



WORK INSTRUCTION

**LOW DENSITY (LD) CARTRIDGE HEATERS TYPICAL
FUNCTIONAL FLOW**

REVISION: 00

PROCEDURE NO.: WI-8.2.4.14

DATE EFFECTIVE: 01/27/09

	Operation Description	Documentation Clarifying Characteristics (As applicable for each operation)	Monitoring & Measurement Activities	Monitoring & Measurement Records/Check Lists
1	Winding	Specification Sheet	<ul style="list-style-type: none"> ▪ 1st Piece Verification on set-up using steel ruler and multimeter/ohm-meter ▪ Ongoing Verification if a new spool/pail of wire is used 	Order Tracker Initial & Date Specification Sheets
2	Punch termination holes on empty tube (if applicable)	Tube Ticket LD Tube Design	<ul style="list-style-type: none"> ▪ Verification based on Visual Review 	Tube Ticket is initialed on the back to indicate the operation is complete
3	Marking	Copy of specification sheet	<ul style="list-style-type: none"> ▪ Verification based on Visual Review 	Spec sheet is initialed on the back to indicate the operation is complete
4	Coil Assembly/Fusion Welding for tubular elements only	Specification Sheet	<ul style="list-style-type: none"> ▪ 1st Piece Verification on Set-up using tape measure and multimeter/ohm-meter 	Order Tracker Initial & Date Specification Sheets
5	Assembly	Specification Sheet	<ul style="list-style-type: none"> ▪ 1st Piece Verification on the Tube Length & Winding Ohms ▪ 1st Piece Verification on Ohms using multimeter/ohmmeter ▪ 100% Ohms & Hypot on channel heaters only ▪ Visual Verification 	Order Tracker Initial & Date Specification Sheets
6	Cementing	Specification Sheet	<ul style="list-style-type: none"> ▪ Verification based on Visual Review 	Order Tracker Initial & Date Specification Sheets
7	MGO Loading	Specification Sheet	<ul style="list-style-type: none"> ▪ Verification based on Visual Review 	Order Tracker Initial & Date Specification Sheets
8	Drying/Baking (if applicable)	Work Instruction	<ul style="list-style-type: none"> ▪ Visual Verification 	No Initial off required
9	Potting (if applicable)	Specification Sheet Work Instruction Sheet	<ul style="list-style-type: none"> ▪ Visual Verification ▪ Scale is used for epoxy mixing (as required) 	Order Tracker Initial & Date Specification Sheets



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10	Termination for some HD heaters only	Specification Sheet	<ul style="list-style-type: none"> 100% Hypot 	Initial & Date Specification Sheets
11	Termination & Final Test (as appropriate) - Hypot - Resistance Ohms - IR Insulation Resistance - Ground	Specification Sheet	<ul style="list-style-type: none"> 100% Ohms Test & 100% Hypot using any following option: <ul style="list-style-type: none"> Hypot Meter Multimeter Milliohm Meter 	Order Tracker Initial & Date Specification Sheets
12	Manufacturing Order & Specification Sheet are matched up	Specification Sheet Manufacturing Order	<ul style="list-style-type: none"> Verify P/N, MO#, 	No Initial off required Final Quality Inspection ensures visual compliance
13	Final Quality Assurance Inspection	Specification Sheet/Drawing Manufacturing Order	<ul style="list-style-type: none"> Dimensional/electrical inspection/ test performed on all drawing/ specification requirements on a random sample basis 	QC Log Evaluation Record of Final Inspections Electrical Test Data if applicable Engineering Verification Form when requested

REVISION HISTORY

REVISION LEVEL	DATE OF REVISION	SECTIONS	DESCRIPTION OF CHANGE
00	01/27/09	All	Initial release

AUTHORIZATION

POSITION	HELD BY	AUTHORIZATION SIGNATURE OR INITIALS
Prepared By: Production Engineering Manager	Ananda Palanichamy	
Senior Management Representative/ Management Representative:	Abe Joseph	