

APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM00000EJ
Revision No:
4

This is to certify:

That

Karl Diederichs GmbH & Co. KG
Plant Karl Diederichs GmbH & Co. KG - Dirostahl
Luckhauser Strasse 1-5, 42899 Remscheid,
Germany

is an approved manufacturer of
Steel Forgings

in accordance with

DNV rules for classification – Ships
DNV-OS-B101 – Metallic materials
DNV class programme – DNV-CP-0247 Steel forgings

and the following particulars:

Application area	Forgings for hull structures and equipment Forgings for shafting and machinery Forgings for gearing Forgings for boilers, pressure vessels and piping systems Ferritic steel forgings for low temperature service Stainless steel forgings
Steel type(s)	Carbon and Carbon-Manganese, Alloy, Austenitic stainless, Martensitic stainless, Austenitic-ferritic (Duplex) stainless
Manufacturing method	Open die forging, ring rolling
Max. weight	See page 2 ff.
Max. diameter/section	See page 2 ff.
Heat treatment condition	See page 2 ff.
Additional approval condition	See page 2 ff.

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 **2025-03-25**

This Certificate is valid until **2028-03-07**.

DNV local unit: **Essen**

Approval Engineer: **Christian Wildhagen**



for **DNV**

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

Stefan Rohr

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 hull structures and equipment

Steel type	Grade ³⁾	Forging method ¹⁾	Max. weight [kg]	Max. thickness / height [mm]	Outer diameter [mm]	Heat treatment condition ²⁾
C and C-Mn	NV F400UW, NV F440UW, NV F480UW, NV F520UW, NV F560UW, NV F600UW	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
Alloy	NV F550AW, NV F600AW, NV F650AW	OD	36 000	1 600	-	QT
		RR	8 000	800	3 500	

Forgings for shafting and machinery

Steel type	Grade ³⁾	Forging method ¹⁾	Max. weight [kg]	Max. thickness / height [mm]	Outer diameter [mm]	Heat treatment condition ²⁾
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	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
Alloy	NV F600A, NV F700A, NV F800A, NV F900A, NV F1000A, NV F1100A	OD	36 000	1 600	-	QT
		RR	8 000	800	3 500	

Forgings for boilers, pressure vessels and piping systems

Steel type	Grade ³⁾	Forging method ¹⁾	Max. weight [kg]	Max. thickness / height [mm]	Outer diameter [mm]	Heat treatment condition ²⁾
C and C-Mn	NV F450H, NV F490H	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
Alloy	NV F0.5Mo, NV F1Cr0.5Mo, NV F2.25Cr1MoN, NV F2.25Cr1MoQT	OD	36 000	1 600	-	NT, QT
		RR	8 000	800	3 500	

Ferritic steel forgings for low temperature service

Steel type	Grade ³⁾	Forging method ¹⁾	Max. weight [kg]	Max. thickness / height [mm]	Outer diameter [mm]	Heat treatment condition ²⁾
C and C-Mn	NV F450L, NV F490L	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
Alloy	NV F3.5Ni, NV F5Ni, NV F9Ni	OD	36 000	1 600	-	NT, QT (*NNT)
		RR	8 000	800	3 500	

Stainless steel forgings

Steel type / grade ⁴⁾	Forging method ¹⁾	Max. weight [kg]	Max. thickness / height [mm]	Outer diameter [mm]	Heat treatment condition ²⁾
Austenitic	OD	36 000	1 600	-	SHT
	RR	8 000	800	3 500	
Martensitic	OD	36 000	1 600	-	QT
	RR	8 000	800	3 500	
Ferritic	OD	36 000	1 600	-	SHT
	RR	8 000	800	3 500	
Austenitic-ferritic (Duplex)	OD	36 000	1 600	-	SHT
	RR	8 000	800	3 500	

Steels acc. other standards

Steel type	Grade ³⁾⁴⁾	Forging method ¹⁾	Max. weight [kg]	Max. thickness / height [mm]	Outer diameter [mm]	Heat treatment condition ²⁾
C and C-Mn	Acc. to EN ISO 683-1 (EN 10083-2)	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
	Acc. to EN 10250-2	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
	Acc. to SEW 550	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
	Acc. to EN ISO 683-3 (EN 10084)	OD	36 000	1 600	-	NT, QT
		RR	8 000	800	3 500	QT
	Acc. to EN 10222-2	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	NT, QT
	Acc. to EN 10222-4	OD	36 000	1 600	-	N, QT
		RR	8 000	800	3 500	N, NT, QT
	Acc. to EN 10269	OD	36 000	1 000	-	N, QT
Alloy	Acc. to EN ISO 683-2 (EN 10083-3)	OD	36 000	1 600	-	QT
		RR	8 000	800	3 500	
	Acc. to EN 10250-3	OD	36 000	1 600	-	QT
		RR	8 000	800	3 500	
	Acc. to SEW 550	OD	36 000	1 600	-	QT
		RR	8 000	800	3 500	
	Acc. to EN ISO 683-3 (EN 10084)	OD	36 000	1 600	-	QT
		RR	8 000	800	3 500	
	18CrNiMo7-6 acc. to EN ISO 683-3 (EN 10084) ⁵⁾⁶⁾	OD	36 000	1 600	-	QT
		RR	8 000	800	3 500	
	Acc. to EN 10222-2	OD	36 000	1 600	-	NT, QT
		RR	8 000	800	3 500	
	Nickel steel acc. to EN 10222-3	OD	36 000	1 600	-	NT, NNT, QT
		RR	8 000	800	3 500	
Martensitic	Steel acc. to EN 10088-3	OD	36 000	1 600	-	QT
		RR	8 000	800	3 500	

Remarks:

- ¹⁾ OD: Open die forging; RR: Ring Rolling
- ²⁾ QT: Quenched and tempered; N: Normalised; NNT: double normalised and tempered
NT: Normalised and tempered
- ³⁾ Incl. equivalent grades in acc. to other standards
- ⁴⁾ Stainless steel forgings shall be in accordance with recognized standards, e.g. EN 10222, ASTM A473/A965/A1049 and JIS G 3214, provided that supplementary requirements contained herein are also met. Recognition of other standards is subject to submission to the Society for evaluation.

Additional approval conditions:

- ⁵⁾ Clean steel forgings of grade 18CrNiMo7-6 acc. to EN ISO 683-3 (EN 10084) are qualified for approved applications (see pt. 2). Special requirements for clean steel forgings are given in DNV Rules Pt. 2, Ch. 2, Sec.6, [1.6.10].
- ⁶⁾ Subject to special approval, clean steel forgings of grade 18CrNiMo7-6 acc. to EN ISO 683-3 (EN 10084) are approved for further processing to gears acc. to DNV Class Guideline No. DNV-CG-0036 and classed to "high grade".