



Gesellschaft für
Umweltsimulation e.V.

Program

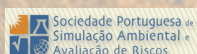
5th European Weathering Symposium EWS

(XXVIIth Colloquium
of Danubian Countries
on Natural and Artificial
Ageing of Polymers)

September 21 - 23, 2011
Lisbon, Portugal



Confederation of European
Environmental Engineering
Societies



Associação
Portuguesa da
Indústria de
Plásticos



LABORATÓRIO NACIONAL
DE ENGENHARIA CIVIL

5th European Weathering Symposium EWS

(XXVIIth Colloquium of Danubian Countries on Natural and Artificial Ageing of Polymers)

Invitation

It is with great pleasure that we invite you to participate in the 5th European Weathering Symposium EWS (XXVIIth Colloquium of Danubian Countries on Natural and Artificial Ageing of Polymers) to be held in Lisbon on September 21 - 23, 2011, organised by CEEES.

Launched in 1967 by four relevant institutes from Austria, Czechoslovakia, Hungary and Yugoslavia, the Colloquia of Danubian Countries have been the only exclusive meetings in the field of natural and artificial weathering of polymers for more than 40 years. Relaunched as EWS they have attracted a broader scope of attendees.

In the tradition of these colloquia, the EWS is a meeting point for experts from industry and academia to learn from each other. The main topics in 2011 will be:

- Weathering of Polymeric Products – Plastics and Coatings
- Determination, Simulation and Effects of Relevant Climatic Quantities
- New Test Procedures and Devices
- Weathering Reference Materials
- Analysis of Polymer Degradation
- Service-Life Prediction

Schedule

September 21, 2011

2.00 p.m. - 5.30 p.m. Training course
7.00 p.m. - 9.00 p.m. Welcome reception

September 22, 2011

08.00 a.m. Registration
09.00 a.m. - 05.15 p.m. Conference day 1
05.30 p.m. - 07.30 p.m. Sightseeing tour by bus
08.00 p.m. - 11.00 p.m. Conference dinner

September 23, 2011

09.00 a.m. - 03.30 p.m. Conference day 2
03.30 p.m. - 05.30 p.m. Technical tour to the Laboratório Nacional de Engenharia Civil, Lisbon (near the airport)

General Information

Language	The conference language will be English.
Program	The program will be available online at http://www.weathering-symposium.org
Scientific Committee	Peter Trubiroha (Chairman), Berlin, D Domenico Acierno, UniNa, DIMP, Naples, I Eva Bejarano, AIMPLAS, Paterna, ES Norman Billingham, US, Brighton, GB Olga Guseva, EMPA, Dübendorf, CH Ali Harlin, VTT, Espoo, FIN Anne-Lise Høg Lejre, DTI, Taastrup, DK Ignacy Jakubowicz, SP, Boras, S Leopold Kranner, ÖGUS, Vienna, A Jonathan Martin, NIST, Gaithersburg, USA Regina Nogueira, IBB, Minho, P Constantine Papaspyrides, NTU Athens, LPT, GR Krzysztof Pielichowski, CUT CTP, Cracow, PL Jan Pilar, IMC, Prague, CZ Béla Pukánszky, BME, Budapest, HU Vesna Rek, UZ, Zagreb, HR Lyda Rychla, PI, Bratislava, SK Jacques Sampers, DSM Research, Geleen, NL Yoshimitsu Takane, JWTC, Choshi City, J Jacques Verdu, ENSAM, Paris, F Mireille Wenkin, CoRI, Limelette, B
Chairman	Thomas Reichert, Fraunhofer ICT, Pfinztal, Germany
Organisation/ Conference Management	The 5 th European Weathering Symposium is being organised on behalf of CEEES by the German Society for Environmental Engineering GUS (Gesellschaft für Umweltsimulation e.V.) and supported by SOPSAR, APIP and LNEC from Portugal.
Participation Fee	The participation fee is €450,-- for registrations up to June 15, 2011. This fee includes lunches and refreshments, the welcome reception, the sightseeing tour and the conference dinner. For registrations after June 15, 2011 the fee is €550,--.
Cancellation	If written cancellation is received before August 15, 2011, a refund will be given minus €100,-- administration charge. No refunds can be provided for registrations cancelled after this date.

General Information

Registration

Please mail the attached registration form to

Gesellschaft für Umweltsimulation GUS
Sonja Holatka
c/o Fraunhofer ICT
P.O. Box 1240
76318 Pfingstal, Germany
Phone: +49 (0) 721 46 40-391
Fax: +49 (0) 721 46 40-345
sonja.holatka@gus-ev.de
www.gus-ev.de

The registration fee must be paid on receipt of invoice or in cash in Euros on arrival at the venue. Credit cards are not accepted.

Conference Venue

The symposium will be held at:
Real Palácio Hotel, Rua Tomás Ribeiro 115,
1050-228 Lisbon, Portugal

Accommodation

GUS has reserved a room contingent at the Real Palácio Hotel and the Real Parque Hotel (close to the conference venue) at special convention rates. Reservations must be made before July 1, 2011.

Please indicate your room reservation on the attached Hotel Booking Form and send it to Real Palácio Hotel, João Ramos, by July 1, 2011 at the latest.

Deadlines

Early registration
June 15, 2011

Hotel room reservation:
July 1, 2011



Pre-Meeting Program
Wednesday, September 21, 2011

Training Course

14.00 – 17.30 h

**Weathering and Polymer Degradation -
A Review**

L. E. Pimentel Real, Laboratório Nacional de Engenharia Civil, Departamento de Materiais, Núcleo de Materiais Orgânicos, Av. do Brasil, Lisbon, PT

Boundary Surface Climates at Irradiated Surfaces

- **Radiation heating / cooling**
- **Black standard and black panel temperatures**
- **Temperature of other surface colours**
- **Relative humidity and condensation**

P. Trubiroha, Consultant, Berlin, D
A. Geburtig, BAM Federal Institute for Materials Research and Testing, Berlin, D

19.00 – 21.00 h

Welcome Reception

Real Palácio Hotel

Conference Program
Thursday, September 22, 2011

09.00 h

Opening of the Conference

T. Reichert, CEEES, GUS and Fraunhofer ICT, Pfinztal, D

Greetings

M. de Botton, APIP and PIEP, Lisbon, PT
C. A. de Brito Pina, LNEC, Lisbon, PT
A. Brito, SOPSAR, Braga, PT

Session 1

Methods of Service Life Prediction

Chair: J.-L. Gardette
University Blaise Pascal, Clermont-Ferrand, F

09.15 h

V 1

**Accelerated Weathering Testing:
A New Approach to Anticipating Florida
Exposure Results**

M. E Nichols, T. Misovski, C. A. Peters, Ford Motor Company, Dearborn, USA,
J. Boisseau, L. Pattison, BASF Coatings, Southfield, USA
J. Quill, Q-Lab Corp., Cleveland, USA
J. Zhang, Atlas Materials Testing LLC, Chicago, USA
D. Smith, Bayer Materials Science, Pittsburgh, USA
J. Seeberg, D. Berry, Boeing Company, Seattle, USA

09.40 h

V 2

**Methodology for Developing Tailored
Weathering Test Programs**

A. Riedl, Atlas MTT, Linsengericht-Altenhasslau, D

10.05 h

V 3

Service Life Prediction for Sealants

C. White, D. Hunston, K. T. Tan, National Institute of Standards and Technology, Gaithersburg, USA

10.30 h

Coffee Break

Session 2

Spectral Data

Chair: V. Wachtendorf, BAM Federal Institute for Materials Research and Testing, Berlin, D

11.00 h

V 4

**Investigating Effects of Temperature on
Wavelength Dependence of UV Radiation
Induced Damages**

A. Heikkilä, Finnish Meteorological Institute, Helsinki, FIN
M. Kaunismaa, Elastopoli Oy, Vammala, FIN
A. Sormanen, P. Kärhä, Aalto University, School of Electrical Engineering, Espoo, FIN

11.25 h

V 5

**UV-LEDs – A New Tool to Determine the
Spectral Response**

A. Geburtig, V. Wachtendorf, BAM Federal Institute for Materials Research and Testing, Berlin, D

Conference Program
Thursday, September 22, 2011

11.50 h **V 6**

Parameters Characterizing the Grade of Fitting the Spectral Distribution of Solar Simulators to a "Reference Sun"

D. Kockott, Wissenschaftliche Beratung, Hanau, D
A. Schoenlein, Atlas MTT, Linsengericht-Altenhaslau, D

12.15 h

Lunch

Session 3

Poster Presentations

13.15 h **P 1**

Mechanical Stress of PA6 Staple Fibres in Paper Machine Felts

T. Hakala, Tampere University of Technology, Tampere, FIN
A. Harlin, VTT Technical Research Centre of Finland, Espoo, FIN

P 2

Multi-Parametric Damage Functions for Historic Paper

E. Menart, M. Strlič, University College London, Centre for Sustainable Heritage, London, UK
G. de Bruin, Nationaal Archief, The Hague, NL

P 3

Degradation Effects after Sterilization Treatments of Chitosan-Based Materials

A. San Juan, A. Montembault, I. Royaud, L. David, Université Claude Bernard Lyon 1, Ingénierie des Matériaux Polymères, Villeurbanne, F
D. Gillet, France Chitine, Chemin de Porte Claire, Orange, F
S. Rouif, Ionisos, Parc Dombes Cotière Activités, Dagneux, F
T. Bouet, Tetra Médical, PAE de Marenton, Annonay, F

P 4

CarboLifeCycle - Weathering-Induced Degradation of Nanoparticle- Functionalised Composites

V. Wachtendorf, A. Geburtig, H. Sturm, A. Meyer-Plath, BAM Federal Institute for Materials Research and Testing, Berlin, D

P 5

Artificial Weathering of Polypropylene Geotextiles

J. R. Carneiro, M. de Lurdes Lopes, University of Porto, Faculty of Engineering, PT
P. J. Almeida, University of Porto, Faculty of Sciences, PT

P 6

Virtual Product Qualification of Automobile Interior Parts

T. Reichert et al., Fraunhofer Institute of Chemical Technology ICT, Pfinztal, D

Conference Program

Thursday, September 22, 2011

- P 7** **New Ways for Investigation of Polymer Weathering by ESR**
R. Mix, M. Ramanujam, V. Wachtendorf,
J. Friedrich, BAM Federal Institute for Materials
Research and Testing, Berlin, D
- P 8** **Degradation of ALD-Coated PLA Films in Composting Conditions**
M. Vikman, T. Hirvikorpi, M. Vähä-Nissi, A. Harlin,
VTT Technical Research Centre of Finland, Espoo, FIN
M. Karppinen, Aalto University School of
Technology and Science, Espoo, FIN
- P 9** **Interlaboratory Comparison of UV-Radiation Sources for Accelerated Durability Testing of PV-Modules**
D. Philipp, K.-A. Weiss, M. Koehl, Fraunhofer
Institute for Solar Energy Systems ISE, Freiburg, D
- P 10** **Natural Photodegradation of Plastics as Materials for Objects of Art Studied by Chemiluminescence and Thermal Analysis**
L. Rychlá, J. Rychlý, K. Csomorová, I. Janigová,
Polymer Institute, Slovak Academy of Sciences,
Bratislava, SK
- P 11** **Lifetime Determination for Polymer Liners Used in Construction of Seasonal Thermal Storage**
I. Paranowska, Danish Technological Institute,
Taastrup, DK
- P 12** **Ageing Effects of Photoselective Greenhouse Films**
P. Russo, D. Acierno, University of Naples Federico II,
Materials and Production Engineering, Naples, I
A. Greco, M. Frigione, University of Salento,
Engineering for Innovation, Lecce, I
L. Marinucci, Plastik Textile S.p.A., Modugno (Ba), I
- P 13** **Effect of Artificial UV Weathering with Varied Humidity on Dielectric and Surface Properties of Polymers**
M. Ramanujam, R. Mix, V. Wachtendorf,
A. Schoenhals, J. F. Friedrich, BAM Federal
Institute for Materials Research and Testing,
Berlin, D
- P 14** **Correlations of Climate Factors and the Ageing of Polymer Wood Coatings**
G. Hora, J. Aderhold, A. Redich, A. Keudji-Dinga,
Fraunhofer Institute for Wood Research WKI,
Braunschweig, D

Conference Program
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P 15 **Durability of Epoxy Adhesives for On-Site Rehabilitation of Timber Structures**
J. Custódio, H. Cruz, Laboratório Nacional de Engenharia Civil, Lisbon, PT
J. Broughton, Oxford Brookes University, Oxford, UK

P 16 **New Test Method to Assess the Durability of Bonded Connections Used in the On-Site Rehabilitation of Timber Structures**
J. Custódio, H. Cruz, Laboratório Nacional de Engenharia Civil, Lisbon, PT
J. Broughton, Oxford Brookes University, Oxford, UK

P 17 **Stress Aged HDPE Pipes: Effects of Recycled Polyethylene, Anti-Oxydant and Nanoclay**
M. M. B. de Oliveira Sampaio, L. E. Pimentel Real, Laboratório Nacional de Engenharia Civil, Lisbon, PT

Session 4

Correlation Natural / Artificial Exposure
Chair: J. Quill, Q-Lab Corp., Cleveland, USA

14.15 h **V 7** **Degradation Profiles of Injection-molded Block-co-Polymer Polypropylene after Outdoor and Artificial Weathering**
D. Kusakabe, M. Mizoguchi, T. Kuriyama, Yamagata University, Graduate School of Science and Engineering, Yonezawa, J

14.40 h **V 8** **Natural and Accelerated Weathering of Acrylonitrile-Butadiene-Styrene (ABS)**
R. M. Santos, C. Cramez, A. V. Machado, Universidade do Minho, Engenharia de Polimeros, Guimarães, PT
C. Cramez, Poliversal, Plásticos e Tecnologia, Aveiras de Cima, PT
G. Botelho, Universidade do Minho, Quimica, Braga, PT

15.05 h **V 9** **Weathering Resistance of the Colour in Water Based Coatings for Architectural Use**
M. P. Rodrigues, Laboratório Nacional de Engenharia Civil, Departamento de Materiais, Núcleo de Materiais Orgânicos, Lisbon, PT

15.30 h **Coffee Break**

Session 5 **Comparison of Different Exposure Conditions**
Chair: A. Riedl, Atlas MTT, Linsengericht-Altenhasslau, D

16.00 h **V 10** **Influence of Different Beginnings of Outdoor-Weathering on Weathering Results**
W. Rauth, Bayer MaterialScience AG, Leverkusen, D

Conference Program

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Friday, September 23, 2011

16.25 h V 11

The Investigation of Polymer Degradation by Luminescence Detection Caused by Different Ageing Factors

B. Röder, J. Schlothauer, Humboldt-Universität zu Berlin, Institute of Physics, Berlin, D
M. Köhl, Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, D

16.50 h V 12

Impact of Different Cycling Weathering Conditions on Cellulose

U. Henniges, A. Potthast, University of Natural Resources and Life Sciences, Vienna, A

17.30 h - 19.30 h

Tour

Sightseeing Tour Lisbon

20.00 h - 23.00 h

Conference Dinner

Real Palácio Hotel

Session 6

Analysis of Weathering Effects I

Chair: L. Rychla, Polymer Institute, Bratislava, SK

09.00 h V 13

Exploitation of Modern Physical Techniques in Characterization of Accelerated Weathering Processes in Commodity Polymers

J. Pilař, I. Šeděnková, J. Pflieger, D. Michálková, J. Pospíšil, Institute of Macromolecular Chemistry, Prague, CZ

09.25 h V 14

Water Uptake in Multilayer Coatings Measured by Magnetic Resonance Imaging

L. G. J. van der Ven, P. J. A. Geurink, T. Scherer, R. v. Overbeek, AkzoNobel Car Refinishes, Sassenheim, NL

V. Baukh, H. P. Huinink, O. C. G. Adan, S. J. F. Erich, Eindhoven University of Technology, Applied Physics, Eindhoven, NL

09.50 h V 15

Effects of Weathering on the Ionic Permeability of Coated Metal Substrates

V. Uhl, E. Pohle, ofi Research Institute for Chemistry and Technology, Vienna, A

10.15 h V 16

Assessing the Progress of Thermally and Light Induced Oxidation of Polyurethans by Chemiluminescence and Thermal Analysis

J. Rychlý, L. Matisová-Rychlá, M. Maliková, K. Csomarová, I. Janigová, Polymer Institute, Slovak Academy of Sciences, Bratislava, SK
A. Lattuati-Derieux, B. Lavédrine, Centre de Recherche sur la Conservation des Collections, Muséum National d'Histoire Naturelle, Paris, F

10.40 h

Coffee Break

Conference Program
Friday, September 23, 2011

Session 7

11.10 h **V 17**

Analysis of Weathering Effects II

Chair: G. Hora, Fraunhofer WKI, Braunschweig, D

Microscopic Investigation of the Degradation of Polypropylene with Different Stabilization Systems

K.-A. Weiß, M. Falk, T. Kaltenbach, C. Peike, M. Köhl, C. Stöver, Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, D
A. Lichtblau, M. Zäh, Clariant Produkte Deutschland GmbH, Gersthofen, D

11.35 h **V 18**

Assessment of Weathering Performance through Depth Profiling: Comparison between Water-borne and Solvent-borne Automotive Coating Systems

S. Al-Malaika, E. Lakin, H. H. Sheena, Aston University, EAS, Birmingham, UK
K. Moller, M. Palm, A. Backman, SP Swedish National Testing and Research Institute, Borås, S
K. Bechtold, Clariant, Huningue, F

12.00 h **V 19**

Towards a Non-Empirical Kinetic Model for the Photo-Thermo-Oxidation of Polypropylene

A. François-Heude, E. Richaud, X. Colin, Arts et Metiers ParisTech, PIMM, UMR CNRS, Paris, F
A. François-Heude, E. Desnoux, V. Klouz, Renault, DREAM-DIMAT, Guyancourt, F

12.25 h **V 20**

Temperature Dependence of Hydrothermal Ageing of Poly(ethylene Terephthalate)

B. Du, R. Yang, X. Xie, Tsinghua University, Chemical Engineering, Beijing, PRC

12.50 h

Lunch

Session 8

Stabilization

Chair: J. Pilař, IMC, Prague, CZ

14.00 h **V 21**

Resistance of Polypropylene Geotextiles against Natural Weathering

J. R. Carneiro, M. de Lurdes Lopes, University of Porto, Faculty of Engineering, PT

14.25 h **V 22**

Polycarbonate Light Stabilization: Everything but Standard

M. C. Grob, BASF Schweiz AG, Basel, CH

14.50 h **V 23**

Vacuum Deposited UV-Protective Coatings for Bisphenol-A Polycarbonate

C. Präfke, U. Schulz, N. Kaiser, Fraunhofer Institute for Applied Optics and Precision Engineering IAO, Jena, D

15.15 h

Closing Remarks

15.30 h

Technical Tour

Laboratorio Nacional de Engenharia Civil, Lisbon



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