

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe System with Couplings**with type designation(s)
VSH XPress

Issued to

Aalberts integrated piping systems B.V.
Hilversum, Noord-Holland, Netherlandsis found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Temperature range:** Dependent on the sealing (see certificate)
Max. pressure: 10 / 12,5 / 16 bar (dependent on size - see certificate)
Design: Pipes and press fitting systemThis Certificate is valid until **2025-06-30**.Issued at **Høvik** on **2020-10-01**for **DNV GL**DNV GL local station: **Netherlands FIS**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.

Product description

Carbon steel and stainless steel pipes and press fittings with O-ring seals

XPress Carbon steel systems:

Outer diameter (in mm):

12 - 15 - 18 - 22 - 28 - 35 - 42 - 54 - 76,1 - 88,9 - 108

Material:

Press fittings: E195 (1.0034) acc. to EN10305-3.

Pipes: Galvanized and polypropylene coated unalloyed steel pipes E195 (1.0034) acc. to EN10305. Externally and complete galvanized versions acc. to EN10305, material E195 (1.0034) and E190 (1.0031).

XPress Stainless Steel:

Outer diameter (in mm):

15 - 18 - 22 - 28 - 35 - 42 - 54 - 76,1 - 88,9 - 108

Material:

Press fittings: 1.4404 according to EN10088-2

Pipes: Stainless steel 1.4401 and 1.4521 acc. to EN10312.

O-rings: EPDM black - Viton Green - Viton Grey

Dimensional data:

Outer diameter	Carbon Steel thickness ⁽¹⁾	Stainless Steel thickness ⁽²⁾
12 mm	1,2 mm	-
15 mm	1,2 mm	1,0 mm
18 mm	1,2 mm	1,0 mm
22 mm	1,5 mm	1,2 mm
28 mm	1,5 mm	1,2 mm
35 mm	1,5 mm	1,5 mm
42 mm	1,5 mm	1,5 mm
54 mm	1,5 mm	1,5 mm
76,1 mm	2,0 mm	2,0 mm
88,9 mm	2,0 mm	2,0 mm
108 mm	2,0 mm	2,0 mm

⁽¹⁾ Tolerances shall be in accordance with EN10305-3.

⁽²⁾ Tolerances shall be in accordance with EN10312.

Application/Limitation

The XPress pipe system with couplings covered by this certificate is only approved for use in non-class systems.

Below Stainless steel couplings are to be considered approved fire resistant type:

- Stainless steel couplings (O.D. 15 to 108 mm) with Viton sealing ⁽¹⁾
 - Stainless steel couplings (O.D. 15 to 108 mm) with EPDM sealing
 - Carbon steel couplings (O.D. 12 to 108 mm) with EPDM sealing
- ⁽¹⁾ Dry test: In the fire test and during the first 8 min the pipe was without water flushing (dry run)

Stainless steel & Carbon steel couplings may be used in the following class III piping systems:

- Flammable fluids (flash point $\leq 60^{\circ}\text{C}$):
 - Cargo oil lines, Crude oil washing lines (In pump rooms and open decks - only approved fire resistant types)
 - Vent lines (only approved fire resistant types)
- Inert gas:

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- Water seal effluent lines, scrubber effluent lines
- Main lines (Not inside machinery spaces of category A or accommodation spaces) & (In pump rooms and open decks - only approved fire resistant types)
- Distributions lines (In pump rooms and open decks - only approved fire resistant types)
- Flammable fluids (flash point > 60°C)
 - Cargo oil lines (In pump rooms and open decks - only approved fire resistant types)
 - Fuel, lubricating, hydraulic and thermal oil lines (Not inside machinery spaces of category A or accommodation spaces and only approved fire resistant types)
- Fresh water
 - Cooling water system, condensate return (Inside machinery spaces of category A - only approved fire resistant types)
 - Fire main and water spray, foam system (only approved fire resistant types)
 - Dry and wet Sprinkler systems^(*) (only approved fire resistant types)
 - Non-essential system
- Sanitary/drains/scuppers
 - Deck drain (internal) (Inside machinery spaces of category A - only approved fire resistant types)
 - Scuppers and discharge (overboard), sanitary drains
- Sounding/Vent
 - Water tanks/Dry spaces
 - Oil tanks (flash point>60°C) (Not inside machinery spaces of category A or accommodation spaces and only approved fire resistant types)
- Miscellaneous
 - Service air (non-essential), brine, Steam
 - Starting/control air, CO2 system (Inside machinery spaces of category A)

(*) There are not any differences between requirements for dry and wet sprinkler systems in DNV GL ship rules Pt.4 Ch.6. Therefore all fire resistant couplings can be used in all sprinkler systems – both dry and wet.

Design pressure:

- XPress carbon steel couplings and pipings:
 - 15, 18, 22, 28, 35, 42, 54mm: 16 bar
 - 76.1mm: 12.5 bar (compressed air max. 10 bar)
 - 88.9, 108mm: 10 bar
- XPress stainless steel couplings and pipings:
 - 15, 18, 22, 28, 35, 42, 54, 76.1mm: 16 bar
 - 88.9mm: 12.5 bar (compressed air max. 10 bar)
 - 108mm: 10 bar

Design temperatures:

- EPDM black: -35°C to +135°C
- Viton green: -30°C to +200°C
- Viton grey: -20°C to +150°C

EPDM is not to be used for hydrocarbon service.

Each coupling is to be hydraulic pressure tested to at 1.5 times of maximum working pressure.

The components are to be mounted according to manufacturer's instructions.

The components shall not be used in 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.

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Pipe penetrations through watertight bulkheads, fire bulkheads or shell plating shall be approved in each separate case. When penetrating a watertight bulkhead there shall be remotely operated valves secured to each bulkhead. The valves and control system shall be located outside the damage zone of the ship.

Type Approval documentation

- Xpress catalogue Pr-EN-10-1.0 – 2010
- IMA Dresden test reports No. C099/10.1 dated 2010-12-14 (test reports on Stainless steel couplings) witnessed by GL surveyor
- IMA Dresden test reports No. C099/10.2 dated 2011-04-07 (test reports on Carbon steel couplings) witnessed by GL surveyor
- IHA fire test reports numbers 002, 003, 006 dated 2010-12-15 on stainless steel couplings with EPDM sealing witnessed by GL surveyor
- IHA fire test reports numbers 001, 004, 005 dated 2011-04-07 on Carbon steel couplings with EPDM sealing witnessed by GL surveyor
- IHA fire test reports numbers 144-15 dated 2015-10-06 / 138-15 dated 2015-10-05 / 140-15 dated 2015-10-05 / 142-15 dated 2015-10-06 on stainless steel couplings with Viton sealing
- Assembly drawings dated 2010-12-03

Tests carried out

These tests have been carried on stainless steel couplings according to DNV GL CP-0185 (and IACS UR P2) : Vacuum, burst, tightness, vibration, pull-out, fire test

Marking of product

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

- Manufacturer's name or trademark
- Type designation

The identification marking shall be located in low stressed areas.

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 approval are complied with. Reference is made to DNVGL-CP-0338.