

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.

Manufacturer **Aalberts integrated piping systems B.V.**

Address Oude Amersfoortseweg 99, Hilversum, 1212 AA, Netherlands

Type Mechanical Pipe Joints

Description System of stainless steel pipes (1.4401, 1.4301 and 1.4521) and stainless steel compression (press type) couplings (1.4404), sealed by butyl rubber (EPDM) or Viton O-ring. Compression and reshape to be achieved with special crimping tools.

Trade Name VSH XPRESS STAINLESS STEEL, Press Type

Application Use in essential piping systems and non-essential piping systems on ships, classed or intended for classification with Lloyd's Register, for the following services:

- Fresh water cooling for main and auxiliary machinery;
- Fresh water wet type sprinkler systems;
- Fresh water dry type sprinkler, water-spray and foam systems;
- Fresh water for condensate return;
- Inert gas: water seal effluent lines, scrubber effluent lines;
- Potable and domestic hot and cold water;
- Hot and chilled water for air conditioning plants;
- Internal deck drains and sanitary drains;
- Compressed air for non-essential services;
- Bilge lines;
- Sea water ballast system;

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Permanent water filled fire extinguishing systems. e.g. fire main, sprinkler

Specified Standard	LR Rules and Regulations for the Classification of Ships, July 2024. IACS Unified Requirements P2.11, 2023 (Rev.6, October 2023) (vacuum, burst, tightness, fire endurance, vibration, pull-out tests). EN 10312, EN 10296-1, EN 10893-1.																			
Ratings	<p>Pipe and Fitting sizes:</p> <table><tr><td>15x1.0 mm,</td><td>18x1.0 mm</td></tr><tr><td>22x1.2 mm,</td><td>28x1.2 mm</td></tr><tr><td>35x1.5 mm,</td><td>42x1.5 mm,</td></tr><tr><td>76.1x2.0 mm</td><td>88.9x2.0 mm</td></tr><tr><td></td><td>54x1.5 mm</td></tr><tr><td></td><td>108x2.0 mm</td></tr></table> <p>Max Pressures:</p> <table><tr><td>16 bar (12-76.1 mm)</td></tr><tr><td>12.5 bar (88.9 mm)</td></tr><tr><td>10 bar (108 mm)</td></tr><tr><td>10 bar (for compressed air, all sizes)</td></tr><tr><td>7 bar (for steam, all sizes)</td></tr></table> <p>Temperature Range:</p> <table><tr><td>-20°C to 200°C (Green Viton O-ring)</td></tr><tr><td>-35°C to 135°C (Black EPDM O-ring)</td></tr></table>	15x1.0 mm,	18x1.0 mm	22x1.2 mm,	28x1.2 mm	35x1.5 mm,	42x1.5 mm,	76.1x2.0 mm	88.9x2.0 mm		54x1.5 mm		108x2.0 mm	16 bar (12-76.1 mm)	12.5 bar (88.9 mm)	10 bar (108 mm)	10 bar (for compressed air, all sizes)	7 bar (for steam, all sizes)	-20°C to 200°C (Green Viton O-ring)	-35°C to 135°C (Black EPDM O-ring)
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Other Conditions	<p>Use for fuel piping systems (gaseous or liquid) in domestic applications (heating, fireplace, galley, etc.) is not allowed.</p> <p>Application in piping systems conveying flammable liquids (with flashpoint equal or greater than 60°C) is not allowed.</p> <p>Application in piping systems conveying flammable liquids or gaseous fuels (with flashpoint below 60°C) is not allowed.</p> <p>Application in Class I and Class II piping systems is not allowed.</p>																			

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Ferritic stainless steel grades (1.4521) is not allowed for use in essential piping systems.

Screwed fittings and threaded couplings are not allowed in essential piping systems for pipes exceeding 51 mm outside diameter.

Application for internal deck drains is allowed only for positions above the freeboard deck.

VSH XPRESS system is not allowed to pass through tanks or to be connected to ship's side as an overboard discharge for all services.

Application for main lines and distribution lines of inert gas piping system is not allowed in machinery spaces of category A and accommodation spaces.

Application in other machinery spaces is subject to mandatory condition, that press-fitcouplings are fitted in easily visible and in accessible positions.

Bend radius of stainless steel pipes to be not less than 3D (D = outer diameter of pipe)

The manufacturer's list of the chemical resistance of the piping components is to be observed.

The selection of fittings, pipes and O-rings for the corresponding application and the right mounting with the stipulated pressing tools is to be in accordance with the manufacturer's instructions.

Bilge lines, Fresh water dry type sprinkler, water-spray and foam systems; VSH XPRESS with only Viton O rings should be used.

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.

Previous Version: LR2003826TA-3

The Design Appraisal Document LR25304263TA_DAD and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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