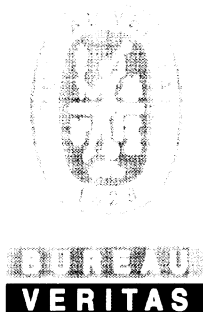


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Published on <http://www.veristar.com>  
Certificate N°:  
01707/G0 BV  
The attached Schedule forms part of the certificate  
File Number : ACM 135/1909/001  
Product Code : 2107H

## CERTIFICATE OF TYPE APPROVAL

*This is to certify that the product identified below was found to be in compliance with the relevant hereunder stated Regulations & standards*

### MECHANICAL JOINTS / SLIP - ON JOINTS / SLEEVE TYPE

STRAUB-FLEX 1L, STRAUB-FLEX 2, STRAUB-FLEX 3  
STRAUB-FLEX 1L.dot, STRAUB-FLEX 2.dot, STRAUB-FLEX 3.dot

**MANUFACTURED BY:**

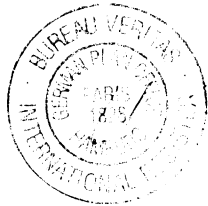
**STRAUB WERKE A.G.**  
Wangs - SWITZERLAND

**SPECIFIED REGULATIONS & STANDARDS :**

- BUREAU VERITAS Rules for the Classification of Steel Ships
- IACS Req. 2001 P2.11

**The Approval is valid until : 01.10.2009**

BUREAU VERITAS HAMBURG



At Paris la Défense, on : 01.10.2004

**J.BENOIT**  
For the Secretary

This Certificate remains valid until the date stated on, hereunder, unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory into service.  
This Certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested.  
This Certificate is not valid without the stamp of the above mentioned BUREAU VERITAS Inspection Center.  
The manufacturer should notify BUREAU VERITAS of any modification or changes to the equipment in order to obtain a valid Certificate.  
The latest published Regulations or Standards referred to, above, and the Marine Division General Conditions are applicable.



## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION :

**STRAUB-FLEX 1L; STRAUB-FLEX 2L, 2LS, 2LU, 2LH; STRAUB-FLEX 3LS, 3H  
STRAUB-FLEX 1L.dot; STRAUB-FLEX 2L.dot, 2LS.dot, 2LU.dot, 2LH.dot; STRAUB-FLEX 3LS.dot,  
3H.dot**

- Design:

Coupling without axial restraining and with sealing and axial anchoring to join metal pipes with commercial outer diameter

- Size                    48.3 mm to 168.3 mm    PN 16 for STRAUB-FLEX 1L  
                             180.0 mm to 1219.2 mm 25 to 2.5 bar depending on size for STRAUB-FLEX 2  
                             558.8 mm to 2032.0 mm 19 to 2 bar depending on size for STRAUB-FLEX 3  
                             48.3 mm to 168.3 mm    PN 16 to PN 10 depending on size for STRAUB-FLEX 1L.dot  
                             180.0 mm to 1219.2 mm 25 to 2.5 bar depending on size for STRAUB-FLEX 2.dot  
                             558.8 mm to 2032.0 mm 19 to 2 bar depending on size for STRAUB-FLEX 3.dot

- Service temperature    NBR                    -20 °C to +80 °C  
   EPDM                 -20 °C to +80 °C

### 2. DESIGN DRAWINGS and/or SPECIFICATIONS

2.1 As per manufacturer's catalogue:

- Design drawings
- Technical specification
- Fitting instructions
- Technical Manual 6/02 (page 74): Electrical conductivity clips
- Sectional view profile insert dated 11/07/2002

2.2 Drawings

Title	STRAUB-FLEX 1L STRAUB-FLEX 1L.dot	STRAUB-FLEX 2 STRAUB-FLEX 2.dot	STRAUB-FLEX 3 STRAUB-FLEX 3.dot
Assembling	611.6 rev. 6 of 11/11/1997 651.6 rev. 6 of 24/11/1997 681.6 rev. 6 of 05/11/1998 2834.2 rev.2 of 25/11/1997	417.7 rev. 7 of 27/10/1997 474.7 rev. 7 of 28/10/1997	411.7 rev. 7 of 30/10/1997 510.6 rev. 6 of 31/10/1997
Technical data	E/145110 D 99/11 AT E/145511 A 02/03 AT	E/145120 D 99/11 AT E/145512 A 02/03 AT	E/145130 D 99/11 AT E/145513 A 02/03 AT

### 3. TYPE TEST REPORTS / LABORATORY RECOGNITION STATUS

Tests reports:

- Tightness test, burst test and vacuum test: Z4 030520-e dated 21/05/2003  
  . Specimen F57.0 and F139.7 Straub-Flex 1L
- Pressure tests and vacuum tests: 831114/2 (25/11/83), 830429/8 (30/04/83), 830505/6 (05/05/83), 840510/7 (10/05/83), 830308 (29/03/83) and 840403/2 (08/06/84)
- Vibration tests: F 2633 s (18/01/79)
- Fire test: F2646 w/d (23/11/79) and F/G 2670 d/w (4/11/80)
- Short-time withstand current test according to EN 60947-7-2: 95, clause 8.3.4 by Swiss Electrotechnical Association (SEV): Test report 01-IK-0331.10 dated 07/12/2001

**4. MATERIALS and/or COMPONENTS REQUIRED TO BE TYPE APPROVED**

Not applicable.

**5. OTHER MATERIALS and/or COMPONENTS**

Material combination W1, W2 or W5

- STRAUB-FLEX 1L and STRAUB-FLEX 1L.dot (W2 or W5)
- STRAUB-FLEX 2L, 2LS, 2LU, 2LH and STRAUB-FLEX 2L.dot, 2LS.dot, 2LU.dot, 2LH.dot (W2, W5, W1)
- STRAUB-FLEX 3LS, 3H and STRAUB-FLEX 3LS.dot, 3H.dot (W2, W5, W1)

Components	W1	W2	W5
Casing	AISI 1024, hot-dip galv.	AISI 316Ti	AISI 316Ti
Screws	AISI 4135	AISI 4135	AISI 316L
Bolts	AISI 12L 14, galv.	AISI 12L 14, galv.	AISI 316L
Strip insert (option)	AISI 316L	AISI 316L	AISI 316L

Sealing sleeve NBR or EPDM

**6. APPLICATION / LIMITATION OF USE**

6.1 May be used for the following services on board ships:

- Fresh and sea water (for cooling and other systems)
- Bilge and ballast
- Air, filling and sounding pipes for fresh and sea water tanks
- Scupper and sanitary discharges led overboard above freeboard deck
- Cargo piping of tankers
- Low pressure air system
- Fire extinction by pressure water and spraying water system
- Inert gas system, on deck, outside of engine room
- Liquid fuel and lubricating oil
- Deck wash lines
- Hold sounding pipes
- Soils and waste pipes also in machinery space
- Oil fuel transfer for deck transfer systems and through other fuel tanks. Couplings may be used on fuel oil pipelines in duct keels (only with STRAUB-T-insert)
- Vapour lines within cargo tanks (only with STRAUB-electrical-conductivity clips)

6.2 Approval also valid for ships to be granted with the notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS. Where notation AUT is expected, coupling screws are to be provided with locking devices. The coupling shall not be used on hydrocarbon piping circuits. File number : AP 2795

6.3 The gasket material must be resistant to conveyed fluid in the pipes.

6.4 Unless the couplings are additionally equipped with STRAUB-electrical-conductivity clips, they are not to be used in piping systems as per 6.1 above where generation of electrostatic charge would cause a hazardous situation.

**7. PRODUCTION SURVEY REQUIREMENTS**

Arrangements shall be made for a Society's Surveyor to carry out, on a periodic basis, visit of the manufacturer's premises and product audits.

**8. ON BOARD INSTALLATION & MAINTENANCE REQUIREMENTS**

8.1 Assembly instructions given by the manufacturer are to be complied with.

8.2 In all cases, the associated pipes are to be suitably supported and anchored. The couplings are to be at any time accessible, excepting inside tanks where permitted by the Bureau Veritas Rules.

8.3 After completion of the installation a test of conductivity is to be carried out.

**9. MARKING FOR IDENTIFICATION**

Each coupling is to be clearly marked to avoid any wrong utilization as per manufacturer's identification with at least:

- The manufacturer's name
- The type description
- The date of manufacture or Serie N°
- The PN and the DN

#### **10. OTHERS**

10.1 This approval is given with the understanding that the manufacturer will accept full responsibility for informing shipbuilders or their sub-contractors of the proper method of fitting and general maintenance of Straub pipe couplings and of the conditions of this approval.

10.2 This certificate supersedes the Type Approval Certificate N° 01707/F3 BV issued on 07/08/2003 by this Society.

**\*\*\* *Last page (End of Document)* \*\*\***

BUREAU VERITAS HAMBURG