

CALIFORNIA INSTITUTE OF ELECTRONICS AND MATERIALS SCIENCE

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CO-LEASH INC. LETTER of 04 MARCH 2006

DIVISION OF ELECTRONIC MEASUREMENTS AND DEVICES

TEST REPORT

No. 960730970-1 of 07 MARCH 2006

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LUMINANCE TEST

Material Tested: Krytaglow® Paint Layer identified by Co-Leash Inc. as consisting of three coats: (i) Krytaglow White Latex Base Coat # 1171, (ii) Krytaglow Paint MEA Special Blend # 1300A, and (iii) Krytaglow Clear Protective Top Coat # 1102, and listed in the table below as Material A.

Test Conditions:

1. The test was performed in a windowless laboratory room by the contact method (ISO 17398:2004(E), para. 7.11.6.3).

2. Test sample excitation: 21.60 ± 0.02 lx along the entire sample surface during 120 min for each sample.

3. Excitation System.

3.1. The excitation light source: Fluorescent Double Linear 13 W Lamp of the 410 nm - 670 nm quasicontinuous spectrum with two parallel linear light tubes 120 mm long, 11.5 mm in diameter, with the interaxial distance of 13.5 mm, located in the same horizontal plane. The tube holding fixture is equipped with two sliding black screens that control the part of the tube length, the light from which is directed toward the sample under test. The fixture is connected to the lamp pedestal with a system of fixable levers that allows the motion of the light tube holder parallel to itself in the vertical direction to vary the distance between the sample surface and the tube plane from 160 mm to 1,000 mm.

3.2. The excitation system was covered with a pressboard box of the dimensions (mm) of 180×180×1,100 with a vertical slit along one side that allowed the motion of the fixable levers to vary the distance between the light source and the sample surface. In our experiments, the angle of vision of the sample from the light source location was close to 5.7°; with the open light source dimensions close to 25 mm by 25 mm, the theoretical uniformity of the illuminance of the entire sample surface was achieved, which was confirmed by the illuminance measurements.

4. The test consisted of three 240-minute (120 min excitation/90 min phosphorescent luminance measurements, 30 min waiting period) cycles. The waiting period is related to the difference in duration of the excitation and the luminance parts of the cycle.

5. The test samples were preconditioned per ISO 17398:2004(E), para. 7.11.2. for ninety six hours. The sample luminance measured prior to the test cycle was on the level of the luminance meter zero noise.

LIMINANCE TEST RESULTS

TABLE 1. LUMINANCE TEST DATA PER NYC DOB RS 6-1A, para. 1.2 and 1.4

*Luminance, mcd/m², after the Time Period of
No. Material
10 min 60 min 90 min*

1 Kryptaglow® Material A, Sample 1 44.61 11.63 8.69
2 Same, Sample 2 45.21 11.39 8.79
3 Same, Sample 3 44.98 11.51 8.71
Mean for Kryptaglow® Material A 44.93 11.51 8.73

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**Conclusions: 1. The material tested meets the requirements of NYC DOB RS 6-1A, para. 1.4.
2 The Brightness Rating of the material tested is: 45-12-9.**

TEST DESCRIPTION

1. The test per NYC DOB RS 6-1A, para. 1.0 - 1.4. Test conditions: T=22°C, RH=43%, P=100.9 kPa.
 2. After 120-min excitation period, the sample was removed from the excitation chamber (in the darkened room) and put on the laboratory table; the luminance detector was installed upon the sample center, and the luminance test chamber of the inner dimensions (mm) of 258×208×164 and the wall/top thickness of 12 mm was used to cover the sample/detector pair to prevent any uncontrolled irradiation of the sample.
 3. The experimental error, evaluated on the basis of the data related to the illuminance process and the results of the luminance measurements on a standard reference material by the partial derivatives and least squares methods, does not exceed 6%. The data on the standard deviation are kept on file at CIEMS. To concentrate the numerical information for statistical considerations, a set of the luminance measurements on each of the samples tested was performed at the end of ten-minute intervals from 10 min to 100 min from the moment of the illuminance process completion.
4. INSTRUMENTS AND DEVICES USED
- Advanced Light Meter Model 84002 with Photosensor Q130110 Sper Sci. (10 mlx to 0.4 Glx) - illuminance
 - Optometer Model X11 with Detector PD-9310B Gigah.-Optik (10 μ cd/m² to 5 kcd/m²) - luminance
 - Radiation Pyrometer Model ST-30 Raynger - luminance reference calibration
 - Goniometer Model 3501-08 FD - angle measurements
 - 50 A, 6 V Stabilized Power Supply Model SC506FAVD HBC
 - Digital Timer Model Labchron-1402 Lab-Line Instr.

- Starrett Dial Indicator Model 25-109 (1.270 $\mu\text{m}/\text{div}$)
- Digital Hygrothermometer Model 63-844 MI, Barometer Model 602650 SB.

5. The standard reference material used for the test setup calibration:

- Absolute Black-Body Radiator Model 9291L HMI with Platinum Wire Radiator - luminance measurements
- Standard Candle with Optical Bench Model 47496 Sci. Kit & Boreal Labs. - illuminance.

6. The equipment used in the test meets the applicable NIST, ASTM, ASME, OSHA and State requirements and was

calibrated with the standards traceable to the NIST. The calibration was performed per ANSI/ASQC M1-1996,

ANSI/ISO/ASQ Q9004-2000, ISO 10012:2003, ISO 5725-2:1994, MIL-STD-45662, MIL-I-45208, NAVAIR-17-35-

MTL-1, CSP-1/03-93, and the instruments manufacturers' specifications.

7. The equipment passed a periodic accuracy test in June 2005. Next test - June 2006. The linear and angular measure equipment and weights will be calibrated in December 2005.

TEST ENGINEER: 29

DIVISION MANAGER: *Cynthia Smythe*

(KRgl979-1)