



CERTIFICATE OF PRESSURE TEST

Customer Name: Premissa, Inc.
PO Number: P2019-G30
Item/Tag Number: N/A
Serial Number: 048867-1-1-1
Drawing Number: VE795500
Number of Pieces: 1

Side To Pressure	Test Pressure	Gauge Number	Test Date	Test Duration	Performed By
Tank	75 PSIG	DG3000-9/-10	03-Apr-20	10 Minutes	AME
-	-	-	-	-	-

Comments:

We certify that the items supplied were tested in accordance with our procedure ABC-80-TP-0408, at the above listed pressure, and were found not to leak. It is possible with some types of equipment we manufacture, vibration inherent in shipping can disturb some of the compression devices that seal the unit.

If there are any questions regarding this unit, please contact the Allegheny Bradford Customer Service Department at (800)-542-0650.

On behalf of Allegheny Bradford Corporation, this document has been prepared and certified by:

Date: 09-Apr-20

Andrew T. Wilson



CERTIFICATE OF PRESSURE TEST

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PO Number: P2019-G30
Item/Tag Number: N/A
Serial Number: 048867-1-1-1
Drawing Number: VE795500
Number of Pieces: 1

Side To Pressure	Test Pressure	Gauge Number	Test Date	Test Duration	Performed By
Tank	75 PSIG	DG3000-7/-11	14-Aug-20	10 Minutes	LET
-	-	-	-	-	-

Comments:

We certify that the items supplied were tested in accordance with our procedure ABC-80-TP-0408, at the above listed pressure, and were found not to leak. It is possible with some types of equipment we manufacture, vibration inherent in shipping can disturb some of the compression devices that seal the unit.

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On behalf of Allegheny Bradford Corporation, this document has been prepared and certified by:

Date: 14-Aug-20

Andrew T. Wilson

ALLEGHENY BRADFORD CORPORATION			TECHNICAL PROCEDURE	
ABC-80-TP-0408	ISS: 3 REV: 0	October 31, 2019	Reviewed by: MLJ	Approved by: MAS

Hydrostatic Testing

1.0 PURPOSE

1.1 To describe the methods to be employed and the personnel responsible for performing hydrostatic testing.

2.0 SCOPE

2.1 This procedure applies to all pressure retaining units and parts manufactured, repaired or altered by Allegheny Bradford Corporation, to assure that all pressure retaining units and parts are thoroughly examined and tested for overall integrity of welds, and sealing areas.

3.0 DEFINITIONS

- 3.1 ABC – Allegheny Bradford Corporation
- 3.2 QC – Quality Control
- 3.3 MAWP – Maximum Allowable Working Pressure
- 3.4 AI – Authorized Inspector
- 3.5 VT II – ASNT SNT-TC-1A Visual Testing Level II Qualified

4.0 RESPONSIBILITIES

- 4.1 All VT II Qualified personnel may execute this procedure.
 - 4.1.1 On-site Hydrostatic tests may be performed by a trained employee who has received a certification with a documented minimum 40 hours of formal training by VTII Qualified personnel.
- 4.2 Qualified personnel must comply with required Safety protocol;
 - 4.2.1 PPE requirements: Safety glasses, face shield, hearing protection, rubber boots
 - 4.2.2 Designated work space: Work space perimeter, $\geq 6'$, marked off with signs communicating type of testing being conducted. Only qualified personnel permitted to enter area.
 - 4.2.3 Vent/pressure relief must be pointed in a safe direction, away from others.
 - 4.2.4 A technician must be present the entire time work piece is under pressure.
 - 4.2.5 Barriers must be in place at in case of sudden pressure release or catastrophic failure.

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5.0 PROCEDURE

5.1 Prepare the vessel for testing.

- 5.1.1** Hydrostatic tests shall be scheduled so that all joints and connections to be covered by assemblies are given a visual inspection for leaks at the specified test pressure prior to covering with the assemblies (i.e. insulation sheathing, dimple jacket, simple jacket, etc.)
- 5.1.1.1** If the manufacturing assembly sequence prohibits a visual inspection of specific joints or connections at test pressure, the test may be waived via a written and signed note on QC Inspection Form provided by AI and/or Engineering as applicable. Alternative testing, if required, shall be defined at that point.
- 5.1.1.2** Unless permitted by the user or his designated agent, pressure-retaining welds of vessels shall not be painted or otherwise coated either internally or externally prior to the pressure test.
- 5.1.1.3** It is recommended that the gaskets/o-rings and bolting specified in the design are used during any pre-final hydrostatic tests but not required if the scope of the inspection only includes joints to be covered by assemblies.
- 5.1.2** All equipment shall be final hydrostatically tested (with AI when required) in its as-sold, fully assembled state including specified gaskets/o-rings, lift assists, man-way brackets, spring assists, bolting, etc.
- 5.1.2.1** Pressure relief devices and rupture disks shall not be included in the hydrostatic test.
- 5.1.2.2** Cosmetic grinding/polishing which does not affect the required base metal thickness (i.e. Electropolishing, buffing...) may be performed after the final AI hydrostatic test only if an additional final hydrostatic test is completed by a qualified ABC inspector.
- 5.1.3** Combination units that are designed to operate independently (i.e. shell side and tube side of heat exchangers) shall be tested as separate vessels, that is, each chamber shall be tested without pressure in the adjacent chamber.
- 5.1.4** All job specific hydro test instructions shall be indicated on manufacturing print including the specified test pressure. Engineering shall be consulted if the specified test pressure is not indicated on the manufacturing print.
- 5.1.5** All fabrication and testing up to the current manufacturing stage must be completed (except for those tests required after hydrostatic testing) before the hydrostatic test is performed.

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5.1.5.1 Verify all internal and external inspections are complete. Inspections include, but are not limited to, all dimensional checks, weld inspections, and visual inspections.

5.1.5.1.1 Welds shall be visually inspected for full penetration, fusion, excessive concavity, size, convexity, or any other weld defects.

5.1.5.2 Inspections shall be recorded on the appropriate Quality Inspection Form.

5.1.6 Verify all covers, bonnets; clamps etc. have been tightened to the required specifications noted on the Print, Quality Control Inspection Form as applicable.

5.1.6.1 All hand clamps shall be tightened by hand “only” with no tool assistance. Bolting shall be torqued using the manufacturers torque specification.

5.1.6.1.1 Contact engineering for any other torque specifications or configurations.

5.1.7 A vent and a minimum of (2) calibrated gauges shall be positioned at the high point of the vessel in a visible location for testing. Additional vents shall be provided as needed to purge possible air pockets while filling as needed.

5.1.7.1 Ensure the pressure gauges used have current calibration stickers and expiration dates. Gauge reference number shall be recorded on Quality Control Inspection form by person executing this procedure.

5.1.7.2 Valves shall not be placed between pressure gauges and the vessel.

5.1.8 Dial indicating pressure gauges used in testing shall be graduated over a range of about double the intended maximum test pressure, but in no case shall the range be less than 1 ½, nor more than 4 times that pressure.

5.1.8.1 Digital reading pressure gauges having a wider range of pressure may be used provided the readings give the same or greater degree of accuracy as obtained with dial pressure.

5.1.9 Remove all persons not directly involved with the test from the immediate test area.

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5.2 Performing the pressure test.

5.2.1 Unless otherwise specified on the manufacturing print, only deionized (DI) water shall be used for hydro testing. The unit shall be completely filled with deionized water.

5.2.1.1 When the test fluid requirement is other than DI water, the requirement shall be identified on the manufacturing print by engineering.

5.2.1.2 Unless otherwise specified on the manufacturing print, the vessel and fluid temperatures should be maintained at least 30°F (17°C) above the minimum design temperature, but should not exceed 120°F (48°C).

5.2.2 Pressurize the vessel gradually until the specified test pressure has been achieved.

5.2.2.1 The specified test pressure may be exceeded to allow for pressure drop due to temperature stabilization. Caution shall be exercised to prevent permanent distortion of the vessel.

5.2.3 Unless otherwise specified on the print, the specified hydrostatic test pressure shall be maintained for a minimum of 10 minutes prior to inspection by a qualified inspector and Authorized Inspector (if applicable).

5.2.3.1 If pressure drop exceeds 2 psi during the holding period, the hold time shall be extended to allow the contents to stabilize. If the vessel fails to maintain pressure after an extended holding period and there are no visible signs of leakage, a non-conformance shall be written and vessel shall be placed on hold pending a corrective action.

5.2.3.1.1 If the vessel has visible signs of leakage, the test failure shall be recorded in the hydrostatic testing database and returned to production for repair.

5.2.4 Visual inspection for leaks of all joints and connections shall be conducted while the unit is under the specified test pressure or reduced pressure as permitted by the manufacturing print. Leakage is not allowed at the time of the required visual inspection. The inspection shall include any visible signs of permanent distortion in the vessel resulting from the pressure test.

5.2.4.1 Any moisture on the vessel that would interfere with the visual inspection of the welds is not permitted. A wipe down shall be performed prior to inspection if moisture is present.

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5.2.4.2 Permanent visible distortion shall be reported on a Non-Conformance /Corrective Action and Preventative Action and placed on hold pending a corrective action.

5.2.4.3 Results of a successful visual inspection at the specified test pressure shall be recorded on the applicable QC Inspection Form with the gauge reference numbers and in hydrostatic testing log for in-shop inspections.

5.2.4.3.1 When applicable, verify the AI has recorded the results of the inspection on the QC Inspection form.

5.2.4.4 A failed shop inspection shall be recorded in the hydrostatic testing log and the vessel shall be returned to production for repair.

5.2.5 After the test is complete, safely relieve the pressure by opening the vent located at the top of the vessel to the atmosphere.

5.2.5.1 Once the pressure has been released, fully drain the unit.

6.0 REFERENCES

- 6.1** ABC-70-FM-0833 QC Inspection Form - Heat Exchanger
- 6.2** ABC-70-FM-0834 QC Inspection Form - Filter Housing
- 6.3** FRM-1980 QC Inspection Form - On-Site
- 6.4** ABC-70-FM-2005 QC Inspection Form – Tanks
- 6.5** ABC-70-FM-0457 Hydrostatic Testing Log
- 6.6** ABC-00-FM-1901 Employee Nonconformance Form

7.0 ATTACHMENTS

- 7.1** N/A

ABC-80-TP-0408

ISS: 3 REV: 0

October 31, 2019

Reviewed by: MLJ

Approved by: MAS

REV LEVE L	REV DATE	DETAILS		DESCRIPTION OF CHANGE
		Page	Para.	
8	11/21/2007	All	All	New Format
9	03/06/2008	All	All	Reviewed and approved final version of document.
0	02/20/2010	All	All	Re-issued new document, now Issue 2 Revision 0.
2-1	02/25/2010	1	5.2	Changed min/max water temp from 36F-76F to 30F (2C)-120F (48C) and added statement that test pressure shall not be applied until vessel and its contents are to about the same temperature per Section VIII Division 1. 5.2.1 For work addressed through NBIC required temperature range is to be between 60°F. and 120°F. and the hydrostatic test pressure shall be maintained for a minimum of 10 minutes prior to inspection by Authorized Inspector.
2-2	05/17/2010	2	5.7, 6.2	Reviewed Document. Changed FRM-801 to FRM-457
2-3	06/29/2010	2	5.5	Added: Vessels to be pressure tested per applicable Code requirements as indicated on drawings.
2-4	07/01/2010	2	5.8 6.3	Added hydro testing failure criteria to procedure
2-5	10/10/2012	2	5.5	Changed, Vessels shall be pressure tested per applicable Code requirements as indicated on drawings. If not specified, the designated test pressure for pressure vessels shall equal or surpass 1.3 times the MAWP and the designated test pressure for piping shall equal or surpass 1.5 times the MAWP.
2-6	04/09/2014	All	All	Review and update
2-7	07/14/2014	All	All	Review, update, and rewrite.
2-8	10/10/2014	2	5.1.7	Updated the minimum required pressure tests gauges for the hydro test to (2)
2-9	7/25/2016	All	All	Review and update
3-0	10/31/19		6.0	Updated form numbers to new format. No content changed