

<b>Standard Operating Procedure</b> <b>Hydrostatic Leak Test For Hydronic Piping</b>	<b>SOP No.</b> <b>6.004</b>
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**Page No.:** 1 of 5

- 1 Purpose
  - 1.1 To establish a standard procedure for hydrostatic leak testing of hydronic piping (e.g. heating and cooling piping).
- 2 Scope
  - 2.1 This procedure applies to all Therma projects requiring a hydrostatic leak test for the hydronic piping.
- 3 Responsibility
  - 3.1 Therma's general foreman is responsible for performing the tasks listed herein.
- 4 Reference
  - 4.1 2001 California Mechanical Code, Section 1201.2.8, Chapter 12.
- 5 Procedures
  - 5.1 Review the customer's hydrostatic leak test requirements and the type of test medium to be used for each of the hydronic piping.
  - 5.2 If required, use a calibrated one pound increment pressure gauge. Record calibration date of the pressure gauge in the comment section of pressure test log, form # FN 6.004.1.
    - 5.2.1 Ensure that the calibration is NIST traceable.
  - 5.3 If required by project specifications, mark up a dedicated set of drawings (e.g. P&ID) showing the limits of the test, by using a colored marker. Indicate all removed devices on the P&ID with <R> next to the device.

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Revision No.	SOP No.	Page
2	6.004	2 of 5

- 5.4 Pre-test set-up and visual inspection.
  - 5.4.1 Inspect the piping systems to be tested for visual defects and ensure that all connections are tight.
  - 5.4.2 Remove any instrumentation or equipment, which may be damaged by higher test pressures. This includes gauges, sensors, tank rupture disks, regulators, etc. Open and cap all valves and ports.
  - 5.4.3 Attach “PRESSURE TEST IN PROGRESS” tags on all branch or bleed valves.
  - 5.4.4 Whenever possible vent air from the high spots and fill from valves in the lower locations to force the air out of the system.
  - 5.4.5 Fill piping system with tap or industrial cold water unless otherwise specified by the owner.
  - 5.4.6 If water cannot be used due to the adverse effects on the piping systems or the processes, and pneumatic testing isn’t allowed, contact the engineering department for other recommendations.
- 5.5 Pressure Hold Test
  - 5.5.1 Attach a water supply to the piping system. If the supply water cannot achieve the required test pressure, hook up a diaphragm pump to increase the pressure as needed.
  - 5.5.2 Allow water to flow through system to remove air from the pipes; it’s important to remove as much of the air as possible.
  - 5.5.3 Fill and pressurize the piping to be tested, to approximately 20 psig and hold for at least ten (10) minutes. Perform a visual inspection and repair any leaks if required. Repeat the test. If there is no pressure loss proceed to step 5.5.4.

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Revision No.	SOP No.	Page
2	6.004	<b>3 of 5</b>

5.5.4 Increase the test pressure in the system at least 100 psig or at least fifty (50) psig greater than operating pressure, whichever is the greater.

Example # 1:

If operating pressure is 80 psig,

Calculated test pressure =  $80+50 = 130$  psig.

Therefore, the test pressure shall be 130 psig.

Example # 2:

If operating pressure is 40 psig and calculated test pressure is 90 psig (i.e.  $40+50=90$  psig), the test pressure shall be 100 psig.

5.5.5 Wait until the test pressure is stabilized (i.e. no continuous drop), record test pressure and start time on the pressure test log, form # FN 6.004.1.

5.5.6 Maintain the test pressure for at least thirty (30) minutes.

5.5.6.1 Observe the test pressure reading displayed on the pressure gauge. If the test pressure continuously drops, stop the test and relieve pressure. Perform visual inspection and repair any leaks. Repeat pressure test per steps 5.5.3 through 5.5.6.

Note: The test pressure may fluctuate due to many reasons, such as air dissolves in water, temperature expansion/contraction, chemical reaction, etc.

5.5.7 When the holding time is achieved, record end time and pressure on the pressure test log, form # FN 6.004.1.

5.5.8 Be sure to notify the owner or owner representatives to witness and sign the pressure test log if required.

5.6 Replace all removed instrumentation and reconnect all equipment.

5.7 Remove all "PRESSURE TEST IN PROGRESS" tags.

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Revision No.	SOP No.	Page
2	6.004	<b>4 of 5</b>

6 Review and Approval

- 6.1 Therma's general foremen shall submit the pressure test log, form # FN 6.004.1 to project manager for review.
- 6.2 Therma's project manager shall review the pressure test log, form # FN 6.004.1 and submit to owner for record.

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Revision No.	SOP No.	Page
2	6.004	5 of 5

Document Approval

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6/23/03  
Date

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Engineering Manager

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