

Certificate No:  
**P-15002**  
 File No:  
**792.11**  
 Job Id:  
**262.1-009291-4**

**TYPE APPROVAL CERTIFICATE****This is to certify:**

**That the Pipe Couplings with Bolts Not Covered by a National Standard**

with type designation(s)  
**Style 07 Zero-Flex, Style 005 FireLock**

Issued to

**Victaulic Company**  
**EASTON PA, United States**

is found to comply with

**Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"**  
**Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment**  
**Det Norske Veritas' Standards for Certification 2.9 No. 5-792.20**

**Application :**

**See certificate**

**Temperature range:** Grade E / EPDM -30°F to +230°F (-34°C to +110°C) Grade T / Nitrile: -20°F to +180°F (-29°C to +82°C) Grade T (Type A) Nitrile: -20°F to +180°F (-29°C to +82°C)  
**Max. working press.:** 232 psi (16 bar)  
**Sizes:** 2" to 12" steel pipes. 1" to 10" Cu-Ni pipes.

This Certificate is valid until **2018-06-30**.

Issued at **Høvik** on **2014-09-03**

DNV GL local station: **New York**

Approval Engineer: **Tom Berg-Nielsen**



**for DNV GL**

Digitally Signed By: Marianne Spaeren Marveng

Location: DNV Høvik, Norway

Signing Date: 2014-09-04

**Marianne Spaeren Marveng**  
**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 proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

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## Product description

### Design:

Grooved pipes and fittings are joined by couplings. Sizes 1" – 12" (25-300mm) are two piece cast housings. The sealing is provided with a rubber gasket, internal to the coupling.

### Nominal sizes:

- 2" to 12" (50 to 300 mm) for steel piping.
- 1" to 10" (25 to 250 mm) for Cu-Ni Class 200 piping groove ended pipes and for groove ended fittings in configurations of 45° and 90° elbows and tee's.

Size, Style 07		Size, Style 005	
inch	mm	Inch	mm
1 to 5	33 to 141	1 ¼"	-
6 and 6½	168 to 180	1 ½"	-
8	219	2"	-
10	273	2 ½"	-
12	323,8	3"	76,1
-	-	4"	108
-	-	5"	133
-	-	6"	139
-	-	8"	159 and 165,1

### Materials:

Coupling housings: Ductile iron to ASTM A-536 65-45-12

Bolts and nuts: Carbon steel ASTM A-183 heat treated to 110 000 psi minimum tensile strength.

Gasket: EPDM or Nitrile.

For Style 07, the approval is also valid for 90/10 Cu-Ni Class 200 pipes and fittings, supplied with grooved ends according to manufacturer's specification.

### Application/Limitation

The Victaulic couplings may be used for the following systems on board:

Systems			Systems		
Flammable fluids (Flash point ≤ 60 °C)			Fresh water		
1	Cargo oil lines	+ 5)	21	Cooling water system	+ 1)
2	Crude oil washing lines	+ 5)	22	Condensate return	+ 1)
3	Vent lines	+ 3)	23	Non-essential system	+
Inert gas			Sanitary/Drains/Scuppers		
4	Water seal effluent lines	+	24	Deck drains (internal)	+ 4)
5	Scrubber effluent lines	+	25	Sanitary drains	+
6	Main lines	+ 2) 5)	26	Scuppers and discharge (overboard)	÷(no)
7	Distribution lines	+ 5)			
Flammable fluids (Flash point > 60°C)			Sounding/ vent		
8	Cargo oil lines	+ 5)	27	Water tanks/Dry spaces	+
9	Fuel oil lines	+ 3) 2)	28	Oil tanks (flash point > 60°C)	+ 2) 3)
10	Lubrication oil lines	+ 2) 3)			
11	Hydraulic oil	+ 2) 3)			
12	Thermal oil	+ 2) 3)			
Sea Water			Miscellaneous		
13	Bilge lines	+ 1)	29	Starting/control air	-(no)
14	Fire main and water spray	+ 3)	30	Service air (non-essential)	+
15	Foam systems	+ 3)	31	Brine	+
16	Sprinkler system	+ 3)	32	CO2 system	-(no)
17	Ballast system	+ 1)	33	Steam	-(no)
18	Cooling water system	+ 1)			
19	Tank cleaning services	+			
20	Non-essential system	+			

Slip-on joints allowed for systems marked +, not allowed marked ÷.

#### Limitations/remarks:

- 1) Inside machinery spaces of category A - only approved fire resistant types
- 2) Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions.
- 3) Approved fire resistant types.
- 4) Above free board deck only.
- 5) In pump rooms and open decks - only approved fire resistant types.
- 6) If compression couplings include any components which readily deteriorate in case of fire, they are to be of approved fire resistant type as required for Slip-on joints.

The style 07 couplings of sizes 2" up to and including 12" and the style 005 coupling, size 1 ½" up to 8" are fire tested and are of fire resistant types. The products covered in this certificate are Machine Grooved Type suitable for class I, II and III piping systems in accordance with Table 8, IACS URP2, Rev. 7, 2007.



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EPDM is not to be used for hydrocarbon applications.

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

When used in systems where vacuum may occur, due precautions shall be taken to prevent the internal gasket from being drawn into the gap between the two pipe ends.

### **Type Approval documentation**

- Manufacturers catalogue "Victaulic General Catalog" no. G-103 0798 Rev. P
- Test report no. Ex 1820 83 NK 26575 dated 23/2-84, Ex 1820 84NK15038 dated 21/6-84 and Ex 1820 83NK 21728 dated 25/10-83 from Underwriters Laboratories Inc., Tampa, Florida.
- Test reports acc. ASTM F-1476 (for Cu-Ni piping) dated 8. Feb. 96 and 29. June 95
- High temp. exposure test on Victaulic rubber gasketed fitting, ULC rep. dated March 7, 1997
- Test report J.I. 3007294 dated 2000-05-05 from Factory Mutual
- DNV witnessed test dated 2000-02-01
- Dwgs: D-C-012-005-013 rev.N, D-C-040-005-020 rev.W, D-C-080-005-015 rev.R
- WTD 71 fire test reports No.: 48/03, 51/03 and 53/03.
- Fire test reports dated 2006-02-10
- DNV witnessed burst test report dated 2010-06-03
- DNV retention survey report dated 2010-06-02/03

### **Tests carried out**

For steel piping: Leakage test, hydrostatic burst test, flexural bending test, low temperature test.

For Cu-Ni piping: Pneumatic proof, vacuum proof, hydrostatic proof, hydrostatic burst, rigidity, bending proof, bending ultimate, fire tests (only couplings of style 07).

### **Marking of product**

For traceability to this type approval, the couplings should be marked with:

- Manufacturer's name or trade mark.
- Type designation.
- Size.

### **Periodical assessment**

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

END OF CERTIFICATE