



**Mechanical Engineering
For Petrochemical Plants**

INDEX

About Us.	2
1. Company Structure.	3
1.1. ProMec Engineering Organization Chart.	3
2. Engineering Services.	3
2.1. Mechanical Department Summary.	5
2.2. Plant Engineering and Site Surveys.	7
2.3. Expediting Activities	9
2.4. Inspections and Tests.	9
3. Documents Management.	10
4. Software Suites.	11
5. Projects History.	12
5.1. Main Equipment treated by ProMec.	12

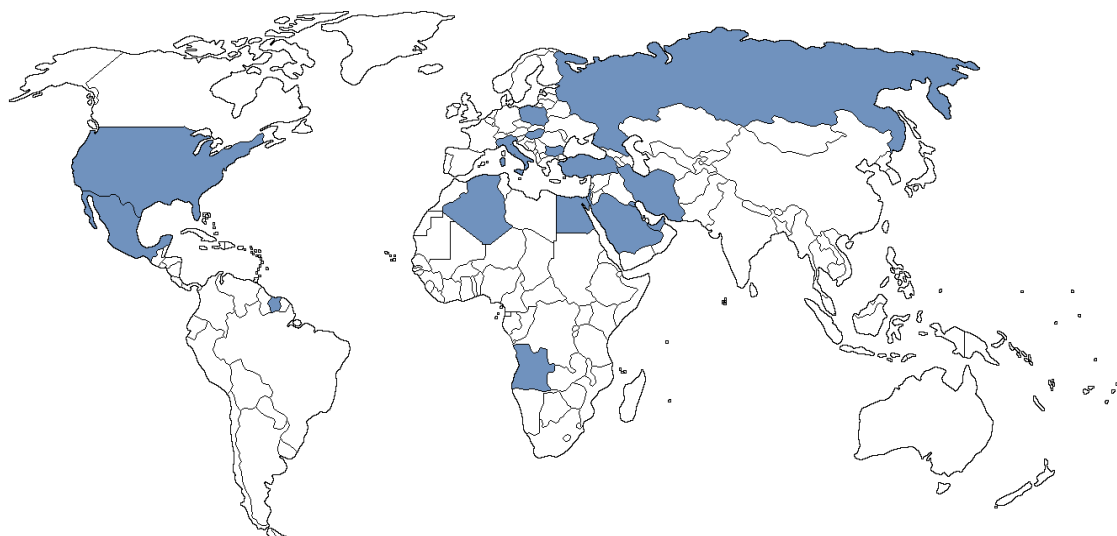


About Us.

A young company, with experience

ProMec Engineering is a young company with a solid background. Competence, flexibility and research for lateral solutions are the core of our solution-oriented approach, ensuring our clients that when choosing ProMec Engineering they are choosing a reliable and dynamic company capable of offering professional services to meet their needs. ProMec Engineering was founded in 2015 by a well-trained team of engineers and technicians who decided to continue the experience gained while working for ICRI Engineering, an important Italian company which had been active in the field of mechanical design of petrochemical plants for 30 years.

Our engineers, technicians and draftsmen have a solid technical background and longstanding team-working experience, they have successfully completed important challenges, working at major international projects in partnership with leading engineering companies, such as **APS Engineering**, **KT Kinetic Technologies**, **SAIPEM** and **Technip Italy**.



Worldwide overview of Projects Sites

1. Company Structure.

Perfectly functional.

ProMec Engineering has a flexible structure, enabling the company to adapt to different working environments and to give a prompt response to any issue which may arise, no matter how unpredictable.

Such flexibility is ensured by the versatile experience of our team, capable to swiftly readjust the way of approaching an issue as well as the workflow, based on work-in-progress deviations requested by the clients. Our team is fully accustomed to the fast-paced dynamics typical of EPC engineering.

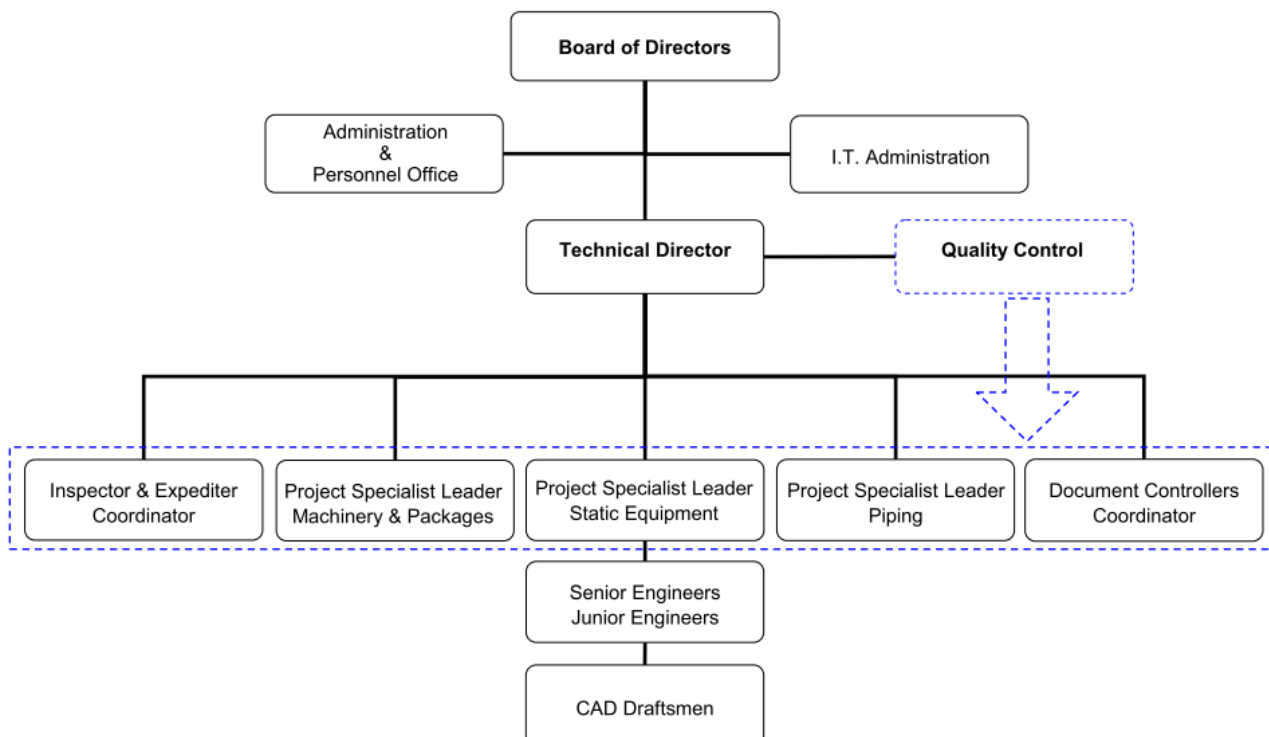
The company is under the responsibility of a Board of Directors, all coming from a longstanding engineering experience which allows them to combine commercial sensitiveness to technical competence and project management ability.

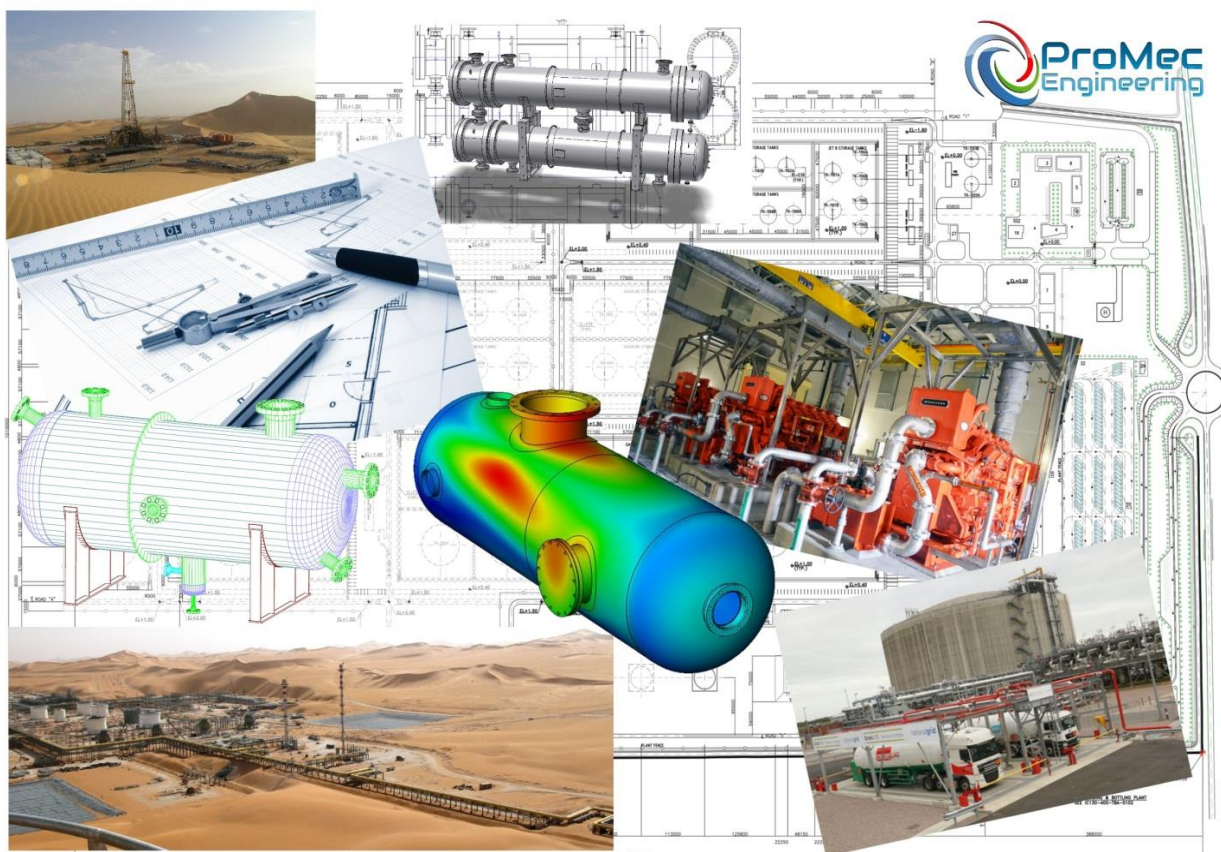
Engineering activities are under the responsibility of a Technical Director who analyses the critical aspects of projects, plans how to develop the work to obtain the most effective allocation of tasks, he also supervises the overall development of projects providing technical support in order to solve most complex issues.

At the same time, our Quality Control Supervisor ensures that all working procedures are fully compliant with the high standards of ProMec Engineering "Quality Management System".

When you choose ProMec Engineering, you know you are in good hands.

1.1. ProMec Engineering Organization Chart.





2. Engineering Services.

Top quality engineering services to assist clients in meeting their project needs.

ProMec Engineering provides a wide range of engineering services for petrochemical, fertilizer and gas treatments plants. Our team, composed by engineers coming from leading companies such as ICRI Engineering, Saipem and Snam, holds extensive experience and expertise in mechanical design and has successfully worked at a number of major international projects in partnership with companies such as **APS Engineering, KT Kinetic Technologies, SAIPEM and Technip Italy.**

ProMec experience covers following fields:

- Static Equipment.
- Machinery and Packages.
- Plant Engineering.
- Expediting.
- Inspection & Test.
- Mechanical Supervision at Site.
- Documentation Management.

2.1. Mechanical Department Summary.

ProMec Engineering performs **Mechanical Design** of **Pressure Vessels, Shell & Tube Heat Exchangers** and **Storage Tanks** complying to Project Specifications and Client Standards **using certified calculation software** such as MT-MECH from **MicroTechno** and Codeware COMPRESS, according to the following international codes:

Mechanical Design Codes:

- ASME VIII div.1 & div.2
- EN-13445
- VSR
- AD-Merkblatt
- TEMA RCB
- API 650

Wind and Seismic Codes:

- UBC '97
- ASCE 7-02
- EN-1991-1-4
- EN-1998-1
- DM-2005 and 2008

ProMec Engineering also carries out activities such as Technical Alignment, Technical bid Evaluation and Follow-Up for **Machinery** (rotating equipments) and **Packages**.

Technical Design Phase Activities.

During this stage, ProMec Engineering provides equipment design, preparing technical documentation needed for the **Issuance for Inquiry and Issuance for Order**, including:

- Mechanical Design & Calculation based on Process Datasheets (Static Equipments).
- Mechanized Data-Sheets drafted using CAD & MicroStation.
- Material Requisitions & Inspection Data Sheets.
- Technical Bid Evaluations & Cost Estimations.

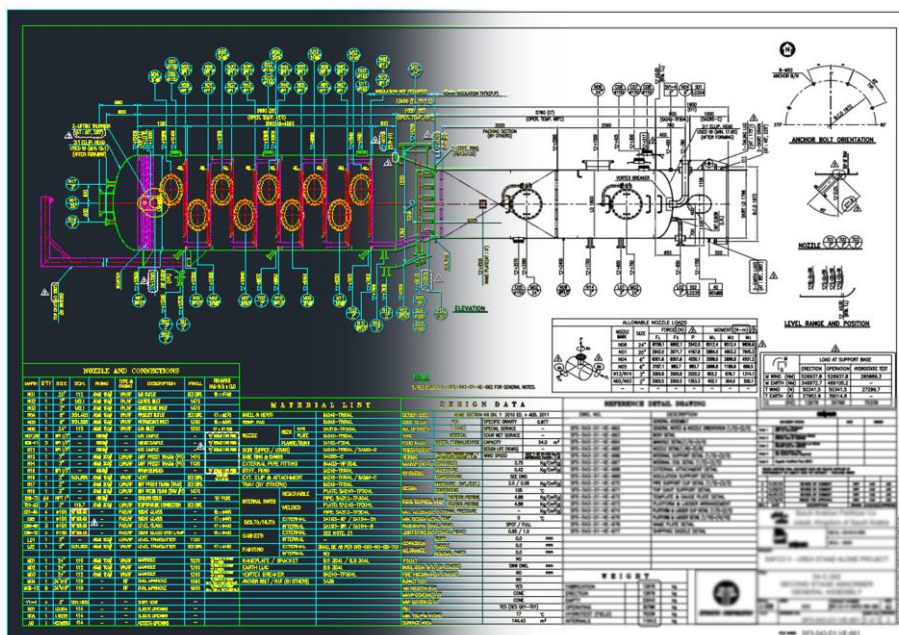
If requested, ProMec Engineering can directly manage technical communications with vendors, for both static and rotating equipments, during the **Technical Bid Evaluation**, and can provide **support to the client's Purchase Office**.

Vendor's offers will be aligned in accordance with project specifications and Client's requirements. A detailed **Supply Specification** report including Deviations List will be drafted at the end of this stage.

Executive Phase Activities

ProMec Engineering performs the control, review and approval of Vendor's documents according to the technical documentation approved during the design phase, including project mechanical datasheet, mechanical drawings, project standards and technical specifications. To meet clients' needs ProMec Engineering can directly manage contacts with suppliers during the **Follow-Up** phase and provide a **technical interface between the Client and the Suppliers**, in order to swiftly solve any technical or procedural issue which may possibly arise.

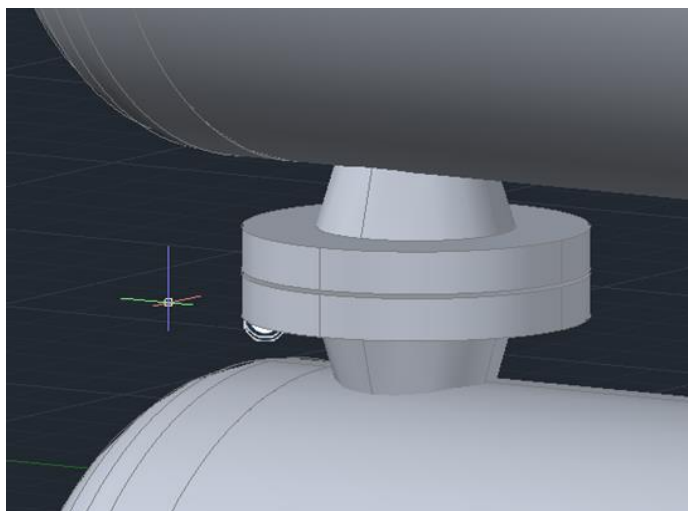
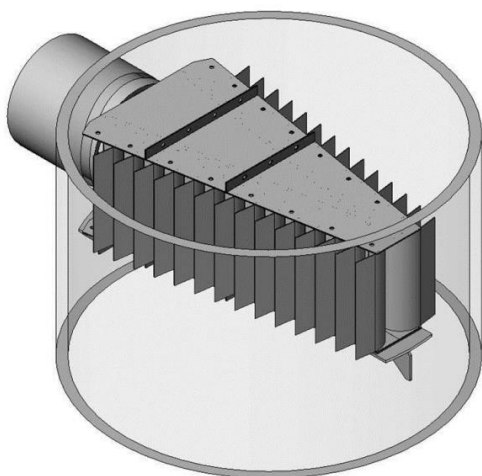
ProMec Engineering can also provide **Focal-Point activities** in support of all other technical departments involved in the project: Process, Piping, Instrument & Automation, Construction in order to focus the diverse necessities of all sectors towards a commonly agreed solution.



Drafting of technical drawings.

ProMec provides technical support to clients also in drafting technical drawings like general arrangements and detail views for Pressure Vessels, Distillation Columns with relevant internals, Storage Tanks and Heat Exchangers.

Starting from sketches, mechanical calculations or process datasheets, drafting of drawings is adapted to clients requests in order to comply with project standards and specifications. Upon request, ProMec Engineering can also provide engineering support during the drafting of drawings, so as to help solving any possible layout or design issue that could occur during the follow-up phase due to unforeseen or last-minute changes. ProMec Engineering can also draft three-dimensional AutoCAD models, in order to analyze and solve complex problems, such as the studies for interferences between columns' internals, nozzles' layout, clashing of external and internal attachments.



2.2. Plant Engineering and Site Surveys.

During previous working experiences ProMec personnel have been involved in following In-field activities carried out on various construction sites.

API Refinery (Falconara Marittima, Italy):

- Surveys to update plot-plans of Steam network upon whole refinery.
- Surveys for identification of both Process & Utilities lines that should be modified and/or dismantle in order to insert the New Vacuum Distillation Plant.

ENICHEM Plant (Brindisi, Italy):

- Surveys for installation of sleeper-way utility lines from pickup point to battery limit of the new “Polimeri Europa Plant” under construction within EniChem Plant.
- Drafting of plot-plans and P&ID with relevant detailed drawings, including drafting of relevant isometrics, bill-of-materials for take-off and pre-fabrication.



ENI / SONATRACH Plant (Hassi Messaoud, Algeria):

ProMec Engineering personnel was assigned to ENI Construction Department that was in charge of supervising installation activities, they were working together with an EPC Leader from Saipem supporting him during inspections of construction process. During this in-field activity they have been involved, among the others, in following tasks:

- Supervision of correct pipelines installations according to approved plot-plans.
- Supervision upon the installation of Static Equipment matching the correct position, orientation and alignment with foundations and pipelines layout.
- Supervision of hydraulic and pneumatic tests (Test Packs) for process units and utility lines in accordance with codes requirements and projects specifications.

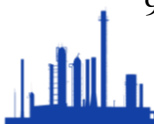
AUSIMONT Chemical Plant (Bussi sul Tirino, Italy):**Surveys inside Perborate Plant:**

- Relocation of existing dust belt conveyors and insertion a new one with consequential changes upon decks and walkways.
- Changes to the supply lines for water storage tank and installation of new transfer water. Surveys for installation of a new silo storage for perborate.

Surveys inside Chlorine-Methane Plant.

- Survey and execution of detailed engineering for the expansion of production facilities of chlorine methane with partial changes to existing structures.
- Survey upon revamping activities: insertion of new equipment and new lines, removal of out-dated items and modification of pipelines, identification of Tie-In points with relevant design of supports walkways and dedicated facilities.



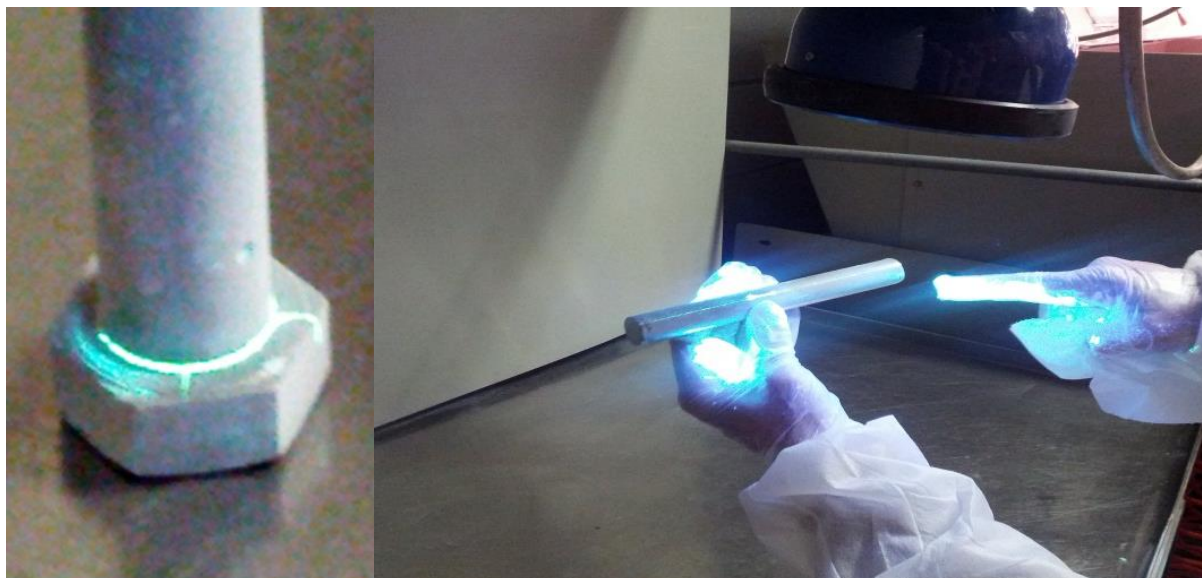


2.3. Expediting Activities.

ProMec Engineering expeditors can provide the Client with a state of progress report, drafted in accordance with all carried out audits, they can ensure that Vendors will comply to contractual requirements contained in project documents like Bill of Materials, Inspection & Test Plan, Purchase Order, Technical Specifications and Mechanical Data Sheets.

Expeditors constantly monitor delivery schedules helping both the supplier and the Client in planning a recovery plan if needed and managing the interface between technical units and suppliers in order to find the best possible solution in order to reduce any delay.

In case of a critical supply Expediting Activities can be, carried out directly at supplier's workshop, providing to the Client an Expediting Report, accompanied by photographic documentation in order to certify the state of progress and report any possible quality compliance problem or delivery time issue.



2.4. Inspections and Tests.

ProMec Engineering quality inspectors are capable of verifying materials compliance to above mentioned contractual documents and assist the Client in drafting specifications and planning Tests Procedures. Inspections will be carried out directly at supplier's workshop, according to Quality Control Plan, typical Inspection activity includes:

- Definition and planning of tests and inspections to be carried out;
- Supervision of the tests and later analysis of the test results;
- Final inspection before shipment.

At the end of each Inspection Activity, it will be produced an **Inspection Report** and a **Release Note** complete with an appropriate photographic documentation certifying the Inspections & Tests carried out on materials and equipment, results of each test and measurement will also be organized in a report that will be forward to the Client. Certificate of acceptance will be issued as a final document for every component or material which complies with Project Specifications of Quality Control.

3. Documents Management.

Go Green.

ProMec Engineering has planned the whole internal project management adopting a paperless model, in order to reduce as much as possible the environmental impact of its work in terms of consumption of natural and energy resources, indirect CO2 emissions and production of hazardous waste (such as toner, ink etc.), we strongly believe that every sector of Petrochemical Engineering can be rethought in a more eco-friendly way. This paperless system has greatly improved the internal document management process, streamlining the electronic storage procedures and simplifying retrieval of information thanks to our comments management system that is optimized through the continuous support of our engineers who adapt procedures to requirements typical of each project. ProMec Engineering can help clients in documentation management providing experienced personnel capable of:



- Documents' management according to Client's specifications.
- Preparation of Transmittals from/to Vendors.
- Project documentation Numbering Management.
- Secretarial support to Technical Units.
- State of Progresses management.
- Monitoring and Updating of revision stages of project documentation

4. Software Suites.

MECHANICAL CALCULATION SOFTWARES

ProMec has chosen **MicroTechno MT-MECH** as mechanical design software to perform mechanical calculation of static equipments.

MT-MECH is equipped with following calculation modules:

- MT-VESS: Design of vertical and horizontal pressure.
- MT-EXCH: Design of TEMA Shell & Tube heat exchangers.
- MT-LAYOUT: Design and optimization of tubesheet layout.

Equipments can be designed in compliance with following codes:

Mechanical Design Codes:

- ASME VIII div.1 (U.S.A.)
- ASME VIII div.2 (U.S.A.) (u. Dev.)
- TEMA RCB
- ISPESL-VSR (Italy)
- AD-MERKBLATT (Germany)
- EN 13445 (Europe)

Wind calculation codes:

- ANSI
- ASCE 7-95 & 7-02
- BSI CP3
- CNR 1982 & 1996
- DM 2005
- Eurocode 1
- Neige et VENT
- NTC / DM2008
- UBC 1994 & 1997
- USER DEFINED

Seismic calculation codes:

- ANSI 1982
- ASCE 7-95 & 7-02
- -
- CNR 1986
- DM-2005 / OPCM-3274
- Eurocode 8
- Parasismique PS92
- NTC / DM2008
- UBC 1994 & 1997
- USER DEFINED

During the second half of 2016 ProMec Engineering has planned the acquisition of **CODEWARE COMPRESS®** licenses in order to meet Clients' request and provide design of Pressure Vessel with the support of one of the most appreciated design software

ProMec personnel during his working experience had the chance to use some of the best Mechanical Design Software including: **Intergraph PV Elite®**

COMPUTER-AIDED DESIGN SOFTWARES.

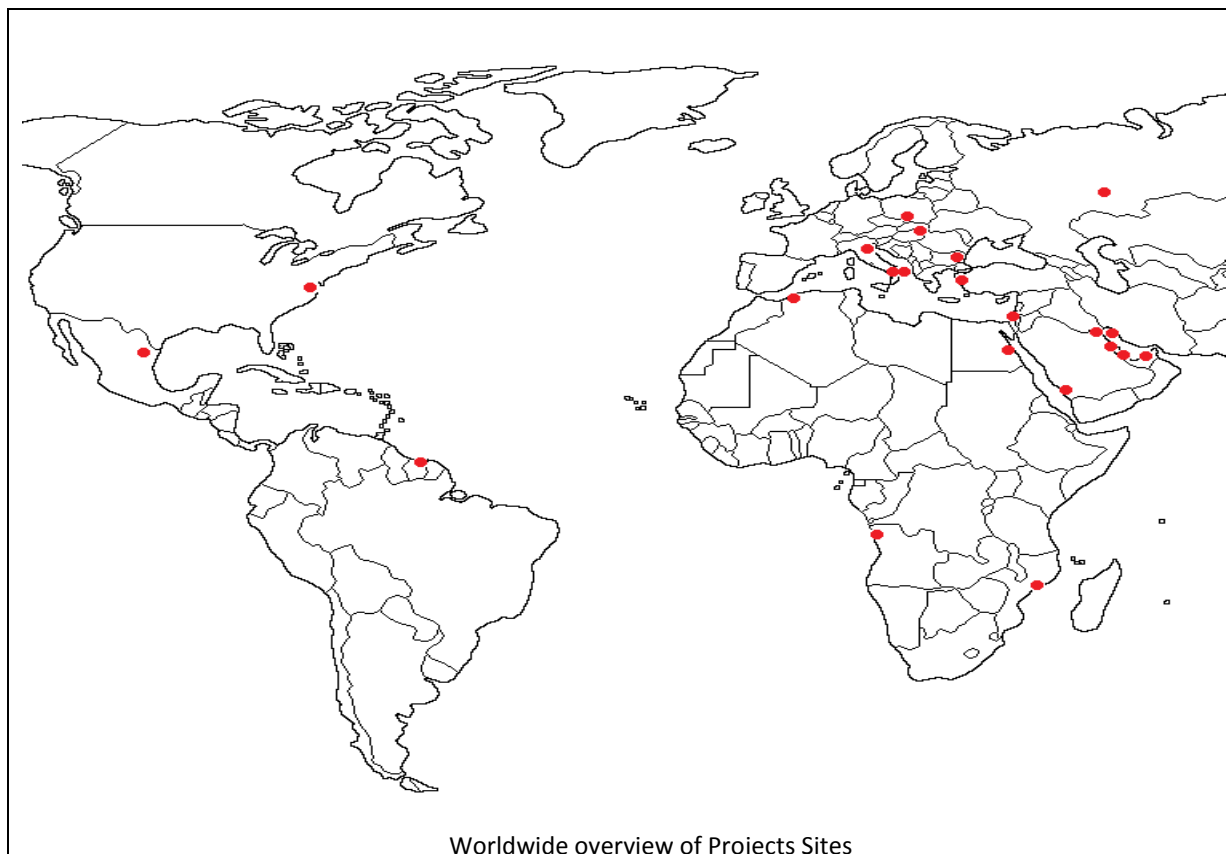
ProMec draftsmen are highly experienced in the preparation of Mechanical Drawings such as **Mechanical Datasheets**, **General Assemblies** and **Details Drawings**, these documents can be drafted using following drawing software: **AutoCAD®** & **MicroStation®** capable to handle most common technical drawing file types:

.DWG, .DGN, .DXF;

5. Projects History.

ProMec technicians and engineers have been involved in many large scale projects during their previous working experiences, the following is a selection made among the most important projects:

PLANT TYPE	ACTIVITIES
Crude Oil Refining Plant	(Design & Follow-Up)
Elastomeric Plant	(Design)
EPDM Slurry Plant	(Design)
Ethylene Plant	(Design)
Fuel Tank Farm	(Design & Follow-Up)
Gas Gathering & NGL Recovery	(Design & Follow-Up)
H-OIL & VGO Hydrocracking Plant	(Design & Follow-Up)
Hydrogen and Nitrogen Plants	(Design & Follow-Up)
LNG Complex	(Design)
Phosphoric Acid Plant	(Design & Follow-Up)
Power Generation Plant	(Design)
Styrene Butadiene Rubber Plant	(Follow-Up)
Urea Standalone Plant	(Design & Follow-Up)



Starting from the second half of 2015 ProMec Engineering has begun its activities working upon the mechanical engineering of following projects:

Bio Fuel plant for APS S.p.A. (Rome) [Front-End Engineering Design]

- Drafting Mechanical D/S:
- Pressure Vessel, Columns and Reactors.
 - S&T and Plates Heat Exchangers, AirCoolers.
 - Storage Tanks with fixed/floating roof.
 - Static Mixers, Ejectors and Filters.

Oil Refinery for APS S.p.A. (Rome) [Front-End Engineering Design]

- Drafting Mechanical D/S:
- Pressure Vessel, Pig Traps and Columns
 - S&T Heat Exchangers, AirCoolers and Heaters.
 - Storage Tanks with fixed/floating roof.
 - API e non API pumps.

Polymers Plant for APS S.p.A. (Rome)

- Design and follow-up:
- Stainless steel pressure vessels.
 - Carbon steel pressure vessels.
 - Pressure vessels' internals and appurtenances.
 - API e non API pumps.

LPG Bottling Plant Plant for TwoSeven s.r.l.

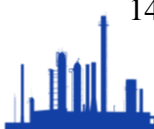
- F.E.E.D. Review / Design:
- Fixed Roof Storage Tanks.
 - Pressure Vessels and LPG Bullets.
 - API Centrifugal Pumps.
 - Nitrogen, Compressed Air and Water Packages.

Gasoil/Gasoline Tank Farm for TwoSeven s.r.l.

- Design and follow-up:
- Fixed and Floating Roof Storage Tanks.
 - Loading Arms, Water Treatment Packages.
 - Centrifugal and Reciprocating Pumps.
 - Pressure Vessels and Filters.

Delayed Coking Unit for KT

- Follow-Up of:
- Induced Draft Air Coolers
 - Pressure Vessels.



5.1. Main Equipment treated by ProMec.

Columns:

- Ammonia Absorbers.
- Debutanizers.
- Demethanizer.
- Distillation Towers.
- H₂S Strippers.
- Inert Washing Towers.
- Sour LPG Amine Absorbers / Contactors.
- Stabilizers.
- Vacuum Columns.

Storage Tank:

- Potable, Service and Fire Water Tanks (up to 20m diameter).
- Carbon Brick Lined Fluorosilicic Acid Tank.
- Double Wall Storage Tank.
- Fixed Roof Gasoline Storage Tank (up to 65m meters diameter).
- Floating Roof Gasoline and Jet Fuel Storage Tank (up to 40m meters diameter).
- Steam Traced Tank.
- Acid Mixer Tank .
- Cryogenic Tank.

Heat Exchangers:

- Ammonia Absorber & Condenser Vertical Shell&Tube Heat Exchangers.
- TEMA Shell & Tube Heat Exchangers, among the others:
 - AES, AEU, AKU, AXS, AXU, BES, BEU, CKU, NEN;
- Naval Brass TubeSheets & Bundles.
- Stacked S&H Heat Exchangers.
- Multichamber Heat Exchangers.

Columns and Vessels Internals:

- Bubble Trays.
- Cartridge Trays.
- Chimney Trays.
- Dispenser Trays.
- Valve Trays.
- Collectors, Distributors, Feed Pipes and Spray Nozzles.
- Demisters.
- Random Packing with Bed Limiters.
- Schoepentoeter.
- Vane Pack.

Pressure Vessel:

- Ammonia accumulators.
- Filters, Scrubbers and Venturi Scrubbers.
- Jacketed and Coil Heated Vessels.
- Hydro Desulphurizers.
- Adiabatic Reactors.
- Large Thickness and Large Diameter Pressure Vessel.
- LPG Bullets.
- Molecular Sieve Dryers.
- Vacuum Separators.
- Rubber Compound Mixing Vessel (With Motorized Impellers).
- Urea Granulators.

Machinery And Packages:

- General Purpose pumps.
- Multistage pumps (up to 10 stages, 200 kW).
- **API 610** pumps.
- **API 674** reciprocating pumps
- **API 675** metering pumps.
- High Speed (high head) pumps (up to 30.000 rpm).
- **API 617** Centrifugal Compressors (up to 5 MW).
- **API 618** Reciprocating Compressors.
- **API 673** Turbo Blowers and Compressors.
- **API 560** Furnaces air blowers and exhaust gas blowers.
- Gas engine self-driven Compressor for gas reinjection (750 kW).
- Carbon fibre spinning, winding and handling machines for fibre plants.
- CO2 recycling min-plant from refinery to urea plant.
- Emergency Diesel generators (up to 10MW).
- Liquid Nitrogen production and storage packages.
- Refrigeration package (up to 4 MW).
- Dosing units.
- Loading Arms.

Air Coolers:

- Forced Draft Air Coolers.
- Induced Draft Air Coolers.
- Plug and Cover Plate Headers.
- Finned Tube Air Coolers.
- U-Bend Air Coolers.

