



Marine & Offshore

Certificate number: 62231/A0 BV

File number: MAT 49775-2020

Product code: 9009I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

www.veristar.com

APPROVAL CERTIFICATE for MATERIALS

This certificate is issued to

INDUSTEEL FRANCE
CHATEAUNEUF - FRANCE

for the type of product

EXTRA HIGH STRENGTH STEEL ROLLED PRODUCTS

Hot rolled plates in steel grade E690.

Requirements:

Bureau Veritas Rules on Materials and Welding for the Classification of Marine Units

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 04 Sep 2025

For Bureau Veritas Marine & Offshore,

At BV LYON, on 04 Sep 2020,

Yann Krempewicz



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

Hot rolled plates.

Steel grade	Deoxidation practice and Refining	Delivery condition
E690	Killed and fine grain treated with Al+V	Quenched, tempered and stress relieving with thickness up to 254mm

Steelmaking in Electric Arc Furnace (EAF) and Vacuum Degassing (VD). Ingot casting. Minimum reduction ratio 3:1.

2. DOCUMENTS AND DRAWINGS :

2.1-Documents issued by Industeel France:

- "Presentation Industeel France" dated February 2017.
- "Extension of qualification up to 254mm thick" dated 25/07/2019.

2.2-Chemical composition specification on ladle for grades E690 issued by Industeel France and summarized hereafter

Elements (%)	C	Mn	Si	P	S	Al	Ti	V	Ni
Min.	-	-	0.10	-	-	0.020	-	0.03	-
Max.	0.15	1.60	0.40	0.020	0.010	0.080	0.02	0.05	3.90
Elements (%)	Cr	Cu	Mo	Nb	B	N	Ceq	Pcm	
Min.	-	-	0.45	-	-	-	-	-	
Max.	0.70	0.25	0.65	0.015	0.005	0.008	0.75	0.33	

$C_{eq} = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15$; $P_{cm} = C + Si/30 + (Mn + Cu + Cr)/20 + Ni/60 + Mo/15 + V/10 + 5B$.

2.3-CTOD tests have been carried out on base metal and on butt weld assembly with steel grade E690-QT, thickness 254mm, Plate No.22161.2, according to test method ISO 12135 and ISO 15653 and results are summarized hereafter:

Grade	Welding method	Heat input (KJ/cm)	Temperature	Notch position	CTOD values (mm)
E690	N.A.	N.A.	-10°C	Base metal	0.38 ; 0.48 ; 0.38 ; 0.33 ; 0.24 ; 0.24
	SAW	20	-10°C	Weld metal	0.19 ; 0.23 ; 0.21
				CGHAZ	0.19 ; 0.17 ; 0.15 ; 0.13 ; 0.15 ; 0.17

3. TEST REPORTS :

3.1-Documents issued by Industeel France:

- Report Ref.22161.2 dated 25/04/2019
- Report Ref.NT-CRMC-2019-132 Rev.1 dated 19/06/2019.
- Report Ref.21802.2 dated 04/07/2014.

3.2-Documents issued by Institut de soudure - Yutz:

- Reports Ref.4680-4I6IWT-V1, Ref.4680-4I6S5B-V1, Ref.4680-4I6P1O-V1 dated 17/07/2019.

4. APPLICATION / LIMITATION :

As per Bureau Veritas Rules for Classification. Maximum heat input for weldability testing is 20kJ/mm.

5. PRODUCTION SURVEY REQUIREMENTS :

5.1 - The steel plates are to be supplied by Industeel France in compliance with the type and the requirements described in this certificate.

5.2 - This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

5.3 - BV product certificate is required.

6. MARKING OF PRODUCT :

As per Bureau Veritas Rules for Classification. In addition to the material grade designation, products are to be marked with the symbol Z25-Z35 as appropriate.

7. OTHERS :

Nil.

***** END OF CERTIFICATE *****