

TYPE APPROVAL CERTIFICATE

Certificate No:
TAP000016H
Revision No:
1

This is to certify:

That the Pipe Couplings, Bite and Compression Type

with type designation(s)
L-Series / S-Series

Issued to

Rastelli Raccordi Commerciale S.r.l.
Villanterio, PV, Italy

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021
DNV class programme DNV-CP-0185 – Type approval – Mechanical joints

Application :

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

Temperature range: -55°C to +400°C (See page 3)
Max. working press.: 160 - 630 bar (dependent on size/type)
Sizes: 6 to 42 mm (dependent on size/type)

Issued at **Høvik** on **2023-06-29**

for **DNV**

This Certificate is valid until **2027-12-26**.

DNV local unit: **Italy/Malta CMC**

Approval Engineer: **Sarah Miller**

Zeinab Sharifi
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

Pipe couplings, cutting ring type

Including: Light series (L-series) and heavy series (S-series)

Material		
Part	Carbon Steel Coupling	Stainless Steel Coupling
Body	1.0737 (9SMnPb 36)	1.4571 (AISI 316Ti)
Nut	Ø8L - 15L: 1.0214 (C 10C) Ø28L - 38S: 1.0502 (C35Pb)	1.4571 (AISI 316Ti)
Ring	1.0715 (11SMN30)	1.4435 (AISI 316L)

Type	Designation
Welding bulkhead Conn.	TN117
Male Stud Couplings	TN92 /-93
Welding Bosses	TN91
Male Stud fitting type A	TN92A
Stud Elbows	TN95 /-94
Male Stud UNF/UN	TN92 UNF/UN
Stud Branch Tees	TN96 /-97
Stud Barrel Tees	TN127 /-129
Equal Tees	TN100
Straight Coupling	TN98 /-K /-R
Equal Crosses	TN101
Equal Elbows	TN99
Bulkhead Elbows	TN118
Swivel Elbows	TN114

Type	Designation
Swivel Barrel Tees	TN116
Angular Rotary Fitting	TN119
Rotary L-fitting	TN121
Swivel Branch Tees	TN115
Banjoes	TN111 /-131
Rotary T-fitting	TN120
Rotary Fitting no Neck	TN130
Double orientable Fitting	TN136
Standpipe / Tube Red.	TN132
Stud/Standpipe Adapt.	TN126
Gauge Couplings	TN103
Male / Female Stud Adapt.	TN141 /-GG
Female Stud Coupling	TN147
Bulkhead Connections	TN102

Application/Limitation

Couplings covered by this certificate are approved to be used in class I, II, and III piping systems according to the latest requirements of governing rules in following applications:

- | | |
|--|---|
| <p>1) Flammable fluids (flash point ≤ 60°C)</p> <ul style="list-style-type: none"> - Cargo oil lines ⁽¹⁾ - Crude oil washing lines ⁽¹⁾ - Vent lines ⁽²⁾ <p>2) Inert gas</p> <ul style="list-style-type: none"> - Water seal effluent lines - Scrubber effluent lines - Main lines ⁽¹⁾ - Distributions lines ⁽¹⁾ <p>3) Flammable fluids (flash point > 60°C)</p> <ul style="list-style-type: none"> - Cargo oil lines ⁽¹⁾ - Fuel oil lines ⁽²⁾ - Lubricating oil lines ⁽²⁾ - Hydraulic oil ⁽²⁾ - Thermal oil ⁽²⁾ <p>4) Fresh water</p> <ul style="list-style-type: none"> - Cooling water system ⁽³⁾ - Condensate return ⁽³⁾ - Non-essential system | <p>5) Sanitary/drains/scuppers</p> <ul style="list-style-type: none"> - Deck drains (internal) ⁽⁴⁾ - Sanitary drains - Scuppers and discharge (overboard) <p>6) Sounding/vent</p> <ul style="list-style-type: none"> - Water tanks/dry spaces - Oil tanks (f.p. > 60°C) ⁽²⁾ <p>7) Miscellaneous</p> <ul style="list-style-type: none"> - Starting/control air ⁽³⁾ - Service air (non-essential) - Brine - CO₂ system (outside protected space) - CO₂ system (inside protected space) ⁽⁵⁾ - Steam |
|--|---|

- 1) Couplings with O-rings are not allowed to be installed in pump rooms and open decks.
- 2) Couplings with O-rings are not allowed except in cases where such mechanical joints are installed on exposed open decks, as defined in SOLAS II-2/Reg. 9.2.3.3.2.2(10) and not used for fuel oil lines.
- 3) Couplings with O-rings are not allowed to be installed in machinery spaces of category A.
- 4) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.
- 5) Couplings without O-rings are not allowed inside protected spaces

The approval is only valid when the couplings are assembled with tubing of correct temperature and tolerances as recommended by the manufacturer.

Couplings covered by this certificate shall not be used in system subject to pressure below atmospheric or vacuum condition.

Maximum allowable pressures:

Series	Type	Max. pressure (bar)	Series	Type	Max. pressure (bar)
L	6L	315 bar	S	6S	630 bar
	8L			8S	
	10L			10S	
	12L			12S	
	15L			14S	
	18L			16S	
	22L	400 bar			
	28L			20S	
	35L			25S	
	42L			30S	
		38S	315 bar		

These couplings should not be used on tubes in cold fabricated (hard temper) conditions.

Maximum working temperature for couplings of the following materials:

- Carbon steel -40 °C to 120 °C
- Stainless steel -55 °C to 400 °C

In addition the limitations given by the coupling materials, the maximum working temperatures for couplings with o-rings of the materials:

- NBR/Nitrile rubber -30 °C to 90 °C
- FPM/Fluorinated rubber -25 °C to 170 °C

At elevated temperatures, the maximum working pressure has to be reduced with the following factors:

Temperature (°C)	20	50	100	120	150	200	250	300	350	400
Stainless Steel	1	0,95	0,85	0,81	0,77	0,71	0,67	0,63	0,60	0,58
Carbon Steel	1	1	1	0,97	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Threaded joints (having pipe threads where pressure-tight joints are made on the threads with parallel or tapered threads) may be used for outside diameters as stated below except for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur:

- Tapered thread: class I, outside diameter not more than 33.7 mm
- Tapered thread: class II and class III, outside diameter not more than 60.3 mm
- Parallel thread: Just for class III, outside diameter not more than 60.3 mm

Austenitic stainless steels grades 316L and 316Ti are not approved to be used in system conveying seawater.

Type Approval documentation

Manufacturer's catalogue No.2BA6 dated 06/2016
 Test report no. 12 0261 0 92 from MPA NRW dated 26. November 1993.
 Test report no. 12 0622 4 97 from MPA NRW dated 26. March 1998.
 Pull-out test reports dated 2008-03-26
 Fire test No. 2013CS013495/1; 2013CS013495/2; 2013CS013495/5; 2013CS013495/6;
 2013CS013495/7;2013CS013495/8; 2013CS013495/9 and 2013CS013495/10
 Test pressure report No.OC2-1011-AI dated 2013-09-20 witnessed by DNV surveyor
 Test pressure report No.OC2-1011/BI dated 2017-11-31 witnessed by DNV GL surveyor
 Tightness test report number 315934
 Repeated test assembly number OC2-1011 dated 2007-11-22
 Vibartion/impulse test report number 120002588 dated 2008-04-07
 Drawing nos: 5086-I dated 28-11-97,5087-I dated 28-11-97,6119-A-I dated 28-11-97,6119-B-I dated 28-11-97,4288-A-I
 dated 28-11-97,4288-B-I dated 19-10-93,6006-A-I dated 1-12-97,6006-B-I dated 1-12-97,5086 dated 27-11-97,5087
 dated 27-11-97,6119-A dated 27-11-97,6119-B dated 27-11-97,4288-A dated 27-11-97,4288-B dated 27-11-97,6006-A
 dated 27-11-97,6006-B dated 27-11-97

Tests carried out



Job Id: **262.1-003252-5**
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Assembly/Tightness test, Burst test, Pressure pulsation/Vibration test, pull-out test and fire test.

Marking of product

For traceability to this type approval the products are to be marked with:

- Manufacturer's name or trade mark
- Type designation and dimension

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.