DNV·GL

Certificate No:
TAP00001U7

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pipe Couplings, Bite and Compression Type

with type designation(s)
Compression Coupling L- and S-Series

Issued to
ARMATUREN-ARNDT GmbH
Troisdorf, 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:	**-55°C up to +400°C**
Max. working press.:	**630 bar**
Sizes:	**OD 6 mm up to OD 42 mm**

Issued at **Hamburg** on **2019-05-16**
This Certificate is valid until **2024-05-15**.
DNV GL local station: **Essen**

for **DNV GL**

Approval Engineer: **Christian Kaemmer**

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.

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Product description

The Armaturen-Arndt-Pipe-Coupling System consists of the following components:

- Basic component, cutting ring, union nut, reinforcement cover.
- Series L (light) and Series S (heavy) acc. to EN ISO 8434-1/-4 (DIN 2353)

Materials:

Component	**Material designation**	**Design Standard**
Basic component (Screw connection)	1.4571 / X6CrNiMoTi17-12-2 / DIN EN 10088-3	ISO 8434-1
Cutting ring (with O-Ring)	1.4571 / X6CrNiMoTi17-12-2 / DIN EN 10088-3	Armaturen-Arndt
Union nut	1.4571 / X6CrNiMoTi17-12-2 / DIN EN 10088-3	ISO 8434-1
Pipe [1,2]	Seamless steel tube 1.4571 or of equivalent material quality	customary

Notes
[1] For selection of the tubes refer to Armaturen-Arndt-Catalogue "Technical Information".
[2] Minimum tube wall thickness acc. to DNV GL Ship Rules Pt.4, Ch.6 - Section 9, Table 3. Regarding material certificates refer Section 2, Table 3.

Application/Limitation

The pipe coupling system is type approved for application in pipe class I, II and III-piping systems, as listed in DNV GL Ship Rules Pt. 4, Ch. 6, Sec. 9 Table 10, 11 & 12 / Compression Coupling, Bite-type.

The pipe couplings are not approved for fire resistance, restrictions of DNV GL Ship Rules Pt. 4, Ch. 6, Sec. 9 Table 11 are to be observed. They are not approved for application in high pressure fuel injection systems of combustion engines. Banjo-couplings and non-return-valves are not type approved.

Tube fittings made of stainless steel 1.4571 are not permitted in seawater systems and unprotected installation against green sea on open deck.

For the assembly and the installation of the joints manufacturer's instructions have to be observed.

Sizes and pressure range[1]

Tube O.D. mm	Nominal pressure PN[1]	
	Light Series L	Heavy Series S
6, 8, 10, 12	315	630
14	n.a.	630
15	315	n.a.
16	n.a.	400
18	315	n.a.
20	n.a.	400
22	160	n.a.
25	n.a.	400
28	160	n.a.
30	n.a.	400
35	160	n.a.
38	n.a.	250
42	160	n.a.

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

Temperature range:

The temperature range of the compression coupling system is limited by the soft seal material of the fittings, if applicable.

Component	Material	Temperature range
Pipe coupling without gasket	Stainless Steel	-55°C to +400°C
Gasket	IT	+250°C
Gasket	PTFE	-200°C up to +260°C
Gasket	FPM	-20°C up to +200°C
Gasket	NBR	-30°C up to +110°C
Gasket	Graphit	+550°C

The maximum service temperature (M.A.W.T.) arise out of the pipe coupling and sealing material combination.

Example M.A.W.T.:
Stainless steel fitting with NBR sealing -30°C up to +110°C.
Stainless steel fitting with PTFE sealing -55°C up to +260°C.
Stainless steel fitting without any rubber sealing -55°C up to +400°C.

Pressure reduction factors:
For service temperatures above 50 °C the pressure is to be reduced in accordance with the manufacturer's pressure reduction factors:

Temperature	Pressure Reduction Factor
50°C:	-4.5%
100°C:	-11%
200°C:	-20%
300°C:	-29%
400°C:	-33%

Bulkhead unions
Bulkhead couplings with type designation GSV-L/S, WSV-L/S are not approved through tank walls, watertight decks and bulkheads. For application through fire divisions a separate type approval is required.

Bulkhead couplings types ESV-L/S 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 connectors with parallel thread[1] are not approved for pipe class I and II.
- Pipe connectors with tapered[2] or parallel thread are not approved for toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur[3].

Notes
[1] for example:male thread BSPP
[2] for example: tapered thread BSPT, male thread NPT
[3] Refer to DNVGL Rules, Pt.4, Ch.6 – Section 9 – 5.2.6.

Type Approval documentation

Tests carried out

Marking of product

Component	Scope	Example
Fitting body	Manufacturer sign, suppliers mark	71, AA, Charge
Cutting ring		71 (AA)
O-Ring	Color, FKM	Green, black
Nut	Size, suppliers mark	12L, 71, AA

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.