



**arveng**  
training & engineering



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## Our company

Arveng Training & Engineering SL is a leading company providing Training and Engineering services based in Madrid, Spain. Our mission and vision is 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.

Arveng is a company strongly committed to the environment, our sustainable solutions contribute to reduce the impact of processes and day to day operations and optimal use of our precious natural resources to achieve reduction of environmental impact of industrial activity. 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.

Through our rich experience participating in multidisciplinary engineering projects in sectors such as Oil & Gas, Petrochemical, Chemical and Power Generation Industry, we provide solutions, methods and solve specific and special technical requirements for product and performance enhancements. We believe in building long lasting, mutually beneficial relationships with our partners, stake holders and esteemed customers. This is proven by the repeat businesses we get from our customers.

We believe that facts and actions speak louder than words, that is why the references of our clients are our best credentials.

### Some of our partners in training...



## Added value

The added value of our company is in the high technical qualifications of our professionals participating in each project, as well as in the agility and flexibility with which we face the constant challenges of the sector.

These strong traits and characteristics gives us the drive to provide efficient and highly effective engineering solutions, in increasingly complex technological projects, with extremely short execution timeframes.

The experience acquired with each executed project, added to our strength of constant study of the state of art technologies and continuous development of profes-

sional training activities, place us in a privileged position to face almost any engineering challenge in developing high quality solutions.

Through our vision and work philosophy, we have committed all our efforts to strict compliance of delivery times and guarantee high quality delivery of solutions to the project objectives. We understand that these qualities are a must to face the numerous technical and critical regulatory requirements that are imposed on projects in today's business environment.

### Some of our clients in engineering...



## Training

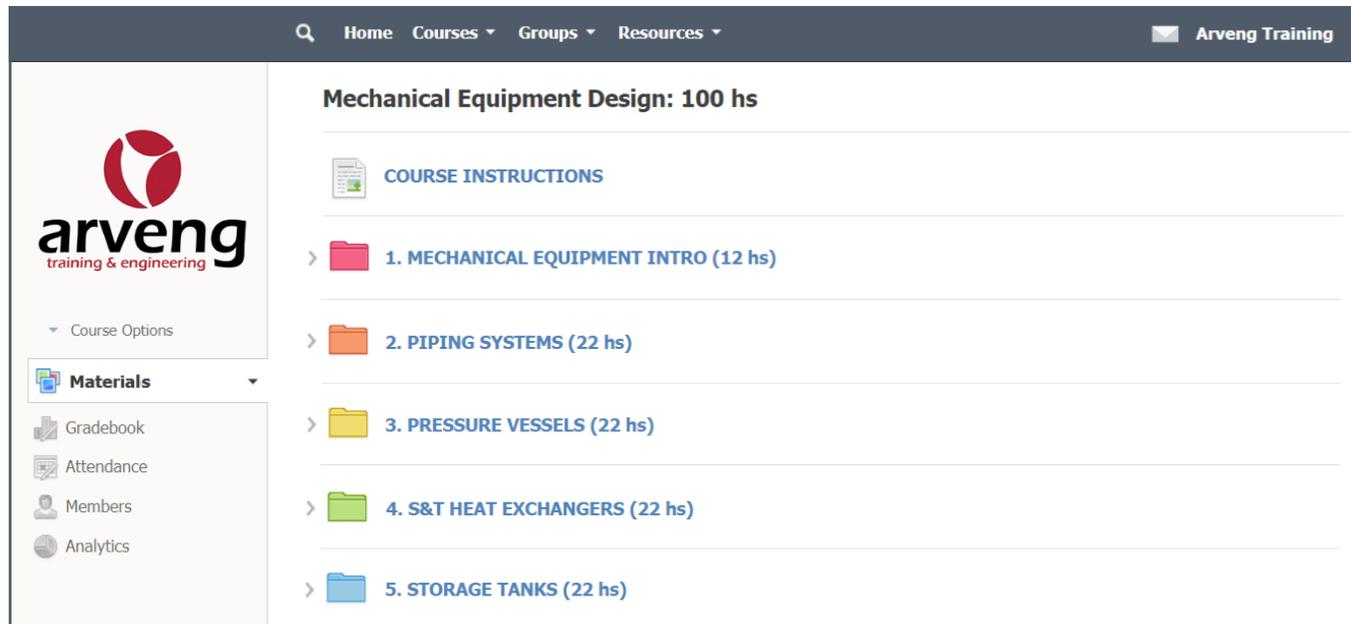
Arveng Training has developed effective and practical courses for the needs of today's industrial challenges by delivering specific and high-quality engineering training courses utilizing all three approaches: classroom, on-line and tailored training. We are proud to have imparted more than 100 classroom 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 develop 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.

## 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 designed 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.



## TRAINING BASED ON EXPERIENCE



Some of the disciplines reached by our training courses are:



Piping Systems



Static Equipment



Rotating Equipment



Process Engineering



Civil Engineering & Structures



Instrumentation & Control



Metallurgy & Materials



Welding & Inspection



Studies & Projects

## Online

Our training courses are designed for **self-directed training**, allowing you to begin at your convenience, progress at your own time and own pace, while benefiting from instructor support. Courses follow the “learn by doing” concept.

### “ AT YOUR OWN PACE, ON YOUR OWN TIME ”

Case studies are the fundamental cornerstone of our training approach and delivery done in adult learning format to suit the audience levels and to meet company's requirements. Once participants are acquainted with the contents that will be covered in each module, the proposed cases shall be solved. They include **multiple choice questions, selection charts and sections to design, calculate and elaborate.**

Our training courses are available in both English and Spanish.



 <https://arvengtraining.com/en/courses/online-en/>  
 <https://arvengtraining.com/courses/online/>



## Classroom

Classroom courses are **hands-on**, designed to encourage audience participation and promote the resolution of real cases. Our face-to-face courses are a compilation of lessons learned and best practices.

### “ HANDS-ON TRAINING COURSES ”

Our classroom training methodology is based on case studies. The training material consists of various elements, developed specifically to facilitate the learning process. The main resources are the **study notes, videos and specific animations, data sheets, study cases and automated calculation sheets.**

Our training courses are available in both English and Spanish.



 <https://arvengtraining.com/courses/presencial/>  
 <https://arvengtraining.com/en/courses/classroom/>

## Engineering

Arveng Engineering is a multidisciplinary company with international presence and projects in different geographies. Formed by a team of highly qualified professionals developing customized engineering solutions for our clients. Our experience resides in the Petrochemical, Energy Generation and Industrial sectors.

Our added value lies in the technical expertise and commitment of our professionals. We are an agile and flexible company, the experience acquired in these many

years allows us to provide efficient and cost-effective engineering solutions. Based on our strengths, we are committed to strict compliance with delivery deadlines, assuring the quality of project deliverables at all times.

We are not alone when it comes to developing large engineering projects. Arveng has Strategic Alliances with other well recognized companies that increase our capabilities to take on larger engineering projects and even greater challenges.

## Services

Arveng Engineering provides Plant Technical Assistance, including the Diagnosis and solution of critical equipment failures, Process Optimization, Energy Efficiency, Asset Integrity Management and Risk Based Inspection.

We develop integral engineering solutions, from Conceptual Studies, Feasibility and Viability, FEED Studies, Basic Engineering, Detail Engineering, to Specialized Studies of components and equipment of industrial

plants. Innovation and Development is in Arveng's DNA. Our highly qualified professionals collaborate with different companies and institutions in high added value technological projects. These collaborations place us at the forefront in terms of knowledge, which we bring to all the projects developed.



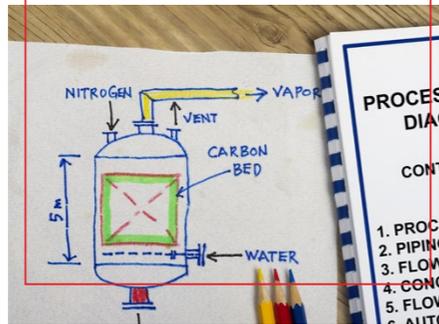
**YOUR PROJECTS ARE OUR PROJECTS, WE WISH TO ACCOMPANY YOU**



### TECHNICAL ASSISTANCE



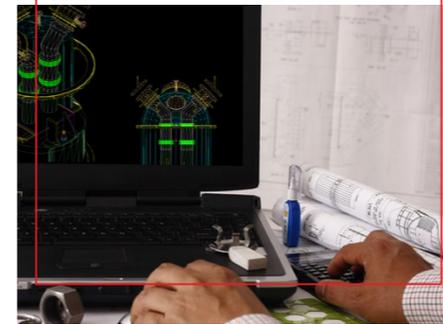
### CONCEPTUAL ENGINEERING



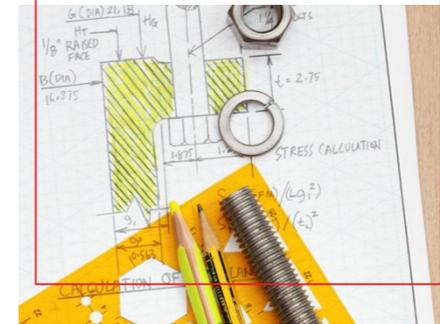
### BASIC ENGINEERING | FEED



### DETAILED ENGINEERING



### SPECIALIZED STUDIES



### PROCUREMENT SUPPORT



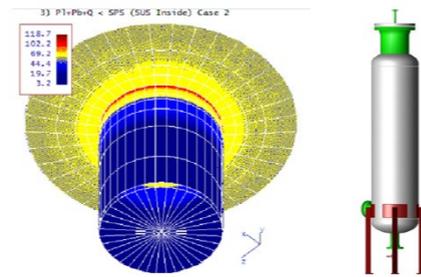
## Executed projects

### Design, Calculation and Fatigue Analysis of Reactor D-481. Petrochemical Sector

Design and calculation of reactor D-481 fabricated in Carbon Steel, material SA516 Gr.70, design pressure 15.5 barg and design temperature 80°C. The vessel operates in cyclic service, 72 cycles of 20min per day, 525600 cycles throughout the entire life. The equipment was designed and calculated under inter-

nal pressure in accordance with the ASME VIII Div.1 code. Fatigue verification in accordance with the ASME VIII Div.2 code was performed. Stress at critical points of the equipment were obtained through Finite Element Analysis.

Final Client: CEPSA  
Location: Huelva, España

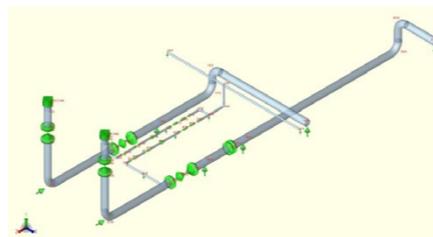


### Stress Analysis of 14 Piping Systems for a Chemical Plant. Petrochemical Sector

Stress and flexibility analysis according to the ASME B31.3 code. The objective of the project is to verify if the proposed layout and supports configuration meet the requirements imposed by the operating conditions. In other words, from the point of view of the

stresses, deformations, displacements and allowable stresses. The pipelines are fabricated in carbon steel from 2" to 14" in diameter, with operating pressures ranging from 5 to 21 barg and operating temperatures from 25 to 150°C.

Final Client: CEPSA Química  
Location: Huelva, España

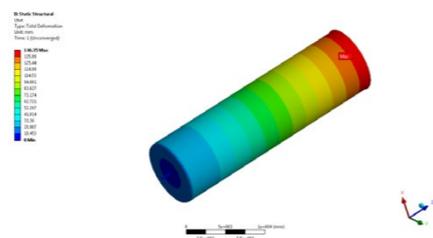


### Design & Calculation of a Storage Tank for Molten Salts. Thermosolar Plant

Design, calculation and verification by Finite Elements Analysis of a molten salt storage tank (thermal storage, thermosolar plant). Tank of 4m diameter and 14m high, design temperature is 570°C. The tank is fabricated in stainless steel, SA240 Tp.347H. The scope of the job was the material selection, tank

calculation according to API 650 code, verification of allowable stresses according to the ASME VIII Div.1 and the design of all welded joints of the tank. Subsequently, a verification by FEA was carried out due to the high design temperatures.

Final Client: IeCTECH  
Location: Confidencial

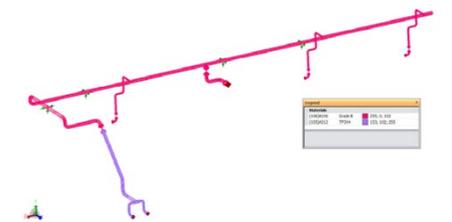


### Flexibility & Stress Analysis of stress Analysis of Piping Systems. Dry / Wet Air Piping Systems

Stress and flexibility analysis of three piping systems according to the ASME B31.3 code. The objective of the project was to verify that both the proposed layout and the supports configuration meet the operating conditions, from

the point of view of the stresses, deformations, displacements and allowable stresses. The lines are carbon steel (A106 Gr.B) and Stainless steel (A240 Tp.304).

Final Client: Atlantic Copper  
Location: Huelva, España



### Decommissioning of a Fuel Storage Tank in a Cement Plant. Industrial Sector.

Development of specifications and tender documents for the Request For Quotation, for the decommissioning of one Fuel Oil Storage Tank located in a cement plant. The Fuel Oil storage tank was built in Carbon Steel, 12m in

diameter and 18m high. The specifications of the project include the dismantling sequence of the tank, safety features and equipment needed for these activities.

Final Client: Cementos Lemona  
Location: Bilbao, España



### Design and Calculation of an Aluminium Pressure Vessel. Aviation Sector.

Design and calculation of a pressure vessel subjected to internal pressure made of aluminium, material EN AW 5083 H-111, 16 barg of design pressure and 60° C of design temperature. The scope of the project was material selection, equipment design and calcu-

lation of all the elements of the equipment. Calculation were carried out in accordance with the European EN 13445 code. Additionally, the induced stresses during the hydrostatic test of the separator were verified.

Final Client: Vimasol  
Location: Valencia, España



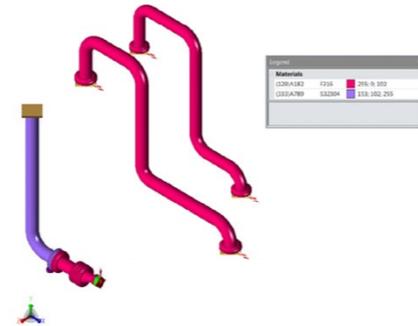
## Executed projects

### Stress Analysis of High Pressure/Temperature Piping Systems. Water/Steam Cycle

Stress and flexibility analysis of three piping systems according to the ASME B31.1 Code. The objective of the project was to verify that both the proposed layout and the supports configuration meet the operating conditions, from

the point of view of the stresses, deformations, displacements and allowable stresses. The pipelines are made of AISI 316 / 304 stainless steel, with diameters of 12" and 14".

**Final Client:** Iberdrola  
**Location:** Topolobampo, México

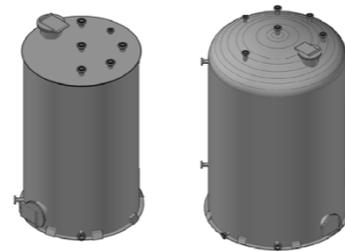


### Design and Calculation of two Storage Tanks according to API 650

Design, calculation and drafting of two storage tanks manufactured in Carbon Steel, material A-36 and A-285 Gr. C respectively. The tanks operate at atmospheric pressure. Calculations according to the API 650 code were carried

out for all the elements of tanks EPA-240 and EPA-250, including the bottom, wall, roof and connections. Also, construction drawings for the fabrication of the tanks were developed.

**Final Client:** Atlantic Copper  
**Location:** Huelva, España



### Drying System, Pipeline Performance Enhancement. Pressure Loss Optimization

Pressure loss analysis of a high temperature piping system belonging to the drying tower. The scope of the project was to obtain the total pressure loss of the hot air main pipeline, operating at 1.05 bar of pressure and 200° C of tem-

perature. The flow rate was 11880 m<sup>3</sup>/h, and the complexity of the project resided in the high flow conditions and the consequent difficulty to obtain accurate results for the proposed system.

**Final Client:** Altos Hornos de Vizcaya  
**Location:** Echevarri, España

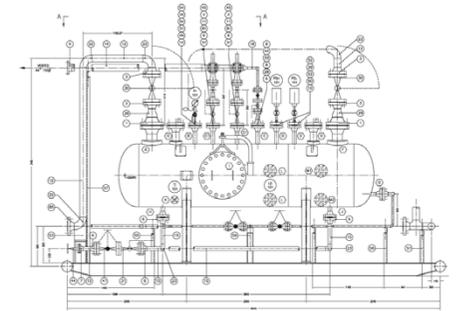
Pérdida de Carga Total del sistema	
M [mca] = Pérdida de carga total del sistema	337.433
M [bar] =	0.041
Pérdida de Carga en tramos rectos de tubería:	
Mf [mca] = $f \cdot L \cdot V^2 / D \cdot 2g$ : pérdida de carga en tramo recto de tubería (Darcy-Weisbach)	44.973
Mf [bar] =	0.004
Re [adim] = $D \cdot V / \nu$ : Número de Reynolds	158.643
f [adim] = 64/Re: flujo laminar -> RE < 2000 (Poiseuille)	0.0004
f [adim] = Churchill 1977, reproduce Moody en todos los regímenes	0.0112
f [adim] = Cheng 1979, buena performance para régimen turbulento -> solo para referencia	0.0112
Pérdida de Carga en fittings, válvulas y otros	
Fittings = 4 Codos 90° + 4 Codos 45°	
Mf [mca] = Pérdida de carga total en Fittings [mca]	330.451
Mf [bar] =	0.038
f [adim] = Crane, tubería de acero comercial, flujo totalmente turbulento -> para válvulas y fittings	0.019

### Detailed Engineering of three Biphasic Separators. Oil & Gas sector, Upstream

Detail engineering for the fabrication of three biphasic separators, SG-100, SG-101 and SV-106. The vessels were skid mounted. The scope of the project included from the design of the vessel, the associated pipelines, electricity, in-

strumentation and the actuators of the valves. The vessels were calculated according to the ASME VIII Div.1 code and the pipes in accordance with the ASME B31.3 code.

**Final Client:** AESA  
**Location:** Mendoza, Argentina

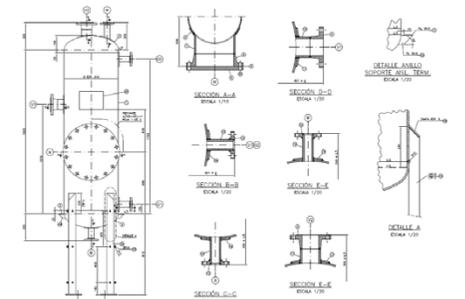


### Design and Calculation of Propane Pressure Vessel Y-V2. Refining Sector

Design and calculation of a pressure vessel manufactured in Carbon Steel, material SA-516 Gr. 60, operating at 8.1bar of pressure plus total vacuum and 150° C of design temperature. Calculations of all the elements of the ves-

sel were carried out according to the ASME VIII Div.1 code, including heads, shell, nozzles, and structural elements. Also, the technical report for the fabrication of the vessels was developed.

**Final Client:** CEPESA  
**Location:** Palos de La Frontera, Huelva, ES

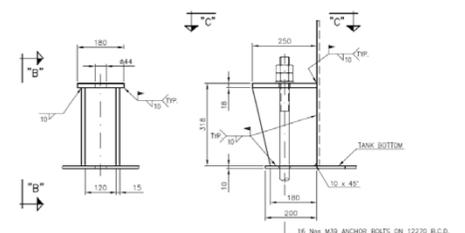


### Design, Calculation and Drafting of Anchor Bolts for a Metanol Storage Tank

Design, calculation and drafting of the anchor bolts of a Storage Tank fabricated in Carbon Steel, material SA36, operating at atmospheric pressure and 55° of design temperature. The calculation of the anchor bolts of the equip-

ment was carried out in accordance with the API 650 code. The scope of the project also included the design of the saddles and the construction drawings of these elements.

**Final Client:** SerIDOM  
**Location:** Huelva, España





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**Your training here:**

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**Your project here:**

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