



APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM0000252
Revision No:
2

This is to certify:

That

CMF S.p.A.

Via Vino della Pace 36, 34071 Cormons, GO, Italy

is an approved manufacturer of
Steel Forgings

in accordance with

DNVGL-OS-E302 – Offshore mooring chain, Edition July 2018

and the following particulars:

Product	Forgings for chain cable accessories
Grades	R3, R3S, R4, R5 (see page 2)
Max. thickness/Diameter	562 mm
Delivery Condition	NAQT (see page 2)
Remarks	See particulars of the approval

Manufacturer approved by this certificate is 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 **Høvik** on **2021-05-28**

for **DNV**

This Certificate is valid until **2024-06-30**.

DNV local station: **Venice**

Approval Engineer: **Dechun Lou**

Sondre Løken
Head of Section

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

Forgings for chain cables accessories			
Grade	Max. thickness or Diameter (mm)	Delivery condition ¹⁾	Material manufacturer ²⁾
R3, R3S	500	NAQT	Breitenfeld Edelstahl
R3, R4	562	NAQT	Acciaieria Fonderia Cividale S.P.A
R4, R5	500	NAQT	Breitenfeld Edelstahl

Remarks:

¹⁾ NAQT: Normalized, annealed ($\leq 690^{\circ}\text{C}$), quenched and tempered.

²⁾ The approval is limited to the listed raw material manufacturer.

³⁾ For approved specification for chemical composition see table S1.

Table S1 - Specification for chemical composition - Forgings for chain cables accessories													
Grade		C	Si	Mn	P	S	Cr	Ni	Mo	Cu	Al	V	N
R3S, R3	Min.	.30	-	.50	-	-	1.30	1.30	.15	-	.020	-	-
	Max.	.38	.40	.80	.035	.035	1.70	1.70	.30	.40	.050	.03	.010
R4	Min.	.30	.15	.80	-	-	.85	1.80	.40	-	.020	.08	-
	Max.	.34	.35	1.00	.020	.008	1.00	1.90	.50	.20	.035	.10	.010
R3, R4, R5	Min.	.26	-	.30	-	-	1.80	1.80	.30	-	.020	-	-
	Max.	.34	.40	.60	.035	.035	2.20	2.20	.50	.40	.050	.03	.010

Remarks:

The content of Sn, Sb and As may be required determined. In such cases, the maximum content shall be 0.020 % for Sn, 0.010% for As and 0.010 % for Sb.