Industeel

ArcelorMittal

Steel solutions for cryogenic applications

A wide range of steel solutions to fit most stringent requirements in cryogenic applications

More than 150 years of experience
of melting, casting, rolling and finishing special steel plates.

Technical support
for material selection and fabrication.

The largest size
range of plate products.

Prefabrication
forming, bevelling, bending, painting, cutting.

R&D
fully dedicated to development and optimization of Industeel products for your business.

Certified
to all major certification and quality systems.

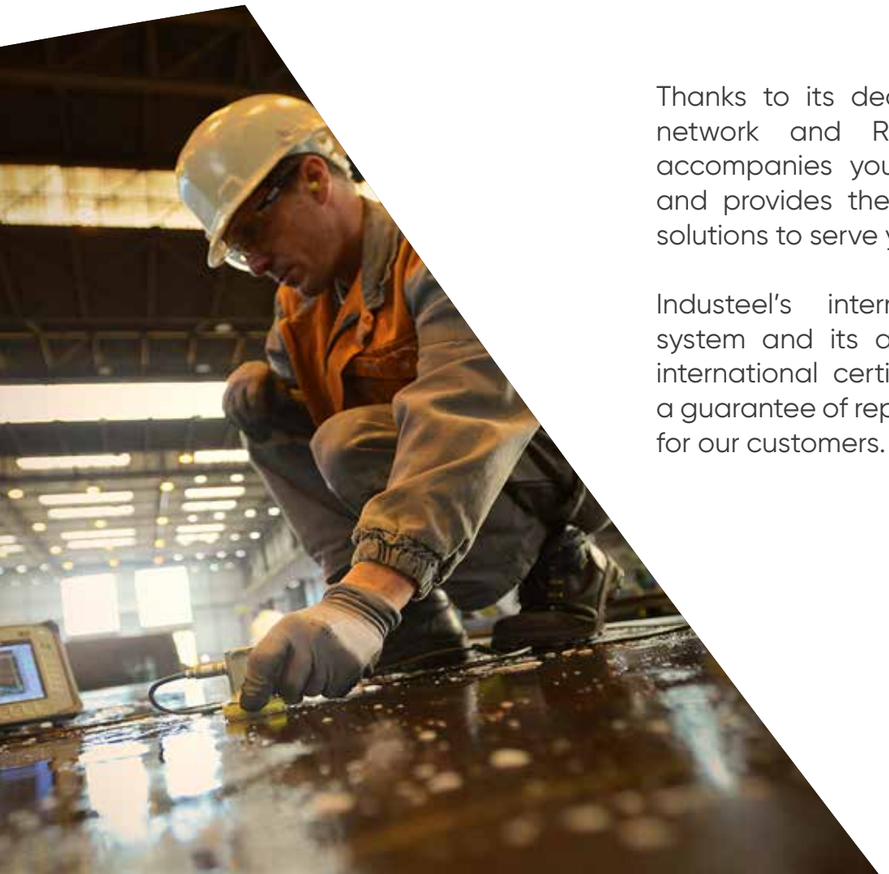
Key Benefits

- High quality steel plates
- High level of technical expertise
- Largest dimensional range
- Innovation

Leading producer of high quality steels

Industeel is specialized in the production of hot rolled as well as forged steel plates, ingots and formed pieces, with the largest dimensional range worldwide.

Industeel offers a complete range of high quality steel grades designed to meet the most severe customer specifications. Industeel's production facilities permit to covers the full spectrum of alloys used in cryogenic applications, ranging from Low Temperature Carbon Steels up to Nickel Base Alloys.



Thanks to its dedicated worldwide sales network and R&D facilities, Industeel accompanies your projects development and provides the most appropriate steel solutions to serve your business at best.

Industeel's internal quality assurance system and its approvals by the largest international certifying authorities provide a guarantee of reproducibility and reliability for our customers.

With a wide range of specialized equipment

First-class steel plate producer for most critical low temperature applications, from LTCS* to high nickel content steel grades.

With over 150 years of experience, the Industeel name stands for high performance steel at its best.

Careful selection of raw materials to produce high purity steel melted by electric arc furnace.

Fine tuned secondary metallurgy, vacuum and special degassing processes for high cleanliness steels.

Continuous casting or bottom-poured ingot programs and latest industrial techniques.

Computer controlled quarto plate rolling mills.

Automatic quenching devices and high precision tempering furnaces to create homogeneous hardness and microstructure through the cross section.

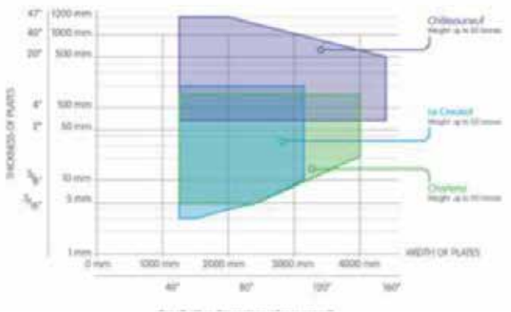
As a result, materials with uniform properties, providing consistent performance in service.

Largest dimensional range worldwide

CHARLEROI
Thickness: 5 - 175 mm - Width: up to 4.000 mm
Weight: up to 20 tonnes

LE CREUSOT
Thickness: 4 - 180 mm - Width: up to 3.100 mm
Weight: up to 20 tonnes

CHÂTEAUNEUF
Thickness: 80 - 1200 mm - Width: up to 4.300 mm
Weight: up to 80 tonnes



* *LTCS = Low Temperature Carbon Steels*

Large capacity flat-bottom above ground cryogenic tanks

Industeel offers a complete range of Nickel-alloyed steels and stainless steels used for the fabrication of large-scale onshore storage tanks.

Grade	ASTM/ASME	EN	KV temperature
CryElso™ 9Q	A/SA 553 Type I	EN 10028-4 X7Ni9 EN 10028-4 X8Ni9+QT680	-196°C / -320F
CryElso™ 7	A/SA 553 Type III	-	-196°C / -320F
CryElso™ 5	-	EN 10028-4 X12Ni5	-120°C / -184F
CryElso™ 201LN	A/SA 240 Type 201LN	EN 10028-7 X2CrMnNiN17-7-5	-196°C / -320F
UR™ 304	A/SA 240 Type 304	EN 10028-7 X5CrNi18-10	-269°C / -452F

With 60 years of experience in producing plates for LNG applications and more than 250 LNG tanks worldwide built using 400,000 metric tons of CryElso™ 9Q,

Industeel remains the most experienced steelmaker for that application and offers the best in-class products and associated expertise.

Industeel also provides cost competitive solutions to improve the economics of your project and to help you making it real.

Stainless steels for deep cryogeny

Industeel offers a complete range of stainless steels to withstand service temperature down to 4K.

Austenitic stainless steels

Austenitic stainless steels present a good ductility, ease of working and good corrosion resistance. They are derived from the 18Cr-8Ni stainless steel Type 304 or from the 17Cr-12Ni-3Mo stainless steel type 316.

Stainless steels can be used for multiple applications, such as cryogenic LNG transfer lines, for large scale components in compressors of liquefaction trains, as well as for liquid gases storage end transportation.

Grade	ASTM/ASME	EN	KV temperature
UR™ 304	A/SA 240 Type 304	EN 10028-7 X5CrNi18-10	-269°C / -452F
UR™ 304L	A/SA 240 Type 304L	EN 10028-7 X2CrNi18-9 or X2CrNi19-11	-269°C / -452F
UR™ 304N	A/SA 240 Type 304N	EN 10028-7 X5CrNiN19-9	-269°C / -452F
UR™ 304LN	A/SA 240 Type 304LN	EN 10028-7 X2CrNiN18-10	-269°C / -452F
UR™ 316	A/SA 240 Type 3016	EN 10028-7 X3CrNiMo17-13-3	-269°C / -452F
UR™ 316L	A/SA 240 Type 316L	EN 10028-7 X2CrNiMo17-12-2	-269°C / -452F
UR™ 316LN	A/SA 240 Type 316LN	EN 10028-7 X2CrNiMoN17-13-3	-269°C / -452F
UR™ XM19	A/SA 240 Type XM19	-	-269°C / -452F
CryElso™ 201LN	A/SA 240 Type 201LN	EN 10028-7 X2CrMnNiN17-7-5	-196°C / -320F

Austenitic stainless steels are also suitable for liquid hydrogen storage spheres servicing at -252°C (-421F) and for road transportation trailers. They can be produced in very thick sections for critical low temperature service components, such as cryostats in fusion reactors servicing at 4K.

Pressure vessel steels for low temperature process equipment and storage vessels

Industeel offers a large range of grades able to serve in low temperature environments that can be used either in cryogenic processes or for storing and transporting cold substances.

Grade	ASTM/ASME	EN	KV temperature
CarElso™ 537	A/SA 537 Class 2	-	-60°C / -76F
SuperElso® 533E	A/SA 533 Type E Class 2	-	-60°C / -76F
SuperElso® 500HR	-	EN 10028-6 P500Q/QH/QL1 & 2	-60°C / -76F
	A/SA 203 Grade A/B	-	-80°C / -112F
CryElso™ 203	A/SA 203 Grade D	-	-101°C / -150F
CryElso™ 203	A/SA 203 Grade E/F	EN 10028-4 12Ni14	-101°C / -150F
CryElso™ 5	-	EN 10028-4 X12Ni5	-120°C / -184F
CryElso™ 7	A/SA 553 Type III	-	-196°C / -320F
CryElso™ 9Q	A/SA 553 Type I	EN 10028-4 X7Ni9 EN 10028-4 X8Ni9+QT680	-196°C / -320F

Industeel provides a large range of pressure vessel grades with improved chemical compositions and production routes able to operate at low temperatures. Depending on the grades, sections up to 350 mm+ can be produced for specific equipment.

Industeel also proposes grades to be used according to various construction codes and design rules (ASME BPV, EN 13445, IMO IGC/IGF, ...). Multi-certified grades can also be produced as per customer requests and as per project specifications. Please enquire.

Emerging markets, liquid ammonia as fuel or liquid CO_2 shipment, can also benefit of our large experience in producing steel grades for low temperature applications and in managing corrosion issues.

The most advanced steel solutions for emerging markets

Additional services to support your projects and facilitate your supply chain

Complementary to its plate offer, Industeel can perform additional operations aiming at easing the projects logistics and the overall fabrication process.

Thanks to its two workshops at Dunkirk and in Saint-Chamond, Industeel can carry out various operations – such as beveling, chamfering, forming, welding of subcomponents to provide "ready-to-be-assembled" elements at the project site.

Industeel shops can perform the following operations (list is not exhaustive):

- Cutting of plates (oxy-cutting and plasma cutting) and/or of components (disk, stiffeners, etc.)
- Rolling of plates to shell radius
- Head or component forming
- Mechanical beveling of chamfers as per drawings
- Packing of components as per project specifications, ...

Please enquire in case of specific needs, we may have a solution to support your project.

Industeel R&D Center (CRMC)

A real centre of innovation, with 50 researchers dedicated to our customers, located in Le Creusot. Industeel's CRMC is a world class research facility with unequalled concentration of high-tech equipment and steel experts

R&D

Each year, half a dozen new products are put on the market thanks to the work of the research center. Over 40 products and process patents from the R&D center are currently in operation.

Innovation

In collaboration with customers, our engineers design new solutions to respond to specific market requirements with innovative products and/or processing methods. With dedicated expert, the research center offers the best vailable expertise in the business.

Technical assistance, cost control

Our team gives you on-field technical assistance to help you gain full advantage of Industeel grades.
During the lifetime of the project, we provide solutions in terms of heat treatment, welding, cutting and forming recommendations and other specific technical issues such as corrosion testing.

ArcelorMittal

Smarter steels for people and planet

XCarb®
Towards carbon neutral steel

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