

APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No:
AMMM0000023
Revision No:
4

This is to certify:

That

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

is an approved manufacturer of
Steel Pipes and Fittings

in accordance with
DNV rules for classification – Ships

and the following particulars:

Product	Pipes
Application area	Pipes for pressure systems, Austenitic and ferritic-austenitic steel pipes, Pipes for low-temperature service, Carbon and carbon-manganese, Alloy,
Steel type	Austenitic stainless, Ferritic-austenitic (Duplex) stainless, See page 2
Manufacturing method	Seamless
Max. outer diameter	See page 2
Max. wall thickness	See page 2
Heat treatment condition	See page 2
Remarks	1. Including low temperature service (LNG/LPG) and liquid chemicals for austenitic stainless steels 2. Approved as Independent Heat Treatment Company, see page 3

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 **2022-07-20**

for **DNV**

This Certificate is valid until **2025-06-30**.

DNV local station: **Gimhae**

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.



Particulars of the approval

Semi-finished products: Billets for piping stock.

Steel type	Steelmaking ¹⁾
Carbon and carbon-manganese	EAF, CC
Austenitic stainless	EAF, CC

Remarks

¹⁾ EAF: Electric Arc Furnace; CC: Continuous Casting.

Pipes for pressure systems ³⁾

Pipes for low-temperature service ⁴⁾

Steel type /grade	Manufacturing method ¹⁾	Max. outer diameter [mm]	Max. wall thickness [mm]	Heat treatment condition
C and C-Mn	CFS/HFS	170	25	Acc. standard

Austenitic and Ferritic-austenitic steel pipes ⁵⁾⁶⁾

Steel type /grade	Manufacturing method ¹⁾	Max. outer diameter [mm]	Max. wall thickness [mm]	Heat treatment condition ²⁾
Austenitic stainless	CFS/HFS	273.1	23.01	SHT
22Cr duplex stainless	CFS/HFS	115	11.13	SHT
25Cr duplex stainless	CFS/HFS	115	11.13	SHT

Remarks:

- ¹⁾ HFS: hot finished seamless
CFS: cold finished seamless
- ²⁾ SHT: Solution Heat Treated (solution annealing)
- ³⁾ Pipes for pressure systems
Suitable pipe grades shall be selected from the following recognized standards:
ISO 9329 Parts 1 and 2, ISO 9330 Parts 1 and 2, EN 10216 Parts 1 to 3, EN 10217 Parts 1 to 3, EN 10305 Part 1 and 2, ASTM A53, ASTM A106, ASTM A135, ASTM A335, JIS G3454, JIS G3455, JIS G3456 or JIS G3458
- ⁴⁾ Pipes for low-temperature service
Suitable pipe grades shall be selected from the following recognized standards:
ISO 9329 Part 3, ISO 9330 Part 3, EN 10216 Part 4, EN 10217 Part 6, ASTM A333, ASTM A334 or JIS G3460
- ⁵⁾ Austenitic and ferritic-austenitic steel pipes
Suitable pipe grades shall be selected from the following recognized standards:
ISO 9329 Part 4, ISO 9330 Part 6, EN 10216 Part 5, EN 10217 Part 7, ASTM A269, ASTM A312, ASTM A358, ASTM A789, ASTM A790, ASTM A928 or JIS G3459
- ⁶⁾ Including low-temperature service applications for austenitic stainless steel

Approval scope for Independent Heat Treatment Company

Item	Description
Product Type	Steel Pipes and Fittings
Steel Type	C and C-Mn Steels, Austenitic Stainless, 22Cr Duplex Stainless, 25Cr Duplex Stainless
Furnace I.D. No.	SeAH CSS Barrel No.1
Furnace Details	Continuous furnace, Working zone (mm): Width 850, Height 200
Capacity	Transferring Roll Speed (mm/min.): 420 ~ 910 Temperature (°C): Max. 1,250
Max. Thickness	11.07 mm (wall thickness)
Heat Treatment Type	Solution Heat Treatment
Heat Treatment Procedure	Doc. No. SC-E-1D26 Rev.17 dated 2018-05-09
Temperature Uniformity Survey Procedure	Doc. No. NORSOK-30-09 Rev.0 dated 2013-12-29