

# APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No: **AMMM00001MK**Revision No:

This is to certify:

That

## Doosan Enerbility Co., Ltd.

2, Doosan Volvo-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Republic of Korea

is an approved manufacturer of **Steel Castings** 

in accordance with

DNV rules for classification – Ships DNV-OS-B101 – Metallic materials DNV class programme – DNV-CP-0246 Steel castings

and the following particulars:

Application area Castings for hull structures and equipment

**Castings for machinery** 

Steel type(s) Carbon and carbon-manganese,

Alloy, See page 2

Casting method Sand casting

Max. weight 350 000 kg Carbon and carbon-manganese

95 000 kg Alloy

Heat treatment condition See page 2

Additional approval conditions Approved as Independent Heat Treatment Company,

see page 2

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 2023-12-08

for DNV

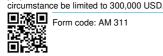
This Certificate is valid until 2026-12-31.

DNV local unit: Gimhae Station

Approval Engineer: Andreas Koch

Thorsten Lohmann

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**Head of Section** 



Job Id: **263.11-010854-3** Certificate No: **AMMM00001MK** 

Revision No:

## Particulars of the approval

#### Castings for hull structure and equipment

Steel type	Grade <sup>3)</sup>	Casting method 1)	Max. weight [kg]	Heat treatment condition 2)
C and C-Mn	NV C400UW, NV C440UW, NV C480UW	SC	350 000	N, NT, QT
Alloy	NV C550AW, NV C620AW	SC	95 000	QT

### **Castings for machinery**

Steel type	Grade <sup>3)</sup>	Casting method 1)	Max. weight [kg]	Heat treatment condition 2)
C and C-Mn	NV C400U, NV C440U, NV C480U, NV C520U	SC	350 000	N, NT, QT
Alloy	NV C550A, NV C600A, NV C690A	SC	95 000	QT

#### Remarks:

1) SC: Sand Casting

2) N: Normalized

QT: Quenched and tempered

NT: Normalized and tempered

Incl. equivalent grades in acc. to other standards

### **Approval scope for Independent Heat Treatment Company**

Item	Description		
Product type	Steel Castings		
Steel Type	Carbon and carbon-manganese, Alloy		
Maximum Loading Weight	No. 1-4-6A: 300 ton		
Maximum Loading Weight	No. 2-2-1C: 120 ton		
Max. thickness	1 000 mm		
Heat Treatment Type	Annealing, Normalizing, Tempering and Stress reliving		
Furnaca Dataila	Type : Car bottom type, Working zone (mm) :		
Furnace Details	No. 1-4-6A: Width 11 000, Legth 12 000 x Height 3 000		
	No. 2-2-1C: Width 5 500, Legth 13 500 x Height 3 500		
Heat Treament Procedure	Doc. No. HTF-CF1406 Rev.2 dtd. 2019-10-01		
Temperature Uniformity Survey Procedure	Doc. No. HTF-CF1405 Rev.2 dtd. 2019-03-04		

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