# TYPE APPROVAL CERTIFICATE

Certificate no.:
**TAP00001WY**
Revision No:
**1**

## 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 rules for classification – Ships Pt.4 Ch.6 Piping systems**
**DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021**
**DNV class programme DNV-CP-0183 – Type approval – Flexible non-metallic hoses**

## Application:

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

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

Issued at **Hamburg** on **2025-09-11**

This Certificate is valid until **2028-03-10**.
DNV local unit: **Essen**

Approval Engineer: **Hagen Markus**

for **DNV**

Digitally Signed By:
Sven Klinger
Location: DNV Hamburg, Germany

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

## Product description

Skive / Non-Skive Swage Ferrules and Inserts (Hose connectors) made of carbon and stainless steel for the use on DNV type approved rubber hoses listed on page 3 of this certificate.

Reference “STAUFF Catalogue 4 – VOSWINKEL Hose Connectors”.

### ECOVOS, ECOVOS+[2]

| | | | | | |
|---|---|---|---|---|---|
| Ferrule HF | HF-1000 | HF-2001 | HF-3000 | HF-5002[2] | |
| 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[3] | 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**
[2] ECOVOS+: Standard ECOVOS insert plus integrated mobile interlocking protection ring HCE-AS plus ferrule HF-5002
[3] With Pull-Out Protection (Interlock)

## Materials

| | | |
|---|---|---|
| Ferrules and inserts | Carbon steel | 11SMnPb30 |
| | 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 |

## Selection of materials

It shall be noted that the selection of the materials considers the applicable service condition with respect to type of media, flow velocity, media temperature and installation area of the piping system.
In particular, the resistance to corrosion, erosion, oxidation and other deterioration during projected service life are to be considered.

**Sea water application**
The term sea water application includes piping systems conveying sea water and piping systems installed on the open deck.

The stainless-steel materials 1.4571 (AISI 316Ti), 1.4404(AISI 316L) or 1.4401(AISI 316) are approved for sea water application.

Even the stainless-steel grade specified above cannot be considered immune to attack under all situations, avoidance of stagnant seawater conditions and removal of welding oxides after welding are some of the crucial factors to the successful use in piping systems for sea water and installation on open deck.

References:
- DNV-RU-SHIP Rules Pt.4 Ch.6 – Section 2 – Materials Table 1 and DNV-OS-D101 Ch.2 – Sec. 2 – Materials
- DNV-CG-0288 Corrosion protection of ships.

## 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 TA Certificate[1] |
|---|---|---|
| Manuli Hydraulics(Suzhou) Co., Ltd., China | 4SH, 4SP, R13<br>1SN, 2SN, 1ST, 2ST,<br>1SC, 2SC | TAP000002E (R13, 4SH, 4SP)<br>TAP00000BG (1SN, 2SN)<br>TAP0000144 |
| Semperit | 4SH | TAP0000164 |
| Parker Hannifin Manufacturing S.r.l., Italy | R15 | TAP000016Z |

**Notes**
[1] Other valid TA certificates issued for the hose manufacturer and hose type may be accepted by case-by-case approval.

## Maximum allowable working pressure (MAWP) of the hose assembly

The hose connectors have been type tested according to the MAWP. of the hose types.
In some cases, the design pressure of the hose connector pipe connection side may be lower than MAWP.
of the hose.
This is to be observed in production testing and marking of the hose assembly (indication of reduced MAWP).
Refer to “STAUFF Catalogue 4 – VOSWINKEL Hose Connectors – Technical Appendix”.

## Type Approval documentation

**TAP00001WY, Revision 1**
Work scope: Intermediate renewal for 2.5 years without modification
**Documents**
Assessment report production place Meinerzhagen, 2025-03-26

## Tests carried out

Fire resistance tests acc. to ISO15540/41(wet condition), 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 Surveyor shall perform periodical assessment to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNV-CP-0338, Section 4.

In addition, burst pressure testing according to approved test plan to be carried out in the course of the full term renewal of the certificate.

To check the validity of this certificate, please look it up in https://approvalfinder.dnv.com

## Manufactured by:

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.