

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**

with type designation(s)  
**Hose Connectors - ECOVOS, ECOVOS+ and MULTIVOS**

Issued to  
**Walter Stauffenberg GmbH & Co. KG**  
**Werdohl, Germany**

is found to comply with  
**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses**

## Application :

**Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

**Temperature range:** up to 120°C  
**Max. working press.:** Refer to certificate  
**Sizes:** up to DN 51

Issued at **Hamburg** on **2020-03-16**

This Certificate is valid until **2025-03-15**.

DNV GL local station: **Essen**

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.



Job Id: **262.1-031465-1**  
Certificate No: **TAP00001WY**

## Product description

Skive / Non-Skive Swage Ferrules and Inserts (Hose connectors) made of carbon and stainless steel for the use on DNV GL type approved rubber hoses listed on page 3 of this certificate.  
Reference "STAUFF Catalogue 4 – VOSWINKEL Hose Connectors".

## ECOVOS, ECOVOS+<sup>2</sup>

|            |         |         |         |                      |
|------------|---------|---------|---------|----------------------|
| Ferrule HF | HF-1000 | HF-2001 | HF-3000 | HF-5002 <sup>2</sup> |
|------------|---------|---------|---------|----------------------|

|             |              |               |                               |                          |                  |
|-------------|--------------|---------------|-------------------------------|--------------------------|------------------|
| Inserts HCS | HCS-..-BE-.. | HCS-..-CE-... | HCS-..-DK, DKR, DKJ, DKOR-... | HCS-..-AGR, AGJ, AGN-... | HCS-..-SFL, S-.. |
|-------------|--------------|---------------|-------------------------------|--------------------------|------------------|

## MULTIVOS – High pressure hose connectors

|                         |         |         |         |         |
|-------------------------|---------|---------|---------|---------|
| Ferrule HF <sup>3</sup> | HF-5000 | HF-6000 | HF-5001 | HF-6001 |
|-------------------------|---------|---------|---------|---------|

|             |              |             |                    |                |
|-------------|--------------|-------------|--------------------|----------------|
| Inserts HCS | HCS-..-CE... | HCS-..-DK.. | HCS-..-AGJ, AGN-.. | HCS-..-ORFS-.. |
|-------------|--------------|-------------|--------------------|----------------|

|             |                    |                           |                |
|-------------|--------------------|---------------------------|----------------|
| Inserts HCI | HCI-..-SFL, S, C.. | HCI-..-DKR, DKJ, DKOR-... | HCI-..-ORS-... |
|-------------|--------------------|---------------------------|----------------|

### Notes

<sup>1</sup> Regarding VOSWINKEL Part Numbers refer to Walter Stauff Catalogue 4

<sup>2</sup> ECOVOS+: Standard ECOVOS insert plus integrated mobile interlocking protection ring HCE-AS plus ferrule HF-5002

<sup>3</sup> With Pull-Out Protection (Interlock)

## Materials

|                                     |                              |                                                              |
|-------------------------------------|------------------------------|--------------------------------------------------------------|
| Ferrules and inserts                | Carbon steel                 | 11SMnPb30, C22, C35, C45                                     |
|                                     | Surface corrosion protection | Zinc / Nickel-Plating                                        |
|                                     | Stainless steel              | 1.4571 (AISI 316 Ti), 1.4401 (AISI 316), 1.4404 (AISI 316 L) |
| Mobile interlocking protection ring | Non-metallic, Metallic       | PEEK, C45                                                    |

The standard stainless-steel materials 1.4401, 1.4571, 1.4301, 1.4404, 1.4435, 1.4541 are not approved for application in sea water systems.

Reference is made to DNV GL Rules Pt.4, Ch.6 – Section 2 Materials.

## Production places

|                                                                            |
|----------------------------------------------------------------------------|
| Walter Stauffenberg GmbH&Co KG, Neugrünenthal, 58531 Meinerzhagen, Germany |
| ARMATUREN-ARNDT, Heuserweg 16, 53842 Troisdorf, Germany                    |

## Responsibility

The company Walter Stauffenberg GmbH & Co. KG, Werdohl takes the responsibility that the design and the production of the products is in compliance with the Rules, Standards and/or Regulations listed on page 1 of this certificate.

Job Id: **262.1-031465-1**  
Certificate No: **TAP00001WY**

## Application/Limitation

The hose connectors of type ECOVOS, ECOVOS+ and MULTIVOS are type approved for crimping on rubber hoses as listed in the following table.

| Hose Manufacturer                           | Hose type                                             | DNV GL TA Certificate <sup>1</sup>                                                                                                                                  |
|---------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manuli Hydraulics(Suzhou) Co., Ltd., China  | 4SH, 4SP, R15, 2TE, 3TE, 1SN, 2SN, 1ST, 2ST, 1SC, 2SC | TAP000002E (R13, 4SH, 4SP), TAP00000B6 (R15) TAP00000SM(ASTRO/2), TAP00001HD(ASTRO/3) TAP00000BG (1SN, 2SN), TAP000002D (2SN, 2SC,1SN) TAP0000144, TAP00000FZ (1SC) |
| Semperit                                    | 4SH                                                   | TAP0000164                                                                                                                                                          |
| Parker Hannifin Manufacturing S.r.l., Italy | R15                                                   | TAP000016Z                                                                                                                                                          |
| Alfagomma, Italy                            | 4SH                                                   | TAP00001GK                                                                                                                                                          |

### Notes

<sup>1</sup> Other valid TA certificates issued for the hose manufacturer and hose type may be accepted by case by case approval.

## Maximum allowable working pressure (M.A.W.P) of the hose assembly

The hose connectors have been type tested according to the M.A.W.P. of the hose types.

In some cases the design pressure of the hose connector pipe connection may be lower than M.A.W.P. of the hose. This is to be observed in production testing and marking of the hose assembly(indication of reduced M.A.W.P.). Refer to "STAUFF Catalogue 4 – VOSWINKEL Hose Connectors – Technical Appendix".

## Type Approval documentation

### Tests carried out

Fire resistance tests acc. to ISO15540/41, Pressure impulse test according to DIN 20024, ISO 6803 respectively.

## Marking of product

| Scope             | Example                                                                             |
|-------------------|-------------------------------------------------------------------------------------|
| Manufacturer sign |  |

## Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNVGL-CP-0338, Sec.4.

## End of certificate