



Worldwide references

CryElso® grades are approved by all major cryogenic storage tanks operators, designers and fabricators as well as classification societies : Lloyd's, TÜV...

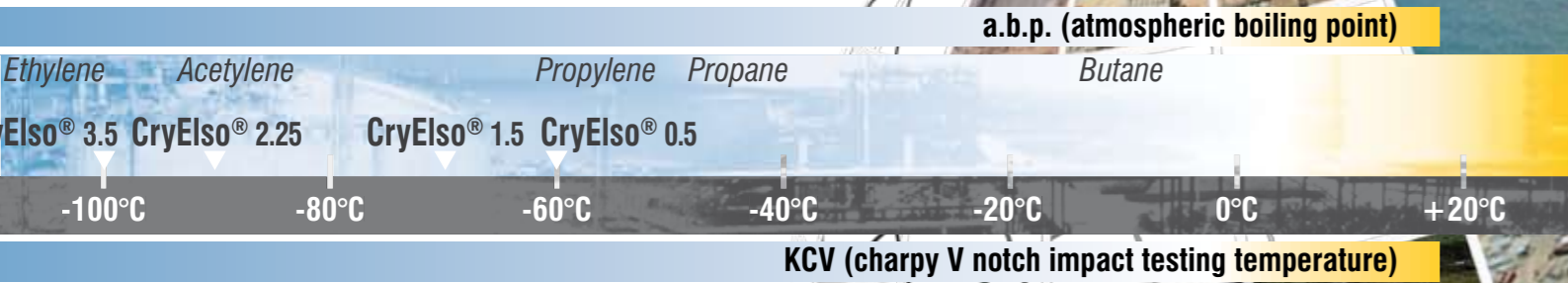
Industeel has supplied close to 300 000 tonnes of cryogenic steels over the last 35 years for storage tanks, process vessels, pipes, ships and offshore facilities worldwide including :

- ADRIATIC LNG OFFSHORE GBS (Italy)
- LNG TANK PUMP COLUMNS
- ETHYLENE SHIPS (Italy)
- SMALLER FIXED AND MOBILE STORAGE TANKS
- PEAKSHAVING FACILITIES
- PRELUDE FLNG

as well as numerous large facilities :

- ZEEBRUGGE (Belgium)
- GUANGDONG, FUJIAN (China)
- DAMIETTA (Egypt)

- FOS SUR MER (France)
- HAZIRA, DAHEJ (India)
- COSTA AZUL, ALTAMIRA (Mexico)
- BONNY ISLAND (Nigeria)
- SINES (Portugal)
- RAS LAFFAN (Qatar)
- TONG-YEONG, INCHEON, PYEONG-TAEK (South Korea)
- CARTAGENA, BARCELONA, BILBAO, HUELVA, EL FERROL (Spain)
- IZMIR (Turkey)
- DRAGON, ISLE OF GRAIN (UK)
- COVE POINT, FREEPORT, SABINE PASS, CAMERON (USA)
- ...



- 1 LNG storage tank for export (Qatar)
- 2 Ethylene bi-lobe tank (Romania)
- 3 LNG storage tank for import (Portugal)
- 4 LPG storage tank (Europe)
- 5 LNG storage tank for import (Dominican Republic)



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Industeel



Cryogenic steel grades

for low temperature applications

transforming
tomorrow

Cryogenic steel grades for low temperature applications

Worldwide leader in cryogenic plates

The demand for gas as a clean source of energy has been growing markedly over the last decade and is forecast to continue in the foreseeable future. The distances involved in transporting gas from source to market require significant investment in gas storage and transport facilities.

Cryogenic storage and transport demands the highest levels of safety, and this aspect has been fully integrated into steel design. Using a special steelmaking process based on the electric arc furnace with special ladle metallurgy and vacuum degassing, Industeel's CryElso® range ensures the best balance between strength, toughness and weldability, with special attention paid to crack arrest properties.



In response to this demand, Industeel has developed a range of Ni-alloyed steels specially designed for cryogenic gas storage and transportation, from 0.5%Ni steel for liquefied petroleum gas (LPG) to 9%Ni steel for liquefied natural gas (LNG).



A complete offer adapted to customers needs

● Dimensional

The whole range of cryogenic steel grades can be supplied in the following conditions covering a very large program.

Length : up to 16000 mm
Width : up to 4000 mm
Thickness : minimum 5 mm up to 200 mm and above

Actual size capabilities depend on grade.
Please consult for further details.

● Tolerances

Length and width : inscribed rectangle
Thickness : according to standard or customer specification
Flatness : 5 mm/m allowing for easy
• cutting and bevelling operations
• plate alignment
• automatic welding

CryElso® offers an enhanced range of thickness and flatness tolerances compared to international standards.



Project oriented services

● Project team organization

Our project team aims at providing customers with the highest level of logistical help by organizing prefabrication and transportation as well as single point-of-contact services.

● Prefabrication

CryElso® grades can be supplied as fully fabricated pieces ready for site construction :

- cut pieces according to drawings with stringent tolerances
- pre-bevelled rectangular plates
- pre-bent shells
- pre-welded sub-assemblies



● Coating and conditioning

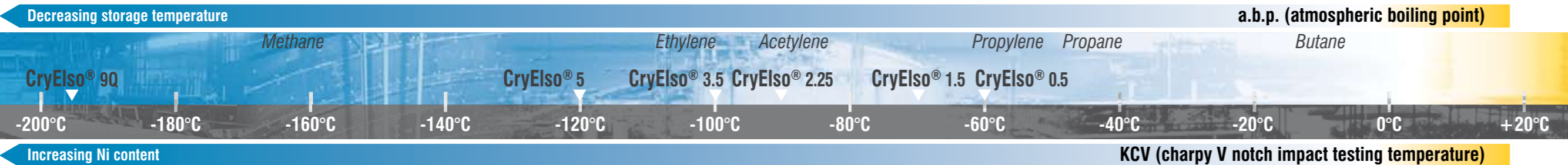
Plates are supplied in the shotblasted condition or primed with fully weldable paints meeting industry requirements.

● Weldability

CryElso® grades have been designed to be fully weldable using existing industrial techniques and materials. CryElso® 5 and 9Q are supplied with a maximum of 50 gauss residual magnetism thanks to specific mill handling procedures, thereby avoiding issues with welding.

● Technical support

Our research center (CRMC) and marketing department can provide the technical assistance required in order to help customers with material selection or fabrication questions like cutting, forming and welding.



The CryElso® family

A complete range of cryogenic steel grades from 0.5%Ni to 9%Ni steels, adapted for gas storage and transportation from propane to LNG and meeting the highest quality standards.

CryElso®	Corresponding standards EN10028/ASME
CryElso® 0.5	13MnNi6-3 / SA537 class 2
CryElso® 1.5	15NiMn6
CryElso® 2.25	SA203 grade B
CryElso® 3.5	12Ni14 / SA203 grade E
CryElso® 5	X12Ni5
CryElso® 9Q	X7Ni9 / SA553 Type I

*Industeel Trademark

● Testing and qualifications

Drop weight testing, CTOD testing, cold and hot forming. CryElso® 9Q is fully qualified for PD7777 up to 50.8 mm (2") thick.

Electric arc furnace melting, modern ladle metallurgy facilities and accurate heat treatment furnaces ensure the highest quality standards of cleanliness, soundness and reproducibility.

- Low P, S for excellent low T charpy impact properties and crack arrest safety
- Low C for controlled microstructure, giving excellent NDT and CTOD results