



APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM000001U
Revision No:
3

This is to certify:

That

Breitenfeld Edelstahl AG
Breitenfeldstraße 22, 8662 St. Barbara-Mitterdorf,
Austria

is an approved manufacturer of
Steelmaking

in accordance with

DNV-OS-E302 – Offshore mooring chain, Edition July 2022
DNV class programme – DNV-CP-0237 Offshore mooring chain and accessories

and the following particulars:

Product	Ingots for chain cables
Grades	R3S, R4, R5
Steelmaking	Electric arc furnace, Vacuum degassed, Ingot casting
Deoxidation	Killed
Fine grain elements	See page 2
Remarks	See particulars of the approval

Manufacturer(s) approved by this certificate is/are accepted to deliver according to DNV GL, DNV and GL rules. Materials to be applied to DNV classed object shall fulfill the material requirements in the applicable DNV class rules.

Issued at **Hamburg** on **2025-03-07**

This Certificate is valid until **2028-03-03**.

DNV local unit: **Augsburg**

Approval Engineer: **Christian Wildhagen**



for **DNV**

This document has been digitally signed and will
therefore not have handwritten signature

Stefan Röhr

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Particulars of the approval

Ingots for chain cables		
Grade ¹⁾	Steelmaking ²⁾	Fine grain elements
R3S	EAF, VD, IC	Al+V
R3S, R4, R5	EAF, VD, IC	Al

Remarks:

¹⁾ Specification for chemical composition according to table S1.

²⁾ EAF: Electric Arc Furnace; VD: Vacuum degassing; IC: Ingot Casting.

Table S1 - Specification for chemical composition ¹⁾ - Ingots for chain cables													
Grade		C	Mn	Si	P	S	Cr	Ni	Mo	Cu	Al	V	N
R3S	Min.	.10	.30	-	-	-	2.00	-	.90	-	.020	.030	-
	Max.	.20	.90	.50	.025	.015	2.50	.50	1.20	.35	.025	.050	.010
R3S	Min.	.30	.50	-	-	-	1.30	1.30	.15	-	.020	.020	.004
	Max.	.38	.80	.40	.010	.005	1.70	1.70	.30	.20	.035	.030	.010
R3S & R4	Min.	.30	.50	-	-	-	1.30	1.30	.20	-	.020	-	.004
	Max.	.38	.80	.40	.015	.010	1.70	1.70	.30	.25	.035	.030	.015
R5	Min.	.26	.30	-	-	-	1.80	1.80	.30	-	.020	.020	.004
	Max.	.34	.60	.40	.010	.005	2.20	2.20	.50	.20	.035	.030	.010

¹⁾ Remarks:

²⁾ ¹⁾ The content of Sn, Sb, As and B may be required. In such cases, the maximum content shall be 0.025 % for Sn, 0.0025 % for Sb, 0.010% As and 0.0005% for B.