



The Victaulic® PFT510 tool is the only press tool approved for use on the Vic-Press™ for Schedule 10S System.

### 1.0 PRODUCT DESCRIPTION

**Available Sizes:**

- ½ – 2"/DN15 – DN50

**Maximum Working Pressure:**

- Accommodates pressures ranging from full vacuum (29.9 in Hg/760 mm Hg) up to 500 psi/3447 kPa
- Up to 300 psi/2068 kPa on Schedule 5S
- FM Approved up to 300 psi/2068 kPa

**Application:**

- Joins ASTM A312 Schedule 10S Types 304/304L stainless steel pipe
- Recommended on services conveying water, hydrocarbons, water/hydrocarbon mixtures, air (wet/dry/with oil vapors), other gases, vegetable and mineral oils, as well as automotive fluids such as engine oil and transmission fluid within the temperature range of -30°F to +300°F/-34°C to +149°C, depending on service and seal material selected.
- For product installation instructions, refer to Victaulic Product Assembly Instructions ([I-P500](#)) and the Tool Operating and Maintenance Instructions Manual ([TM-PFT510](#)).

**Pipe Materials:**

- Standard ASTM A312 Schedule 10S Types 304/304L and 316/316L stainless steel pipe

**NOTE**

- Vic-Press™ seals are pre-lubricated to further simplify the installation process. To maintain the integrity of the lubrication, components are shipped in factory sealed bags and should remain bagged until ready for use. For more information regarding the lubricant used, please refer to publication [05.07](#).

**Codes and Requirements:**

- Support hanger spacing correspond to ASME B31.1 Power Piping Code, ASME B31.3 Process Piping, and ASME B31.9 Building Services Piping Code.
- Meets ASME requirements and ratings for ANSI Class 150 systems for water, oil, gases and general chemical services, rated for vacuum service
- Meets the requirements of ASME B31.1, B31.3 and B31.9
- Request publication [18.16](#), [18.17](#) and [18.18](#) for details.

**ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.**

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

## 2.0 CERTIFICATION/LISTINGS



### NOTES

- UL Classified in accordance with ANSI/NSF 61 for cold +73°F/+23°C and hot +180°F/+82°C potable water service and ANSI/NSF 372.
- Download publication [10.01](#) for Fire Protection Certifications/Listings Reference Guide.
- See publication [02.06](#): Victaulic Potable Water Approvals ANSI/NSF for potable water approvals if applicable.
- For complete information on Maritime approvals, visit <https://www.victaulic.com/maritime-approvals/>.

## 3.0 PRESSURE TESTS

**Description:** Vic-Press™ for Schedule 10S stainless steel couplings and fittings were assembled onto Schedule 10S stainless steel pipe and proof tested in accordance with ASME Section VIII, Division 1, Part UG 101(b). The testing was conducted to validate pipe joint and product integrity for obtaining Canadian Registration Numbers (CRN) for use in higher pressure applications. Testing was witnessed by ABS Consulting Inc., a division of American Bureau of Shipping. To meet the CRN testing requirements, smallest diameter, largest diameter and intermediate diameter product were tested.

Each test assembly consisted of several couplings, elbows and tees. The test assemblies were filled with room temperature water and pressurized to the Vic-Press™ for Schedule 10S stainless steel products published maximum rated working pressure of 500 psi/3447 kPa and held at that pressure for 5 minutes. The pressure was increased to 1½ times the published maximum rated working pressure, 750 psi/5171 kPa and held at that pressure for 5 minutes. The pressure was gradually increased until leakage or failure of the pipe joint was detected.

**Results:** The maximum pressure obtained for test assemblies is as shown below.

Size		Working Pressure (5 Mins.) psi kPa	1½ times Working Pressure (5 Mins.) psi kPa	Maximum Test Pressure psi kPa
Nominal inches DN	Actual Outside Diameter inches mm			
½ DN15	0.840 21.3	500 3447	750 5171	5510 37990
1 DN25	1.315 33.4	500 3447	750 5171	2920 20133
2 DN50	2.375 60.3	500 3447	750 5171	1765 12169

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### 3.1 FLEXURE TESTS

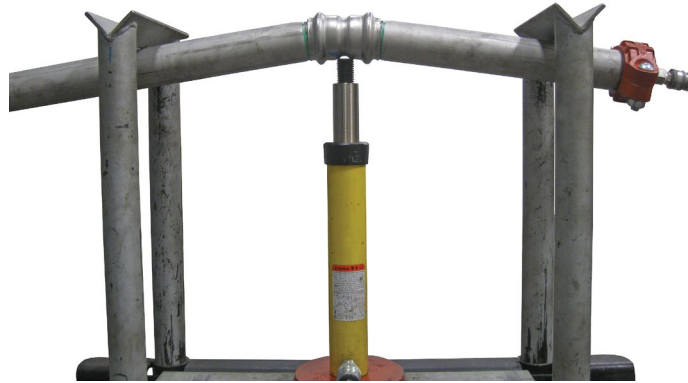
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**Description:** Vic-Press™ for Schedule 10S stainless steel couplings and fittings were assembled onto Schedule 10S stainless steel pipe and subjected to flexure (bending moment) testing. Testing was completed in compliance with Underwriters Laboratories Inc., (UL) test standard UL213 and FM Approvals test standard FM1920. Testing also complied with the method documented in ASTM F1476 Performance of Gasketed Mechanical Couplings for Use in Piping Applications, Section Test Methods (Annex A9).

The water filled test samples were mounted in a frame and internally pressurized to various pressures within their published maximum rated working pressure. With the pipe restrained against perpendicular loading at a measured distance from the test joints, a load was placed on the test fitting with a ram. The load from the ram was increased until it exceeded the aforementioned UL, FM or ASTM bending moment requirements. The load was then increased in an attempt to create pipe joint leakage or failure.

In the majority of tests, the pipe deflected/buckled to the extent that the test ram ran out of perpendicular stroke prior to leakage occurring.

**Results:** The flexure testing showed that the Vic-Press™ for Schedule 10S stainless steel connections have superior bending moment resistance as compared to the minimum industry requirements. The results also confirm that Vic-Press™ for Schedule 10S stainless steel piping systems may be supported in accordance with the most commonly used industry standards. (NFPA 13, ASME B31.1, ASME B31.3, ASME B31.9, etc.)



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### 3.2 PRESSURE CYCLING TESTS

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**Description:** Vic-Press™ for Schedule 10S stainless steel couplings and fittings were assembled onto Schedule 10S stainless steel pipe and subjected to pressure cycling testing. Testing was completed in compliance with FM Approvals test standard FM1920.

Water filled test samples were internally pressurized to their FM Approved working pressure for a duration of 5 minutes. The pressure was reduced to zero then the assemblies subjected to 20,000 cycles from zero pressure to the FM Approved working pressure.

**Results:** The test samples subjected to the above protocol did not leak at any time during the test period. Subsequent to the testing, each assembly was subjected to hydrostatic pressure tests equal to their FM Approved pressure rating, 1½ times this value and 4 times this value without leakage.

### 3.3 VIBRATION TESTS

**Description:** Vic-Press™ for Schedule 10S stainless steel couplings and fittings were assembled onto Schedule 10S stainless steel pipe and subjected to mechanical vibration testing. Testing was completed in compliance with FM Approvals test standard FM1920.

Water filled samples were pressurized to 80 psi/552 kPa and subjected to the following vibration sequence. No joint leakage or other failure was allowed during the test.

Total Stroke inches mm	Frequency Hz	Time Hours
0.020 0.5	28	5
0.040 1.0	28	5
0.150 3.8	28	5
0.040 1.0	18 to 37 (variable)	5
0.070 1.8	18 to 37 (variable)	5

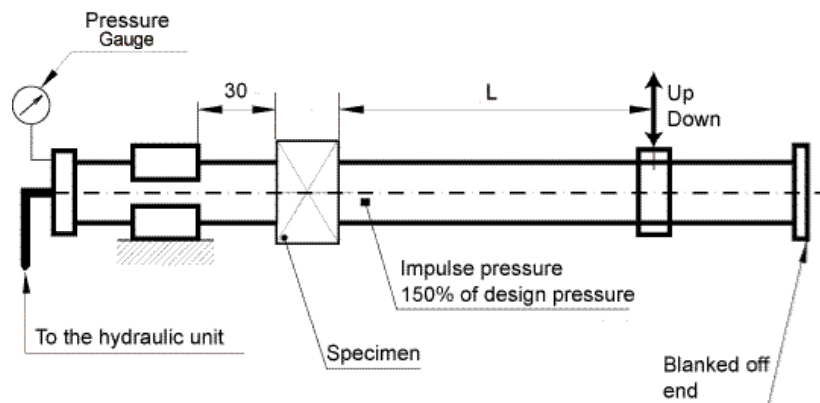
**Results:** The test samples subjected to the above protocol did not leak at any time during the test period. The total number of vibration test cycles exceeded 2.5 million. Subsequent to the testing, each assembly was subjected to hydrostatic pressure tests equal to their FM Approved pressure rating, 1½ times this value and 4 times this value without leakage.

### 3.4 VIBRATION/PULSATION TESTS

**Description:** ½" – 2"/DN15 – DN50 Vic-Press™ for Schedule 10S stainless steel couplings and fittings were assembled onto Schedule 10S stainless steel pipe and subjected to vibration and pulsation tests carried out simultaneously, in accordance with International Association of Classification Society Rules. DNV and Lloyds Register of Shipping rules were followed.

The test specimens were filled with water and subjected to 10 million vibration cycles at a frequency between 20 – 50 Hz. Simultaneously, the test specimens were subjected to a minimum of 500,000 pressure cycles between 0 psi and 350 psi/2413 kPa, 1½ times the rated working pressure for shipboard applications with a frequency of pulsations between 30 – 100 cycles per minute.

**Results:** All test assemblies maintained structural and leak tight integrity through the duration of all tests.



### 3.5 WATER HAMMER TESTS

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**Description:** 2"DN50 Vic-Press™ for Schedule 10S stainless steel couplings were assembled on Schedule 10S stainless steel pipe and pressure tested with air under water to confirm leak tightness. The assembly was then filled with water and pressurized to 500 psi/3447 kPa. The assembly was then subjected to pressure pulses to 1100 psi/7584 kPa in less than 0.1 seconds, then the pressure was lowered to 500 psi/3447 kPa. The assembly was subjected to over 100,000 pressure pulsations prior to the test being stopped.

**Results:** The assembly was visually examined and showed neither signs of damage to the components nor signs of the pipe trying to disengage from the joint. The assembly was re-pressure tested with air under water and once again confirmed that it was leak tight.

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### 3.6 LOW TEMPERATURE EXPOSURE TESTS

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**Description:** All sizes of Vic-Press™ for Schedule 10S stainless steel couplings and fittings were assembled onto Schedule 10S stainless steel pipe and subjected to freezer (-40°F/-40°C) testing. Testing was completed in compliance with Underwriters Laboratories Inc, (UL) test standard UL213 and FM Approvals test standard FM1920. The first test consisted of pressurizing and sealing the assemblies with 40 psi/276 kPa air and placing in a freezer at -40°F/-40°C.

After 24 hours, the assembly was removed and warmed to room temperature. The room temperature internal pressure was then measured.

The second test consisted of placing a sealed but unpressurized test assembly in a -40°F/-40°C glycol bath for 24 hours. The test assembly was then pressurized with air and observed for the leakage of air bubbles.

**Results:** The first test showed the assemblies to regain room temperature internal pressure equal to 40 psi/276 kPa, indicating no detectible leakage.

The second test showed the assemblies to provide bubble-tight sealing at the test conditions of -40°F/-40°C and 50 psi/345 kPa.

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### 3.7 HIGH TEMPERATURE EXPOSURE TESTS

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**Description:** Multiple size assemblies of Vic-Press™ for Schedule 10S stainless steel couplings with HNBR and EPDM o-rings were subjected to heat age performance testing.

The first test consisted of pressurized (to maintain the water in a liquid state) water filled assemblies and placed in a 340°F/171°C oven for a designated time period. Once a week, the assemblies were removed from the oven, cooled to room temperature, and then subjected to a 300 psi/2068 kPa hydrostatic pressure test. Upon successful leak free tests, the assemblies were placed back into the oven to repeat the identical test cycle. Testing was continued until a designated number of cycles were reached or leakage was detected.

The second test followed the procedures for high temperature testing in FM Approvals test standard FM1920. During these tests, the test assemblies were heat aged in air at 275°F/135°C. After 45 days at this temperature, the assemblies were removed from the oven and cooled to room temperature. The test assembly pipe ends were sealed and the assemblies were pressurized to 50 psi/345 kPa with air and submersed in a room temperature water tank.

**Results:** The results of the heat aging/cycle testing in water showed that in all cases and with both HNBR and EPDM o-rings, the number of test cycles exceeded the test design criteria. Applying these results into an Arrhenius Equation type longevity analysis reveals life expectancies well in excess of the typical design life of piping systems.

The results of the FM high temperature testing showed with both HNBR and EPDM o-rings, bubbletight sealing was achieved when subjected to industry standard testing.

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### 3.8 FIRE TESTS

**Description:** Multiple size assemblies of Vic-Press™ for Schedule 10S stainless steel couplings and fittings with HNBR o-rings were subjected to fire testing to verify compliance with the requirements of the International Association of Classification Societies (IACS) test standard UR P-2 Section 2.11.5.5.6 – Fire Endurance. IACS represents the major International Classification Societies for Maritime (Commercial Ships) applications. The IACS test standard UR P-2 Rules for Piping Design, Construction and Testing refers to ISO 19921 for the Test Method, and ISO 19922 for the Test Apparatus.

The Fire Endurance test procedure calls for a flame temperature of 1472°F/800°C (+/-90°F/50°C) measured at a distance of ½" to ¾" (12.7 mm to 19.0 mm) from the bottom of the test joints. Water at 72.5 psi/500 kPa is circulated through the test assembly during the flame exposure. The minimum inlet water temperature permitted is 172°F/78°C and the maximum outlet water temperature permitted is 185°F/85°C.

These test conditions are maintained constant for 30 minutes. At the completion of flame exposure test, the assembly is hydrostatically pressure tested to 2 times its' IACS Listed rated working pressure. A leakage rate of no greater than 6.8 ounces/min. (0.2 Liters/min.) is considered acceptable.

**Results:** Tests on six different assemblies, constructed from all offered sizes of Vic-Press™ for Schedule 10S stainless steel and multiple couplings and fitting configurations, were witnessed by representatives of Lloyd's Register North America Inc. and Det Norske Veritas, (two of the IACS member organizations). The results of the tests showed Zero Leakage from any of the joints during both the flame endurance and the post flame hydrostatic pressure test.

### 3.9 AIR PRESSURE TESTS

**Description:** Multiple size assemblies of Vic-Press™ for Schedule 10S stainless steel couplings with HNBR and EPDM o-rings were subjected to air pressure testing. The test assemblies were assembled then submerged underwater. They were then pressurized with air or nitrogen at 10 psi/69 kPa, 50 psi/345 kPa and 100 psi/689 kPa, holding the pressure at each level for 5 minutes.

A second test was completed for shipbuilding Type Approval. This test consisted of subjecting multiple size assemblies of Vic-Press™ for Schedule 10S stainless steel couplings and fittings to air pressure testing to 232 psi/1600 kPa while submerged under water. The test duration was 5 minutes with the acceptability standard being no leakage.

**Results:** During both test protocols above and on every assembly and at every pressure, no air bubbles were detected emanating from the Vic-Press™ for Schedule 10S stainless steel pipe joints.

### 3.10 VACUUM TESTS

**Description:** Vic-Press™ for Schedule 10S stainless steel couplings and fittings were assembled onto Schedule 10S stainless steel pipe and subjected to vacuum resistance testing. Testing was completed in compliance with FM Approvals test standard FM1920.

Testing consisted of filling the assemblies with water and pressurizing to 175 psi/1207 kPa for a duration of 5 minutes. After pressurization, the samples were drained of all water, connected to a vacuum pump, and subjected to a vacuum pressure equal to 25" of mercury (85 kPa) for 5 minutes during which time no pressure increase is permitted. Following the exposure to vacuum pressure, the samples were submerged in water and pressurized with air from zero to 50 psi/345 kPa for a minimum of 2 minutes.

**Results:** During the Vacuum pressure exposure, no increase in internal pressure was noted on any of the test samples. Additionally, no air bubbles were detected emanating from any test assembly at Vic-Press™ for Schedule 10S stainless steel pipe joints.

#### User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

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#### Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

#### Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

#### Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

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