

CERTIFICATE NUMBER
15-GE1317817-PDA

DATE
16 Apr 2015

ABS TECHNICAL OFFICE
Genoa Engineering Department

CERTIFICATE OF DESIGN ASSESSMENT

This is to certify that a representative of this Bureau did, at the request of

CAST SPA

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: **Pipe Couplings, Compression Type**

Model: **Bite Type Compression Couplings (DIN 2353), L- and S-series**

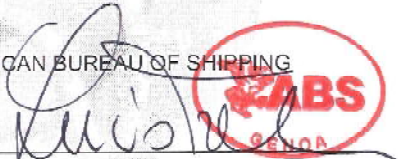
This Product Design Assessment (PDA) Certificate 15-GE1317817-PDA, dated 16/Apr/2015 remains valid until 15/Apr/2020 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING


Lucio Trevisan
Engineer

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturers standards. It is issued solely for the use of ABS, its constituents, its clients or other authorized entities. Any significant changes to the referenced product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by the terms and conditions as contained in ABS Rules 1-1-ABS-8 Terms and Conditions of the Request for Product Type Approval and Agreement (2010).

CAST SPA

STRADA BRANDIZZO, 404/408 BIS

VOLPIANO (TO)

Italy 10088

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Email: cast@cast.it

Web: www.cast.it

Tier: 2 - PDA Issued

Product: Pipe Couplings, Compression Type

Model: Bite Type Compression Couplings (DIN 2353), L- and S-series

Intended Service:

Installation on board ships and offshore unites in steel and stainless steel piping systems, except those excluded under below Service Restrictions.

Description:

Cutting ring type B3 and B4

Materials:

Carbon Steel Pipes: 11SMnPb37 or equivalent and Fittings 1.0401 (C15) or equivalent.

Stainless Steel Pipes and Fittings 1.4571 (X6CrNiMoTi17-12-2), or equivalent.

Sealing for B4 ring type: NBR working temperature: -35 up to 100 C deg, VITON working temperature -25 up to 200 C deg.

Model Types: see Manufacturer's datasheet

Rating:

Series L (Light) (Carbon/Stainless Steel): 6 mm to 18 mm Pipe OD, PN 315 bar; 22 mm to 42 mm Pipe OD, PN 160 bar.

Series S (Heavy) (Carbon/Stainless Steel): 6 mm to 14 mm Pipe OD, PN 630 bar; 16 mm to 30 mm Pipe OD PN 400 bar; 38 mm Pipe OD, PN 315 bar.

Temperature Range Carbon Steel Fittings: -40 up to 120 C deg.

Temperature Range Stainless Steel Fittings: -60 up to 200 C deg

Service Restriction:

Unit Certification is not required for this product. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

The compression coupling cannot be used in systems where pulsation other than water hammer is expected as per 4-6-2/Table 12 of Steel Vessel Rules.

Coupling types with tapered threads are not to be used for toxic and corrosive fluid services. Further, their use is limited to restrictions as per 4-6-2/5.5.5 of Steel Vessel Rules.

For service temperatures above 40 C deg the allowed working pressure for stainless steel fittings manufacturer with 1.4571 must be reduced according to the working temperature as per ISO 8434:

Temp \geq 50 C deg -4% pressure lowering percentage

Temp \geq 100 C deg -11% pressure lowering percentage

Temp \geq 200 C deg -20% pressure lowering percentage

Sealing for B4 ring type:

NBR working temperature: -35 up to 100 C deg,

VITON working temperature -25 up to 200 C deg.

Comments:

The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product. Each particular application is to be specifically approved in connection with the relevant system and installation. Selection of the pipe unions for the corresponding service and the right installation are to be in accordance with Manufacturer's instructions.

Notes/Drawing/Documentation:

This Product Design Assessment (PDA) is valid only for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.



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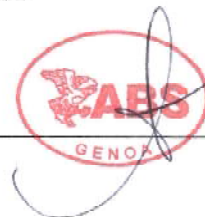
Drawing No. Anello 42L B3+B4, Detail Drawing B3 B4 Ring, Revision: 0, Pages: 1
Drawing No. Cast Brochure, Brochure, Revision: 0, Pages: 1
Test Report No. 11120 Rev. 01 For Tightness, Pull-Out, Vacuum Test, From Cetena Dated 01-DEC-2014
Drawing No. Cetena Report, Cetena Report, Revision: 1, Pages: 35
Drawing No. Hydrostatic Proof Test, Hydrostatic Proof Test GL, Revision: 0, Pages: 33
Drawing No. Vacuum Test, Vacuum Test, Revision: 0, Pages: 38
Drawing No. Vacuum Test, Vacuum Test, Revision: 0, Pages: 39
Pull Out Test Report No. CAST2000 RAT.Doc from Enel Hydro, Dated 30-AUG-2000
Drawing No. Vibration Test and Pull Out Test DNV, Vibration Test And Pull Out Test DNV, Revision: 0, Pages: 5
Drawing No. Annex Pull Out Test, Annex Pull Out Test, Revision: 0, Pages: 6
Fire Test Report No. 2013CS011480 from Test Laboratory Of RINA Dated 12-JUN-2013:
Drawing No. DIA10SAVP, Fire Test, Revision: 0, Pages: 12
Drawing No. DIA10SINOX, Fire Test, Revision: 0, Pages: 13
Drawing No. DIA12LAVP, Fire Test, Revision: 0, Pages: 14
Drawing No. DIA12LINOX, Fire Test, Revision: 0, Pages: 15
Drawing No. DIA14INOX, Fire Test, Revision: 0, Pages: 17
Drawing No. DIA14SAVP, Fire Test, Revision: 0, Pages: 16
Drawing No. DIA16SAVP, Fire Test, Revision: 0, Pages: 18
Drawing No. DIA16SINOX, Fire Test, Revision: 0, Pages: 19
Drawing No. DIA18LAVP, Fire Test, Revision: 0, Pages: 20
Drawing No. DIA18LINOX, Fire Test, Revision: 0, Pages: 21
Drawing No. DIA22LAVP, Fire Test, Revision: 0, Pages: 22
Drawing No. DIA22LINOX, Fire Test, Revision: 0, Pages: 23
Drawing No. DIA30SAVP, Fire Test, Revision: 0, Pages: 24
Drawing No. DIA30SINOX, Fire Test, Revision: 0, Pages: 25
Drawing No. DIA38SAVP, Fire Test, Revision: 0, Pages: 26
Drawing No. DIA38SINOX, Fire Test, Revision: 0, Pages: 27
Drawing No. DIA42LAVP, Fire Test, Revision: 0, Pages: 28
Drawing No. DIA42LINOX, Fire Test, Revision: 0, Pages: 29
Drawing No. DIA6LAVP, Fire Test, Revision: 0, Pages: 8
Drawing No. DIA6LINOX, Fire Test, Revision: 0, Pages: 9
Drawing No. DIA6SAVP, Fire Test T, Revision: 0, Pages: 10
Drawing No. DIA6SINOX, Fire Test, Revision: 0, Pages: 11
Repeated Assembly Test Report No. V.D. P. N. 24/11 From Cast Dated 27-SEP-2011:
Drawing No. Repeated Assembly Test, Repeated Assembly Test, Revision: 0, Pages: 36
Burst Test Report No. V.D. P. N. 11/12 From Cast Dated 19-NOV-2012:
Drawing No. Hydrostatic Burst Test, Hydrostatic Burst Test, Revision: 0, Pages: 37
Repeated Assembly and Burst Test Report No. V.D.P. N. 02/15 Dated 23-JAN-2015:
Drawing No. Vdp 02-15 Prove ABS+Report, Vdp 02-15 Prove ABS+Report, Revision: 0, Pages: 1
Drawing No. GE2817469 ABS Report, GE2817469 ABS Report, Revision: 0, Pages: 1

Terms of Validity:

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STANDARDS

ABS Rules:

2015 Rules for Conditions of Classification – Offshore Units and Structures 1-1-4/9.7, 1-1 Appendix 2 and 3

2015 Mobile Offshore Drilling Units Rules 4-2-1/11.13

2015 Rules for Conditions of Classification, 1-1-4/7.7, 1-1 Appendix 3 and 4,

2015 Steel Vessel Rules 4-6-2/5.5.5 and 5.9, except 5.9.2(e) v)2 and 5.9.2(e) v)3.

2015 Steel Vessels Under 90 Meters (295 Feet) in Length, 4-4-2, 13.1 and 13.7

2015 Offshore Support Vessels, 4-6-2/5.9

National:

NA

International:

NA

Government:

NA

EUMED:

NA

OTHERS:

NA





DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **P-14374**

This is to certify that the
Pipe Couplings, Bite and Compression Type

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

Manufactured by
CAST S.P.A.
Volpiano TO, Italy

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Standards for Certification 2.9 No. 5-792.20

Application

The couplings may be used in the following: **Hydraulic, Fuel, Lubrication Oil, Compressed Air, Steam and Condensate, Freshwater, Seawater and Marsh Gas systems.**

Type:	Temperature range:	Max. working press.:	Sizes:
L-Series	see cert.	315 bar - 160 bar (see cert.)	6 to 42 mm
S-Series	see cert.	630 - 315 bar (see cert.)	6 to 38 mm

This Certificate is valid until **(2017-12-31)**.

Issued at **Høvik** on **(2013-02-21)**

DNV local station: **Milan**

Approval Engineer: **Mohsen Mohebbi**

for **Det Norske Veritas AS**



Digitally Signed By: **Ragavendhra Rao, Vishnumurthi**

Location: **DNV Høvik, Norway**

Signing Date: **26.02.2013**

for **Giorgio Saia**
Acting 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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Product description

Pipe couplings, cutting ring type, Light series (L-series) and heavy series (S-series).

Materials:

Part	Carbon Steel Coupling	Stainless Steel Coupling
Ring and Body	CF9SMnPb 28 / 36 or CF9SMn 28 / 36 acc. UNI 4838	X10CrNiMoTi1810 (WNo. 1.4571) or X5CrNiMo1810 (WNo. 1.4401)
Nut	CF9SMnPb 28 / 36 or CF9SMn 28 / 36 acc. UNI 4838	X10CrNiMoTi1810 (WNo. 1.4571) or X2CrNiMo1810 (WNo. 1.4404)

Cutting ring type B3 and B4.

Manufacturing Plant:
 CAST S.p.A. –
 Casalgrasso CN, Italy

Application/Limitation

Sizes and maximum pressure:

Series	Size	Max. pressure bar
L	6L	315 bar
	8L	
	10L	
	12L	
	15L	
	18L	
S	22L	160 bar
	28L	
	35L	
	42L	
	6S	630 bar
	8S	
	10S	
	12S	
14S		
16S	400 bar	
20S		
25S		
30S		
	38S	315 bar

Couplings with studded ends with threads where packing is performed on threads or by packing ring of artificial material are not accepted for fuel systems. Carbon steel couplings are not permitted for sea water systems.

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

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

The wall thickness and material of the tubes are to be in accordance with the current Rules of Det Norske Veritas.

Maximum working temperature for couplings of the following materials:

Carbon steel -20 °C to 120 °C
 Stainless steel -60 °C to 200 °C

Certificate No.: P-14374
File No.: 792.21
Job Id.: 262.1-004933-2

For couplings made of stainless steel at elevated temperatures, the maximum working pressure has to be reduced with the following factors:

Temp	20 °C	50 °C	100 °C	150 °C	200 °C
Factor	1	0,95	0,89	0,84	0,80

In addition to the limitations given by the coupling materials, the maximum working temperatures for couplings with o-rings are:
NBR Nitrile rubber -35 °C to 90 °C
FPM Fluorinated rubber -25 °C to 170 °C

Couplings made of carbon steel are not to be used at temperatures below -10°C unless the material is normalised.

Type Approval documentation

Drawings (date):

Tests carried out

Leakage, Pressure Pulsation, Vibration, Pull-out, Burst and Repeated Assembly test.

Marking of product

For traceability to this type approval, each coupling is at least to be marked with:

- Manufacturer's trade mark
- Type designation
- Size

Certificate Retention Survey

For retention of the Type Approval, a DNV Surveyor shall perform a survey - before the expiry date of this certificate - to verify that the conditions for the type approval are complied with, and to witness burst testing of samples of couplings selected at random from stock or from the running production.

END OF CERTIFICATE

Type Approval Certificate



This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the GL Type Approval System.

Certificate No. **12 438 - 10 HH**

Company **CAST S.p.A.**
Strada Brandizzo 404/408
10088 Volpiano, ITALY

Product Description **PIPE UNIONS**

Type **Bite Type Fittings B3**
L, H - Series

Environmental Category **None**

Technical Data / **TECHNICAL DATA**

Range of Application **Fitting material carbon steel CF9SMnPb36, 11SMnPb37**

Metallic sealing with cutting ring type B3

M.A.W.P:	L-Series	6 - 18 [mm]	22 - 42 [mm]		
		315 [bar]	160 [bar]		
	H-Series	6 - 14 [mm]	16 - 30 [mm]	38 [mm]	
		630 [bar]	400 [bar]	315 [bar]	

Temperature range: **-20 [°C] up to 120[°C]**

Size Range: **6 - 42 [mm] for L-Series**
6 - 38 [mm] for H-Series

RANGE OF APPLICATION

The above mentioned pipe unions of bite type with cutting ring B3 are type approved as compression couplings for the use in piping systems according to the Rules I-1-2 Machinery Installations, Section 11, Table 11.13/ 11.14, compression coupling, bite type, fire resistant. For service temperatures above 40°C the reduction in pressure specified by the manufacturer is to be observed.

Test Standard **VI-7-8: Test Requirements for Components and Systems of Mechanical Engineering and Offshore Technology. Edition 2008**

Documents **- Test report according to GL Approval Ref.-No. 09-108886, 11-135829**
- Catalogue data sheet
- ISO 9001:2000 Certificate

Remarks **The selection of the pipe unions for the corresponding service and the right installation are to be in accordance with the instructions of the manufacturer.**

Valid until **2016-12-01**

Page **1 of 1**

Type Approval Symbol



File No. **II.C.05**

Hamburg, 2011-11-24

Germanischer Lloyd

Hanspeter Raschle
Hanspeter Raschle

Sven Dudzus
Sven Dudzus

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

This certificate is issued to:

PRODUCER	CAST S.p.A. Strada Brandizzo 404 10088 Volpiano - Torino Italy
PLACE OF PRODUCTION	CAST S.p.A Via Regione Gamna 3 12030 Casalgrasso (CN) Italy
DESCRIPTION	Carbon steel and stainless steel pipe couplings, cutting ring types for B3 without and B4 with double elastomer seal (NBR or Viton) for L & S pipe series.
TYPE	B3 and B4
APPLICATION	General use in piping systems on ships classed or intended for Classification with Lloyd's Register, where the rotary flexure test is not required. <u>Restrictions for B4 cutting ring:</u> <ol style="list-style-type: none">1. Starting/control air and CO2 systems.2. Inside machinery spaces of category A or accommodation spaces for main lines of inert gas systems.3. Water spray or sprinkler systems which are not always filled with water.4. Scupper pipes below freeboard deck over board

Certificate No.	15/20031
Issue Date	13 April 2015
Expiry Date	12 April 2020
Sheet	1 of 2



LR0311.2013.12

Torsten Schröder
Hamburg Technical Support Office
Lloyd's Register EMEA

Lloyd's Register EMEA
71 Fenchurch Street, London EC3M 4BS

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Lloyd's
Register

STANDARD	LR Rules and Regulations for the Classification of Ships, 2014		
RATINGS	Type	Sizes (mm)	Pressure (bar)
	L-Series (light)	6 to 42	315 to 160
	S-Series (heavy)	6 to 38	630 to 315
	Temperature range: -20°C to 120°C (carbon steel) -60°C to 200°C (stainless steel)		
OTHER CONDITIONS	Selection and installation of couplings have to be in accordance with manufactures recommendations and instructions.		

"This Certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid certificate."

The Design Appraisal Document No. HTS/ENS 32446-15 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

Certificate No. 15/20031
Issue Date 13 April 2015
Expiry Date 12 April 2020
Sheet 2 of 2



Torsten Schröder
Hamburg Technical Support Office
Lloyd's Register EMEA

Lloyd's Register EMEA
71 Fenchurch Street, London EC3M 4BS

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