

**ANALYSIS CERTIFICATE FOR TIN COATED COPPER STRIPS/BUS BARS**

F:TC:424:04A:00

CUSTOMER NAME : M/s RAM RATNA INTERNATIONAL		Report no.	1978	Date.	28.11.2012
Ram Ratna House, Victoria mill Compound, P. B. Marg		P. O. No.	7897-348	Date.	17.11.2012
Worli, Mumbai - 400013, INDIA		Invoice No.	4064 & 4065	Date.	28.11.2012
SPECIFICATION: EN 13601 & IS 1359:1992		Temper.	FULL - HARD	Batch No.-11TNL-667,11TNL-648,11TNL-662,11TNL-647,11TNL-653,11TNL-650,11TNL-651,11TNL-660,11TNL-669,11TNL-675,11TNL-673	

Visual Inspection : Free from Surface Imperfection.

SN	Nom. size (mm)		Tolerance (mm)		Obs. Value (mm)		Radius on Corner(mm)	Resistivity at 20°C Ohm. mm <sup>2</sup> /mtr	Conductivity	Tensile strength (N/mm <sup>2</sup> )	Elongatio n (%)	Hardnes s (HV)	Tin Coating Thickness (Micron)	ADHESION TEST		Bend test	Copper (%)	Remark
	Width	thick.	Width	thick.	Width	thick.								Burnishing Test	Quenching Test			
SPECIFIED VALUE																		
			±	±	~	~		Max: 0.01759	Min: 98.3	Min: 300	Min: 8	Min: 90	Nom: 7	No cut mark or any scratch	At 185, +/-5° for 15 Sec. no blister and tin coating not remove	No crack	Min. 99.98	
1	40.00	5.00	0.30	0.30	OK	OK	1.00	0.0173625	99.30	301.64	20.60	90.2	7.3	OK	OK	OK	99.99	OK
2	40.00	10.00	0.30	0.30	OK	OK	1.00	0.0173800	99.20	301.40	21.20	90.6	7.1	OK	OK	OK	99.99	OK
3	50.00	5.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	301.70	21.63	91.6	7.2	OK	OK	OK	99.99	OK
4	50.00	10.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	302.26	22.15	90.8	7.0	OK	OK	OK	99.99	OK
5	60.00	5.00	0.30	0.30	OK	OK	1.00	0.0173800	99.20	301.88	21.55	91.2	7.0	OK	OK	OK	99.99	OK
6	60.00	10.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	302.10	20.96	92.0	7.1	OK	OK	OK	99.99	OK
7	80.00	5.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	302.20	21.73	90.8	7.3	OK	OK	OK	99.99	OK
8	80.00	10.00	0.30	0.30	OK	OK	1.00	0.0173800	99.20	301.60	21.90	91.2	7.2	OK	OK	OK	99.99	OK
9	100.00	5.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	301.90	21.60	92.0	7.4	OK	OK	OK	99.99	OK
10	120.00	10.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	301.55	21.35	94.1	7.3	OK	OK	OK	99.99	OK
11	150.00	10.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	301.78	21.80	93.2	7.1	OK	OK	OK	99.99	OK

Remark : 1. Made from Continuous Upcast (OF) Copper Rod

- Purity of Copper is as per Cathode chemical analysis test certificate
- The Resistivity value is calculated from conductivity result & viceversa
- The specified values are the values as per reference standard or customer requirement.
- The test results relate only to the samples tested.
- Conductivity, Hardness & Radius on Corner done on lot sample basis and these coils / bars belong to the same lot.

*P. Patel*  
(Prepared By)



*P. Patel*

( Authorized Signatory )

**ANALYSIS CERTIFICATE FOR TIN COATED COPPER STRIPS/BUS BARS**

CUSTOMER NAME : M/s RAM RATNA INTERNATIONAL		Report no.	1977	F:TC:424:04A:00	
Ram Ratna House, Victoria mill Compound, P. B. Marg		P. O. No.	7897-348	Date.	28.11.2012
Worli, Mumbai - 400013, INDIA		Invoice No.	4064 & 4065	Date.	17.11.2012
SPECIFICATION: EN 13601 & IS 1359:1992		Temper.	FULL - HARD	Date.	28.11.2012
Visual Inspection : Free from Surface Imperfection.		Batch No-11TNL-671,11TNL-666,11TNL-668A,11TNL-665,11TNL-658,11TNL-659,11TNL-663,11TNL-657,11TNL-656,11TNL-667A.			

SN	Nom. size (mm)		Tolerance (mm)		Obs. Value (mm)		Radius on Corner(mm)	Resistivity at 20°C Ohm. mm <sup>2</sup> /mtr	Conductivity	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Hardness (HV)	Tin Coating Thickness (Micron)	ADHESION TEST		Bend test	Copper (%)	Remark
	Width	thick.	Width	thick.	Width	thick.								Burnishing Test	Quenching Test			
1	10.00	3.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	301.68	21.36	90.2	7.3	OK	OK	OK	99.99	OK
2	10.00	5.00	0.30	0.30	OK	OK	1.00	0.0173451	99.40	301.60	21.23	92.4	7.1	OK	OK	OK	99.99	OK
3	12.00	5.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	301.80	21.26	90.3	7.2	OK	OK	OK	99.99	OK
4	15.00	5.00	0.30	0.30	OK	OK	1.00	0.0173625	99.30	301.38	21.26	92.0	7.2	OK	OK	OK	99.99	OK
5	20.00	5.00	0.30	0.30	OK	OK	1.00	0.0173800	99.20	301.75	20.23	90.4	7.3	OK	OK	OK	99.99	OK
6	20.00	10.00	0.30	0.30	OK	OK	1.00	0.0174152	99.00	301.62	21.26	90.2	7.2	OK	OK	OK	99.99	OK
7	25.00	5.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	301.60	20.23	90.4	7.2	OK	OK	OK	99.99	OK
8	25.00	8.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	301.80	21.36	90.2	7.3	OK	OK	OK	99.99	OK
9	25.00	10.00	0.30	0.30	OK	OK	1.00	0.0174152	99.00	301.65	20.38	90.6	7.1	OK	OK	OK	99.99	OK
10	30.00	5.00	0.30	0.30	OK	OK	1.00	0.0173976	99.10	302.10	20.80	92.0	7.2	OK	OK	OK	99.99	OK
11	30.00	10.00	0.30	0.30	OK	OK	1.00	0.0174152	99.00	301.72	20.40	90.2	7.1	OK	OK	OK	99.99	OK

Remark : 1. Made from Continuous Upcast (OF) Copper Rod

2. Purity of Copper is as per Cathode chemical analysis test certificate

3. The Resistivity value is calculated from conductivity result & viceversa

4. The specified values are the values as per reference standard or customer requirement.

5. The test results relate only to the samples tested.

6. Conductivity, Hardness & Radius on Corner done on lot sample basis and these coils / bars belong to the same lot.

*(Signature)*  
(Prepared By)

*(Signature)*  
(Authorized Signatory)