

APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM00000EM
Revision No:
1

This is to certify:

That
GROUP KARL DIEDERICHS
Plant Wilhelm Sönnecken KG
Wuppertal, Germany

is an approved manufacturer of
Steel Forgings

in accordance with
DNV GL rules for classification – Ships
DNV GL offshore standards

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
Steel type	Ferritic steel forgings for low temperature service Carbon and carbon-manganese, Alloy, See page 2
Manufacturing method	Open die forging/ ring rolling
Max. weight	See page 2
Max. diameter / section	See page 2
Heat treatment condition	See page 2

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 GL classed object shall fulfill the material requirements in the applicable DNV GL class rules.

Issued at **Hamburg** on **2019-02-14**

This Certificate is valid until **2022-03-06**.

DNV GL local station: **Essen**

Approval Engineer: **Stefan Röhr**



for **DNV GL**

Digitally Signed By: Wildhagen, Christian

Location: DNV GL Hamburg, Germany

Signing Date: 2019-02-14, on behalf of

Thorsten Lohmann
Head of Section



Job Id: **263.11-003085-3**
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Particulars of the approval

Forgings for hull structures and equipment

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	VL F400UW, VL F440UW, VL F480UW, VL F520UW, VL F560UW, VL F600UW	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
Alloy	VL F550AW, VL F600AW, VL F650AW	OD	36 000	1 600	-	QT
		RR	8 000	800	3 500	

Forgings for shafting and machinery

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	VL F400U, VL F440U, VL F480U, VL F520U, VL F560U, VL F600U, VL F640U, VL F680U, VL F720U, VL F760U	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
Alloy	VL F600A, VL F700A, VL F800A, VL F900A, VL F1000A, VL 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⁾⁴⁾	Forging method ¹⁾	Max. weight [kg]	Max. thickness / height [mm]	Outer diameter [mm]	Heat treatment condition ²⁾
C and C-Mn	VL F450H, VL F490H	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
Alloy	VL F0.5Mo, VL F1Cr0.5Mo, VL F2.25Cr1MoN, VL 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⁾⁴⁾	Forging method ¹⁾	Max. weight [kg]	Max. thickness / height [mm]	Outer diameter [mm]	Heat treatment condition ²⁾
C and C-Mn	VL F450L, VL F490L	OD	36 000	1 600	-	N, NT, QT
		RR	8 000	800	3 500	
Alloy	VL F3.5Ni, VL F5Ni, VL F9Ni*	OD	36 000	1 600	-	NT, QT (*NNT)
		RR	8 000	800	3 500	

Steels according to other standards

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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	Acc. to 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 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 10083-3	OD	36 000	1 600	-
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 10084		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	

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) Certification of any material applied to classed object shall fulfill the applicable material requirements in the DNV GL class rules
- 4) Incl. equivalent grades in acc. to other standards