



Marine & Offshore

Certificate number: 37273/B1 BV

File number: MAT 2395-2013

Product code: 9019I

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

SIDENOR ACEROS ESPECIALES, S.L.

Reinosa (Cantabria) - SPAIN

for the type of product

ROUND BARS FOR OFFSHORE MOORING CHAIN CABLE

Round bars for offshore mooring chain cables in steel grades QR3, QR3S, QR4/R4S and QR5

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: 10 Jan 2024

For Bureau Veritas Marine & Offshore,

At BV BILBAO, on 29 Mar 2019,

Juan Jose GUTIERREZ GARCIA



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 round bars for offshore mooring chain cables.

Steel grade	Delivery condition - Round bar diameter
QR3; QR3S; QR4; QR4S (1)	As rolled with thickness up to 185mm
QR3(2)	As rolled with thickness up to 203mm
QR3S (3)	As rolled with thickness up to 186,5mm
QR3S (4)	As rolled with thickness up to 210mm
QR4 (5)	As rolled with thickness up to 183mm
QR5 (6)	As rolled with thickness up to 175mm
QR5 (7)	As rolled with thickness up to 230mm

(1) Steelmaking in Electric Arc Furnace, Ingot casting by bottom pouring. Reduction ratio is above 7.0 for steel grades QR3, QR3S, QR4, QR4S.

(2) QR3 chemical composition as per specification Ref.MPSR3 Rev.02 dated 28/03/2015. Steelmaking in Electric Arc Furnace, LF Refining and Vacuum Degassing, Continuous Casting. Blooms size 470 × 350mm are manufactured by Sidenor Basauri. Minimum Reduction ratio is 5.1;

(3) QR3S alternative chemical composition as per specification Ref.MPSR3S Rev.02 dated 05/12/2014. Steelmaking in Electric Arc Furnace, LF Refining, Continuous Casting. Blooms size 470 × 350mm are manufactured by Sidenor Basauri. Minimum Reduction ratio is 6.0;

(4) QR3S alternative chemical composition as per specification Ref.MPSR3S Rev.02 dated 05/12/2014. Steelmaking in Electric Arc Furnace, LF Refining, Ingot Casting size 464 × 464mm. Minimum Reduction ratio is 5.6;

(5) Steelmaking in Electric Arc Furnace, LF Refining, Continuous Casting. Blooms size 470 × 350mm are manufactured by Sidenor Basauri. Minimum Reduction ratio is 6.0;

(6) Steelmaking in Electric Arc Furnace, LF Refining and Vacuum Degassing, Continuous Casting. Blooms size 470 × 350mm are manufactured by Sidenor Basauri. Minimum Reduction ratio is 5.05.

(7) Steelmaking in Electric Arc Furnace, Ingot casting by bottom pouring. Reduction ratio is above 8 for round bar up to 185mm and above 5 for round bar 180mm/230mm ;

2. DOCUMENTS AND DRAWINGS :

Chemical composition (wt%) specification (Ref.MPSR3 Rev.01 & Ref.MPR3 Rev.13) on ladle of steel grade QR3 for chains diameter 180mm max.:

Element	C	Mn	Si	P	S	Ni (1)	Mo (2)	Cr	Al	Cu
min max										
Element	Sn	V	Ti	As	Sb	B	N2(ppm)	O2 (ppm)	H2(ppm)	Others
min max										

(1) Ni content up to 0.55% as per Ref.MPR3 Rev.13 for chains made at Vicinay Deusto site only; (2) Mo content up to 0.13% for diameter above 140mm; (2) B content up to 0.002% for diameter above 140mm; (1) O2 content up to 25ppm as per Ref.MPR3 Rev.13 for chains made at Vicinay Deusto site only;* n.s. means not specified.

Chemical composition (wt%) specification (Ref.MPSR3 Rev.02) on ladle of steel grade QR3 for chains diameter 195mm max.:

Element	C	Mn	Si	P	S	Ni	Mo (1)	Cr	Al	Cu
min max										
Element	Sn	V	Ti	As	Sb	B (2)	N2(ppm)	O2 (ppm)	H2(ppm)	Others
min max										

(1) Mo content: 0.08max. for Ø <140mm, 0.13max. for Ø>140mm; (2) B content: 0.0015max. only for Ø>140mm;* n.s. means not specified.