

APPROVAL OF MANUFACTURER CERTIFICATE

This is to certify:**That****Reinhard Tweer GmbH**
Krackser Str. 191, 33689 Bielefeld, Germanyis an approved manufacturer of
Iron Castingsin accordance with
DNV GL rules for classification – Ships

and the following particulars:

Iron type	Nodular cast iron
Casting method	Sand casting
Max. Weight	See page 2
Heat treatment condition	As cast, ferritizing, see page 2
Additional approval conditions	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 **2018-07-30**for **DNV GL**This Certificate is valid until **2021-06-30**.DNV GL local station: **Magdeburg**Approval Engineer: **Enno Brück**

Thorsten Lohmann
Head of Section

Job Id: **263.11-008861-1**
Certificate No: **AMMM000026E**

Particulars of the approval

Cast iron

Iron type	Grade ³⁾⁴⁾	Casting method ¹⁾	Max. weight [kg]	Heat treatment condition ²⁾
Nodular	VL NCI 400	SC	5 000	AC, F
	EN-GJS-400-15 acc. EN 1563 ³⁾	SC	5 000	AC, F
	EN-GJS-400-18-LT acc. EN 1563 ³⁾	SC	5 000	AC, F

Remarks:

- 1) SC: Sand casting
- 2) AC: As cast
F: Ferritizing
- 3) Certification of any material applied to classed object shall fulfil the applicable material requirements in the DNV GL class rules
- 4) Incl. equivalent grades in acc. to other standards

APPROVAL OF MANUFACTURER CERTIFICATE

This is to certify:**That****Reinhard Tweer GmbH
Krackser Str 191, 33689 Bielefeld, Germany**is an approved manufacturer of
Steel Castingsin 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 boilers, pressure vessels and piping systems
Steel type	Carbon and carbon-manganese, Alloy, See page 2, 3
Casting method	Sand casting
Max. weight	5 000 kg
Heat treatment condition	Normalized, normalized and tempered, quenched and tempered, see page 2, 3
Additional approval conditions	See page 2, 3

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Particulars of the approval

Castings for hull structure and equipment

Steel type	Grade ³⁾⁴⁾	Casting method ¹⁾	Max. weight [kg]	Delivery condition ²⁾
C and C-Mn	VL C400UW, VL C440UW, VL C480UW, VL C520UW, VL C560UW, VL C600UW	SC	5 000	N, NT, QT
Alloy	VL C550AW, VL C620AW	SC	5 000	QT

Castings for machinery

Steel type	Grade ³⁾⁴⁾	Casting method ¹⁾	Max. weight [kg]	Delivery condition ²⁾
C and C-Mn	VL C400U, VL C440U, VL C480U, VL C520U, VL C560U, VL C600U	SC	5 000	N, NT, QT
Alloy	VL C550A, VL C600A, VL C690A	SC	5 000	QT

Castings for boilers, pressure vessels and piping systems

Steel type	Grade ³⁾⁴⁾	Casting method ¹⁾	Max. weight [kg]	Delivery condition ²⁾
C and C-Mn	C450H, C490H	SC	5 000	N, NT, QT
Alloy	VL C0.5Mo, VL C1Cr0.5Mo, VL C2.25Cr1Mo	SC	5 000	QT

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Certificate No: **AMMM0000269**

Castings acc. international standards

Steel type	Standard³⁾	Casting method¹⁾	Max. weight [kg]	Delivery condition²⁾
C and C-Mn, Alloy	EN 10293, EN 10213, EN 10340, SEW520	SC	5 000	N, NT, QT

Remarks:

- 1) SC: Sand casting
- 2) N: Normalised
QT: Quenched and tempered
NT: Normalised and tempered
- 3) Certification of any material applied to classed object shall fulfil the applicable material requirements in the DNV GL class rules
- 4) Incl. equivalent grades in acc. to other standards