



# FACT SHEET (LIVE COURSE)

## Principles | Operation | Selection Centrifugal Compressor



**Centrifugal compressor principles, design & operation: gas compression, configurations, drivers, control system, auxiliary & ancillary systems, packages, applications, commercial analysis.**

### Who Should Attend?

This course is intended for graduates (or soon to be), designers, freelancers, technicians and engineers involved in: calculation, design, selection, manufacturing, safety, quality and maintenance of systems and equipment in industrial processes.

**Previous knowledge of this subject is not required to attend to the course.**

### Training Objectives

The main objective of this course is to transfer to participants the theoretical and practical skills required in projects, obtained from experience and sound engineering practices.

### Methodology

Instructor-led training course in adult learning format with discussions, individual exercises and simplified case studies, providing practical knowledge to implement in the field.

### Duration

The duration of this training course is **16 hours**, divided into several sessions to facilitate the learning process.

### What to expect?

Understand the basic principles of compression

Familiarization with design parameters

Selection criteria

Comprehend the operation data and criteria

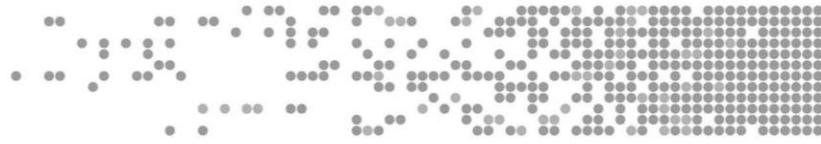
Design and select appropriate auxiliary systems

Recognize all type of drivers

Control system understanding

Commercial evaluation

Develop a centrifugal compressor specification



## Contents

### Introduction to compression

Compressibles fluids  
Compression and gas transport  
Compressor types and applications

### Centrifugal compressor basic principles

Operation principle.  
Energy conversion  
Parts and components of a centrifugal compressor

### Centrifugal compressor configuration

In-line.  
Double Flow.  
Compound.  
Back-to-Back

### Performance & Aerodynamics

Efficiency and aerodynamics limits.  
Velocity triangles.  
Performance curves.

### Rotordynamics

Natural frequencies and critical speeds.  
Amplification factor.  
Rotordynamic stability

### Centrifugal compressor drivers

Direct drive / gearbox  
Electric Motor.  
Gas Turbine.  
Steam Turbine

### Centrifugal compressor operation control

Variable speed.  
Suction or discharge throttling.  
Variable inlet guide vanes.

### Aux. systems and compressor packages

Lubrication, sealing, and control systems  
P&IDs, conventional package Vs. Offshore package

### Centrifugal compressor applications

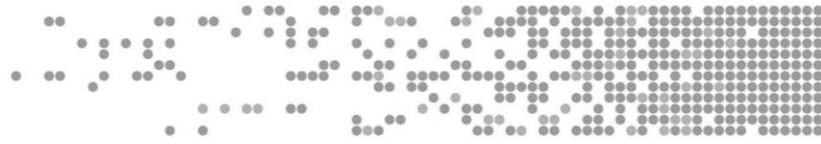
Downstream  
Midstream  
Upstream

### Commercial evaluation

CAPEX Vs. OPEX  
Spare part analysis

### Case studies in the classroom:

Centrifugal compressor selection:  
Required process parameters  
Design conditions  
Volumetric Flow  
Q-H & performance curves



## Instructor

Industrial Engineer and MSc Mechanical Engineering. **Oil & Gas projects consultant specialized in Rotating Equipment**, in which he has developed his whole professional career. Throughout the years, he has been involved in different areas such as design and manufacturing, projects engineering, commissioning & start up, and field operation.

**Broad international experience. He is currently the Managing Director of OSL Iberia**, the Spanish branch of the British engineering group OSL. In his previous position, he was based in London where he managed the Client Services Dept. for Europe, Middle East, and Africa of one of the world's leading oil & gas compression and turbine manufacturer.

**Vast experience providing specific training sessions in both classroom and online methodologies. Training courses carried out** in different institutions and in-company, courses oriented to graduates, designers, engineers and experienced professionals.

## Tailored Training

The most effective training is one that satisfies the needs of each company's business focus and deliverables. **We adapt our training programs to each specific requirement, offering bespoke solutions for each need.** The result, 100% tailored programs, developed to maximize the time investment and deliver tangible and intangible returns to the work teams.

After an assessment phase, a tailored training plan is de-signed jointly with the client. This plan is specifically tailored to meet the client's needs, focusing on effectively enhancing the capabilities of the work team. **We provide practical, dynamic and hands-on training**, making available the best instructors in each subject.

## Arveng Training

**Arveng Training has developed effective and practical courses for the needs of today's industrial challenges by delivering specific and high-quality engineering training courses utilizing all three approaches: classroom, on-line and tailored training.** We are proud to have imparted more than 100 classroom courses, 200 online courses and over 15 in-company sessions. Our training activities has benefited over 1,500 professionals. Our greatest pride is in the letters of recommendation we receive from so many of our customers in this area.

**We consider the time of our students as the most valuable.** For this reason, all our courses have been designed with the main objective of quickly the professional skills of the participants, through our expert instructors in different disciplines. **We stimulate creativity, innovation and initiative to make the participants inquisitive to bring good engineering practices and lessons learned to the field that benefits their employers in the long term.**

## Our Company

**Arveng Training & Engineering SL is a leading company providing Training and Engineering services based in Madrid, Spain.** Our mission and vision are to be a leading training and engineering services company. We are a team of highly motivated, talented high qualified professionals with more than 20 years of experience. Our main goal is to provide our clients, the best training and engineering services and to exceed their expectations in all their spheres of industrial activity, through our renowned services which are based on efficient, innovative, cost-effective and transparent principles.

Established in July 2010, mainly oriented to the industrial sector, from the very beginning Arveng has always worked with closeness, responsibility and commitment in the different areas of activity.