



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. P-12677
This Certificate consists of 4 pages

This is to certify that the
Axial Restraining Pipe Couplings
with type designation(s)
STRAUB-GRIP-L and Grip-L-Flamstop

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

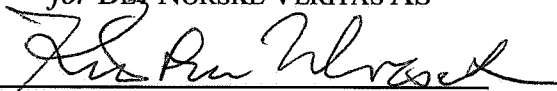
Application

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

Type:	STRAUB-GRIP-L and Grip-L-Flamstop
Temperature range:	-20°C to 80°C
Max. working press.:	16 bar, depend on size (see cert.)
Sizes:	For pipe O.D. 26,9mm to 406,4mm, (see cert.)

Place and date
Høvik, 2008-01-28


for DET NORSKE VERITAS AS


Hanne Anita Hjerpetjønn
Head of Section



Local Office
DNV Essen

This Certificate is valid until
2011-12-31


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-12677
 File No.: 792.41
 NPS Job No.: 262.1-004034-1

Product description

Type: Slip-on joint Grip Type

Sizes:

Grip-L: 26,9 mm to 406,4 mm

Grip-L-Flamstop: 26,9 mm to 219,1 mm

Design:

Grip-L: Stainless steel plate casing, with inside rubber sleeve

Grip-L-Flamstop: Stainless steel casing, with inside rubber sleeve. Outer stainless steel fireproof sleeve with integrated woven ceramic fibre.

Materials:

Casing: AISI 316 Ti

Fasteners: AISI 316 L

Gasket/ sealing: NBR/ EPDM

Application/Limitation

The slip-on joints are allowed for Class II and III piping systems.

Slip-on joints are not to be used in pipelines in cargo holds, tanks, and other spaces which are not easily accessible.

Slip-on joints 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)	+ 2) 3)
10	Lubrication oil lines	+ 2) 3)			
11	Hydraulic oil	+ 2) 3)			
12	Thermal oil	+ 2) 3)			
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	CO2 system	÷(no)
17	Ballast system	+ 1)	33	Steam	+
18	Cooling water system	+ 1)			

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19	Tank cleaning services	+		
20	Non-essential system	+		

Limitations/remarks:

- 1) Inside machinery spaces of category A - only Grip-L-Flamstop 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 Grip-L-Flamstop to be used. Grip-L acceptable for fire mains.
- 4) Above free board deck only.
- 5) In pump rooms and open decks – only Grip-L-Flamstop to be used .

Max. allowable working pressure, bar:

ND/ Pipe O.D.mm	Grip-L	Grip-L-Flamstop
26.9 to 141,3	16,0	16,0
154,0 to 168,3	13,0	13,0
219,1	10,0	10,0
244,5 to 254,0	5,5	
267,0	5,0	
273,0 to 304,0	4,0	
323,9	3,0	
355,6	2,5	
406,4	2,0	

Design temperature range dependent on gasket material:

NBR: -20°C to 80°C
EPDM: -20°C to 80°C, not to be used for hydrocarbon applications.

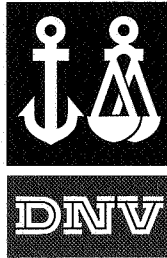
Rubber elements and other parts subject to wearing are to be replaced by new parts in case of repeated use of the coupling.

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. E/400000 E03/03 MV
- Technical Data, Straub-Grip-L, document ref. PZ-E/165120 A 00/01 AT
- Straub Test Reports nos. 921113-e (921023-e) dated 23.10.92, Z960207-e, dated 07.02.96 and Z 960918-e, dated 18.09.96, Z1 030520-e dated 2003-05-20
- Datasheet: E/165120 i 02/05 AT, E / 180010 J 00/01 AT
- Drawings: 3384.1, 902172.2, 3356.0, 3378.0, 3207.0, 2270.5, 2271.4, 2272.4, 2206.3, 3361.0
- Fitting / disassembly instruction
- Straub leaflets and catalogue
- WTD 71 Approval No. 07 / 2007



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Tests carried out

Hydrostatic pressure, Vacuum, Vibration, Fire endurance, Pull-Out, Corrosion tests and Fire Test

Marking of product

For traceability to this Type Approval, each joint is at least to be marked with:

- Manufacturer's name or trade mark.
- Type designation.

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