

**BHARAT HEAVY ELECTRICALS LIMITED, JHANSI**

4 Page

B.H.E.L. QX/007/0006		STANDARD SUB-VENDOR QUALITY PLAN FOR Electro Plating of Silver On Aluminium and it's Alloys		MATERIAL INSPECTION / IN PROCESS INSPECTION / FINAL INSPECTION		SUB-VENDOR'S / VENDOR'S / CONTRACTOR'S WORKS		QP.No. QP/BD/164, Ro2 Rev.02 Date 16.07.2003 Page 1 of 4		
SLING	COMPONENT AND OPERATION	CHARACTERISTICS	CLASS	TYPE O CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTAN CE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
	2	3	4	5	6	7	8	9	10	11
A	Composition And maintenance of Bath Solution	a) Alkaline degreasing solution b) Chromic sulphuric acid pickling solution c) De oxidizing solution d) Zincate solution e) Copper plating solution f) Potasium Cyanide dip solution g) Silver strike solution h) Silver plating solution i) Brighter addition j) Anti tarnishing solution	B B B B B B B B B B	I I I I I I I I I I	Sample to be taken from bath  Sample  Sample Sample Sample Sample Sample Sample Sample Sample	SG: 15600 Cl. 6.1 Cl. 6.2  Cl. 6.4  Cl. 6.5 Cl. 6.6 Cl. 6.7 Cl. 6.8 Cl. 6.9 Cl. 7.9 Cl. 6.10	SG: 15600 Cl. 6.1 Cl. 6.2  Cl. 6.4  Cl. 6.5 Cl. 6.6 Cl. 6.7 Cl. 6.8 Cl. 6.9 Cl. 7.9 Cl. 6.10	Sub vendor Check list / Formats / Records	Sub vendor	Review of records by BHEL (periodic surveillance by BHEL inspector).

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1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.
B. Cleaning / preparation of Aluminium items	a) wire brushing	B	V	100%	SG: 15600	SG: 15600	Sub vendor Check list / Formats / Records	Sub vendor	Review of Records
	b) solvent degreasing	B	V	100%	Cl. 8.1	Cl. 8.1			
	c) alkaline degreasing	B	V	100%	Cl. 8.2	Cl. 8.2			
	d) Rinsing	B	V	100%	Cl. 8.3	Cl. 8.3			
	e) Acid cleaning / pickling	B	V	100%	Cl. 8.4	Cl. 8.4			
	(i) Chromic sulphuric acid pickling	B	V	100%	Cl. 8.4.1	Cl. 8.4.1			
	(ii) Rinsing	B	V	100%	Cl. 8.4.2	Cl. 8.4.2			
	(iii) Nitric Hydrofluoric acid pickling	B	V	100%	Cl. 8.4.3	Cl. 8.4.3			
	(iv) Rinsing	B	V	100%	Cl. 8.4.4	Cl. 8.4.4			
	f) Deoxidation	B	V	100%	Cl. 8.4.5	Cl. 8.4.5			
C. Preparation for Silver plating	g) Rinsing	B	V	100%	Cl. 8.5	Cl. 8.5	Sub vendor Check list / Formats / Records	Sub vendor	Review of records by BHEL periodic surveillance by BHEL Inspector
	a) First zincate treatment	B	I	100%	SG: 15600 Cl. 8.6	SG: 15600 Cl. 8.6			
	b) Rinsing	B	I	100%	Cl. 8.6.1	Cl. 8.6.1			
	c) Deoxidation	B	I	100%	Cl. 8.6.2	Cl. 8.6.2			
	d) Rinsing	B	I	100%	Cl. 8.6.3	Cl. 8.6.3			
	e) Second zincate treatment	B	I	100%	Cl. 8.6.4	Cl. 8.6.4			
	f) Rinsing	B	I	100%	Cl. 8.6.5	Cl. 8.6.5			

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2	3	4	5	6	7	8	9	10	11
Silver plating Process	a) Copper plating	B	I	100%	Cl. 8.7.1	Cl. 8.7.1	Sub vendor Check list / Formats / Records	Sub vendor	Review of records by BHEL (periodic surveillance by BHEL Inspector
	b) Rinsing	B	I	100%	Cl. 8.7.2	Cl. 8.7.2			
	c) Cyanide dip	B	I	100%	Cl. 8.7.3	Cl. 8.7.3			
	d) Silver striking	B	I	100%	Cl. 8.8	Cl. 8.8			
	e) Silver plating	B	I	100%	Cl. 8.10 & 8.11	Cl. 8.10 & 8.11			
	f) Dragout & rinsing	B	I	100%	Cl. 8.12	Cl. 8.12	Sub vendor Test report	Sub vendor	CHP by BHEL At sub vendor Works.
	g) Hot rinsing	B	I	100%	Cl. 8.13	Cl. 8.13			
	h) Anti tarnishing	B	I	100%	Cl. 8.14	Cl. 8.14			
	i) Rinsing	B	I	100%					
Inspection of Electroplated Surface	a) Surface finish	B	V	Sample	IS:1771 / 3203	Drg.	Sub vendor Test report	Sub vendor	CHP by BHEL At sub vendor Works.
	b) Thickness of Plating	B	T	Sample					
	c) Adhesion	B	T	Sample					
	(I) Burnishing test or	B	T	Sample					
	(II) Bend test or	B	T	Sample					
	d) Anti tarnish Treatment	B	T	100%					

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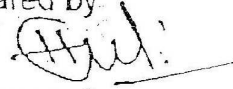
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**GHARATILAW ELECTRICALS LIMITED**

B.H.E.L. COX/007/0006		STANDARD SUB-VENDOR QUALITY PLAN FOR Electro Plating of Silver On Aluminium and it's Alloys		MATERIAL INSPECTION / IN PROCESS INSPECTION / FINAL INSPECTION			SUB-VENDOR'S / VENDOR'S / CONTRACTOR'S WORKS		QP.No. QP/BD/164 Rev.02 Date 16.07.2003 Page 4 of 4	
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F.	Protection coating for silver plating	a) Application of protective coating a) Drying b) Packing c) Removal of packing & protective coating	B B B B	I I I I	100% 100% 100% 100%	BD:15012 P Cl. 1.0 Cl. 2.0 Cl. 3.0 Cl. 4.0	BD:15012 P Cl. 1.0 Cl. 2.0 Cl. 3.0 Cl. 4.0	Sub vendor Check list / Formats	Sub vendor  At Site	Review of Records

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LEGENT :- A :- Critical, I :- Inspection, B :- Major, TC :- Test Certificate, T :- Testing  
OS :- Observation sheet, C :- Minor, V :- Visual, Drg. :- Drawing.

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