**DNV-GL** 

# APPROVAL OF MANUFACTURER CERTIFICATE

Certificate No: **AMMM000012T** Revision No:

1

This is to certify:

That

ŽDAS, a.s.

Ždár nad Sázavou 1, Czech Republic

is an approved manufacturer of

**Steel Castings** 

in accordance with

DNV GL rules for classification - Ships

and the following particulars:

Application area Castings for hull structures and equipment,

Castings for machinery, Castings for propellers,

Castings for boilers, pressure vessels and piping systems,

Ferritic steel castings for low temperature service,

Steel type Carbon and carbon-manganese,

Alloy,

Austenitic stainless, Martensitic stainless,

Casting method Sand casting Max. weight 50 000 kg
Max. wall thickness See page 2
Heat treatment condition 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 GL classed object shall fulfill the material requirements in the applicable DNV GL class rules.

Issued at Hamburg on 2020-03-04

for  $\ensuremath{\textbf{DNV GL}}$ 

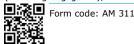
This Certificate is valid until **2022-12-31**.

DNV GL local station: **Prague** 

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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.



n code: AM 311 Revision: 2020-01 www.dnvgl.com Page 1 of 3

Job Id: **263.11-006824-2** Certificate No: **AMMM000012T** 

Revision No: 1

## Particulars of the approval

#### Castings for hull structure and equipment

Steel type	Grade <sup>3)</sup>	Casting method <sup>1)</sup>	Max. weight [kg]	Heat treatment condition <sup>2)</sup>
C and C-Mn	VL C400UW, VL C440UW, VL C480UW, VL C520UW, VL C560UW, VL C600UW	SC	50 000	N, NT, QT
Alloy	VL C550AW, VL C620AW	SC	50 000	QT

### Castings for machinery

Steel type	Grade <sup>3)</sup>	Casting method <sup>1)</sup>	Max. weight [kg]	Heat treatment condition <sup>2)</sup>
C and C-Mn	VL C400U, VL C440U, VL C480U, VL C520U, VL C560U, VL C600U	SC	50 000	N, NT, QT
Alloy	VL C550A, VL C600A, VL C690A	SC	50 000	QT

### Castings for propellers

Steel type	Grade <sup>3)</sup>	Casting method <sup>1)</sup>	Max. weight [kg]	Heat treatment condition <sup>2)</sup>
Martensitic	VL C12Cr1Ni, VL C13Cr4Ni, VL C16Cr5Ni	SC	50 000	QT

#### Castings for boilers, pressure vessels and piping systems

Steel type	Grade <sup>3)</sup>	Casting method <sup>1)</sup>	Max. weight [kg]	Heat treatment condition <sup>2)</sup>
C and C-Mn	VL C450H, VL C490H	SC	50 000	N, NT, QT
Alloy	VL C0.5Mo, VL C1Cr0.5Mo, VL C2.25Cr1Mo	SC	50 000	QT

Form code: AM 311 Revision: 2020-01 www.dnvgl.com Page 2 of 3

Job Id: **263.11-006824-2** Certificate No: **AMMM000012T** 

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#### Ferritic steel castings for low temperature service

Steel type	Grade <sup>3)</sup>	Casting method <sup>1)</sup>	Max. weight [kg]	Heat treatment condition <sup>2)</sup>
C and C-Mn	C450L, C490L	SC	50 000	N, NT, QT
Alloy	VL C2.25Ni, VL C3.5Ni	SC	50 000	N, NT, QT

#### Remarks:

1) SC: Sand Casting

SHT: Solution Heat Treated (Solution Annealing)

N: Normalized

QT: Quenched and tempered NT: Normalized and tempered

<sup>3)</sup> Incl. equivalent grades in acc. to other standards

Form code: AM 311 Revision: 2020-01 www.dnvgl.com Page 3 of 3