



Gesellschaft für
Umweltsimulation e.V.

Program

6th European Weathering Symposium EWS

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

September 11 - 13, 2013
Bratislava, Slovak Republic

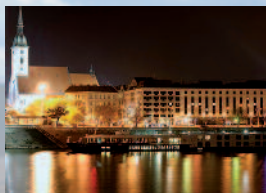
*In conjunction with
CEES Fall Meeting
September 10 – 11, 2013*



Confederation of European
Environmental Engineering
Societies



POLYMER INSTITUTE SAS



6th European Weathering Symposium EWS

(XXVIIIth 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 6th European Weathering Symposium EWS (XXVIIIth Colloquium of Danubian Countries on Natural and Artificial Ageing of Polymers) to be held in Bratislava on September 11 - 13, 2013.

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. Relunched 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 2013 will be:

- Comparison of outdoor and artificial exposure
- Influence of irradiance and wavelength
- Influence of moisture and soil
- Improved weathering procedures
- Analysis of weathering results and UV-data
- Ageing of photovoltaic cells

Schedule

September 11, 2013

2.00 p.m. - 5.00 p.m. Training course

7.00 p.m. - 9.00 p.m. Welcome reception

September 12, 2013

9.00 a.m. - 5.00 p.m. Conference day 1

5.30 p.m. - 7.30 p.m. Sightseeing tour

8.00 p.m. - 11.00 p.m. Conference dinner

September 13, 2013

9.00 a.m. - 3.30 p.m. Conference day 2

3.30 p.m. - 5.30 p.m. Technical tour to the

Polymer Institute, Slovak Academy of Sciences

General Information

Language

The conference language will be English.

Program

The program is available on www.weathering-symposium.org

International Scientific Committee

Peter Trubiroha (Chairman), Berlin, D
Domenico Acierno, UniNa, DIMP, Naples, I
Eva Bejarano, AIMPLAS, Paterna, ES
Norman Billingham, US, Brighton, GB
Joannie W. Chin, NIST, Gaithersburg, USA
António Guerreiro de Brito, IBB-UMinho, Braga, P
Olga Guseva, EMPA, Dübendorf, CH
Ali Harlin, VTT, Espoo, FIN
Anne-Lise Høgg Lejre, DTI, Taastrup, DK
Ignacy Jakubowicz, SP, Borås, S
Leopold Kranner, ÖGUS, Vienna, A
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 Rychlá, PI, Bratislava, SK
Jacques Sampers, DSM Research, Geleen, NL
Yoshimitsu Takane, JWTC, Choshi City, J
Jacques Verdu, ENSAM, Paris, F
Mireille Wenkin, CoRI, Limette, B

Chairman

Thomas Reichert, Fraunhofer ICT, Pfinztal, Germany

Organisation/Conference Management

The 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 the Polymer Institute, Slovak Academy of Sciences, Bratislava.

Participation Fee

The participation fee is € 450,-- for registrations up to May 31, 2013. This fee includes lunches and refreshments, the welcome reception, the sightseeing tour and the conference dinner. For registrations after May 31, 2013 the fee is € 550,--.

Cancellation

If written cancellation is received before August 1, 2013, a refund will be given minus € 100,-- administration charge. No refunds can be provided for registrations cancelled after this date.

General Information

Registration

Please register online at www.weathering-symposium.org or mail the attached registration form to:
Gesellschaft für Umweltsimulation GUS
Sabine Aref
c/o Fraunhofer ICT
P.O. Box 1240
D-76318 Pfinztal, Germany
Phone: +49 (0) 721 46 40-391
Fax: +49 (0) 721 46 40-345
secretariat@gus-ev.de
www.gus-ev.de

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

Conference Venue

The symposium will be held at:
Park Inn Danube Hotel, Rybné Námestie 1,
811 02 Bratislava, Slovak Republic

Accommodation

GUS has reserved a room contingent at the Park Inn Danube Hotel at special convention rates. Reservations must be made before June 1, 2013.

Please indicate your room reservation on the attached Hotel Booking Form and send it to the Park Inn Danube Hotel, by June 1, 2013 at the latest.

Transfer

Individual transfers are offered from Vienna Airport to the Park Inn Danube Hotel in Bratislava for € 60,-- (key word: EWS). Please contact 2pcom@2pcom.sk
www.2pcom-limousineservice.sk

International buses from Vienna Airport to Bratislava
www.eurolines.at
www.oebb.at

Deadlines

Early registration
May 31, 2013

Hotel room reservation
June 1, 2013

Pre-Program

CEEES Meeting Program

(Additional Registration via www.cee.es.org)

Tuesday, September 10, 2013

2.00 – 5.00 p.m.

CEEES Technical Advisory Board Meetings

Air Pollution and Climatic Effects
Mechanical Environment
Reliability and ESS

8.00 p.m.

CEEES Dinner

Wednesday, September 11, 2013

9.00 – 12.30 p.m.

CEEES General Assembly

12.30 p.m.

Lunch

Pre-Symposium Program

Wednesday, September 11, 2013

2.00 – 5.00 p.m.

Training Course

Chemiluminescence and FT-IR Spectroscopy for Polymer Analytics

Educational training course in the Park Inn Danube Hotel, presented by Lyda Rychlá, Jozef Rychlý, Štefan Chmela, Polymer Institute, Slovak Academy of Sciences, Bratislava. The participation fee is € 80,--.

Please indicate with the registration if you would like to attend.

7.00 – 9.00 p.m

Welcome Reception

Park Inn Danube Hotel

Conference Program
Thursday, September 12, 2013

9.00 a.m.

Opening of the Conference

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

Greetings

H. Roossien, CEEES and PLOT, Leusden, NL
Lyda Rychlá, PI SAS, Bratislava, SK

Session 1

Comparison of outdoor and artificial exposure

Chair: A. Riedl, ATLAS MTT, Linsengericht-Altenhasslau, D

9.15 a.m.

OP 01

Weathering of wood-plastic composite deck boards, a correlation study

J. Quill, S. Fowler, Q-Lab Corporation, Westlake, Ohio, USA

9.40 a.m.

OP 02

Novel approach in analysis of light source effects to spectral sensitivity of fir wood surfaces

V. Živković, H. Turkulin, University of Zagreb, Faculty of Forestry, Department of Furniture and Wood Products, Zagreb, HR

M. Arnold, Empa, Swiss Federal Laboratories for Materials Science and Technology, Applied Wood Materials, Dübendorf, CH

K. K. Pandey, Institute of Wood Science and Technology, Bangalore, IND

K. Richter, Technische Universität München, Lehrstuhl für Holzwissenschaft Holzforschung München, München, D

10.05 a.m.

OP 03

Evaluation of the ageing of polymeric coatings: correlation of the natural and artificial weathering

G. Eder, L. Spoljaric-Lukacic, N. Marques Tanure, V. Uhl, OFI, Austrian Research Institute for Chemistry and Technology, Vienna, A

T. Meinschad, DOKA Industrie GmbH, Amstetten, A

Session 2

Influence of irradiance and wavelength

Chair: P. Trubiroha, D

11.00 a.m.

OP 04

Statistical prediction of sealant modulus change due to outdoor weathering

C. White, K. Tan, D. L. Hunston, A. Pintar, J. Filiben, National Institute of Standards and Technology, Gaithersburg, MD, USA

Conference Program
Thursday, September 12, 2013

11.25 a.m. **OP 05**

Deterministic acceleration of laboratory weathering method and test results

A. Schönlein, Atlas Material Testing Technology, Linsengericht, D
W. Rauth, Bayer MaterialScience AG, Leverkusen, D

11.50 a.m. **OP 06**

Accounting for time and intensity of exposure in deriving action spectra of photo-degradation

A. Heikkilä, Finnish Meteorological Institute, Research and Development, Climate Change / Atmospheric Radiation, Helsinki, FIN
P. Kärhä, Aalto University, School of Electrical Engineering, Department of Signal Processing and Acoustics, Espoo, FIN
M. Kaunismaa, Elastopoli Oy, Sastamala, FIN
H. Lemmetyinen, Tampere University of Technology, Department of Chemistry and Bioengineering, Tampere, FIN

12.15 p.m.

Lunch

Session 3

Poster presentations

1.15 p.m. **PP 1**

Prediction of long term behaviour of elastomers

P. Davies, P.-Y. LeGac, IFREMER, Plouzané, F
B. Fayolle, ENSAM, Paris, F

PP 2

Towards a better understanding of cellulose degradation in the presence of acidic vapors

M.-J. Jeong, K. Ahn, A. Potthast, Department of Chemistry, University of Natural Resources and Life Sciences, Vienna (BOKU Wien), Vienna, A

PP 3

Constitutive modelling of UV irradiated poly(methyl methacrylate)

D. Hrelja, D. Zulian, A. Lorenzetti, S. Besco, M. Roso, E. Carniel, M. Modesti, Padova University, Dept. of Industrial Engineering, Padova, I

PP 4

Effect of UV accelerated weathering on flexural creep behaviour of bisphenol-A polycarbonate

M. Modesti, D. Hrelja, D. Zulian, A. Lorenzetti, S. Besco, M. Roso, R. Rabachin, E. Carniel, Padova University, Dept. of Industrial Engineering, Padova, I

PP 5

Accelerated weathering of multi-layer films

G. Oreski, Polymer Competence Center Leoben, Leoben, A
G. Pinter, University of Leoben, Chair of Materials Science and Testing of Polymers, Leoben, A

Conference Program

Thursday, September 12, 2013

- PP 6** **Ageing of plastic materials in electronics**
H. Palmén, VTT Expert Services Ltd, Espoo, FIN
- PP 7** **Global surface UV radiation products derived from satellite data**
J. Tamminen, J. Kujanpää, A. Arola, S. Hassinen, A. Heikkilä, Finnish Meteorological Institute, Research and Development, Helsinki, FIN
- PP 8** **Weathering and biodegradability of polyamide 4,10 and polylactide composites with microfibrillated cellulose (MFC) – the effect of surface modification of filler**
J. Pagacz, A. Leszczyńska, K. Pielichowski, Department of Chemistry and Technology of Polymers, Faculty of Chemical Engineering and Technology, Cracow University of Technology, Kraków, PL
- PP 9** **Structural changes of LDPE mulching foils after one season of application**
J. Mosnáček, K. Mosnáčková, J. Rychlý, Š. Chmela, M. Danko, J. Kollár, I. Lacík, Polymer Institute, Slovak Academy of Sciences, Bratislava, SK
- PP 10** **Surface temperatures of irradiated test specimens – decisive physical quantities and a largely unsolved problem**
P. Trubiroha, Berlin, D
A. Geburtig, V. Wachtendorf, BAM Bundesanstalt für Materialforschung und -prüfung, Berlin, D
- PP 11** **Numerical ageing of polymer parts**
T. Reichert et al., Fraunhofer Institute for Chemical Technology ICT, Pfinztal, D
- PP 12** **Water uptake of some polymeric materials for use in photovoltaic applications**
K. Möller, Department of Materials Technology, SP Technical Research Institute of Sweden, Borås, S
- PP 13** **Standardization of test methods for rotor blade coatings**
G. Pausch, Pausch Messtechnik, Haan, D

Conference Program
Thursday, September 12, 2013

Session 4

2.15 p.m. **OP 7**

Influence of moisture and soil

Chair: K. Möller, SP, Borås, S

Is soil an environmental parameter that impacts on oxo-degradable polyethylene thin films?

E. Gauthier, R. Truss, G. Cash, School of Chemical Engineering, The University of Queensland, St Lucia, QLD, AUS

B. Laycock, P. Halley, AIBN, The University of Queensland, St Lucia, QLD, AUS

M. Nikolic, G. George, Queensland University of Technology, Brisbane, QLD, AUS

2.40 p.m. **OP 8**

Effect of photo-oxidative aging on chemico-physical properties of fully biodegradable blown films reinforced with halloysites

P. Scarfato, E. Avallone, Department of Industrial Engineering – University of Salerno, Fisciano (SA), I

D. Acierno, B. Vetrano, Department of Chemical and Materials Engineering and Industrial Production, University of Naples Federico II, Naples, I

P. Russo, Institute of Chemistry and Technology of Polymers – National Council of Research, Pozzuoli (NA), I

3.05 p.m. **OP 9**

ASTM G 155 Cy 1 versus ISO 4892-2 Cy 1: So similar and so different

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

3.30 p.m.

Coffee Break

Session 5

4.00 p.m. **OP 10**

Optimizing weathering experiments for the reproduction of simultaneous photochemical and physical degradation pathways

F. Feil, Atlas MTT, Linsengericht-Altenhasslau, D

D. P. Dumbleton, Atlas MTT, Chicago, USA

4.25 p.m. **OP 11**

Accelerated weathering of solar mirror: a new methodology based on the monitoring of protective back layer degradation

O. Raccurt, C. Delord, C. Bouquet, R. Couturier, CEA LITEN, National Institute of Solar Energy INES, Solar Technologies Department, Thermal Systems Laboratory, Le Bourget-du-Lac, F

5.30 - 7.30 p.m.

Tour (Guided city tour with Prešporáčik Oldtimer)

8.00 - 11.00 p.m.

Conference Dinner

Park Inn Danube Hotel

Conference Program
Friday, September 13, 2013

Session 6

9.00 a.m. **OP 12**

Analysis of weathering results and UV-data

Chair: M. Modesti, Padova University, Padova, I

Irradiation-induced surface changes on CNT-filled polymeric materials

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

9.25 a.m. **OP 13**

Kinetic analysis and modeling of the oxidative ageing of high density polyethylene used in engineering and construction applications

M. Da Cruz, K. Benzarti, L. Van Schoors, Institut Français des Sciences et des Technologies des Territoires, de l'Aménagement et des Réseaux, Paris, F
X. Colin, Ecole Nationale Supérieure des Arts et Métiers, Paris, F

9.50 a.m. **OP 14**

Correlation of UV irradiance from ozone monitoring instrument (OMI) with integral and spectral measurements

K. Slamova, C. Schill, J. Wirth, M. Koehl, Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, D

10.15 a.m. **OP 15**

Field-deployable FTIR for coatings degradation analysis

J. M. Colwell, G. A. George, G. Will, Queensland University of Technology, Brisbane, Queensland, AUS
T. Trueman, Defence Science and Technology Organisation, Melbourne, Victoria, AUS

10.40 a.m.

Coffee Break

Session 7

11.10 a.m. **OP 16**

Analysis of weathering results

Chair: P. Russo, Institute of Chemistry and Technology of Polymers, Pozzuoli, I

Chemiluminescence from pre-oxidised ecoflex polymers

P. Stloukal, M. Koutný, Centre of Polymer Systems, Tomas Bata University in Zlin, Zlin CZ and Environmental Protection Engineering, Faculty of Technology, Tomas Bata University in Zlin, Zlin, CZ
J. Rychlý, L. Rychlá, Polymer Institute, Slovak Academy of Sciences, Bratislava, SK

11.35 a.m. **OP 17**

The influence of the aging-temperature and the relative humidity on the aging behaviour of polyethylene terephthalate

B. Hirschmann, G. Oreski, Polymer Competence Center Leoben, Leoben, A

Conference Program
Friday, September 13, 2013

12.00 p.m. **OP 18**

Physical changes during weathering of polyester-urethane coatings: space-resolved characterisation and simulation

K. N. S. Adema, H. Makki, J. Laven, E. A. J. F. Peters, L. G. J. van der Ven, R. A. T. M. van Benthem, G. de With, Laboratory of Materials and Interface Chemistry, Eindhoven University of Technology, Eindhoven, NL

12.25 p.m. **OP 19**

Multi-scale simulation of weathering of polyester-urethane coatings: physical and mechanical aspects

H. Makki, K. N. S. Adema, J. Laven, E. A. J. F. Peters, L. G. J. van der Ven, R. A. T. M. van Benthem, G. de With, Laboratory of Materials and Interface Chemistry, Eindhoven University of Technology, Eindhoven, NL

12.50 p.m.

Lunch

Session 8

Ageing of photovoltaic cells

Chair: M. Köhl, Fraunhofer ISE, Freiburg, D

2.00 p.m. **OP 20**

Influence of environmental factors on the ageing behaviour of photovoltaic backsheets

Y. Voronko, G. C. Eder, OFI, Austrian Research Institute for Chemistry and Technology, A
M. Knausz, G. Oreski, PCCL, Polymer Competence Center Leoben, Leoben, A
T. Koch, Y. Voronko, Institute of Materials Science and Technology, Vienna University of Technology, A
K. A. Berger, AIT Austrian Institute of Technology GmbH, Energy Department, Vienna, A

2.25 p.m. **OP 21**

Spectral and thermal influence on the photochemical degradation behavior of ethylene-based PV encapsulants

C. Peike, K. Apin, M. Hummel, K.-A. Weiß, M. Köhl, Fraunhofer Institute for Solar Energy Research, Freiburg, D

2.50 p.m. **OP 22**

Simultaneous performance and weather testing of solar cells

S. Roest, A. Mulder, Eternal Sun B.V., Delft, NL

3.15 p.m.

Closing Remarks

3.30 p.m.

Technical Tour

Visit of Polymer Institute, Slovak Academy of Sciences

If online registration is not possible, please use the form below:

Gesellschaft für Umweltsimulation e.V.
Sabine Aref
Joseph-von-Fraunhofer-Str. 7
76327 Pfinztal
Germany

Fax: +49 (0) 721 46 40-345

E-mail: secretariat@gus-ev.de

Invoice Address

Surname/First Name

Title

Organisation

Street

Postal Code/City

Country

Phone

Fax

E-mail

Please type or print

Conference Fee

- Registration before May 31, 2013: € 450,--
- Registration after May 31, 2013: € 550,--
- Training course € 80,--
- Accompanying person (welcome reception, dinner, sightseeing tour) € 90,--

Payment

- By money order (after receipt of invoice) Cash on arrival

Hotel Room Reservation

Please complete the attached booking form and return it by June 1, 2013
at the latest to Park Inn Danube Hotel:

Fax: +421 2 5441 4311, E-mail: reservation.bratislava@rezidorparkinn.com

Transfer from Vienna Airport to Bratislava

Please see the contact details from the General Information

I agree that pictures taken during this event may be published.

Date

Signature

Gesellschaft für Umweltsimulation e.V.
Sabine Aref
P. O. Box 12 40

76318 Pfinztal
Germany





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Umweltsimulation e.K.**