

SunSpots®

Spring 2013

Weather Testing of Paints and Coatings

By Allen Zielnik, Senior Consultant, Atlas Material Testing Technology LLC

Although paints have been used since our earliest civilizations, one of, if not the first, references to formal paint testing appeared in “Practical Paint Tests in 1907” [1] by Edwin Fremont Ladd and published by the North Dakota Agricultural College, Government Agricultural Experiment Station of North Dakota. A series of vertical test “fences” were constructed in 1906 and faced on both sides with four types of lumber.

In 1907, the Paint Manufacturers Association commissioned an exposure test of various formulations of white, gray and yellow exterior paints; these were non-commercial formulations so as not to disparage any particular manufacturer’s product. The fences were oriented north-south and paints exposed both east and west facing (Figure 1). Most testing is now performed in more severe climates such as subtropical south Florida, and panels are now oriented south or north facing (Figure 2). However, little else has changed in most outdoor weathering testing for wood coatings in the intervening 106 years as evidenced in ASTM’s Paint and Coating Testing Manual [2]. In fact today we often still call exposure racks “test fences.”

Paint Weathering Fundamentals

Whether a basic house paint, a high performance automotive or aerospace coating, a durable architectural paint, or a protective or functional coating such as a bridge or anti-graffiti coating, all products face three fundamental weatherability issues. First, the binder (for film-formers) must remain intact without adverse degradation. Second, the coating must remain adhered to the substrate. And third,

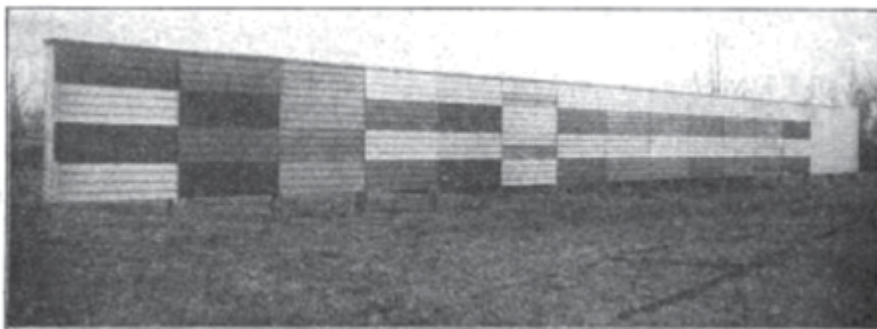


Figure 1: Earliest reported paint weathering “test fence,” 1906, Fargo ND, faced east and west. Rusting nails stained the coatings.

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Keep Your Team Up to Date!

Atlas' education and training solutions will help you and your staff master the skills now needed to develop long-lived products in shortened development cycles. Our programs are designed for all levels to ensure that everyone on your team understands the fundamentals of weathering and how to operate our instruments. For the latest schedules and locations, visit www.atlas-mts.com or e-mail atlas.info@ametek.com.

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|--------------------------------------|--------------------|-------------------------|----------------------|
| Fundamentals of Weathering I | May 29, 2013 | Zwolle, The Netherlands | Presented in Dutch |
| | June 26, 2013 | Leicester, UK | Presented in English |
| | July 17, 2013 | Chicago, IL, USA | Presented in English |
| | October 16, 2013 | Chicago, IL, USA | Presented in English |
| | November 13, 2013 | Magdeburg, Germany | Presented in German |
| Fundamentals of Weathering II | May 30, 2013 | Zwolle, The Netherlands | Presented in Dutch |
| | June 27, 2013 | Leicester, UK | Presented in English |
| | July 18, 2013 | Chicago, IL, USA, | Presented in English |
| | October 17, 2013 | Chicago, IL, USA, | Presented in English |
| | November 14, 2013 | Magdeburg, Germany | Presented in German |
| Weather-Ometer® Workshop | June 4–5, 2013 | Leicester, UK | Presented in English |
| | July 16, 2013 | Chicago, IL, USA | Presented in English |
| | September 11–12 | Linsengericht, Germany | Presented in German |
| | October 15, 2013 | Chicago, IL, USA | Presented in English |
| SUNTEST® Workshop | June 6, 2013 | Leicester, UK | Presented in English |
| | June 13, 2013 | Linsengericht, Germany | Presented in German |
| | November 7, 2013 | Linsengericht, Germany | Presented in German |
| Xenotest® Workshop | June 11–12, 2013 | Linsengericht, Germany | Presented in German |
| | November 5–6, 2013 | Linsengericht, Germany | Presented in German |
| Sample Preparation Workshop | June 19, 2013 | Linsengericht, Germany | Presented in German |
| UVTest Workshop | December 11, 2013 | Linsengericht, Germany | Presented in German |



Visit Atlas' booth at these shows to learn about the latest weathering developments and how we can help advance your testing program.

For a complete list of Atlas shows, visit www.atlas-mts.com.

Control

May 14–17, 2013
Stuttgart, Germany
Hall 1, Booth 1302

Asia Coatings Congress 2013

May 14–15, 2013
Ho Chi Minh City, Vietnam
Booth #45

SNEC PV Power Expo 2013

May 14–16, 2013
Shanghai, China
Booth #E1 910–911

CHINAPLAS 2013

May 20–23, 2013
Guangzhou, China
Booth #4.2E61

Japan Automotive Engineering Expo

May 22–24, 2013
Yokohama, Japan
Booth #39

Latin American Coatings Show

July 17–18, 2013
Mexico City, Mexico
Booth #A3

Expo Solar Korea

September 4–6, 2013
Seoul, Korea

Asia Pacific Coatings Show

September 12–13, 2013
Bangkok, Thailand
Booth #G4

testXpo

October 14–17, 2013
Ulm, Germany

K-Show

October 16–23, 2013
Düsseldorf, Germany
Hall 10, Booth D51

Workshop Photovoltaics Modular Technology

November 24–25, 2013
Cologne, Germany



Asia Coatings Congress Conference

May 14–15, 2013

Windsor Plaza Hotel, Ho Chi Minh City, Vietnam

“More Sustainable Eco-Friendly Paints and Coatings Through Contributions from More Realistic Weathering Testing”

Presenter: Dr. Oliver D. Rahäuser

Atlas Material Testing Technology GmbH

International Symposium on Weathering and Service Life Prediction, Japan 2013

Co-organized by Atlas Material Testing Technology, Japan Paint Inspection and Testing Association, Toyo Seiki and Toyotsu Chemiplas

May 15–16, 2013

STEC Information Building,
Tokyo, Japan

May 17, 2013

WINC AICHI, Nagoya, Japan

“What Mother Nature Gives You Is What You Get”

Presenter: Larry Bond

Atlas Material Testing Technology LLC

7th Sino-American (International) Academic Symposium on Environmental Corrosion & Degradation Tests of Materials

Co-organized by Atlas Material Testing Technology, China National Electric Apparatus Research Institute (CEI) and Environmental Adaptability State Key Laboratory (EAS)

May 20–21, 2013

Guangdong Guest House, Guangzhou, China

“An Improved Accelerated Weathering Protocol to Anticipate Florida Exposure Behavior of Coatings”

Presenter: Matthew McGreer

Atlas Material Testing Technology LLC

“The Trouble with Corrosion — A Case Study of One Industry’s Efforts to Select a Cyclic Corrosion Method to Address Coastal Corrosion of Coatings Over Aluminum”

Presenter: Scott Zimmerman

Atlas Material Testing Technology LLC

“Global Trends by Automotive OEMs on Materials and Component Level Durability Testing”

Presenter: Fred Lee

Atlas Material Testing Technology LLC

9th Annual International Conference on Weathering and Reliability - Automotive and PV

Co-organized by ABNexo, Atlas Material Testing Technology, Korea Conformity Laboratory (KCL) and Ministry of Knowledge and Economy

May 23–24, 2013

Hahiho Hotel, Daejeon, Korea

“An Improved Accelerated Weathering Protocol to Anticipate Florida Exposure Behavior of Coatings”

Presenter: Matthew McGreer

Atlas Material Testing Technology LLC

“Comprehensive Long-term Durability Testing Options for Building Integrated Photovoltaics”

Presenter: Scott Zimmerman

Atlas Material Testing Technology LLC

“Global Trends by Automotive OEMs on Materials and Component Level Durability Testing”

Presenter: Fred Lee

Atlas Material Testing Technology LLC

“Advancements in Solar Simulation Environmental Testing Technology and its Utilities in Auto and PV Industry”

Presenter: Max Fischer

Atlas Material Testing Technology GmbH

Lightfastness of Paper Materials and Colour Fastness of Prints Symposium

June 3–4, 2013

Papiertechnische Stiftung (PTS), Heidenau, Germany

“Weather Factors and Lightfastness Testing”

“Standards for the Lightfastness Testing of Prints and Printing Inks”

Presenters: Andreas Riedl and Rüdiger Lehn

Atlas Material Testing Technology GmbH

9. ThGOT Thementage Grenz- und Oberflächentechnik

September 3–5, 2013

Bio-Seehotel Zeulenroda, Zeulenroda, Germany

“Simulation eines Mikroklimas auf sonnenbestrahlten Oberflächen” (Simulation of a Microclimate on Sun-Exposed Surfaces)

» *Presented in German*

Presenter: Dr. Artur Schönlein

Atlas Material Testing Technology GmbH



Figure 2: South (shown) and north facing paint panels in Florida. Panels are offset to avoid runoff contamination.

the coating must also retain key properties: appearance, such as color and gloss, or functional performance such as reflectivity for a cool roof coating or corrosion protection for a bridge or industrial plant. A lot can happen outdoors to degrade these three factors and cause coating failure. We must adequately test products both during R&D to understand how to improve their durability and determine their service life, as well as understand their performance in various climates, with different application methods and substrates, and other critical variables.

Effect of Weather on Coatings

The most damaging weather elements are solar radiation, moisture and heat. The ultraviolet (UV) portion of sunlight contains sufficient energy to break chemical bonds and initiate free radical degradation mechanisms for most organic materials. This is especially true for the shorter UV-A and UV-B wavelengths. Some coatings chemistries, such as epoxies and polyester, are quite sensitive to this UV and not long-lived outdoors while others, such as fluoropolymers, are extremely UV resistant. The UV resistance of many coatings can be substantially improved with stabilizing additives, but not indefinitely. Many stabilization schemes still leave the coating surface largely unprotected, and this is where most of the damage originates. Surface degradation often exhibits as loss of gloss, chalking, microcracking and crazing, pigment color fade or binder yellowing. If UV passes through the coating it can degrade substrates such as wood, causing the binder to lose adhesion and fail.

Longer wavelength UV-A and visible light can also initiate photodegradation; many colorants, especially organic ones, and photodegradation products, such as hydroperoxides, are sensitive to these wavelengths. The near infra-red in sunlight causes many colors to heat up as

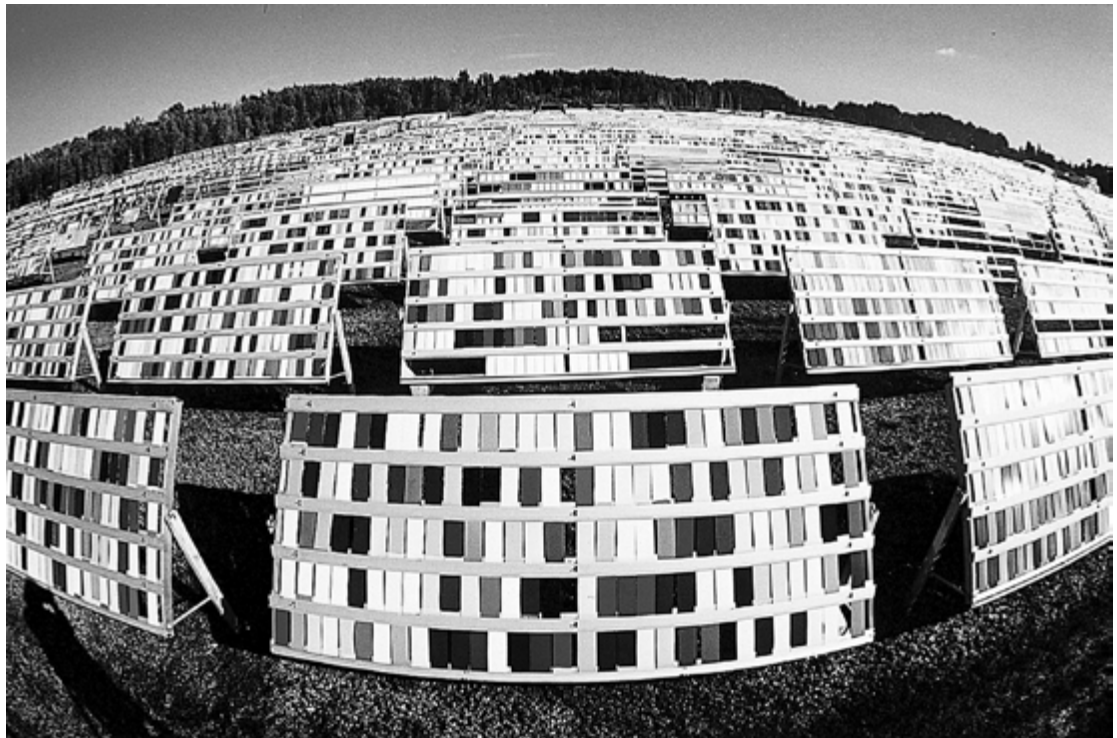


Figure 3: Fisheye view of some of the “test fences” at South Florida Test Service near Miami, the world’s largest exposure facility and primary coatings benchmark climate



Figure 4: EMMAQUA® solar concentrator for accelerated weather testing

anyone with a dark colored car in a hot sunny climate knows well; this heat may directly cause degradation such as that related to thermal-mechanical movement, but can also increase the loss rate of stabilizers and accelerate chemical degradation and mechanisms.

Moisture is a key degrading factor for many coatings and substrates, both organic and inorganic. Many coatings degrade due to hydrolysis reactions. Others fail from the physical action of hydrodynamic swelling and shrinking moving from wet to dry and back. Moisture can leach out stabilizers and provides a habitat for biological organisms such as mold and mildew. Some coatings need to be moisture permeable to allow the substrate to “breathe” such as concrete coatings, while others must be moisture impermeable like anti-corrosion coatings to protect the substrate.

Each of these three main weather factors (heat, light, moisture) is not independent; light can affect temperature which in turn affects moisture. Plus, the outdoors is not steady-state; each of these factors changes at any location in cycles and ranges which vary by hour, day, season and year in complex and non-reproducible patterns. Service use, such as pipe coatings in an industrial plant or offshore marine coatings, can be subject to many important additional stresses. Add to this list many secondary climate factors such as wind, atmospheric pollutants and others and you can see the armada of stresses coatings must endure.

Key Weather Testing Climates

There are many climates in the world. In general, the three that are commonly identified as having the greatest degradation effects on materials, including coatings, are hot/wet (subtropical/tropical), hot/arid (desert) and temperate (higher latitude freeze/thaw). A specific coating, depending on its chemistry and functional requirements, may perform very differently in each of these environments. This generally requires outdoor testing in more than one climate. With that being said, the hot/wet subtropical climate of the southern tip of Florida has historically been used as the primary weathering testing benchmark for coatings of all types. This is due to the combination of high solar radiation, high temperatures and



Figure 5: EMMAQUA® water sprays provide thermal shock or night time dew wetting

Continued on next page

extreme moisture that has been found to be very degrading to organic materials. Other world locations have similar climates, such as Atlas' Chennai, India site, but south Florida has emerged as the de facto primary global benchmark for the comparative testing of coatings.

Many coatings performance standards require south Florida exposure testing. Several global coatings companies maintain test sites in south Florida as do commercial testing companies such as Atlas' South Florida Test Service (Figure 3). Atlas has, however, established a Worldwide Exposure Network of over 25 global test sites for product manufacturers requiring testing to other regional climates.

South Florida coatings exposures may be conducted at various orientations. Today, direct exposures are oriented toward the equator (e.g., facing due south in the northern hemisphere) and most global test sites are located in the bands of 15-35° latitude where solar radiation is high and temperatures are warm. However, there are some temperate and cold weather sites as well and these can be important for coating/substrate systems sensitive to moisture freeze/thaw conditions.

Hot arid sites, such as Atlas' DSET Laboratories in Arizona's Sonoran Desert near Phoenix, Arizona or the Kalahari Desert in South Africa, are also used for coatings testing, especially for automotive paints (in conjunction with South Florida). On average, Arizona receives about 20% more total UV than south Florida but with less than 5% of the "wet time" and with much higher summer and lower winter (below freezing) temperatures. Arizona exposures can be more severe where UV degradation is the dominant failure mode, and for color fade where colorant degradation is primarily a direct photon-absorption process.

A Matter of Degrees

While the original 1906 Fargo test fences were vertical, other exposure angles have since emerged. As most painted wood is used vertically, 90° inclined equator-facing exposures are most common, with alternate exposure facing away from the equator out of direct solar radiation for mildew testing. However, wood used horizontally such as decking, or other horizontally-used coatings such as concrete stains, traffic control marking, etc., on other substrates are typically exposed at near-horizontal 5° inclination to avoid standing water. Due to the height of the sun, a vertical exposure receives about half the solar radiation of a horizontal one (this is highly dependent on latitude and other factors, however). In Florida, the wet time of a horizontal specimen will be greater than for a vertical orientation.

Architectural and other coatings on non-wood substrates, including metals and wood-plastic composites, are often exposed at either 45° inclination angle or "station latitude" which is 26° for south Florida and 34° for Arizona. The 45° exposure is most common globally as it provides a good compromise for "direct normal incidence" through the year as the sun elevation varies seasonally with a reasonable wet time although 5° and 26° provide about 10% more UV annually. In Arizona, with more UV being present in the direct solar beam due to low atmospheric moisture, the 5° provides about 7% and 34° near 11% greater UV dose.

By comparison, south Florida delivers about 75% and Arizona 100% more solar radiation than a specimen receives in Germany, so testing for 2 years at these sites provides an approximate 4 year (UV) equivalent to Germany. Of course, other factors such as moisture and temperature are not comparable.



Figure 6: Ci5000 Weather-Ometer® rotating rack xenon instrument and SUNTEST® XXL+ flatbed xenon instrument

Accelerating the Weather

Coatings R&D and testing can't always wait for natural outdoor exposure tests; they take too long for most formulation decisions. Hence the need for more accelerated testing, and two main methods have emerged: accelerated outdoor testing using concentrated sunlight and laboratory testing using solar and climate simulation.

Atlas pioneered using concentrated sunlight for coatings testing in the EMMA[®] and EMMAQUA[®] devices (Figure 4) in 1958. These use ten specialized Fresnel reflectors to concentrate sunlight, including the UV, onto test specimens.

These devices track the sun during the day and focus ten images of the sun onto the test target. The test specimens are then cooled so that their temperatures are near to what they would be on a static test fence. Periodic water sprays can be programmed to provide wetting or thermal shock during the day and/or nighttime dew wetting typical of south Florida, or operated dry (Figure 5).

As only the direct beam sunlight is focused, the actual concentration factor is about 8x over a natural exposure. This acceleration is seasonally dependent upon the sun and the test acceleration is therefore highest in summer. Special variations for temperature and moisture control are possible to provide better correlation to static exposures for these factors. The technique is widely employed for automotive and architectural coatings on metal; the low thermal conductivity and temperature/moisture sensitivity of wood is not optimal for this method. Due to the specialized dry atmospheric requirements, these devices are suitable only for operation in arid climates such as Arizona.

Moving Weather into the Lab

Laboratory-induced weathering was initiated with Atlas' introduction of carbon arc lamp devices in 1916 for UV color fade testing. With subsequent technological developments in solar simulating light sources and environmental controls, the primary method in accelerated coatings testing is represented by Atlas' Weather-Ometer[®], Xenotest[®] and SUNTEST[®] devices employing specialized xenon arc lamps and optical filters. Together with advanced controls of temperature, humidity and water delivery, these xenon arc devices represent the "gold standard" in laboratory accelerated weathering (Figure 6), particularly in their ability to provide an extremely good match to full spectrum solar radiation. This spectral match, more than any other factor, has been very technically challenging for testing device developers.

An alternative exposure apparatus known as a "fluorescent-condensation" device is based on UVA-340 fluorescent UV lamps (Figure 7). Light exposure typically alternates with a dark moisture condensation period. These devices, such as the Atlas UVTest, are widely employed in coatings R&D. This technique is relatively inexpensive and very useful in screening large numbers of binder formulations for UV and moisture resistance. As correlation with outdoor weathering can be poor for appearance properties such as gloss and color fade, it is not generally considered to be a weathering device. Lack of correlation to outdoors largely is due to the limited spectrum of the UV lamps and restricted temperature control compared to xenon devices.

The spectral match to actual solar radiation, coupled with good control of temperature, humidity and moisture delivery, has made xenon arc testing to ISO, DIN, ASTM and other international and corporate standards indispensable and a key component of coatings R&D and service life estimation. While xenon weathering devices were first introduced by Atlas in 1954, the technique gained widespread acceptance after 1979 with the introduction of automatic irradiance (light intensity) monitoring and control. The technique was especially adopted by the automotive industry for exterior paint and trim following key failures of early base coat-clear coat systems, then by interior with problems regarding instrument panels and textiles.



Figure 7: Inside of an Atlas UVTest showing UV lamps, Black Panel Temperature Control and ergonomically designed specimen retention clips

Continued on next page

Standard committees such as ISO, ASTM, SAE and others created standard test methods based on best available knowledge and technology . . . at the time. Sadly, the process of standards modernization in these large bodies is often compromised with a desire for the lowest technology and backwards compatibility. This came to a head, especially in the USA's automotive industry in the early 2000's when many OEM's abandoned the outdated standards in favor of fundamental science and improved instrument technology.

A Better Mouse Trap

Automotive coatings are among the higher-performing systems in use today. These require high appearance retention for ten years and performance in many climates globally on challenging substrates. To underscore their importance, the paint line is the most expensive part of an automotive plant, and the paint system is the most expensive part of a vehicle.

Recently, following some key research with EMMAQUA® devices, a consortium of researchers including Ford Motor, Boeing, Atlas, and others, experimented with improved xenon arc spectral match filters and test cycles for automotive and aerospace coatings to better correlate with south Florida exposures [3]. For automotive coatings, in particular, both the spectral match and amount and form of water delivery have proven to be critical as the more an artificial test deviates from the natural processes the less likely results will agree with real time. This work has resulted in a substantially improved test method (at least for high performance automotive coatings) that may be proposed as an international standard. This science-based approach should serve as a model to the rest of the coatings standards development organizations.

Summary

Only outdoor weathering in various actual climates is “real.” However, given today's highly durable coatings systems, the requisite test time is unrealistic to meet R&D requirements. Therefore, accelerated testing which generally can provide up to about a 5-10x acceleration over real time (test method and material dependent), is necessary. Two accelerated weathering test methods have emerged: Fresnel sunlight concentrators and xenon arc weathering devices. These techniques require a high degree of technology, but as tools, they still require good science and test methods to use them properly. Any accelerated test result should ultimately be validated with real time outdoor testing in one or more climates. ■

References

- [1] Edwin F. Ladd, Practical Paint Tests In 1907; Issue 81 Of Bulletin (North Dakota Agricultural Experiment Station, Fargo), North Dakota Agricultural College, Government Agricultural Experiment Station for North Dakota, 1908.
- [2] Joseph V Koleske, editor, Paint and Coating Testing Manual: 15th Edition of the Gardner-Sward Handbook, ASTM International, 2012.
- [3] Mark Nichols, et al, Accelerated Weathering Testing: A new approach to anticipating Florida weathering results, presentation 2011 Coatings Science International, Noordwijk, Netherlands, June 30, 2011.



New User Interface Software Facilitates Sample Tracking

In keeping with our commitment to continuous improvement, Atlas has released a new revision to the user interface software for the current production Weather-Ometers. In addition to minor software updates, the latest revision includes the following new enhancements:

E-mail Notification – Tracking your Weather-Ometer’s status is now just an e-mail alert away! The new tool prompts the instrument to automatically e-mail you when several user-defined conditions are met, including when:

- » a test is complete
- » a scheduled stop has been reached
- » an alarm has been triggered
- » scheduled maintenance/calibration is required

The software allows you to input multiple e-mail addresses (including defining the “To” and “CC” details), as well as specify when e-mails should be sent based on the conditions listed above.

Sample Management – Given the extensive capacity of the Weather-Ometer®, it is common for multiple tests with multiple start times to be running in the same instrument. The task of recording and keeping track of those individual tests has been a manual process, usually accomplished with log books or homemade spreadsheets/databases. With this new tool, keeping track of exposure time is easier than ever. You can keep track of multiple tests within the same Weather-Ometer® right on the user interface. This allows you to:

- » Name specific sets of samples
- » Input the number of specimens within each sample set
- » Tell the Weather-Ometer® if the samples are currently on exposure or out of the instrument for evaluation purposes
- » Delete sample sets once exposures are complete

Up to 10 individual sample sets can be tracked at once, either by time or by radiant dosage. ■

The screenshot shows two panels: 'SMTP Server Settings' and 'Notification Settings'. The SMTP panel includes fields for SMTP Server, SMTP Port, a checkbox for SSL Enabled?, Username, and Password. The Notification panel includes a 'Send To: Email Address' field and a 'Configure Notifications' button. A navigation bar at the top contains buttons for RUN/STOP, MONITOR, LIBRARY TOOLS, SETUP, SERVICE, and SETTINGS.

The screenshot shows a table with columns: On Exposure, # of Sample, Sample Group, Stop Interval, Next Stop In, Elapsed Exposure, Units, and Delete Group. There are 10 rows, each with a radio button in the 'On Exposure' column and a 'Delete' button in the 'Delete Group' column.

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For more information about this new software revision, contact your local Atlas sales or service representative or e-mail atlas.info@ametek.com.



New ASTM Method Coming Soon

Atlas Weather-Ometers Fully Meet New Standard Requirements

For over 20 years, SAE J1960 (and the performance-based equivalent, SAE J2527) has been the most popular test method used for testing automotive exterior materials. First developed by General Motors in the mid-1980s, it was soon adopted by several other automotive OEMs, largely in the U.S. and Japan. Despite the popularity of this method, it was deficient in terms of 1) the quality of the spectral power distribution (SPD) for the light source, 2) moisture delivery, and 3) irradiance level to provide meaningful acceleration and correlation.



Work has been conducted by automotive OEMs, major paint suppliers, and weathering instrument manufacturers for nearly 10 years to develop an artificial test that better replicates natural exposures (where South Florida is the “benchmark”), demonstrating that good scientific methodology and an understanding of both material sensitivities and details of the natural environment can be utilized to develop better artificial test cycles.

Highlights of the new standard include:

- » Tighter SPD requirements to match the short wavelength UV found in terrestrial daylight. (The Atlas Right Light filter meets these requirements and was the basis for the requirements listed in the new test method.)
- » Multiple irradiance levels to better match real-world conditions
- » A sub-cycle with rapid changes in conditions to simulate thermal shock effects and test a material’s mechanical and expansion/contraction properties as they relate to weathering
- » Longer dark phases with spray to match the moisture uptake seen in South Florida exposures

The method also describes in detail a means to verify minimum spray requirements, as well as a detailed justification of each phase within the test cycle.

Despite some confusion reported in the marketplace, all current Atlas Weather-Ometers can fully meet the requirements of the new standard.

It is expected that this standard will be published within the current calendar year and referenced in material specifications by several automotive OEMs. ■



Look for further updates regarding this new standard in upcoming Atlas communications. Copyright laws do not allow us to print any specific details about this method, but for more information, please contact Atlas at atlas.info@ametech.com.

New Radio-Controlled Light Monitors Introduced for Xenotest®

Atlas has developed a new generation of radio-controlled (RC), on-rack light monitors for the Xenotest® Series air-cooled xenon rotating rack instruments. The first new RC-type light monitor, — the RC-34 which controls irradiance within UV wavelength range 300-400 nm and simultaneously Black Standard Temperature (BST) — became available January 1 for the Xenotest 220/220+, Atlas' dedicated textile color lightfastness tester.

The new XENOSENSIV® RC sensors incorporate state-of-the-art radio control technology and are designed to provide premium control of both light and temperature. Radio control allows for faster and more reliable data transmission and will soon become the new standard, replacing the old “collector ring” technology. Clients will benefit from improved instrument control and reduced maintenance costs.

Three models of the new radio-controlled light monitor will be made available, each with different wavelength controls:

- » XENOSENSIV RC-34 BST (control: 300-400 nm)
- » XENOSENSIV RC-420 BPT (control: 420 nm)
- » XENOSENSIV RC-38 BST (control: 300-800 nm)

All of the XENOSENSIV RC light monitors can be calibrated with existing XenoCal® sensors. For more information, contact your local Atlas sales representative. ■



XENOSENSIV RC-34 BST

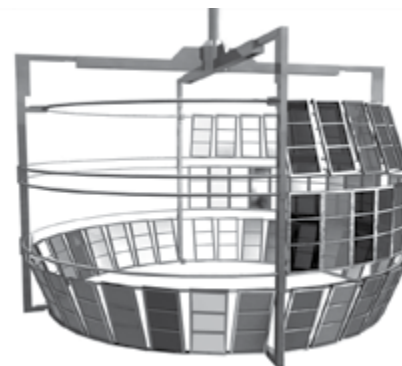
New Weather-Ometer® Specimen Rack Introduced

Atlas has made the most significant design change to the inclined specimen rack since the introduction of the current Ci Series of Weather-Ometers. The change, which has been incorporated into Ci3000+, Ci4000, and Ci5000 model Weather-Ometers, includes:

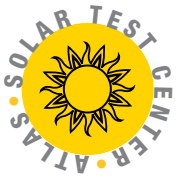
- » **Rounded rings** – The previous design had several bevels on the rack rings where specimen holders are placed. The original intent was to provide a perfect match to the specimen holder tabs. However, after years of use, the tabs would sometimes lose their original shape and become too tight to fit on the beveled ring, making the holders difficult to slide. The new rounded rings allow any holder to slide more easily, while still maintaining a consistent distance from the xenon lamp.
- » **Different rack arms** – The previous design had specific bends to allow for the proper inclination of the bottom and top tiers. Working closely with our supplier, we designed an arm that is significantly easier to manufacture.
- » **Assembly** – The previous design was quite difficult to disassemble (and even more difficult to reassemble) to allow for access in the chamber for periodic cleaning and maintenance. The new rack design can be easily disassembled/assembled in about 20 minutes.

Testing of the new rack has proven that the most critical features of the specimen rack have been maintained, including near-perfect roundness of the rings for uniform irradiance around the circumference of the rack, proper inclination for the best tier-to-tier uniformity, and strength to hold extremely heavy samples. The rack accommodates all of Atlas' standard specimen holders.

The new design is also available as a retrofit. Since it has the same capacity and is the same size as the previous design, the new rack will still provide reproducible results, and no xenon lamp re-calibration is required. For more information, contact your local Atlas sales or service representative. ■



Weather-Ometer specimen rack



AWSG-Arizona Receives European Collector Testing Accreditation

In January, Atlas Weathering Services Group was accredited by the European certification organization DIN CERTCO to serve as a partner lab providing qualification testing for the coveted Solar KEYMARK. All solar collectors marketed in European nations are required to show compliance with European standard EN12975, which is key to obtaining Solar KEYMARK certification and DIN CERTCO listing.

Atlas' DSET Laboratories in Phoenix, Arizona pioneered solar collector qualification testing in the 1970s and is an authorized testing lab for the U.S.-based Solar Rating and Certification Corporation (SRCC) organization. With the addition of EN12975 testing capability and accreditation by DIN CERTCO, the team in Arizona can now offer combined SRCC OG-100 and DIN CERTCO Solar KEYMARK testing protocols, which can reduce time and costs for clients who wish to market their collector products in North America as well as Europe.

The testing methods required by both SRCC and DIN CERTCO are based on ISO 9806 international test standards, allowing the ability to leverage common testing and reporting requirements. This capability also opens the door for support of other regional standards which rely on the same methods.

Additionally, the Atlas Solar Test Center (STC) at the DSET Laboratories is A2LA-accredited to perform testing to international PV and CPV standards. Virtually all solar power testing requirements can be handled by the team in Arizona, including Combined Heat and Power (CHP) products and other innovative technologies.

Atlas' Arizona and Florida sites also provide other solar power evaluations, such as custom power monitoring and soiling impact studies, as well as the industry-recognized Atlas 25[®] PV reliability/durability program. ■

To learn more about Atlas' solar testing capabilities, contact John Wonders at john.wonders@ametek.com or at +1-800-255-3738 x101.





UL Data Acceptance Program Extends Atlas' Accreditation

After a successful annual accreditation audit by the UL's Data Acceptance Program (DAP) in December 2012, Atlas' UL-accredited status has been extended until August 2014 for the qualification testing of PV and CPV modules.

DAP allows UL to accept externally generated test data from accredited laboratories in support of UL certification. The accreditation allows Atlas to perform testing to many of the test methods listed in the following specifications:

- » IEC 61215 - Crystalline Silicon Terrestrial PV Modules, Design Qualification & Type Approval
- » IEC 61646 - Thin Film Terrestrial PV Modules, Design Qualification & Type Approval
- » IEC 61730-2 - Photovoltaic (PV) Module Safety Qualification
- » IEC 62108 - Concentrator Photovoltaic (CPV) Modules and Assemblies - Design Qualification and Type Approval
- » UL 1703 - Flat Plate Photovoltaic Modules and Panels
- » ULC/ORD-C1703 - Flat Plate Photovoltaic Modules and Panels

For a copy of Atlas' new UL DAP scope of accreditation or for further details on our testing capabilities, contact Customer Support at 800-255-3738 or e-mail john.wonders@ametek.com. ■

German Lab Receives ISO 17025 Re-Accreditation

Atlas' laboratory in Duisburg, Germany recently received re-accreditation to ISO 17025 by the German accreditation body Deutsche Akkreditierungsstelle GmbH (DAkkS).

The Duisburg laboratory conducts accelerated weathering and lightfastness testing on plastics, paints and coatings, sealants, rubber, automotive exterior and interior materials and components, printing inks, glues, anodized aluminum and non-metallic materials.

The laboratory also provides gloss, instrumental color and visual evaluations.

The Duisburg lab utilizes xenon, fluorescent and metal halide weathering devices that meet most accelerated test methods from corporate, national and international standard organizations. Atlas' flexible accreditation is based upon the full capabilities of the instruments in the lab. This allows us to include all test methods that the instruments can perform under our scope of accreditation.

With more than 25 different weathering devices and highly skilled staff, the Atlas laboratory in Duisburg ensures the highest level of service and quality.

If you have questions or would like to request a quotation, contact Olaf Sucker at +49/(0)2065-7649-0 or olaf.sucker@ametek.de. ■





Atlas® Introduces New Workshop on Sample Preparation and Evaluation

Responding to client requests, Atlas has developed a new one-day workshop, “Sample Preparation and Evaluation.” This course is being offered at our offices in Linsengericht, Germany.

The Sample Preparation and Evaluation Workshop is designed for those who prepare, test and evaluate test samples. It addresses the importance of sample selection and preparation, as well as sample replication, and guides laboratory staff through cleaning and visual evaluation methods. Also included is an in-depth examination of various weathering defects and how they can be evaluated and rated according to both reference scales and reference materials.

Workshop participants will get hands-on training in visual evaluation methods using controlled light conditions for both outdoor and laboratory weathering and lightfastness testing. Attendees will also learn about:

- » The differences in evaluation methods and rating scales
- » Weathering defects/changes (general appearance, color change, gloss reduction, etc.)
- » The effect of different illumination conditions in color inspection booths
- » The use of reference materials to define the end point of a test and how reference materials are used to determine lightfastness rating

Who Should Attend

Professionals involved in the design, evaluation, specification and implementation of lightfastness, outdoor and accelerated laboratory weathering tests. This includes materials engineers, laboratory technicians, R&D and quality assurance personnel, formulation chemists or anyone interested in gaining knowledge on weatherability. ■

For details on this workshop and other Atlas course offerings, visit <http://atlasmtt.com/courses>





Atlas Now Serving Customers Directly in China

Atlas is pleased to announce that effective January 1, 2013, we began direct operations in China for both sales and technical service. We have entered into a new agreement with our current distributor, SDL Atlas Ltd., to continue sales and service for our China customers in the textile industry.

Atlas has enjoyed a long working relationship with SDL Atlas and many of its core staff since we entered the China market more than 20 years ago. Our customers have benefited from SDL Atlas' high level of technical expertise, strong customer service and continued investment in resources to stay ahead of China's rapid expansion. As SDL Atlas will continue to manufacture a complete line of textile testing instruments and maintain a large presence in China, we feel we still have an ideal partner to service this industry for years to come. Additionally, after our acquisition by Ametek in 2012, Atlas now has the local infrastructure and support required to effectively work directly with customers in China.

The two companies worked out an agreement by which many of the experienced sales and service engineers from SDL Atlas have joined Atlas, while others remain with SDL Atlas to serve the textile industry's lightfastness needs. So customers will be able to expect the same level of service and response time as before, without disruption to their operations.

SDL Atlas will continue to serve all of the Hong Kong and Macau markets as it has in the past.

Through Ametek, Atlas now has direct offices in Shanghai, Beijing, Guangzhou and Chengdu, along with several remote locations throughout China for both sales and technical support.

The Shanghai office will feature a new demonstration and applications laboratory equipped with a Ci4000 Weather-Ometer®, SUNTEST® XLS+ and UVTest. Customers can visit this facility for product training, application support or to view the instruments in operation. The office also houses a significant supply of repair parts and consumables to provide faster response to customer needs. ■



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