

**COURSE OVERVIEW PE0625-4D**  
**Introduction to Polypropylene Technology**

**Course Title**

Introduction to Polypropylene Technology

**Course Reference**

PE0625-4D

**Course Duration/Credits**

Four days/2.4 CEUs/24 PDHs



**Course Date/Venue**

Session(s)	Date	Venue
1	February 12-15, 2024	Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
2	May 20-23, 2024	Club B, Ramada Plaza By Wyndham Istanbul City Center, Istanbul, Turkey
3	August 12-15, 2024	Al Aziziya Hall, The Proud Hotel Al Khobar, Al Khobar, KSA
4	November 11-14, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, 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 complete overview of polymers and polymerization. It covers the commercial significance of polypropylene and polymerization catalyst covering stereospecific catalyst and  $TiCl_3$ ; the mechanism of propylene polymerization, kinetics of polymerization and copolymerization; the latest development of metallocene catalysts, propylene—ethylene copolymers, propylene- $\alpha$ -olefin copolymers and propylene industrial production with metallocene catalyst; the polypropylene morphology; the crystallinity and stereoregularity; and the relationship of morphology to the structure, processing and properties of polypropylene.



During this interactive course, participants will learn the melting behavior, kinetics and phase separation; the viscosity ratio and processing of rubber—modified polypropylene; the injection moulding process and various additives; the antioxidants, flame retardants, filters, acid scavengers, etc; the compounding technologies, compounding process, extrusion or coextrusion and use of fillers and vulcanizers; the melt point and strength and moulding comprising of injection, blow and compression; and the global environment, price cyclicity and future strategies of polypropylene.

## Course Objectives

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

- Apply and gain an in-depth knowledge on polymers and polymerization
- Discuss the commercial significance of polypropylene and polymerization catalyst covering stereospecific catalyst and  $TiCl_3$
- Recognize the mechanism of propylene polymerization, kinetics of polymerization and copolymerization
- Identify the latest development of metallocene catalysts, propylene—ethylene copolymers, propylene- $\alpha$ -olefin copolymers and propylene industrial production with metallocene catalyst
- Describe polypropylene morphology covering crystallinity and stereoregularity
- Explain the relationship of morphology to the structure, processing and properties of polypropylene
- Identify the melting behavior, kinetics and phase separation
- Discuss the viscosity ratio and processing of rubber—modified polypropylene
- Illustrate injection moulding process and identify various additives covering the antioxidants, flame retardants, filters, acid scavengers, etc
- Explain the compounding technologies, compounding process, extrusion or coextrusion and use of fillers and vulcanizers
- Recognize the melt point and strength and moulding comprising of injection, blow and compression
- Describe the global environment, price cyclicity and future strategies of polypropylene

## 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, sample video clips of the instructor’s actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.

## Who Should Attend

This course provides an overview of all significant aspects and considerations of polymers and polymerization for researchers, chemists, engineers, physicists, or technicians who work in or are beginning to work in this field. Also, managers in the polypropylene industry should greatly benefit from this course.

### 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

Abu Dhabi	<b>US\$ 4,500</b> per Delegate + <b>VAT</b> . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Istanbul	<b>US\$ 5,000</b> per Delegate + <b>VAT</b> . This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Al Khobar	<b>US\$ 4,500</b> per Delegate + <b>VAT</b> . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	<b>US\$ 4,500</b> per Delegate + <b>VAT</b> . 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


Certificates are accredited by the following international accreditation organizations: -

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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 **2.4 CEUs** (Continuing Education Units) or **24 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.

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. 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.



### 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:



**Mr. Saad Bedir, MSc, BSc**, is a **Senior Chemical Engineer** with over **30 years** of extensive experience in the **Power, Petrochemical, Oil & Gas** and **Cement** industries. He is well-versed in the areas of **Polymers & Polymerization**, Introduction to **Polymers, Polymers & Composites**, **Distillation Column** Operation & Control, **Oil Movement** Storage & Troubleshooting, **Process Equipment** Design, Applied **Process Engineering** Elements, **Process Plant** Optimization, **Heat & Power Consumption, Heat Transfer, Clean Energy & Power Saving**, Fuel Handling System, **Oil Movement & Operation**, Oil Production, Gas Conditioning & Processing, Plastic Additives, Process Plant Performance & Efficiency, Plant Optimization and Process Operations. His expertise also includes the implementation of Environmental Impact Assessment (**EIA**), **OHSAS 18001, ISO 9001, ISO 14001, QHSE** Management Planning, Air Quality Management, Health, Fire, Safety, Security & Environmental Codes of Practice, Legislations and Procedures. Crisis & Business Continuity Management Planning, Emergency Response & Procedures, Industrial Security Risk Assessment & Management, , Behavioural Safety, Incident & Accident Investigation, Integrated EHS Aspects, Risk Assessment & Hazard Identification, Environmental Audits, Hazardous & Non-Hazardous Waste Management, Confined Space Safety, **SHEMS** Principles, Process Safety, Basic & Advanced Construction Safety, Rig & Barge Inspection, Safety & Occupational Health Awareness, Loss Control, Lifting & Slings, Marine Pollution Hazards & Control, Ground Contamination & Reclamation Processes, Waste Management & Recycling, **HAZOP, HAZID, HSEIA, QRA**, Hazardous Area Classification, Radiation Protection, Active and Positive Fire Fighting, Fire & Gas Detection Systems, Fire Fighting Systems, Fire Proofing, ESD, Escape Routes. Presently, he is the **HSE Director** for one of the largest and renowned companies in the Middle East, wherein he takes charge of all HSE and security operations of the company.

Mr. Saad's vast professional experience in directing & managing process operations and health, safety and the environment aspects as per OSHA framework and guidelines can be traced back to his stint with a few international companies like **Saudi ARAMCO, CONOCO, Kuwait Oil Co. (KOC)**, etc, where he worked as the **Field Senior Process Consultant** handling major projects and activities related to the discipline. Through these, he gained much experience and knowledge in the implementation and maintenance of **internationally accepted principles** of process operations. Through this, he has also gained knowledge regarding international safety standards for the National Fire Protection Association (**NFPA**), the American Petroleum Institute (**API**), Safety of Life at Sea (**SOLAS**), and Safety for Mobile Offshore Drilling Unit (**MODU**).

Mr. Saad has a **Bachelor's** degree in **Chemistry** from the **Ain Shams University** and a **NEBOSH** certificate holder. Further, he is a **Certified Instructor/Trainer**, a **Certified Lead Auditor** for **OHSAS 18001, ISO 9001, ISO 14001** and a member of the **Egyptian Syndicate & Scientific Professions**. His passion for development and acquiring new skills and knowledge has taken him all over the Middle East to attend and share his expertise in numerous trainings and workshops.

### **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	<b>PRE-TEST</b>
0830 – 0930	<b>Introduction</b> History • Commercial Significance of Polypropylene
0930 – 0945	Break
0945 – 1100	<b>Polymerization Catalyst</b> Stereospecific Catalyst • $TiCl_3$ • Mechanism of Propylene Polymerization • Kinetics of Polymerization • Copolymerization
1100 – 1230	<b>Latest Development</b> Metallocene Catalysts • Propylene – Ethylene Copolymers
1230 – 1245	Break
1245 – 1420	<b>Latest Development (cont'd)</b> Propylene-A-Olefin Copolymers • Propylene Industrial Production with Metallocene Catalyst
1420 – 1430	<b>Recap</b> Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day One

#### **Day 2**

0730 – 0900	<b>Polypropylene Morphology</b> Crystallinity and Stereoregularity • Relationship of Morphology to the Structure, Processing and Properties of Polypropylene
0900 – 0915	Break
0915 – 1100	<b>Polypropylene Morphology (cont'd)</b> Melting Behavior • Kinetics • Phase Separation
1100 – 1230	<b>Rubber – Modified Polypropylene</b> Viscosity Ratio
1230 – 1245	Break
1245 – 1420	<b>Rubber – Modified Polypropylene (cont'd)</b> Processing
1420 – 1430	<b>Recap</b> Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Two

#### **Day 3**

0730 – 0900	<b>Injection Moulding Process</b>
0900 – 0915	Break
0915 – 1100	<b>Additives</b> Antioxidants • Flame Retardants • Fillers • Acids Scavengers



1100 – 1230	<b>Additives (cont'd)</b> Nucleating Agents • Slip Agents & Lubricants • Antistatic Agents • Mold Release Agent
1230 – 1245	Break
1245 – 1430	<b>Additives (cont'd)</b> Pigments • Metal Chelators • Biocides • UV Stabilizers
1420 - 1430	<b>Recap</b> Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Three

**Day 4**

0730 – 0900	<b>Compounding Technologies</b> Compounding Process • Extrusion or Coextrusion
0900 – 0915	Break
0915 – 1100	<b>Compounding Technologies (cont'd)</b> Use of Fillers and Vulcanizers • Melt Point and Strength • Moulding (Injection, Blow & Compression)
1100 – 1230	<b>Future of Polypropylene</b> Global Environment
1230 – 1245	Break
1245 – 1345	<b>Future of Polypropylene (cont'd)</b> Price Cyclicalilty • Future Strategies
1345 - 1400	<b>Course Conclusion</b> Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course
1400 - 1415	<b>POST-TEST</b>
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**

Kamel Ghanem, Tel: +971 2 30 91 714, Email: [kamel@haward.org](mailto:kamel@haward.org)

