



APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM0000119
Revision No:
2

This is to certify:

That

SETFORGE BOUZONVILLE
Route de Guerstling, 57320 Bouzonville,
France

is an approved manufacturer of
Steel Forgings

in accordance with
DNV GL rules for classification – Ships

and the following particulars:

| | |
|---------------------------------|---|
| Application area | Forgings for hull structures and equipment Forgings for shafting and machinery Forgings for boilers, pressure vessels and piping systems |
| Steel type(s) | Carbon, Carbon-Manganese, Alloy |
| Forging method | Open die forging/closed die forging |
| Max. weight | See page 2 ff. |
| Max. diameter/section | See page 2 ff. |
| Heat treatment 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 **2021-12-06**

for **DNV**

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

DNV local station: **Belgium FIS**

Approval Engineer: **Stefan Röhr**

Thorsten Lohmann
Head of Section

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Particulars of the approval

Forgings for hull structures and equipment

| Steel type | Grade ⁴⁾ | Forging method ¹⁾ | Max. weight [kg] | Max. diameter/section [mm] | Heat treatment condition ²⁾ |
|------------|--|------------------------------|------------------|----------------------------|--|
| C and C-Mn | VL F400UW, VL F440UW, VL F480UW, VL F520UW, VL F560UW, VL F600UW | OD, CD | 850 | 400 | N, NT, QT |
| Alloy | VL F550AW, VL F620AW, VL F650AW | | | | |

Forgings for shafting and machinery

| Steel type | Grade ⁴⁾ | Forging method ¹⁾ | Max. weight [kg] | Max. diameter/section [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, CD | 850 | 400 | N, NT, QT |
| Alloy | VL F600A, VL F700A, VL F800A, VL F900A, VL F1000A, VL F1100A | | | | |

Forgings for boilers, pressure vessels and piping systems

| Steel type | Grade ⁴⁾ | Forging method ¹⁾ | Max. weight [kg] | Max. diameter/section [mm] | Heat treatment condition ²⁾ |
|------------|---------------------|------------------------------|------------------|----------------------------|--|
| C and C-Mn | VL F450H | OD, CD | 850 | 400 | N, NT, QT |
| | VL F490H | | | | N, NT, QT |
| Alloy | VL F0.5Mo | | | | NT, QT |
| | VL F1Cr0.5Mo | | | | N |
| | VL F2.25Cr1MoN | | | | QT |
| | VL F2.25Cr1MoQT | | | | |

Special alloy forgings according to customer specifications

| Steel type / grade ³⁾ | Forging method ¹⁾ | Max. weight [kg] | Max. diameter/section [mm] | Heat treatment condition ²⁾ |
|--|------------------------------|------------------|----------------------------|--|
| 1.4939 acc. to MAN B&W Q10.09431-5221 | OD, CD | 850 | 400 | acc. to customer spec. |
| 1.4923 acc. to ABB HZTL651278 | | | | |
| X12CrNiMo12 acc. to WL1.4939-2 | | | | |

Remarks:

- 1) OD: Open die forging; CD: Closed die forging
- 2) QT: Quenched and tempered; N: Normalised; 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 or DNVGL approved drawings
- 4) Incl. equivalent grades in acc. to other standards