

# APPROVAL OF MANUFACTURER CERTIFICATE

**This is to certify:**

That

**FORGIA DI BOLLATE S.P.A.**

**Strada Provinciale, 4 Canneto Casalromano 9, Canneto sull'Oglio MN,  
Italy**

is an approved manufacturer of  
**Steel Forgings**

in accordance with  
**DNV GL rules for classification – Ships**

and the following particulars:

<b>Application area</b>	<b>Forgings for hull structures and equipment Forgings for shafting and machinery Forging for gearing Forgings for boilers, pressure vessels and piping systems Stainless steel forgings</b>
<b>Steel type</b>	<b>Carbon and carbon-manganese, Alloy, Austenitic stainless, Austenitic-ferritic (Duplex) stainless</b>
<b>Forging method</b>	<b>See page 2 Open die forging, Ring rolling</b>
<b>Max. weight</b>	<b>See page 2</b>
<b>Heat treatment condition</b>	<b>See page 2</b>
<b>Additional approval conditions</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 GL classed object shall fulfill the material requirements in the applicable DNV GL class rules.

Issued at **Hamburg** on **2019-03-04**

for **DNV GL**

This Certificate is valid until **2021-06-30**.

DNV GL local station: **Milan**

Approval Engineer: **Christian Wildhagen**

**Thorsten Lohmann**  
**Head of Section**



Job Id: **263.11-004493-3**  
 Certificate No: **AMMM00002BD**  
 Revision No: **1**

## 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. thickness / height [mm]	Max. outer diameter [mm]	Delivery condition <sup>2)</sup>
C and C-Mn	VL F400UW, VL F440UW, VL F480UW, VL F520UW, VL F560UW, VL F600UW	OD	23 000	1000	-	N, NT, QT
		RR	9 000	2500	7 500	N, NT, QT
Alloy	VL F550AW, VL F600AW, VL F650AW	OD	23 000	1000	-	QT
		RR	2 500	2500	7 500	QT

### Forgings for shafting and machinery

#### Forgings for gearing

Steel type	Grade <sup>3)</sup>	Forging method <sup>1)</sup>	Max. weight [kg]	Max. thickness / height [mm]	Max. outer diameter [mm]	Delivery condition <sup>2)</sup>
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	23 000	1000	-	N, NT, QT
		RR	9 000	2500	7 500	N, NT, QT
Alloy	VL F600A, VL F700A, VL F800A, VL F900A, VL F1000A, VL F1100A	OD	23 000	1000	-	QT
		RR	2 500	2500	7 500	QT

### Forgings for boilers, pressure vessels and piping systems

Steel type	Grade <sup>3)</sup>	Forging method <sup>1)</sup>	Max. weight [kg]	Max. thickness / height [mm]	Max. outer diameter [mm]	Delivery condition <sup>2)</sup>
C and C-Mn	VL F450H, VL F490H	OD	23 000	1000	-	N, NT, QT
		RR	9 000	2500	7 500	N, NT, QT
Alloy	VL F0.5Mo, VL F1Cr0.5Mo, VL F2.25Cr1Mo	OD	23 000	1000	-	QT
		RR	2 500	2500	7 500	QT

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### Stainless steel forgings

Steel type <sup>4)</sup>	Grade <sup>3)4)</sup>	Forging method <sup>1)</sup>	Max. weight [kg]	Max. thickness / height [mm]	Max. outer diameter [mm]	Delivery condition <sup>2)</sup>
Austenitic	CrNiMo	RR	12 000	750	1800	SHT
22 Cr Duplex		RR	7 500	2250	650	SHT
25 Cr Duplex		RR	7 500	2250	650	SHT

#### Remarks:

- 1) OD: Open die forging  
RR: Ring rolling
- 2) QT: Quenched and tempered  
N: Normalised  
NT: Normalised and tempered  
SHT: Solution Heat Treated (Solution Annealing)
- 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.