

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pipe Couplings, Bite and Compression Type

with type designation(s)
VOSSRingM - Cutting Ring Couplings

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 :

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

Temperature range: Refer to certificate

Max. working press.: 800bar

Sizes: 6mm up to 42mm

Issued at **Hamburg** on **2020-12-21**

This Certificate is valid until **2025-12-20**.

DNV GL local station: **Essen**

for **DNV GL**

Approval Engineer: **Hagen Markus**

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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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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 VOSSRingM cutting ring coupling system (24° cutting ring system) made of carbon steel consist of pressure series L and S.

VOSS 24° DIN tube couplings, union nut acc. to DIN EN ISO 8434-1 and VOSSRingM cutting rings.

Corrosion protection of couplings and nuts by VOSScoat (zinc-nickel based surface coating).
Reference "VOSS Tube coupling technology catalogue".

The VOSS Fluid VOSSRingM cutting ring system consist of the following main components:

Component	Type designation	Material designation ¹
Double edge cutting ring	VRM	Carbon steel
24° DIN tube couplings	Acc. to "Scope of type approval"	
Union nut	N	
Sealing rings	PEFLEX, OR	FKM, NBR

Notes

¹ For detailed material designation refer to "VOSS Tube coupling technology catalogue – General technical notes".

Selection of the tubes

For selection of the tubes the following references are to be observed:

- 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

Scope of type approval¹

This type approval certificate includes coupling types as specified in the "VOSS Tube coupling technology catalogue".

Coupling type	Type designation
Male stud connectors	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
Component parts and accessories for couplings	
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
Hydraulic valves	Type designation
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, VNROPTHP, VNROTPHP
Internal valve part installation kits	VNRIO

Note

¹ 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

Bulkhead coupling types with type designation BHLSN, BHELN, BHSDSLN are not approved through tank walls, watertight decks and bulkheads.
For application through fire divisions a separate type approval is required.

Straight Bulkhead weld fitting of type WDBHS is 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 ¹	
..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

¹ 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 VOSS Fluid VOSSRingM cutting ring system is type approved for joining of tubes intended to be used in piping systems of pipe class I, II and III.

Reference DNV GL Ship Rules Pt. 4, Ch. 6, Sec. 9 -5.2 Pipe couplings other than flanges, para. 5.2.1 and Table 8 Examples of mechanical joints – Compression coupling – Bite type.

Approved scope of application according to Table 9 and 10 - Compression coupling – Fire resistant type.

Coupling series L and S may be used for gases having an oxygen content exceeding 21% at working pressure 250 bar and 360 bar respectively.

Gas fueled ship installations – Fuel piping system

Accessory lines and instrumentation lines with external diameters of 25 mm or less. Pipe couplings with metallic sealing shall be used only.

Refer to Pt.6 Ch.2, Sec. 5 – 11.2 (3) Fuel piping systems.

The VOSS Fluid VOSSRingM cutting ring system is not approved for application in high pressure fuel injection systems of combustion engines.

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 etc. 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 taken into account.

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

Sizes and pressure range

The specified pressure values are applicable on straight fittings.
For other fitting types such as elbows or tees the nominal pressure PN may be less.
Refer to "VOSS Tube coupling technology catalogue".

Tube O.D. mm	Nominal pressure PN ¹	Tube O.D. mm	Nominal pressure PN ¹
	Light Series		Heavy Series
6, 8, 10	500	6, 8, 10	800
12, 15, 18	400	12, 14, 16	630
22, 28, 35, 42	250	20, 25, 30, 38	420

Notes

¹ Max working pressure of the piping system depend on the selected pipe material and wall thickness.

Temperature range

The temperature range of the VOSS Fluid VOSSRing[®] cutting ring system is limited by the soft seal material of the fittings, if applicable.

Material	Lowest allowable Temperature	Maximum allowable Temperature
Carbon steel ²	- 20°C ¹	+ 250°C
NBR	- 35°C	+ 100°C
FKM	- 25°C	+ 200°C

Notes

¹ Lowest medium temperature -20°C and lowest environmental temperature -40°C. Refer to DIN 3859-1.

² For service temperatures above 120°C (Carbon steel) and above 50°C (Stainless steel) the pressure reductions factors specified in "VOSS Tube coupling technology catalogue – General technical notes" are to be observed.

Temperature range examples

Carbon steel pipe couplings with metallic sealing	- 20°C up to +250°C
Carbon steel male stud couplings of type PEFLEX, UN/UNF, ISO 6149 with soft seal	- 20°C up to + 100°C (NBR)
	- 20°C up to + 200°C (FKM)

Assembling and Installation

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

Tube connections are to be made of tube couplings manufactured by VOSS Fluid solely.

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Certificate No: **TAP000027X**

Type Approval documentation

Tests carried out

- Gas pressure test / Tightness test / Burst test / Vacuum test
- Pull-out test, Combined Vibration and Pressure pulsation test, Fire resistance test acc. to ISO 19921/22,
- Repeated assembly test

Marking of product

Component	Scope	Example
Tube coupling	Manufacturer – Material code – Supplier code	VOSS -20 - K
Cutting ring	Manufacturer – Supplier code	VOSS 2
Nut	Manufacturer – Size – Supplier code – Country origin	VOSS-S16-95/86-DE

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, Sec.4.

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

End of certificate