COURSE OVERVIEW HE0254
Occupational Hygiene Certification Program
OHTA502: Thermal Environment
(Accredited by the Occupational Hygiene Training Association - OHTA)

Course Title
Occupational Hygiene Certification Program: OHTA502: Thermal Environment *(Accredited by the Occupational Hygiene Training Association - OHTA)*

Course Date/Venue
Option 1: February 23-27, 2025 or,
Option 2: April 27- May 01, 2025 or,
Option 3: November 02-06, 2025
Venue: TBA Meeting Room, City Center Rotana Doha, Doha, Qatar

Course Reference
HE0254

Course Duration
Five days/4.0 CEUs/40 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course aims to provide the participants with a sound understanding of the effects of the thermal environment on people and means of assessing and controlling the risks associated with thermal stress.

On completing this course successfully, the participants will be able to:-

- Identify sources of thermal stress within the working environment
- Understand the nature of thermal strain on the body
- Make an assessment of the thermal environment through appropriate measurement and other means
- Evaluate the likely risk from exposure to thermal stress
- Suggest appropriate control approaches for the thermal environment

The course is normally run as a taught course over 5 days (minimum of 40 hours including practical/demonstration sessions, lectures, tutorials, guided reading, overnight questions and examination).

This course is designed to provide participants with a detailed and up-to-date overview of thermal environment. It covers the thermal spectrum covering extreme and moderate temperatures; the principles of heat stress, heat strain, homeostasis, thermal regulation and physiological responses to hot and cold environments; the heat production and heat exchange with the surroundings, heat balance equation and metabolic heat production and efficiency; the dry or non-evaporative heat transfer covering conduction, convection and radiation; the evaporative heat loss and acclimisation; the effects of excessive heat strain of hot and cold environments; and the predisposing factors in thermal stress.

During this interactive course, participants will learn the thermal surveys, measurement equipment, surveys and assessment of the degree of risk; the thermal comfort, scales for subjective evaluation of comfort, actual ideal indoor environments and work of fanger; the controls of thermal comfort and evaluation of hot environments; the use of heat stress indices; the effects of heat stress; the effective and corrective effective temperatures; the predicted 4-hour sweat rate, wet bulb globe temperature, heat stress index, required sweat rate, predicted heat strain index and thermal work limit (TWL); controlling hot and cold environments; and the various approaches to risk assessment.

Course Objectives

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

- Achieve the OHTA Certificate in OHTA502: Thermal Environment
- Recognize the thermal spectrum covering extreme and moderate temperatures
- Identify the principles of heat stress, heat strain, homeostasis, thermal regulation and physiological responses to hot and cold environments
- Recognize heat production and heat exchanges with the surroundings, heat balance equation and metabolic heat production and efficiency
- Discuss the dry or non-evaporative heat transfer covering conduction, convection and radiation
- Discuss the effects of excessive heat strain of hot and cold environments and identify the predisposing factors in thermal stress
- Explain the thermal surveys, measurement equipment, surveys and assessment of the degree of risk
- Determine thermal comfort, scales for subjective evaluation of comfort, actual ideal indoor environments and work of fanger
- Evaluate hot environments and identify the use of heat stress indices, effects of heat stress as well as the effective and corrective effective temperatures
- Determine the predicted 4-hour sweat rate, wet bulb globe temperature, heat stress index, required sweat rate, predicted heat strain index and thermal work limits (TWL)
- Describe and control hot and cold environments and determine various approaches to risk assessment

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 covers systematic techniques and methodologies on the assessment and control of thermal environment for health and safety professionals, occupational health specialists including physicians and nurses. Specialists in subjects such as acoustics, ergonomics, human factors, occupational psychology, work organisation, biosafety, engineering, analytical chemistry and those who want a broader appreciation of how their role interfaces with other professions over health issues in the workplace will find this course beneficial.

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.

Training Fee

US$ 8,000 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Exam Fee

US$ 200 per Delegate.

Accommodation

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

Course Certificate(s)

(1) OHTA Certificates will be issued to participants who have successfully completed the course and passed the exam of the course.

OHTA Certificate(s)

The following certificate is a sample of the OHTA certificates that will be issued to successful candidates:-

(2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

Haward Technology Middle East

Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 14-Nov-23

HTME No. 74852

Participant Name: Waleed Al Habeeb

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
HE0254	Industrial Hygiene Certification Program: OHTA502: Thermal Environment *(Accredited by OHTA)*	November 10-14, 2023	45	4.5

Total No. of CEU's Earned as of TOR Issuance Date **4.5**

TRUE COPY

Jaryl Castillo
Academic Director

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

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | E-mail: info@haward.org | Website: www.haward.org

Certificate Accreditations

Haward Technology is accredited by the following international accreditation organizations:-

- Occupational Hygiene Training Association (OHTA)

  Haward Technology is an Approved OHTA Trainer under the OHTA201 and OHTA500 series modules that promote better standards of occupational hygiene practice throughout the world.

  Haward Technology supports hygiene professionals who wanted people around the world to enjoy the benefits of healthy working environments.

- 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.

- 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 **4.0 CEUs** (Continuing Education Units) or **40 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:

Mr. Steve Angele, MSc, BSc, BSOH, AIHA, is a **Senior HSE & Industrial Hygiene Consultant** with **25 years** of extensive experience within **Oil & Gas**, **Refinery** and **Petroleum** industries. His wide experience covers in the areas of **Occupational Health**, **Safety & Industrial Hygiene**, **Industrial Hygiene W5 Series**, **Occupational Health** Management, **Safety & Industrial Hygiene**, **Occupational Health & Safety** Practices, **Industrial Hygiene** Management Systems, **Health Risk** Assessment, **Environmental Resources Management** (**ERM**), **Emergency Response**, **Sustainability & Environmental** Awareness, **Environmental** Management, **Environmental Pollution**, **Environmental** Emergency Plan, **Environmental** Management, **Environmental** Impact & Life Cycle Assessments, **HAZOP**, **HAZMAT**, **HAZID**, Modern **Safety Risk** Management, **Process Hazard Analysis** (**PHA**), **Process Risk** Management, **Root Cause Analysis** (**RCA**), **HSE** Management System Development & Implementation, **Lab Chemicals Handling & Storage**, **Hazardous Materials**, **Industrial Safety** & Housekeeping, **Job Safety Analysis** (**JSA**), **Hazardous Substances** Measurement, **Workplace** Control, Physical Agents, **Safety & Loss Prevention**, Safety in **Chemical Laboratory**, **Confined Space Safety**, **Ergonomics**, **HSSE** Management Tools & Techniques, **HSSE** Practices, **Security Operating** System, **Emergency Response & Crisis** Management, Behavioural Based Safety (**BBS**), **Safety Observation & Conversation**, **Corporate Social Responsibility** (**CSR**), **Sustainability** Principles & Practices, **Root Cause Analysis** & Prevention, **Root Cause Analysis** Techniques & Methodologies, **Accident/Incident & Condition Reporting & Investigation**, **Incident Command & Report Writing** and **Near Miss Reporting**. He is currently the **President & CEO** of Belgian Center of Occupational Hygiene (**BeCOH**) wherein his responsibilities focused on leadership, governance and promoting occupational hygiene and safety.

During his career life, Mr. Angele has gained his practical and field experiences through his various significant positions and dedication as the **Industrial Hygienist**, **Industrial Hygiene Manager**, **Occupational Hygienist**, **Head** of the **Section Environmental Analysis**, **Occupational Hygiene Consultant**, **ANSES Expert**, **Research Assistant Laboratory**, **Voluntary Worker** and **Senior Instructor/Trainer** from various international companies such as the University of College Gent, Mensura EDPBW, GT Silice Cristalline & GT Metrologie and Nickel Institute, just to name a few.

Mr. Angele has **Master** and **Bachelor** degrees in **Environmental Chemistry** from the **University of Ghent**, **Belgium**, a **Bachelor's** degree (**Cum Laude**) in **Chemistry** from the **Hogeschool Gent**, **Belgium**. Further, he holds certificates in **Specialization Occupational Hygiene** and **Multidisciplinary Basic Information Prevention & Protection at Work**, a **Certified Instructor/Trainer**, an active **Member** of the Board of Directors in Occupational Hygiene Training Association (**OHTA**), International Commission on Occupational Health (**ICOH**), Belgian Society of Occupational Hygiene (**BSOH**) and Workplace Health without Borders (**WHWB**) and a **Committee Member** of **AIHA** Sampling and Laboratory Analysis. Moreover, he has published and authored several academic papers, research and journals and delivered numerous trainings, courses, seminars, workshops and conferences worldwide.

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 – 0745	*Registration & Coffee*
0745 – 0800	*Welcome & Introduction*
0800 – 0815	***PRE-TEST***
0815 – 0945	***The Thermal Spectrum*** *Work in Extreme Temperatures • Work in Moderate Temperatures*
0945 - 1000	*Break*
1000 – 1230	***Principles*** *Heat Stress • Heat Strain • Homeostasis (Definition; Typical Body Temperatures) • Thermal Regulation • Physiological Responses to Hot Environments (Vasodilatation; Sweating; Electrolyte Changes; Dehydration; Heart Rate; Respiration Rate)*
1230 – 1330	*Lunch*
1330 – 1500	***Principles (cont'd)*** *Physiological Responses to Cold Environments (Vasoconstriction; Shivering; Piloerection; Cold Diuresis; Respiration; Heart Rate; Dehydration; Psychological; Other Effects) • Heat Production & Heat Exchange with the Surroundings (Basic Thermodynamics; External Heat Sources; Internal Heat Sources) • Heat Balance Equation*
1500 – 1530	*Break*
1530 - 1650	***Principles (cont'd)*** *Metabolic Heat Production & Efficiency (Metabolic Heat Production; Typical Values of Metabolic Heat Production) Dry or Non-Evaporative Heat Transfer (Conduction; Convection; Radiation) • Evaporative Heat Loss • Acclimatisation*
1650 – 1700	***Recap*** *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*
1700	*End of Day One*

Day 2

0730 – 0945	***Effects of Temperature Extremes*** *Effects of Excessive Heat Strain – Hot Environments (Acute Illnesses; Chronic Illness)*
0945 - 1000	*Break*
1000 – 1230	***Effects of Temperature Extremes (cont'd)*** *Effects of Excessive Heat Strain – Cold Environments • Predisposing Factors in Thermal Stress*
1230 – 1330	*Lunch*
1330 – 1500	***Thermal Surveys*** *Measurement Equipment (Air Temperature; Radiant Temperature; Humidity; Air Movement; Composite & Integrating Meters; Personal Monitoring)*
1500 – 1530	*Break*

1530 - 1650	***Thermal Surveys (cont'd)*** *Surveys (Data Collection; Monitoring Strategies) • Assessment of the Degree of Risk (Introduction; Recording of Results; Assessment of Risk; Outcome of Surveys)*
1650 – 1700	***Recap*** *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*
1700	*End of Day Two*

Day 3

0730 – 0945	***Thermal Comfort*** *What is Thermal Comfort? (Why Thermal Comfort can be Important) • Scales for Subjective Evaluation of Comfort*
0945 - 1000	*Break*
1000 – 1230	***Thermal Comfort (cont'd)*** *Actual Ideal Indoor Environments • An Introduction to the Work of Fanger (The Fanger Equation; The Predicted Mean Vote (PMV); Predicted Percentage Dissatisfied; A Standard for Thermal Comfort) • Controls for Thermal Comfort*
1230 – 1330	*Lunch Break*
1330 – 1500	***Evaluation of Hot Environments*** *The Use of Heat Stress Indices • Effect of Heat Stress & Evaluation of Thermal Strain by Direct Physiological Measurements (Body Core Temperature; Skin Temperatures; Heart Rate; Body-Mass Loss Due to Sweating) • Effective & Corrective Effective Temperatures (Effective Temperature Index; Corrected Effective Temperature Index) • Predicted 4-Hour Sweat Rate • Wet Bulb Globe Temperature*
1500 – 1530	*Break*
1530 - 1650	***Evaluation of Hot Environments (cont'd)*** *Heat Stress Index (HSI) • Required Sweat Rate • Predicted Heat Strain Index • Thermal Work Limit (TWL) • Summary of Indices for Hot Environments*
1650 – 1700	***Recap*** *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*
1700	*End of Day Three*

Day 4

0730 – 0945	***Control of Hot Environments*** *A Simple Introduction to Control by Engineering & Organisational (Environmental Controls; Administration Controls; Personal Protective Clothing & Equipment*
0945 - 1000	*Break*
1000 – 1230	***Control of Hot Environments (cont'd)*** *AIHA Checklist for Heat Exposures • Refuges • Hot Surfaces (Introduction; ISO 13732-1)*
1230 – 1330	*Lunch Break*
1330 – 1500	***Evaluation of Cold Environments*** *Wind Chill Index & Equivalent Chilling Temperature • Required Clothing Insulation Index*
1500 – 1530	*Break*

1530 - 1650	***Evaluation of Cold Environments (cont'd)*** *ACGIH TLV Standards • Use of Cold Stress Indices*
1650 – 1700	***Recap*** *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*
1700	*End of Day Three*

Day 5

0730 – 0945	***Control of Cold Environments*** *Personal Factors • Engineering Controls • Management Controls (Monitoring; Work-Rest Regimes; Other Managerial Controls)*
0945 - 1000	*Break*
1000 – 1230	***Control of Cold Environments (cont'd)*** *Clothing (Intrinsic Clothing Insulation; Selection & Use of Appropriate Clothing) • AIHA Checklist for Working in Cold Environments*
1230 – 1330	*Lunch*
1330 - 1500	***Approaches to Risk Assessment*** *AIOH Tiered Approach • Republic of South Africa Dom&E Code of Practice (Aspects to be Addressed in the COP; Occupational Hygiene; Medical Surveillance)*
1500 – 1530	*Break*
1530 - 1615	***Approaches to Risk Assessment (cont'd)*** *ACGIH Thermal Stress TLVs® • Quantitative vs Qualitative Approaches • Physiological Assessments • References*
1615 - 1630	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1630 – 1645	***POST-TEST***
1645 – 1700	*Presentation of Course Certificates*
1700	*End of Course*

MOCK Exam

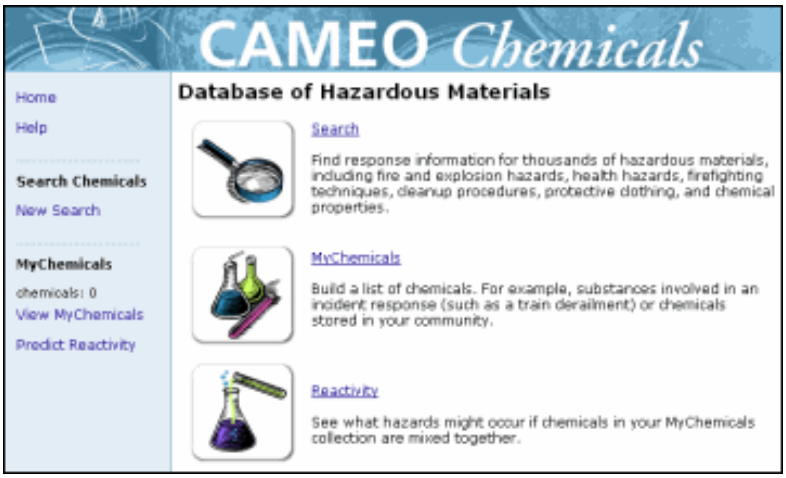
Upon the completion of the course, participants have to sit for a MOCK Examination similar to the exam of the Certification Body through Haward's Portal. Each participant will be given a username and password to log in Haward's Portal for the MOCK exam during the 30 days following the course completion. Each participant has only one trial for the MOCK exam within this 30-day examination window. Hence, you have to prepare yourself very well before starting your MOCK exam as this exam is a simulation to the one of the Certification Body.

Day 6: ***OHTA Online Exam (to be scheduled within 30 days of course completion)***

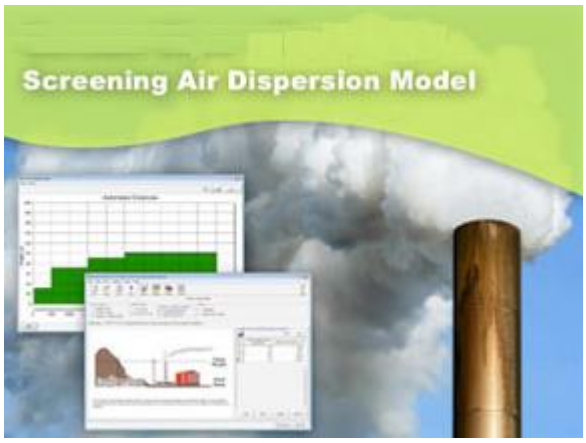
0900 – 0945	***OHTA Exam Registration/Briefing***
0945 - 1145	***OHTA Exam***
1145 - 1200	*Closing Ceremony*
1200	*End of Exam*

Simulators (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the Environmental simulators "CAMEO Chemicals Suite Software", "US EPA SCREEN3 Model", "AERSCREEN Model", "Industrial Hygiene Virtual Laboratory Simulator" and "CIHprep V9.0 Simulator".



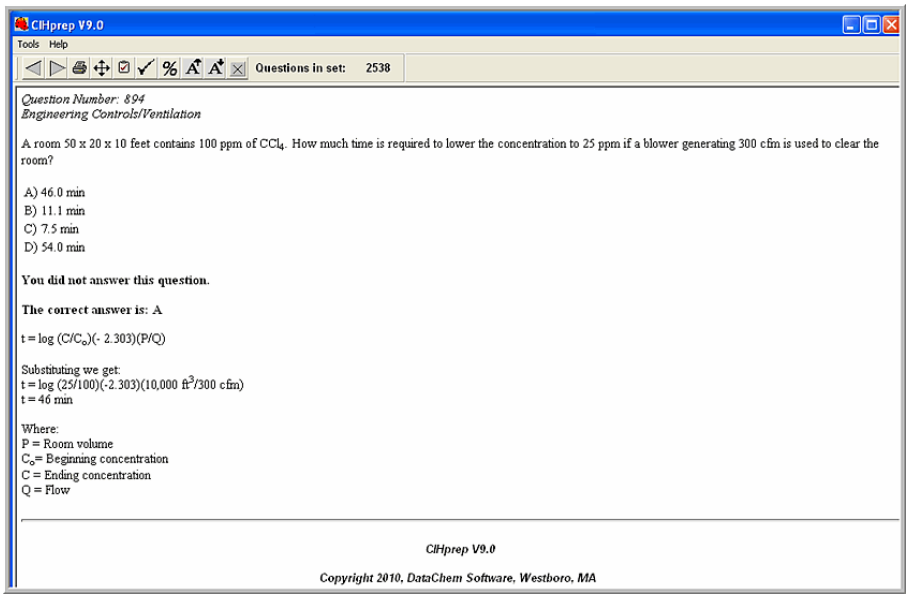
CAMEO Chemicals Suite Software



US EPA SCREEN3 Model

AERSCREEN Model

Industrial Hygiene Virtual Laboratory Simulator



CIHprep V9.0 Simulator

Course Coordinator
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