

# APPROVAL OF MANUFACTURER CERTIFICATE

Certificate no.:  
**AMMM00000HX**  
Revision No:  
**4**

## This is to certify:

that

**FORJA ROTEC SRL**  
12, Aleea Industriilor (Hala Forja), 120068 Buzau,  
Romania

is an approved manufacturer of  
**Steel Forgings**

in accordance with

**DNV rules for classification – Ships**  
**DNV class programme – DNV-CP-0247 Steel forgings**  
**DNV-OS-E302 – Offshore mooring chain, Edition July 2022**  
**DNV class programme – DNV-CP-0237 Offshore mooring chain and accessories**

and the following particulars:

<b>Application area</b>	<b>Forgings for hull structures and equipment, Forgings for shafting and machinery, Forgings for offshore mooring chain accessories</b>
<b>Steel type/grade</b>	<b>Carbon and carbon-manganese, Alloy, R3S, R4, see page 2</b>
<b>Forging method</b>	<b>See page 2</b>
<b>Max. weight</b>	<b>10 650 kg for carbon and carbon-manganese steel, 5 000 kg for alloy steel, see page 2</b>
<b>Max. diameter / section thickness</b>	<b>See page 2</b>
<b>Heat treatment condition</b>	<b>See page 2</b>

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 **2025-10-28**

This Certificate is valid until **2025-12-31**.

DNV local unit: **Galatz**

Approval Engineer: **Dechun Lou**



for **DNV**

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

Christian Wildhagen

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 USD 300 000.

## Particulars of the approval

### Forgings for hull structures and equipment

Steel type	Grade <sup>3)</sup>	Forging method <sup>1)</sup>	Max. weight [kg]	Max. diameter / section [mm]	Heat treatment condition <sup>2)</sup>
C and C-Mn	NV F400UW, NV F440UW, NV F480UW, NV F520UW, NV F560UW, NV F600UW	OD, CD	10 650	-	N, NT, QT
Alloy	NV F550AW, NV F600AW, NV F650AW	OD, CD	5 000	-	QT
Alloy	NV F550AW, NV F600AW, NV F650AW	RR	5 000	3 000	QT

### Forgings for shafting and machinery

Steel type	Grade <sup>3)</sup>	Forging method <sup>1)</sup>	Max. weight [kg]	Max. diameter / section [mm]	Heat treatment condition <sup>2)</sup>
C and C-Mn	NV F400U, NV F440U, NV F480U, NV F520U, NV F560U, NV F600U, NV F640U, NV F680U, NV F720U, NV F760U	OD, CD	10 650	-	N, NT, QT
Alloy	NV F600A, NV F700A, NV F800A, NV F900A, NV F1000A, NV F1100A	OD, CD	5 000	-	QT
Alloy	NV F600A, NV F700A, NV F800A, NV F900A, NV F1000A, NV F1100A	RR	5 000	3 000	QT

Remarks:

- 1) OD: Open die forging  
CD: Closed die forging  
RR: Ring Rolling
- 2) QT: Quenched and tempered  
N: Normalized  
NT: Normalized and tempered
- 3) Incl. equivalent grades in acc. to other standards

Steel forgings for offshore mooring chain cable accessories			
Grade	Heat treatment condition <sup>1)</sup>	Max. diameter or section thickness [mm] <sup>2)</sup>	Material manufacturer <sup>3)</sup>
R3S, R4	NQT	460	Breitenfeld Edelstahl AG

Remarks:

- 1) NQT: Normalizing, Quenched and Tempered.
- 2) Total reduction ratio  $\geq 6:1$
- 3) The approval is limited to the listed raw material manufacturer.
- 4) The approval is according to "Manufacturing Procedure Specification acc. to DNV-OS-E302; DNV-CP-0237 (Doc.MPS-DNV-CP-0237-R3S-R4, Form code: F-MPS-FR, rev. 00, Date 09/07/2024)" and "Ultrasonic Examination Procedures for steel forgings acc. to DNV-RP-0034 (doc. Cod: UT-IL-8.2.4-03-02; rev.0, Date 06.2025)." "Visual Inspection Cod: IL-8.2.4-04-01 rev 2, Date 06.2025". These documents are stored in NPS job id: 263.11-005830-5.
- 5) For approved material specification see table S1.

Table S1 - Specification for chemical composition <sup>1)</sup> - for chain cable accessories													
Grade		C	Mn	Si	P	S	Cr	Ni	Mo	Cu	Al	V	N
R3S, R4	Min.	.15	.40	.15	-	-	2.00	-	.95	-	.020	-	-
	Max.	.18	.60	.35	.010	.005	2.50	.50	1.10	.30	.030	.03	.008

Remarks:

- 1) The content of Sn, Sb, As and B may be required. In such cases, the maximum content shall be 0.010 % for Sn, 0.010 % for Sb, 0.010% for As, 0.001% for Pb, 0.001% for Bi, 0.0005% for B, 0.0002% for H and 0.0020% for O.