



COURSE OVERVIEW ME0669 **Centrifugal, Reciprocating & Screw Compressor**

Course Title

Centrifugal, Reciprocating & Screw Compressor

Course Date/Venue

August 09-13, 2026/SocietyM [M1] Meeting Room, CitizenM Kuala Lumpur Bukit Bintang Hotel, Kuala Lumpur, Malaysia

Course Reference

ME0669

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



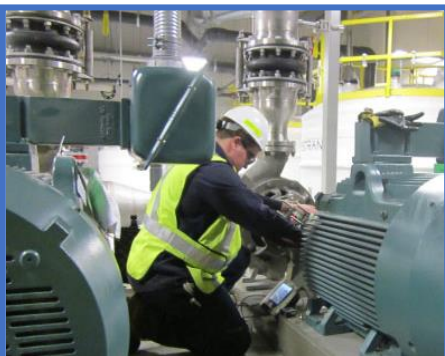
Course Description



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 is designed to provide delegates with a detailed and up-to-date overview of reciprocating and screw compressors. It covers the various types of compressors; the principles of gas compression; the effect of staging, stage and interstage cooling; the practical compressor theory; the mechanical design and compressor systems; the systematic alignment techniques; the support criteria of centrifugal compressors; and the centrifugal compressor parameters.



Further, the course will also cover centrifugal process compressors; the process conditions; the positive displacement compressors; the compressor operation; the reciprocating compressor cycle; the effect of staging; the oil free cylinders of floating pistons; condensation and liquid slugs; and the valve response and capacity control of reciprocating compressor.

During this interactive course, participants will learn the compressor control; performance considerations; the gas pulsations and reduction of pulsations; the proper techniques in starting up, running and shutting down compressors; the practical screw compressor theory; the screw compressor process packages; the areas of application; the operating principles and capacity control; the power requirement and fitting control; and the performance, condition monitoring and troubleshooting.

Course Objectives/Outcomes & Benefits for the Participants

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

- Apply and gain a good working knowledge on centrifugal, reciprocating and screw compressor
- Discuss the various types of compressors and employ the principles of gas compression
- Identify the effect of staging, stage and interstage cooling
- Illustrate mechanical design, employ systematic alignment techniques and determine the support criteria of centrifugal compressors
- Describe centrifugal compressor parameters and select centrifugal process compressors
- Recognize positive displacement compressors, reciprocating compressor cycle and effect of staging
- Discuss oil free cylinders of floating pistons as well as condensation and liquid slugs
- Describe the valve response and capacity control of reciprocating compressor
- Explain performance considerations as well as gas pulsations and reduction of pulsations
- Employ proper techniques in starting up, running and shutting down compressors in a professional manner
- Discuss screw compressors, its areas of application, operating principles, capacity control and performance

Exclusive Smart Training Kit - H-STK®



*Participants of this course will receive the exclusive “Howard 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 is intended for rotating equipment/machinery engineers, plant engineers and/or maintenance engineers involved in turbomachinery operations and/or maintenance, superintendents, supervisors, foremen and other technical staff involved in turbomachinery management, operation and/or maintenance, operations, process and/or process unit contact engineers and mechanical and/or project engineers.

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: -

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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**. 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.

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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 **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:



Mr. Andrew Ladwig is a **Senior Process & Mechanical Maintenance Engineer** with over **25 years** of extensive experience within the **Oil & Gas, Refinery, Petrochemical & Power** industries. His expertise widely covers in the areas of **Ammonia Manufacturing & Process Troubleshooting, Distillation Towers, Crude Oil Distillation, Ammonia Storage & Loading Systems, Operational Excellence in Ammonia Plants, Fertilizer Storage Management (Ammonia & Urea), Fertilizer Manufacturing Process Technology, Sulphur Recovery, Phenol Recovery & Extraction, Refining Process & Petroleum Products, Refinery Planning & Economics, Hydrotreating & Hydro-processing, Separators in Oil & Gas Industry, Gas Testing & Energy Isolations, Industrial Liquid Mixing, Extractors, Fractionation, Water Purification, Water Transport & Distribution, Environmental Emission Control, Process Plant Troubleshooting & Engineering Problem Solving, Process Plant Performance, Plant Startup & Shutdown, Process Troubleshooting Techniques and Oil & Gas Operation/Surface Facilities.** Further, he is also well-versed in **Rotating Machinery (BRM), Rotating Equipment Operation & Troubleshooting, Root Cause Analysis (RCA), Process Plant Shutdown, Turnaround & Troubleshooting, Planning & Scheduling Shutdowns & Turnarounds, Optimizing Equipment Maintenance & Replacement Decisions, Maintenance Planning & Scheduling, Material Cataloguing, Maintenance, Reliability & Asset Management Best Practices, Storage Tanks Operations & Measurements, Tank Inspection & Maintenance, Pressure Vessel Operation, Flare & Relief System, Flaring System Operation, PSV Inspection & Maintenance, Centrifugal & Reciprocating Compressor, Screw Compressor Troubleshooting, Heat Exchanger Overhaul & Testing, Pipe Stress Analysis, Control Valves & Actuators, Vent & Relief System, Centrifugal & Reciprocating Pump Installation & Repair, Heat Exchanger Troubleshooting & Maintenance, Steam Trapping & Control, Control & ESD System and Detailed Engineering Drawings, Codes & Standards.**

During his career life, Mr. Ladwig has gained his practical experience through his various significant positions and dedication as the **Mechanical Engineer, Project Engineer, Reliability & Maintenance Engineer, Maintenance Support Engineer, Process Engineer, HSE Supervisor, Warehouse Manager, Quality Manager, Business Analyst, Senior Process Controller, Process Controller, Safety Officer, Mechanical Technician, Senior Lecturer and Senior Consultant/Trainer** for various companies such as the Sasol Ltd., Sasol Wax, Sasol Synfuels, just to name a few.

Mr. Ladwig has a **Bachelor's degree in Chemical Engineering** and a **Diploma in Mechanical Engineering**. Further, he is a **Certified Instructor/Trainer, a Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and has delivered various trainings, workshops, seminars, courses and conferences internationally.

Accommodation

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

Course Fee

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.

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.

Learning Design & Customization

This course can be customized to the exact requirements of clients. Haward Technology is so proud of our huge capabilities in tailoring our courses to the training needs of our valued clients.

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: Sunday, 09th of August 2026

0730 – 0800	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0930	Compressor Types
0930 – 0945	<i>Break</i>
0945 – 1100	Principles of Gas Compression
1100 – 1230	Effect of Staging, Stage and Interstage Cooling
1230 – 1245	<i>Break</i>
1245 – 1330	Mechanical Design of Centrifugal Compressors
1330 – 1420	Centrifugal Compressor Alignment Techniques & Support Criteria
1420 – 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2: Monday, 10th of August 2026

0730 – 0930	Centrifugal Compressor Parameters
0930 – 0945	<i>Break</i>
0945 – 1100	Selection of Centrifugal Process Compressors

1100 – 1230	Positive Displacement Compressors
1230 – 1245	Break
1245 – 1330	Reciprocating Compressor Cycle
1330 – 1420	Effect of Staging
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3: Tuesday, 11th of August 2026

0730 – 0930	Oil Free Cylinders–Floating Pistons
0930 – 0945	Break
0945 – 1100	Condensation
1100 – 1230	Liquid Slugs
1230 – 1245	Break
1245 – 1330	Reciprocating Compressor Valves–Valve Response
1330 – 1420	Reciprocating Compressor Capacity Control
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4: Wednesday, 12th of August 2026

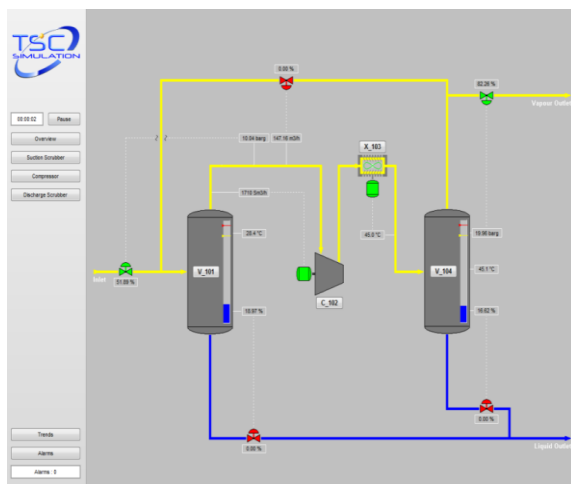
0730 – 0930	Performance Considerations
0930 – 0945	Break
0945 – 1100	Gas Pulsations–Reduction of Pulsations
1100 – 1230	Starting up, Running, Shutting Down
1230 – 1245	Break
1245 – 1420	Screw Compressors
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5: Thursday, 13th of August 2026

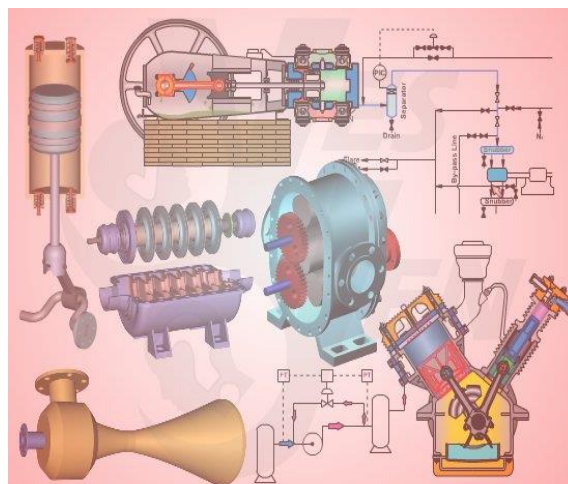
0730 – 0930	Areas of Application
0930 – 0945	Break
0945 – 1100	Operating Principles
1100 – 1230	Capacity Control
1230 – 1245	Break
1245 – 1345	Performance
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

Simulator (Hands-on Practical Sessions)

Practical session 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 state-of-the-art simulators “SIM 3300 Centrifugal Compressor” and “CBT on Compressors”.



SIM 3300 Centrifugal Compressor Simulator



CBT on Compressors

Course Coordinator

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