



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

**CERTIFICATE NO. P-13220**  
This Certificate consists of 4 pages

*This is to certify that the*  
**Tube Fittings**  
*with type designation(s)*  
**Walform WD, Walform Plus and Walform Plus-M**

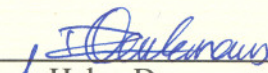
*Manufactured by*  
**EATON Fluid Connectors GmbH**  
LOHMAR RHEINLAND, Germany

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

*Application*  
May be used for hydraulic, compressed air, fuel oil, (not high pressure injection systems),  
lubricating oil, fresh water cooling and sanitary

Temperature range:	-55 °C to +400 °C (see cert.)
Max. working press.:	250 to 800 bar (dep. size and type, see cert.)
Sizes:	6 to 42 mm (dep. type, see cert.)


*Place and date*  
Høvik, 2009-08-03  
for DET NORSKE VERITAS AS

  
Helge Drange  
Head of Section



Local Office  
DNV Essen

*This Certificate is valid until*  
2013-06-30

  
Carl Ulrik Simonsen  
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-13220  
 File No.: 792.24  
 Job No.: 262.1-008081-1

## Product description

### Design:

Walform is a positive tube fitting system that consists of two or three components. The mechanically reshaped tube end is positively connected by a conventional DIN fitting body and a DIN nut. The only possible leakage path is sealed of either by an elastomer ring or by a metallic seal (integral 24° cone of the tube).

Walform WD: Viton Soft Seal.  
 Walform Plus: Viton Soft Seal.  
 Walform Plus-M: Metallic seal.

Materials: Carbon steel St37.4 and St52.4.  
 Stainless steel 1.4571.  
 CuNi 70/30 according to NES 780 part 3

## Application/Limitation

Maximum working pressure in bar:

Sizes [mm]	Walform Plus		Walform Plus-M			Walform WD	
	Max working pressure Stainless or Carbon steel		Max working pressure Stainless or Carbon steel		Max working pressure CuNi 70/30	Max working pressure Stainless or Carbon steel	
	L-Series	S-Series	L-Series	S-Series	S-series	L-Series	S-series
6	500	800	500	800	300	500	630
8	500	800	500	800	300	500	630
10	500	800	500	800	300	500	630
12	400	630	400	630	300	400	630
15	400	-	400	-	-	400	-
16	-	630	-	630	300	-	500
18	400	-	400	-	-	400	-
20	-	420	-	420	300	-	400
22	250	-	250	-	-	250	-
25	-	420	-	420	300	-	400
28	250	-	250	-	-	250	-
30	-	420	-	420	300	-	400
35	250	-	250	-	-	250	-
38	-	420	-	420	300	-	400
42	250	-	250	-	-	250	-

### Temperature range:

Carbon steel: -20 °C to +120 °C  
 Stainless steel: -55 °C to +400 °C  
 CuNi 70/30: 20 °C to +300 °C

*CWSI*



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For service temperatures above 50 °C (1.4571) and 120 °C (carbon steel) the pressure is to be reduced in accordance with the manufacturer's specifications.

For service temperatures above 50 °C (CuNi 70/30) the pressure is to be reduced in accordance with Table 1 in BS 1306.

The wall thickness and material of the tubes is to be in accordance with the current Rules of Det Norske Veritas.

The couplings are accepted used with the following tube specifications:

A tube grade suitable for cold bending and flaring is to be used.  
Seamless precision steel tube, material St 37.4/ St 52.4 to DIN 1630, type NBK 3.1B.  
Tubes made of stainless steel 1.4571, cold-drawn, seamless and scale-free heat-treated form "m" to DIN 17458. Tolerances of tube outside and inside diameter to DIN 2391-1-C (edition 1994-09)

#### **Type Approval documentation**

- Manufacturer's leaflet "WALFORM tube fittings" RV 280 D/GB/F 11/03 M10-II.
- Manufacturer's technical information for the Walform Plus Tube Fittings.
- Drawings No: GS 42 L BLK, GS 20 S BLK, GS 6 S BLK, GS 6 L BLK, WF-Plus-SBM 16S-0/2 and WF-Plus-FS 16X4,0M
- Ringbinder with test documentation.
- WTD 71 Fire Test reports No: 1/97, 2/97 and 4/97 dated 10.04.1997.
- MPA NRW Test report No: 120001236 dated 21.12.2001 and 120001511 dated 23.07.2002.
- QinetiQ Test report No: QINETIQ/FST/RF025041 dated 17.09.2002.
- Letter from Germanischer Lloyd ref: 05-049961/HMa dated 2005-04-25.

#### **Tests carried out**

Repeated assembly, Leakage, Burst, Impulse, Vibration and Fire Test

#### **Marking of product**

For traceability to this Type Approval, the tube fittings are at least to be marked with:

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

WS1

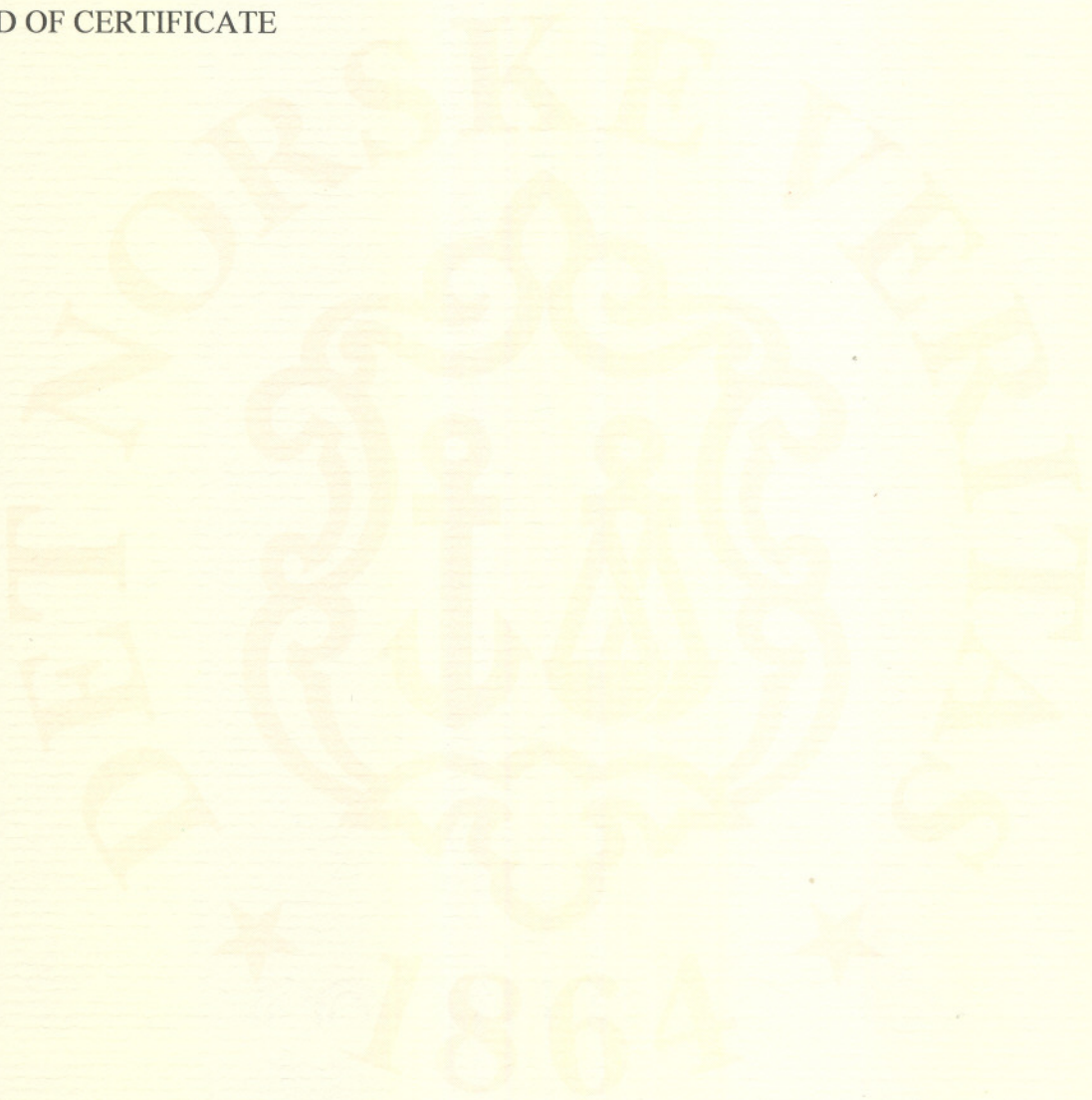


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### Certificate retention survey

For retention of the Type Approval, a DNV Surveyor shall perform a survey – every second year and before the expiry date of this certificate – to verify that the conditions for the type approval are complied with. The Surveyor shall witness burst testing of samples of couplings selected at random from stock or from the running production as a part of this survey.

END OF CERTIFICATE



*CVS1*