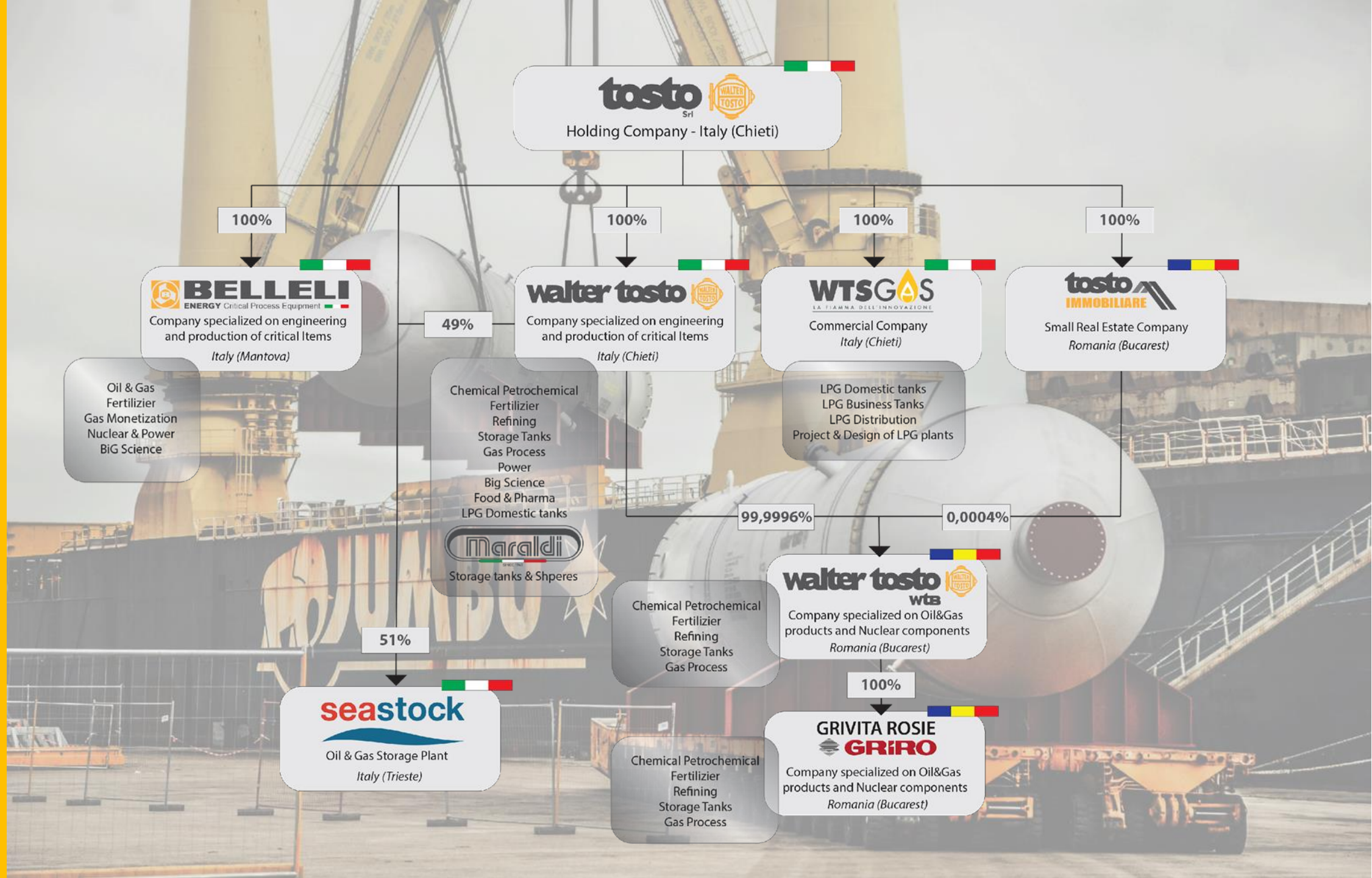
Maraldi

SINCE 1947

COMPANY PRESENTATION 2023

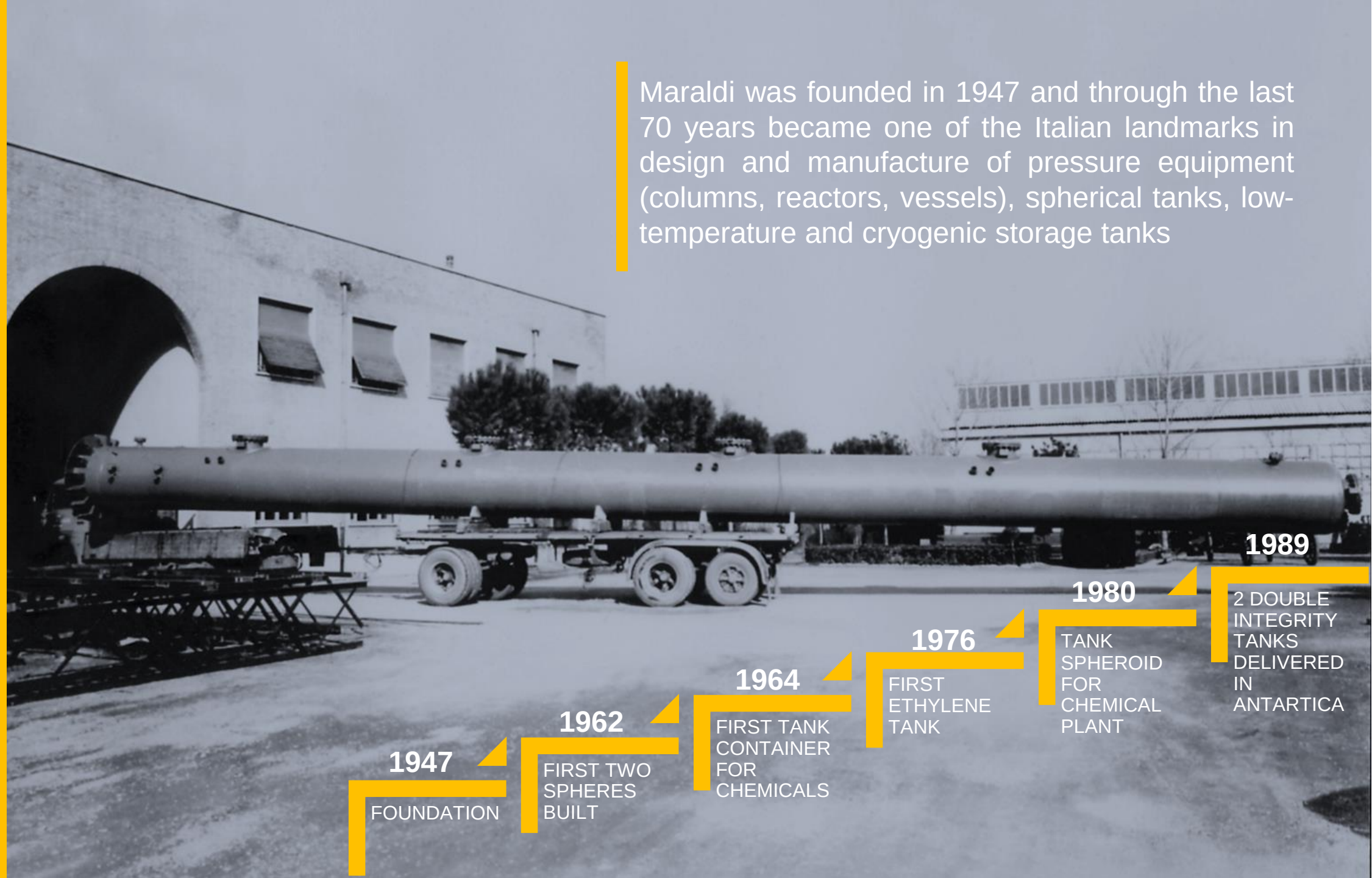
Tosto Group



Maraldi

History

Maraldi was founded in 1947 and through the last 70 years became one of the Italian landmarks in design and manufacture of pressure equipment (columns, reactors, vessels), spherical tanks, low-temperature and cryogenic storage tanks



1947
FOUNDATION

1962
FIRST TWO SPHERES BUILT

1964
FIRST TANK CONTAINER FOR CHEMICALS

1976
FIRST ETHYLENE TANK

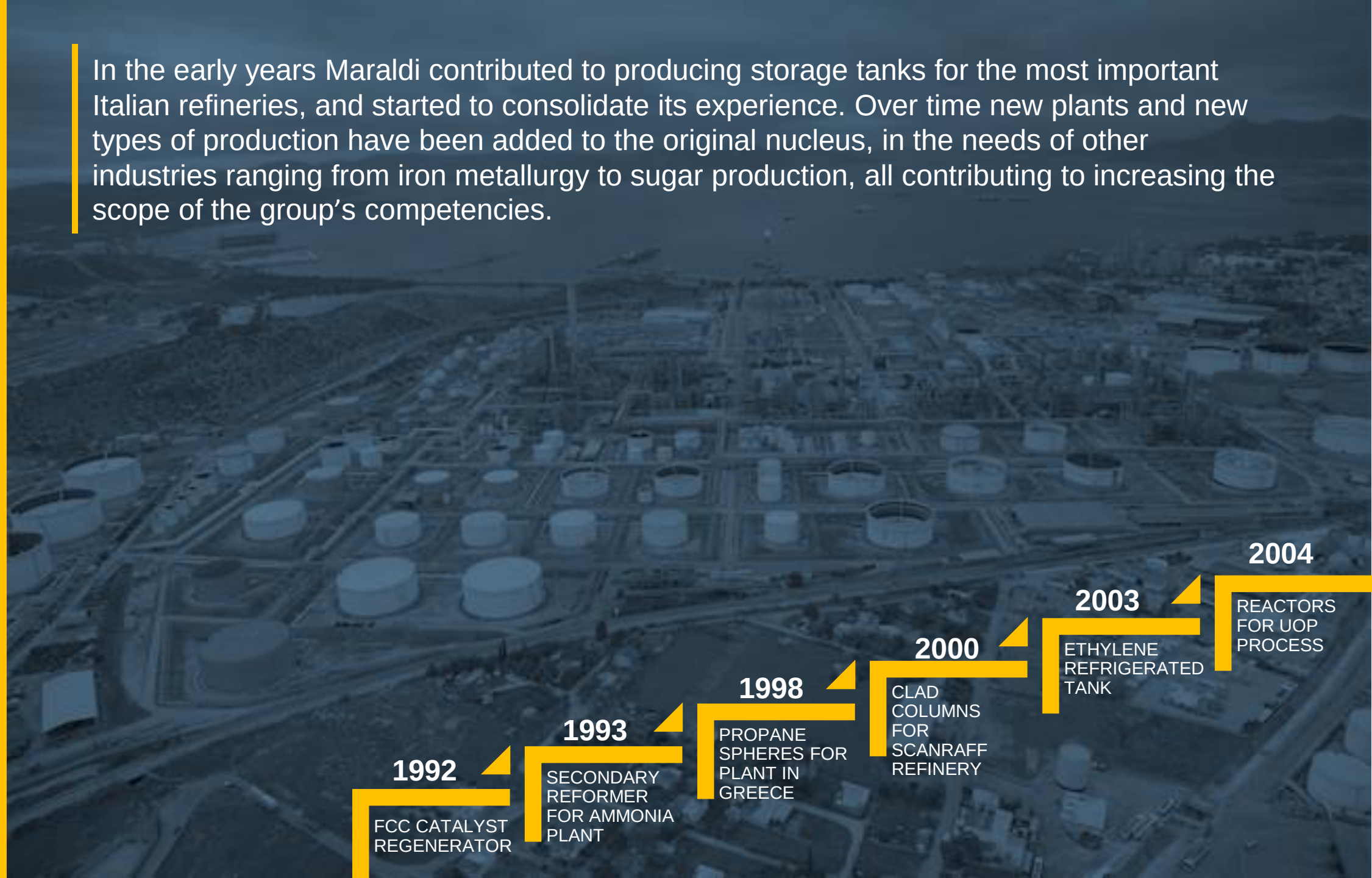
1980
TANK SPHEROID FOR CHEMICAL PLANT

1989
2 DOUBLE INTEGRITY TANKS DELIVERED IN ANTARTICA

Maraldi

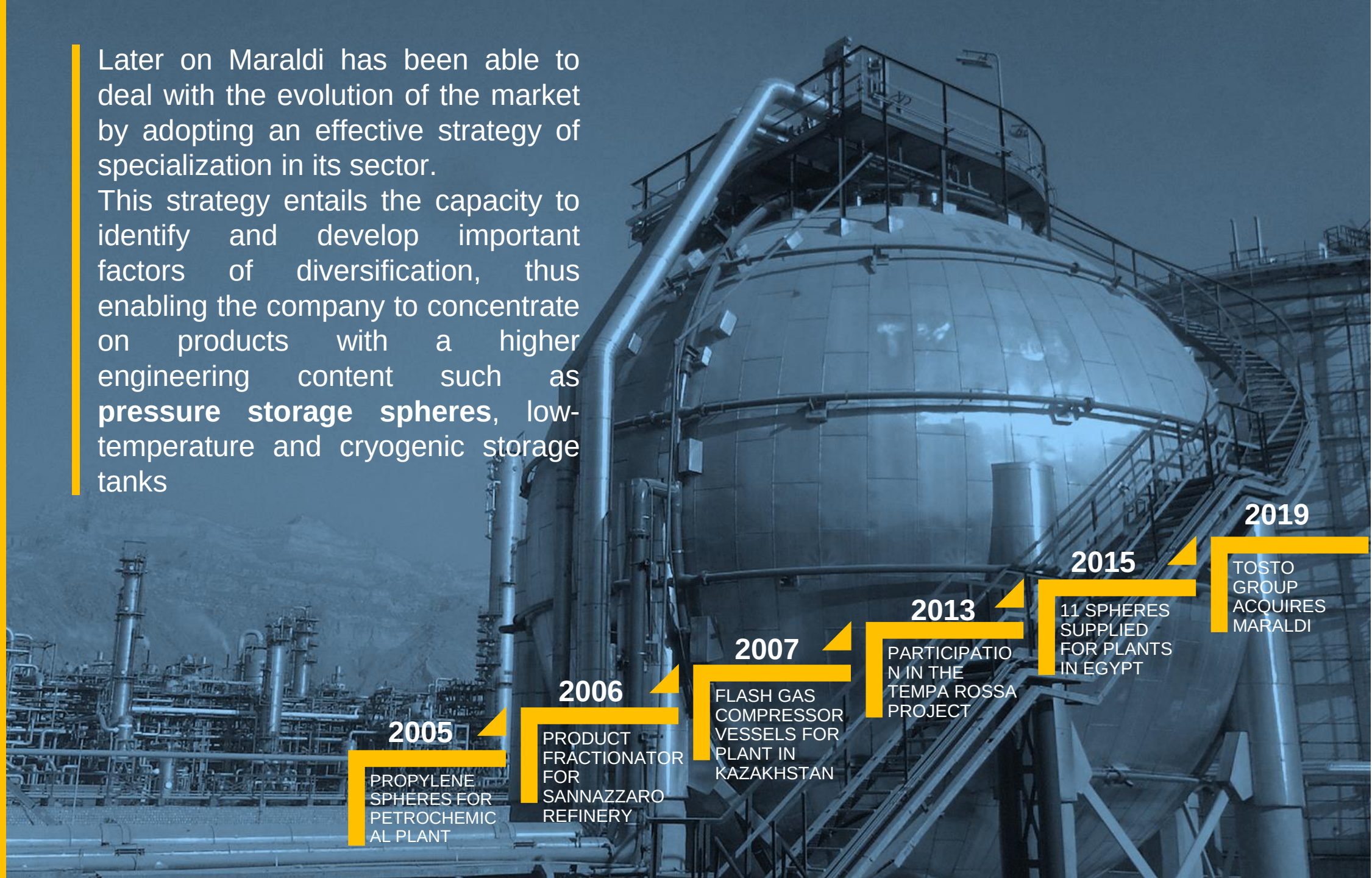
History

In the early years Maraldi contributed to producing storage tanks for the most important Italian refineries, and started to consolidate its experience. Over time new plants and new types of production have been added to the original nucleus, in the needs of other industries ranging from iron metallurgy to sugar production, all contributing to increasing the scope of the group’s competencies.



History

Later on Maraldi has been able to deal with the evolution of the market by adopting an effective strategy of specialization in its sector.
This strategy entails the capacity to identify and develop important factors of diversification, thus enabling the company to concentrate on products with a higher engineering content such as **pressure storage spheres**, low-temperature and cryogenic storage tanks



2005
PROPYLENE SPHERES FOR PETROCHEMICAL PLANT

2006
PRODUCT FRACTIONATOR FOR SANNAZZARO REFINERY

2007
FLASH GAS COMPRESSOR VESSELS FOR PLANT IN KAZAKHSTAN

2013
PARTICIPATION IN THE TEMPA ROSSA PROJECT

2015
11 SPHERES SUPPLIED FOR PLANTS IN EGYPT

2019
TOSTO GROUP ACQUIRES MARALDI

Identity

Maraldi

a Business Unit of Walter Tosto SpA

Walter Tosto Company

340.000 sqm Workshops

110 ml € Turnover

630 Employees

Maraldi

Walter Tosto Company

Sea Front Workshop

Wide Machine Park

60 Years Experience

Maraldi

Products

Maraldi provides state of the art Pressure Storage Spheres, Low-temperature and Cryogenic Storage Tanks for oxygen, nitrogen, ethylene, ethane, propane, LPG, ammonia and various hydrocarbons

Storage Tanks

Pressure Storage Spheres

Low-temperature & Cryogenic Tanks

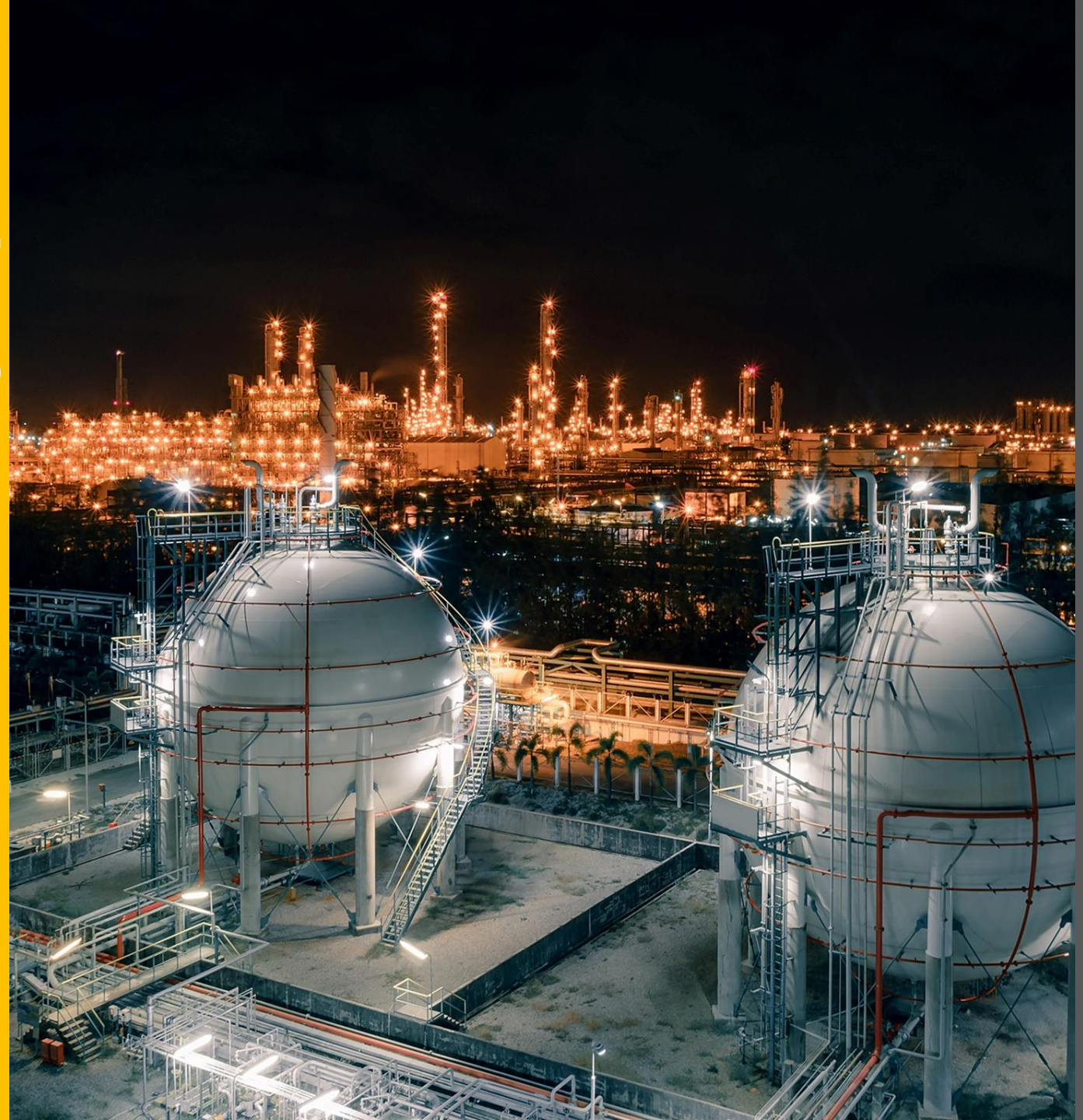
Pressure Storage Spheres

The construction of 20 - 25 meter diameter pressure storage spheres is a job that requires extensive skills and the best technologies for millimetric precision.

In addition to extremely accurate design and planning, a careful attention and experience are needed in the fabrication phase: forming the crowns and the various size petals entails compliance with very stringent tolerances. Even the sequence of execution of the different unit operations (pressure forming, cutting and beveling) plays a key role in the final outcome of a sphere since the seamless connection of any petal to another is a pre-requisite for a smooth onsite erection.

In order to provide an idea about the magnitude of these spheres, a typical sphere size can range from 1,000 to 7,000 m^3, with diameters between 12 and 24 meters and thicknesses from 30 to 80 mm. The weight of a large sphere can go beyond 1,200 tons.

Pressure Storage Spheres



Spheres are installed for the storage of liquified gases under pressure at ambient temperature; unlike the cryogenic tanks, spheres use the pressure effect rather than the temperature effect to ensure maintaining the gas in liquid state. Spheres are mostly used when the hydrocarbon gas (LPG, ethylene, propane, butane, etc.) is received at a certain pressure from the production site or from the grid and also when the storage space available is limited.

Maraldi's scope of supply normally includes all the auxiliary structures, the firewater/cooling rings, the heat detection system, valves (cut-off valves and pressure relief valves) and instrumentation including radar-type level instrument.

Maraldi has been building spherical tanks since the year 1962, when the first sphere was supplied to Anic in Ravenna; with more than 340 past references in this field, Maraldi can guarantee structures that in addition to being easy to assemble are extremely safe in service.

Pressure Storage Spheres

- Over 300 past references
- Maximum diameter: 25 m

Low-temperature and Cryogenic Storage Tanks

Efficiency and safety to store liquified gases

Made to store gases in liquid phase under low pressure, low-temperature and cryogenic tanks must ensure constant low temperatures to keep evaporation of the product to a minimum.

There are a number of important factors to consider in their design, including use of proper thermal insulation techniques, knowledge of materials and their behavior under thermal gradient and application of the best control systems.

Optimal tank operation and performance depend on all these elements.

From this point of view, Maraldi is able to ensure design experience and precision in the construction phase of single- or double-walled tanks for containing ammonia, oxygen, nitrogen, ethylene, ethane, propane and other hydrocarbons.

Low-temperature and Cryogenic Storage Tanks

The history of Maraldi with these types of tanks dates back from the year 1976, when the first ethylene tank (-104°C) was supplied to Tecnimont for a petrochemical plant in Tomsk, Russia.

In the specific field of fertilizer plants (typical configuration of an ammonia plant coupled with a urea plant), Maraldi's reference list shows a considerable number of ammonia storage tanks installations for several clients, starting from the first ammonia tank supplied in the year 1990 to Snamprogetti (presently Saipem) to the most recent installations for end users in Egypt and Pakistan.

The number of ammonia storage tanks awarded to Maraldi amounts to a total of eight and includes clients in Asia and Africa.

The largest ammonia tank designed and supplied by Maraldi is that for PIDEC/PIDMCO in Iran in 2007 for a capacity of 44,000 m3.

Low-temperature and Cryogenic Storage Tanks

- **Stored Products** : Nitrogen, Oxygen, Ethylene, Ethane, Propane, LPG and Ammonia
- Lowest design temperature: -196°C

Major Clients

FFBL Fauji Fertilizer Bin Qasim Limited
Tecnimont
Technip
SADELMI
SAIPEM
EGYPT GAS غاز مصر
ABB
PIDEC
pakarab FERTILIZERS LIMITED
Fatima Fertilizer Company Limited
SARAS
Braskem Idesa
ANSALDO ENERGIA
JORDAN PETROLEUM REFINERY CO. LTD.
PETROJET
النفط والغاز PETROGAS E&P
BENTINI
SOLEXIM
VÍTKOVICE VÍTKOVICE POWER ENGINEERING a.s.
PETROMEL
Kosan Crisplant
KELLOGG
SGI GENERAL INSPECTION
TECHNIPETROL HELLAS S.A. A Technip Company
CTIP OIL&GAS
MOTOR OIL (HELLAS) CORINTH REFINERIES S.A.
Air Liquide creative oxygen
HELLENIC PETROLEUM
MONTEDISON
api
ITALCO ITALIAN LUBRICANTS COMPANY
Gulf
Eni
thyssenkrupp

Maraldi SINCE 1947

Workshops

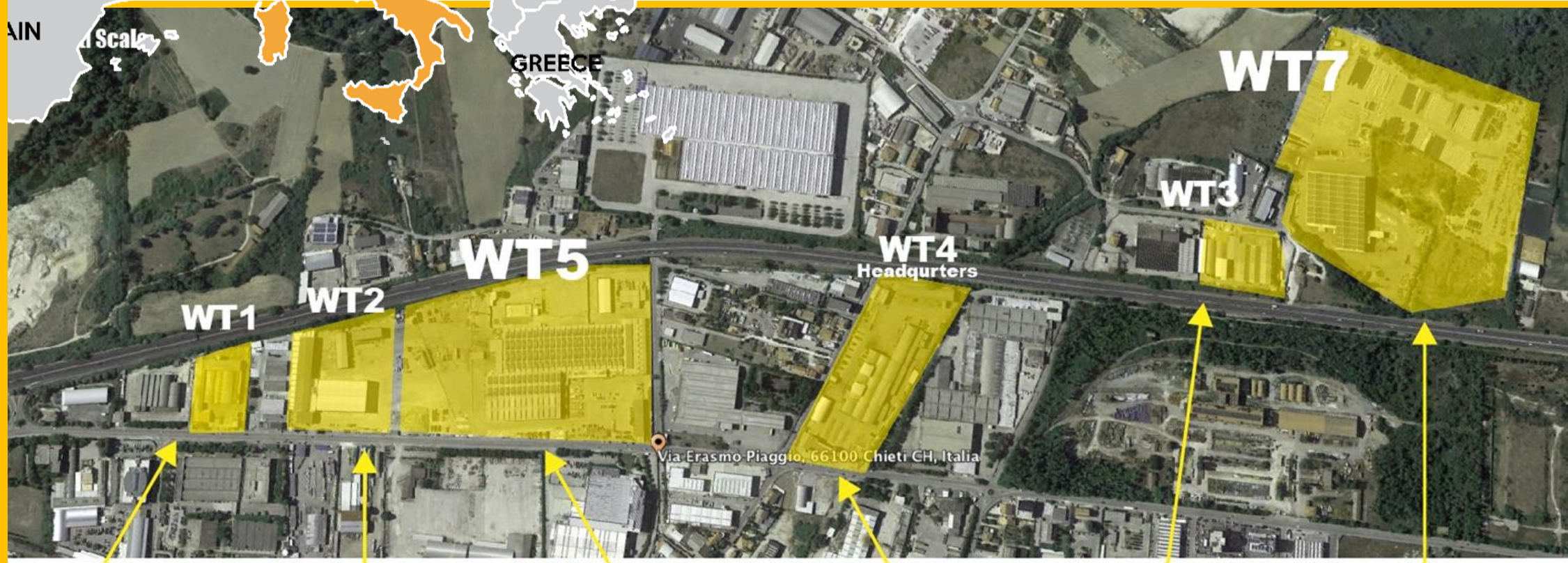
Workshops

Maraldi

Workshops

ITALY - Chieti

The company carries out its activities on a total area of over 300.000 sqm. with eight workshops, six of which are located in Chieti Scalo and a workshop that is located directly on the Adriatic sea, in the port of Ortona, which allows the direct shipment of the items with no limitations.



Workshops

ITALY – Ortona Sea Front Workshop

Walter Tosto Spa owns one sea-front workshop (WT6) directly located in the Ortona Port, on the Adriatic Sea, where there are 3 quays with the following features:

- RIVA : Height: 1.60 mt, Water Depth: 6.00 mt
- RIVA NUOVA : Height: 2.00 mt, Water Depth: 6.00 mt
- NORD NUOVA : Height: 2.00 mt, Water Depth: 7.00 mt

With over 9.000 sqm of covered facilities, Ortona's 3 covered spans are each equipped with double overhead cranage with unique lifting capacities. The significant dimensions of our furnace for Post Weld Heat Treatment (32m x 11m x 10m) allows us to minimize the quantity of localized PWHTs, while its "Cooperheat" combustion system assures a more rapid and uniform heating while allowing an accurate control of the overall temperature within the furnace (maximum deviation +5%).

Workshops

ROMANIA - Bucharest

Walter Tosto WTB's infrastructure in Bucharest has been completely renewed with energy efficient improvements, new machinery equipment and modern facilities for employees.

Workshops

ROMANIA - Bucharest

Covered Area : 32.500 sqm
Uncovered Area : 87.500 sqm

Workshops

ROMANIA - Oltenita

We own a private River Port in Oltenița including a covered area of 7.700 sqm and an uncovered area of 72.000 sqm. All logistics are carried out by self-propelled trailers and mobile cranes, and our own access ramps to the river for roll-on and roll-off operations.

Workshops

ITALY-Belleli Mantova

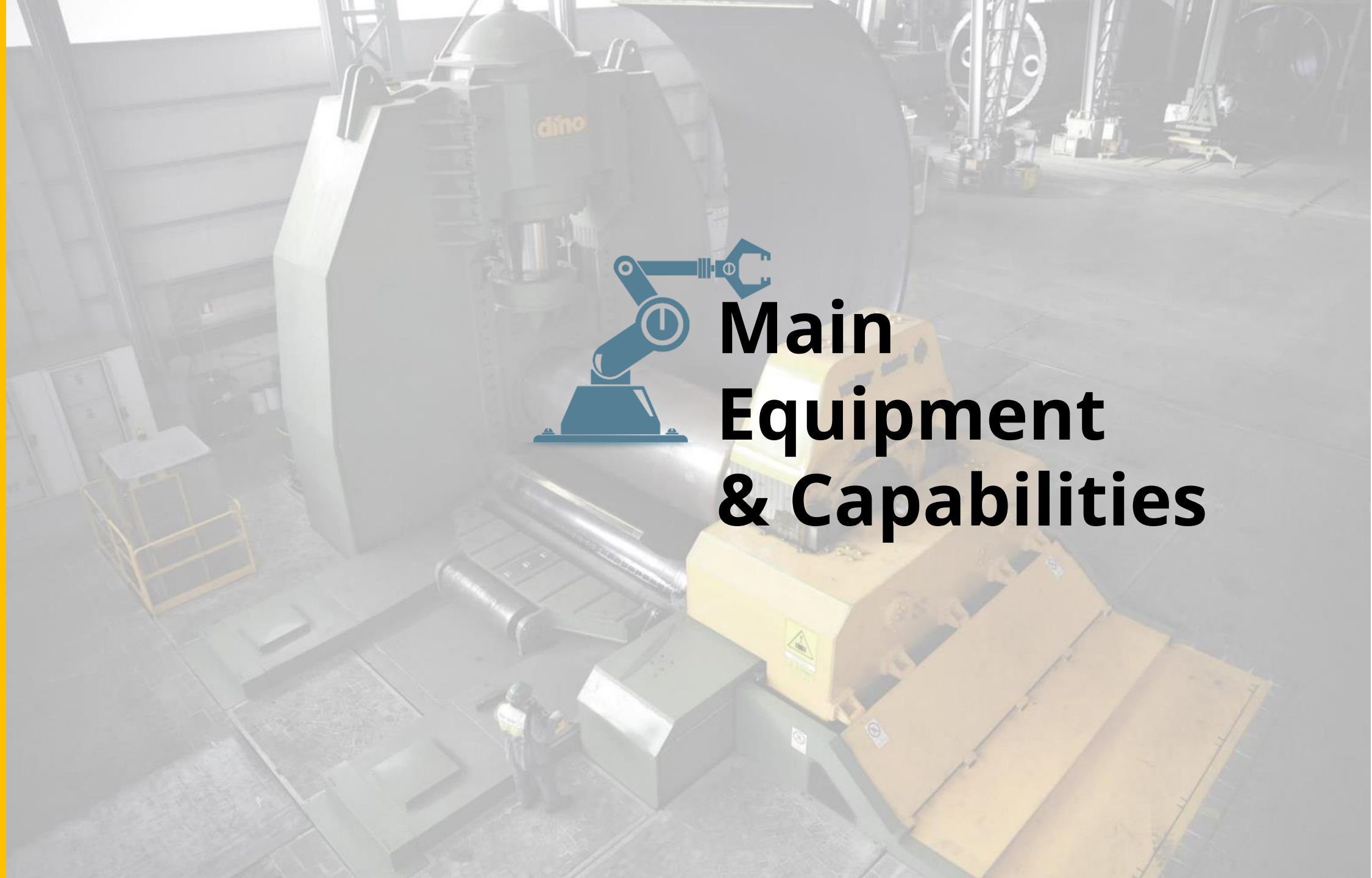
Founded in 1947, Belleli Energy CPE defines solutions for critical process equipment for the hydrocarbon and power industries.

The in-house design, engineering and manufacturing allow the company to ensure integrity of materials, processes and products from raw materials through fabrication, to completed products.

Workshops

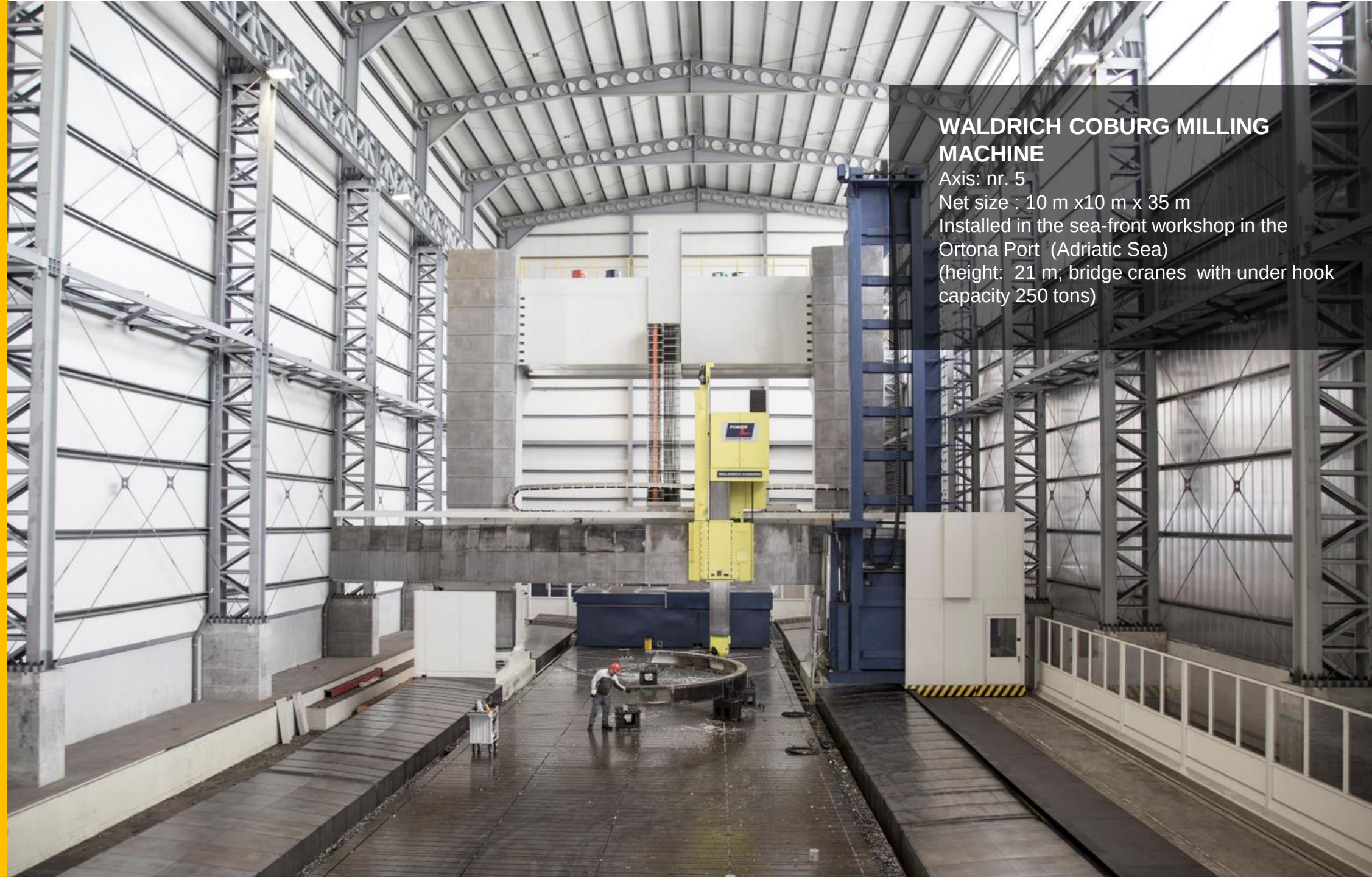
ITALY - Bertinoro

An additional Operational Department corresponding to the Maraldi Business Unit is located in Bertinoro (Italy). It includes Technical, Quality, Commercial, Project Management and Construction Management skills.



Main Equipment & Capabilities

Main Equipment & Capability



WALDRICH COBURG MILLING MACHINE

Axis: nr. 5

Net size : 10 m x10 m x 35 m

Installed in the sea-front workshop in the Ortona Port (Adriatic Sea)

(height: 21 m; bridge cranes with under hook capacity 250 tons)

Main Equipment & Capability

ROLLING MACHINE DINO 9000

Rolling Thk: over 300 mm Cold (subject to material type and width)
Pressing power (Tons)9000/1000
Maximum rotating power (Kg/m)1.300.000
Installed power (Kw)1.200
Table width (maximum plate width) (mm)3.600
Diameter of the bottom rolls (mm)860
Diameter of top rolls (mm)1.750

Main Equipment & Capability

PRESSING MACHINE BOLDRINI
Capacity: 1000 Tons
Board dimension: 3500x3500 mm
Run: 1500 mm

Main Equipment & Capability

PRESSING MACHINE SAPORITI
Capacity: 600 Tons
Maximum Diameter: 5000 mm
Maximum thickness: 70 mm

Main Equipment & Capability

VERTICAL HYDRO PRESS MACHINE
Capacity : up to 3000 tons
Max width of working area: 4200 x 3700 mm;
Max vertical stroke : 2200 mm

Main Equipment & Capability

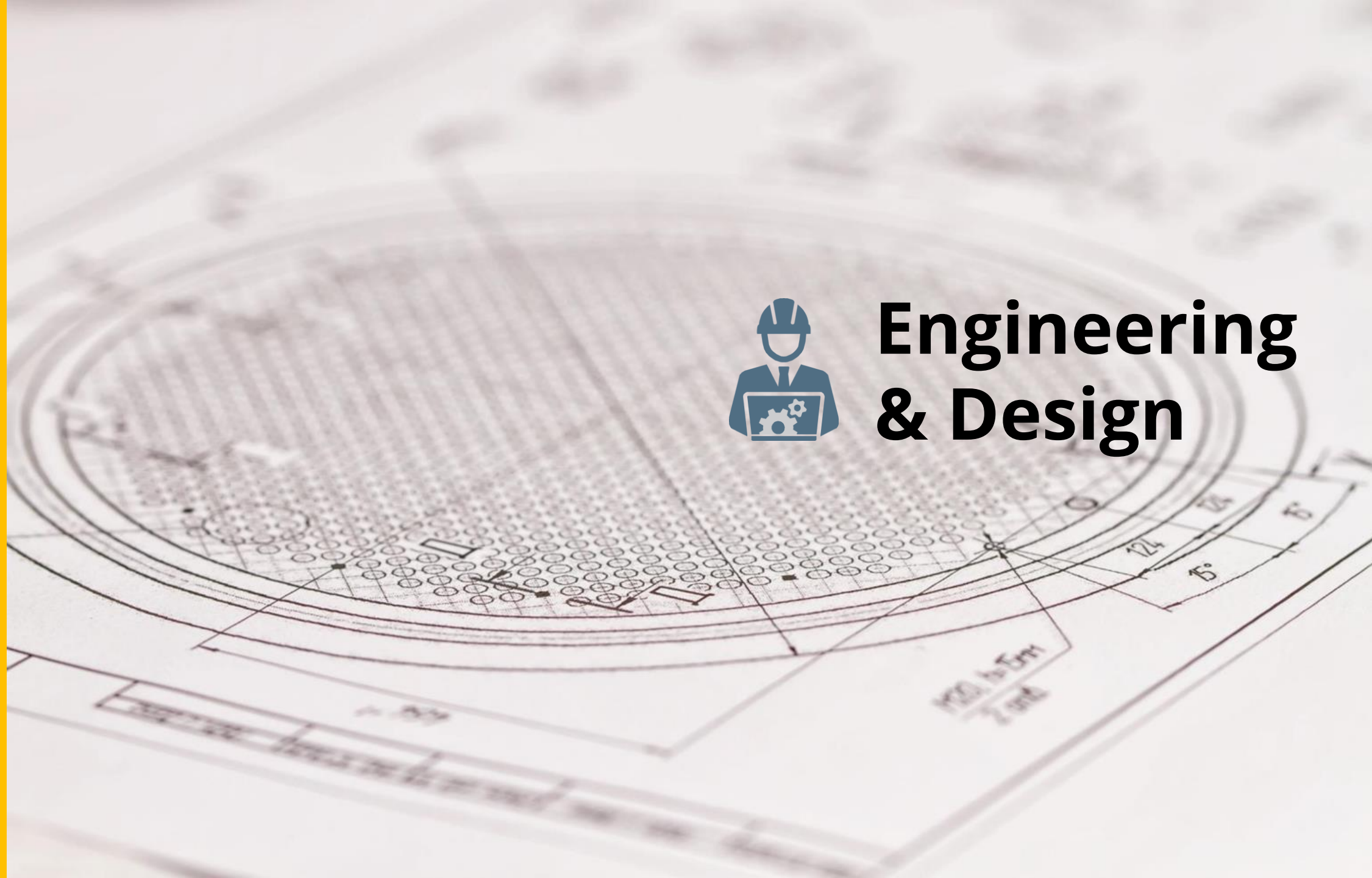
SANTEUSTACHIO VERTICAL LATHE

Platform Dia: 8.000 mm
Capacity: Up to 200 Tons
Axis: X 8.300 – Y 4.000
Z1 2.200 – Z2 2.200 – Z3 2.000
CNC: Siemens 840 D

Main Equipment & Capability

CORREA VERSA

This Gantry Milling Machine has 5 axes able to machine pieces up to mt 10,5 in lenght, 1,65 in height and 6,8 wide with very tight tolerances.



Engineering & Design

Engineering & Design

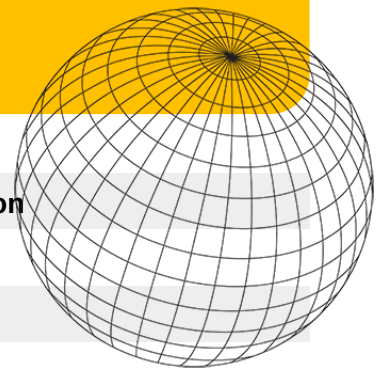
The full knowledge and the familiarity with all the existing design codes allow us to develop the best design from the mechanical point of view.

In-house presence of FEM experts, together with the several ANSYS licenses, make the Finite Element Analysis a powerful instrument in our hands, for the design of critical parts of the equipment.

Strong skills in the development of the thermal and fluid-dynamic design starting from Process Data Sheets, ensuring all the required guarantees to our customers.

Our design activities include:

- 3D simulations
- Stress analysis by finite elements methods
- Fracture mechanics analysis
- Static analysis in steady and unsteady conditions
- Fatigue analysis
- Creep fatigue damage evaluation
- Thermo-hydraulic design of heat transfer systems



Design codes and standards

ASME I	**ASME III Ed.2007 Add. 2009**	**ASME VIII Div.1 latest edition**
ASME VIII Div.2 latest edition	**ASME VIII Div.3 latest edition**	**API 620/625/650/653/2000**
AD Merkblatt 2000	**VSR**	**STOOMWEZEN**
SELO	**API 579 – 1 ASME FFS-1**	**PD 5500**
CODAP 2000 CODRES	**HEI**	**GOST**
IBR	**TEMA**	**EN 13445**
IBC 2006	**UBC 97**	**ABSA**
ASCE / SEI 7-05	**BS 7910-2005**	**EJMA 9TH Ed.**
EN 1405	**ASME B 16.5**	**ASME B 16.47**
API STD 6A	**API 934 – 941**	**NACE MR 0175/ ISO 15156-3**
RCC-M e RCC-MR – nuclear sector	**EUR (European Utility Requirements) – nuclear sector**	**ABSA**

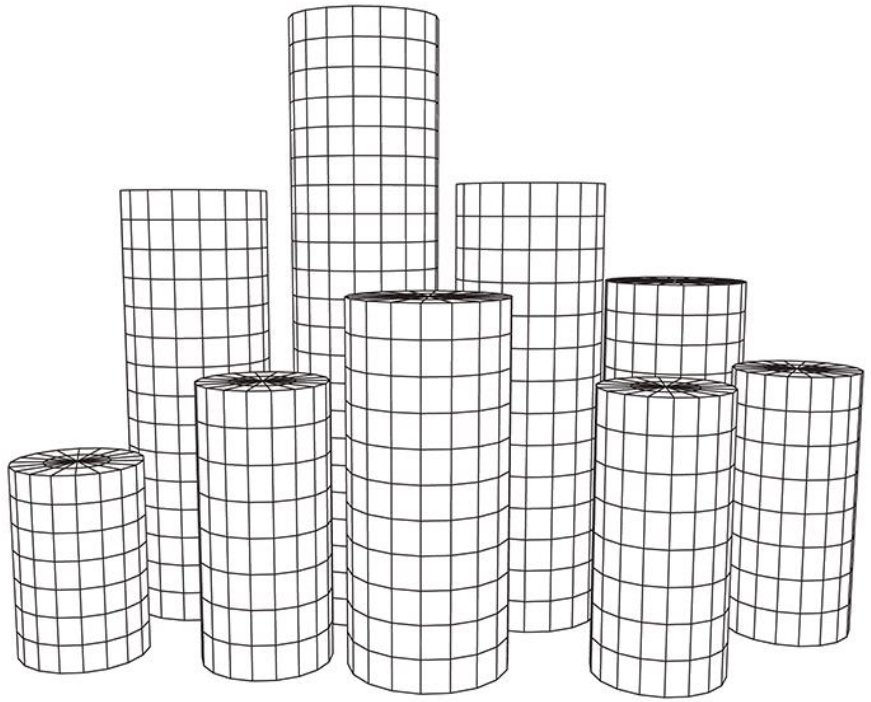
Engineering & Design

Main Design Software

- Finglow: PD 5500 pressure vessels calculation software
- Solid Edge: 3D drawing calculation software
- Pro ENGINEER: parametric 3D drawing program
- CATIA V5 R20: 3D drawing program
- ANSYS: finite element analysis and CFD analysis
- ASPEN Shell & Tube Exchanger Design Rating Software
- Aspen Exchanger Mechanical Design Software
- Sant'Ambrogio: mechanical calculation software for VSR, ASME VIII Div. 1 + EJMA expansion joints module
- ASME VIII Div. 2, AD 2000 Merkblatt + expansion joints module, WRC 107/257
- AUTOCAD AUTODESK: 2D drawing program
- TANK 2017 for API 650 and API 620 tank design

Metrology Software

- New River Kinematics: Spatial Analyzer
- Innovmetric: Polyworks
- Hexagon: Emscon, Tracker Pilot, RDS
- Aberlink: 3D MKIII



Engineering & Design

Materials

Carbon Steel (CS)
Fine-grain Steel/Normalized

Cr - Mo alloys
0,5 Mo
1 Cr – 0,5 Mo
2,25 Cr – 1 Mo
2,25 Cr – 1 Mo 0,25V

Ferritic Austenitic Steel Duplex
S 31803
S 32205

Ni - Alloyed Steel
0,5 Ni
3,5 Ni
9 Ni

Stainless Steel
Ferritic
Austenitic
Alloy cladded

Non Ferr. Materials
Ti-Gr I/Gr. II
Copper Alloy
High Nickel Alloy

Welding

Welding

The welding process is the core of our manufacturing activities

Welding Process employed	Manual	Automatic
Shielded Metal-Arc welding – SMAW	X	
Submerged-Arc Welding – SAW		X
Subm.-Arc Weld. with strips – SAW STRIP		X
SAW Double Wire – SAW Tandem		X
Gas Metal-Arc Welding – GMAW	X	X
Gas Tungsten-Arc Welding – GTAW	X	X
Flux-Cord Arc Welding – FCAW	X	X
Electro Slag Welding – ESW		X
Plasma-Arc Welding – PAW		X

Quality

Quality

The Group Quality Policy involves the management of all the activities and pursues the aim to guarantee quality standards at all the organization levels

Certificates

- ISO 9001
- ISO 3834-2:2006
- ISO 14001
- National Board R Symbol Certificate
- SELO Pressure V
- SELO Boiler
- National Board
- ASME U3
- ASME U2
- Asme S
- ASME N
- AEO – Full
- PED H, H1
- ASME NPT
- CU TR Compliance Certificate
- ASME U
- CU TR Certificate for Heat Exchanger
- Asme PP
- Asme NS
- Asme NB
- Gost for heat exchanger
- Gost for Pressure Vessel
- SQL China

HSE

Health & Safety

By following the shared Tosto Group policies, Maraldi is committed to guarantee health and safety of all the people working within the company. In this regard, precise preventive safety measures have been implemented in order to minimize injuries.

Environment

The strong connection with the territory makes the environmental protection part of Maraldi's philosophy. For this reason, the company is committed to define, observe and enforce the best practices for the reduction of all possible environmental impacts. This intention was achieved by the ISO 14001 certification, which formalizes the respect and protection of the environment by the company, that is committed to reduce the emissions.

CONTACTS

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