

**ASSE International
Product (Seal) Listing Program**

**ASSE 1020-2020
Performance Requirements for Pressure Vacuum Breaker Assemblies**

Manufacturer: _____

Contact Person: _____ **E-mail:** _____

Address: _____

Laboratory: _____ **Laboratory File Number:** _____

Model # Tested: _____

Model Size: _____

Additional models report applies to: _____

Additional Model Information (i.e. orientation, series, end connections, shut-off valves)

Date models received by laboratory: _____ **Date testing began:** _____

Date testing was completed _____

If models were damaged during shipment, describe damages:

Prototype or production sample? _____

Were all tests performed at the selected laboratory? Yes No

If offsite, identify location: _____

General information and instructions for the testing engineer:

The results within this report apply only to the models listed above.

There may be items for which the judgment of the test engineer will be involved. Should there be a question of compliance with that provision of the standard, a conference with the manufacturer should be arranged to enable a satisfactory solution of the question.

Should disagreement persist and compliance remain in question by the test agency, the agency shall, if the product is in compliance with all other requirements of the standard, file a complete report on the questionable items together with the test report, for evaluation by the ASSE Seal Control Board. The Seal Control Board will then review and rule on the question of compliance with the intent of the standard then involved.

Documentation of material compliance must be furnished by the manufacturer. The manufacturer shall furnish to the testing agency, a bill of material which clearly identifies the material of each part included in the product construction. This identification must include any standards which relate thereto.

Section I

1.0 General

1.1 Application

Does the device meet the application?

Yes No Questionable

If no or questionable, explain _____

1.2 Scope and Purpose

1.2.1 Description

Does this device conform to this section?

Yes No Questionable

If no or questionable, explain _____

1.2.2 Size Range

What is the size of the device? _____ NPS (_____ DN)

1.2.3 Static Pressure Range

What is the maximum rated static pressure of the device? _____ psi (_____ kPa)

1.2.4 Temperature Range

a. What is the cold water temperature range? _____°F to _____°F (_____°C to _____°C)

b. What is the hot water temperature range? _____°F to _____°F (_____°C to _____°C)

1.3 Mechanical Function

1.3.1 Check Valve

Are check valves force-loaded to a normally closed position under static conditions?

Yes No Questionable

If no or questionable, explain _____

1.3.2 Air Inlet Valve

a. Is the air inlet valve force-loaded to a normally open position when the supply pressure is atmospheric?

Yes No Questionable

If no or questionable, explain _____

Is the air inlet valve located above the outlet pipe line so that water can drain from it by gravity?

Yes No Questionable

If no or questionable, explain _____

b. Does the air inlet valve start to open when the line pressure reaches 1.0 psi (6.9 kPa)?

Yes No Questionable

If no or questionable, explain _____

Is the air inlet valve fully open when water drains from the body?

Yes No Questionable

If no or questionable, explain _____

1.3.3 Test Cocks

Are test cocks resilient seated?

Yes No Questionable

If no or questionable, explain _____

Are test cocks replaceable or repairable?

Yes No Questionable

If no or questionable, explain _____

What is the size of the test cock? _____ NPS (_____ DN)

Are test cocks full port?

Yes No Questionable

If no or questionable, explain _____

Are the internal diameters of the test cocks smaller than the nominal size of the test cock?

Yes No Questionable

If yes or questionable, explain _____

1.3.4 Inspection and Repair

Are the check and air inlet valves accessible for inspection, repairs, or replacements?

Yes No Questionable

If no or questionable, explain _____

Are replaceable parts of the assemblies of the same size and model interchangeable with the original parts?

Yes No Questionable

If no or questionable, explain _____

1.3.5 Connections

Check all that apply for the pipe threads and other connections:

- Tapered pipe threads comply with ASME B1.20.1.
- Dry seal pipe threads comply with ASME B1.20.3.
- Compression connections comply with SAE J512.
- Soldered connections comply with ASME B16.18 or ASME B16.22.
- Push fit connections comply with ASSE 1061.
- Press connections comply with ASME B16.51.

Section III

3.0 Performance Requirements and Compliance Testing

3.1 Hydrostatic Test of the Complete Device

3.1.2 Procedure

What was the test pressure? _____ psi (_____ kPa)

How long was the pressure maintained? _____ minutes

3.1.3 Criteria

Were there any leaks?

Yes No Questionable

If yes or questionable, explain _____

Is the device in compliance with this section?

Yes No Questionable

If no or questionable, explain _____

3.2 Hydrostatic Test of the Check Valve

3.2.2 Procedure

What was the test pressure? _____ psi (_____ kPa)

How long was the pressure maintained? _____ minutes

3.2.3 Criteria

Were there any leaks?

- Yes No Questionable

If yes or questionable, explain _____

Was there any damage that prevented compliance with any part of the standard?

- Yes No Questionable

If yes or questionable, explain _____

Is the device in compliance with this section?

- Yes No Questionable

If no or questionable, explain _____

3.3 Pressure Drop at Rated Flow

3.3.2 Procedure

2. What flow rate was reached? _____ GPM (_____ L/min)
3. What was the maximum pressure loss, Ptotal? _____ psi (_____ kPa)
What was the corresponding flow rate, F? _____ GPM (_____ L/min)
4. What was the flow rate? _____ GPM (_____ L/min)
What the pressure loss between, Pcorr? _____ psi (_____ kPa)
5. What was P? _____ psi (_____ kPa)

3.3.3 Criteria

Was there any indication of leakage?

- Yes No Questionable

If yes or questionable, explain _____

Is the device in compliance with this section?

- Yes No Questionable

If no or questionable, explain _____

3.4 Atmospheric Vent

3.4.2 Procedure

What was the water level in the sight glass? _____ inches (_____ mm)

Was the air inlet valve fully open when the water drained from the body?

- Yes No Questionable

If no or questionable, explain _____

3.4.3 Criteria

At what pressure did the atmospheric air inlet valve start to open? _____ psi (_____ kPa)

Is the device in compliance with this section?

- Yes No Questionable

If no or questionable, explain _____

3.5 Drip Tightness of Check Valve Test

3.5.2 Procedure

4. What height was the sight glass filled to? _____ inches (_____ mm)
7. How long was the water level in the sight glass dropped for? _____ minutes
8. What was the static water level in the sight glass? _____ inches (_____ mm)

3.5.3 Criteria

Is the device in compliance with this section?

Yes No Questionable

If no or questionable, explain _____

3.6 Air Passage Comparative Areas

3.6.2 Procedure

3.6.2.2.

What length pipe was connected to the outlet of the device? _____ inches (_____ mm)

3.6.2.3.

What was the size of the reamed nipple connected to the inlet of the device?
_____ inches (_____ mm)

Trial 1:

3.6.2.4.

What was the initial vacuum in the tank? _____ in-Hg (_____ kPa)

What was the vacuum in the tank dissipated to? _____ in-Hg (_____ kPa)

3.6.2.5.

How long did it take the dissipate the vacuum? _____ seconds

3.6.2.6.

What was the initial vacuum in the tank? _____ in-Hg (_____ kPa)

What was the vacuum in the tank dissipated to? _____ in-Hg (_____ kPa)

How long did it take the dissipate the vacuum? _____ seconds

Trial 2:

3.6.2.4.

What was the initial vacuum in the tank? _____ in-Hg (_____ kPa)

What was the vacuum in the tank dissipated to? _____ in-Hg (_____ kPa)

3.6.2.5.

How long did it take the dissipate the vacuum? _____ seconds

3.6.2.6.

What was the initial vacuum in the tank? _____ in-Hg (_____ kPa)

What was the vacuum in the tank dissipated to? _____ in-Hg (_____ kPa)

How long did it take the dissipate the vacuum? _____ seconds

Trial 3:

3.6.2.4.

What was the initial vacuum in the tank? _____ in-Hg (_____ kPa)

What was the vacuum in the tank dissipated to? _____ in-Hg (_____ kPa)

3.6.2.5.

How long did it take the dissipate the vacuum? _____ seconds

3.6.2.6.

What was the initial vacuum in the tank? _____ in-Hg (_____ kPa)

What was the vacuum in the tank dissipated to? _____ in-Hg (_____ kPa)

How long did it take the dissipate the vacuum? _____ seconds

3.6.3 Criteria

What was the average time to dissipate the vacuum in Section 3.6.2.5? _____ seconds

What was the average time to dissipate the vacuum in Section 3.6.2.6? _____ seconds

Is the device in compliance with this section?

- Yes No Questionable

If no or questionable, explain _____

3.7 Backsiphonage Test

3.7.2 Procedure

3.7.2.1.

What was the diameter of the wire used to foul the check or moving member?

_____ NPS (_____ DN)

3.7.2.3.

The outlet of the device and the lower end of such tube was submerged in water _____ inches (_____ mm) from the bottom or critical installation level (CIL) point of the device.

3.7.2.5.

Trial 1:

a) What constant vacuum was instantly applied? _____ in-Hg (_____ kPa)

How long was the constant vacuum applied for? _____ seconds

b) The following intermittent vacuums were instantaneously applied:

Vacuum Applied	Time On	Time Off
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds

c) What was the initial vacuum? _____ in-Hg (_____ kPa)

What was the final vacuum? _____ in-Hg (_____ kPa)

d) What was the initial vacuum? _____ in-Hg (_____ kPa)

What was the final vacuum? _____ in-Hg (_____ kPa)

Trial 2:

a) What constant vacuum was instantly applied? _____ in-Hg (_____ kPa)

How long was the constant vacuum applied for? _____ seconds

b) The following intermittent vacuums were instantaneously applied:

Vacuum Applied	Time On	Time Off
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds

c) What was the initial vacuum? _____ in-Hg (_____ kPa)

What was the final vacuum? _____ in-Hg (_____ kPa)

d) What was the initial vacuum? _____ in-Hg (_____ kPa)

What was the final vacuum? _____ in-Hg (_____ kPa)

Trial 3:

a) What constant vacuum was instantly applied? _____ in-Hg (_____ kPa)

How long was the constant vacuum applied for? _____ seconds

b) The following intermittent vacuums were instantaneously applied:

Vacuum Applied	Time On	Time Off
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds

- c) What was the initial vacuum? _____ in-Hg (_____ kPa)
 What was the final vacuum? _____ in-Hg (_____ kPa)
- d) What was the initial vacuum? _____ in-Hg (_____ kPa)
 What was the final vacuum? _____ in-Hg (_____ kPa)

Trial 4:

- a) What constant vacuum was instantly applied? _____ in-Hg (_____ kPa)
 How long was the constant vacuum applied for? _____ seconds
- b) The following intermittent vacuums were instantaneously applied:

Vacuum Applied	Time On	Time Off
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds

- c) What was the initial vacuum? _____ in-Hg (_____ kPa)
 What was the final vacuum? _____ in-Hg (_____ kPa)
- d) What was the initial vacuum? _____ in-Hg (_____ kPa)
 What was the final vacuum? _____ in-Hg (_____ kPa)

Trial 5:

- a) What constant vacuum was instantly applied? _____ in-Hg (_____ kPa)
 How long was the constant vacuum applied for? _____ seconds
- b) The following intermittent vacuums were instantaneously applied:

Vacuum Applied	Time On	Time Off
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds
_____ in-Hg (_____ kPa)	_____ seconds	_____ seconds

- c) What was the initial vacuum? _____ in-Hg (_____ kPa)
 What was the final vacuum? _____ in-Hg (_____ kPa)
- d) What was the initial vacuum? _____ in-Hg (_____ kPa)
 What was the final vacuum? _____ in-Hg (_____ kPa)

3.7.3 Criteria

What was the maximum water rise during this test? _____ inches (_____ mm)
 Is the device in compliance with this section?

- Yes No Questionable

If no or questionable, explain _____

3.8 Shock (Water Hammer) Test of the Device

3.8.2 Procedure

	Shock Wave Measured
Trial 1	_____ psi (_____ kPa)
Trial 2	_____ psi (_____ kPa)
Trial 3	_____ psi (_____ kPa)
Trial 4	_____ psi (_____ kPa)

3.8.3 Criteria

Was there any indication of damage that impaired the intended functions of the device?

Yes No Questionable

If yes or questionable, explain _____

Is the device in compliance with this section?

Yes No Questionable

If no or questionable, explain _____

3.9 Deterioration at Extremes of Manufacturer's Temperature

3.9.2 Procedure

What type of device was tested? Cold water Hot water Both

What was the water temperature? _____°F (_____°C)

What was the water pressure? _____ psi (_____ kPa)

How many total hours was water at the above temperature and pressure circulated through the device? _____ hours

Was the air inlet valve opening verified in accordance with Section 3.4 after each eight (8) hour period?

Yes No Questionable

If no or questionable, explain _____

Within _____ minute of the conclusion of the final 8 hour test period, water at _____°F (_____°C) was recirculated through the device for _____ hours.

3.9.3 Criteria

Were there any leaks?

Yes No Questionable

If yes or questionable, explain _____

Was there any damage that prevented compliance with any part of the standard?

Yes No Questionable

If yes or questionable, explain _____

Is the device in compliance with this section?

Yes No Questionable

If no or questionable, explain _____

3.10 Life Cycle Test

3.10.2 Procedure

a. What was the flow rate? _____ GPM (_____ L/min)

How long was water at the above flow rate flowed for? _____ seconds

b. What was the static pressure? _____ psi (_____ kPa)

How long was the above static pressure held for? _____ seconds

- c. How many cycles were run at the conditions stated in Sections 3.10.2.a and 3.10.2.b? _____ cycles

Retest Section 3.4:

What was the water level in the sight glass? _____ inches (_____ mm)

Was the air inlet valve fully open when the water drained from the body?

- Yes No Questionable

If no or questionable, explain _____

At what pressure did the atmospheric air inlet valve start to open? _____ psi (_____ kPa)

Retest Section 3.5:

4. What height was the sight glass filled to? _____ inches (_____ mm)

7. How long was the water level in the sight glass dropped for? _____ minutes

8. What was the static water level in the sight glass? _____ inches (_____ mm)

- d. What was the flow rate? _____ GPM (_____ L/min)

How long was water at the above flow rate flowed for? _____ seconds

- e. What was the static pressure? _____ psi (_____ kPa)

How long was the above static pressure held for? _____ seconds

How many cycles were run at the conditions stated in Sections 3.10.2.a and 3.10.2.b? _____ cycles

Retest Section 3.4:

What was the water level in the sight glass? _____ inches (_____ mm)

Was the air inlet valve fully open when the water drained from the body?

- Yes No Questionable

If no or questionable, explain _____

At what pressure did the atmospheric air inlet valve start to open? _____ psi (_____ kPa)

Retest Section 3.5:

4. What height was the sight glass filled to? _____ inches (_____ mm)

7. How long was the water level in the sight glass dropped for? _____ minutes

8. What was the static water level in the sight glass? _____ inches (_____ mm)

- f. What was the flow rate? _____ GPM (_____ L/min)

How long was water at the above flow rate flowed for? _____ seconds

- g. What was the static pressure? _____ psi (_____ kPa)

How long was the above static pressure held for? _____ seconds

How many cycles were run at the conditions stated in Sections 3.10.2.a and 3.10.2.b? _____ cycles

Retest Section 3.4:

What was the water level in the sight glass? _____ inches (_____ mm)

Was the air inlet valve fully open when the water drained from the body?

- Yes No Questionable

If no or questionable, explain _____

At what pressure did the atmospheric air inlet valve start to open? _____ psi (_____ kPa)

Retest Section 3.5:

4. What height was the sight glass filled to? _____ inches (_____ mm)

7. How long was the water level in the sight glass dropped for? _____ minutes

8. What was the static water level in the sight glass? _____ inches (_____ mm)

- h. What was the flow rate? _____ GPM (_____ L/min)
 How long was water at the above flow rate flowed for? _____ seconds
- i. What was the static pressure? _____ psi (_____ kPa)
 How long was the above static pressure held for? _____ seconds
 How many cycles were run at the conditions stated in Sections 3.10.2.a and 3.10.2.b? _____ cycles

Retest Section 3.4:

What was the water level in the sight glass? _____ inches (_____ mm)
 Was the air inlet valve fully open when the water drained from the body?

- Yes No Questionable

If no or questionable, explain _____

At what pressure did the atmospheric air inlet valve start to open? _____ psi
 (_____ kPa)

Retest Section 3.5:

4. What height was the sight glass filled to? _____ inches (_____ mm)
 7. How long was the water level in the sight glass dropped for? _____ minutes
 8. What was the static water level in the sight glass? _____ inches (_____ mm)

j. Retest Section 3.4:

What was the water level in the sight glass? _____ inches (_____ mm)
 Was the air inlet valve fully open when the water drained from the body?

- Yes No Questionable

If no or questionable, explain _____

At what pressure did the atmospheric air inlet valve start to open? _____ psi
 (_____ kPa)

Retest Section 3.5:

4. What height was the sight glass filled to? _____ inches (_____ mm)
 7. How long was the water level in the sight glass dropped for? _____ minutes
 8. What was the static water level in the sight glass? _____ inches (_____ mm)

3.10.3 Alternate Procedure

Was the University of Southern California Foundation for Cross-Connection Control & Hydraulic Research (USC FCCC&HR) life cycle test protocol in the Manual of Cross Connection Control section 10.1.2.2.3.8 followed?

- Yes No Questionable

If questionable, explain _____

If yes, attached the USC life cycle test to this report.

3.10.4 Criteria

Is the device in compliance with this section?

- Yes No Questionable

If no or questionable, explain _____

Section IV

4.0 Detailed Requirements

4.1 Materials

4.1.1 Material in Contact with Water

What is the lead content of the solder and fluxes in contact with potable water? _____%

Are there any metal alloys in contact with potable water?

Yes No Questionable

If questionable, explain _____

If yes, what is the lead content of the metal alloys in contact with potable water? _____%

Is the device intended to convey or dispense water for human consumption through drinking or cooking?

Yes No Questionable

If questionable, explain _____

If yes, what is the weighted average lead content of the fittings and device when evaluated in accordance with the test method specified in NSF/ANSI 372? _____%

4.1.2 Non-Ferrous Cast Part

Do non-ferrous cast parts have a corrosion resistance at least equal to ASTM B584 alloy UNS #C844400 or of a non-ferrous material at least equal in strength and corrosion resistance of not less than seventy-eight percent (78%) copper?

Yes No Questionable

If no or questionable, explain _____

4.1.3 Internal Non-Cast Part

Are internal non-cast parts of a material having a corrosion resistance at least equal to a non-ferrous alloy of not less than fifty-eight percent (58%) copper?

Yes No Questionable

If no or questionable, explain _____

4.1.4 Springs

Do springs in contact with the water flowing through the device have a corrosion resistance of at least equal to stainless steel, Series 300?

Yes No Questionable

If no or questionable, explain _____

4.1.5 Flexible or Non-Flexible Non-Metallic Parts

Are valve discs, seat facings or other flexible or non-flexible non-metallic parts designed, manufactured and supplied for continuous exposure to water at the maximum rated operating temperature of the device without change in physical characteristics which prevents full compliance with all requirements of this standard?

Yes No Questionable

If no or questionable, explain _____

4.1.6 Metal to Metal Seats

Is there metal to metal seating of check valves or valve venting to atmosphere?

Yes No Questionable

If yes or questionable, explain _____

Are either the seat, valve disc, or both of non-metallic materials that will assure pressure tight seating and reseating?

Yes No Questionable

If no or questionable, explain _____

4.1.7 Test Cocks

Do test cocks have a resilient seal that is equal or greater in strength and corrosion resistance as ASTM B584 Alloy UNS #C84400?

Yes No Questionable

If no or questionable, explain _____

4.1.8 Pipe Threads

Are tapered pipe threads, except dryseal, in compliance with ANSI/ASME B1.20.1?

Yes No Questionable N/A

If no or questionable, explain _____

Are dryseal pipe threads in compliance with ANSI/ASME B1.20.3?

Yes No Questionable N/A

If no or questionable, explain _____

4.1.9 Dezincification Resistance

Are copper alloys in contact with water and containing more than 15% zinc (Zn) by weight resistant to dezincification?

Yes No Questionable N/A

If no or questionable, explain _____

When tested in accordance with ISO 6509-1, did the maximum depth of dezincification exceed 200 µm (7.87 mil)?

Yes No Questionable N/A

If yes or questionable, explain _____

4.2 Identification and Markings

Does the device have the following marked?

- Manufacturer's name or trademark.
- Type and model number of the device.
- Maximum rated working pressure.
- Maximum rated water temperature for which the device is designed.
- Serial number consistent with the manufacturer's standard practice.
- Nominal valve size.
- The direction of water flow through the device.

Do labels comply with UL 969 for permanence?

Yes No Questionable N/A

If no or questionable, explain _____

4.3 Installation and Maintenance Instructions

Were instructions for installation packaged with the device?

Yes No Questionable

If questionable, explain _____

Check all those that were found on the installation instructions:

- Inlet and outlet connection sizes.
- Manufacturer's maximum working pressure.
- Manufacturer's maximum flow rate.

Do the instructions indicate that the device shall be accessible for replacement and repair?

- Yes No Questionable

If no or questionable, explain _____

Check all those statements that were found on the instructions:

- "The backflow assembly test procedure shall be per the local authority having jurisdiction (AHJ)."
- "The assembly shall not be installed in a concealed or inaccessible location, nor where the venting of water from the assembly may cause damage. The serial number shall be visible after installation."

LISTED LABORATORY: _____

ADDRESS: _____

PHONE: _____ FAX: _____

TEST ENGINEER(S): _____

If applicable:

OUTSOURCED LABORATORY: _____

ADDRESS: _____

PHONE: _____ FAX: _____

TEST ENGINEER(S): _____

Scope of outsourced testing: _____

We certify that the evaluations are based on our best judgments and that the test data recorded is an accurate record of the performance of the device on test.

Signature of the official of the listed laboratory: _____

Signature

Title of the official: _____ Date: _____