

# Bharat Heavy Electricals Limited Bhopal

CONDENSER & HEAT EXCHANGER ENGINEERING

BHOPAL-462022

## STANDARD QUALITY PLAN FOR U-BEND WIRE WOUND TUBES

**CUSTOMER** :- BHARAT HEAVY ELECTRICALS LTD. BHOPAL

**INSPECTION** :- BY BHEL / BHEL TPI

**DRG NO** :- 2-16505-40003 & 2-16505-40219 as applicable

**DESCRIPTION** :- 90/10 Cu Ni U-Bend Wire Wound Finned Tubes

**QAP NO.** :- CDE-09-2703

**BHEL P.O.NO** :- \_\_\_\_\_ **Dtd-** \_\_\_\_\_

**DATE** :-27.04.2010

SL NO	ACTIVE COMPONENT	INSPECTION DESCRIPTION	QUANTAM OF CHECK	SUPPLIER QC (SQC)	TPI /BHEL	APPLICABLE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	REMARK
1	2	3	4	5	6	7	8	9	10
1.0	Material								
1.1	Base tube	Chemical composition analysis	Sample as per Specification	W	R	AA12130 R 05	AA12130 R 05	T.C.	See note
		Mechanical test including Elongation, Hardness, Flattening, Expansion	Sample as per Specification	W	R	-DO-	-DO-	T.C.	
		Hydraulic test	100%	W	R	-DO-	-DO-	T.C.	
		Eddy current test	100%	W	R	A STM E 243	A STM E 243	T.C.	
		Heat Treatment Bright Annealed	100%	W	R	AA12130 R 05	AA12130 R 05	T.C.	
		Mercurous nitrate / Ammonia Vapor cracking test	Sample as per Spec.	W	R	-DO-	-DO-	T.C.	
		Microscope examination	Sample as per Spec.	W	R	-DO-	-DO-	T.C.	
		Dim check with respect to tolerance and straightness	Sample as per Spec.	W	R	-DO-	-DO-	T.C.	
1.2.a	Fin (COPPER-Wire)	Conductivity	Sample as per Spec. ( per Lot)	W	R	IS- 1897/IS- 191	97%	T.C.	Govt. Approved Lab / BHEL TSD
		Purity	1 sample / batch	W	R	As per spec.	As per spec.	T.C.	-DO-
		Wire Diameter	Random in each lot	W	R	BHEL-Drg	BHEL-Drg	Q.C.R.	
1.2.b	Solder Wire	Chemical composition analysis	Random in each lot	W	R	As per spec.	As per spec.	T.C.	
2.0	<b>IN PROCESS INSPECTION</b>								
2.1	Finned tube	Dimension check ( Complete Winding Formula ) including U-Bend Dimension	Random (20%)	H	W	BHEL-Drg	BHEL-Drg	Q.C.R.	
		Fin adhesion test	Sample at random	H	W	As per approved Std.	As per approved Std.	Q.C.R.	
		Hydraulic test at 20 kg/cm <sup>2</sup> for 10 sec.	100% by SQC, 20% by BHEL	H	W	BHEL.Drg /Spec	BHEL.Drg /Spec	Q.C.R.	
		Final inspection & packing	100%	-	-	BHEL Drg / PO&QAP	BHEL Drg / PO&QAP	Q.C.R.	

**NOTE:-** Inside surface of the tube to be cleaned to remove dirt, carbon deposit. Tube end edge to be smooth without burrs, to be protected by end caps before dispatch (BHEL QC to ensure). Base tube will be procured from B.H.E.L approved sources only..

**Abbr.**

H-Hold Point, W-Witness, R-Review of documents, RI-Random inspection, T.C. - Test certificates, DP-Document preparation & submission, Dim-Dimensional examination, QCR-Quality control records.

**Approval does not relieve supplier from meeting our requirements as per the drawing / spec.**

*S.K. Biswas*

**(S.K. Biswas), BHEL Bhopal**

**APPROVED BY**

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