

# Aquatherm Technical Bulletin

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## **Pressure Testing Aquatherm Pipe**

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Aquatherm would like to remind installers of the importance of completing and submitting the required pressure test after completing an installation. Aquatherm uses the test information to verify proper installation for warranty purposes.

Heat fusion is essentially an all-or-nothing joining process. An improper fusion will hold very little pressure and will fail almost immediately when subjected to pressure. A proper fusion becomes at least as strong as the pipe wall and can easily pass a system pressure test. Therefore, the final pressure test is the best way to verify that all the joints have been properly fused. It also helps locate and identify pipes that were cracked before or during installation that the installers may have missed.

The pressure test exists to help protect the installer from liability in the event of a failure. Aquatherm's warranty extensively covers manufacturer's defects, but does not apply to installer error. Completing the pressure test helps eliminate the risk of failure due to improper installation, as improperly fused joints or post-factory damaged pipes will not pass the pressure test. This also helps reduce the cost and hassle of replacing pipes that have been improperly installed, as the mistakes will be found before the pipes are closed-up. In addition, catching the problem during the pressure test, when the building is still mostly concrete and bare studs, is preferable to finding a problem after the building is occupied and filled with finished walls, carpets, and ceilings. Thus, the pressure test is as much an insurance policy for the contractor as the Zurich insurance policy is for Aquatherm.

The Aquatherm warranty will continue to cover manufacturer's defects on all systems that have been installed by Aquatherm-trained installers and properly pressure tested, including systems that were tested under the old standard.

Due to past instances of fraud, Aquatherm requires that a copy of the pressure test be submitted to Aquatherm within 30 days of completion. Aquatherm places a high value on the reputation of its products, and attempts to minimize both the frequency and impact of material failures. The frequency of these failures is reduced with thorough training and careful installation, and the impact is reduced by completing the pressure test as soon as possible after installation.

Detailed information regarding the pressure test, as well as a copy of the test itself, can always be found at [www.Aquatherm.com/pressure-test](http://www.Aquatherm.com/pressure-test)

Fused connections should be visually inspected upon completion, as described in the Aquatherm Installer Manual. A proper connection will have two even rings or beads of melted PP-R, touching or nearly so, and a visible depth mark to ensure proper insertion. If the beads are uneven, it may be indicative of an

error in the fusion. Alternatively, the beads may appear as a flat, smooth surface around the fitting face, with two tick marks 180° apart, indicating the use of a cold ring and chamfer tools.

While still accessible, all pipelines must be pressure tested using water, air, or a combination of the two. For SDR 17.6 piping compressed air should only be used up to 25 psi max. for preliminary leak testing prior to doing the full hydrostatic testing. Due to the lower wall thickness of the SDR 17.6 pipe, the necessary test pressure is lower than for the other SDR's. Therefore, the required test pressure for SDR 17.6 is based on working pressure. If the working pressure of the system is less than 65 psi, then the testing pressure is 100 psi.

If the working pressure of the system is greater than 65 psi, the testing pressure shall be 150% of working pressure. In either case SDR 17.6 should never be tested with compressed air alone. Always test SDR 17.6 hydrostatically.

For SDR 7.4, SDR 9 and SDR 11 pipe, the final test pressure must be 1.5 times the operating pressure or 150 psi, whichever is higher. Aquatherm recommends using a hydrostatic test (water only), or filling the piping with water and then using compressed air to achieve the required pressure (air over water).

If the system is comprised partially of SDR 17.6 pipe, and partially of another SDR pipe, the required minimum test pressure shall be reduced to 100 psi or 1.5 times the operating pressure, as indicated above, whichever is higher. Again, test only hydrostatically. Do not use compressed air alone.

The following points need to be observed when pressure testing Aquatherm pipe:

- Do not test to 150 psi with compressed air alone. Always use a mixture of air and water when testing above 150 psi (except compressed air systems, which should be tested at 150% of working pressure with only compressed air).
- Do not leave butt fusing machines or clamping devices clamped to pipeline during testing.
- All personnel shall stand clear of the pipe during the testing.

If the system is a compressed air system, the system must be tested using compressed air alone. The test pressure shall be 150 psi or 1.5 times the intended working pressure. Extreme care should be taken when testing a compressed air system.

Following are some safety guidelines that should be observed when testing Aquatherm piping with compressed air:

1. 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.
2. 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 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.
4. 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.
5. 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 lateral/outward and longitudinal/axial directions.
6. 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 the great of 5 pipe diameters or 3 ft. (1m).
7. 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.

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

PP-RP (RCT) SDR 9 – 400 psi

PP-R SDR 7.4 - 400 psi

PP-R SDR 11 – 270 psi

PP-R SDR 17.6 – 160 psi

Revisions: