

CO.FO.ME.GRA.

solarbox

simulates sunshine day and night



IRRADIANCE CONTROL

Radiant energy in the SOLARBOX is provided by a single air-cooled Xenon Lamp. Irradiance is the rate at which light energy falls onto the samples. A weathering tester must control irradiance if it is to achieve accurate and reproducible test results.

SOLARBOX offers constant measurement and control of irradiance during every test, compensating for lamp and filter ageing via a closed loop irradiance narrow-band sensor control system.

Irradiation uniformity is guaranteed by a parabolic reflector chamber with the Xenon Lamp in the focus, instead of a rotating specimen holder.



SOLARBOX 3000

TEMPERATURE CONTROL

Temperature is another component of the end use environment which plays a key role in material degradation. Heat in the natural environment comes from the infrared portion of natural sunlight.

An object exposed to direct sunlight is always warmer than the air surrounding it.

Your product is exposed in the same manner in our SOLARBOX tester.

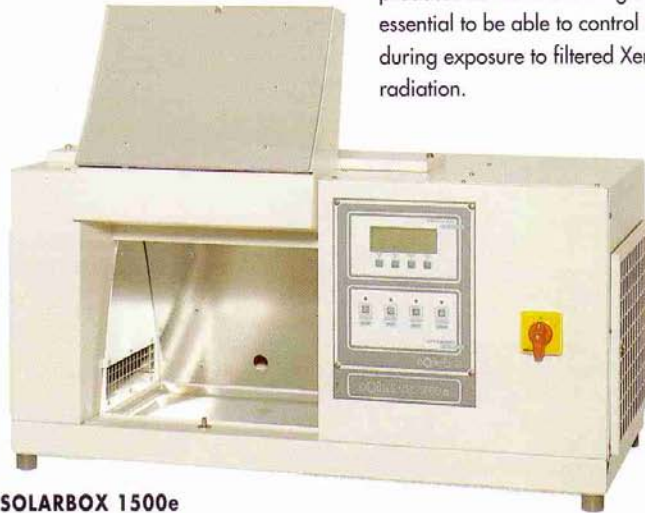
The radiant heat received from the Xenon Lamp is continuously monitored and controlled by a B.S.T. (Black Standard Thermometer) built in the plane of test panels near your samples.

In SOLARBOX 1500e and 3000e there is the control and display of the black

standard temperature between 35°C and 100°C. The importance of temperature in the weathering degradation process is that the kinetic

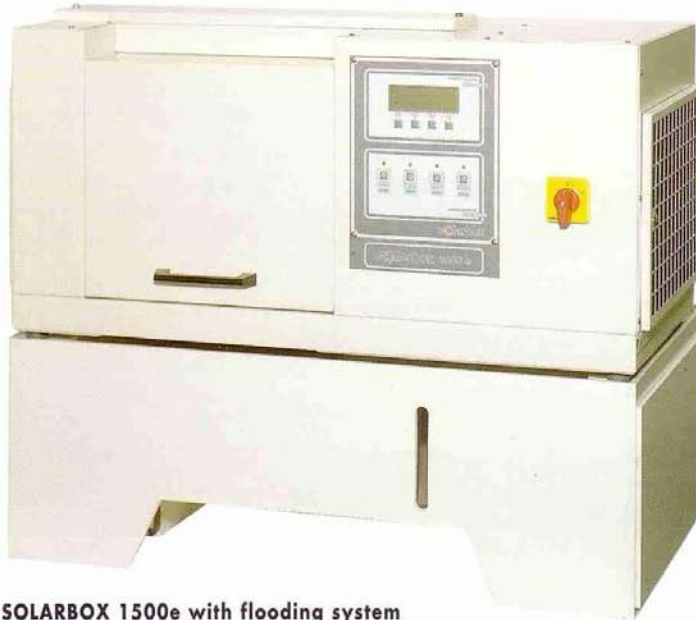
reaction rate doubles for every 10°C temperature increase.

Consequently, because the temperature produces an accelerated ageing, it is essential to be able to control B.S.T. during exposure to filtered Xenon radiation.



SOLARBOX 1500e

SIMULATING THE EFFECT OF RAIN AND MOISTURE



SOLARBOX 1500e with flooding system

A flooding system for conducting weathering tests with freely selectable flooding interval is an available option for SOLARBOX 1500e and 3000e:

- water level indicator
- continuous flooding possible
- flooding intervals selectable between 1 and 999 minutes throughout the test program
- water temperature of 30°C to 50°C (option).

During flooding, the Xenon Lamp can be programmed on or off.

The standard flooding system operates with demineralized water from a closed recycling circuit or optional pump system, providing optimum water flow to the specimen tray from your laboratory line. PVC and corrosion-resistant materials ensure long life of this system:

Flooding specifications	SOLARBOX 1500e	SOLARBOX 3000e
Capacity:	40 litres (10,5 gallons)	50 litres (13,2 gallons)
Dimensions (WxDxH):	750 x 450 x 260 mm. (30x18x10 in.)	890 x 450 x 260 mm. (35x18x10 in.)
Weight:	20 Kg. (44 lb)	22 Kg. (49 lb)

XENON AND FILTER COMBINATION OPTIMIZE SUNLIGHT SIMULATION:

The SOLARBOX 1500-1500e and SOLARBOX 3000-3000e are 4 modern filtered Xenon light exposure and weathering instruments which simulate realistic natural outdoor weathering conditions.

Accelerating the process requires the accurate reproduction of the sun's rays. The air cooled Xenon Lamp in the SOLARBOX replicates the total spectrum

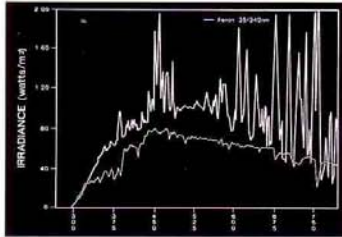
of the sun and not just the short wavelength UV.

Easily interchangeable UV filters allow the reproduction of the specific spectral distributions found in your product's end use environments.

CUT-ON FILTERS extra-long life limiting radiation of xenon lamp:

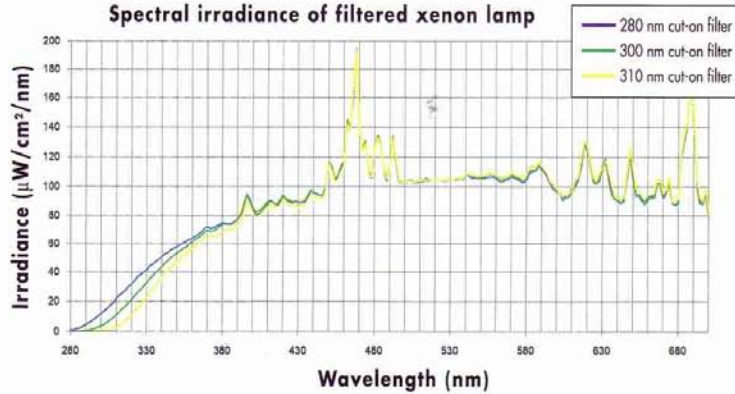
- Soda-lime glass UV filter to simulate OUTDOOR exposure.
- Soda-lime glass UV filter to simulate INDOOR exposure.
- Soda-lime glass UV filter to simulate OUTDOOR exposure with INFRA-RED reflection coating.
- Soda-lime glass UV filter to simulate INDOOR exposure with INFRA-RED reflection coating.

Spectral power distribution



Xenon Arc vs. daylight

Spectral irradiance of filtered xenon lamp



4 SOLARBOX MODELS FEATURES

SOLARBOX 1500/3000 standard versions include the following equipment:

- timer and time elapsed meter for accurate control of test sequence
- air cooled Xenon Lamp
- rotary knob to adjust irradiance level
- control system for constant irradiance
- basic 280 nm filter for maximum UV radiation effect

SOLARBOX 1500e/3000e enhanced models are equipped with microprocessor control of irradiance, heat and flooding cycles, monitoring and controlling the test process:

- microprocessor controls for programming the test parameters
- LCD with 4 lines to display the test parameters and program menu
- control and monitoring of irradiance and black panel temperature
- optional measurement and display

of temperature and relative humidity in the test chamber

- free programming, up to 15 different test programs, input via keyboard
- data transfer via RS 232-C interface
- link-up with programmable flooding system accessories

RADIOMETER AND BLACK-PANEL STANDARD THERMOMETER



The MULTIMETER is a battery operated radiometer and thermometer, specially developed for use with the SOLARBOX, but it can control the output of any UV lamp in many industrial applications.

It is portable and together with its case, can easily be returned to the manufacturer (CO.FO.ME.GRA) for re-certification of calibration to an official national laboratory standard.

The MULTIMETER measures either irradiance or temperature using the following easily interchangeable, good cosine response sensor:

- UV 295 - 400 nm large band sensor
- UV 340 nm narrow band sensor
- UV 420 nm narrow band sensor
- Illuminance sensor spectral response similar C.I.E. photopic luminosity curve, measuring range up to 2 MEGALUX.
- B.S.T. Black Standard Temperature sensor

ISO 9000 COMPLIANCE

The SOLARBOX 1500e and SOLARBOX 3000e allow compliance with current ISO requirements. Temperature and irradiance calibration and radiometer are traceable to an official national laboratory standard. Re-calibration is quick and easy via a sensor calibration program.

NORMATIVE REFERENCES

The SOLARBOX, because of 4 different models and flexibility in available options, meets the test conditions specified by ASTM, ISO, SAE, CEN, DIN, BS, UNI and other international standards in the various fields of application.

TEST REPORT

With SOLARBOX 1500e and SOLARBOX 3000e the test conditions and all the parameters are periodically saved or sent to a printer or to a PC through a RS 232 serial interface: a simple but powerful tool that fully documents the test.

FIELDS OF APPLICATION

- Plastics - Textiles - Foods - Paints
- Inks - Cosmetics - Building Materials
- Electronic Components
- Pharmaceuticals - etc.

The large dimensions of SOLARBOX 3000 and 3000e test chamber can accommodate 3 dimensional objects and finished industry products.

This facility, for which there is increased of demand, is generally available only in very expensive Xenon testers.



TECHNICAL DATA

SOLARBOX Model	1500	1500e	3000	3000e
Electrical connection				
Mains voltage	230 Vac \pm 10%, 50/60 Hz.			
Mains connection	1/N/PE			
Current consumption	16 A (max.)			
Measures and weight	1500	1500e	3000	3000e
Dimensions	750 x 390 x 400 mm.		890 x 390 x 400 mm.	
Exposure area (Horizontal Specimen Holder)	280 x 200 mm.		420 x 200 mm.	
Weight	29 Kg.		31 Kg.	
Number of specimen panels (15 x 30 mm.)	more than 120		more than 180	
Features	1500	1500e	3000	3000e
Light source: air-cooled Xenon Lamp	X	X	X	X
Adjustment and control of irradiance level	X	X	X	X
Display of current irradiance level		X		X
Irradiance range: from 250 to 1.000 W/m ² (300-800 nm)	X	X	X	X
BST: control of temperature level, range: up to 100°C		X		X
BST: display of current temperature value		X		X
Timer for test time setting up to 999 hours	X	X	X	X
Microprocessor control		X		X
4 lines LCD for test parameters and program menu		X		X
Bi-directional RS 232 interface for data output		X		X
Free programming of 15 tests standards		X		X
Special sensors calibration program		X		X
Options and accessories	1500	1500e	3000	3000e
Borosilicate glass UV filter 280 nm. to simulate outdoor exposure.	X	X	X	X
Soda-lime glass UV filter, extra long life . to simulate outdoor exposure.	X	X	X	X
Soda-lime glass UV filter, extra long life . to simulate indoor exposure.	X	X	X	X
Soda-lime glass UV filter, extra long life . to simulate outdoor exposure with Infra Red reflection coating.	X	X	X	X
Soda-lime glass UV filter, extra long life . to simulate indoor exposure with Infra Red reflection coating.	X	X	X	X
Flooding system for specimen		X		X
Water cooled specimen table	X	X	X	X
Test chamber humidity and temperature display		X		X
Magnetic stirrer for liquid samples	X	X	X	X
XEN 32 REPORT LEVEL		X		X
XEN 32 MAINTENANCE LEVEL data transfer and calibration software.		X		X
Cooling unit, air refrigerator	X	X	X	X
Radiometer and thermometer with sensors:	X	X	X	X
Sensor 295-400 nm. wide band total UV	X	X	X	X
Sensor 340 nm. narrow band	X	X	X	X
Sensor 420 nm. narrow band	X	X	X	X
Illuminance sensor up to 2 Mlux	X	X	X	X
Black Standard Temperature sensor	X	X	X	X