Industeel has references all around the world…

... for applications and markets with high safety equipments

- **COAL**
  Special steels for coal processing and usage:
  - Power Generation: heat resistant boiler steel 4290, 9MoNb
  - Coal Chemicals including gasification / liquefaction: 3.5% Ni steels, A203, A132Gr11, Gr132Gr11, clad plates

- **GAS TREATMENT**
  H2S resistant steels specially designed to the highest quality level for separators, amine absorbers:
  - XIC
  - XCC
  - Clad plates are also available
  - Austenitic & Duplex Grades

- **NUCLEAR**
  A real commitment allied to a strong experience to meet the challenge of the world nuclear renaissance:
  - Reactor Pressure Vessels
  - Steam Generators
  - Pressure Vessels, Boron Injection Tank
  A complete range of nuclear grades: 9Cr13, 9Cr13Mo, 16Mo3255, A132Gr11, stainless steels

- **REFINING & PETROCHEMICAL**
  High performance steels for the most severe applications of tomorrow’s refineries and petrochemical plants:
  - High Pressure, H2, high temperature, CrMo(V) series (HDC, HDT…)
  - H2S environment: HIC CMn series
  - Clad plates: coke-drum, distillation towers, separators
  - Stainless steels

- **PETROCHEMICAL**
  High performance steels for the most severe applications of tomorrow’s refineries and petrochemical plants:
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* Limited selection of references, this list is not exhaustive
** Industeel, referenced supplier for generation 2, PWR, AEBWR, EPR, AP1000, PBMR reactor types.

Industeel has references all around the world…

... and all markets needing high safety pressure vessel equipments

- **PETROCHEMICAL**
  Petrochemicals:
  - Urea: Alberta, Henan (China)
  - Ethylene:
    - Vera Cruz, Corpus Christi (USA)
  - Ammonia:
    - Waziers (France), Shiraz (Iran)

- **NUCLEAR**
  Nuclear:
  - St-Lucie, North Anna (USA)
  - Chooz, Civaux (France)
  - Hamm (Germany)
  - Olkiluoto (Finland)
  - Angra (Brazil)
  - Qinshan, Lingao (China)
  - Wolsung 1 (South Korea)
  - Koeberg (South Africa)

- **PETROCHEMICAL**
  Petrochemicals:
  - Vera Cruz, Corpus Christi (USA)
  - Ethylene:
    - Vera Cruz, Corpus Christi (USA)
    - Corpus Christi (USA)
    - St-Fergus, Sleipner Vest (North Sea)
    - Berri Gas, Hab (Middle East)
    - Hazira (India)
    - Bontan (Indonesia)

- **PETROCHEMICAL**
  Petroleum Refining:
  - Port Arthur, Garyville (USA)
  - Fort Hills (Canada)
  - KNP Refineries (Kuwait)
  - Cardon, SinCor (Venezuela)
  - ARAUCARIA (Brazil)
  - Bahia Blanca (Argentina)
  - Sasolburg (South Africa)
  - Ras Tanura (Saudi Arabia)
  - Mawei, Nanjing (China)
  - Mangalore (India)

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Steel solutions for pressure vessels

From design to commissioning…
Pressure vessels are critical pieces of equipment for a wide range of industries ranging from Oil & Gas to Petrochemical and Power Generation.

In all cases, the design and construction of these equipments must comply with strict design codes such as the European Pressure Equipment Directive (PED) and the American ASME code. They may be supplemented by API, NACE requirements for pressure vessels in oil and gas or refinery service. Further defining the exact conditions for safe fabrication and operation of such equipments.

These constraints dictate that the steel used in pressure vessel fabrication is particularly adapted for the given service conditions. This is why Industeel has developed a range of tailor made pressure vessel steels to account not only for improved vessel reliability and increased lifetime but also for easier fabrication and assembly. Whatever the nature of the difficulty, be it resistance to high temperature hydrogen rich environments or resistance to corrosive compounds such as H2S, Industeel can propose a range of carbon, low alloy or solid and clad stainless steels up to 200 mm thick up to 18 tons.

Finally, there may be additional specifications accounting for severe operating conditions ranging from cryogenic temperatures, to high temperatures in the creep range, or for severe operating conditions ranging from cryogenic environments or resistance to corrosive compounds such as H2S. Industeel can propose a range of carbon, low alloy or solid and clad stainless steels to account not only for improved vessel reliability and increased lifetime but also for easier fabrication and assembly. Whatever the nature of the difficulty, be it resistance to high temperature hydrogen rich environments or resistance to corrosive compounds such as H2S, Industeel can propose a range of carbon, low alloy or solid and clad stainless steels up to 200 mm thick up to 18 tons.

… a global experience
Industeel worldwide experience is a great asset to its customers through a global approach for the presence of corrosive environments where in-service degradation must be considered.

In a wide range of grades…
Industeel has developed specific solutions to resist demanding environments. Our traditions offer improved properties for particular applications, still maintaining specific code requirements.

For the thicker range of products, Industeel offers the capability to produce forge grades thanks to its proprietary forging rolling process.

For the pressures vessels, Industeel offers high performance grades through an optimized production process.

Working with Industeel is a guarantee to find help and support at each stage of your project.

From research to innovation…
In a rapidly evolving environment, Research, Development and Innovation are keys to success. Industeel has a world class Research Centre equipped with very powerful and technologically advanced means and experienced teams to develop new and better adapted steel solutions and provide technical assistance at every stage of the material life.

Example of low alloy steel families.

In a wide range of grades...

Steel solutions for pressure vessels

All components for pressure vessels...

- PLATES and forged plates for shells in different thicknesses:
  - Plate thickness from 5 mm (0.2’’) up to 100 mm (4’’)
  - Up to 4000 mm width (15’’)
  - Depending on steel grade for large plates with weights up to 150 MT
- Stainless plates up to 250mm thick up to 18 tons
- Fully welded clad plates up to 120 mm (4.75’’)
- Devisors for reactors internals stainless steels up to 200 mm thick up to 18 tons

- SINGLE PIECE DISCS
  (for tubeshells) up to:
  - 4 500 mm diameter (18’’)
  - 600 mm thick (2’’)
  - Larger diameters available in ready to weld multi segment discs

- SINGLE FORMED HEADS PIECE
  - Hemispherical: Inner diameter 1500 to 5000 mm (19’’ – 118’’)
  - Thickness up to 250 mm (10’’)
  - Elliptical: Inner diameter 2000 to 3500 mm (78’’ – 138’’)
  - Thickness up to 250 mm (10’’)

- MULTI-PIECES HEADS AND SHELLS
  - Ready to weld half shells (diameter up to 6000 mm (236’’)
  - Depending on cut back
  - Ready to weld complete heads for shells (diameter up to 1200 mm)

In a wide range of processing...

- 800 mm thick (32’’)
- 4 500 mm diameter (180’’)
- Beams for reactors internals stainless steels up to 1000 mm (39’’)
- Roll-bonded clad plates up to 120 mm (4.75’’)
- Stainless plates up to 200mm thick up to 18 tons
- Extra large plates with unit weights up to 100 MT
- Plates from 5 mm (3/16’’) up to over 300 mm (12’’)

- Multi-segment discs (diameter up to 12000 mm)
- Depending on cut back)

In a wide range of thickness...

- Thickness up to 250 mm (10’’)
- Inner diameter 2000 to 3500 mm (78 to 138’’)

For pressure vessels...

- Larger diameters available in ready to weld multi segment discs

For improved vessel reliability and increased lifetime and to reduce global life-cycle costs, but also for easier fabrication and assembly.

Whatever the nature of the difficulty, be it resistance to high temperature hydrogen rich environments or resistance to corrosive compounds such as H2S, Industeel can propose a range of carbon, low alloy or solid and clad stainless steels up to 200 mm thick up to 18 tons.

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