

# APPROVAL OF MANUFACTURER CERTIFICATE

Certificate no.:  
**AMMM0000022**  
Revision No:  
**5**

## This is to certify:

that

**SeAH Changwon Integrated Special Steel Corporation**  
**47, Jeokhyeon-ro, Seongsan-gu, Changwon-Si, Gyeongsangnam-do,**  
**Republic of Korea**

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-0242 Semi-finished steel products**  
**DNV class programme – DNV-CP-0247 Steel forgings**  
**DNV class programme – DNV-CP-0351 Manufacture of heat treated products - heat treatment workshop**

and the following particulars:

|                         |                                                                                                                                                                       |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Application area</b> | <b>Forgings for hull structures and equipment</b><br><b>Forgings for shafting and machinery</b><br><b>Forgings for crankshafts</b><br><b>Stainless steel forgings</b> |
| <b>Steel type(s)</b>    | <b>Carbon and carbon-manganese,</b><br><b>Austenitic stainless</b>                                                                                                    |
| <b>Max. weight</b>      | <b>See page 2</b>                                                                                                                                                     |
| <b>Remarks</b>          | <b>1. Including steelmaking</b><br><b>2. Including continuous grain flow (CGF) crankshafts, 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 classed object shall fulfill the material requirements in the applicable DNV class rules.

Issued at **Hamburg** on **2026-05-18**

This Certificate is valid until **2028-06-30**.

DNV local unit: **Busan, CMC Korea**

Approval Engineer: **Andreas Koch**



for **DNV**

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

Christian Wildhagen

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 USD 300 000.

## Particulars of the approval

### Forgings for hull structures and equipment

| Steel type | Grade <sup>3)</sup>                                              | Forging method <sup>1)</sup> | Max. weight [kg] | Heat treatment condition <sup>2)</sup> |
|------------|------------------------------------------------------------------|------------------------------|------------------|----------------------------------------|
| C and C-Mn | NV F400UW, NV F440UW, NV F480UW, NV F520UW, NV F560UW, NV F600UW | OD                           | 90 000           | N, NT, QT                              |

### Forgings for shafting and machinery Forgings for crankshafts

| Steel type | Grade <sup>3)</sup>                                                                                | Forging method <sup>1)</sup> | Max. weight [kg] | Heat treatment condition <sup>2)</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 | OD                           | 90 000           | N, NT, QT                              |

### Stainless steel forgings

| Steel type | Grade <sup>3)5)</sup> | Forging method <sup>1)</sup> | Max. diameter / section [mm] | Max. weight [kg] | Heat treatment condition <sup>2)</sup> |
|------------|-----------------------|------------------------------|------------------------------|------------------|----------------------------------------|
| Austenitic | CrNiMo                | OD                           | 500                          | 6 000            | SHT                                    |

#### Remarks:

- <sup>1)</sup> OD: Open die forging
- <sup>2)</sup> QT: Quenched and tempered  
N: Normalized  
NT: Normalized and tempered  
SHT: Solution Heat Treated (Solution Annealing)
- <sup>3)</sup> Incl. equivalent grades in acc. to other standards

#### Special conditions:

- Including steelmaking.
- Including continuous grain flow (CGF) crankshafts or crank throws; according to DNV-CG-0037S.