

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Couplings, Bite and Compression Type**with type designation(s)
VOSSLok40

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:** Up to 200°C
Max. working press.: up to 50MPa
Sizes: 6mm up to 22mmIssued at **Hamburg** on **2019-04-11**for **DNV GL**This Certificate is valid until **2024-04-10**.DNV GL 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.



Product description

The VOSSLok⁴⁰ pipe coupling system consists of a 40° sealing cone formed on the pipe by using the VOSS Fluid forming machine of type TD-TYPE40VL , special nut and pipe fittings listed in this certificate.

Component	Material designation ³	Design standards	Delivery condition
Pipe coupling	1.4404, AISI 316L	DIN EN 10088-3	--
Special nut			
Seamless tubes ^{1,2}	1.4571, 1.4404, 1.4435, 1.4301, 1.4306	DIN EN 10216-5 DIN EN 10305-1	CFA or CFD. Max. hardness 90 HRB

Notes

¹ For selection of tubes refer to the VOSS Fluid catalogue "VOSSLok⁴⁰".

² Tube wall thickness acc. to DNV GL Ship Rules Pt.4, Ch.6 - Section 9, Tables 3 and 4. Regarding material certificates refer Section 2, Table 3.

³ For detailed material designation refer to VOSS Fluid catalogue "Hydraulic connection technology, Edition 2018 - Section 9".

Scope of type approval

This type approval certificate includes the following coupling types and accessories

Pipe couplings types	Type designation
Male stud connectors	SDE, SDS
Unions	S, E, T
Bulkhead unions	BHSLN
40° taper couplings	SWE, SWS, SW2S
Female connectors	S
Component parts and accessories for couplings	
Nuts, -screws	N, SU
Blanking plug for ports, plugs	PLC, TBS
Sealing rings	GP-SR, GP-OR
Tools	
Forming machine	VOSSLok ⁴⁰ – TD-TYPE40VL

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

Bulkhead unions

Coupling types with type designation BHLSN is not approved through tank walls, watertight decks and bulkheads.

For application through fire divisions a separate type approval is required.

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

- Pipe couplings with parallel thread are not approved for pipe class I and II.
- Tapered or parallel thread is not approved for toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.

Refer to DNVGL Rules, Pt.4, Ch.6 – Section 9 – 5.2.6.

Overview of threaded pipe couplings with limitations

Type	Name
SDE, SDS	Male stud connector with tapered thread

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

Application / Limitation

The VOSSLoK⁴⁰ form pipe 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 12 and 13 - compression couplings – fire resistant type.

The pipe couplings are 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 considered.

Pipe couplings made of stainless steel material 1.4571 are not approved for application in sea water systems and unprotected installation against green sea on open deck.

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

Sizes and pressure range²

Tube O.D.	Tube O.D.	Nominal pressure ¹
Metric mm	Inch in	PN MPa
6, 8, 10	3/16, 1/4, 5/16	50
12	3/8	40
14, 15	1/2, 5/8	40
16, 18	3/4, 7/8	32
20	1	25
22	--	25

Notes

¹ For PN of individual pipe couplings refer to VOSS Fluid catalogue "VOSSLoK⁴⁰".

² Max working pressure of the piping system depend on the selected pipe material and wall thickness.

Temperature range

The temperature range of the VOSSLok⁴⁰ form pipe coupling system is limited by the soft seal material, if applicable.

Material	Min. Temperature	Max. Temperature
Stainless steel ¹	- 55°C	+ 200°C
FKM	- 25°C	+ 200°C

Notes

¹ For service temperatures above 50°C (Stainless steel) the pressure reductions factors specified in the VOSS Fluid catalogue "VOSSLok⁴⁰" are to be observed.

Tube forming and assembling of pipe couplings

For tube forming and assembling of pipe couplings the instruction specified in the VOSS Fluid catalogue "VOSSLok⁴⁰" are to be observed.

Type Approval documentation

Test reports based on test plan released on 2017-12-06

VOSS Automotive GmbH – Testing Laboratory, Wipperfürth

2018_0419/1	Repeated assembly test, gas leak tightness test, hydraulic tightness and burst pressure test.
2018_0418/1	Tightness test, vacuum, pull out
UA-Nr.: 2018_0419	Burst pressure test report

IMA Materialforschung und Anwendungstechnik GmbH, Dresden

K041/17, 2018-03-13	Tightness test, Combined pressure pulsation and vibration test
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Dr. -Ing. T. Bäumer GmbH test laboratory, Herford

Fire resistance tests acc. to ISO 19921/22 on stud couplings with elastomeric seals

Test report	Date
IBB1308:L06	2014-10-22
IBB1304:L18	
IBB1306:S6	
IBB1302:S16	2014-10-23
IBB1310:L42	
IBB1312:S38	

Miscellaneous

- DNVGL Assessment report of VOSS Fluid GmbH, D-51688 Wipperfürth, 2019-04-08
- VOSS Fluid catalogue "VOSSLok⁴⁰"
- Data sheet forming machine FL-TD-TYPE40VL

Job Id: **262.1-023822-1**
Certificate No: **TAP00001MD**

Tests carried out

Repeat assembly test, gas leak test (70bar), hydraulic tightness test, burst pressure test, combined pressure impulse and vibration test, pull-out test, vacuum test, fire resistance test.

Marking of product

Component	Scope	Example
Pipe coupling	Manufacturer sign, suppliers mark, heat no., material code, unit system and size	VOSS 00-3816 VA MM 12
O-Ring (FKM)	Color	Black
Nut	Manufacturer sign, suppliers mark, heat no., material code, unit system and size of first pipe connection, type and size of inner thread	VOSS 003816 VA MM12 BS3/8

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 DNVGL-CP-0338, Sec.4.

End of certificate