

A global leader in  
applied light technology

**IWASAKI**

EYE SUPER UV TESTER

**Accelerated weather durability tester:  
substantially reduces time needed for reproducing natural deterioration**

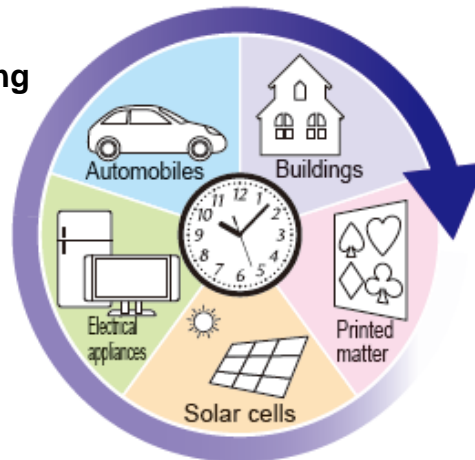
**EYE Super UV Tester**

# EYE SUPER UV TESTER

Many products are used outdoors and must endure the harsh treatment of Mother Nature. They are exposed to the light from the sun, rain and wind. Plastics gradually crack, and paint colors fade. This phenomenon is referred to as deterioration. An accelerated weather-durability test artificially recreates outdoor conditions such as light, heat, rain and wind providing a rapid observation of the deterioration process to determine the life of a product.

## Examples of materials benefiting from weather durability testing

- **Painted Panels**  
Automobiles, building exteriors
- **Resins**  
Automobiles, PV panels, buildings, electrical appliances
- **Printed Material**  
Rubber, artificial stone



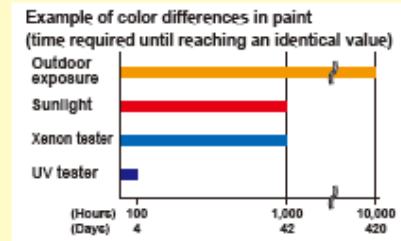
## UV Durability Testing

The quality of materials is steadily improving, but the demand for these products to survive prolonged exposure continues to expand. This is difficult to predict without actual data and it is financially impossible to wait 5, 10 or 20 years while this data is acquired. Artificial weather-durability tests have become essential to enable development of materials in a reasonable time frame. However, to develop a product with a 10-year warranty using regular testers would require one full year of testing. To meet the need for more rapid testing we have developed a Super Acceleration UV test system. The phenomenal speed of this tester enables it to simulate ten years of outdoor exposure in approximately 1,000 hours, and makes it an indispensable tool in ongoing material development and research.

The Super UV acceleration chamber can simulate three years of outdoor exposure in only nine days of testing. Correlated acceleration factors, greater than 100 times natural solar UV irradiation, provide proven, extended outdoor exposure evaluation testing. Regardless of the product, this system can dramatically reduce testing time, improving quality and profitability.

**Features**

- 1 Providing correlated acceleration factors more than 10 times typical weatherometer systems, the Super UV tester greatly increases the efficiency of research and development, quality control and process control of plastic, paint, ink, pigment, textiles and other materials. Uniform irradiation of high intensity ultraviolet light ensures accurate and fast weather durability assessment.
- 2 Programmable temperature, humidity, rainfall, UV power, rest (night time), and cycle/duration timing.
- 3 An electronic feedback system provides flexible control of UV irradiation intensity and ensures constant energy to target material and uniform distribution of irradiation.
- 4 Custom spectral filtering cuts UV irradiation below 295nm to eliminate the negative effect from UV irradiation not present in natural sunlight.

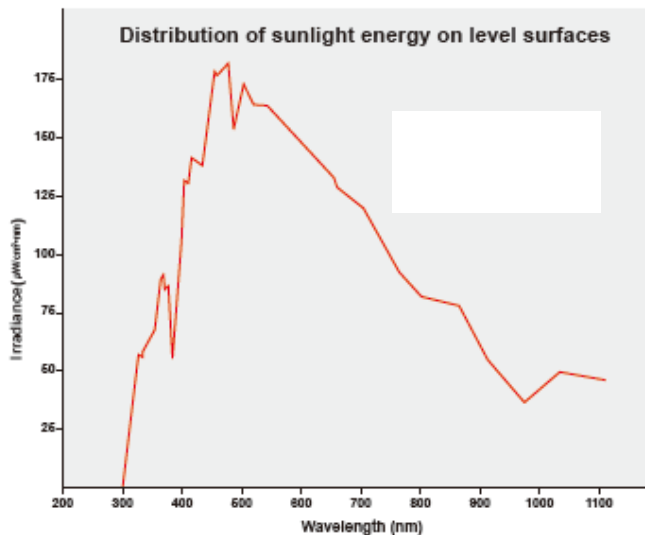
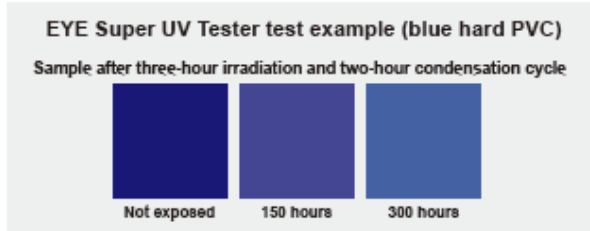


**High UV irradiation intensity speeds up weather durability testing.**

The system concentrates the high deteriorating power of UV irradiation. The EYE Super UV tester enables weather durability testing at an unprecedented speed. It dramatically reduces testing time that required months or years of outdoor exposure or several hundreds, or thousands, of hours of accelerated testing and speeds up quality checks during research and development.

**UV rays are the greatest cause of product deterioration.**

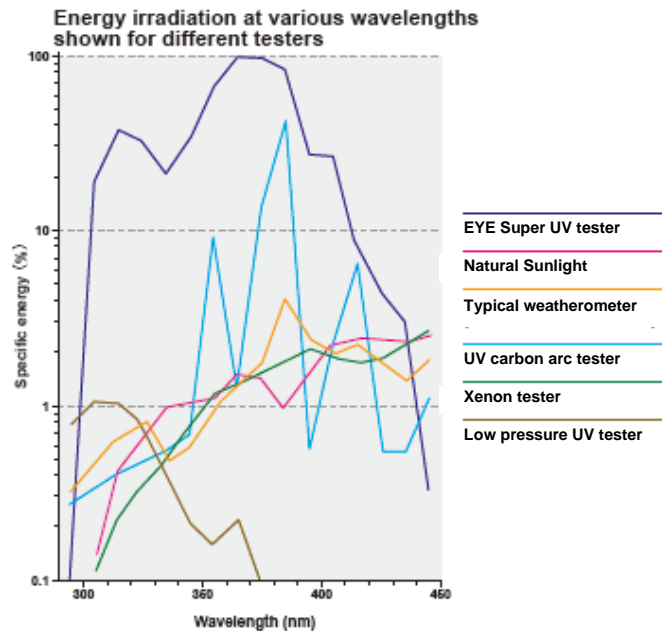
Whether it's the prolonged hot dry sun of Arizona or the humid, wet irregular sun of England, the Super UV system can recreate these environmental conditions for repeatable testing. The system boosts accelerated UV irradiation deterioration and generates the physical changes that occur during outdoor exposure and conventional weatherometer testing. These features greatly speed up weather durability testing. The EYE Super UV system, an ultra-accelerated weather durability test system, comes with capabilities that exceed what was thought to be achievable.



## 30 times or greater UV irradiation intensity than conventional weatherometers.

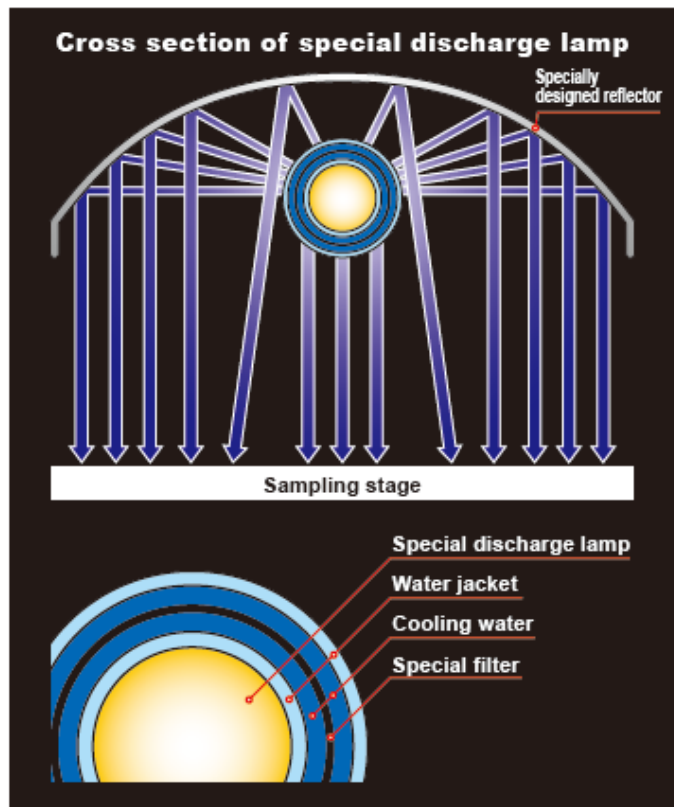
### Unprecedented test speeds.

The Super UV system uses a proprietary high output UV lamp that generates ultraviolet light very efficiently. Its UV irradiation intensity is 30 or more times greater than that of sunlight and conventional weatherometers. For even greater solar correlation, UV radiation below 295 nm is removed from the light source by a custom filter. Removing this radiation below 295nm, that in natural sunlight does not reach earth, produces accelerated deterioration that more closely resembles outdoor exposure. There is no risk that light of a wavelength not present in sunlight will bias the test results.



## Uniform distribution of irradiation intensity ensures the reliability of weather durability test assessment.

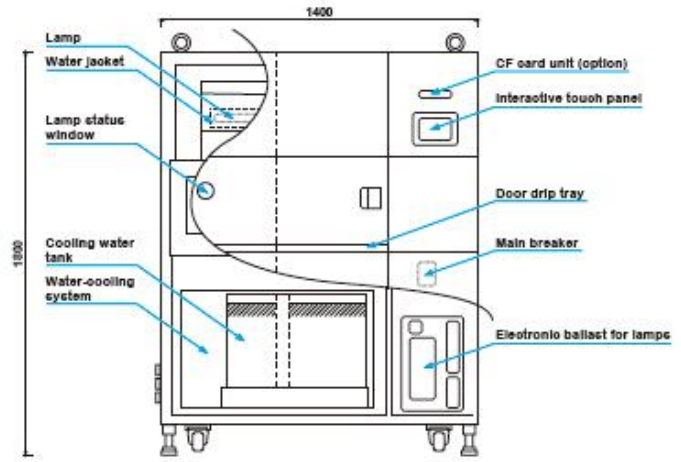
Specially designed reflectors ensure uniformity of UV irradiation distribution on the sampling stage. In addition, the automatic feedback control system guarantees that the UV intensity remains constant for unrivalled uniformity. Highly accurate accelerated deterioration makes this testing system a high reliability ultra-accelerated weather durability tester.



# EYE Super UV Tester SUV-W151

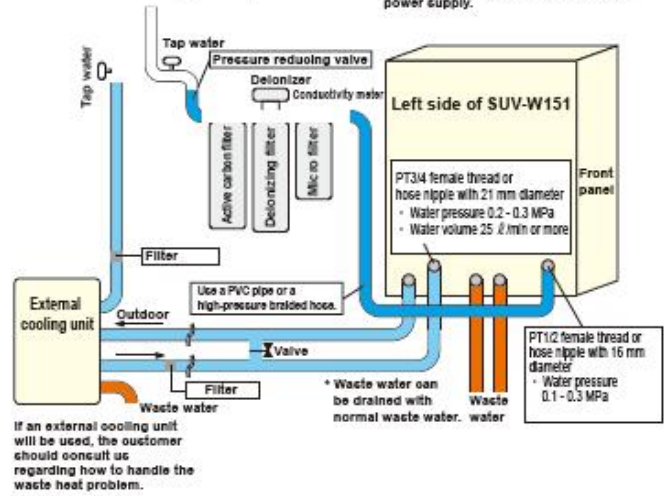
# WTYPE

(All weather model)



**Electric wiring**  
 1. Connect the breaker on the control board at the place of installation with the terminal block in the UV tester.  
 2. Connect the breaker on the control board at the place of installation with the cooler power supply.

• SUV-W151 water piping diagram and electric wiring example



• Operation area of the touch panel



## Features

- 1 Large Sample Area**  
 The SUV-W151 provides a sample area (effective irradiation area) that is twice as large as previous models.
- 2 Automatic UV Irradiation Control**  
 UV irradiation intensity is set on the touch panel and then controlled automatically. Constant irradiation intensity ensures highly reliable tests even as the lamp ages.
- 3 Improved Reliability**  
 A proprietary electronic ballast eliminates the effect of voltage fluctuations in the power supply enabling continuous, precise control for greater test reproducibility.
- 4 Easy Maintenance**  
 Compact, and light weight, lamps and jackets are easily replaced.
- 5 User Friendly Controls**  
 All settings are easily entered from the touch panel. The system is fully programmable including temperature, humidity, rainfall, UV power, and custom cycle setup. It also facilitates identification and monitoring of any problems that might occur.
- 6 Simple Data Acquisition and Analysis**  
 Optional built in data-logger with removable CF card provides data storage and transfer to common programs such as MS-Excel

# EYE Super UV Tester Specifications

Model		SUV-W151
Light source	Lamp	Proprietary Iwasaki metal halide based UV lamp with water cooled jacket and filter; Wavelength: 295-450nm (natural solar UV)
	Lamp type	M04-L21WBX/SUV
	Water-cooling jacket	WJ50-SUV
Test methods		Continuous irradiation or programmable cycle operation (1) Light continuous irradiation (2) Light → pause cycle (3) Light → condensation cycle (4) Light → condensation → pause cycle (5) Light → pause → condensation cycle
Test duration		Duration of each of irradiation, condensation and pause Total timer span (0.1- 9999.9 hours)
Ultraviolet Irradiation		Programmable up to 1500 ±80 W/m <sup>2</sup> (see footnote 2)
Ultraviolet Irradiation distribution		Uniformity ratio: 90%
Ultraviolet Irradiation measurement		Permanently-installed UV irradiation sensor for feedback control of UV irradiation power during test
Ultraviolet illuminance adjustment		Adjustable with built-in electronic touch panel
Temperature control	Irradiation period (BP)	50-85°C (when ambient temperature is 20°C)
	Pause period (BP)	35-75°C (when ambient temperature is 20°C)
Black Panel temperature control		Closed loop system
Auto-temperature adjustment function		±3°C with black panel temperature
Humidity control range	Irradiation period	40-70% (when BP is 63°C)
	Pause period	50-90% (when BP is 50°C)
Continuous irradiation duration		0-9999.9 hours
Effective irradiation area		190mm (7.5in) x 422mm (16.5in)
Lamp cooling	Cooling method	Water-water heat exchanging method
	Cooling water tank capacity	25L (pure water) + 35L (pure water)
Externally-supplied water		Pure water 6L/min (required for operation) Water pressure: 0.1-0.3MPa Tap water quantity: 25L/min or more, 20°C or less Water pressure: 0.2-0.3MPa
Power consumption		21kVA (3 phase, 208V, 50/60Hz), maximum current: 65A
Outer dimensions (mm)		1400mm (55.1in)W x 1200mm (47.2in)D x 1800mm (70.8in)H
Weight		Approximately 700kg (1540lbs)
Standard specifications	Temperature/humidity control during pause	Temperature and humidity can be controlled during pause. Control range, temperature: 35-75±3°C, humidity: 50-90%RH
	Heat exchange/water cooling	Lamp jacket heat-exchanger utilizes external cooled water to exhaust heat out of test area
	Filter	30% light intensity reduction filter
	Shower (rain)	Shower possible after condensation and pause
Data Acquisition		Built in datalogger with compact flash memory unit Data transfer (csv) to MS-Excel or similar programs

(1) Contact us for other specifications. "Drain pan" for preventing water leakage is available

(2) JIS compliant value (100W/cm<sup>2</sup> with conventional UV radiometer)

(3) BP = Black Panel thermometer

(4) Please note that specifications may change due to continuous system improvement program

## Test data — 1

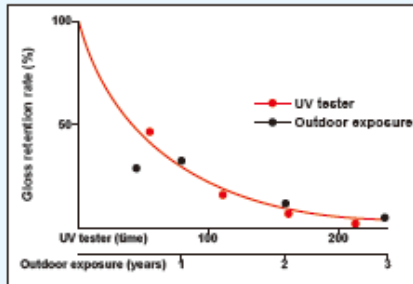
Sample: ABS (commercial item)

Test conditions

Cycle (hr) Irradiation/condensation	BP temperature (°C) Irradiation/condensation	Humidity (%RH) Irradiation/condensation	UV irradiation intensity (mW/cm <sup>2</sup> )	Acceleration factor (Outdoor rate)
12/6	63/(30)	50/(96)	150*	110 times

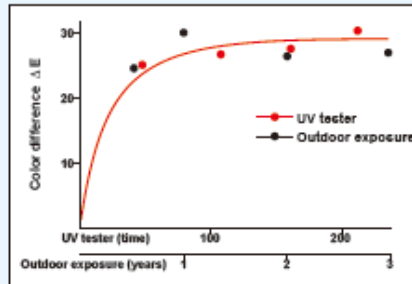
### Result

(1) Gloss retention rate



- Gloss of samples placed in the tester and those placed outside began to fade when the test started and decreased to a few % after three years of outdoor exposure and 240 hours in the tester.

(2) Color difference



- The color differences of samples placed in the tester and those placed outside increased as the test started and became a low 30 after one year of outdoor exposure or about 80 hours in the tester, but then stayed the same.

(3) Exterior Effects

Outdoor exposure	0.5 years	1 year	2 years	3 years
Outdoor exposure	Yellowing	Yellowing and cracking	Yellowing and cracking	Yellowing and cracking
UV tester	54 hrs	108 hrs	162 hrs	216 hrs
	Yellowing	Yellowing	Yellowing	Yellowing and cracking

## Test data — 2

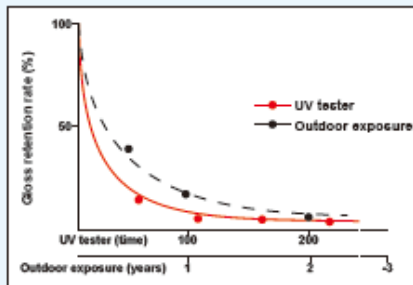
Sample: PP (commercial item)

Test conditions

Cycle (hr) Irradiation/condensation	BP temperature (°C) Irradiation/condensation	Humidity (%RH) Irradiation/condensation	UV irradiation intensity (mW/cm <sup>2</sup> )	Acceleration factor (Outdoor rate)
12/6	83/(30)	50/(96)	150*	88 times

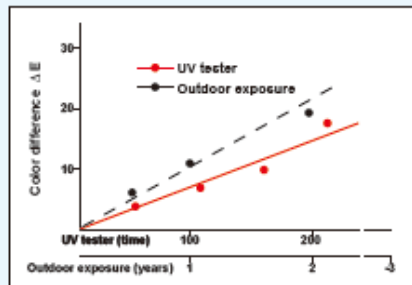
### Result

(1) Gloss retention rate



- Exhibits a similar tendency, but the tester drops to a few % first.

(2) Color difference



- Both increases linearly, but samples placed outdoors showed a quicker increase. (This is probably caused by soiling.)

(3) Exterior Effects

Outdoor exposure	0.5 years	1 year	2 years	3 years
Outdoor exposure	Cracks	Cracks and dirt	Damage	Damage
UV tester	54 hrs	108 hrs	162 hrs	216 hrs
	Cracks	Cracks	Damage	Damage

## Test data — 3

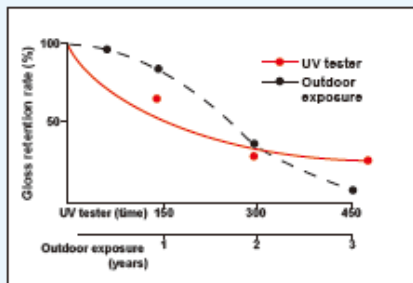
Sample: Hard PVC (grey) (commercial item)

Test conditions

Cycle (hr) Irradiation/condensation	BP temperature (°C) Irradiation/condensation	Humidity (%RH) Irradiation/condensation	UV irradiation intensity (mW/cm <sup>2</sup> )	Shower	Acceleration factor (Outdoor rate)
4/2	50/(30)	50/(96)	120*	Provided	60 times

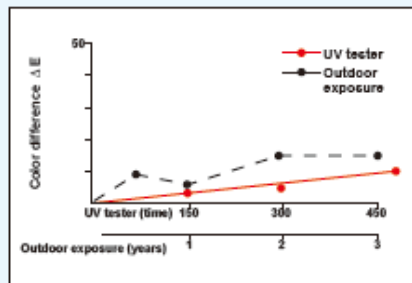
### Result

(1) Gloss retention rate



- Similar tendencies for both.

(2) Color difference



- Both samples show similar tendencies. Outdoor exposure of 1 year and 150 hours in the tester.

(3) Exterior Effects

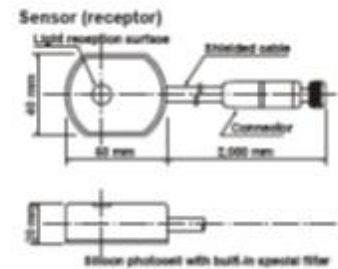
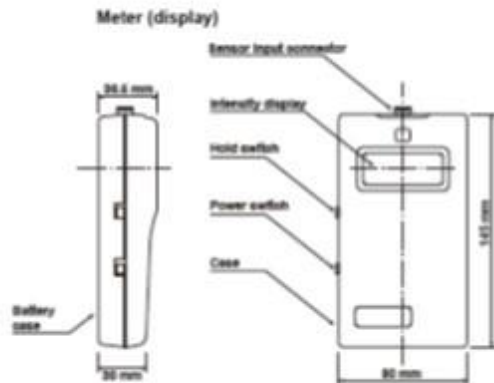
Outdoor exposure	0.5 years	1 year	2 years	3 years
Outdoor exposure	Yellowing	Decoloration	Choking	Choking
UV tester		150 hrs	300 hrs	450 hrs
		Yellowing	Decoloration	Choking

# Option

## Handheld UV photometer: UVP365-03 (complies with JIS C 1613, high irradiance ultraviolet radiometers of the metal halide lamp type exposure apparatus)

### Features

- 1 Accurate numerical management of UV irradiation intensity (300 to 400 nm)**  
 Measurement values are digitally indicated and easy to read. A measurement value hold function helps preventing measurement errors.
- 2 High measurement accuracy**  
 Spectral sensitivity characteristics that match the spectral distribution curve of the UV tester ensures high measurement accuracy.
- 3 Compact and easy to use**  
 Measurements are available by turning the tester on and off and calibration is not required.  
 The receptor cells are silicon photocells. The receptors are compact. The meter is powered from a dry battery (9 V). A battery check function is provided.



### The following precautions must be heeded to maintain safety.

This document classifies precautions into WARNINGS and CAUTIONS .

- |                           |   |
|---------------------------|---|
| <b>Safety Precautions</b> | <ul style="list-style-type: none"> <li>• Be sure to read through the User's Guide before using this product.</li> <li>• Do not use the product for special applications not described in this document, as this could damage the quality of the product.</li> </ul> |
|---------------------------|---|

<b>Symbol Explanation</b>	<ul style="list-style-type: none"> <li>  This symbol is intended to alert the user to the presence of important precautions (including DANGER and WARNING signs). The specific precaution is depicted inside or beside diagrams (the symbol shown at left is a general warning sign).                 </li> <li>  This symbol indicates a prohibited action. The specific action that is prohibited is depicted inside or beside diagrams (the symbol shown at left indicates that disassembly and repair are prohibited).                 </li> <li>  This symbol indicates a mandatory action. The specific precaution is depicted inside or beside diagrams (the symbol shown at left is a general mandatory action sign).                 </li> </ul>
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