

# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAP000006B**  
Revision No:  
**2**

## 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, Netherlands**

is found to comply with

**DNV rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**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:** Dependent on the sealing (see certificate)  
**Max. pressure:** 10 / 12,5 / 16 bar (dependent on size - see certificate)  
**Design:** Pipes and press fitting system

Issued at **Høvik** on **2022-06-03**

This Certificate is valid until **2025-06-30**.

DNV local station: **Netherlands FIS**

Approval Engineer: **Sarah Miller**

for **DNV**



Digitally Signed By: Zeinab, Sharifi

Location: DNV Høvik, Norway

**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

Carbon steel and stainless steel pipes and press fittings with O-ring seals.  
 Copper press-fittings with o-ring seal. Threaded connection in accordance with ISO 7-1.

### For VSH 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).

### For VSH 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 <sup>(1)</sup>	Stainless Steel thickness <sup>(2)</sup>
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

<sup>(1)</sup> Tolerances shall be in accordance with EN10305-3.

<sup>(2)</sup> Tolerances shall be in accordance with EN10312.

### Copper press-fittings with o-ring seal

Material:

Fittings : Copper 2.0090 (CW024A) according to DIN CEN/TS 13388  
 Copper 2.1096.01 (G-CuSn 5ZnPb) according to EN1982  
 Copper CC499K (CuSn5Zn5Pb2-C) according to EN1982  
 O-ring : EPDM

Sizes	Maximum working pressure
DN10, 12, 15, 18, 22, 28, 35, 42	16 bar
DN54, 64, 76, 89, 108	10 bar

Manufactured at:

1. Production locations are Aalberts integrated piping systems SAS – France
2. Aalberts integrated piping systems Kft – Hungary

Fitting types:

Product Description	Art. No
Female Elbow 90°	6090G
Male Elbow 90°	6092G
Bent female union connector	6096G
Female branch tee	6130G
Straight male connector	6243G
Female adaptor	6246G
Backplate elbow parallel female thread	6472G
Straight female connector	6270G
Male adaptor	6280G
Union coupling	S6330
Union connector	6330G
Female branch tee with multi ports	6331G
Union	6359

Product Description	Art. No
Obtuse Elbow 45° F/F	7041
Full crossover F/F	7085
Partial crossover M/F	7086
Street crossover M/M	7087
Equal & Reduced Tee	7130
Reducer	7240
Reducer	7243
Straight	7270
Straight, long	7270S
End cap (Stop end)	7301
Obtuse street elbow 45°	7040
Backplate elbow parallel female thread	6472L
Street Elbow 90°	7001A
Elbow 90°	7002A

### Application/Limitation

The VSH XPress pipe system with couplings covered by this certificate is only approved for use in non-class systems. Except for those with Copper press-fittings with o-ring seal which may be used in class III piping systems conveying fresh water (not inside machinery spaces of category A), potable water, Sanitary/drains/scuppers (Deck drain: Only above bulkhead deck of passenger ships and freeboard deck of cargo ships), Service air (non-essential).

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

- Stainless steel couplings (O.D. 15 to 108 mm) with Viton sealing <sup>(1)</sup>
  - Stainless steel couplings (O.D. 15 to 108 mm) with EPDM sealing
  - Carbon steel couplings (O.D. 12 to 108 mm) with EPDM sealing
- <sup>(1)</sup> 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 ≤60°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:
  - 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<sup>(\*)</sup> (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 ship rules Pt.4 Ch.6. Therefore all fire resistant couplings can be used in all sprinkler systems – both dry and wet.

**Design pressure:**

- VSH 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
- VSH 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 o-ring: 110 °C for copper press fittings

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.

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.

As for those component with Copper press-fittings with o-ring seal the fittings are to be used with copper pipes according to EN1057 of the following dimensions:

Tube OD	Wall Thk.
10, 12, 15, 18 mm	1,2 / 1,5 mm
22, 28, 35, 42 mm	1,5 mm
54 mm	2,0 mm
64, 76, 89, 108 mm	2,5 mm

The piping system may not penetrate enclosed spaces below the freeboard deck (e.g. watertight- or fire bulkheads).

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

Threaded joints are allowed for Class III piping systems when outside diameter is not more than 60.3 mm (reference is made to DNV Ship Rules pt.4 Ch.6 Sec.9 [5.2.6]).

**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 DNV surveyor
- IMA Dresden test reports No. C099/10.2 dated 2011-04-07 (test reports on Carbon steel couplings) witnessed by DNV surveyor
- IHA fire test reports numbers 002, 003, 006 dated 2010-12-15 on stainless steel couplings with EPDM sealing witnessed by DNV surveyor

- IHA fire test reports numbers 001, 004, 005 dated 2011-04-07 on Carbon steel couplings with EPDM sealing witnessed by DNV 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 and carbon steel couplings according to DNV CP-0185 (and IACS UR P2) : Vacuum, burst, tightness, vibration, pull-out, fire test. As for Copper press-fittings in addition to Burst, vacuum and impulse/vibration tests, leakage and pull-out test must be performed.

### 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 and size

The identification marking shall be located in low stressed areas.

### 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.