



Gesellschaft für
Umweltsimulation e.V.

Program

8th European Weathering Symposium EWS

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

*50th Anniversary
of the Colloquia of
Danubian Countries*

September 20 - 22, 2017
Vienna, Austria



Confederation of European
Environmental Engineering
Societies

Invitation

8th European Weathering Symposium EWS

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

50th Anniversary of the Colloquia of Danubian Countries, since 2003 continued as European Weathering Symposia (EWS)

It is with great pleasure that we invite you to participate in the 8th EWS (XXXth Colloquium of Danubian Countries on Natural and Artificial Ageing of Polymers) to be held in Vienna, the place of incorporation, on September 20 - 22, 2017.

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. 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 2017 will be:

- Spectral Response of Polymers
- UV Radiation
- Wetting and Moisture
- Varying Exposure Conditions
- Polymers in Photovoltaic Devices
- Influence of Temperature in Thermal Ageing and Weathering

Schedule

September 20, 2017

02.00 p.m. - 05.00 p.m. Technical tour to the Vienna Climatic Wind Tunnel (Rail Tec Arsenal)
07.00 p.m. - 09.00 p.m. Welcome reception

September 21, 2017

09.00 a.m. - 05.00 p.m. Conference day 1
05.30 p.m. - 07.30 p.m. Sightseeing tour
08.00 p.m. - 11.00 p.m. Conference dinner

September 22, 2017

09.00 a.m. - 04.00 p.m. Conference day 2

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
Sahar Al-Malaika, AU, CEAC, Birmingham, UK
Eva Bejarano, AIMPLAS, Paterna, ES
Joannie W. Chin, NIST, Gaithersburg, USA
Marjolein Diepens, DSM Ahead TP, Geleen, NL
Jean-Luc Gardette, CU, CNRS, Aubière, F
António Guerreiro de Brito, IBB-UMinho, Braga, P
Olga Guseva, EMPA, Dübendorf, CH
Ali Harlin, VTT, Espoo, FIN
Anne-Lise Høg Lejre, DTI, Taastrup, DK
Leopold Kranner, ÖGUS, Vienna, A
Kenneth Möller, SP Technical Research Inst., Borås, S
Constantine Papaspyrides, NTU Athens, LPT, GR
Krzysztof Pielichowski, CUT CTP, Cracow, PL
Béla Pukánszky, BME, Budapest, HU
Vesna Rek, UZ, Zagreb, HR
Lyda Rychla, PI, Bratislava, SK
Yoshimitsu Takane, JWTC, Choshi City, J
Volker Wachtendorf, BAM, Berlin, D
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.), supported by the Austrian Society for Environmental Engineering ÖGUS, Wr. Neustadt and Österreichisches Forschungsinstitut für Chemie und Technik OFI, Wien.

Participation Fee

The participation fee is € 450,-- for registrations up to June 26, 2017. This fee includes conference proceedings, lunches and refreshments, technical tour, welcome reception, sightseeing tour as well as the conference dinner. For registrations after June 26, 2017 the fee is € 550,--.

Cancellation

If written cancellation is received before August 11, 2017, 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:
LINDNER
Hotel am Belvedere
Rennweg 12
1030 Vienna, Austria

Accommodation

Room contingents at special convention rates are reserved at:

LINDNER Hotel am Belvedere
NH Wien Belvedere
Hotel Daniel Vienna
Motel One Wien-Hauptbahnhof

Reservations must be made before June 26, 2017

Therefore please see the attached Hotel Information Form with the contact details and send your room reservation directly to the selected hotel before June 26, 2017.

Visit

Technical tour to the Vienna Climatic Wind Tunnel (Rail Tec Arsenal).

Sightseeing Tour

Guided Tour Vienna

Pre-Program

CEEES Meeting Program

(Additional Registration is necessary)

Tuesday, September 19, 2017

2.00 p.m. – 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 20, 2017

9.00 a.m. – 12.30 p.m.

CEEES General Assembly

12.30 p.m.

Lunch

2.00 p.m. – 5.00 p.m.

Join Technical Tour to the Vienna Climatic Wind Tunnel (Rail Tec Arsenal)

Pre-Symposium Program

Wednesday, September 20, 2017

2.00 p.m. – 5.00 p.m.

Technical Tour to the Vienna Climatic Wind Tunnel (Rail Tec Arsenal).

RTA operates one of the largest testing and research facilities worldwide for vehicles, new transport systems and technical facilities that are subject to extreme climatic conditions.
Meeting Point: LINDNER Hotel am Belvedere

7.00 p.m. – 9.00 p.m.

Welcome Reception

LINDNER Hotel am Belvedere

Conference Program
Thursday, September 21, 2017

9.00 a.m.

Opening of the Conference

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

Greetings

D. Loidl, Austrian Society for Environmental Engineering ÖGUS, Wr. Neustadt and Österreichisches Forschungsinstitut für Chemie und Technik OFI, Wien

Session 1

Spectral Response of Polymers

Chair: P. Trubiroha, Berlin, D

9.15 a.m.

OP 01

Measurement and Application of Action Spectra in Photodermatology

D. Kockott, Hanau, D

9.45 a.m.

OP 02

Identifying the causal agent for degradation of materials due to selective, solar radiation

H. Kita, S. Suga, Suga Test Instruments Co., Ltd. Shinjuku, Tokyo, J

10.15 a.m.

Coffee Break

Session 2

UV Radiation

Chair: S. Al-Malaika, AU, CEAC, Birmingham, UK

10.45 a.m.

OP 03

UV Filter Radiometer Spectral Mismatch a Systematic Error

A. Schönlein, Atlas MTT GmbH, Linsengericht, D

11.15 a.m.

OP 04

An Estimation of Ultraviolet Radiant Exposure onto Leading Edges of Wind Turbine Blades

W. Schöppel, Neuss, D

11.45 a.m.

OP 05

Natural and artificial weathering of polymers – main differences in climatic conditions

P. Trubiroha, Berlin, D

A. Geburtig, V. Wachtendorf, BAM, Berlin, D

12.15 p.m.

Lunch

Conference Program
Thursday, September 21, 2017

Session 3

1.15 p.m. **OP 06**

Wetting and Moisture

Chair: V. Wachtendorf, BAM, Berlin, D

Development of an accelerated laboratory weathering test for Wood Plastic Composites in outdoor applications

J. Erath, T. Kilian, K. Engelsing, SKZ - Das Kunststoff-Zentrum, Würzburg, D

1.40 p.m. **OP 07**

Water absorption and hydrothermal ageing effects on flexural properties, viscoelastic performances and microstructural evolutions of poly(lactic acid)/jute fabric composite laminates

P. Russo, C. Russo, M. Abbate, Institute for Polymers, Composites and Biomaterials, National Research Council, Pozzuoli (NA), I
G. Simeoli, CRdC Tecnologie scarl, Naples, I

2.05 p.m. **OP 08**

Close look on the normative corrosion testing parameter "inclination angle"

E. Klimm, K.-A. Weiß, Fraunhofer Institute for Solar Energy Systems (ISE), Freiburg, D

2.30 p.m.

Coffee Break

Session 4

Varying Exposure Conditions I

Chair: P. Russo, Institute for Polymers, Composites and Biomaterials, National Research Council, Pozzuoli, (NA), I

3.00 p.m. **OP 09**

Correlation between artificial weathering and outdoor weathering – a critical review

W. Rauth, Covestro Deutschland AG, Leverkusen, D

3.25 p.m. **OP 10**

Evaluation of Outdoor Exposures by means of Exposure Response Functions

A. Geburtig, V. Wachtendorf, BAM, Berlin, D
P. Trubiroha, Berlin, D

3.50 p.m. **OP 11**

Weathering of Polyamides and Polyesters: Interrelation of Material Degradation and Climatic Parameters

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

4.15 p.m. **OP 12**

Positive Weathering Results as Milestones in the Development of Thermochromic Nanocoatings

H. Schmid, Fraunhofer Institute for Chemical Technology ICT, Pfinztal, D

5.30 p.m. - 7.30 p.m.

Sightseeing-Tour Vienna

8.00 p.m. - 11.00 p.m.

Conference Dinner

Conference Program
Friday, September 22, 2017

Session 5

9.00 a.m. **OP 13**

Temperature Control During Fluorescent UV Weathering Testing of Plastic Materials

A. Francis, Q-Lab Corporation, Westlake, USA

9.25 a.m. **OP 14**

UV and/or heat resistant polypropylene for automotive applications

S. Van Mierloo, SABIC STC-Geleen, Geleen, The Netherlands, NL

9.50 a.m. **OP 15**

Analysis of annual wind direction and speed in an arid region

K.-A. Weiss, F. Guischar, M. Heck, E. Klimm, Fraunhofer Institute for Solar Energy Systems (ISE), Freiburg, D

10.15 a.m.

Coffee Break

Session 6

10.45 a.m. **OP 16**

Natural and artificial ageing on backsheets – Comparison of degradation effects

B. Ottersböck, G. Oreski, PCCL, Polymer Competence Center Leoben, Leoben, A
G. Pinter, University of Leoben, Leoben, A

11.10 a.m. **OP 17**

UV-Fluorescence measurements as tool for the detection of degradation effects in PV-Modules

G. C. Eder, Y. Voronko, P. Grillberger, OFI, Austrian Research Institute for Chemistry and Technology, Vienna, A
B. Kubicek, AIT, Austrian Institute of Technology, Vienna, A
K. Knöbl, FH-TW, University of Applied Sciences, Vienna, A

11.35 a.m. **OP 18**

Evaluation of Acetic Acid Formation and Retention on PV Module Degradation

G. Oreski, A. Mihaljevic, PCCL, Polymer Competence Leoben, Leoben, A
G. C. Eder, Y. Voronko, OFI, Austrian Research Institute for Chemistry and Technology, Vienna, A
L. Neumaier, C. Hirschl, CTR, Carinthian Tech Research AG, Villach, A
G. Újvári, AIT, Austrian Institute of Technology, Vienna, A
M. Edler, W. Krumlacher, ISOVOLTAIC AG, Lebring, A

12.00 p.m.

Lunch

Session 7

1.00 p.m.

PP 1

A Toolbox for Detection of Weathering Induced Defects in Coatings

I. Alig, H. Oehler, D. Lellinger, Fraunhofer Institute for Structural Durability and System Reliability LBF, Darmstadt, D
M. Wanner, M. Hilt, Fraunhofer Institute for Manufacturing Engineering and Automation IPA, Stuttgart, D

PP 2

Soiling and Abrasion Testing of Surfaces for Solar Energy Systems Adapted to Extreme Climatic Conditions

T. Kaltenbach, M. Masche, E. Klimm, M. Köhl, D. Philipp, K.-A. Weiß, Fraunhofer Institute for Solar Energy Systems (ISE), Freiburg, D

PP 3

Dust Mitigation on PV Modules in Western Saudi Arabia

E. Klimm, M. Deuffhard, K. Slamova, M. Köhl, K.-A. Weiß, Fraunhofer Institute for Solar Energy Systems (ISE), Freiburg, D
A. A. Farah, A. A. Jaber, SABIC CRI at KAUST, Jeddah-Thuwal, KSA

PP 4

FEM-Simulation of Water Vapor Ingress into Glass-Glass-Moduls with Polymeric Edge Sealant and Validation by a New Experimental Set Up for Permeation Tests for Sealing Material

F. Vogt, A. Piekarczyk, A. Ballion, E. Klimm, K.-A. Weiß, M. Köhl, Fraunhofer Institute for Solar Energy Systems (ISE), Freiburg, D

PP 5

Production and Comparison of Artificially Aged Microplastic Particles

C. Patzak, J. Forberger, T. Reichert, Fraunhofer Institute for Chemical Technology ICT, Pfingsttal, D

PP 6

Influence of Backsheet Type on Formation of Acetic Acid in PV Modules

A. Mihaljevic, G. Oreski, PCCL, Polymer Competence Leoben, Leoben, A
G. Pinter, University of Leoben, Leoben, A

PP 7

Evaluation of the Influence of Climate and Microclimate on the Ageing Behaviour of PV Encapsulations

B. Ottersböck, F. Wagner, G. Oreski PCCL, Polymer Competence Leoben, Leoben, A
G. Pinter, University of Leoben, Leoben, A

PP 8

Effect of Humidity on Ageing of Materials

R. Perälä, A. Kuusisto, H. Suokivi, Solar Simulator Finland Ltd, Littoinen, FIN

Poster Presentations

Conference Program
Friday, September 22, 2017

Session 8

Influence of Temperature in Thermal Ageing and Weathering

Chair: A. Geburtig, BAM, Berlin, D

1.50 p.m. **OP 19**

Investigation of elastomer aging by combining cyclic fatigue testing and material characterization

I. Alig, D. Lellinger, T. Kroth, M. Wallmichrath, K. Rode, F. Malz, Fraunhofer Institute for Structural Durability and System Reliability LBF, Darmstadt, D

2.15 p.m. **OP 20**

Thermal resistance properties of fluorine containing elastomer

Masayuki Ito, Waseda University, J

2.40 p.m. **OP 21**

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

3.05 p.m. **OP 22**

Low-Temperature Irradiation Experiments for PE, PA, and PC Matrices

V. Wachtendorf, A.-K. Barthel, A. Geburtig, BAM, Berlin, D
P. Trubiroha, Berlin, D

3.30 p.m.

Closing Remarks



**Gesellschaft für
Umweltsimulation e.V.**



Gesellschaft für Umweltsimulation e.V.

Sabine Aref

P. O. Box 12 40

76318 Pfinztal

Germany



Registration Form

Gesellschaft für Umweltsimulation e.V.

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Invoice Address

Surname/First Name

Title

Organisation

Street

Postal Code/City

Country

Phone

Fax

E-mail

Please type or print

Conference Fee

- Registration before June 26, 2017: € 450,--
- Registration after June 26, 2017: € 550,--
- Technical Tour to the Vienna Climatic Wind Tunnel (free of charge)
- Accompanying person (welcome reception, dinner, sightseeing tour) € 90,--

Payment

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

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

Date

Signature

Hotel Room Reservation

GUS has reserved a special room contingent at the following hotels:

LINDNER Hotel am Belvedere (Conference Venue)

NH Wien Belvedere

Hotel Daniel Vienna

Motel One Wien-Hauptbahnhof

Please make your reservation directly with the hotel by using the **booking code EWS 2017**. Please see the attached Hotel Information Form.