

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Couplings, Bite and Compression Type**

with type designation(s)

Light series (L-series) and heavy series (S-series) designed acc. DIN 3861, DIN 2353, ISO 8434-1 and ISO 8434-4

Issued to

PH Industrie-Hydraulik GmbH und Co. KG
Sprockhövel 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 :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Temperature range:** up to 400°C. Refer to certificate.**Max. working press.:** up to 800 bar. Refer to certificate.**Sizes:** 6mm up to 42mmIssued at **Hamburg** on **2017-08-22**This Certificate is valid until **2022-08-21**.for **DNV GL**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

Pipe couplings, cutting ring type, Light series (L-series) and heavy series (S-series) designed according to DIN 3861, DIN 2353, ISO 8434-1 and ISO 8434-4.

Materials

Tubes¹

Seamless stainless steel tube 1.4571 / X6CrNiMoTi17122, cold-drawn, heat-treated acc. to DIN EN 10216-5, table 6. Surface hardness HRB90. Tube tolerances refer to PH catalogue.

Note

¹ For selection of the tubes, the minimum wall thickness as required by DNVGL Rules, Pt.4, Ch.6 are to be observed.

Coupling, Cutting ring, Nut

Stainless Steel: X6CrNiMoTi17122 / 1.4571 / DIN EN 10088-3:2014-12 / DIN 3859-1, table 2

Scope of type approved fittings^{2,3}

This type approval includes pipe couplings types as specified in the PH Catalogue Section 8 and 9 - Cone Sealing Couplings and Section 10 Weld Nipple Couplings with O-Ring.

The following components are not included in this type approval certificate:

- Non-return valves
- KV- Equal Crosses
- WHV / THV - Banjo elbow / tee
- WEEV - Adjustable elbow
- EVW - Swivel elbows
- EVT - Swivel branch tees
- EVL - Swivel barrel tees

Notes

² Bulkhead connections of type GSV, WSV are not approved through tank walls, fire divisions, watertight deck and bulkheads.

³ Pipe couplings with pipe thread 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.

Application/Limitation

The pipe coupling system is type approved for application in pipe class I, II and III-piping systems, fire resistant type, as listed in DNV GL Ship Rules Pt. 4, Ch. 6, Sec. 9 Table 12 & 13 / Bite-type.

Pressure class, Sizes and nominal pressure PN

Pressure class	Tube O.D. mm	PN ⁴
L	6 - 10	500
L	12 - 18	400
L	22 - 42	250
S	6 - 10	800
S	12 - 16	630
S	20 - 38	420

Note

⁴ Individual PN of pipe coupling as specified in the PH Product Catalogue is to be observed

Temperature range¹

Metallic material	Temperature range
Stainless steel	- 55°C to +400°C
Sealing material	
NBR	- 35°C to +100°C
FPM	- 20°C to +200°C
PTFE	- 55°C to +200°C

Note

¹ Temperature range is limited to -55°C, i.e. non-cryogenic applications.

The combination of stainless steel couplings with sealing materials, e.g. NBR, FPM or PTFE restrict the temperature range.

Example M.A.W.T.:

Stainless steel in combination with

FPM sealing	- 20°C up to + 200°C
PTFE sealing	- 55°C up to + 200°C
NBR sealing	- 35°C up to + 100°C
Metallic sealing	- 55°C up to + 400°C

For application with service temperature above 50°C the maximum working pressure is to be reduced by the following factors:

Temperature	20 °C	50 °C	100 °C	200 °C	300 °C	400 °C
Factor	1	0,95	0,89	0,80	0,71	0,66

Sea water application

The traditional stainless steels, including type 316 or 316L (1.4571), should not be considered suitable for use in seawater systems.

However, certain stainless steels with higher contents of chromium, molybdenum and nitrogen have improved resistance to localised corrosion. These include high molybdenum austenitic steels and ferritic-austenitic (duplex) steels. Even these steels cannot be considered immune to attack under all situations; avoidance of stagnant sea water conditions and removal of welding oxides are some of the important factors to the successful use.

For application in sea water systems stainless steel grades with a minimum pitting resistance equivalent number (PREN) of 30 shall be used.

Material certificate shall include appropriate confirmation tests per ASTM A262, Practice E, Copper - Copper Sulphate - Sulphuric Acid Test or to another recognised standard.

Refer to DNVGL Rules Part 2 Section 3 – Corrosion testing.

Type Approval documentation

Tests carried out

Assembly / Tightness test, Burst test, Pressure pulsation/Vibration test, Vacuum test, Gas leakage test, Fire resistance test and Pull out test.

Marking of product

For traceability to this type approval, each part of the pipe coupling is to be marked as follows:

	Example	Remark
Nuts	- PH	Type of material code depends on component size. Trace code ensures traceability to material charge of pre-material
Fittings	- Material code, trace code	
Cutting rings		

Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by DNVGL surveyor.

The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:

- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking

In connection with the renewal assessment, burst pressure tests on test assemblies are to be carried out in the presence of the DNV GL surveyor. The test assemblies shall consist of two pieces of tubing connected with a mechanical joint of straight type. Selection of joint sizes and quantity of test assemblies is to be determined prior to the assessment.

At least one of the test assemblies is to be manufactured in the presence of the surveyor according to the manufacturers specification.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.