ATLAS
MATERIAL TESTING SOLUTIONS

Ci4000

Weather-Ometer®

Meets International Standards
for Xenon Weathering

Experience. The Atlas Difference.

ATLAS
MATERIAL TESTING SOLUTIONS

The Atlas Vision

Shaping the future of the materials testing world in partnership with our customers.

The Atlas Mission

Advance the technology of material testing through:

- **Our industry expertise**
- **Involvement in international standards development**
- **Partnerships with our customers**
- **Provision of world-class products and services**

Focused On Your Goals

Atlas pioneers innovative ways for companies to test the weatherability of their products. From our industry-leading accelerated weathering equipment to the consulting services of our expert laboratory staff, our approach to the market is clear: Provide our customers with superior, easy-to-use technology and advanced testing solutions to determine how long their products will last. **As a result, they will reach their ultimate goals – a quality product, a competitive edge, a faster time to market.**

Quality at Every Step

Producing the very best instruments is not something we take lightly. Every instrument must pass customer specified test parameters and we visually inspect all xenon lamps and optical filter glass per strict quality procedures. We test every instrument for material compliance before being shipped. The Ci4000 meets relevant CE, UL, CSA, ISO and EN safety and electrical standards for both machinery and laboratory test equipment.

Learn from the Experts*

Your instrument purchase includes attendance to a free Weather-Ometer® Workshop. This hands-on course guides new users through the operation, calibration and maintenance of your Weather-Ometer. We make sure you know all of the instrument features to maximize the efficiency and effectiveness of your testing.

* Offer may differ by country

Making the Most Advanced Instruments Even Better

We've overhauled the Ci4000 to include a simplified operating system and an incredibly fast, fully-digital architecture to produce the most reliable and efficient instrument we've ever made. It all adds up to the most advanced and easy-to-use xenon weathering test instrument the industry has ever seen.

Simplified Control Navigation

The digital control system makes access to its most sophisticated features available to operators. The Ci4000 delivers exceptionally precise and reliable control of all test parameters for repeatable, reproducible and reliable results.

Incredibly Efficient Xenon Lamp Cooling

The dramatically improved on-board xenon lamp cooling system can yield a significant reduction in cooling-water usage.

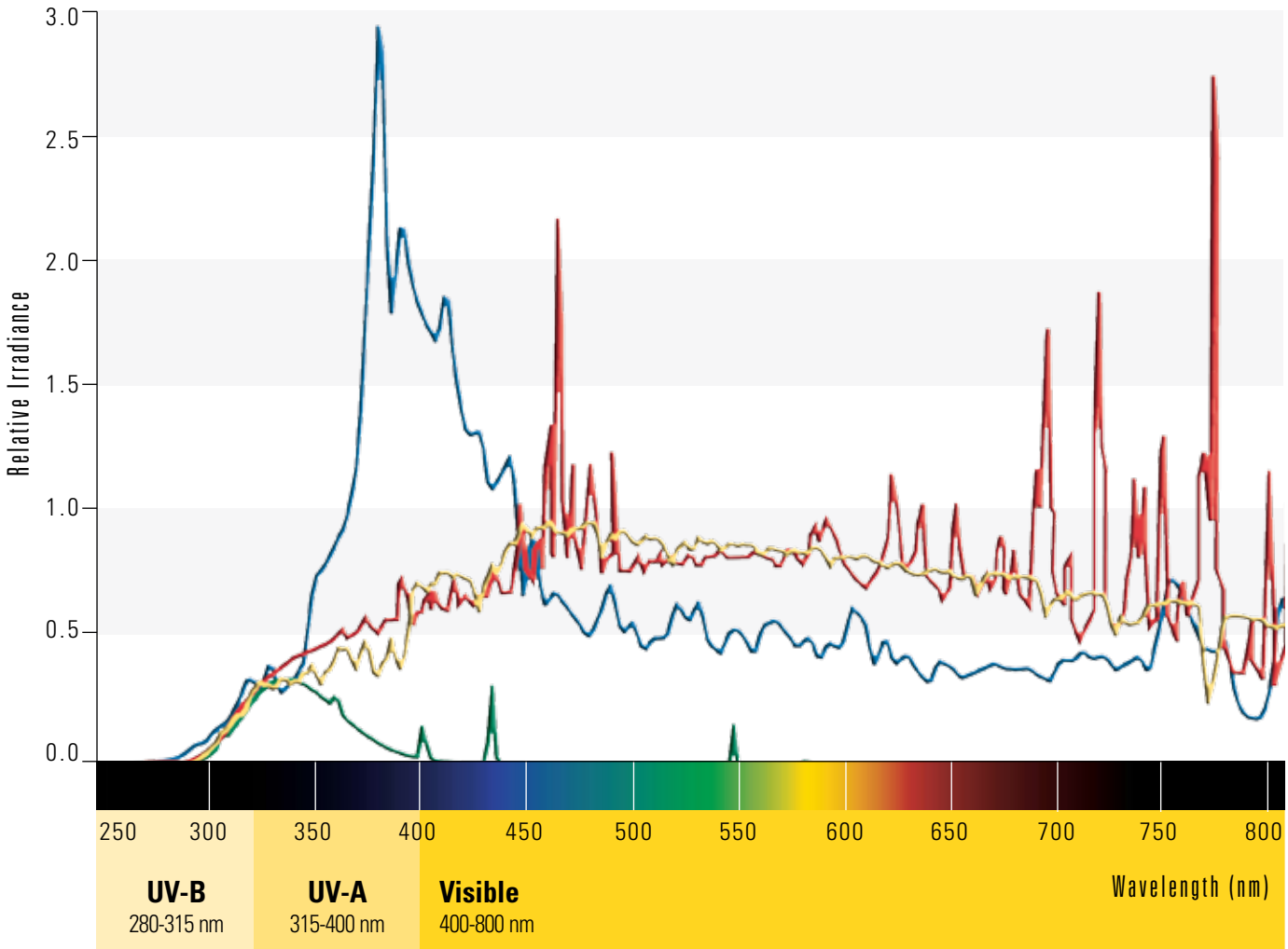
Which Light is Right?

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

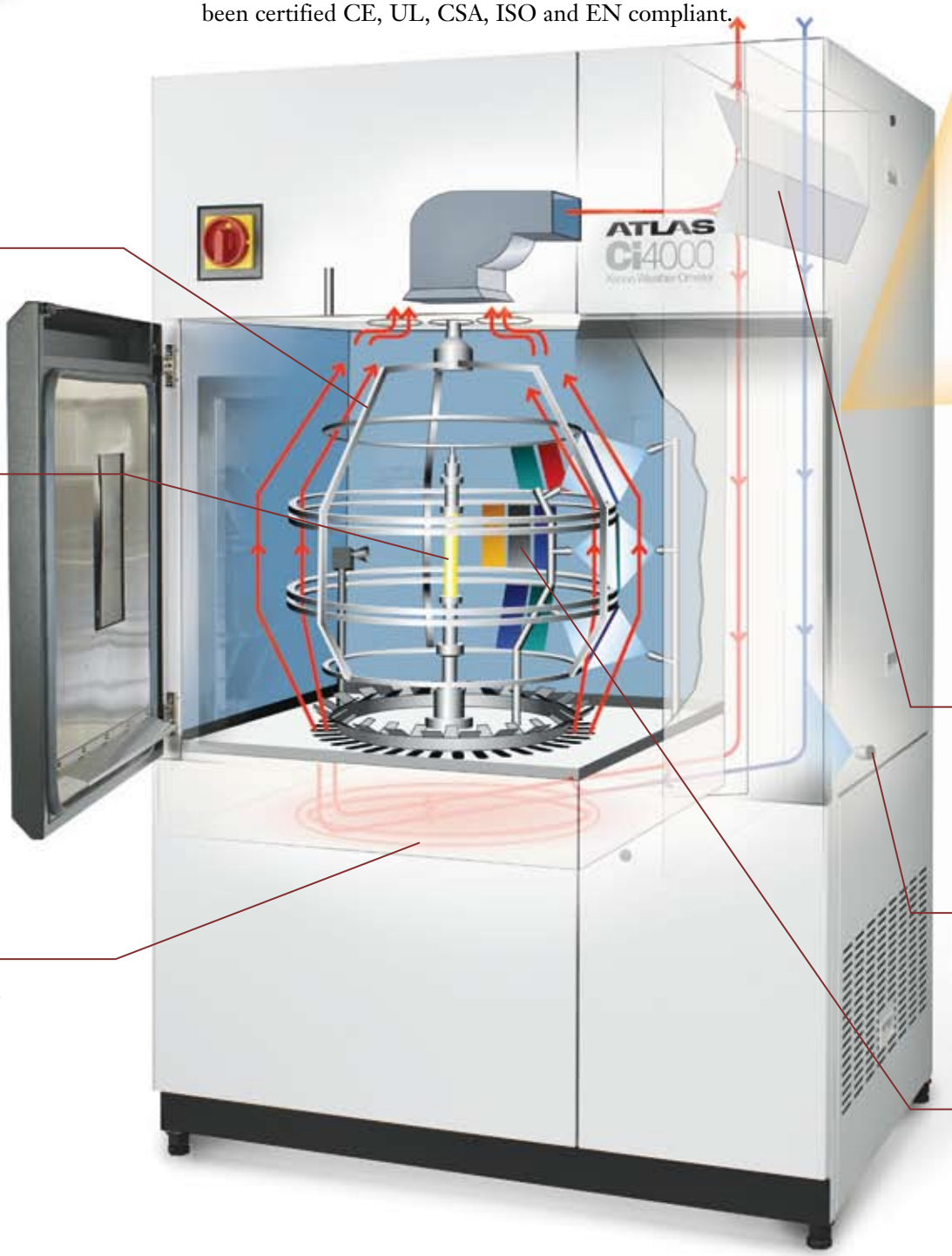


- **Global Solar Radiation** — Average Miami Sunlight 26° South Direct
- **Xenon Arc Lamp** — As used in an Atlas Weather-Ometer® with Right Light® filters
- **UVA-340 Fluorescent Lamp** — Commonly used in the Atlas UV2000
- **Sunshine Carbon Arc** — As used in an Atlas Weather-Ometer with Corex D filters

FEATURES

A Higher Order of Weathering Testing Performance Through Superior Science

The Ci4000 Weather-Ometer®, 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 levels for higher acceleration 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 TFT LCD Touch Screen Interface

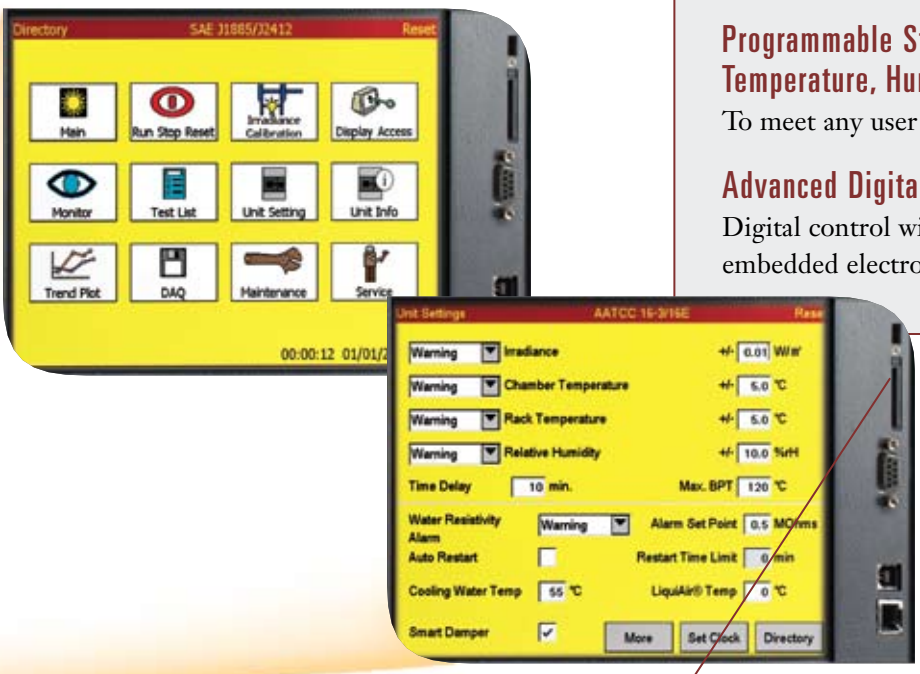
Increases functionality that makes the Ci4000 easy to program, monitor and calibrate

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



Data Acquisition

Streaming data output in a format that can be compatible with many Laboratory Information Management Systems (LIMS) or stored onto a portable media. Connection sources include: SD Card, RS-232 or both simultaneously

Smart Damper™

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

ASTM Black Panel Thermometer or ISO/DIN Black Standard Thermometer

Controls and monitors temperature at specimen level to ensure test repeatability

Additional Features

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

SmartLight Monitor™

Verifies that the correct light capsule is installed

Water Purity Indicator

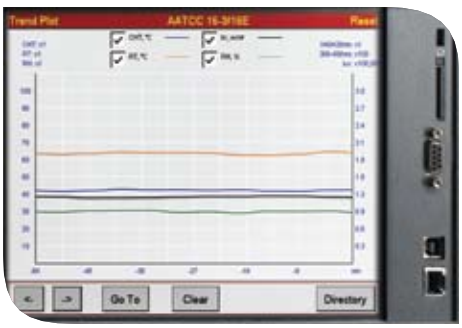
Signals when incoming water quality falls below the factory set point

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 Several Custom Test Programs

Existing test methods can be copied and edited for custom applications

Simplified Setup of Selective Control Features

Set variance level notification for critical variables on one screen

- Irradiance
- Chamber Temperature
- Rack Temperature (BPT, BST or both)
- Relative Humidity
- Auto Restart After Power Interruption

Multi-lingual Capability

Select the desired language:

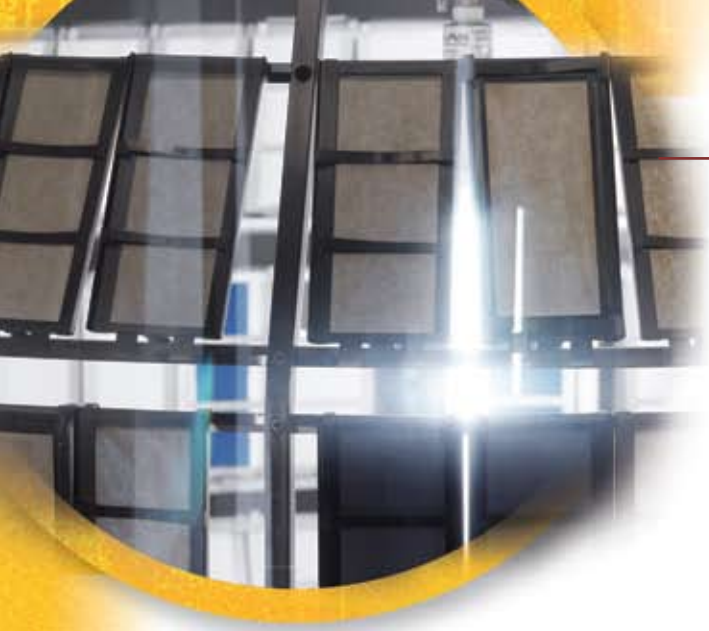
- English
- Chinese
- Japanese
- Korean
- German
- French
- Spanish

Automated 2-Point Irradiance Calibration

Simple procedure allows user calibration and eliminates duplicate information

- Enter Lamp and Certificate Data
- Install the Calibration Lamp
- Press the RUN Button
- Calibration is Done Automatically

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



Rotating Sample Rack

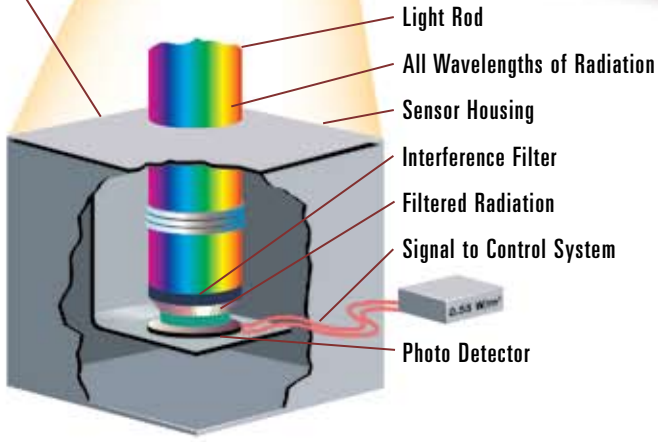
The rotating rack delivers the best exposure uniformity

- 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

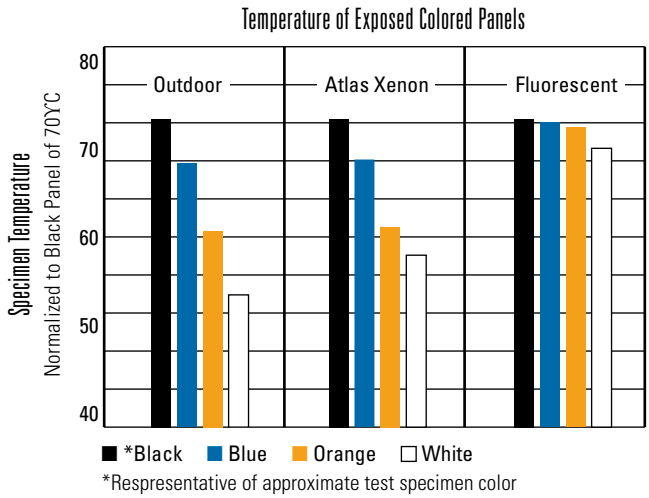
Intelligent Controlled Irradiance (Ci) System

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 (Lux) control (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



Outdoor vs. Atlas Xenon vs. Fluorescent Exposure



Note: Black Panel temperature in the fluorescent device is achieved only by heating the chamber air (no IR). Thus, all specimens are heated equally, without regard to color. Because xenon light is a full spectrum light source like natural light, sample temperatures vary by color, as in natural sunlight.

Fischer, R.M, and Ketola W.D., "Surface Temperature of Materials in Exterior Exposures and Artificial Accelerated Tests," Accelerated and Outdoor Durability Testing of Organic Materials, ASTM STP 1202, Warren D. Ketola and Douglas Grossman, Eds., American Society for Testing and Materials, Philadelphia, 1994

Recalibration on the Web

You can now process the return of your calibrated lamps for recalibration via the internet. This service is intended to reduce turn around time and better facilitate your recalibration request. Visit us at www.atlas-mts.com/recalibration.

Filter Combinations		Test Conditions	Irradiance Ranges W/m²				
Inner	Outer		Wattage	300-400 nm	300-800 nm	340 nm	420 nm
Type S Boro	Type S Boro	Most common combination for weathering tests (Daylight filter system)	Min. 2500 W Max. 7500 W	29 141	307 1356	0.25 1.26	0.59 2.76
Type S Boro	Soda Lime	Most common combination for lightfastness tests behind window glass	Min. 2500 W Max. 7500 W	28 129	308 1340	0.23 1.10	0.61 2.76
Quartz	Type S Boro	Weathering tests with somewhat more and shorter UV than sunlight	Min. 2500 W Max. 7500 W	32 160	304 1385	0.29 1.50	0.59 2.79
Right Light®	Quartz	Weathering tests requiring the most precise match to sunlight available	Min. 2500 W Max. 7500 W	35 168	326 1425	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	Min. 2500 W Max. 7500 W	35 169	311 1352	0.34 1.69	0.66 2.99
CIRA	Type S Boro	Weathering tests requiring full spectrum match and/or lower test temperatures	Min. 2500 W Max. 7500 W	33 168	305 1397	0.31 1.57	0.60 2.93
CIRA	Soda Lime	Weathering tests requiring precise match of solar cut-on, full spectrum match and/or lower test temperatures	Min. 2500 W Max. 7500 W	31 151	313 1383	0.28 1.40	0.64 3.00
Type S Boro	Soda Lime + Float Glass in Auxiliary Lantern	Common combination for testing European automotive interior trim materials (Requires lantern assembly)	Min. 2500 W Max. 7500 W	23 109	269 1223	0.17 0.82	0.56 2.54
CIRA	Soda Lime + Float Glass in Auxiliary Lantern	Lightfastness test for automotive interior materials to meet GMW 3414TM		97	1063	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	537	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	678	.55	1.40

Sunlight Measurements		Irradiance Ranges W/m²				
		300-400 nm	340 nm	420 nm	300-800 nm	300-2450 nm
Average Optimum Natural Daylight	Measured 45° South Cloudless Miami, FL	28	0.30	0.67	287	
Peak Natural Daylight	Measured solar noon on Vernal Equinox at normal incidence Miami, FL	66	0.70	1.53	617	
Peak Natural Daylight Standard	Defined for Horizontal Plane (0°) in CIE Publication No. 85 Table 4	69	0.68	1.50	669	1088

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

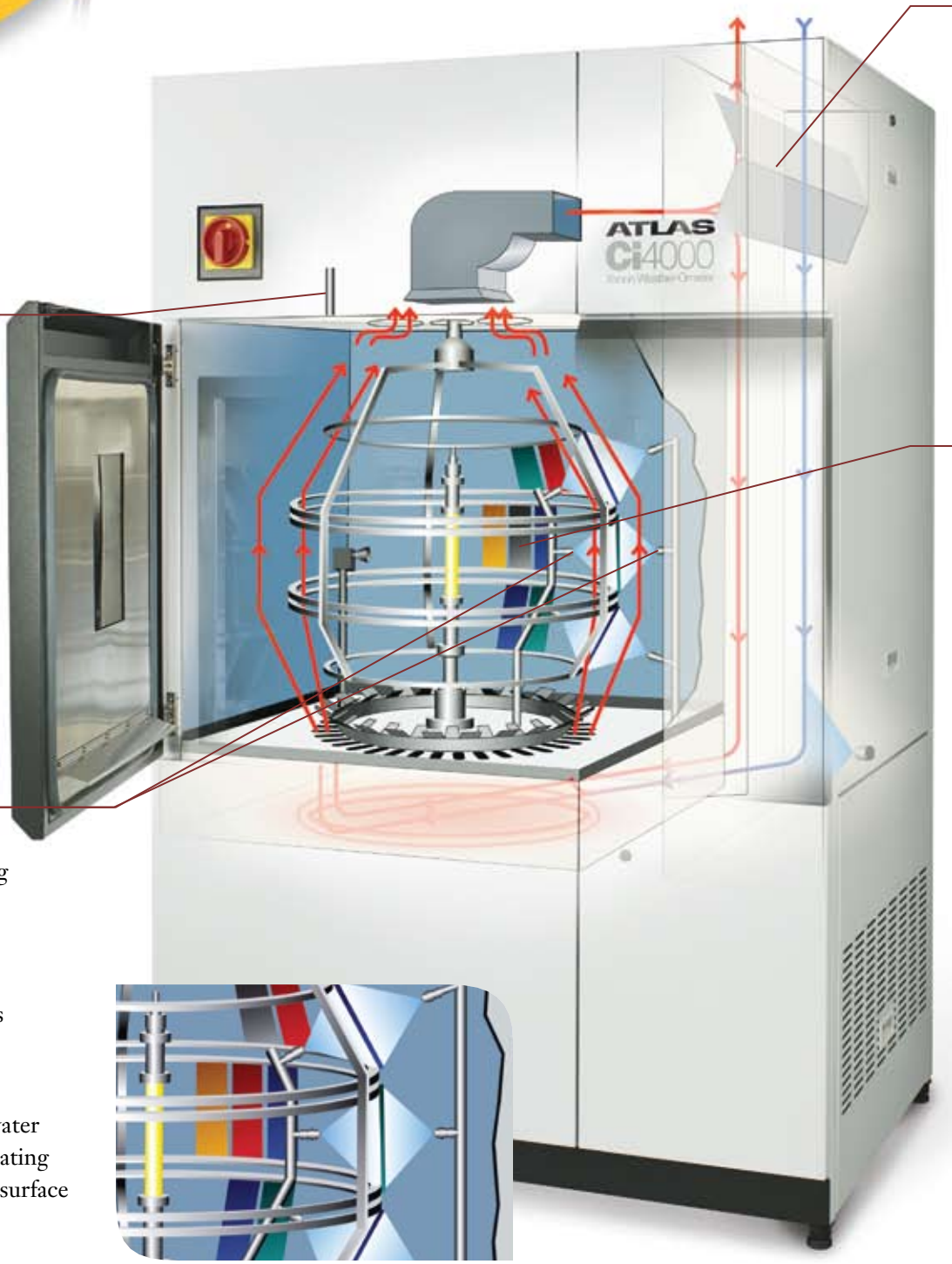
- 10% RH to 75% RH in light cycles*
- Up to 100% in dark cycles*

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

Specimen and Rack Spray

Custom designed precision nozzles provide 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 cool water to the back of the sample, creating condensation on the exposed surface to simulate dew.

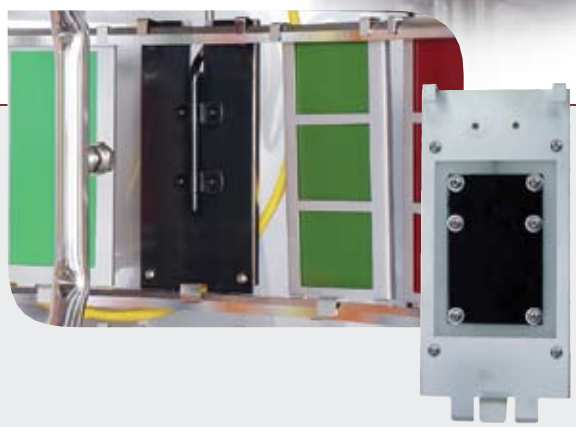


TEMPERATURE CONTROL

Consistent, Controlled Temperature Delivers Repeatable and Reproducible Results

Smart Damper™

- 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



ASTM Black Panel Thermometer (BPT) or ISO/DIN 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 maximum uniformity and can closely match the samples end use environment

Simultaneous Control of BPT/BST and CHT

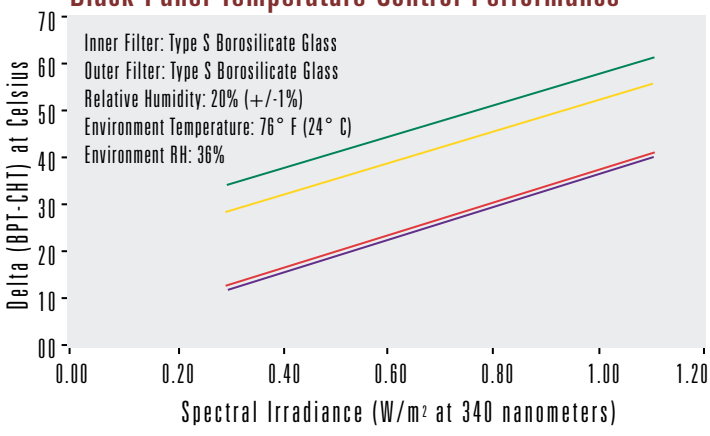
- Advanced PID algorithms allow for discrete manipulation of test parameters
- Smart Damper, variable speed blower and chamber heater are independently controlled
- Instrument performance envelope is optimized allowing maximum flexibility in custom test applications

Temperature and Humidity Control

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

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

Black Panel Temperature Control Performance



Optional Equipment and Features 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

Six Channel Chart Recorder

Plot up to six variables each in its own color. Record any of the following:

- Black Panel Temperature
- Relative Humidity
- Irradiance
- Chamber Temperature
- Black Standard Temperature or Second Irradiance
- Lamp Power

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 WB 300 – 800 nm
  - XenoCal NB 340 nm and XenoCal NB 420 nm

Additional Options

Auxiliary Filter Lantern

For meeting special test requirements

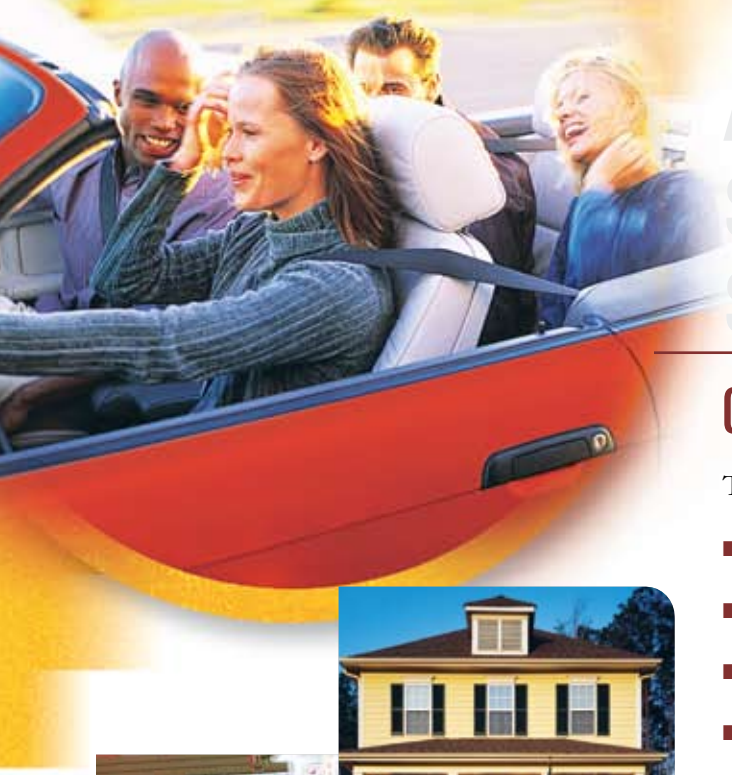
Refrigeration System

Option for lower test temperature applications

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
SL-3T (19163900) Single exposure window w/spring clip back	Textiles, plastic film, automotive interior	69 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	69 x 145 x 15	50 x 121	68
CD-3T (20215700) Three exposure windows w/spring clip back	Textiles, paper, plastic film, automotive interior	69 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	69 x 145 x 15	3 windows: 38 x 50	68
CD-2W (07255500) Thick carpet, hinged w/support	Carpet, foam, foam-backed materials	71 x 145 x 12	60 x 66	68
WPTC-3T (06150400)	Carpet, foam, foam-backed materials, patterned materials, PV, solar cells	165 x 146 x 12	131 x 100	27
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
Drop-in Specimen Bar (19184600)	Plastics	77 x 144 x 3	76 x 125	50
Tensile Bar with Spring Clip Back (19212100)	Plastics	85 x 145 x 3	71 x 121	50
Adjustable Specimen (19210600)	Plastics	55 x 137 x 5	56 x 127	68
Slide (19195800)	35 mm slides, rigid discs, plaques	50 x 151 x 3	39 x 138	68
Glass (19181900)	Automotive or building glass	101 x 101 x 10	101 x 92	41



APPLICATIONS, STANDARDS & SPECIFICATIONS

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**

International Standards

The Ci4000 Weather-Ometer® meets or exceeds the following industry standards:

AATCC	TM 16-2003		TM 16E-1998		TM 169			
ASTM	C1442	C1501	D904	D3424	D3451	D4101	D4303	D4355
	D4459	D4798	D5010	D5071	D5794	D6083	D6551	D6577
	D6662	D6695	G151	G155				
Ford	FLTM BO-116-01							
GB/T	1865	5137	6151	8427	8430	10485	14522	16259
	16422	16991						
GM	GMW14162		GMW3414TM		GME60292			
Hyundai Motor Co.	MS 200-05	MS 300-31						
ISO	105-B02	105-B04	105-B06	11341	3917	4892-1	4892-2	12040
JASO	M 346							
MIL STD	810 F							
Peugeot/ Citroen (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.

Standard Features

TFT Full Color 10.4" 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 (Dry Bulb)
- 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)

Smart Damper™

Smart Light Monitor™

Streaming Data Output via SD Card or RS232 or Both Simultaneously (includes SD Reader)

Air Heater

Main Power Disconnect Switch

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

Optional Features

6 Channel Printing Chart Recorder

Dual ASTM/BPT and DIN/BST Black Panel Temperature Measurement/Control including ASTM/BPT and DIN/BST Sensors

Monitoring of Second Wavelength

LiquiAir™

Physical Dimensions

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

Electrical Specification

Wiring Connections	3 Phase, 3 Wire w/ Ground (3/PE)
Operating Voltage Range	200-250 VAC Phase to Phase
Maximum Current	50 Amps
Frequency	50/60 Hz
Maximum Power	9.5 kW

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

Weight

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

Water Consumption

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

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

ATLAS
MATERIAL TESTING SOLUTIONS

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Specifications, features and standards
are subject to change without notice.

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