

# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAP00000BU**  
Revision No:  
**2**

## This is to certify:

**That the Pipe Couplings, Bite and Compression Type**

with type designation(s)  
**VOSSFormSQR and VOSSFormSQRVA**

Issued to  
**VOSS Fluid GmbH**  
**Wipperfürth, Nordrhein-Westfalen, Germany**

is found to comply with  
**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints**

## Application :

**The pipe couplings specified in this type approval certificate are accepted for installation on all vessels classed by DNV.**

**Temperature range:** -55°C up to 200°C (refer to remarks in following pages)  
**Max. working press.:** 250 to 800 bar (depending on size)  
**Sizes:** 6mm up to 42mm

Issued at **Hamburg** on **2021-07-23**

for **DNV**

This Certificate is valid until **2026-07-22**.

DNV local station: **Essen**

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.

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 300,000 USD.



## Product description

The VOSSForm<sup>SQR</sup> and VOSSForm<sup>SQR</sup> VA compression coupling system consist of standard pipe couplings in accordance with DIN 3861 / ISO 8434-1 in combination with “SQR – function nut” consisting of “Standard Union Nut” acc. to DIN 3861 / ISO 8434-1 with a pressed in “Clamping Ring” (Retaining function) plus moulded seal on formed tube end.

The tube is formed into a taper of 24° by VOSSForm 100 forming machine. Sealing function by combination of metallic sealing with soft seal in the secondary section of the coupling.

Reference: VOSS Catalogue “Hydraulic connection technology”.

Component	Type designation	Materials	Reference
Fitting body	VOSSForm <sup>SQR</sup>	Carbon steel Stainless steel (1.4571)	DIN 3859-1, table 2 or higher grades
	VOSSForm <sup>SQR</sup> VA		
Nut	SQRN – function nut with clamping ring		
SQRMS Moulded seals	FKM (Standard)	VOSS Catalogue Chapter 9 – General technical notes	
Tubes	VOSS Tube coupling technology catalogue – General technical notes		
	DNV GL Ship Rules Pt.4, Ch.6: Section 9, Tables 2 and 3: Minimum Tube wall thickness. Section 2, Table 3: Material certificates		

This type approval includes coupling types made of stainless as specified in the PH Industrie Hydraulic GmbH & Co. KG catalogue, “Pipe and Hose connectors / Stainless Steel, edition 2021” - Section Cone Sealing Couplings according to DIN 2353/ DIN EN ISO 8434-1.

The following coupling types are excluded:

- GE, WE, TE, LE couplings and further types with BSP tapered, NPT thread connection.
- Banjo and Rotary couplings and Valves

## Scope of type approval<sup>1</sup>

This type approval certificate includes carbon steel and stainless coupling types as specified in the VOSS catalogue “Tube coupling technology”.

Coupling type	Type designation
Male stud connectors Form B, Form E, Form F	SDS, SDE, SDL, SDT
Unions	S, E, T, K
Bulkhead unions, Welding bulkhead connectors	BHSLN, BHELN, BHSDSLN, WDBHS
Adjustable couplings with tube socket	SWE, SWT, SWL, SWSDS, SWS
Adjustable stud connectors with locknut	SDAE, SDAE45, SDAL, SDAT
Female and gauge couplings	S, PGS, SWPGS, SWOPGS
<b>Component parts and accessories for couplings</b>	
Double nipple	SD2S
Thread reducing couplings, Straight adapters ISO6149 / DIN3852	SDS
Blanking plug for ports, caps, plugs, Hexagonal nuts	PLIH/PLEH, PLB, PLO/PLOC, TBS, LN
Reinforcing sleeves	RS
Sealing rings	OR, PEFLEX
<b>Hydraulic valves</b>	
<b>Type designation</b>	
Non-return valves standard	VNRO, VNROI, VNROPT, VNROTP
Non-return valve plug-in cartridges	VNRCO
Shuttle valves with ball seats	VST and with soft seat VSOT
High-pressure valves	VNROHP, VNROTPHP, VNROTPHP
Internal valve part installation kits	VNRIO

### Note

<sup>1</sup> Excluded from type approval are Banjo and rotary couplings, flange connections

**For the following coupling types limitations as specified in the Rules Pt.4, Ch.6 are to be observed:**

**Bulkhead and Deck pipe penetrations**

**Screwed bulkhead couplings** are not approved through tank walls, watertight decks and bulkheads. For application through fire divisions a separate type approval is required.

**Straight Bulkhead weld fittings** are approved through tank walls, watertight decks and bulkheads. Through fire divisions the coupling and connected pipe is to be provided with same insulation material as used for the divisions. Total insulation length of 450mm.

**Pipe connectors where pressure -tight joints are made on the threads** are limited in the application as follows:

Pipe connector design	Range of application <sup>1</sup>	
..with tapered or parallel thread	not approved for toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur	
..with parallel thread	approved for pipe class III	up to outside diameter 60.3mm
..with tapered thread	approved for pipe class I	up to outside diameter 33.7mm
	approved for pipe class II, III	up to outside diameter 60.3mm

Note

<sup>1</sup> Refer to DNVGL Rules, Pt.4, Ch.6 – Section 9 – 5.2.6.

**Overview of threaded pipe couplings with limitations**

Type	Name
SDS, SDE, SDL, SDT	Male stud connector sealing types tapered thread
GP-SDS	Thread reducing couplings ISO 1179-2, 4
	Straight adapter ISO 6149/DIN 3852
SWSDS	Swivel connector sealing type tapered thread

All other fittings with thread connection not listed in the above table may be used without limitations.

**Application/Limitation**

The VOSSForm<sup>SQR</sup> and VOSSForm<sup>SQR</sup> VA compression coupling system is type approved for application in pipe class I, II and III-piping systems, as specified in DNV GL Ship Rules Pt. 4, Ch. 6, Sec. 9 Table 9 and 10 - compression couplings, fire resistant type.

Pipe fittings are in general not approved for installation in high pressure fuel injection systems of combustion engines.

**Sea water application**

The standard stainless-steel material 1.4571 is not approved for application in sea water systems or unprotected installation on the open deck.

It shall be noted that the selection of the materials considers the intended service condition and installation area of the piping system. In particular, the resistance to corrosion, erosion, oxidation and other deterioration which may occur during intended service life.

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

### Pressure range<sup>1</sup>

The couplings are type approved for the following nominal pressures PN.

Series	Tube OD mm	PN bar
L - series	6, 8 and 10	500
	12, 15 and 18	400
	22, 28, 35 and 42	250
S - series	6, 8 and 10	800
	12, 14 and 16	630
	20, 25, 30, 38	420

**Note**

<sup>1</sup> Individual pressure ratings of the fittings as specified in the VOSS catalogue "Hydraulic connection technology - Chapter 9" are to be observed.

### Temperature range

Temperature range for pipe coupling and sealing material:

Couplings	Temperature range °C
VOSSForm <sup>SQR</sup> - Carbon Steel	- 20 <sup>2</sup> up to + 250 <sup>1</sup>
VOSSForm <sup>SQR</sup> VA - Stainless Steel	- 55 up to + 400 <sup>1</sup>

Sealings	Temperature range °C
NBR	- 35 up to + 100
HNBR	- 30 up to + 140
EPDM	- 40 up to + 150
FKM	- 25 up to + 200

**Notes**

<sup>1</sup> For service temperatures above 50°C (stainless steel) and 120°C (carbon steel) appropriate pressure derating factors according to VOSS catalogue "Tube coupling technology- Chapter 9" are to be observed.

<sup>2</sup> Lowest medium temperature -20°C, Lowest environmental temperature -40°C

The service temperature range applicable according to coupling material and sealing material selected. In addition, temperature limits with regard to seal durability with hydraulic fluids to be observed. Reference VOSS catalogue "Tube coupling technology – additional information".

### Temperature range examples

Stainless steel pipe coupling with EPDM sealing	- 40°C up to 150°C
Carbon steel pipe coupling with EPDM or FKM sealing	-20°C up to +150°C (EDM)
	-25°C up to +200°C (FKM)

### Assembling and Installation

To ensure the performance of the mechanical joint connection the assembly instructions specified in VOSS catalogue "Tube coupling technology – Assembly instructions" are to be observed.

Tube connections are to be made of tube couplings manufactured by VOSS Fluid solely. Approved metal forming machine: **VOSSForm 100**.

## Type Approval documentation

### Actual TAP00000BU, Rev. 2

Test reports

VOSS Automotive GmbH Versuchslabor

Report	Test scope	Couplings
Untersuchungsbericht 2021_0461/1, 2021-06-01	Wiederholmontage, Dichtheits-,Berstdruckprüfung	VOSSForm L6, S6, S38 Carbon steel

### Miscellaneous documents

- DNV Type Approval Assessment report of production place Wipperfürth, 2021-04-27
- ISO 9001:2015 certificate No. 01 100 1500010 issued by TÜV Rheinland

### VOSS Fluid Legacy GL TAC 44 385-07HH

- Test report no. C101/06 of IMA Dresden
- WTD71 Test report 61070 / 105 to 61070 / 108
- UA.-No.: 4522 issued by company Voss

### PH Industrie Hydraulik TAP00000Z3, Legacy GL TAC 45 936-03HH

- Test Report No. 12000985 of MPA Dortmund, F6 11 004
- Technical Documentation, Catalogue 2011
- GL Audit report no. PHIndustrieHydraulik20110901
- GL Approval Ref.-No.: 10-105546

### VOSS Fluid , Legacy DNV TAC P-14275, Job ID.: 262.1-002866-2

- Voss Examination Report No.: AEL 225/05/1 dated 2005-12-23 and AEL 214/06/1 dated 2006-11-23
- IMA Dresden Test Report No.: C130/05 dated 2006-04-06 and C101/06 dated 2006-12-07
- WTD 71 Fire Test Report No.: 61070/107
- Test report 2011\_328/1
- Retention survey report dated 2012-03-19

## Type Tests carried out

Visual inspection, Repeated assembly test, Pressure test, Burst pressure test, Leakage test, Combined pressure impulse and Vibration test., Pull out test, Vacuum test, Fire resistant test.

## Marking of product

Component	Example
<b>Nut</b>	
Manufacturer – Size – Supplier code – Country origin	VOSS-S16-95/86-DE
Stainless steel	PH-71
<b>Tube coupling</b>	
Manufacturer-Supplier code	VOSS -20 – K
Stainless steel	PH-71

## Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNVGL-CP-0338, Section 4.

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

## End of certificate