

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Couplings**

with type designation(s)

METAL-GRIP, Grip-L, both types fire resistant type in combination with protection cover Fire Fence (FF)

Issued to

**Straub Werke AG Rohrverbindungen
Wangs SG, Switzerland**

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints****Application :**

The slip-on joint grip type couplings of type METAL-GRIP and Grip-L are type approved for pipe class II and III piping systems as listed in Table - Approved applications on page 4. In addition the limitations as specified on page 5 of this certificate are to be observed.

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Type:	Temperature range:	Max. working press.:	Sizes:
METAL-GRIP	-30°C up to +100°C	up to 16 bar	Pipes O.D. 30.0 mm up to 406.4 mm
Grip-L	-20°C up to +180°C	up to 16 bar	Pipes O.D. 26.9 mm up to 406.4 mm

both types fire resistant type in combination with protection cover Fire Fence (FF)

Issued at **Hamburg** on **2017-06-01**This Certificate is valid until **2022-05-31**.DNV GL local station: **Augsburg**for **DNV GL**Approval Engineer: **Hagen Markus**

.....
Olaf Drews
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

Slip-on joint grip type coupling with NBR and EPDM gaskets.

Fire resistant type by application of additional fire sleeve of type Fire Fence (FF).

Materials – Pipe coupling

Material combination according to Straub "TECHNICAL MANUAL SHIPBUILDING"

Material combination	W1 METAL-GRIP	W2 METAL-GRIP	W4 METAL-GRIP	W5 GRIP L
Casing	AISI A 106, hot-dip galvanised	AISI 304	AISI 304	AISI 316Ti / AISI 316L
Bolts	AISI 4135	AISI 4135	AISI 316	AISI 316L
Round bars	AISI 12 L 14, galvanised	AISI 12L 14, galvanised	AISI 304	n.a.
U - Bars	n.a.	n.a.	n.a.	AISI 316Ti
Anchoring rings	AISI 301	AISI 301	AISI 301	AISI 301
Strip insert (optional)	AISI 316L / PVDF	AISI 316L / PVDF		AISI 316L / HDPE / PVDF
Sealing sleeve	NBR, EPDM, FKM, FPM			

Materials - Fire protection cover - Fire Fence

Type	According to specification
Fire Fence (FF)	7.1.2008

Temperature range¹

NBR	-20°C up to +80°C	All sizes and coupling types
FPM, FKM	-20°C up to +180°C	All sizes and coupling types Regarding applicable O.D. refer to product catalogue
EPDM	-30°C up to +100°C	O.D. 30.0mm up to 219.1mm (METAL-GRIP)
	-20°C up to +100°C	O.D. 244.5mm up to 406.4mm (METAL-GRIP)

Notes

¹ According to manufacturer product catalogue

Overview Coupling types

METAL-GRIP and in combination with Fire Fence		Grip-L and in combination with Fire Fence	
Material combination		Material combination	
30.0 - 219.1: W2, W4 244.5 - 406.4: W1		26.9 - 219.1: W5 180.0 - 406.4: W2, W5	
Pipe O.D. ²	PN ¹	Pipe O.D. ²	PN
30.0	16	26.9	16
33.7	16	30	16
38	16	33.7	16
42.4	16	38	16
44.5	16	42.4	16
48.3	16	44.5	16
54	16	48.3	16
57	16	54	16
60.3	16	57	16
63.5	16	60.3	16
76.1	16	66.6	16
84	16	70	16
88.9	16	73	16
104	16	76.1	16
108	16	79.5	16
114.3	16	84	16
129	16	88.9	16
133	16	100.6	16
139.7	16	101.6	16
154	16	104	16
159	16	104.8	16
168.3	16	108	16
219.1	16	114.3	16
244.5	14	127	16
267	12	129	16
273	12	130.2	16
323.9	10	133	16
355.6	8	139.7	16
406.4	8	141.3	16
Notes ¹ PN 20 for Offshore application and size range 30.0mm up to 219.1mm ² Clamping range of coupling refer to Straub "TECHNICAL MANUAL SHIPBUILDING"		154	16
		159	16
		168.3	16
		180	10
		193.7	10
		200.0	10
		219.1	10
		244.5	5.5
		250	5.5
		254	5.5
		267	5.0
		273	4.0
		304	4.0
		323.9	3.0
		355.6	2.5
		406.4	2.0

Application/Limitation

The slip-on joint grip type coupling of type METAL-GRIP and Grip-L are type approved for pipe class II and III piping systems as listed in table below. In addition, the limitations as specified on page 5 of this certificate and in the "Notes" column of the table below are to be observed.

The selection of the pipe couplings for the corresponding application and the right installation are to be in accordance with the fitting instructions of the manufacturer.

Table - Approved applications

Piping systems	Notes
<i>Flammable fluids (flash point ≤ 60 °C)</i>	
Cargo oil lines	4)
Crude oil washing lines	4)
Vent lines	3)
<i>Inert gas</i>	
Water seal effluent lines	5)
Scrubber effluent lines	5)
Main lines	2), 4)
Distribution lines	4)
<i>Flammable fluids (flash point > 60 °C)</i>	
Cargo oil lines	4)
Fuel oil lines	2), 3)
Lubricating oil lines	2), 3)
Hydraulic oil lines	2), 3)
Thermal oil lines	2), 3)
<i>Sea water</i>	
Bilge lines	1)
Water filled fire extinguishing systems (e.g. sprinkler)	3)
Non-water filled fire extinguishing systems (e.g. foam, drencher systems)	3)
Fire main (not permanently filled)	3)
Ballast systems	1)
Cooling water systems	1)
Tank cleaning services	5)
Non-essential systems	5)
<i>Fresh water</i>	
Cooling water systems	1)
Condensate return systems	1)
Non-essential piping systems	5)
<i>Sanitary/drains/scuppers</i>	
Deck drains (internal)	6)
Sanitary drains	5)
<i>Sounding/vent</i>	
Water tanks/dry spaces	5)
Oil tanks (flash point > 60 °C)	2), 3)
<i>Miscellaneous</i>	
Service air piping systems (non-essential)	5)

Notes - Fire resistance

For applications where "fire resistance types" are required, the pipe coupling casing is to be provided with additional fire sleeve of type Fire Fence (FF).

- 1) Inside machinery spaces of category A - only approved fire resistant types.
- 2) Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions.
- 3) Approved fire resistant types except in cases where such mechanical joints are installed on exposed open decks, as defined in SOLAS II-2/Reg. 9.2.3.3.2.2(10) and not used for fuel oil lines.
- 4) Only in pump rooms and open decks - only approved fire resistant types.
- 5) Non-fire resistance types are approved.

Notes - General

- 6) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.

Limitations

Pipe couplings are not approved for:

- bilge lines inside ballast and fuel tanks.
- seawater and ballast lines including air and overflow pipes inside cargo holds and fuel tanks.
- fuel and oil lines including overflow pipes inside cargo holds and ballast tanks.
- scuppers and discharge (overboard)
- starting, control air and CO2 systems.
- piping sections directly connected to sea openings or tanks containing flammable liquids which in the event of damage could cause fire or flooding.
- systems containing oxygen (more than 25% by volume).
- in piping systems with impulse pressure load other than water hammer, e.g. pressure lines of hydraulic piping systems

Slip-on joints inside tanks are permitted only if the pipes and tanks contain a medium of the same nature.

Type Approval documentation

Tests carried out

Tightness test, Burst test, Vacuum test, Fire resistance tests

Marking of product

Pipe coupling / Fire sleeve

Each pipe coupling shall bear legible and durable marking on the body or on a plate fixed securely to the body. Scope of marking shall be at least as follows:

	Example
Manufacturer's mark	straub
Type	METAL-GRIP or Grip L
Size in mm / inch	114,3 / 4
PN	16
Gasket material	NBR
Casing material	W5

Job Id: **262.1-024512-1**
Certificate No: **TAP00000VT**

Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by DNVGL surveyor.
The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:

- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

End of certificate