



Test Report

Test Item: Xenon arc test

1. Test Equipment:

Equipment Name	Model
Xenon Weather-Ometer	BGD 862

2. Test Standard: Q/BYDQ-A1901.707.4-2015 Section 4.11.2

3. Test Condition:

Exposure cycle:

Irradiance: $(0.55 \pm 0.02) \text{ W}/(\text{m}^2 \cdot \text{nm}) @ 340 \text{ nm}$

60min dark at $(38 \pm 3)^\circ \text{CBPT}$, $(38 \pm 3)^\circ \text{CCHT}$, $(95 \pm 5)\% \text{ RH}$, with front and back spray

40min light at $(70 \pm 3)^\circ \text{C BPT}$, $(47 \pm 3)^\circ \text{C CHT}$, $(50 \pm 5)\% \text{ RH}$, no spray

20 min light at $(70 \pm 3)^\circ \text{C BPT}$, $(47 \pm 3)^\circ \text{C CHT}$, $(50 \pm 5)\% \text{ RH}$, with front spray

60min light at $(70 \pm 3)^\circ \text{C BPT}$, $(47 \pm 3)^\circ \text{C CHT}$, $(50 \pm 5)\% \text{ RH}$, no spray

Filter: Boro/Boro

Exposure period: 265 Cycles (795h)

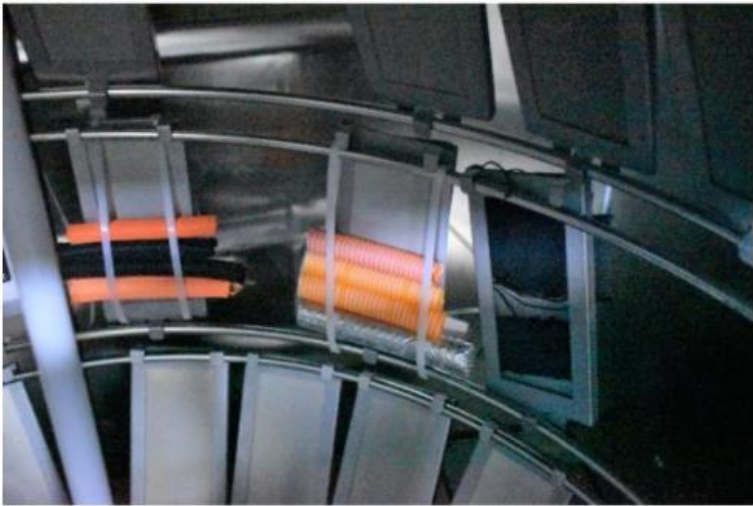
4. Test Result

Sample	Appearance	Client's requirement	Conclusion
1	No visible chalking, cracking, fracture and color change.	No chalking, cracking and fracture	Pass
2	No visible chalking, cracking, fracture and color change.		Pass
3	No visible chalking, cracking, fracture and color change.		Pass

Note: Test samples were cut from the original sample.

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5. Test Photo

			
During test			
			
Reference sample Test sample		Reference sample Test sample	
Before test		After test	

Remark: The testing data and result(s) in this report is(are) just for scientific research, education, internal quality control and product development etc.

XENON ARC TEST EXPLANATIONS / APPLICATIONS

A Xenon arc test is a standardized method used to evaluate the UV resistance of plastic materials by simulating the effects of prolonged exposure to sunlight, heat, and moisture. Here's an overview of how the test works and its purpose:

How the Xenon Arc Test Works:

Light Source:

A Xenon arc lamp is used to replicate the full spectrum of sunlight, including UV, visible, and infrared light. This lamp provides a close approximation of natural sunlight, particularly UV radiation, which is responsible for photodegradation in plastics.

Test Chamber:

The plastic samples are placed in a test chamber where they are subjected to controlled cycles of light, heat, and humidity to mimic real-world environmental conditions.

Exposure Cycles:

The test involves alternating cycles of light and darkness, often combined with moisture (e.g., water spray or condensation) to simulate dew formation. These cycles replicate the daily exposure to sunlight and moisture that materials experience outdoors.

Temperature and Humidity Control:

The chamber maintains precise control over temperature and relative humidity to ensure consistent test conditions.

Monitoring and Measurement:

The test duration and intensity are predetermined based on the material's intended application and expected service life. Measurements are taken periodically to assess changes in the material's properties.

Purpose and Measurements:

The test evaluates how the plastic resists UV degradation, which can manifest as:

- Color changes (fading or yellowing): UV radiation can break down pigments or dyes in the plastic.
- Loss of mechanical properties: UV exposure may weaken the molecular structure, reducing tensile strength or impact resistance.
- Surface changes: This includes chalking, cracking, or embrittlement.

Standards and Test Results:

The Xenon arc test follows standardized procedures, such as:

ASTM G155

ISO 4892-2

The results are typically reported as:

- Time to failure: How long the material retains its properties under exposure.
- Delta E (ΔE): A measure of color change.
- Retained properties: Percent retention of mechanical or physical characteristics.

Applications:

The test helps manufacturers:

- Predict product longevity: Determine how long a plastic item will maintain its functionality and appearance under outdoor conditions.
- Compare materials: Evaluate different formulations or additives for UV stabilization.
- Certify compliance: Meet industry standards or customer requirements for UV resistance.

By simulating accelerated weathering, the Xenon arc test provides valuable insights into a plastic item's durability in outdoor environments.