

RE: ROSTRA ACCESSORIES INC. AND DOT TP-111V-01 CAMERA DURABILITY TESTING.

3/01/2018:

Rostra Accessories Inc. offers select RearSight and Sentry Pro-Grade camera solutions to aid in achieving compliance with FMVSS 111. FMVSS DOT also requires that cameras used in vehicles to meet FMVSS 111 standard must meet a minimum durability standard. This standard is outlined in Rearview Visibility Standard regulation TP-111-V-01 finalized on February 8, 2018.

Cameras listed as able to meet FMVSS 111 requirements have been tested to meet or exceed the required durability standards listed in TP-111-V-01. Rostra Accessories/ Vehicle Safety Manufacturing is a listed and approved ISO 9001 and TS 16949 certified company.

Compliance testing is done in-house and/or in a licensed certified laboratory as required.

See <http://www.rostra.com/about-rostra.php> for current certifications.

DOT TP-111-V-01 required testing:

DOT Required Humidity Testing Standard: (S14.3.2) :

The external components are subjected to 24 consecutive 3-hour humidity test cycles. In each humidity test cycle, external components are subjected to a temperature of $100^{\circ}+7^{\circ}0^{\circ}$ F ($38^{\circ}+4^{\circ}-0^{\circ}$ C) with a relative humidity of not less than 90% for a period of 2 hours. After a period not to exceed 5 minutes, the external components are subjected to a temperature of $32^{\circ}+5^{\circ}-0^{\circ}$ F ($0^{\circ}+3^{\circ}-0^{\circ}$ C) and a humidity of not more than 40% for 1 hour. Allow no more than 5 minutes to elapse between each test cycle.

Total Test time : 144 Hours, Limits 38°C to 0°C , Humidity 90% to 40%

Rostra Accessories Humidity Test Standard:

External Components are subjected to 38 consecutive 4-hour cycles at:

4 hrs @ 21°C Powered @ 13.5VDC

4 hrs @ -30°C Powered @ 13.5VDC

4 hrs @ 85°C Powered @ 13.5VDC

Total Test time: 448 Hours, Limits 85°C to -30°C , Humidity 95+/-5%

DOT Required Temperature Conditioning (S14.3.3)

The external components are subjected to 4 consecutive 2-hour temperature test cycles. In each temperature test cycle, the external components are first subjected to a temperature of $176^{\circ} \pm 5^{\circ} \text{ F}$ ($80^{\circ} \pm 3^{\circ} \text{ C}$) for a period of one hour. After a period not to exceed 5 minutes, the external components are subjected to a temperature of $32^{\circ} +5^{\circ} -0^{\circ} \text{ F}$ ($0^{\circ} +3^{\circ} -0^{\circ} \text{ C}$) for 1 hour. Allow no more than 5 minutes to elapse between each test cycle.

Total Test time : 8 Hours, Limits 80°C to 0°C ,

Rostra Accessories Temperature Conditioning Test Standard:

The External Components are subjected to 24 hours at 85°C and cycled to -30°C for another 24 hours.

Total Test time: 48 Hours, Limits 85°C to -30°C

DOT required Corrosion Conditioning (S14.3.1)

The external components are subjected to two 24-hour corrosion test cycles. In each corrosion test cycle, the external components are subjected to a salt spray (fog) test in accordance with ASTM B117-73, Method of Salt Spray (Fog) Testing for a period of 24 hours. Allow 1 hour to elapse without spray between the two test cycles.

Total Test time: 48 Hours,

Rostra Accessories Corrosion Conditioning Test Standard:

The external components are subjected to a salt spray (fog) test in accordance with ASTM B117-73, Method of Salt Spray (Fog) Testing for a period of 72 Hours.

Products are powered at 13.5vdc.

Total Test time: 72 Hours

Rostra Accessories Added Component Validation beyond DOT test requirements for durability.

Thermal Shock Testing:

10 Cycles of 30 Min. soaks from 85°C to -30°C

Total Test time: 5 Hours

Vibration Testing:

2 Hours each access meeting ES95400-10 Vibration test requirements.

Total Test time: 16 Hours