Ci4000 Weather-Ometer®

Setting the Standard for Xenon Weathering

Accelerating Your Expertise
The Atlas Vision

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

The Atlas Mission

Our mission is to help our customers worldwide provide the most reliable and durable product solutions through our combined experience and expertise in weathering instruments and testing, custom capabilities, consulting and global support.

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. Every step of the way, Atlas is there - Accelerating Your Expertise.

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 specifications. 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

The Ci4000 includes 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 xenon weathering test instrument on the market.

Simplified Control Navigation

The larger user interface makes operating the Weather-Ometer® easier than ever. The Ci4000 delivers exceptionally precise and reliable control of all test parameters for repeatable, reproducible and reliable results.

Revolutionary Innovations

Atlas remains on the cutting edge of state-of-the-art technology, delivering features such as our Specific Specimen Surface Temperature (S³T) System and Full Spectrum Monitoring (FSM).
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

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
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

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.
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

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

VibraSonic Dual Nozzle Humidity Control
Accurately replicates humidity levels to meet stringent global test requirements; a second nozzle is standard on the Ci4000 to expand humidity range.

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.
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
- German
- Chinese
- French
- Japanese
- Spanish
- Korean
- 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.
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

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

<table>
<thead>
<tr>
<th>Inner</th>
<th>Outer</th>
<th>Test Conditions</th>
<th>Irradiance Ranges W/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Light</td>
<td>Quartz</td>
<td>Weathering tests requiring the most precise match to sunlight available</td>
<td>2500 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7500 W</td>
</tr>
<tr>
<td>Right Light</td>
<td>CIRAM Coated Quartz</td>
<td>Weathering tests requiring the most precise match to sunlight available and lower test specimen temperatures</td>
<td>2500 W</td>
</tr>
<tr>
<td>Type S Boro</td>
<td>Type S Boro</td>
<td>Most common combination for weathering tests (Daylight filter system)</td>
<td>2500 W</td>
</tr>
<tr>
<td>Type S Boro</td>
<td>Soda Lime</td>
<td>Most common combination for lightfastness tests behind window glass</td>
<td>2500 W</td>
</tr>
<tr>
<td>Quartz</td>
<td>Type S Boro</td>
<td>Weathering tests with somewhat more and shorter UV than sunlight</td>
<td>2500 W</td>
</tr>
<tr>
<td>Quartz</td>
<td>CIRAM on Type S Boro</td>
<td>Weathering tests requiring full spectrum match and/or lower test temperatures</td>
<td>2500 W</td>
</tr>
<tr>
<td>Type S Boro</td>
<td>Soda Lime + Float Glass in Auxiliary Lantern</td>
<td>Common combination for testing European automotive interior trim materials (Requires lantern assembly)</td>
<td>2500 W</td>
</tr>
<tr>
<td>Quartz</td>
<td>CIRAM on Soda Lime + Float Glass in Auxiliary Lantern</td>
<td>Lightfastness test for automotive interior materials to meet GMW 3414TM</td>
<td>97</td>
</tr>
<tr>
<td>Quartz</td>
<td>Type S Boro + 335 nm long pass filter in Auxiliary Lantern</td>
<td>Lightfastness test for automotive interior materials to meet Ford FLTM B0-116-01</td>
<td>46</td>
</tr>
<tr>
<td>HL 35/65/4000</td>
<td>HL 300/4000</td>
<td>Lightfastness test for automotive interior materials according to ISO 105-B06, VDA 75202 and European company specifications</td>
<td>60</td>
</tr>
</tbody>
</table>

### Sunlight Measurements

<table>
<thead>
<tr>
<th>Average Optimum Natural Daylight</th>
<th>Measured 45° South Cloudless Miami, FL</th>
<th>Irradiance Ranges W/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>300-400 nm</td>
<td>340 nm</td>
<td>420 nm</td>
</tr>
<tr>
<td>300-400 nm</td>
<td>340 nm</td>
<td>420 nm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Peak Natural Daylight</th>
<th>Measured solar noon on Vernal Equinox at normal incidence Miami, FL</th>
<th>300-400 nm</th>
<th>340 nm</th>
<th>420 nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.40</td>
<td>287.20</td>
<td>300-400 nm</td>
<td>340 nm</td>
<td>420 nm</td>
</tr>
<tr>
<td>28.40</td>
<td>287.20</td>
<td>300-400 nm</td>
<td>340 nm</td>
<td>420 nm</td>
</tr>
</tbody>
</table>

### International Standards

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

<table>
<thead>
<tr>
<th>AATCC</th>
<th>ASTM</th>
<th>Ford</th>
<th>GB/T</th>
<th>GM</th>
<th>Hyundai Motor Co.</th>
<th>ISO</th>
<th>JASO</th>
<th>MIL STD</th>
<th>Peugeot/Citroën (PSA)</th>
<th>Renault</th>
<th>SAE</th>
<th>VDA</th>
<th>VW</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM 16.3.2012</td>
<td>C1442</td>
<td>C1501</td>
<td>1865</td>
<td>GMW14162</td>
<td>MS 210-05</td>
<td>105-B02</td>
<td>M 346</td>
<td>B10 G</td>
<td>D27 1389</td>
<td>D27 1911</td>
<td>J1885</td>
<td>621-429</td>
<td>PV 1303</td>
</tr>
<tr>
<td>TM 16E-1998</td>
<td>D4459</td>
<td>D4798</td>
<td>16422</td>
<td>GMW3414TM</td>
<td>MS 300-31</td>
<td>105-B04</td>
<td>J1960</td>
<td>J2140</td>
<td>D27 1389</td>
<td>D27 1911</td>
<td>J2412</td>
<td>621-430</td>
<td>PV 3929</td>
</tr>
<tr>
<td>TM 169</td>
<td>D6682</td>
<td>D6695</td>
<td>5137</td>
<td>GME60292</td>
<td>IS 210-05</td>
<td>105-B06</td>
<td>J2413</td>
<td>J2527</td>
<td>D27 1389</td>
<td>D27 1911</td>
<td>J2413</td>
<td>75202</td>
<td>PV 3930</td>
</tr>
</tbody>
</table>

Standards are subject to change without notice. This might lead to the inclusion or exclusion of certain standards.
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 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

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

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

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

Spectral Irradiance (W/m² at 340 nanometers)

Delta (BPT-CHT) in °C

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

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

Inner Filter: Type S Borosilicate Glass
Outer Filter: Type S Borosilicate Glass
Relative Humidity: 20% (+/-1%)
Environment Temperature: 76°F (24°C)
Environment RH: 38%
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
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.

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

Additional Options

Auxiliary Filter Lantern
For meeting special test requirements.

S³T Monitoring System
Atlas’ patented Specific Specimen Surface Temperature (S³T) 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
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 (S3T) Monitoring System

Ambient Air Conditioning Unit (ACU)

XenoCal® Irradiance Calibration Device
### Physical Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>198 cm (76 in)</td>
</tr>
<tr>
<td>Width</td>
<td>127 cm (50 in)</td>
</tr>
<tr>
<td>Depth</td>
<td>102 cm (40 in)</td>
</tr>
<tr>
<td>Floor Space</td>
<td>148 cm (58 in) x 274 cm (108 in)</td>
</tr>
<tr>
<td>Including Access Area</td>
<td></td>
</tr>
<tr>
<td>Total Exposure Area</td>
<td>6500 cm² (1008 in²)</td>
</tr>
</tbody>
</table>

### Electrical Specifications

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

### Water Consumption

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>138-344 kPa (20-30 psi)</td>
</tr>
<tr>
<td>Flow Rate (max*)</td>
<td>Deionized Water Tap Water @18.5° C</td>
</tr>
<tr>
<td>Humidification</td>
<td>0.2 l/min</td>
</tr>
<tr>
<td>Specimen Spray</td>
<td>0.2 l/min</td>
</tr>
<tr>
<td>Rack Spray</td>
<td>0.2 l/min</td>
</tr>
<tr>
<td>Xenon Lamp Cooling @ 4000W</td>
<td>1.5 l/min</td>
</tr>
</tbody>
</table>

### Weight

<table>
<thead>
<tr>
<th>Description</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight of Fully Skidded and Wrapped</td>
<td>641 kg (1410 lbs)</td>
</tr>
<tr>
<td>Weight of Ci4000 without Skid</td>
<td>586 kg (1290 lbs)</td>
</tr>
</tbody>
</table>

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