Purpose
To acquire basic knowledge about compressors starting with the structure of compressors and compression theory to lead up to operation management.

Characteristics
★ This course focuses on the reciprocating compressor and uses videos of various experiments relating to cut section models and operational theory to provide students with a basic understanding of the structure of a compressor, compression theory, compressor performance and operation management.
★ Combining animated computer graphics, narration, and real video imagery, the explanations are given a sense of presence and realism.

Curriculum
Introduction
Chapter 1 Types of Compressors and Their Structure
Chapter 2 Gases and Compression
Chapter 3 Equation of State for Real Gases
Chapter 4 Absolute Work
Chapter 5 Industrial Work
Chapter 6 Motive Power
Chapter 7 Operation Management

Who should take this course
Novice and mid-level employees responsible for maintenance work, operators and engineers on production-sites (plants), workers, supervisors, and administrators in the field

Course material outline
◆ Expected learning time: 5 hours  ◆ Number of tests: 2
◆ Shortest duration: 123 minutes

Supervised by
Idemitsu Kosan Co., Ltd. Technical Training Center
Chapter 1 Types of Compressors and Their Structure
101 What Is a Compressor?
102 Categorizing Compressors by Structure
103-1 The Structure of a Reciprocating Compressor (1) - 1
103-2 The Structure of a Reciprocating Compressor (1) - 2
104 The Structure of a Reciprocating Compressor (2)

Chapter 2 Gases and Compression
201 Gases and Energy
202 Compression Mechanism
203 Forms of Compression

Chapter 3 Equation of State for Real Gases
301 State Function
302 Boyle’s Law
303 Gay-Lussac’s Law
304-1 Equation of State for Real Gases - 1
304-2 Equation of State for Real Gases - 2
305 Equation of State for Real Gases for Practical Use
306 Vapor Mixture and Equation of State for Real Gases
307 Specific Heat

Chapter 4 Absolute Work
401-1 Isothermal Compression Absolute Work - 1
401-2 Isothermal Compression Absolute Work - 2
402 Adiabatic Compression Work
403 Polytropic Compression Work

Chapter 5 Industrial Work
501-1 Isothermal Compression Industrial Work - 1
501-2 Isothermal Compression Industrial Work - 2
502 Industrial Work of Adiabatic Compression
503 Work of Multistage Compression
504 Temperature of Multistage Compression
505 Actual Cycle
506 Exercises

Chapter 6 Motive Power
601 Adiabatic Compressor Power
602 Shaft Horsepower of a Reciprocating Compressor
603 Shaft Horsepower Calculation (1)
604 Shaft Horsepower Calculation (2)
605 Shaft Horsepower Calculation (3)
606 Shaft Horsepower Calculation (4)
607 Shaft Horsepower Calculation (5)
608 Shaft Horsepower Calculation (6)

Chapter 7 Operation Management
701 Compressor System
702 Gas Flow and Drainage Measures
703 Flow Control for a Reciprocating Compressor
704 Impact of Operational Variations
705 Compression Abnormalities and Measures
706 Air Compressor Safety Measures