

# Ci4000

Weather-Ometer®



Setting the Standard  
for Xenon Weathering



Accelerating Your Expertise



# Which Light is Right?

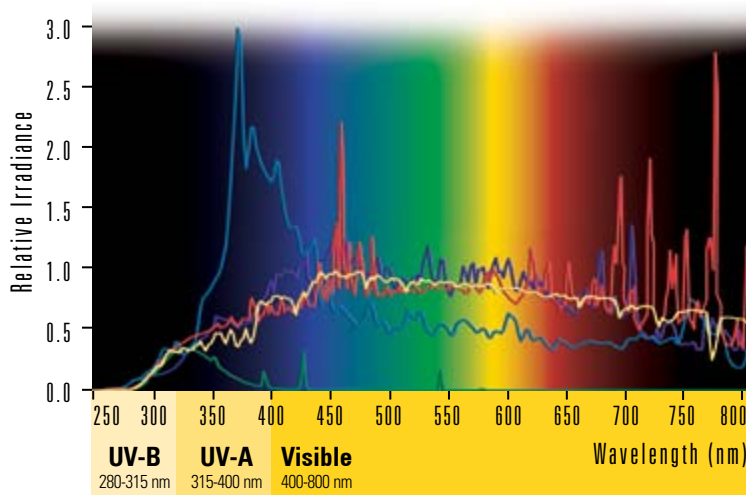
Choosing the “right light” is one of the first steps in creating an accurate and reliable weathering test program. The Ci4000 simulates solar radiation using xenon lamps and advanced filter systems specifically designed for weathering. Atlas xenon lamps are developed exclusively for weathering to meet high performance criteria for their spectral power distribution, lifetime irradiance stability and lot-to-lot uniformity.

The Ci4000 uses interchangeable glass filters that tailor the xenon light spectrum to match light conditions in your products’ end use environment.



## Sunlight vs. Artificial Light Sources

### A Comparison of Relative Spectral Power Distribution



- **Global Solar Radiation**  
Average Miami Sunlight 26° South Direct
- **Xenon Arc Lamp**  
As used in an Atlas Weather-Ometer® with Right Light™ filters
- **UVA-340 Fluorescent Lamp**  
Commonly used in the Atlas UVTest
- **Metal Halide**  
As used in the Solar Environmental Chambers (SEC)
- **Sunshine Carbon Arc**  
As used in an Atlas Weather-Ometer® with Corex D filters

## Common Applications

The Ci4000 is perfectly suited for testing:

- **Automotive Materials**
- **Plastics**
- **Inks**
- **Paints and Coatings**
- **Packaging**
- **Photovoltaics**
- **Textiles including Industrial and Geotextiles**
- **Pigments, Dyestuffs, Stabilizers and Additives**







# FEATURES

## A Higher Order of Weathering Testing Performance Through Superior Science

The Ci4000 Weather-Ometer<sup>®</sup>, with its advanced digital control system, represents monumental achievement in applying digital and optical technologies in an easy-to-use laboratory weathering instrument. The Ci4000 is approved by many OEMs in the automotive, paints & coatings and plastics industries as the exclusive platform to deliver accurate, reproducible and repeatable results for predicting service life. The Ci4000 has been certified CE, UL, CSA, ISO and EN compliant.

### Rotating Sample Rack

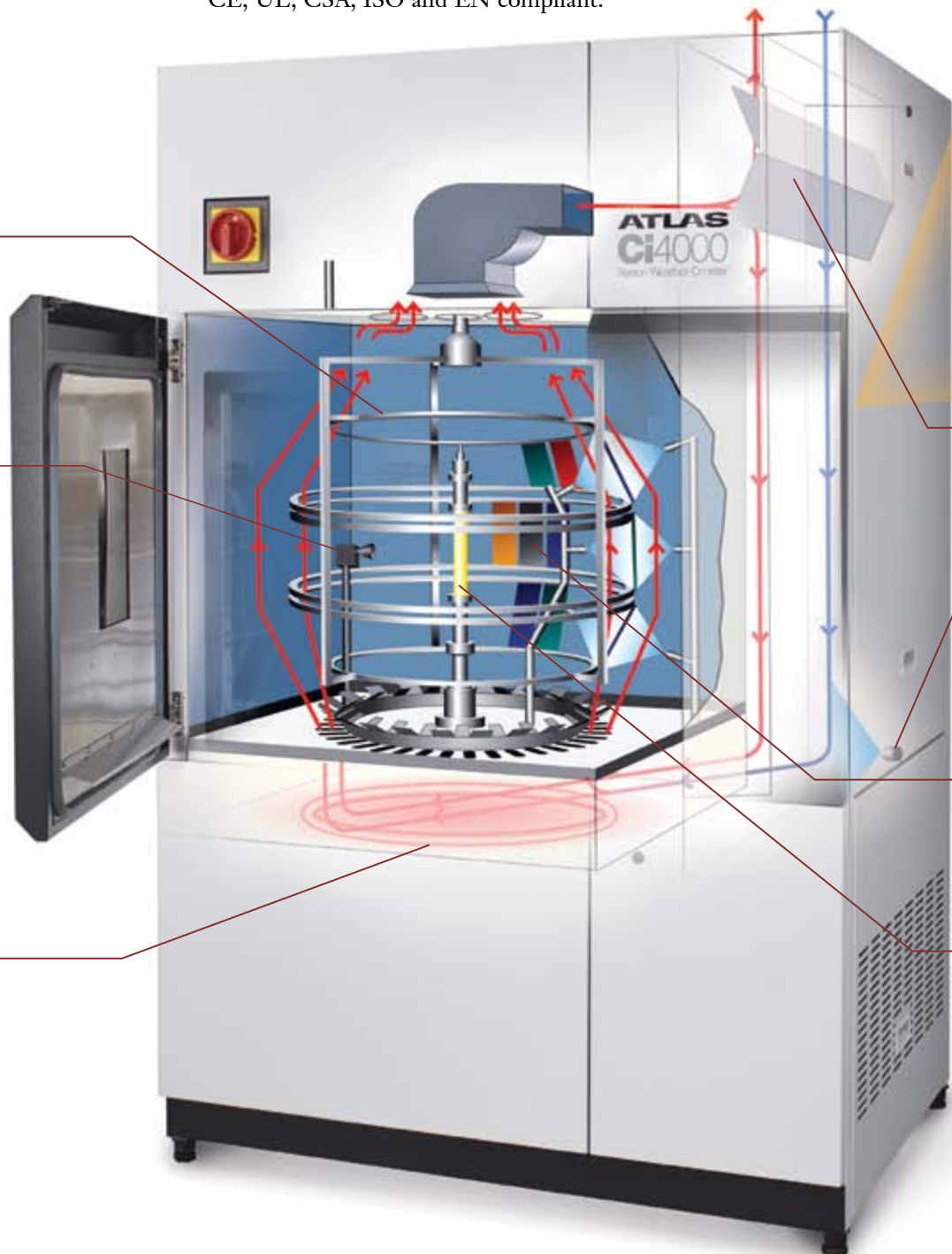
Maximizes exposure uniformity over all specimens

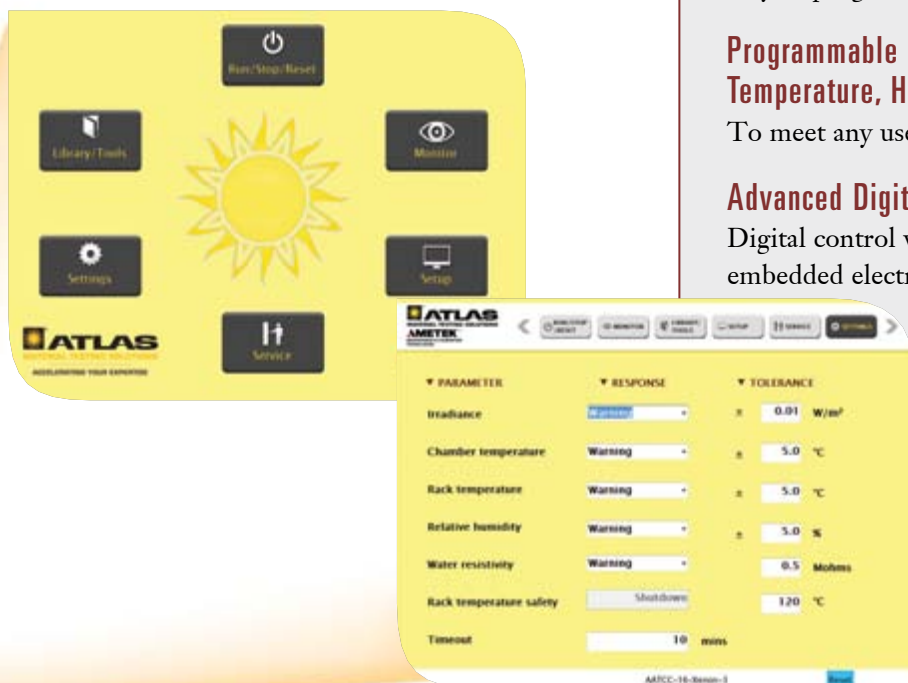
### Controlled Irradiance

Up to 2-sun irradiance levels or higher based on your test requirements. Narrow band (340 nm or 420 nm), broad band (300-400 nm) or illuminance control/Lux (400-750 nm) with optional monitoring at a second wavelength to meet global test requirements

### Test Chamber Temperature

Closely simulates your material's end use environment





### Intuitive User Touch Screen Interface

Increases functionality that makes the Ci4000 easy to program, monitor and calibrate

### Programmable Stepped Changes in Irradiance, Temperature, Humidity and Other Test Conditions

To meet any user defined test program or cycle

### Advanced Digital Control

Digital control with rugged, state-of-the-art embedded electronics

### SmartDamper

Reduces test variability in chamber temperature and humidity and compensates for changes in ambient laboratory conditions.

### VibraSonic Humidity Control

Accurately replicates humidity levels to meet stringent global test requirements

### Black Panel Thermometer (BPT) or Black Standard Thermometer (BST)

Controls and monitors temperature at specimen level to ensure test repeatability.

### Xenon Lamp Cooling System

The Ci4000 is equipped with a new, ground-breaking xenon lamp cooling system that dramatically reduces the amount of cooling water used.

## Additional Features



### Data Acquisition

Streaming data output in a format that can be read in real-time or stored onto a portable media. Connection sources include USB or Ethernet.

### SmartLight Monitor

Verifies that the correct light capsule is installed.

### Water Purity Notification

Signals when incoming water quality falls below the factory set point.



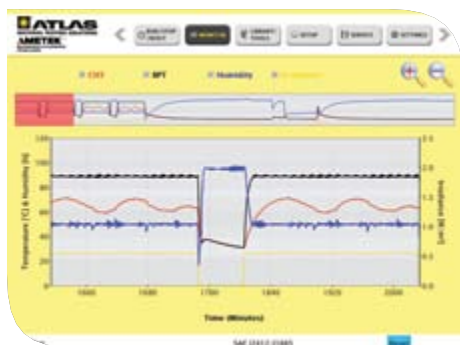
# CONTROL

## Enhanced Control System Enables Complex, Custom Test Programs or Simple, Preprogrammed Test Operation

### Easy to Understand Icons Simplify Navigation

New icons make getting to the information you need fast and easy

- Large, Touch Sensitive Buttons
- Clear, Easy-to-See Icons



### Two Simple-to-read Pages and On-screen Trend Plot Monitor All Critical Status Information

Monitor and/or plot all critical set points and compare with real time readings for:

- Rack Temperature:  
Black Panel Temperature (BPT),  
Black Standard Temperature (BST)  
or both
- Chamber Temperature
- Relative Humidity
- Irradiance
- Incoming Deionized  
Water Quality
- Lamp Cooling  
Water Temperature
- Countdown in Time  
or Radiant Exposure
- Phase Type and Duration







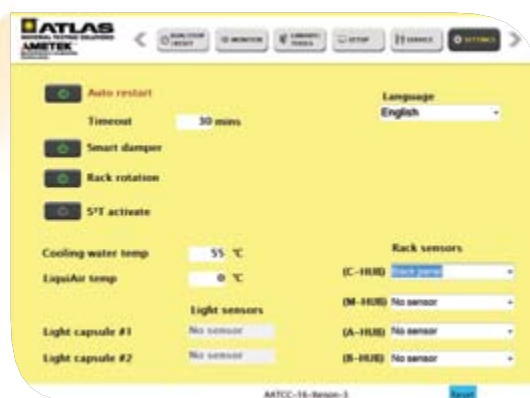
## 14 Factory Preprogrammed Test Methods

The test list includes:

ISO	GM	JASO
ASTM	Ford	AATCC
SAE	VW	

## Space for Four Custom Test Programs

Existing test methods can be copied and edited for custom applications



## Simplified Setup of Elective Control Features

Set variance level notification for critical variables on one screen

- Irradiance
- Chamber Temperature
- Rack Temperature (BPT, BST or both)
- Relative Humidity



## Multi-lingual Capability

Select the desired language:

- English
- Chinese
- Japanese
- Korean
- German
- French
- Spanish
- Turkish



## New User Functionality

Sample Management:

- Operators can keep track of multiple tests within the same Weather-Ometer® right on the user interface. Up to 10 individual sample sets can be tracked at once, either by time or by radiant dosage.

E-mail Notification:

- Your Weather-Ometer can alert you by email when user define test conditions have been met.

# LIGHT

## Long Arc Xenon is the Closest Simulation of UV, Visible and IR Solar Radiation

### Rotating Sample Rack

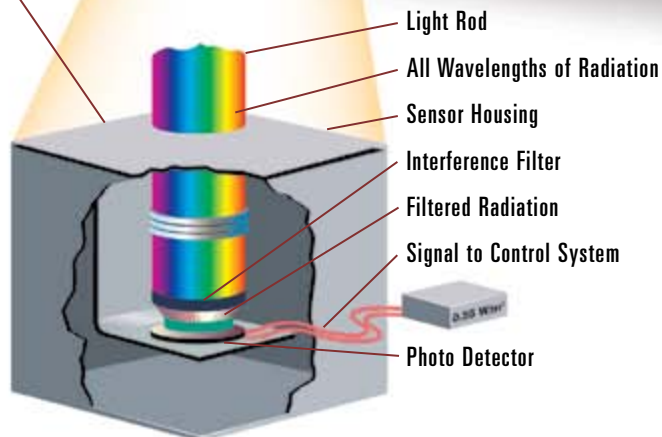
The inclined rotating rack delivers the best exposure uniformity

- Samples are rotated continuously during test. No need to manually rotate test samples
- Uniform specimen and chamber temperature, RH, irradiance and spray
- Allows for even and consistent airflow over sample surfaces
- Can accommodate three dimensional samples
  - Small Components
  - Finished Products
  - Bottles

### Intelligent Controlled Irradiance (Ci) System

A closed loop system automatically adjusts lamp output in real-time delivering the most stable radiant exposure

- Narrow band (340 nm or 420 nm), broad band (300-400 nm) or illuminance control/Lux (400-750 nm)
- Irradiance defined by user during test programming or by factory programmed test methods
- Intelligent control will only allow the user to select an irradiance that matches the defined test method
- Wattage regulating system





Filter Combinations		Test Conditions	Irradiance Ranges W/m <sup>2</sup>			
Inner	Outer		Wattage	300-400 nm	340 nm	420 nm
Right Light	Quartz	Weathering tests requiring the most precise match to sunlight available	2500 W 7500 W	35 168	0.35 1.68	0.66 2.99
Right Light	CIRA Coated Quartz	Weathering tests requiring the most precise match to sunlight available and lower test specimen temperatures	2500 W 7500 W	35 169	0.34 1.69	0.66 2.99
Type S Boro	Type S Boro	Most common combination for weathering tests (Daylight filter system)	2500 W 7500 W	29 141	0.25 1.26	0.59 2.76
Type S Boro	Soda Lime	Most common combination for lightfastness tests behind window glass	2500 W 7500 W	28 129	0.23 1.10	0.61 2.76
Quartz	Type S Boro	Weathering tests with somewhat more and shorter UV than sunlight	2500 W 7500 W	32 161	0.29 1.50	0.59 2.79
Quartz	Cira on Type S Boro	Weathering tests requiring full spectrum match and/or lower test temperatures	2500 W 7500 W	33 168	0.31 1.57	0.60 2.93
Type S Boro	Soda Lime + Float Glass in Auxiliary Lantern	Common combination for testing European automotive interior trim materials (Requires lantern assembly)	2500 W 7500 W	23 109	0.17 0.82	0.56 2.54
Quartz	Cira on Soda Lime + Float Glass in Auxiliary Lantern	Lightfastness test for automotive interior materials to meet GMW 3414TM		97	0.80	2.20
Quartz	Type S Boro + 335 nm long pass filter in Auxiliary Lantern	Lightfastness test for automotive interior materials to meet Ford FLTM B0 116-01		46	0.38	1.06
HL 35/65/4000	HL 3000/4000	Lightfastness test for automotive interior materials according to ISO 105-B06, VDA 75202 and European company specifications		60	0.55	1.40

Sunlight Measurements		Irradiance Ranges W/m <sup>2</sup>				
		300-400 nm	340 nm	420 nm	300-800 nm	300-2450 nm
Average Optimum Natural Daylight	Measured 45° South Cloudless Miami, FL	28.40	0.30	0.67	287.20	
Peak Natural Daylight	Measured solar noon on Vernal Equinox at normal incidence Miami, FL	66.20	0.70	1.53	617.00	
Peak Natural Daylight Standard	Defined for Horizontal Plane (0°) in CIE Publication No. 85 Table 4	69.20	0.68	1.50	669.70	1087.80

## International Standards

The Ci4000 Weather-Ometer<sup>®</sup> meets or exceeds the following industry standards:

AATCC	TM 16.3-2012		TM 16E-1998		TM 169			
ASTM	C1442	C1501	D904	D3424	D3451	D4101	D4303	D4355
	D4459	D4798	D5010	D5071	D5794	D6083	D6551	D6577
	D6662	D6695	D7869	G151	G155			
Ford	FLTM B0-116-01							
GB/T	1865	5137	6151	8427	8430	10485	14522	16259
	16422	16991						
GM	GMW14162		GMW3414TM		GME60292			
Hyundai Motor Co.	MS 210-05		MS 300-31					
ISO	105-B02	105-B04	105-B06	105-B10	11341	3917	4892-1	4892-2
	12040	16474-1	16474-2					
JASO	M 346							
MIL STD	810 G							
Peugeot/ Citroën (PSA)	D27 1389							
Renault	D27 1911							
SAE	J1885	J1960	J2412	J2413	J2527			
VDA	621-429	621-430	75202					
VW	PV 1303	PV 3929	PV 3930					

This is a sample of global standards that can be met by the Ci4000. For more information on additional or specific standards, contact your local Atlas representative. Standards are subject to change without notice. This might lead to the inclusion or exclusion of certain standards.



# CLIMATE CONTROL

The Ci4000 Offers Thorough Climate Control to Best Replicate Your Materials' End Use Environment

## Precise Humidity Control

The electronic sensor provides direct and accurate measurements of relative humidity and enables automatic control at the specimen level

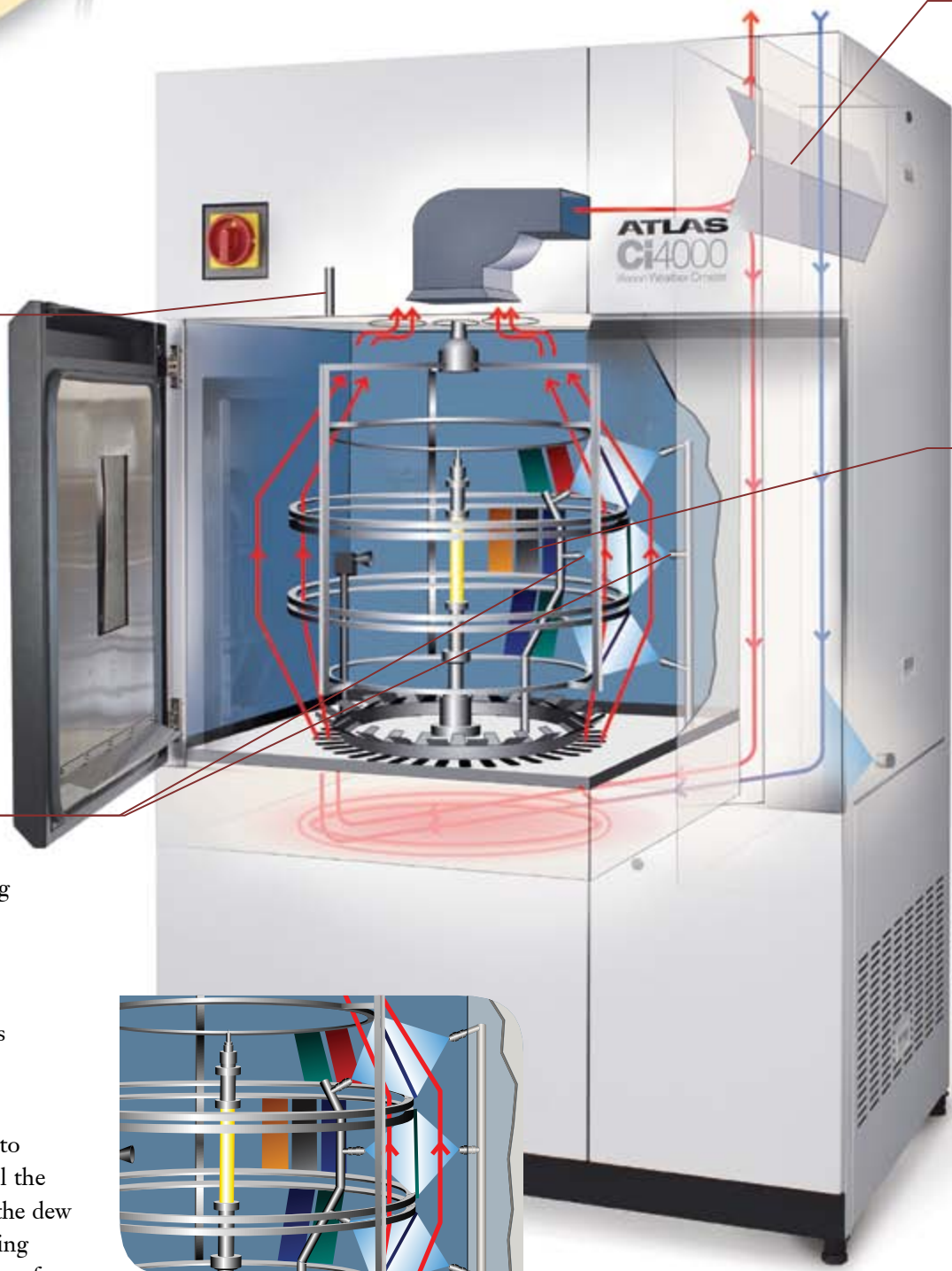
- 10% RH to 75% RH in light cycles\*
- Up to 100% in dark cycles\*

\* Dependent on other parameters such as lamp power, chamber temperature, ambient lab conditions etc.

## Specimen and Rack Spray

Custom designed precision nozzle provides uniform spraying of samples with deionized water

- The specimen spray applies water to the exposed surface of the sample which simulates rain to induce temperature shock and erosion effects
- The rack spray applies water to the back of the sample to cool the specimen temperature below the dew point during dark cycles causing condensation on the exposed surface



# TEMPERATURE CONTROL

## Consistent, Controlled Temperature Delivers Repeatable and Reproducible Results

### SmartDamper

- Balances test chamber temperature, BPT or BST and humidity levels and compensates for changes in ambient laboratory conditions
- Recirculates chamber air, introduces ambient air or a combination of the two

### Black Panel Thermometer (BPT) or Black Standard Thermometer (BST)

- Controls and monitors temperature at specimen level to ensure test repeatability
- Control of one sensor type while simultaneously monitoring the other

### BPT/BST Temperature vs. Chamber Temperature (CHT)

- BPT and BST sensors simulate an estimate of the maximum temperature on a sample's surface
- CHT measures the temperature of the air circulating within the chamber
- Controlling both sample and air temperature delivers superior repeatability and can closely match the samples end use environment



### Simultaneous Control of BPT/BST and CHT

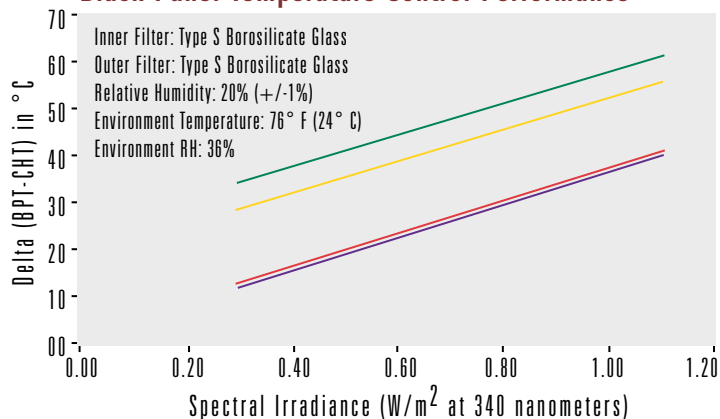
- Advanced PID algorithms allow for discrete manipulation of test parameters
- SmartDamper, variable speed blower and chamber heater are independently controlled
- Instrument performance envelope is optimized allowing maximum flexibility in custom test applications

### Temperature and Humidity Control

Operable ranges of temperature control at various irradiance levels (under normal laboratory conditions).

- Minimum Delta BPT/CHT @ 60° C
- Minimum Delta BPT/CHT @ 45° C
- Maximum Delta BPT/CHT @ 45° C
- Maximum Delta BPT/CHT @ 60° C

### Black Panel Temperature Control Performance





# OPTIONS

## Optional Features and Accessories to Extend the Capabilities of Your Next Weather-Ometer®

### Hybrid Cooling System

Improved xenon lamp cooling system dramatically reduces water consumption

- Expanded LiquiAir options include onboard mounting
- Reduces water consumption up to 100%\*

\* Dependent on options, ambient lab conditions, and test methods



### WXView ("Weather" View)

Our new WXView data acquisition program allows users to archive test data or monitor conditions remotely in real time.

- All standard test parameters such as rack temperature, chamber temperature, % RH and irradiance
- Control parameters such as lamp power, fan speed, heater output, and damper position
- Automatic scaling of y-axes
- Convenient options allow user to save, print, or take a snapshot of test data
- Magnify and demagnify functions





## Additional Options

### Auxiliary Filter Lantern

For meeting special test requirements.



### S<sup>3</sup>T Monitoring System

Atlas' patented Specific Specimen Surface Temperature (S<sup>3</sup>T) monitoring system provides users more information about their test specimens.

- Critical for service life prediction
- Utilizes non-contact IR pyrometer
- Emissivity settings
- Traceable calibrations



### Atlas Ambient Air Conditioning Unit (ACU)

Option for lower test temperature applications or conditions where ambient lab air is not controlled. Updated industrial design and tighter temperature/humidity control.



### LS-200 Spectroradiometer

Allows for independent measurement of the spectral power distribution from 300 nm to 800 nm to verify conformance with performance based standards with convenient data output to a spreadsheet format.



### XenoCal® Irradiance Calibration Device

- For independent irradiance calibration and measurement at the sample plane
- Evaluation and graphical display of measured values on a PC by means of the XenoSoft analytical software
- Available with different wavelength sensitivities:
  - XenoCal BB 300-400 nm
  - XenoCal NB 340 nm
  - XenoCal WB 300-800 nm
  - XenoCal NB 420 nm



### Sample Holders

This chart is a representative sample of specimen holders available for the Ci4000 Weather-Ometer®. For specific information about specimen holders that best meet your needs, please contact your local Atlas representative.

Holder Type (Part Number)	Application	Max. Size mm WxHxD	Exposure Size mm WxH	Capacity
RD-3T (20017900) Single or three exposure window w/"bulldog" clip	Coatings on various substrates, plastics, textiles, glass	77 x 152 x 10	57 x 134	68
SL-3T (19163900) Single exposure window w/spring clip back	Textiles, plastic film, automotive interior	67 x 145 x 3	50 x 121	68
SL-3T with Glass (07303900) Single exposure window w/glass and adjustable back	Textiles, paper, plastic film, carpet, automotive interior	67 x 145 x 15	50 x 121	68
CD-3T (20215700) Three exposure windows w/spring clip back	Textiles, paper, plastic film, automotive interior	67 x 145 x 3	3 windows: 38 x 50	68
CD-3T with Glass (07303800) Three exposure windows w/glass, spring clip back	Textiles, paper, plastic film, wood, automotive interior	67 x 145 x 15	3 windows: 38 x 50	68
TEX-3T with Mask (19186700) Single exposure window w/mask, adjustable	Textiles, foam, foam-backed materials	45 x 134 x 12	19 x 119	104
Polystyrene Reference Chip (19183400)	Polystyrene reference chips	50 x 88 x 2	43 x 82	54
4 x 6 Panel (19210200)	Coatings, rigid plastic, wood	104 x 155 x 12	101 x 146	41
3 x 6 Panel (19188501)	Coatings, rigid plastic, wood	76 x 152 x 9	76 x 146	56
Solar Panel (19190400)	Rigid plastic, roofing material, solar panels, wood	127 x 138 x 9	119 x 119	35
Adjustable Bottle (19178100)	Bottles, labels, printing inks, adhesives, liquids, pills	69 x 101 x 43	50 x 121	65

# FEATURES & SPECIFICATIONS

## Standard Features

Full Color 12" Touch Screen Control Panel Display of All Test Parameters

- Direct Setting and Control of Irradiance
- Direct Setting and Control of BPT/BST
- Direct Setting and Control of Relative Humidity
- Direct Setting and Control of Specimen and Chamber Air Temperature
- Display of Diagnostic Messages
- 14 Factory Pre-Programmed Test Methods
- Space for Several Custom Programs
- Multi-Language Capability (English, French, German, Spanish, Japanese, Chinese, Korean, Turkish)

SmartDamper

SmartLight Monitor

Streaming Data Output USB or Ethernet

Air Heater

Xenon Lamp Cooling System

Air Intake Dust Filter

Three-tier Specimen Rack

Water Purity Indicator

Calibrated Xenon Reference Lamp

Chamber Viewing Door

316 Grade Stainless Steel Test Chamber

Universal Electrical Configurations to Meet Local Frequency, Voltage, and Electrical Requirements

Meets CE, UL, CSA, ISO and EN Compliance

Sample Management

E-mail Functionality



## Optional Features

Auxiliary Lantern

LS-200 Full Spectrum Monitoring Device

Dual BPT and BST Black Panel Temperature Measurement/Control Including BPT and BST Sensors

Monitoring of Second Wavelength

LiquiAir Self Contained Xenon Lamp Cooling System

Specific Specimen Surface Temperature (S<sup>3</sup>T) Monitoring System

Ambient Air Conditioning Unit (ACU)

XenoCal<sup>®</sup> Irradiance Calibration Device

## Physical Dimensions

<b>Height</b>	198 cm (76 in)
<b>Width</b>	127 cm (50 in)
<b>Depth</b>	102 cm (40 in)
<b>Floor Space</b>	148 cm (58 in) x 274 cm (108 in) Including Access Area
<b>Total Exposure Area</b>	6500 cm <sup>2</sup> (1008 in <sup>2</sup> )

## Electrical Specifications

<b>Wiring Connections</b>	3 Phase, 3 Wire w/ Ground (3/PE)
<b>Operating Voltage Range</b>	200-250 VAC Phase to Phase
<b>Maximum Current</b>	50 Amps
<b>Frequency</b>	50/60 Hz
<b>Maximum Power</b>	9.5 kW
<b>Wiring Connections</b>	3 Phase, 4 Wire w/ Ground (3/N/PE)
<b>Operating Voltage Range</b>	340-415 VAC Phase to Phase
<b>Maximum Current</b>	47 Amps
<b>Frequency</b>	50/60 Hz
<b>Maximum Power</b>	9.5 kW

## Water Consumption

<b>Pressure</b>	138-344 kPa (20-30 psi)	
<b>Flow Rate (max*)</b>	<b>Deionized Water</b>	<b>Tap Water @18.5° C</b>
<b>Humidification</b>	0.2 L/min	
<b>Specimen Spray</b>	0.2 L/min	
<b>Rack Spray</b>	0.2 L/min	
<b>Xenon Lamp Cooling @ 4000W</b>		1.5 L/min

## Weight

<b>Weight of Fully Skidded and Wrapped Ci4000</b>	641 kg (1410 lbs)
<b>Weight of Ci4000 without Skid</b>	586 kg (1290 lbs)

\* Typical water usage will be less. Tap water requirements for lamp cooling with the LiquiAir system will be near zero.



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