



Objective

This procedure to be used to inspect heater assemblies to insure products shipped to customer are free of defects.

This procedure contains two sections:

- 1) Mechanical and physical inspection
- 2) Electrical inspection

1) Mechanical and physical inspection

1-a) Cable Diameter

Diameter of probe to be measured with a micrometer to make sure it's within .005" of diameter specified per print. 100% of parts must be tested.

1-b) Coil Diameter

Using a caliper, diameter of coil to be measured. Diameter of coil must meet the following criteria, unless otherwise specified per print:

Coil Dia.	Tolerance
up to 3/4"	+ .000", -0.02"
over 3/4" to 1 1/4"	+ .000", -0.03"
over 1 1/4" to 2 1/2"	+ .000", -0.06"

100% of parts must be tested.

1-c) Coil Width

Width of coil must meet the following criteria, unless otherwise specified per print:

Coil width	Tolerance
Up to 6"	-1/8", +0"
over 6" to 12"	-1/4", +1/8"
over 12" to 18"	-1/4", +1/4"

100% of parts must be tested.

1-d) Heater length inspection (uncoiled heaters)

Heater length to be measured with a scale. Following tolerances must be met, unless otherwise specified per print.

Heater diameter	Tolerance up to 18"	Tolerance over 18"
up to .065"	-/+1/4"	-/+ 1 1/2%
over .065"	-/+1/4"	-/+ 1%



1-e) Lead wire length inspection

Lead wire length to be measured. Unless otherwise specified per print, following tolerances must be met.

Lead wire length	Tolerance
Up to 120"	-0 , +6"
120" and over	-0 , +5%

1-f) Appearance and workmanship

Part to be inspected visually for appearance and workmanship. Heater sheath must be clean and free of nicks. Welded end of heater must be round (unless otherwise specified per print) and uniform with no weld cracks or discoloration. 100% of parts must be tested.

2) Electrical inspection

2-a) Resistance Test

Using a multimeter check for resistance between the two heater leads. The resistance shall be within 10% of specified nom. resistance per specification sheet. 100% of parts must be tested.

2-b) Insulation Resistance Test (IR):

Using a Megohmmeter, connect the ground test lead of meter to heater sheath and positive test lead to one or both of heater lead wires. Following minimum resistance requirements must be met.

Heater diameter	Voltage (VDC)	Insulation Resistance
.062" or smaller	50	500 M
over .065"	500	1000 M

100% of parts must be tested.

2-c) Dielectric Strength Test (Hypot)

Connect high potential (red) lead wire terminal of device being tested to one of the heater lead wires. Connect ground (black) lead to sheath frame. Increase test voltage from 0 to 1000 VAC in a smooth ascent, approximately 300 volts per second. The leakage shall not be more .500mA.

2-d) Thermal Cycling

Heaters must be energized at a minimum of 75% of heater voltage in open air for a minimum of 2 minutes. 100% of parts to be tested. An external thermocouple to be used to control the sheath temperature at approximately 1000°F.



WORK INSTRUCTION

INSPECTION PROCEDURE

Cable and Coil Heater assemblies

REVISION: 01

PROCEDURE NO.: WI-8.2.4.22

DATE EFFECTIVE: 02/16/16

REVISION HISTORY

REVISION LEVEL	DATE OF REVISION	SECTIONS	DESCRIPTION OF CHANGE
00	05/22/09	All	Initial release
01	02/16/16	2-d	Added minimum designation to heater voltage and test time. Added line "An external..."

AUTHORIZATION

POSITION	HELD BY	AUTHORIZATION SIGNATURE OR INITIALS
Prepared By: Product Engineering Manager	Ron Vafai	
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