TECHNICAL SPECIFICATION N°10923508-SPC

IND	Modifications	Date	Visa	Verif.	Appr.
01	Création/ *first issue*	03/ 06/ 14	BPY		PBU
02	§4.1 m.à j./ *updated*	05/ 06/ 14	BPY		PBU
03	*Refer to blue marks*	10/ 06/ 14	BPY		PBU
04	*§3 Updated*	20/ 06/ 14	BPY		FDE

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1. SUBJECT

The purpose of this specification is to define the technical requirements on steel plates dedicated to a FCS type fairlead. Max plates th. is 83 mm.
The fairlead is classified in “special” structural category with design temperature +15°C (warm seas).

2. APPLICABLE DOCUMENTS

- EN10225 July 2009: *Weldable structural steels for fixed offshore structure – Technical delivery conditions.*

- BV NR 216 January 2014

- This specification

- TOTAL GS EP STR 201 October 2013

As reference :

- API RP 2Z September 2005

3. DEFINITION

S460G2+M or G2+QT Z35 EN10225

OPTIONS 9 – 10 – 13 and 18

For contractual reference to GS EP STR 201: S460KT-40Z35P

4. ADDITIONAL REQUIREMENTS

4.1 Manufacturers

Authorized manufacturers are:

- Dillinger Hütte
- Voestalpine
- Salzgitter
- Arcelor (NL – B) Gijon factory is not authorized

4.2 Marking

A marking system that guaranty the full traceability with mill, heat, plate N° (including mother plate) shall be proposed.

4.3 Chemical analysis

In addition to EN10225 requirements on product analysis:

Si max % weight	Mo max % weight	Ni max % weight
0,40	**0,10**	**0,55**

For plates with th ≤ 20 mm

CEV max = 0.42 %

4.4 Mechanical tests

In addition to EN10225 requirements:

4.4.1 Test unit

Shall be : EACH MOTHER PLATE

The term "mother plate" (or, otherwise, "rolled plate" or “parent plate”) designates the whole of the plate which has the same thickness and heat treatment (if any) as that of the finished product, obtained from one slab.

4.4.2 Simulated PWHT

Tests shall be done after a simulated PWHT (whatever the thickness of the material is).
At max temp of the scheduled PWHT i.e. 600°C holding time 2min per mm thickness.

4.4.3 Tensile test values to be achieved

	MYS (MPa)	TS (MPa) min	A (%) min	YS/TS max
th ≤ 16	460	530-720	18	0,91
16 < th ≤ 40	430	530-720	18	0,90
40 < th ≤ 63	420	530-720	18	0,88
63 < th ≤ 80	410	530-720	18	0,86
80 < th ≤ 100	400	530-720	18	0,86

4.4.4 Tensile tests in the through thickness direction for Z35

One set of three tensile specimens cut in the through thickness direction at each end of mother plate at midway between plate edges. Frequency testing is : per heat.

4.5 Other tests

4.5.1 UT testing

UT scanning shall be done on body and edges acc. to EN 10160 **Class S_3/E_4** on 100% of the plate surface for plates with wall thickness less than 50 mm.

4.5.2 Weldability tests

To be performed acc. to annex E F and G of EN 10225 standard and witnessed by a recognized third party inspection for plates with th ≥ 60 mm.
Temperature of CTOD tests (performed during qualification) shall be lower than the minimum service temperature (15°C).
For appendix E, if prequalification dossier cannot be presented, the testing program can be limited to: - SAW welding with welding energy 3,5 kJ/mm with PWHT
- Minimim value to obtain shall be 0,25mm with test performed at a T°C < +15°C

Validity of qualification stated above shall be according § 5 of API RP 2Z.
In addition, the following changes shall be considered as MAJOR and shall request a full requalification:

- Specific plate-rolling mill and steel product facility.
- Specific steel-making method or melting practice (EAF-VD, BOF-LRF-VD, etc.), nominal proportions of scrap (by designated scrap grade) and hot-metal charge, nominal weight or heat, and any hot-metal treatment (degassing, desulfurization, injection, refining, etc.).
- Method of inclusion shape control and procedure for verifying metallurgical effectiveness.
- Casting method (top poured ingot, bottom-poured ingot, or continuous), usage of argon shrouding, and implementation of strand-cast soft reduction.
- Segregation-control procedures (electromagnetic stirring, electromagnetic braking, etc.) and segregation quality-control procedures (sulfur and phosphorous prints of slab cross sections and testing frequency) for continuous-cast product.
- Continuous cast slab thickness or ingot size and weight and relationship to plate thickness.
- Cross rolling ratio.

5. THIRD PARTY INSPECTION

3.2 EN10204 certificate shall be supplied.

BV shall sign and stamp all 3.2 certificates. The date of stamping and signature shall be mentioned on certificates.

The minimum scope of work of this third party shall be as follows :
(BV may have a more extensive scope of work to fulfill their own obligations of material acceptance)

- Witness sampling, review chemical analyses (cast and product)
- Review heat treatment records/charts
- Witness and marking test samples and test specimens
- Witness mechanical tests
- Witness/monitoring visual examination and dimensional inspection
- Checking markings (stenciling, color coding, die stamping, shipping mark)
- Review, approval, sign and stamp of Mill certificates, laboratory tests and NDT records
- Witness of above weldability tests
- Hard stamping of third party inspection’s mark.

The supplier will take in charge the a.m. third party inspections (placing of the orders, specifying and notifications for inspections,…).

BV shall check and inform NOV-BLM in case of discrepancy of the present specification with the NR216 rules (most stringent rules shall be applied).