

# APPROVAL OF MANUFACTURER CERTIFICATE

**This is to certify:**

**That**

**Dannenmann GmbH**  
**Heidenheim, Germany**

is an approved manufacturer of  
**Steel Pipes and Fittings**

in accordance with  
**DNV GL rules for classification – Ships**

and the following particulars:

<b>Product</b>	<b>Fittings (Elbows)</b>
<b>Application area</b>	<b>Piping fittings</b>
<b>Material type</b>	<b>Austenitic stainless, Ferritic-austenitic (Duplex) stainless, Ni-base Alloys</b>
<b>Manufacturing method</b>	<b>Cold forming, welding, see page 2</b>
<b>Max. outer diameter</b>	<b>See page 2</b>
<b>Max. wall thickness</b>	<b>See page 2</b>
<b>Heat treatment condition</b>	<b>See page 2</b>

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 **2020-05-29**

for **DNV GL**

This Certificate is valid until **2023-05-28**.

DNV GL local station: **Essen**

Approval Engineer: **Stefan Röhr**

**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.



## Particulars of the approval

### Piping fittings (elbows)

Material type	Grade	Manufacturing method <sup>1)</sup>	Max. outer diameter [mm]	Max. wall thickness [mm]	Heat treatment condition <sup>2)</sup>
Pipe fittings acc. EN 10253-4					
Austenitic	1.4307	CF, MAG	813	15	AW
	1.4306				
	1.4301				
	1.4541				
	1.4404				
	1.4571				
	1.4539				
	1.4547				
1.4529					
Pipe fittings acc. EN 10253-4					
Austenitic-ferritic (duplex)	1.4462	CF, MAG	813	15	AW
	1.4410	CF, GTAW			
	1.4501	CF, GTAW			
Pipe fittings in Ni Alloys acc. to customer specification					
Nickel Alloy	2.4068	CF, MAG	813	15	AW
	2.4360				
	2.4600				
	2.4602				
	2.4605				
	2.4610				
	2.4858				

Remarks:

- 1) CF: Cold forming;  
MAG: Metal Active Gas (MAG) Welding;  
GTAW: Gas Tungsten Arc Welding (GTAW)
- 2) AW: As welded