COURSE OVERVIEW PE0024
Polymer Weathering Durability & Degradation

Course Title
Polymer Weathering Durability & Degradation

Course Reference
PE0024

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Date/Venue

Session(s)	Date	Venue
1	April 19-23, 2026	Crowne Meeting Room, Crowne Plaza Al Khobar, an IHG Hotel, Al Khobar, KSA
2	June 21-25, 2026	Safir Meeting Room, Divan Istanbul, Taksim, Turkey
3	September 21-25, 2026	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	December 13-17, 2026	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Polymer Weathering Durability and Degradation. It covers the effects of the environment to weathering of polymers through sunlight, temperature, moisture and pollutants including ultraviolet radiation, weathering trials and artificial weathering; the characterisation of degraded polymer covering mechanical, physical, solution and electrical properties, spectroscopic, additional miscellaneous and evaluation composites techniques; and the thermal methods and oxygen uptake.

Further, the course will also discuss the photo-oxidation and stabilisation, engineering polymers, polyvinyl chloride, vinyl polymers, polyurethanes and rubbers; the weathering composites and its processes; the accelerated and outdoor weathering testing including salt spray performance evaluation; and the comparative study of standard weathering test methods using image analysis.

During this interactive course, participants will learn the outdoor durability of polymeric films using ion scattering spectroscopy; the techniques and applications to stabilization and stability testing of materials in activation spectra; the stationary rack and black box under glass exposures of mineral filled polyethylene in inland and marine tropical climate; analyzing stress and accelerated test design for interior light environment; reviewing the exposure test results for inkjet inks in interior light environments; the advances in accelerated weathering instrumentation technology using advance control system; predicting the durability of building stone using accelerated weathering; the spectral irradiance of solar radiation for the lifetime prediction of polymer material; and estimating the durability of roofing systems including the durability of modern sculptures constructed of glass.

Course Objectives

Upon the successful completion of this course, each participant will be able to:

- Apply and gain an in-depth knowledge on polymer weathering durability and degradation
- Explain the effects of the environment to weathering of polymers through sunlight, temperature, moisture and pollutants including ultraviolet radiation, weathering trials and artificial weathering
- Identify the characterisation of degraded polymer covering mechanical, physical, solution and electrical properties, spectroscopic, additional miscellaneous and evaluation composites techniques as well as thermal methods and oxygen uptake
- Evaluate photo-oxidation and stabilisation and discuss engineering polymers, polyvinyl chloride, vinyl polymers, polyurethanes and rubbers
- Determine weathering composites and its processes
- Perform accelerated and outdoor weathering testing including salt spray performance evaluation and comparative study of standard weathering test methods using image analysis
- Predict the outdoor durability of polymeric films using ion scattering spectroscopy
- Employ the techniques and applications to stabilization and stability testing of materials in activation spectra
- Recognize stationary rack and black box under glass exposures of mineral filled polyethylene in inland and marine tropical climate and analyze stress and accelerated test design for interior light environment
- Review exposure test results for inkjet inks in interior light environments as well as explain the advances in accelerated weathering instrumentation technology using advance control system
- Predict the durability of building stone using accelerated weathering and calculate the spectral irradiance of solar radiation for the lifetime prediction of polymer material
- Estimate the durability of roofing systems including the durability of modern sculptures constructed of glass

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of polymer weathering durability and degradation for those responsible for the designing, producing, testing, inspecting, storing or purchasing polymer products such as rubber, plastics, paints, etc. This includes process engineers, materials engineers, chemists, laboratory and R&D staff and scientists.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

Al Khobar	**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Istanbul	**US$ 6,000** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Abu Dhabi	**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Certificate(s)
Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations
Haward's certificates are accredited by the following international accreditation organizations:

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Dr. Trevor Hutley, PhD, MBA, BTech, is a **Senior Global Polymer & Petrochemical Industry Specialist/Consultant** with over **40 years** of extensive experience in **Plastic Additives**, **Plastic Materials**, **Plastic Extrusion**, **Thermoplastics Processing**, **Plastic Packaging**, **Polyolefins**, **Material Handling**, **Injection Moulding of Thermoplastics**, **Elastomer/Plastic Blends**, **Thermoplastic Compounds**, **Thermoplastics Composite/ Pultrusion**, **Polypropylene**, **Polymers**, **Polymers Materials Selection**, **Polymer Composite Electrode Development**, **Thermoplastics Polyester Elastomer Resins**, **Glass Reinforced Resins**, **Resin Infusion Process**, **Polyester & Furane Resins**, **Silicone Elastomers**, **Epoxy/Carbon-fibre Composites** and **Electron & Optical Microscopy**. He is currently the **Engineering Manager** of **Pacific Polymers** as well as the **Principal Advisor** of the **Polymer Group** of an International **Institute for Scientific Research** wherein he works across the professional spectrum, from highly technical activities (research, development, technical service, patent & literature research, product & materials development) through resourcing, commercial and strategic activities.

During his career life, Dr. Hutley worked as the **General Manager**, **Regional Asia-Pacific Technical Manager**, **Packaging Group Executive**, **Research Director**, **Research & Innovation Advisor**, **Research Associate**, **Research Officer/Post-Doctoral Fellow**, **Senior Polymer Technologist**, **Polymer Industry Consultant**, **Polymer Consultant**, **Polymer Advisor**, Technical Adviser, Quality Mark Administrator, **Project Leader**, **Materials Consultant & Project Advisor**, Technology Commercialization Consultant, Business Development Consultant, Technical & Management Consultant, Management Consultant and Product Coordinator across various international companies such as the British Plastics Federation, Dunlop Engineering Plastics, Dunlop Technology Division, DuPont Engineering Polymers, OneChem.com, The [Saudi] Royal Commission for Jubail & Yanbu, Lotus Engineering, Sipchem, GPCA, Pan Gulf Holding, Dhahran TechnoValley Company (based in the UK), Switzerland, Hong Kong and (more than 9 years in) the Middle East.

Dr. Hutley has a **PhD** and **Bachelor** degrees in **Polymer Engineering** from the **Cranfield Institute of Technology** and **Brunel University** respectively. Further, he is an executive **MBA Summa cum Laude** in **Finance & Marketing** from the **Business School Laussane**, **Switzerland**. He is also a **Certified Instructor/Trainer**, a **Senior member** of the Society of Plastic Engineers (**SPE**) and an active member of the Institute of Materials (**MMI**^{3}), Royal Society of Chemistry (**MRSC**), Chartered Chemist (**CChem**), Chartered Scientist (**CSci**) and he has been a member of the Board of R&D Centre, European Delrin® Business Team, Derlin® Global Technology Leadership Team, Corporate Polymer Core Competence "Expert Team", Global Industry Advisory Commission, Board of Sipchem Marketing Ltd., Industry Advisory Board for the Department of Chemical Engineering, Industry Advisory Board for KAUST (KIAB), Sipchem Investment Committee, GCPA Research & Innovation Committee and acquired the "**GPCA Plastics Excellence Award Jury**". Moreover, he has published **numerous technical books** and **scientific papers** circulated internationally and delivered technical presentations and seminars in several international conferences.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***The Environment*** *Sunlight ● Temperature ● Moisture ● Pollutants*
0930 – 0945	*Break*
0945 – 1100	***Ultraviolet Radiation*** *Measurement of Solar Ultraviolet Radiation ● Solar Ultraviolet Radiation*
1100 – 1230	***Weathering Trials*** *Materials ● Trail Aspects ● Accelerated Weathering Procedures ● Weathering-Environment Correlation*
1230 – 1245	*Break*
1245 – 1420	***Artificial Weathering*** *Artificial Light Sources ● Ultraviolet Radiation Output of Artificial Sources ●Application of Weathering Devices*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Characterisation of Degraded Polymers*** *Mechanical Properties ● Physical Properties ● Solution Properties ● Spectroscopic Techniques ● Electrical Properties ● Thermal Methods ● Oxygen Uptake ● Miscellaneous Additional Techniques ● Techniques for Evaluation Composites*
0930 – 0945	*Break*
0945 – 1100	***Photo-Oxidation & Stabilisation*** *Photo-Oxidation ● Stabilisation*
1100 – 1230	***Engineering Polymers*** *Polyamides ● Polyacetals ● Polycarbonate*
1230 – 1245	*Break*
1245 – 1420	***Engineering Polymers (cont'd)*** *Polyphenylene Oxide ● Polysulphone ● Thermoplastic Polyesters*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Polyvinyl Chloride*** *Weathering ● Mechanism*
0930 – 0945	*Break*
0945 – 1100	***Vinyl Polymers*** *Polyolefins ● Polystyrene and Related Polymers ● Acrylics*
1100 – 1230	***Polyurethanes*** *Weathering ● Weathering Processes*

1230 – 1245	*Break*
1245 – 1420	***Rubbers*** *Group 1-Unsaturated Rubbers ● Group 2-Saturated Rubbers ● Group 3-Speciality Rubbers*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

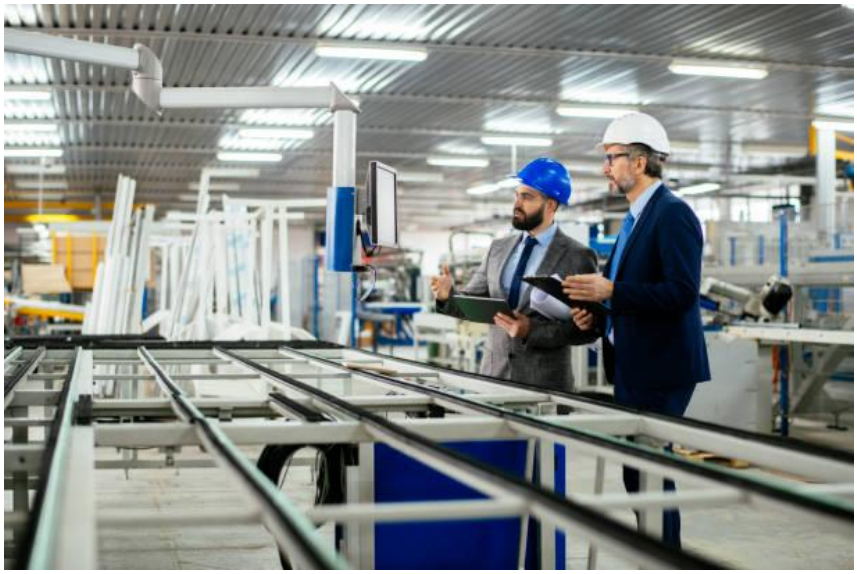
0730 – 0930	***Rubbers (cont'd)*** *Oven Ageing Trials ● Mechanisms of Degradation*
0930 – 0945	*Break*
0945 – 1100	***Composites*** *Weathering ● Weathering Processes*
1100 – 1230	***Accelerated & Outdoor Weathering Testing*** *Salt Spray Performance Evaluation: Proposed Image-Analysis-Based Test Method ● Comparative Study of Standard Weathering Test Methods Using Image Analysis*
1230 – 1245	*Break*
1245 – 1420	***Accelerated & Outdoor Weathering Testing (cont'd)*** *The Use of Ion Scattering Spectroscopy to Predict the Outdoor Durability of Polymeric Films ● Activation Spectra: Techniques and Applications to Stabilization and Stability Testing of Materials*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Accelerated & Outdoor Weathering Testing (cont'd)*** *Stationary Rack and Black Box Under Glass Exposures of Mineral Filled Polyethylene in Inland and Marine Tropical Climates ● Stress Analysis and Accelerated Test Design for Interior Light Environments*
0930 – 0945	*Break*
0945 – 1100	***Accelerated & Outdoor Weathering Testing (cont'd)*** *Exposure Test Results for Inkjet Inks in Interior Light Environments ● Advances in Accelerated Weathering Instrumentation Technology Using Advanced Control Systems*
1100 – 1230	***Accelerated & Outdoor Weathering Testing (cont'd)*** *Predicting the Durability of Building Stone Using Accelerated Weathering ● Calculation of the Spectral Irradiance of Solar Radiation for the Lifetime Prediction of Polymer Materials*
1230 – 1245	*Break*
1245 – 1345	***Accelerated & Outdoor Weathering Testing (cont'd)*** *Estimating the Durability of Roofing Systems ● The Durability of Modern Sculptures Constructed of Glass*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org