



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. P-12845
This Certificate consists of 4 pages

This is to certify that the
Axial Restraining Pipe Couplings
with type designation(s)
STRAUB-METAL-GRIP; STRAUB-METAL-GRIP-FIRE-FENCE

Manufactured by
STRAUB Werke AG
WANGS, Switzerland

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Rules for Classification of High Speed and Light Craft.
Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment
Det Norske Veritas' Standards for Certification 2.9 No. 5-792.20

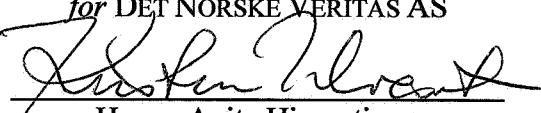
Application

The joints may be used for machinery systems as listed in the certificate.

Type:	Temperature range:	Max. working press.:	Sizes:
STRAUB-METAL-GRIP	see cert.	see cert.	Pipe O.D. 30,0 to 406,4mm
STRAUB-METAL-GRIP-FIRE-FENCE	see cert.	see cert.	Pipe O.D. 30,0 to 219,1 mm

Place and date
Høvik, 2008-07-31

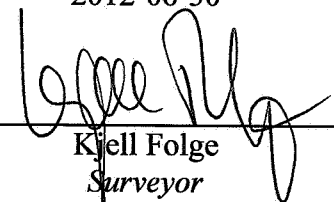
for DET NORSKE VERITAS AS


PP Hanne Anita Hjerpetjønn
Head of Section



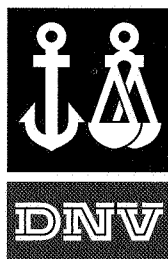
Local Office
DNV Essen

This Certificate is valid until
2012-06-30


Kjell Folge
Surveyor

Notice: 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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Cert. No.: P-12845
 File No.: 792.41
 NPS Job No.: 262.1-004034-3

Product description

Type: Slip-on joint GRIP TYPE

Sizes: 30.0 to 406.4 mm

Design: Metal grip standard: Stainless steel or hot dip galvanized carbon steel plate casing, with inside rubber sleeve
Metal Grip-Fire Fence: With additional Fire protection jacket

Materials: Casing:
 Size 30,0 to 219,1 mm AISI 304 or AISI 316. Size 244,5 to 406,4 AISI 1024 hot dip galvanized
 Fasteners: AISI 4135
 Gasket/ sealing: NBR/ EPDM
 Fire Fence: AISI 316

Application/Limitation

The slip-on joints are allowed for Class II and III piping systems.
 The slip-on joints are not to be used in cargo holds, tanks, and other spaces which are not easily accessible.

Slip-on joints are allowed for systems marked +,
 not allowed marked ÷.
 limitation/remarks) see footnotes

Flammable fluids (Flash point ≤ 60 °C)			Fresh water		
1	Cargo oil lines	+ 5)	21	Cooling water system	+ 1)
2	Crude oil washing lines	+ 5)	22	Condensate return	+ 1)
3	Vent lines	+ 3)	23	Non-essential system	+
Inert gas			Sanitary/Drains/Scuppers		
4	Water seal effluent lines	+	24	Deck drains (internal)	+ 4)
5	Scrubber effluent lines	+	25	Sanitary drains	+
6	Main lines	+ 2) 5)	26	Scuppers and discharge (overboard)	÷ (no)
7	Distribution lines	+ 5)			
Flammable fluids (Flash point > 60°C)			Sounding/ vent		
8	Cargo oil lines	+ 5)	27	Water tanks/Dry spaces	+
9	Fuel oil lines	+3)2)	28	Oil tanks (flash point > 60°C)	+3)2)
10	Lubrication oil lines	+3)2)			
11	Hydraulic oil	+3)2)			
12	Thermal oil	+3)2)			
Sea Water			Miscellaneous		
13	Bilge lines	+ 1)	29	Starting/control air	÷(no)
14	Fire main and water spray	+3)	30	Service air (non-essential)	+
15	Foam systems	+3)	31	Brine	+
16	Sprinkler system	+3)	32	C02 system	÷(no)
17	Ballast system	+ 1)	33	Steam	+ 6)
18	Cooling water system	+ 1)			
19	Tank cleaning services	+			
20	Non-essential system	+			

Limitations/remarks:



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- 1) Inside machinery spaces of category A only "Fire-Fence" type to be used.
- 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) Only "Fire-Fence" type to be used.
- 4) Above free board deck only.
- 5) In pump rooms and open decks- Only "Fire-Fence" type to be used.
- 6) Slip type joints, provided that they are restrained on the pipes, may be used for pipes on deck with a design pressure of 10 bar or less.

Temperature range:

EPDM: -30°C to 100°C (diam. 30,0 to 219,1 mm)
EPDM: -20°C to 100°C (diam. 244,5 to 406,4 mm)
NBR: -20°C to 100°C (diam. 33,7 to 406,4 mm)

Max. working pressures:

Pipe O.D. (mm)	Max. design pressure (bar)
30,0 to 219,1	16 / 20 ¹⁾
244,5	14
267,0	12
273,0	12
323,9	10
355,6	8
406,4	8

- 1) Approved for 20 bar piping systems for other media than flammable fluids and steam.

Rubber elements and other parts subject to wearing are to be replaced by new parts in case of repeated use of the coupling.

The materials used in the couplings must be resistant to the fluid carried in the pipe and also to the surrounding fluid if the coupling is mounted in a tank.

The couplings are to be assembled and mounted according to the manufacturer's recommendations.

Type Approval documentation

- Technical Manual, document ref. D/400000 A 99/08 AT, E/115100 F 01/01 AT
- Technical Data, Straub-Metal-Grip, document ref. E/115100 F 99/11 AT
- Drawings: 1211.6, 1210.27, 74025.0, 7402.0, 1206.0, 1414.3, 2582.2, 1413.25 2581.10, 2613.2 and 2622.2
- Fire Test reports nos. F 2646 w/d dated 23.11.79 and G 2632 w dated 18.01.79.
- Shock Test report no. 5075403-099A-83 from Institute for Mechanical Constructions, Delft, The Netherlands dated June 1983.
- Test report Z 971212-e dated 12.12.1997, Z2 030520-e dated 20.05.2003
- Fitting / disassembly instruction
- Straub leaflets and catalogue
- Test report no.: Z1 080429-e
- Test report No. Z1 080611 e, fire test according to ISO19921/19922

WHL



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– Drawings No. 5018.1- 5001.1- 5004.1 dated 17.06.2008.

Tests carried out

Burst test, Shock test, Corrosion test, Dead load test, Tightness test, Vibration test, Burst test, Pull-out Test,
Vacuum test, Repeated assembly test.
Fire testing of type Fire-Fence to ISO19921/19922

Marking of product

For traceability to this type approval the products are to be marked with:

- Manufacturer's name or trade mark.
- Type designation and size.
- Max. working pressure or pressure class.

Additional marking at manufacturer's option.

Certificate retention survey

For retention of the Type Approval, a DNV Surveyor shall perform a survey - before the expiry date of this certificate - to verify that the conditions for the type approval are complied with. The Surveyor shall perform the following tasks on samples selected at random from stock or from the running production:

- Verify that the dimensions of the couplings comply with Type Approved documentation.
- Witness burst testing.

END OF CERTIFICATE