

Aquatherm Standard Pressure Testing Procedure

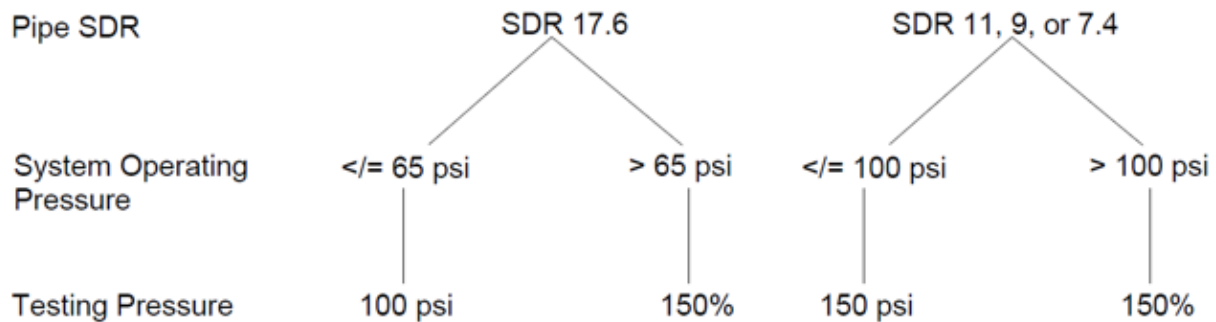
Aquatherm offers an extensive warranty to protect against damages caused by failure from manufacturer's defect. Aquatherm's warranty⁷ does not cover failures caused by improper installation, operation outside of the recommended parameters, freeze damage or damage from mishandling after the pipe has left the manufacturer. The Aquatherm warranty also does not cover elastomeric components (seals, gaskets, O-rings), components made by other manufacturers, or connections made to other non-Aquatherm systems or components.

Step 1: Determine your testing pressure

To help ensure the integrity of the heat fusion connections, a pressure test must be performed on the completed system. The amount of pressure used depends on the type of pipe and intended pressure of the application.

- If the piping system has a mixture of SDR pipe, you should test to the higher SDR's (thinner walled pipe's) testing requirements. For example, if the piping system contains SDR 17.6 pipe and SDR 11 piping, you should test to the requirements of the SDR 17.6 piping.
- If the piping system contains SDR 17.6 pipe and has an intended operating pressure of 65 psi or lower, the system must be tested at 100 psi.
- If the piping system contains SDR 17.6 pipe and has an intended operating pressure higher than 65 psi, the system must be tested at 150% of the intended operating pressure or a maximum of 160 psi¹. **Do not use compressed air to test SDR 17.6¹.**
- If the system contains only SDR 11 or heavier-walled pipe (lower SDR) and has an intended operating pressure of 100 psi or less, the system must be tested at 150 psi.
- If the system contains only SDR 11 or heavier-walled pipe (lower SDR) and has an intended operating pressure higher than 100 psi, the system must be tested at 150% of the intended operating pressure.
- If you have concerns regarding your testing pressure, please contact Aquatherm.

Step 1: Determine your testing pressure (cont.)



The following are maximum testing pressures for high-rise buildings or high-pressure systems. The maximum testing pressures should not exceed the following:

Pipe	Maximum Test Pressure Allowed
SDR 9	400 psi
SDR 7.4	400 psi
SDR 11	270 psi
SDR 17.6	160 psi

Step 2: Determine your testing medium

Water is the preferred medium for testing purposes, due to its incompressibility. However, low pressure, (15 psi or less) air testing may be used to find leaks and open-end pipes. Do not use compressed air alone on any piping system unless it is a compressed air system and suitably protected and contained to prevent catastrophic rupture, injury, or other damage to nearby equipment and building elements.³

- If the system is intended for compressed air service, only compressed air may be used for the pressure test, regardless of the following restrictions.
- If the testing pressure is equal to or less than 150 psi, you may test with water only, or with an air over water combination system (water-filled piping, with air as pressure source and air separated from water³).
- If the testing pressure exceeds 150 psi, the test must be performed using water only.

Step 2: Determine your testing medium (cont.)

Determine Testing Medium

Operating Medium:	Air Service	Water Service
Test Pressure:		
Testing Medium:	Test with Compressed Air	Test with water or air over water system

Do not use compressed air to test SDR 17.6.¹

Step 3: Observe safety protocols

It is important for the tester and all others at the project site⁷ to observe all safety recommendations from Aquatherm until the testing is complete.

For all systems:

- Visually inspect the connections for signs of proper fusion, following the guidelines given in the Aquatherm Installer Manual. Socket connections should have two even rings of melted plastic, and a visible depth mark. Butt welded connections should have a single bead with a rounded top. This inspection is most easily done during the fusion process. The absence of these signs may be indicative of an improper fusion.
- Remove all fusion equipment from the system before starting the pressure test.
- Set your pressure gauge near the lowest point³ of the system, where the pressure will be highest. This reduces the risk of over-pressurizing the system.
- Observe the system during the test for any indications of leaks. If a leak is found, relieve all test pressure and repair the leak before continuing.

Additionally, when using compressed air as the pressure source³:

- Stand clear of the pipe during testing and warn others nearby to do the same. Take measures to secure all³ sections of the pipe in case a rupture does occur.
- Do not perform the test if the ambient temperature is below 40 °F³ or higher than 100 °F. Use water only³.
- Should any transition joints leak during testing, check the joints for proper assembly and repeat the test using water before replacing any of the fittings.
- Always take precautions to eliminate hazards to persons near lines being tested. For the entire duration of the procedure and any subsequent retesting, only authorized persons that are conducting the test or inspecting the piping section being tested should be allowed in the proximity of the section under test. Caution all personnel to stay well clear of the pipe unless checking for leaks.³
- For the entire duration of the procedure, the test section and the work area around the test section and equipment shall be supervised or secured with barricades and warnings so that unauthorized persons are kept at a safe distance away.³
- A failure in the piping system or mechanical components and connections may result in a sudden, violent, uncontrolled, and dangerous movement of the system piping, or components, or parts of components.³
- Take measures to ensure that all parts of the section under test are structurally restrained against movement if failure occurs. Observe manufacturer's precautions for securing and restraining temporary mechanical end (test) caps. Defective or improperly secured temporary end closures or mechanical end caps shall not be used.³
- When connections, joints and seals are to be exposed for observation during the test, use restraint methods to control movement in the event of joint or connection separation, giving due consideration to restraining forces in both the later/outward and longitudinal/axial directions.³
- Pipe connected to connections, joints and seals that are exposed for leakage observation shall be restrained. The unrestrained exposed pipe distance to the side of the exposed connection, joint or seal shall not exceed more than 5 pipe diameters or 3 ft. (1m).³
- When properly made, heat fusion joints in polypropylene pipe are structurally comparable to the parent (PP-R) pipe material and do not leak. Leakage at a fusion joint indicates a possible poor joint having the imminent potential for complete separation. If leakage is observed at a fusion joint, move away immediately, and depressurize the test section.³

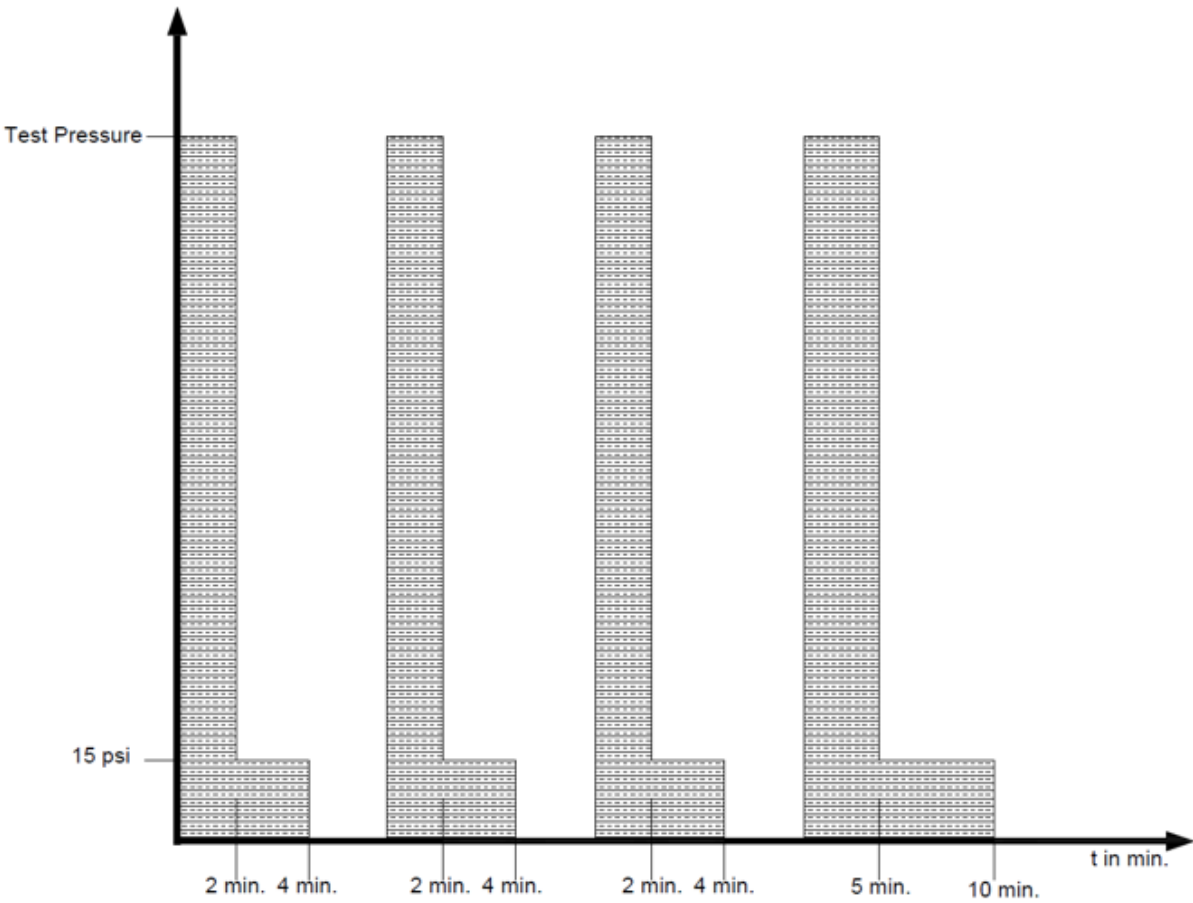
Step 4: Perform the test²

Follow the steps as indicated below. Use a pressure test gauge that is accurate to within 0.5 psi. Record the results on the pressure test form, which can be found on the Aquatherm website.

Cyclic Pressure Test:

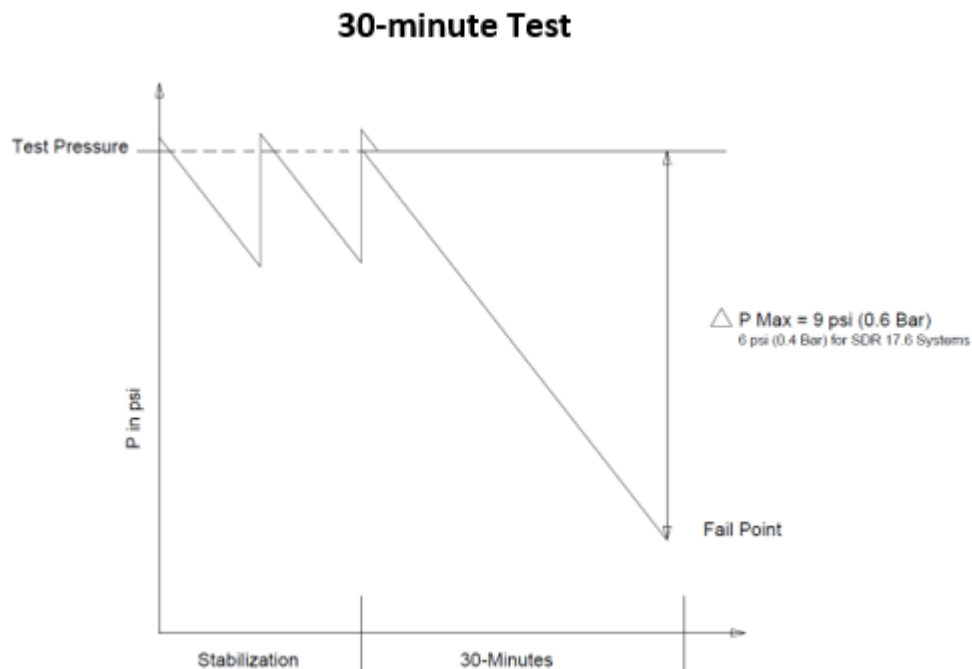
- Release any existing pressure from the system.
- Bring the system up to test pressure for two minutes.
- Reduce the system pressure to 15 psi for two minutes.
- Release the pressure from the system.
- Bring the system up to test pressure for two minutes.
- Reduce the system pressure to 15 psi for two minutes.
- Release the pressure from the system.
- Bring the system up to test pressure for two minutes.
- Reduce the system pressure to 15 psi for two minutes.
- Release the pressure from the system.
- Bring the system up to test pressure for five minutes.
- Reduce the system pressure to 15 psi for five minutes.
- Release the pressure from the system.
- Aquatherm recommends using this test for progress testing, rather than completing the entire testing sequence. The entire testing sequence should be completed on the entire system when it is finished.
- This test is intended to expand and stress the system and joints, so additional pump pressure may be necessary to maintain the test pressure initially. Any significant loss of pressure or inability to maintain the test pressure should be investigated for leaks, damage, entrapped air or equipment malfunction.

Cyclic Pressure Test



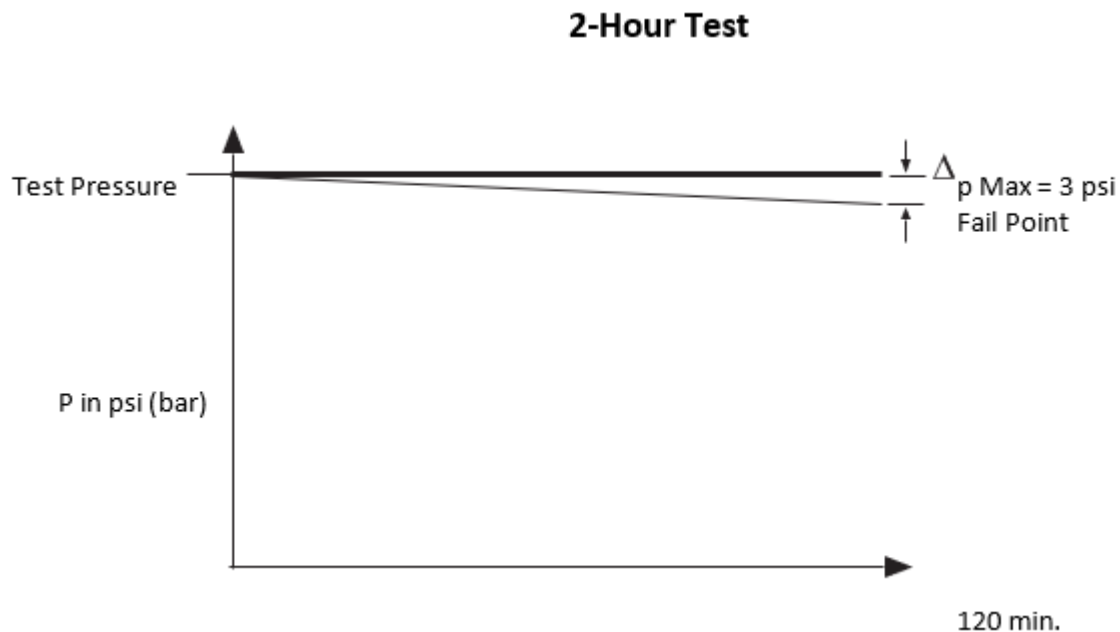
30-Minute test:

- Bring the system up to the test pressure. The system will expand slightly once it is up to pressure, so additional pressure may be required to help it stabilize.
- Once the system stabilizes, observe it for 30 minutes. The system should be able to hold the test pressure during that time.
- The loss of more than 9 psi (6 psi for SDR 17.6 systems) or steadily decreasing pressure during this test is indicative of a leak. If a leak occurs, identify the leak and repair the system then repeat this test.
- If the system does not stabilize properly, but no leak is found, then there is likely entrapped air in the piping. Inspect the system for high points or other locations where filling may have entrapped air and ensure all air is removed from the piping system.³



2-Hour test:

- If the system has lost any pressure during the 30-minute test, bring the system back up to the test pressure.
- Observe the system for 120 minutes. The system should be able to hold the full test pressure during that time.
- The loss of more than 3 psi or steadily decreasing pressure during this test is indicative of a leak. Identify the leak and repair the system before repeating this test. The test pressure must have less than 3 psi loss and have stabilized at a value of less than 3 psi loss during the test.



Step five: Complete the pressure test record and give to building owner⁷

- Submit the forms to the building owner promptly⁷ after completing the pressure test.
- If you are testing a system in sections, save all the pressure test records and submit them together.
- Include the installer numbers of all the installers who fused connections on the system.

Revisions:

1. Revised 13 March 2018
2. Revised 14 Nov. 2018
3. Revised 20 May 2019
4. Revised 25 July 2019
5. Revised 19 August 2019
6. Revised 9 December 2021
7. Revised 1 April 2024 – Warranty revisions