



EVALUATION OF INDUCTION WATER CONDITIONING PRODUCTS BY COMPARISON TO A CONTROL TEST SAMPLE

Prepared for:
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Technical Report Number
30005675

Test Protocol
Induction Water Conditioning Device Evaluation

March 6, 2008

Prepared by:

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Approved by:

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Judd Smith, Technical Manager



Program Description

Attach the device under test to the inlet side of the water heater per diagram provided by R.S. Resources. Test the unit by running the water heater for 15 minutes of on time at 120° F. then an off period of 45 minutes with no water flow through the heater. Water will be conditioned to have a content of 500 parts per million of Total Dissolved Solids (TDS) primarily Calcium Carbonate to simulate hard water in a household environment. Test end criteria will be six weeks or if the flow of the water falls below 0.9 gallons per minute of heated water. Test results are to be compared with the control unit run as a different series of testing.

Executive Summary

After six weeks of testing the flow remained at 3.0 gallons per minute. The test was terminated by prior agreement by R.S. Resources and OnSpeX, the testing agency.

The device under test has kept the hard water from depositing enough minerals to impair heater operation during this series of time accelerated testing.

Analysis of the deposits and flow readings indicate that this unit is effective in preventing clogging due to calcium carbonate build up.

Analysis of the effectiveness of control unit testing:

This test was conclusive. The control unit with no anti scale device installed was shut down because of flow below the test parameters of 1.0 gallons per minute after 39 days.

The chemical makeup of the hard water for the control test was a result of using 98% agricultural grade powdered limestone and 2% calcium chloride mixed with deionized water. No mechanical gas or electrical connections were shared in common with any other heater at any time during these tests.

Revisions

None

The conditions observed during testing are contained in this report.



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Samples:			
Manufacturer	Model/SKU	Quantity	Description
RS Resources, Distributer	Hydroflo Induction Water Conditioner	1	Home water system hard water conditioning device

Test conditions

Standard Referenced: Customer provided conditions

200 feet of 3/4" diameter copper pipe attached to the outlet of each individual heater. Each run will have a total of eighteen (18) 90° elbows and one restriction near the end from 3/4" pipe down to 1/2" pipe to simulate a faucet or other plumbing device found in household plumbing.

The Hydro Flow device will be installed on the inlet copper piping, one foot (1") from the heater inlet.

The Instantaneous Water Heater used is a Rheem RTG-74PVN



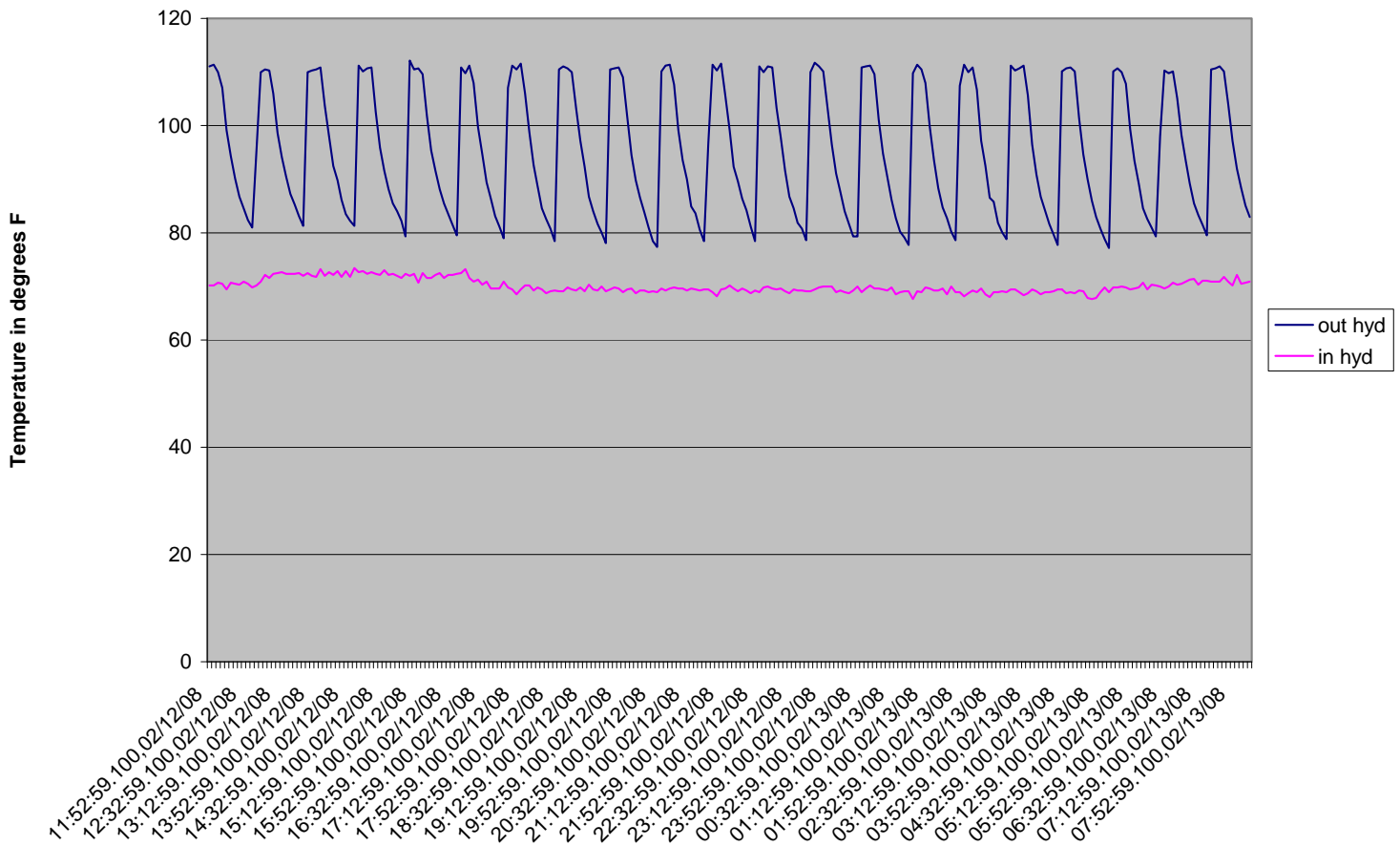
Comments: Set up shown is typical. A diagram of mechanical installation is attached at the end of this report.

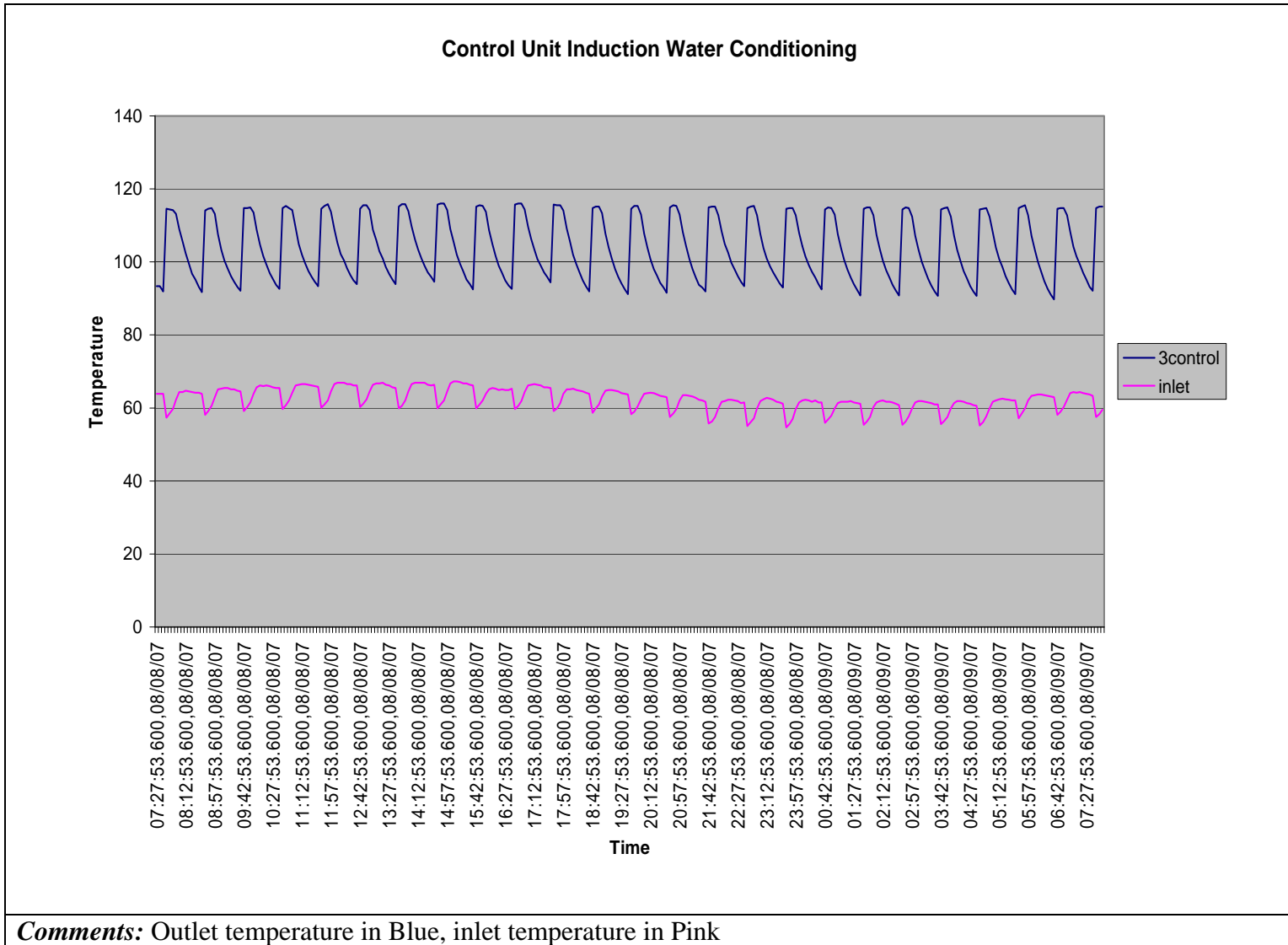
Test Parameters

Standard Referenced: Customer provided parameters

Inlet water maintained at 65° F Outlet to be set at 120°F or heater maximum operating temperature. Water hardness will be maintained at 500 PPM Calcium level, to be read and adjusted twice a day. Flows will be recorded twice a day. Cycle time will be on for fifteen (15) minutes then off with no water flow for forty five (45) minutes.

RS Resources Hydroflow Test Data







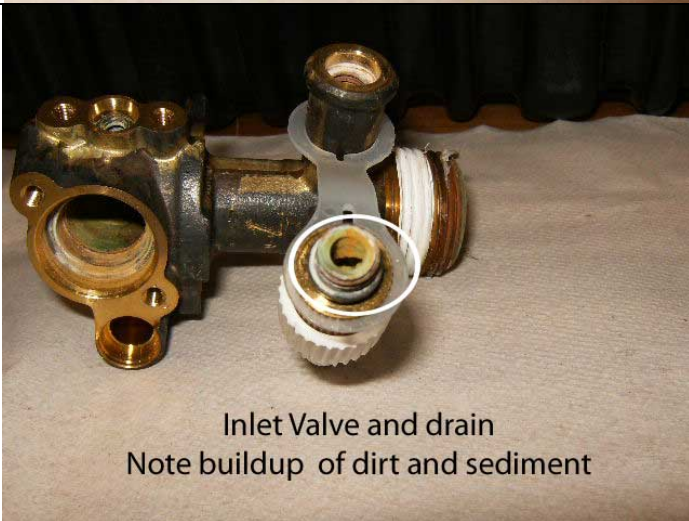
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End of Test Parameters			
Standard Referenced: Customer provided parameters			
When flow decreases below mutually decided parameters (0.9 PPM) or six weeks of testing			
	Average Water Hardness in PPM	Starting Water Flow	Average Water Flow
Hydroflo	487.29 PPM	3.2 GPM	3.0 GPM
Control	The control unit with no anti scale device installed was terminated because of flow below the test.		
Comments: The Hydroflo equipped water heater ran for 6 weeks with no appreciable decrease in flow despite the hard water conditions. The control unit with no anti scale device installed was terminated because of flow below the test			

End of Test Results			
Filter Condition Hydro flow unit	Minimal soft scale build-up with calcium		
Control unit	Blockages with scale buildup		

<p>Outlet Condition Hydroflow equipped unit</p>	<p>Minimal soft scale build-up with calcium</p>	 <p>Drain valve from RS Resources Heater</p>
 <p>Calcium coating on outlet adapter</p>	 <p>Ball valve outlet from 1/2" copper piping</p>	
 <p>The heater tubes show a powdered deposit that naturally occurs when any water system is drained</p>	 <p>RS Resources Heat Exchanger showing typical light corrosion</p>	

Control Unit End of Test Pictures



Control Unit

Comments: Hydro flow equipped unit: End of plumbing restriction condition, minimal soft scale build-up with calcium

Equipment List:

Description	Model Number	Instrument Number	Instrument Range
PH, conductivity meter	34135	9116	0-20,000
Rheem	RTG-74PVN	Instantaneous water heater	140° F. Maximum