

# 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.

<b>Manufacturer</b>	<b>Aalberts integrated piping systems B.V.</b>
<b>Address</b>	Oude Amersfoortseweg 99, Hilversum, 1212 AA, Netherlands
<b>Type</b>	Mechanical Pipe Joints
<b>Description</b>	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.
<b>Trade Name</b>	VSH XPRESS STAINLESS STEEL, Press Type
<b>Application</b>	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: Freshwater 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; Fresh water for non-essential services; Inertgas: water seal effluent lines, scrubber effluent lines; Inert gas: main lines and distribution lines; Potable and domestic hot and cold water; Hot and chilled water for air conditioning plants; Internal deck drains and sanitary drains; Internal vent lines on fresh water tanks and dryspaces;

*Breel Matthijs*

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Compressed air for control systems and starting air;  
Compressed air for non-essential services;  
Steam

**Specified Standard** LR Rules and Regulations for the Classification of Ships, July 2019. IACS Unified Requirements P2.11, 2001 ( Rev.4, March 2016 ) (vacuum, burst, tightness, fire endurance, vibration, pull-out tests). EN 10312, EN 10296-1, EN10246-2.

**Ratings** Pipe and Fitting sizes:  
15x1.0 mm, 18x1.0 mm  
22x1.2 mm, 28x1.2 mm  
35x1.5 mm, 42x1.5 mm, 54x1.5 mm  
76.1x2.0 mm 88.9x2.0 mm 108x2.0 mm

Max Pressures:  
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)

Temperature Range:  
-20°C to 200°C (Green Viton O-ring)  
-20°C to 150°C (Grey Viton O-ring)  
-35°C to 135°C (Black EPDM O-ring)

Max Temperature:  
150°C (for steam, Viton Grey O-ring)

**Other Conditions** Use for fuel piping systems (gaseous or liquid) in domestic applications (heating, fireplace, galley, etc.) is not allowed.

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Application in piping systems conveying flammable liquids (with flashpoint equal or greater than 60°C) is not allowed.

Application in piping systems conveying flammable liquids or gaseous fuels (with flashpoint below 60°C) is not allowed.

Application in Class I and Class II piping systems is not allowed.

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-fit couplings 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.

This is to certify that Certificate No. 14/30008(E1) for the above mentioned products is extended and renumbered as shown.

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## Type Approval Certificate

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. PRJ11100238058-2/MB and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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