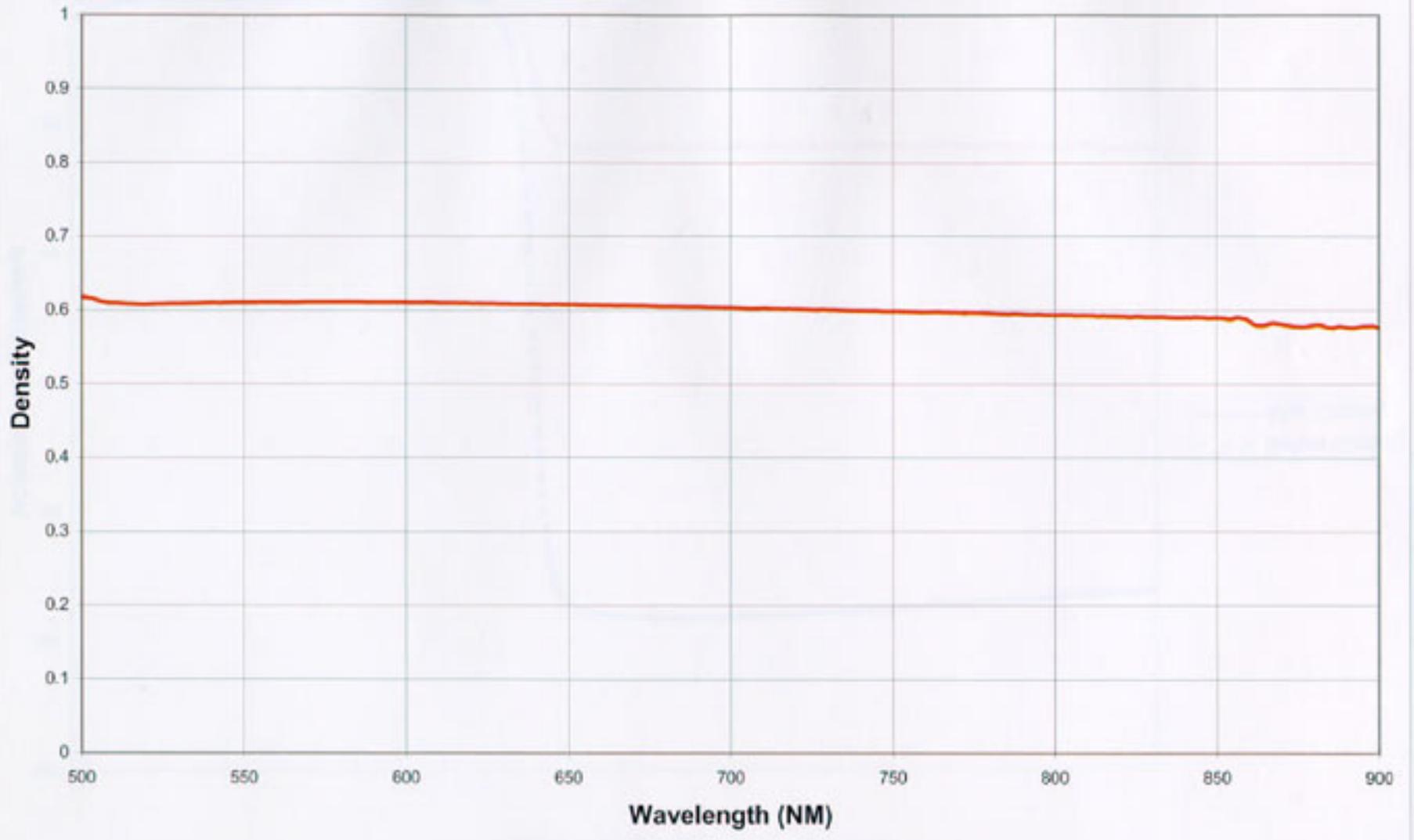


Gary Nothard

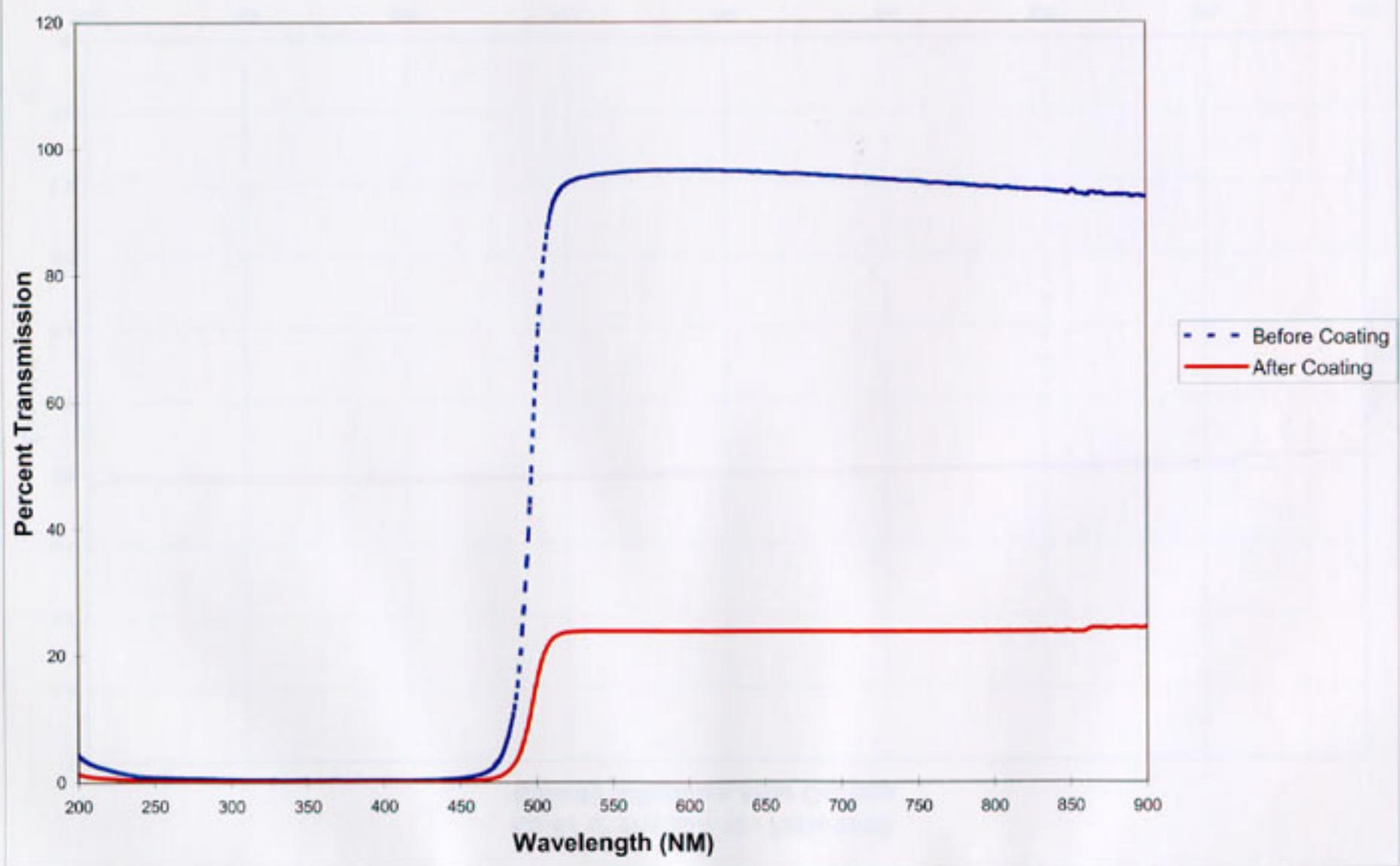
KS-87 6" Wratten 12 - Filter #900



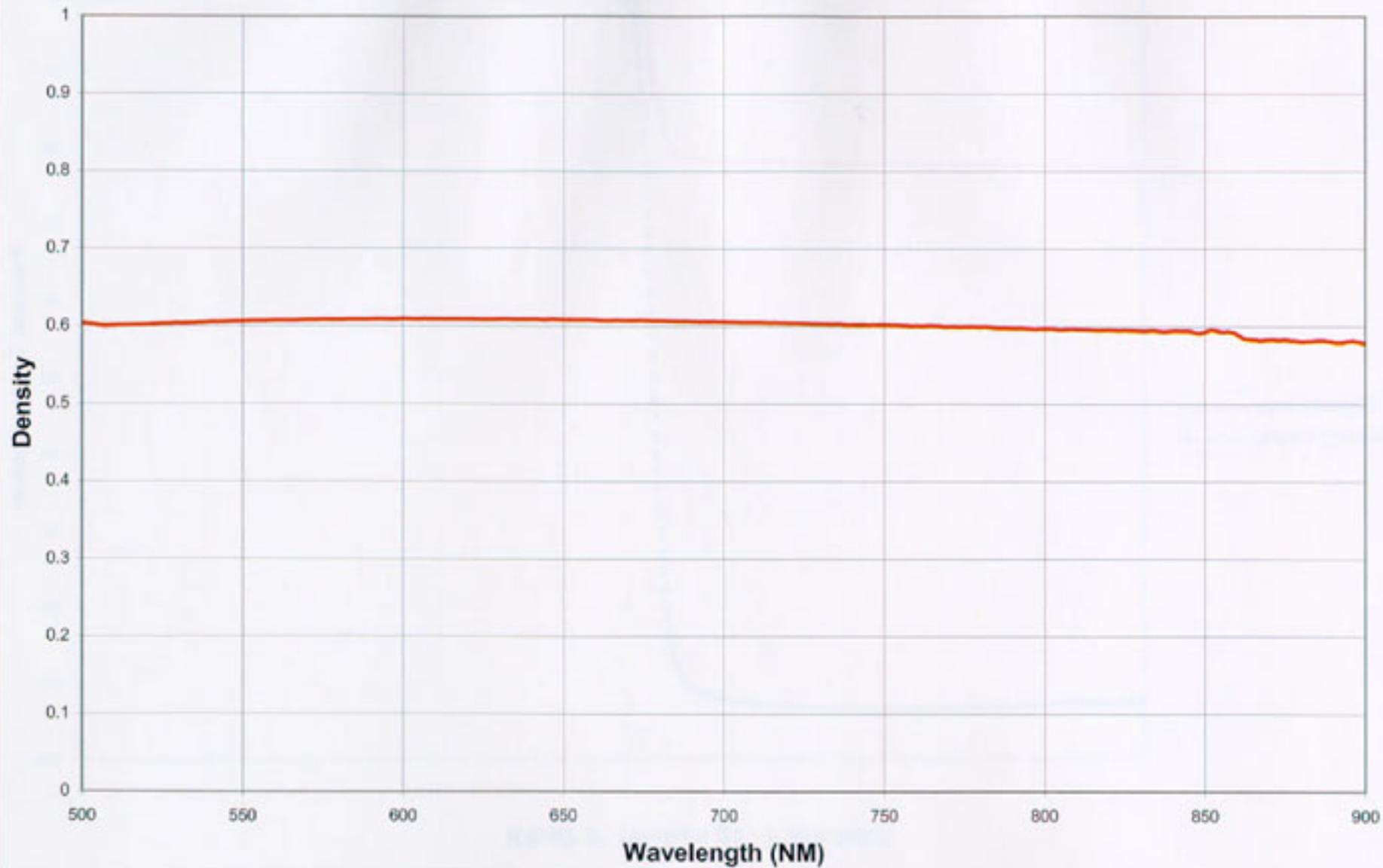
KS-87 6" Wratten 12 - Filter #900
Density Difference After Coating



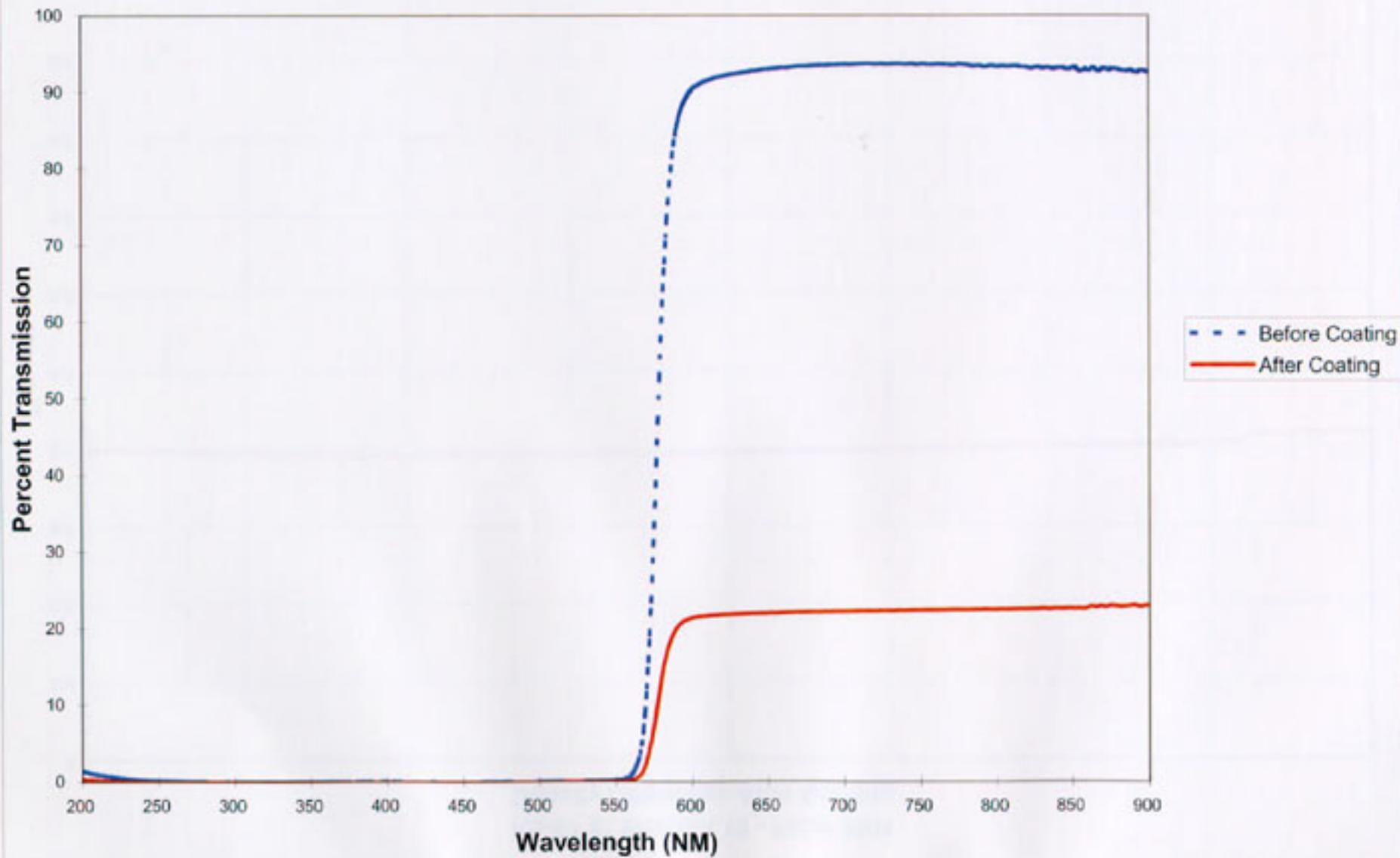
KS-87 6" Wratten 12 - Filter #901



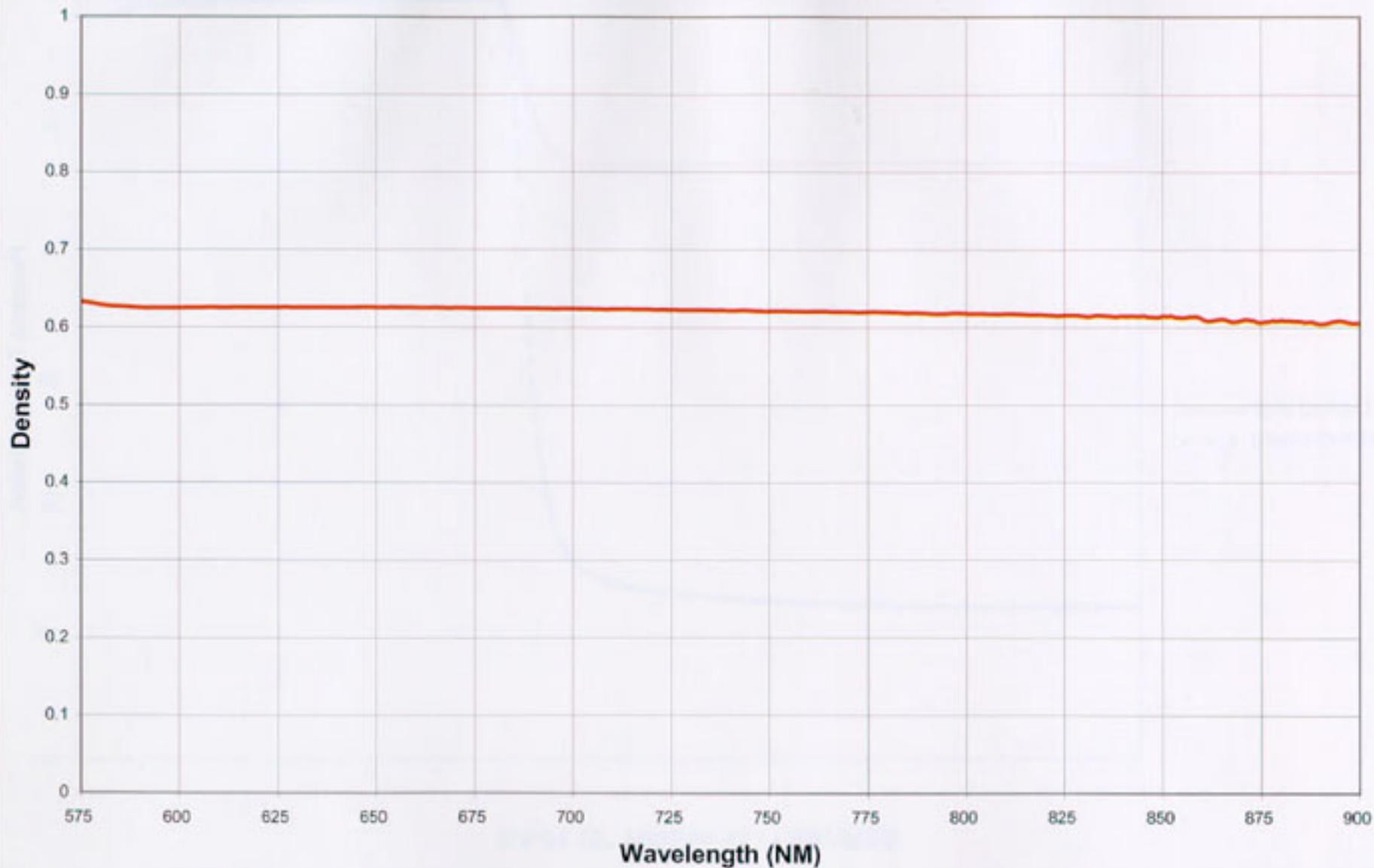
KS-87 6" Wratten 12 - Filter #901
Density Difference After Coating



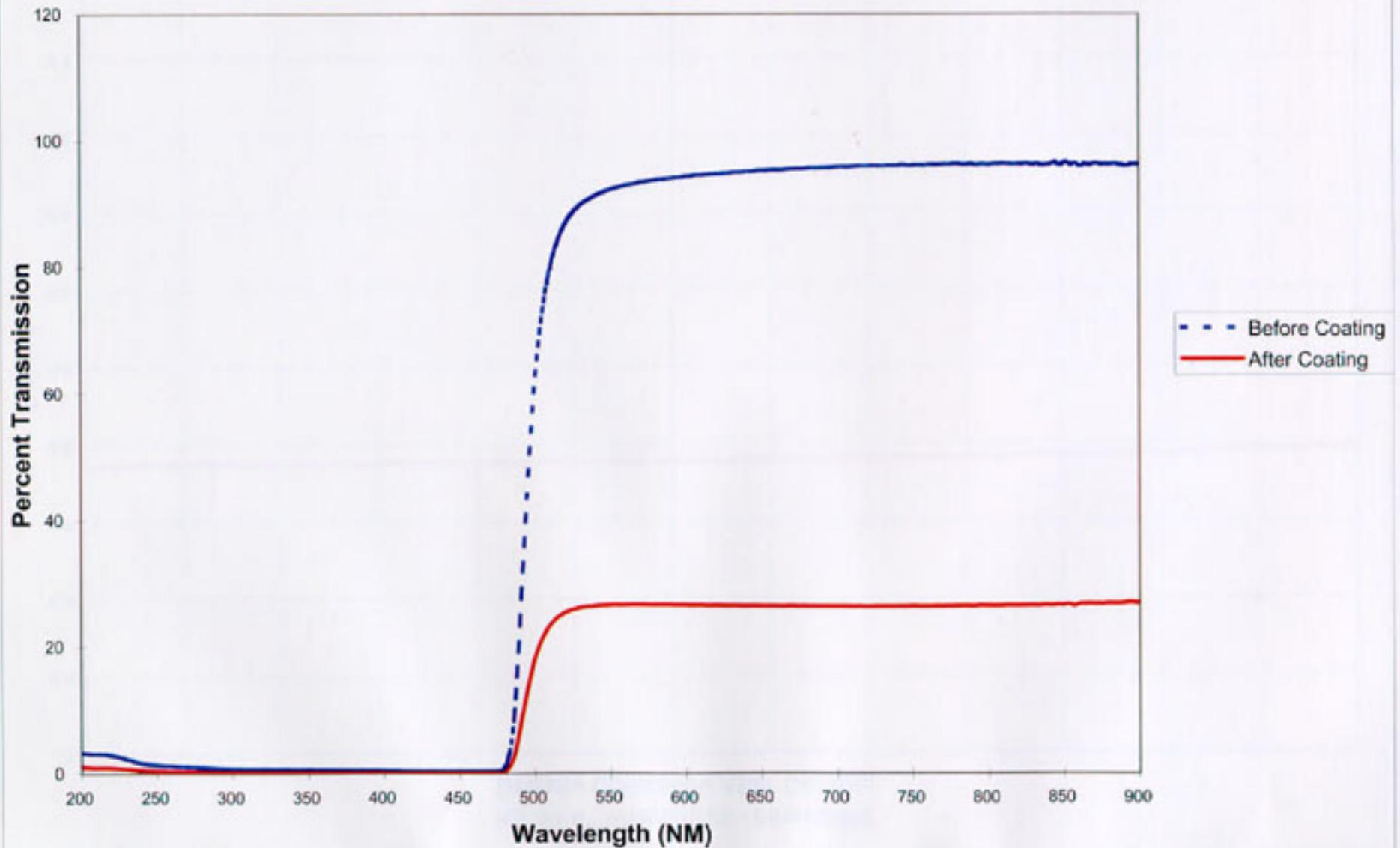
KS-87 6" Wratten 25 - Filter #902



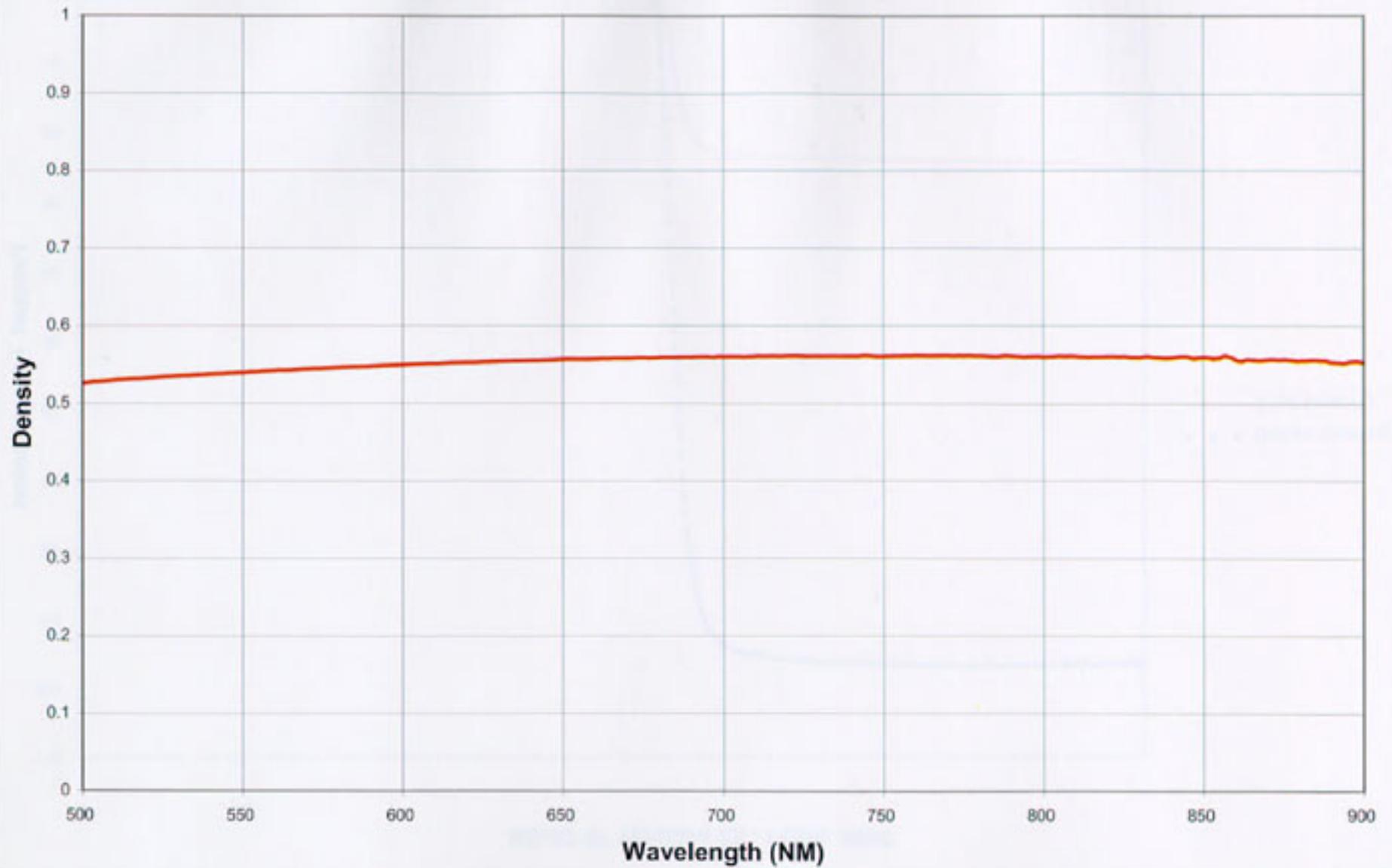
KS-87 6" Wratten 25 - Filter #902
Density Difference After Coating



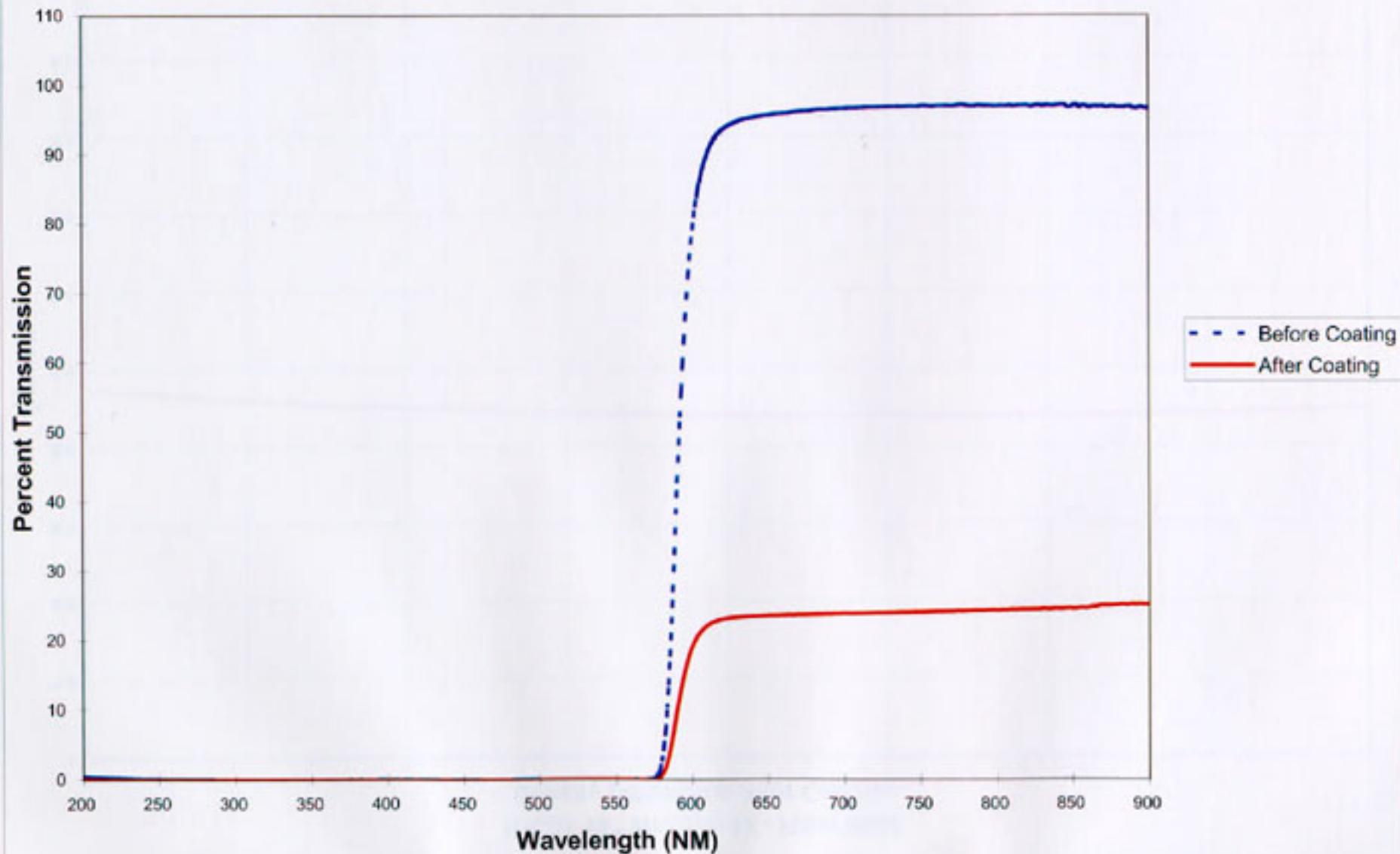
KA-91 18" Wratten 12 - Filter #903



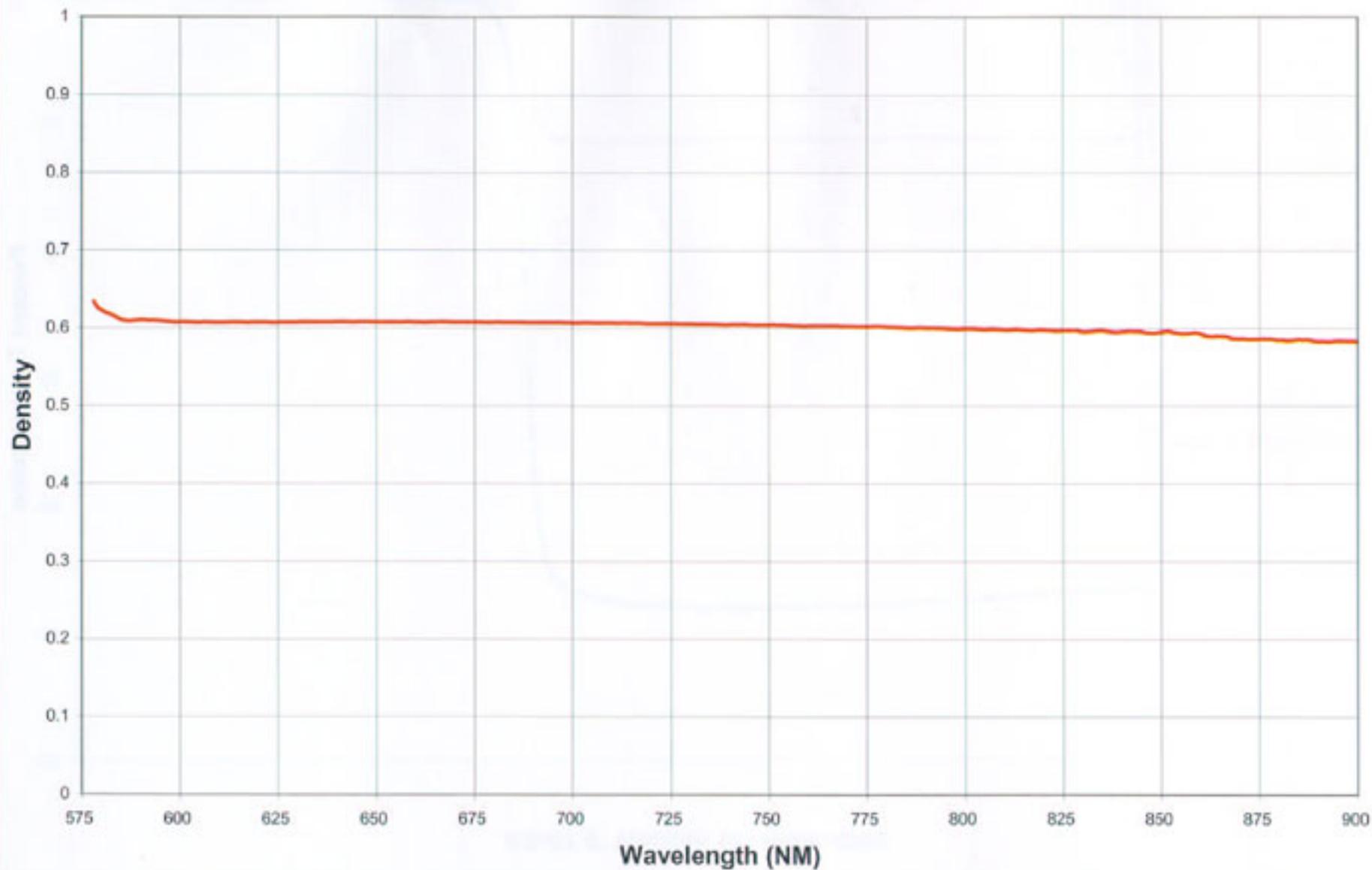
KA-91 18" Wratten 12 - Filter #903
Density Difference After Coating



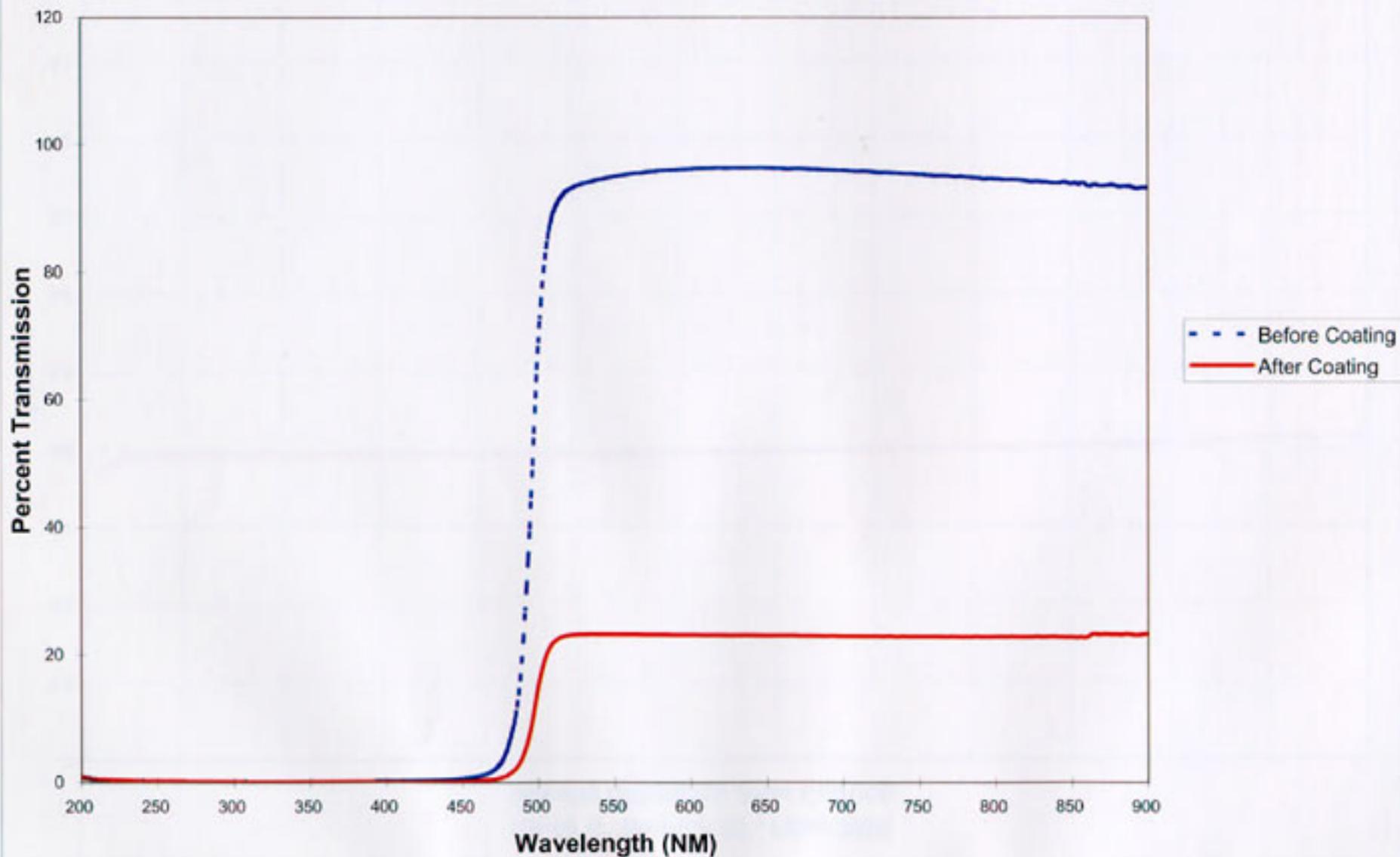
KS-87 6" Wratten 25 - Filter #904



KS-87 6" Wratten 25 - Filter #904
Density Difference After Coating



KS-87 6" Wratten 12 - Filter #905

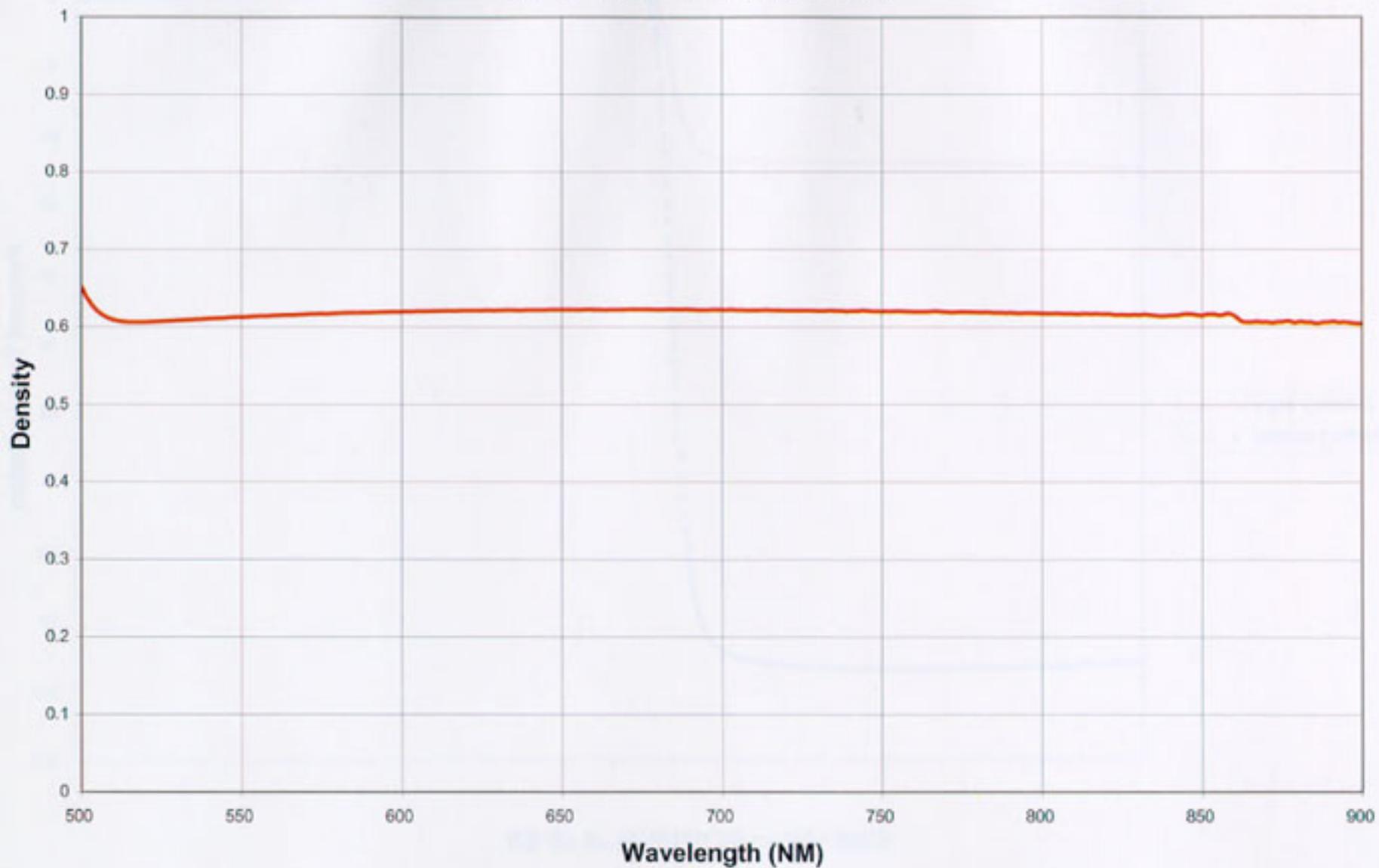


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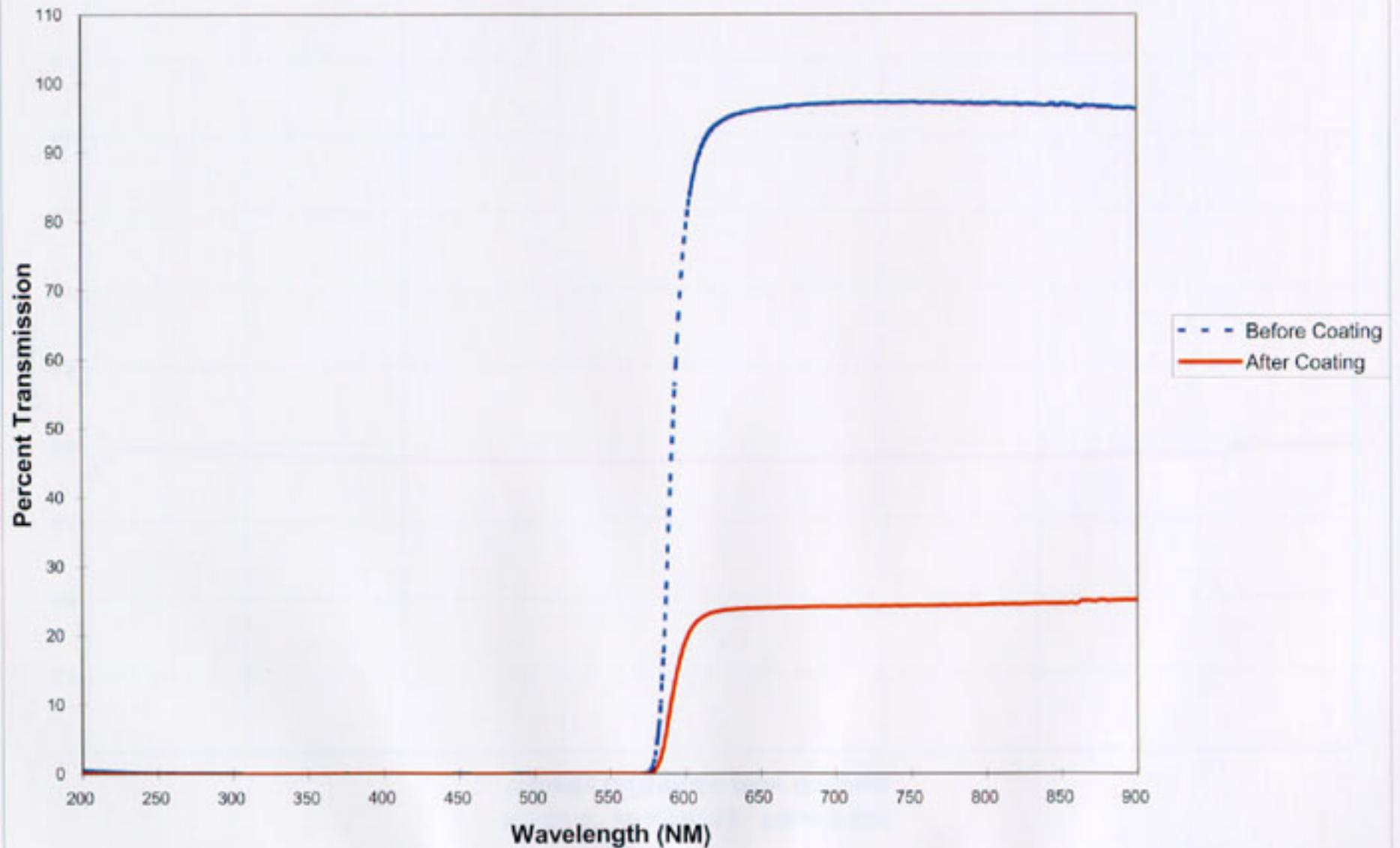
GEN

KS-87 6" Wratten 12 - Filter # 905
Density Difference After Coating

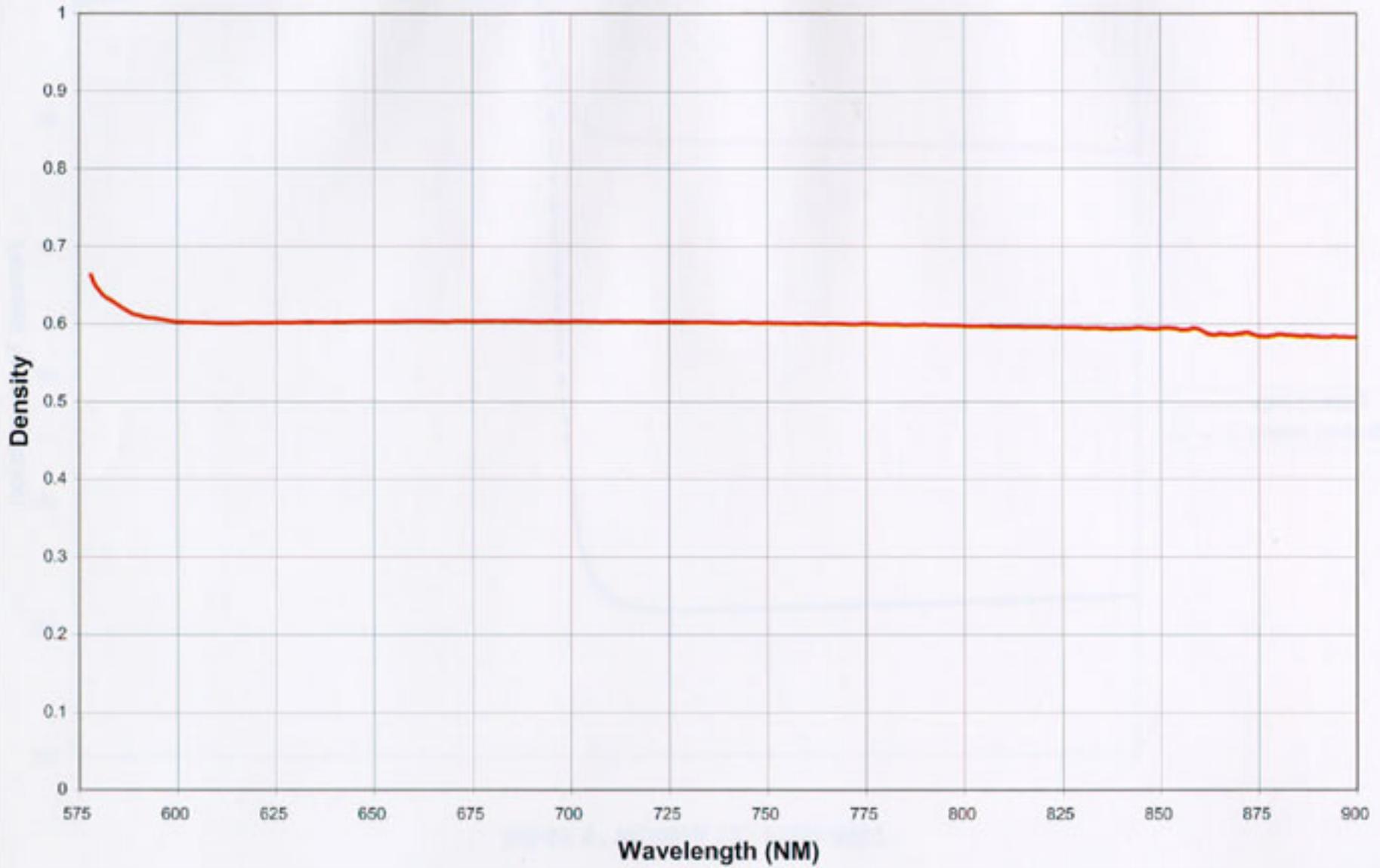


OMS# 985799
4-16-98
GEN

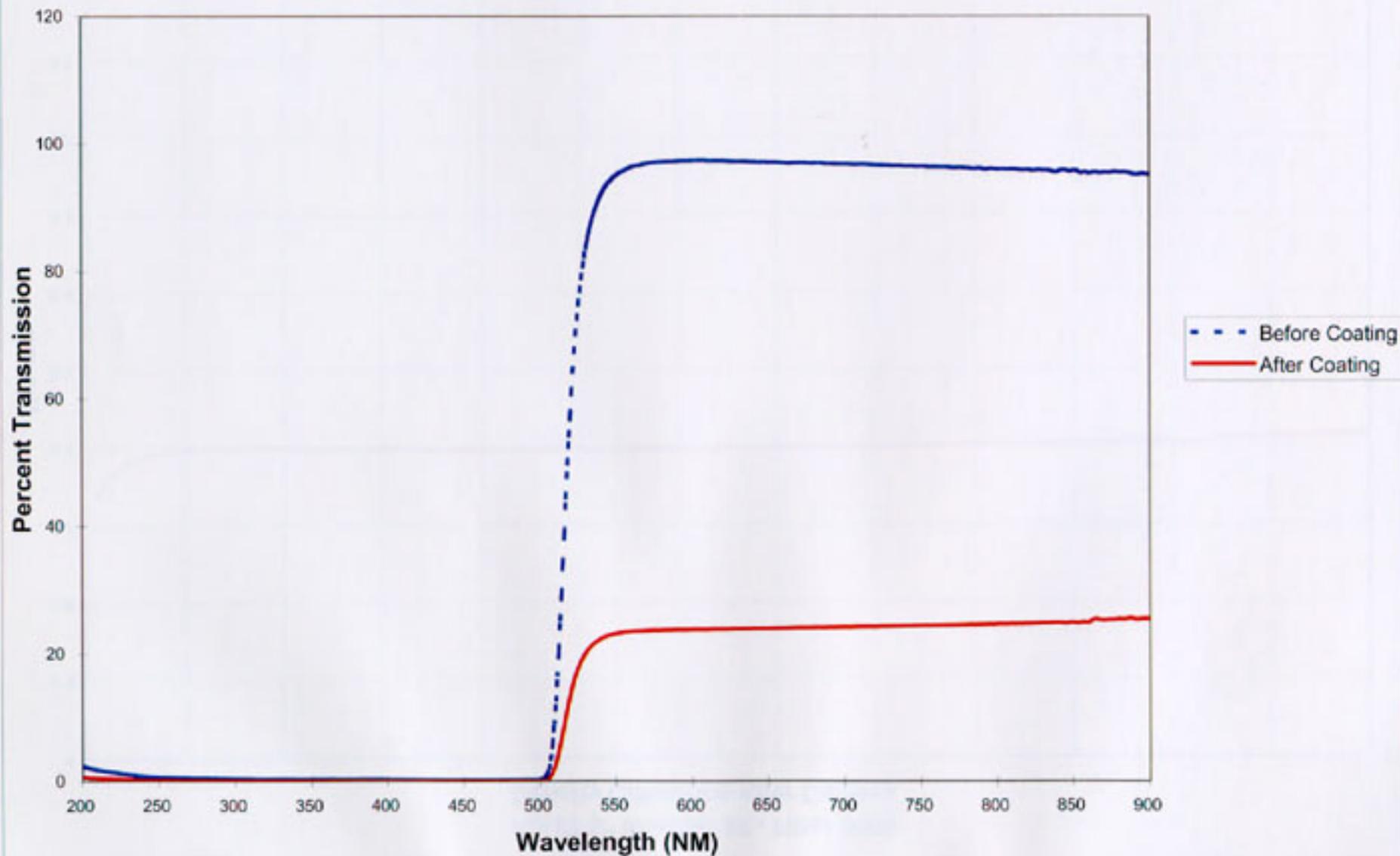
KS-87 6" Wratten 25 - Filter #906



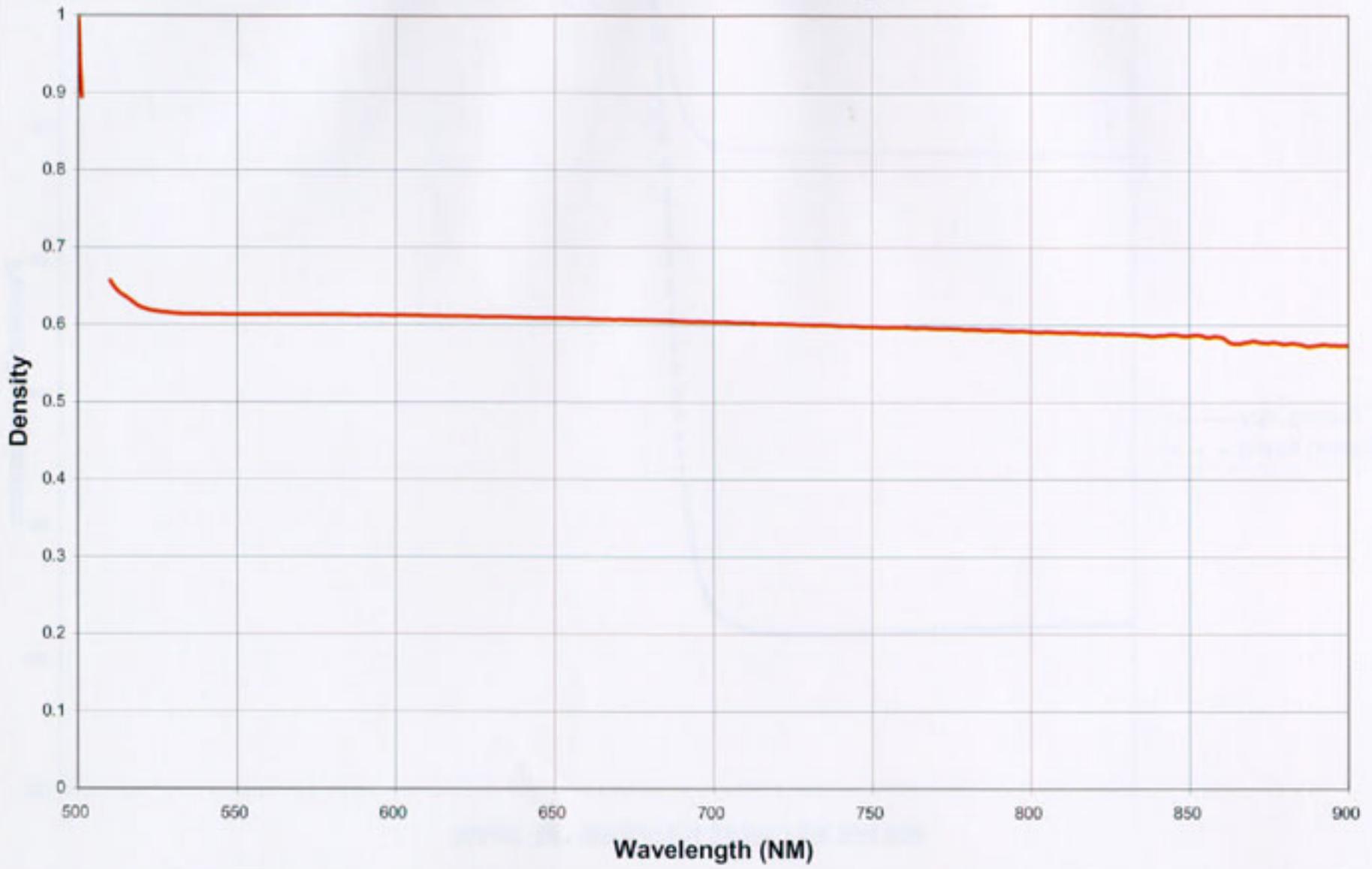
KS-87 6" Wratten 25 - Filter #906
Density Difference After Coating



KS-87 6" Wratten 12 - Filter #907

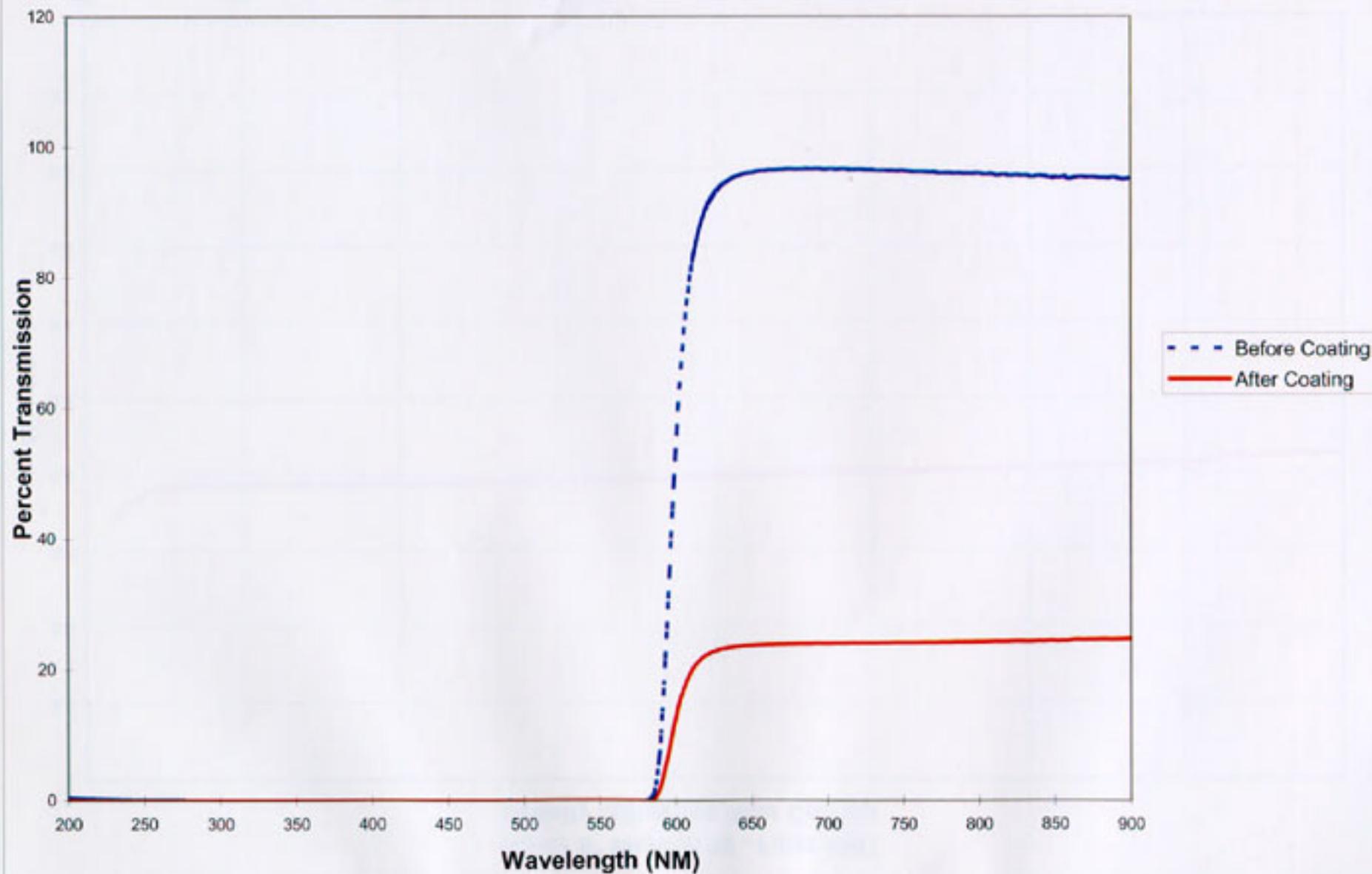


KS-87 6" Wratten 12 - Filter #907
Density Difference After Coating



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GEN

KA-91 18" WRATTEN 25 FILTER S/N 908



KA-91 18" Wratten 25 Filter #908
Density Difference After Coating

