



**Gesellschaft für
Umweltsimulation e.V.**

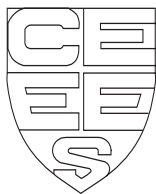
Final Program

3rd European Weathering Symposium EWS

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

September 12th -14th, 2007
Krakow, Poland





The European Weathering Symposia are organised on behalf of the Confederation of European Environmental Engineering Societies (CEEES) by the German Society for Environmental Engineering GUS (Gesellschaft für Umweltsimulation e.V.).



The 3rd EWS in Krakow is jointly organized by GUS and the Cracow University of Technology.

3rd European Weathering Symposium EWS

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

We are pleased to invite you to participate in the 3rd European Weathering Symposium EWS to be held in Krakow, Poland, on September 12th to 14th, 2007.

Launched in 1967 by four relevant institutes from Austria, Czechoslovakia, Hungary, and Yugoslavia, the Colloquia of Danubian Countries have been the only independent meeting - now on a European scale - in the field of natural and artificial weathering of polymers for 40 years. In the tradition of these colloquia the EWS is a meeting point allowing experts from industry and academia to learn from each other.

Key topics in 2007 are:

- **Weathering of Plastics and Coatings**
- **Stabilization of Polymers and Mechanisms**
- **Surface and Bulk Effects**
- **Correlation Field and Laboratory Tests**
- **Analysis of Polymer Degradation**

Before the opening of the conference, a half day training course is being offered: Realization and Evaluation of Weathering Tests. Please register for this course using the attached registration form.

Schedule

September 12th, 2007

13.00 h – 17.30 h	Training Course
19.00 h – 21.00 h	Welcome Reception

September 13th, 2007

08.00 h – 09.00 h	Registration
09.00 h – 17.15 h	Conference
17.30 h – 19.30 h	Sightseeing Tour
20.30 h – 23.00 h	Conference Dinner

September 14th, 2007

08.30 h – 15.30 h	Conference
15.30 h	Closing of the Conference
15.45 h	Technical Tour, University of Technology, Krakow Department of Chemistry and Polymer Technology

General Information

Language

Conference language will be English.

Program

The program will be available on:
<http://www.weathering-symposium.org>
<http://www.gus-ev.de>

Scientific Committee

Peter Trubiroha (Chairman), Berlin, D
Domenico Acierno, DIMP-University Naples, I
Norman Billingham, University of Sussex,
Brighton, UK
Olga Guseva, EMPA, Dübendorf, CH
Ignacy Jakubowicz, SP, Boras, S
Erika Kalman, CRC-HAS, Budapest, H
Leopold Kranner, ofi, Vienna, A
Jonathan Martin, NIST, Gaithersburg, USA
Krzysztof Pielichowski, University of Technology,
Krakow, PL
Jan Pospisil, IMC, Prague, CZ
Vesna Rek, University of Zagreb, HR
Lyda Rychla, PI-SAS, Bratislava, SK
Jacques Sampers, DSM Research, Geleen, NL
Yoshimitsu Takane, JWTC, Choshi City, J
Jacques Verdu, ENSAM, Paris, F

Chairman

Thomas Reichert, Fraunhofer ICT, Pfinztal, D

Organisation/ Conference Management

The European Weathering Symposium is being organised on behalf of the Confederation of European Environmental Engineering Societies (CEEES) by the German Society for Environmental Engineering GUS (Gesellschaft für Umweltsimulation e.V.).

Participation Fee

The participation fee is € 390,-- before March 15th, 2007; after March 15th, 2007 € 490,--. This fee includes lunches and refreshments, welcome reception on September 12th, sightseeing tour and conference dinner on September 13th, technical tour on September 14th and proceedings.

Cancellation

If written cancellation is received before August, 15th, 2007 a refund will be given less € 50,-- administration charge. No refunds can be provided for registration cancelled after this date.

General Information

Registration

Please mail the attached registration form to:

Gesellschaft für Umweltsimulation e.V.
Sonja Holatka
P. O. Box 12 40
D-76318 Pfinztal,
Germany
Phone: +49-721-4640-391
Fax: +49-721-4640-345
sonja.holatka@gus-ev.de
www.gus-ev.de

Registration fee must be paid on receipt of the invoice or in cash on arrival at venue.

Conference Venue

The symposium will be held at:
Sheraton Krakow Hotel,
7 Powisle Street
31-101 Krakow, Poland

Accommodation

GUS has reserved a block of rooms at special convention rates until March 30th, 2007:

Sheraton Krakow Hotel (Conference Venue)

and

Ibis Krakow Centrum

(Walking Distance to Symposium Venue 5 minutes)

Please indicate your room reservation on the attached registration form and send it to Sonja Holatka.

13.00 – 17.30 h

Training Course

Realisation and Evaluation of Weathering Tests

A. Lichtblau, M. Zäh, Clariant Produkte (Deutschland) GmbH, Gersthofen, D

1 Introduction

- Weathering tests are an indispensable precondition in product development and lifetime prediction. They are time consuming and neither cheap nor simple. A profound know-how and good preparation help to avoid a lot of trouble.

1.1 Why weathering tests?

- Time and money saving
- Reproducibility
- Availability

1.2 What kind of weathering tests?

- Artificial weathering
- Natural weathering
- Further factors; heat, humidity, chemicals, mechanical stress, ...

1.3 Expectations - disappointments

- Simulation
- Acceleration
- Trial methods
- Valid results
- Clear answers

1.4 Economy

- Costs of weathering tests
- Value of know-how

2 Realisation

- The practical work
- Description of the problem

2.1 Observing the ageing

- What is ageing?
- How to characterise ageing?
- How to follow ageing?
- Test methods
- Needs and restrictions

Pre-Meeting Program

Wednesday, September 12th, 2007

2.2 Sample setup

- Shape
- Preparation
- Handling

2.3 Sample treatment with

- Light
- Heat
- Water
- Chemicals
- Mechanical stress

3 Evaluation

- Transformation of data into information and know-how

3.1 Method precision and sample size

- What is required to find or see an effect?
- What can't be seen or found?
- Sample size

3.2 Time series

- Independent and dependent samples
- Smoothing methods
- Objective and subjective evaluation
- Thresholds in time series

3.3 Improved test setup

- Single factor tests
- Repetitions
- Interactions
- Statistically planned trials (DoE)

3.4 Documentation

19.00 – 21.00 h

Welcome Reception

Sheraton Krakow Hotel
7 Powisle Street
31-101 Krakow, Poland

Conference Program

Thursday, September 13th, 2007

09.00 h

Opening of the Conference

T. Reichert, GUS e.V. and Fraunhofer ICT, Pfinztal, D

Greetings

Krzysztof Bieda, Vice-Rector for International and Regional Cooperation, University of Technology, Krakow, PL

Karl-Friedrich Ziegahn, GUS, Pfinztal, D

Francois Crepain, CEEES, Brussels, B

1st Session

09.15 h

V 1

Effects of Moisture, Location, and Angle on Automotive Paint System Appearance During Natural Weathering

H. K. Hardcastle, Atlas MTT LLC, Phoenix, Arizona, USA

09.40 h

V 2

Study of the Influence of the Ageing Conditions in the Durability of PVC Formulations Used in Outdoor Applications

L. E. Pimental Real, Laboratorio Nacional de Engenharia Civil, Lisboa, PT

10.05 h

V 3

New Aspects of PVC Weathering

S. Kuberski, J. Rogowski, A. Jedraszek-Bomba, Technical University of Lodz, PL

10.30 h

Coffee Break

2nd Session

11.00 h

V 4

Effect of UV-Irradiation on Biodegradable Composites of Poly(Ethylene Oxide) and Pectin

H. Kaczmarek, P. Galka, Nicolaus Copernicus University, Torun, PL

K. Bajer, Institute for Plastic Processing „Metalchem“, Torun, PL

11.25 h

V 5

Ageing of Polyoxymethylene/Montmorillonite Engineering Nanocomposites

K. Pielichowski, A. Leszczynska, Cracow University of Technology, PL

S. Kuberski, Technical University of Lodz, PL

11.50 h

V 6

Weathering of Model Polyester Coatings

P. Malanowski, R. A. T. M. van Benthem, J. Laven, G. De With, L. G. J. van der Ven, Eindhoven University of Technology, NL

Conference Program

Thursday, September 13th, 2007

12.15 h

Lunch

13.15 h

3rd Session Posters A

P 1 A New Accelerated Test for the Evaluation of the Protective Properties of Coatings

M. Wanner, T. Schauer, Research Institute for Pigments and Coatings, Stuttgart, D

P 2 Influence of Irradiance in UV Weathering Tests for Prepainted Steel

J. Mallégo, Arcelor Research Industry Liège, Liège, B

M. Poelman, Materia Nova ASBL, Mons, B
M.-G. Olivier, Faculté Polytechnique de Mons, Mons, B

P 3 The Comparison of Photodegradation of Natural Polymers by Solar and Artificial UV Radiation

A. Sionkowska, H. Kaczmarek, M. Wisniewski, J. Skopinska, Nicolaus Copernicus University, Torun, PL

S. Manas, C. Rihter, Plataforma Solar de Almeria-CIEMAT, Tabernas, Almeria, E

P 4 Photosensitized Oxygenation in Weathered Polymers: Mechanisms and Impact on Polymer Service Life

J. Pospisil, S. Nespurek, J. Pilar, Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Prague, CZ

P 5 Effects of Natural and Accelerated Artificial Aging on Durability of Cold-Curing Epoxy Resins

M. Lettieri, Inst. of Archaeological Heritage - Monuments and Sites, CNR-IBAM, Lecce, I

M. Frigione, Dept. of Innovation Engineering, University of Salento, Lecce, I

P 6 The Service Time Prediction of Hardwood Paper from Non-Isothermal Chemiluminescence Measurements and Estimation of Paper Properties by Other Standard Tests

Z. Szaboova, J. Hanus, J. Minarikova, Slovak National Archives, Bratislava, SK

J. Rychly, L. Matisova-Rychla, Polymer Institute, Slovak Academy of Science, Bratislava, SK

Conference Program

Thursday, September 13th, 2007

- P 7** **Improved Evaluation of Activation Spectra Determined by the Filter Technique**
A. Geburtig, V. Wachtendorf, BAM, Berlin, D
P. Trubiroha, Berlin, D
- P 8** **Thermal Stability of Carbonyl Iron Filled Elastomers**
I. Kuritka, M. A. Abshinova, J. Vilcakova, P. Saha, Tomas Bata University, Zlin, CZ
N. E. Kazantseva, Tomas Bata University, Zlin, CZ and Russian Academy of Science, Moscow, RUS
- P 9** **Artificial Weathering of Wooden Surfaces Evaluated by Colour Measurement and Near Infrared Spectroscopy**
T. Schnabel, H. Bächle, B. Zimmer, University of Applied Sciences, Salzburg, A
- P 10** **Comparison of the Tolerances for the Spectral Power Distribution Given by Technical Standards for Artificial Weathering to the Measurement Uncertainties of Typical Spectroradiometers in Use Determined by an International Round Robin Test**
J. Hussong, A. Schönlein et.al., ATLAS MTT Linsengericht-Altenhasslau, D
- P 11** **Degradation of Polyurethane/POSS Nanocomposites**
B. Janowski, K. Pielichowski, Department of Chemistry and Technology of Polymers, Cracow University of Technology, Krakow, PL
- P 12** **Polymer Films in Photovoltaic Modules: Analysis and Modelling of Permeation Processes**
O. Angeles, M. Köhl, D. Philipp, K.-A. Weiss, Fraunhofer ISE, Freiburg, D

4th Session

- 14.15 h **V 7** **Stabilization and Mechanisms I**
Chairperson: L. Matisová-Rychlá, PI, Bratislava, SK
- 14.15 h **V 7** **Mechanism of Poly[methyl(phenyl)silylene] Degradation**
P. Horak, I. Kuritka, P. Schauer, Institute of Scientific Instruments, Brno, CZ
- 14.40 h **V 8** **Natural and Artificial Photo-Ageing of a Pigmented, HALS-stabilized Propylene-Ethylene Copolymer**
O. Haillant, ATLAS MTT, Linsengericht-Altenhasslau, D

Conference Program

Thursday, September 13th, 2007

15.05 h V 9

Effect of Atmospheric Impurities on Polymer Weathering Mechanism and Longevity

J. Pospisil, S. Nespurek, Z. Krulis, J. Pilar, Institute of Macromolecular Chemistry, Prague, CZ

15.30 h

Coffee Break

5th Session

Stabilization and Mechanisms I

Chairperson: J. Pospisil, IMC, Prague, CZ

16.00 h V 10

On the Stabilizing Effect of Sterically Hindered Amines and Nitroxide Radicals in Thermal and Photo-Oxidation of Polypropylene

L. Matisova-Rychla, J. Rychly, M. Danko, S. Chmela, P. Hrdlovic, Polymer Institute, Slovak Academy of Sciences, Bratislava, SK

16.25 h V 11

Weathering Behaviour and Stabilization of Transparent Polymeric Applications

M. C. Grob, Ciba Speciality Chemicals, Basel, CH

16.50 h V 12

On the Mechanisms of H₂O Sorption and Diffusion into Glassy Polymers with Different Interacting Capability

G. Mensitieri, University Federico II, Naples, I
P. Musto, Institute of Chemistry and Technology of Polymers, Pozzuoli, I
M. Lavorgna, Institute of Composite and Biomedical Materials, Portici, I

17.30 h - 19.30 h

Sightseeing Tour

Start at Sheraton Krakow Hotel

20.30 h - 23.00 h

Dinner Menu

Sheraton Krakow Hotel

Conference Program
Friday, September 14th, 2007

6th Session

08.30 h **V 13**

Surface and Bulk Effects

Chairperson: K. Pielichowski, Cracow University, PL

Scission and Crosslinking Rates During Photo-Oxidation of Thick-Sectioned Polyolefins: Depth Profiles for Different Exposures

A. V. Shyichuk, University of Technology and Life Sciences, Bydgoszcz, PL

J. R. White, School of Chemical Engineering and Advanced Materials, University Newcastle, UK

08.55 h **V 14**

Application of Nanoindentation to Study Ageing of Rubber

D. Bielinski, Institute of Polymer & Dye Technology, Technical University of Lodz and Rubber Research Institute "STOMIL", Piastow, PL
J. Kleczewska, Rubber Research Institute "STOMIL", Piastow, PL

09.20 h **V 15**

Use of Dynamic CO₂ Monitoring to Study the Early Stages of Photo-Oxidation

S. Fernando, P. A. Christensen,
T. A. Egerton, J. R. White, School of Chemical Engineering and Advanced Materials, Newcastle University, UK

09.45 h **V 16**

Investigation of Surface Temperatures

M. Heck, M. Köhl, D. Philipp, J. Schlieper,
K.-A. Weiß, Fraunhofer ISE, Freiburg, D

10.10 h

Coffee Break

7th Session

Correlation Field/Laboratory I

Chairperson: U. Teipel, FH Nuremberg, D

10.40 h **V 17**

Hardware and Software for Weathering Simulation of Polymeric Used Outdoors

T. Tomiita, Kyushu University, Fukuoka, JAP
Y. Kishima, Daipia Wintes Co. Ltd., Saitama, JAP

11.05 h **V 18**

Linking Field and Laboratory Exposure Results Via Mathematical Models

J. W. Martin, T. Nguyen, X. Gu, J. Chin, W. Byrd,
National Institute of Standards and Technology,
Gaithersburg, USA

11.30 h **V 19**

Outdoor Weathering versus Accelerated Tests – Are Correlations Possible?

J. Pietschmann, FEM, Schwäbisch Gmünd, D
M. Crewdson, Q-Lab, Homestead, Florida, USA
G. Pausch, Pausch Messtechnik, Haan, D

11.55 h

Lunch

12.55 h

8th Session Posters B

- P 13** **Degradation of Poly(ethylene Oxide)/Poly(aspartic Acid) Biomedical Systems**
I. Stachurek, K. Pielichowski, Cracow University of Technology, PL
- P 14** **Analyzing Mechanical Stresses Caused by Temperature Gradients Using Finite Elements Simulation**
K.-A. Weiß, M. Heck, M. Köhl, Fraunhofer ISE, Freiburg, D
- P 15** **UV Degradation of Polyurethane**
V. Rek, Faculty of Chemical Engineering and Technology, University of Zagreb, HR
- P 16** **Report on the Ageing Behaviour of Elastomeric Building Sealants Exposed to Dynamic Natural and Artificial Weathering after 10 Years Exposure**
H. Bolte, T. Böttger, University of Leipzig, Leipzig, D
- P 17** **Simple Method for the Evaluation of Heat Resistant Properties of Elastomers**
M. Ito, Waseda University, Tokyo, JAP
S. Inayoshi, K. Moriyama, Ibaraki University, Ibaraki, JAP
- P 18** **Ageing Behaviour of some Electrical Insulating Polymeric Materials and Systems under Action of the Environmental Stress Factors**
S. Cotescu, E.A. Stere, SC ICPE SA, Bucuresti, RO
L. Avadanei, B. Tereza, SC ICEFS SA, Savinesti, RO
- P 19** **Mechanism of poly[methyl(phenyl)silylene] e-beam degradation**
P. Horak, P. Schauer, Institute of Scientific Instruments, Academy of Sciences of the Czech Republic, Brno, CZ
I. Kuritka, F. Schauer, P. Saha, Polymer Centre, Faculty of Technology, Tomas Bata University in Zlin, Zlin, CZ
- P 20** **Quantification of Material Exposure to Ultraviolet Radiation**
A. Heikkila, A. Tanskanen, A. Lindfors, Finnish Meteorological Institute, Helsinki, FIN
P. Kärha, Helsinki University of Technology, TKK, FIN
S. Syrjala, Tampere University of Technology, Tampere, FIN

Conference Program
Friday, September 14th, 2007

P 21 **Effect of Phase and Relaxation Transitions on the Conductivity of Polymer Composites**
M. Kutsia, J. Aneli, R.Dvali Institute of Machine Mechanics, Tbilisi, GE

P 22 **A High Throughput System for Accelerated Weathering and Automated Characterization of Polymeric Materials**
J. Chin, E. Byrd, B. Dickens, R. Clemenzi, R. Hettenhouser, A. Ellison, J. Garver, D. Stanley, V. Colomb, J. Martin, National Institute of Standards and Technology, Gaithersburg, USA

P 23 **Artificial Weathering Including Acidic Deposition**
A. Geburtig, V. Wachtendorf, BAM, Berlin, D
P. Trubiroha, U. Schulz, Berlin, D

P 24 **Characterization of Test Dust for Environmental Applications**
U. Teipel, H. Winter, FH Nürnberg, D
J. Cäsar, Fraunhofer ICT, Pfinztal, D

P 25 **Gas Chromatography Technique in the Biodegradation Study of Polyethylene Films with Prooxidant Additives**
M. Koutny, A. Cervenkova, P. Drimal, Tomas Bata University, Zlin, CZ
A.-M. Delort, J. Lemaire, University Blaise Pascal, Aubiere, F

9th Session

Correlation Field/Laboratory II
Chairperson: L. Nyikos, IMC, Budapest, H

13.55 h **V 20** **The Principle of Reciprocity and its Limits**
P. Trubiroha, Berlin, D
A. Geburtig, V. Wachtendorf, BAM, Berlin, D

14.20 h **V 21** **Xenon Arc Automotive Test Methods: A Correlation Study**
D. Vesey, R. Luxgrant, DaimlerChrysler, Auburn Hills, Michigan, USA
L. Pattison, BASF Corporation, Southfield, Michigan, USA
R. Roberts, J. Quill, Q-Lab Corporation, Cleveland, Ohio, USA

14.45 h **V 22** **Practical Weathering in View of the Principle of Reciprocity**
W. Rauth, S. Nowak, Bayer MaterialScience AG, Leverkusen, D



Conference Program
Friday, September 14th, 2007

15.10 h **V 23**

Selective Effects of Testing Parameters on Various Climatic and Weathering Tests

E. Pohle, L. Kranner, ofi-Austrian Research Institute for Chemistry and Technology, Vienna, A

15.30 h

Closing Remarks

15.45 h

Technical Tour

To University of Technology, Department of Chemistry and Polymer Technology, Krakow



**Gesellschaft für
Umweltsimulation e.V.**



Gesellschaft für Umweltsimulation e.V.
Sonja Holatka
P. O. Box 12 40

D-76318 Pfinztal
Germany

Registration Form

Gesellschaft für Umweltsimulation e.V.
Sonja Holatka
Joseph-von-Fraunhofer-Str. 7
76327 Pfinztal
Germany
Fax: +49 (0) 721 / 4640-345

It is agreed that pictures being taken during this event may be published.

Name/First name _____

Title _____

Affiliation _____

Street _____

Postal Code/City _____

Country _____

Phone _____

Fax _____

E-mail _____

Please type or print

Conference Fees

- Registration after March 15th, 2007: € 490,--
- Training course € 100,--
- Accompanying person (welcome reception, dinner, sightseeing tour) € 90,--
- Payment by money order (after receipt of invoice)
- Cash on arrival

The following room reservation is requested:

Please indicate your reservation. All room rates include breakfast.

at Sheraton Krakow Hotel (Room rates excl. VAT)

- Single room/per night: € 180,--
- Double room/per night: € 200,--

at Ibis Krakow Centrum (Room rates incl. VAT)

- Single room/per night: € 70,--
- Double room/per night: € 91,--

Arrival date: Departure date:

My reservation is guaranteed by Credit Card:

Expiry date: Card number:

_____ Date

_____ Signature