

CryElso™ 5 Cryogenic steel

Steel plates for liquefied ethylene (LEG)

CryElso™ 5 is Industeel's high toughness quenched and tempered 5% nickel steel grade as per European plates standards for cryogenic applications. The main application is gas storage and transportation at very low temperatures, down to -120°C. A typical use is ethylene transportation in bilobe tanks (LEG carrier).

CryElso™ 5 is available in plates from 5 to 50 mm thick.

Properties

Standards

- EN 10028-4 X12Ni5 (1.5680) (formely known as 12Ni19)

CryElso™ 5 is qualified as a naval grade according to several Class Societies. Please enquire.

Tensile properties

Guaranteed transverse tensile properties at room temperature are (Measured on every plates):

Plate thickness (mm)	Yield Strength (MPa)	Ultimate Tensile Strength (MPa)	Minimum Elongation (%)
5 ≤ t ≤ 30	≥ 390	530/710	20
30 < t ≤ 50	≥ 380		

CVN Impact properties

Guaranteed transverse Charpy V-Notch impact properties (Measured on every plates):

Thickness (mm)	Orientation	Minimum Impact Energy (J) at test temperature								
		-120 °C	-100 °C	-80 °C	-60 °C	-50 °C	-40 °C	-20 °C	0 °C	+20 °C
t ≤ 50 mm	Longitudinal	40	50	60	65	65	65	70	70	70
	Transverse	27	30	40	45	45	45	55	60	60

Chemical composition

Ladle analysis – Expressed in weight percent (wt%)

C	Mn	Si	P	S	Ni	Cu	Cr	Mo	Al
<0.06	0.30-0.80	<0.30	<0.010	<0.002	4.75-5.25	<0.12	≤0.10	≤0.10	≥0.02

Welding

Welding conditions

CryElso™ 5 is typically welded with nickel-base fillers, such as Alloy 625, 620 or C276. The following table provides some guidance on useable consumables classifications for arc welding processes. *(Non exhaustive list)*

	SMAW	GMAW	FCAW	SAW (Wire + Flux)
AWS	SFA5.11: E NiCrMo-3 E NiCrMo-4 E NiCrMo-6	SFA 5.14: ER NiCrMo-3 ER NiCrMo-4	SFA 5.34: E NiCrMo-3 T1-4	SFA5.14: ER NiCrMo-3
EN	EN ISO 14172: E Ni 6625 E Ni 6276 E Ni 6620	EN ISO 14172: S Ni 6625 S Ni 6276	EN ISO 12153: T Ni 6625 P M21 2	EN ISO 14172: S Ni 6625 EN ISO 14174: S A AF2 5643 AC H5

CryElso™ 5 can also be welded with 316L type stainless steel consumables.

Plate processing

Available sizes

CryElso™ 5 can be produced in thicknesses from 5 mm and up to 50 mm (3/16" up to 2")
Industeel proposes the following available sizes :

Thickness (mm)	Width (mm)	Max. Length (mm)
4.75 to 6.99	1200 to 2700 <i>(please consult for wider)</i>	4000 to 12000
7.00 to 7.99	1200 to 3400	4000 to 13000
8.00 to 8.99	1200 to 3600	
9.00 to 17.99	1200 to 3800 <i>(please consult for wider)</i>	4000 to 16000
18.00 to 50.00		

Prefabrication

By special agreement, prefabricated pieces can be delivered according to drawings. The following operations can be performed: beveling, bending, rolling of shell to radius, cutting to shape, fabrication of stiffeners and annular plates, pre-welding. *(Non exhaustive list, please consult)*

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Technical data and information are to the best of our knowledge at the time of editing. However, they may be subject to some slight variations due to our ongoing research programme on steels. Therefore, we suggest that information be verified at time of enquiry or order. Furthermore, in service, real conditions are specific for each application. The data presented here are only for the purpose of description, and considered as guarantees when written formal approval has been delivered by our company. Further information may be obtained from the address opposite.