

APPROVAL OF MANUFACTURER CERTIFICATE

This is to certify:

That

**Metallwerk Franz Kleinken GmbH
Metall- & Eisengießerei - Maschinenfabrik
Dorsten Nordrhein-Westfalen, Germany**

is an approved manufacturer of
Iron Castings

in accordance with
DNV GL rules for classification – Ships

and the following particulars:

Iron type(s)	Grey Cast Iron Nodular Cast Iron
Max. weight	Grey Cast Iron: 30 000kg Nodular Cast Iron: 16 000kg
Remarks	See particulars

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 **2017-11-14**

for **DNV GL**

This Certificate is valid until **2020-11-30**.

DNV GL local station: **Essen**

Approval Engineer: **Andreas Koch**

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**Thorsten Lohmann
Head of Section**



Particulars of the approval

Cast iron

Iron type	Grade	Casting method	Max. weight [kg]	Heat treatment condition
Grey	200	SC	30 000	AC
	250			
	300			
	EN-GJL-200 acc. EN 1561	SM	30 000	AC
	EN-GJL-250 acc. EN 1561			
	EN-GJL-300 acc. EN 1561			
Nodular	VL NCI-1	SC	16 000	AC
	VL NCI-2			
	VL NCI 370			
	VL NCI 400			
	VL NCI 500			
	VL NCI 600			
	VL NCI 700			
	VL NCI 800			
	EN-GJS-400-15 acc. to EN 1563			
	EN-GJS-450-10 acc. to EN 1563			
	EN-GJS-500-7 acc. to EN 1563			
	EN-GJS-600-3 acc. to EN 1563			

SC: Sand Casting
 AC: as cast
 SM: Sand mould