Cromer Black Coating Technical Data Sheet

Introduction

Under contract to NASA, NanoLab developed a number of paints and coatings for very high absorbance optical applications. NanoLab offers multiple products to meet the needs of optical engineers: Singularity Black LT, Cromer Black and IM1.6. NanoLab offers coating services for Cromer Black- it is not yet available tor for those interested in applying the coating in their own facilities.

Cromer-Black, *Overview*

Cromer Black is an aqueous coating filled with carbon nanotube and silicate forming binders. It is spray applied and once baked, it creates a tough, durable coating that is highly black and is resilient to high laser power.

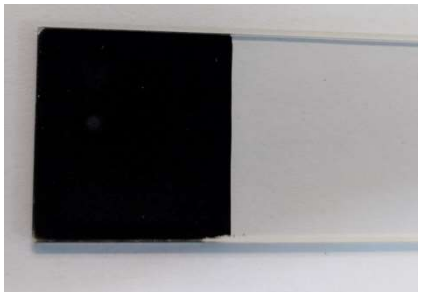
Cromer-Black, *Formulation*

The coating is formulated with water and applied to heated substrates to generate the dried coating. Typical substrate temperatures are just over 100C during spraying.

Cromer-Black, Application & Curing

The coating is formulated for spray coating and requires application in a spray booth or fume hood, or with protective particulate masks suited to the task.

We find that a Iwata Eclipse HPCS airbrush is well suited for small scale coating jobs. Coverage at ~90 microliter/cm^2 results in an opaque (OD>5) coating that performs well in the visible. Thinner coats may also perform well in the visible.



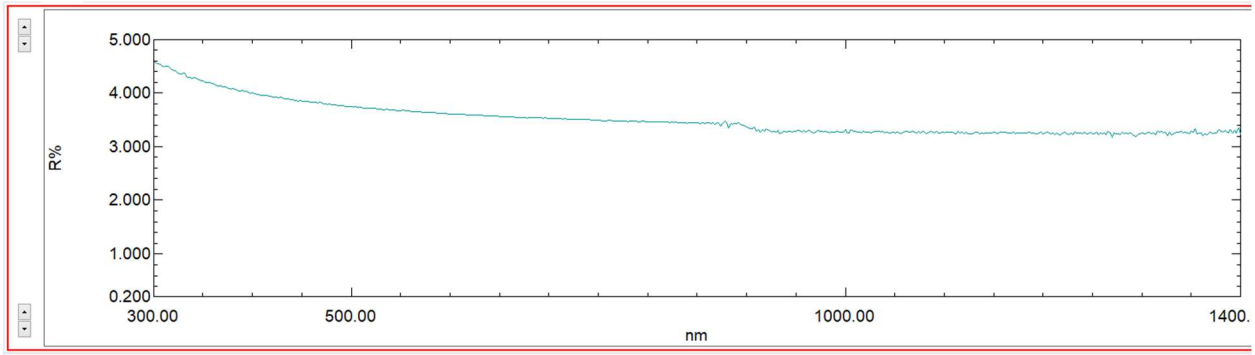
Curing at 140C for 20 minutes has been shown to improve the durability of the coating and further crosslink the silicate binder.

Properties

Viscosity: 5-10cps
Wet Odor: none, water-like
Immersion tests: No reaction to immersion 2hrs in 25C water after bake.
Laser tolerance: up to 15kW/cm2 laser damage threshold, using 1064nm laser*

Total Hemispherical Reflectance (THR)

Samples were loaded into a Shimadzu UV-Vis-NIR spectrometer equipped with 60mm integrating sphere, and measured referenced to Spectralon white sample. Reflectance 350-850nm: <4% across the NIR and visible range. Typical data is given below.



Data Print

Wavelength n	Cromer Black
600.0	3.609

Packaging and Coating Services

NanoLab Inc.
Revision 1.1
Date: 8-13-24

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NanoLab provides coating services for baffles, telescope components, and other optical parts. Parts are handled in a class 100 clean space to prevent particulate contamination during the coating process. All work is done domestically, by US citizens in an ITAR compliant facility.

* Black optical coating for high-power laser measurements from carbon nanotubes and silicate
https://opg.optica.org/ol/abstract.cfm?uri=ol-34-2-193

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