



Weld-i[®] 1000 Thermal Proof Test

Weld-i[®] 1000 Thermal Proof Test 10-10-12

This report covers the results of a thermal proof test performed on a Weldi 1000 system. The test simulated harsh thermal conditions found in common weld applications and validates system performance in high temperature environments.

The head and 2.5 m of umbilical were soaked at 600 F (315C) in a convective oven over an 8 hour period utilizing a closed loop fin-fan chiller to provide cooling to the system. The chiller was operated in 107 F (42C) ambient conditions to simulate harsh shop conditions. The Weldi 1000 was on throughout the test. Focus, iris, and the lamp were exercised on a periodic basis to verify performance. All system functions performed correctly throughout the test.



Weld-i[®] 1000 System Photographed Post Test

Coolmate 1 chiller

Weldi 1000 head



Umbilical 3.5 m overall length

Coolant supply and return lines

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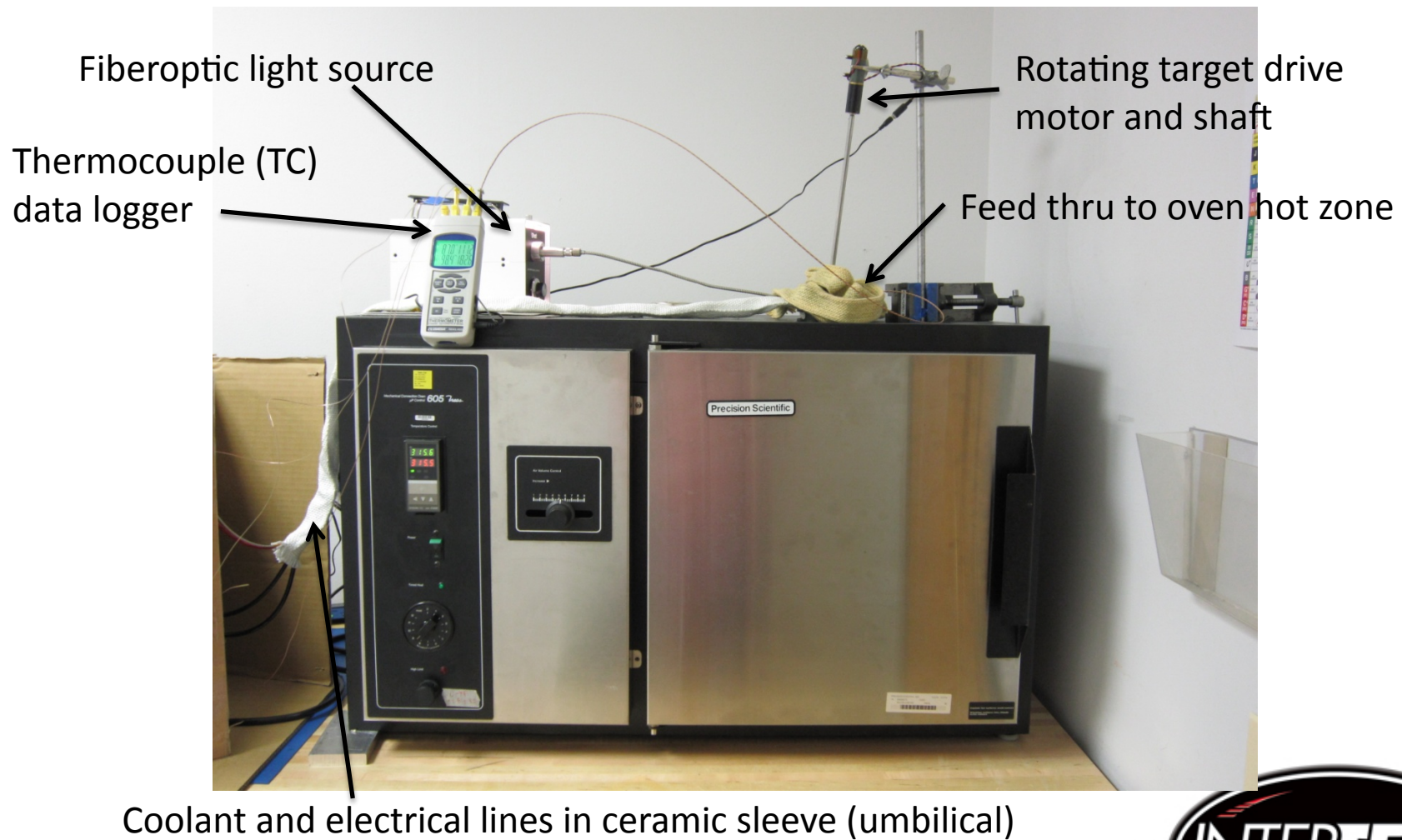
Weld-i[®] 1000 Head Post Test



Weld-i 1000 light cell

Weld-i 1000 head

600F test Weld-i[®] 1000 - setup



600F test Weld-i® 1000 - setup

Visual targets

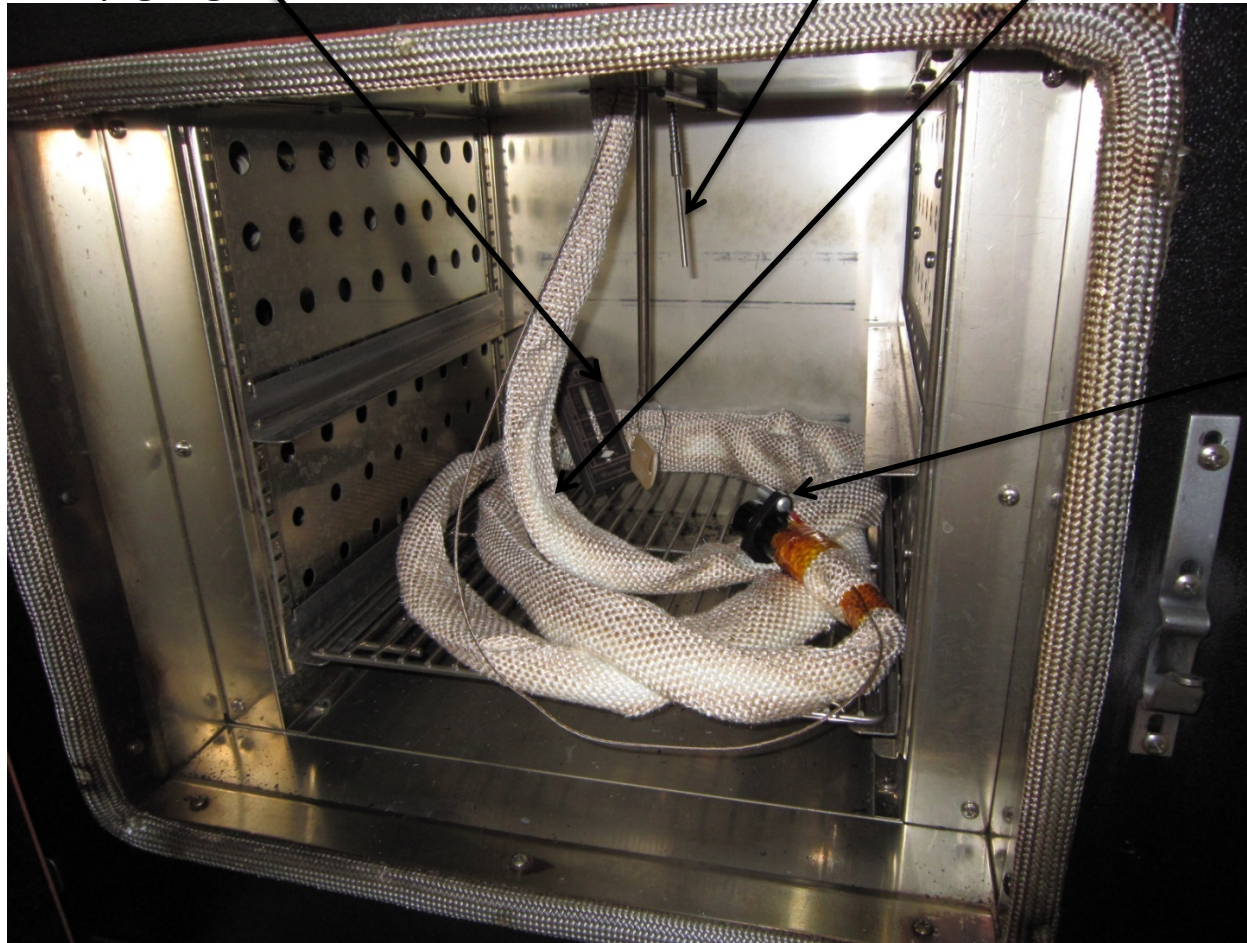
Rotating tag & temp gauge

Fiberoptic light guide

Provide aux illumination

2.5 m umbilical in hot zone

Weld-i 1000
head



600F test Weld-i[®] 1000 – setup

Operated within enclosure to allow high ambient conditions



600F test Weld-i[®] 1000 – setup

Display, control unit & video recorder



View from Weld-i® 1000 head at 600F focused on two targets in test oven
Left is rotating target in foreground
Right is temp gauge in background

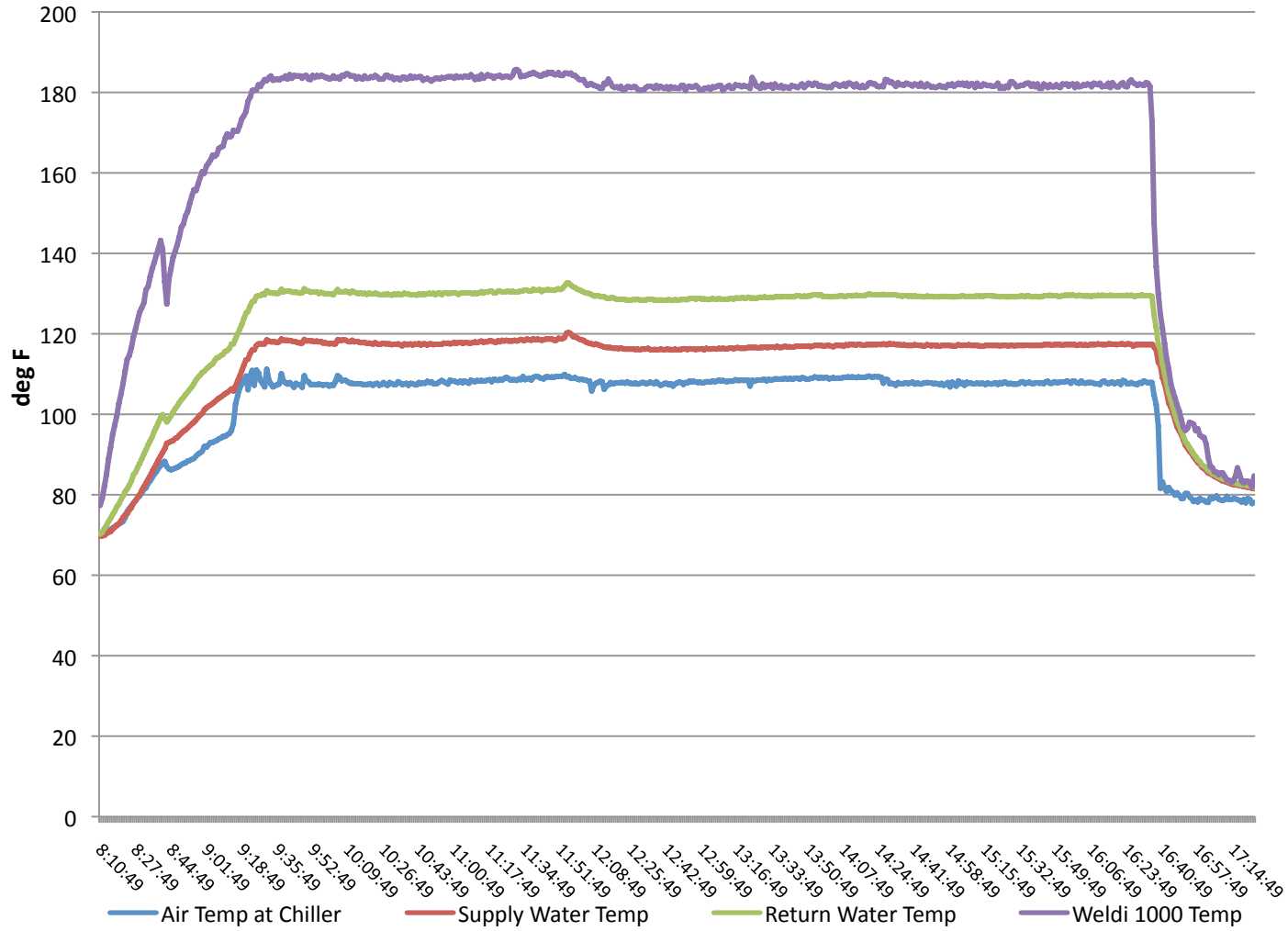


Results

- Weld-i® head + 2.5 m of umbilical operated in convective oven set at 600 F (315C) for 8 hrs
- Miller Coolmate 1 chiller with aluminum protecting antifreeze coolant operated in 107 F ambient conditions
- Direct plumbing of chiller supply and return ports to 3.5 m Weldi 1000 umbilical
- Coolant, Ethylene Glycol, supplied at .17 gpm and 40 psi
- Satisfactory performance of video, focus, iris, and light. Video on continuous throughout test. Focus, iris, and light checked for proper function on approx. 30 minute intervals throughout test.



Weld-i® 1000: 600 deg F Test Data



Post Test Tear Down Findings

- On tear down inspection found localized melting of Teflon jacket on video cable. Teflon (PTFE) melts at 620 F (327 C). Suspect localized hot spot in oven, not considered to be a failure for proof of operation at 600 F
- On tear down inspection found melted plastic spacer at video cable interconnect. This part was replaced with metal component.
- On tear down found localized scar in tygon tubing. This was attributed to overheating during preliminary tests when there was momentary interrupt of coolant supply

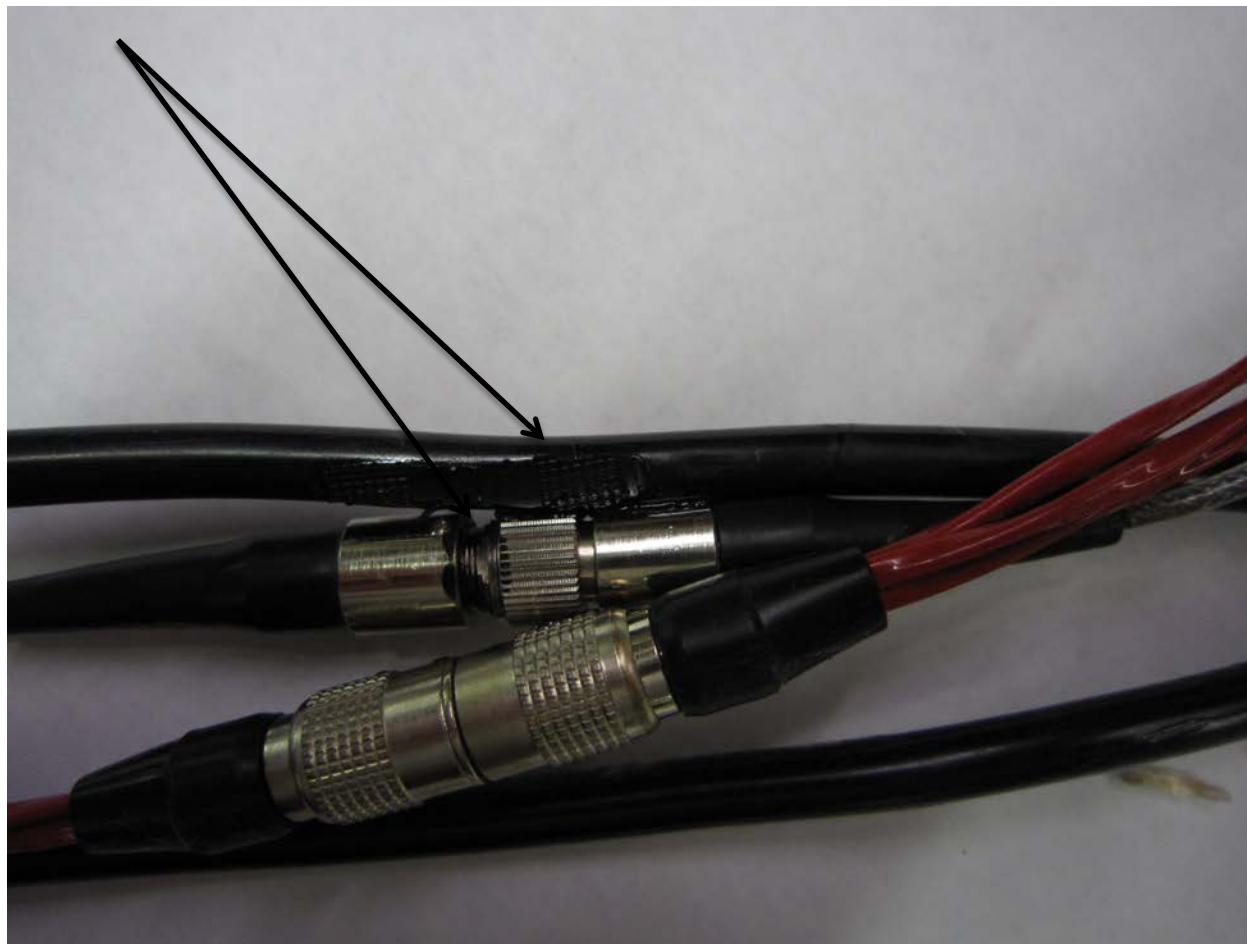
Tear Down Findings

Localized melting of PTFE jacket on camera cable over 3" section



Tear Down Findings

Melting of plastic spacer on video cable interconnect



Conclusion

- The Weld-i® 1000 as configured herein with Coolmate 1 passed thermal proof test at 600 F (315 C)
- Operation with the Coolmate 1 is by direct connection to the inlet and outlet of the unit (no regulator)
- If coolant temperature is monitored the return should not be allowed above 140 F. Remove from service if this condition occurs
- If heat temperature is monitored max allowable is 200 F. Remove from service if this condition occurs



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