



# APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:  
**AMMM000016D**  
Revision No:  
**3**

This is to certify:

That

**Deutsche Edelstahlwerke Specialty Steel GmbH & Co. KG**  
**AuestraÙe 4, 58452 Witten,**  
**Germany**

is an approved manufacturer of  
**Steel Forgings**

in accordance with

**DNV rules for classification – Ships**  
**DNV rules for classification – Naval vessels**  
**DNV class programme – DNV-CP-0247 Steel forgings**

and the following particulars:

|                                       |   |
|---------------------------------------|---|
| <b>Product</b>                        | <b>Forged bars</b>  |
| <b>Application area</b>               | <b>Forgings for hull structures and equipment</b><br><b>Forgings for shafting and machinery</b><br><b>Forgings for gearing</b><br><b>Stainless steel forgings</b><br><b>Special materials for naval ships</b> |
| <b>Steel type</b>                     | <b>Carbon and carbon-manganese,</b><br><b>Alloy,</b><br><b>Austenitic stainless,</b><br><b>Martensitic stainless,</b><br><b>Ferritic stainless,</b><br><b>Austenitic-ferritic (Duplex) stainless</b>          |
| <b>Forging method</b>                 | <b>Open die forging</b>   |
| <b>Max. weight</b>                    | <b>See particulars of the approval</b>  |
| <b>Max. diameter / section</b>        | <b>See particulars of the approval</b>  |
| <b>Heat treatment condition</b>       | <b>See particulars of the approval</b>  |
| <b>Additional approval conditions</b> | <b>See particulars of the approval</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 **2023-09-08**

for **DNV**

This Certificate is valid until **2026-06-19**.

DNV local unit: **Essen**

Approval Engineer: **Christian Wildhagen**

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

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.



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Revision: 2022-12

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Page 1 of 3

## Particulars of the approval

### Forgings for hull structures and equipment

| Steel type | Grade <sup>2)</sup>  | Max. Diameter [mm] | max. Length [mm] | Max. Weight [kg/m] | Heat treatment Condition <sup>1)</sup> |
|------------|--|--------------------|------------------|--------------------|--|
| C and C-Mn | NV F400UW, NV F440UW, NV F480UW, NV F520UW, NV F560UW, NV F600UW | 250                | 11 000           | 1 500              | N, NT, QT                              |
| Alloy      | NV F550AW, NV F600AW, NV F650AW                                  | 250                | 11 000           | 1 500              | QT                                     |

### Forgings for shafting and machinery

#### Forgings for gearing

| Steel type | Grade <sup>2)</sup>  | Max. Diameter [mm] | max. Length [mm] | Max. Weight [kg/m] | Heat treatment Condition <sup>1)</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 | 250                | 11 000           | 1 500              | N, NT, QT                              |
| Alloy      | NV F600A, NV F700A, NV F800A, NV F900A, NV F1000A, NV F1100A                                       | 250                | 11 000           | 1 500              | QT                                     |

### Forgings of liquid quenched and tempered structural steels

| Steel type | Grade <sup>2)</sup>  | Max. Diameter [mm] | max. Length [mm] | Max. Weight [kg/m] | Heat treatment Condition <sup>1)</sup> |
|------------|--|--------------------|------------------|--------------------|--|
| C and C-Mn | NV-M550S, NV-M700S   | 200                | 11 000           | 1 500              | QT                                     |
|            | 15NiCrMo10-6 acc. WL 1.6780-2<br>16NiCrMo12-6 acc. WL 1.6782-2 |                    |                  |                    |  |
|            | HY-80 acc. MIL-S-21952D<br>HY-100 acc. MIL-S-21952D            |                    |                  |                    |  |

### Forgings of non-magnetizable steels

| Steel type       | Grade <sup>2)</sup>      | Max. Diameter [mm] | max. Length [mm] | Max. Weight [kg/m] | Heat treatment Condition <sup>1)</sup> |
|------------------|--------------------------|--------------------|------------------|--------------------|--|
| Non-magnetizable | 1.3964.9 acc. WL 19364-2 | 160                | 11 000           | 1 500              | SHT                                    |
|                  | 1.3964 acc. SEW 390      | 250                | 11 000           | 1 500              | SHT                                    |

**Steels acc. other standards**

| Steel type           | Grade                            | Max. Diameter [mm] | max. Length [mm] | Max. Weight [kg/m] | Heat treatment Condition <sup>1)</sup> |
|----------------------|----------------------------------|--------------------|------------------|--------------------|--|
| C and C-Mn           | acc. EN 10083-2                  | 250                | 11 000           | 1 500              | NT, QT                                 |
|                      | acc. EN 10250-2                  |                    |                  |                    |  |
|                      | acc. ISO 683-1                   |                    |                  |                    |  |
|                      | acc. ISO 683-3                   |                    |                  |                    |  |
| Alloy                | acc. EN 10083-3                  | 250                | 11 000           | 1 500              | QT                                     |
|                      | acc. EN 10250-3                  |                    |                  |                    |  |
|                      | acc. ISO 683-2                   |                    |                  |                    |  |
|                      | acc. ISO 683-3                   |                    |                  |                    |  |
| Austenitic stainless | acc. EN 10088-3                  | 250                | 11 000           | 1 500              | SHT                                    |
|                      | acc. EN 10222-5                  |                    |                  |                    |  |
|                      | acc. EN 10272                    |                    |                  |                    |  |
| Duplex               | acc. EN 10088-3                  | 250                | 11 000           | 1 500              | SHT                                    |
|                      | acc. EN 10222-5                  |                    |                  |                    |  |
|                      | acc. EN 10272                    |                    |                  |                    |  |
| Ferritic             | acc. EN 10088-3                  | 250                | 11 000           | 1 500              | A                                      |
|                      | acc. EN 10272                    |                    |                  |                    |  |
| Martensitic          | acc. EN 10088-3                  | 250                | 11 000           | 1 500              | QT                                     |
|                      | acc. EN 10222-5                  |                    |                  |                    |  |
|                      | acc. EN 10272                    |                    |                  |                    |  |
|                      | 1.4542 acc. EN 10088-3           | 250                | 11 000           | 1 500              | PH                                     |
|                      | Type 630 (17-4PH) acc. ASTM A564 |                    |                  |                    |  |

Remarks:

- 1) QT: Quenched and tempered  
 N: Normalized  
 NT: Normalized and tempered  
 SHT: Solution Heat Treated (Solution Annealing)  
 PH: Precipitation hardened  
 A: Annealed
- 2) Incl. equivalent grades in acc. to other standards