



	AMENDMENT -NOTIFICATION		AA 067 36 11	REV. No. 03					
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<p><b>AA 067 36 11 : PROCESS FOR ELECTROPLATING BRIGHT TIN FORM ACID BATH ON FERROUS AND NON-FERROUS METAL PARTS</b></p> <p><b>PAGE 1 OF 6; CI 4.0 MATERIAL:</b> Activated carbon powder - pure mentioned at third line is modified as follows:</p> <table border="0"> <tr> <td style="text-align: center;"><b><u>MATERIAL</u></b></td> <td style="text-align: center;"><b><u>AVAILABLE FROM</u></b></td> </tr> <tr> <td>Activated carbon pure (for Electroplating)</td> <td>           1) M/s Grauer &amp; Weil (I) Ltd., Mumbai            2) M/s Artek surfen chemicals (P) Ltd., Mumbai         </td> </tr> </table>						<b><u>MATERIAL</u></b>	<b><u>AVAILABLE FROM</u></b>	Activated carbon pure (for Electroplating)	1) M/s Grauer & Weil (I) Ltd., Mumbai 2) M/s Artek surfen chemicals (P) Ltd., Mumbai
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Please see Instructions on the reverse.									
Ref : Cl. NO. 28.16.14 of 28 <sup>th</sup> MOM of MRC(C)	Amd No. 01	Approved MRC (C)	Issued CORP. R&D	Date 15.10.2000	Cum.Sr.No. A 2869f				

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<p><b>AA 067 36 11: PROCESS FOR ELECTROPLATING BRIGHT TIN FROM ACID BATH ON FERROUS &amp; NON-FERROUS METAL PARTS</b></p> <p><b>Amendment 01 (Cum.Sl.No. 2869) :</b></p> <p>The word 'FORM' mentioned in the title is corrected as 'FROM' .</p>					
Please see Instructions on the reverse.					
Ref : Cl. 30.15.09 of MOM of MRC-C	Amd No. 02	Approved MRC-C	Issued CORP. R&D	Date 15.12.2001	Cum.Sr.No. A 3051

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<p align="center">Please see Instructions on the reverse.</p>					
<b>Ref :</b> CI; 31.11.14 of MOM of MRC-C	<b>Amd No.</b> 03	<b>Approved</b> MRC- C	<b>Issued</b> CORP. R&D	<b>Date</b> 15.10.2002	<b>Cum.Sr.No.</b> A 3165

<div></div> <div>CORPORATE STANDARD</div>		AA 067 36 11																									
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PROCESS FOR ELECTROPLATING BRIGHT TIN FROM ACID BATH ON FERROUS AND NON-FERROUS METAL PARTS																											
1.0		GENERAL:																									
This standard details the process for bright tin plating by vat or barrel from an acid tin solution on steel, copper & copper alloys to protect them against corrosion, to provide good surface for soldering and also to provide minimum contact resistance of joints and for masking during nitriding.																											
2.0		APPLICATION:																									
Used for bus-bar and spout connections, cables, sockets, connection cams, brush holder, cable glands, clamp plates, support plating clamps, brackets, hardware, etc.																											
3.0		COMPLIANCE WITH NATIONAL STANDARDS:																									
There is no National Standard covering this Standard. However, assistance has been derived from the following National Standard in respect of surface condition and quality of deposit.																											
IS:1359 : Electroplated Coatings Of Tin in Respect of Surface Condition & Quality of Deposit.																											
4.0		MATERIALS:																									
<table><tr><td>Material</td><td></td><td>IS No. / Available From</td></tr><tr><td>Sulphuric Acid (C.P. Grade)</td><td>:</td><td>IS : 266</td></tr><tr><td>Tin Anodes</td><td>:</td><td>IS : 2384</td></tr><tr><td>Activated Carbon Powder-Pure</td><td>:</td><td>IS : 8366</td></tr><tr><td>Stannous Sulphate</td><td>:</td><td>M/s Grauer &amp; Weil (I) Ltd and</td></tr><tr><td>(Electroplating Grade)</td><td></td><td>M/s Artek Surfin Chemicals (P) Ltd. Bombay</td></tr><tr><td>Tinbrite Make-up Brightner</td><td>:</td><td>M/s Grauer &amp; Weil (I),Limited, Bombay.</td></tr><tr><td>Teknolume Carrier Additive</td><td>:</td><td>M/s Artek Surfin Chemicals (P) Ltd. Bombay.</td></tr></table>				Material		IS No. / Available From	Sulphuric Acid (C.P. Grade)	:	IS : 266	Tin Anodes	:	IS : 2384	Activated Carbon Powder-Pure	:	IS : 8366	Stannous Sulphate	:	M/s Grauer & Weil (I) Ltd and	(Electroplating Grade)		M/s Artek Surfin Chemicals (P) Ltd. Bombay	Tinbrite Make-up Brightner	:	M/s Grauer & Weil (I),Limited, Bombay.	Teknolume Carrier Additive	:	M/s Artek Surfin Chemicals (P) Ltd. Bombay.
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Revisions : Lt No. TSD/SM/800, Dt. 23-6-99, BHEL, BHOPAL		APPROVED : INTERPLANT MATERIAL RATIONALISATION COMMITTEE-MRC (C)																									
Rev. No.03	Amd.No.	Reaffirmed	Prepared EDN BANGALOR	Issued Corp. R&D	Dt. Of 1 st Issue																						
Dt. :15-08-99	Dt :	Year :			Sep. '87																						

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Tinbrite Maintenance Brightner

: M/s Grauer & Weil (I) Ltd, Bombay.

Sediwell-Sn Purifier

: M/s Grauer & Weil (I), Ltd, Bombay.

Teknolume Brightner

: M/s Artek Surfin Chemicals (P) Ltd  
Bombay.

5.0

EQUIPMENT:

5.1

Plating Tank:

The tank shall be made of mild steel lined with rubber/PVC/FRP fitted with insulators for holding the anode and cathode rods and a cathode rod movement system.

5.2

Plating Barrel:

The plating barrel shall be made of hard rubber/polypropylene/ perspex and shall be so driven as to rotate at 10 to 15 r.p.m.

5.3

Cold Water Rinsing Tank:

Mild Steel tank lined with PVC/FRP/Rubber.

5.4

Hot Water Rinsing Tank:

Mild steel tank lined with PVC/FRP.

5.5

Filter Pump:

Standard filtration unit suitable for filtering acid solution.


6.0

COMPOSITION OF ELECTROLYTE AND OPERATING INSTRUCTIONS :

6.1

Composition Of Electrolyte And Operating Conditions:

Parameter	For Vat	For Barrel
Stannous Sulphate, g/l (Grauer & Weil)	40 - 60	25 - 35
Stannous Sulphate, g/l (Artek Surfin)	24 - 35	24 - 35
Sulphuric Acid, ml/l	80 - 100	95 - 110
Tinbrite make-up brightner, ml/l	30 - 40	30 - 40

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Teknolume Carrier Additive m/l	20-40	20-40
Tinbrite maintenance brightner, ml/l	3 - 4	4 - 6
Teknolume Brightner, ml/l	2 - 6	2 - 6
Operating Temperature, °C	20 - 35	20 - 35
Current Density, A/dm²	1 - 2.5	1 - 1.5
Voltage, V	1 - 3	4 - 6
Agitation (Optional)	Cathode Rod movement	-
Filtration	Occasional	Occasional
Anode to Cathode ratio	2:1	-

6.2 Preparation Of Electrolyte:

The vat/barrel shall be filled with cold water (preferably with demineralised water) to about two-thirds of its working level.

The required quantity of sulphuric acid shall be added very slowly to the bath with stirring.

The requisite amount of stannous sulphate shall then be added to this solution with stirring.

After complete dissolution, the electrolyte shall be brought upto the working level by adding water (preferably demineralised water) and subsequently stirred thoroughly.

The required quantity of make-up brightner and maintenance brightner shall then be added with thorough stirring.


6.3 Maintenance Of The Electrolyte:

The electrolyte shall be analysed after initial make-up and subsequently at suitable intervals to maintain the working concentration.

6.3.1 Working Concentration:

The concentration of the electrolyte shall be maintained at the following limits.

	For Vat	For Barrel
Metal content as Sn, g/l :	15 to 25	12 to 18
Sulphuric acid as H <sub>2</sub> SO <sub>4</sub> , ml/l	70 to 100	80 to 120

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**6.3.2 Replenishment:**

If the working concentration do not lie in the limits as mentioned in Cl.6.3.1, addition of stannous sulphate and sulphuric acid shall be made to raise the concentration of metal and acid respectively as per the deficiency of the bath.

In normal cases the addition of brightners shall be as follows for both vat & barrel.

Teknolume Carrier Additive	100 to 150
or	
Tinbright Make-up Brightner,	100 to 200
or	
Tinbright Maintenance Brightner,	200 to 400
or	
Teknolume Brightner	200 to 300

**6.3.3 Purification:**

**6.3.3.1 Removal Of Metallic Impurities:**


When objectionable amounts of metallic impurities are to be removed, electrolytic purification by using corrugated dummy cathode shall be employed at a low current density (0.3 Amp/dm²).

**6.3.3.2 Removal Of Organic Impurities:**

When the electrolyte is not severely contaminated with the organic impurities, the solution shall be filtered by introducing a small amount of activated carbon powder packed within the filter. For severely contaminated organic impurities, the electrolyte shall be treated with activated carbon powder at the rate of 2-3 g/l and Sediwell-Sn purifier at the rate of 1-2 ml/l. After vigorous agitation, the mixture shall be allowed to settle for a few hours, preferably overnight, in a separate tank. Finally, the electrolyte shall be filtered into the plating tank. Sediwell-Sn purifier treatment will also remove the stannic oxide produced during the process and also in idle hours of the electrolyte.

**6.3.3.3** During carbon treatment brightners are partially removed. Therefore, brightners shall be added after carbon treatment as under.

Teknolume Carrier Additive ml/l	
or	
Tinbright Make-up Brightner, ml/l	10 - 15
or	
Tinbright Maintenance Brightner, ml/l	
or	
Teknolume Brightner ml/l	1 - 2

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7.0

PROCESS:

7.1

Cleaning:

All articles shall be properly cleaned as described in the Corporate Standard AA 067 36 01: Process For Cleaning And Preparation Of Metal Surfaces Prior To Electroplating.

7.2

Rinsing:

All articles shall be rinsed thoroughly after cleaning in deionised water to avoid contamination of the plating solution.

7.3

Acid Dipping:

Before dipping in the plating bath all articles shall be dipped in 4 to 5% sulphuric acid (C.P.Grade) solution followed by a dip in deionised water.

7.4

Plating:

All articles shall be plated at specified current density for a duration which will depend on the thickness of the deposit required.

Note:

Articles made of steel, brass or other copper alloys shall not be directly plated with acid tin. An under coat of (3-5 microns) copper shall be given prior to tin plating on these alloys.

7.5

Cold Rinsing:

After removal from the plating bath, all articles shall be rinsed thoroughly in cold running water till all traces of plating solution are removed.

7.6

Hot Rinsing:

After cold rinsing, all articles shall be rinsed in hot water at 60-70°C.

7.7

After Drying:

Finally, all articles shall be dried in centrifugal drier or by hot air.

8.0


PRECAUTIONS:

8.1

The electrolyte shall be kept covered when not in use to keep the bath free from dust and foreign matter.

8.2

The anode shall be kept immersed in the electrolyte during idle hours to minimise oxidation of tin to stannic oxide, which is objectionable.

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8.3	Any article that becomes lodged in any part of barrel/vat shall be removed immediately.
8.4	Ensure that the bath is ‘alive’ before loading the job into the plating vat.
8.5	Any metal that may be deposited on any part of the vat/barrel shall be removed.
9.0	<b>INSPECTION AND QUALITY OF DEPOSIT:</b>  When tested in accordance with the test methods shown against each, the deposit shall conform to the norms specified below:
9.1	<b>Sampling:</b>  A minimum of 1% of each batch of vat/barrel load or part thereof shall be taken at random for testing.
9.2	<b>Condition Of Surface:</b>  The coating shall be uniformly bright, free from black patches, stains, pin holes, sponginess, blisters, uncovered areas and other superficial blemishes visible to the unaided eye.
9.3	<b>Thickness Of Deposit (IS:3203):</b>  The minimum Thickness shall be as specified on the purchase order or drawing.
9.4	<b>Adhesion (IS:1359):</b>  Flaking and blistering of the coating is not acceptable.
9.5	<b>Solderability (IS:1359):</b>  The actual soldering on the component may be done on shop floor and observations be made. If uniform coating free from breaks and discontinues when seen with unaided eye, sample be considered solderable.
10.0	<b>REJECTION:</b>  If the samples taken do not comply with clauses 9.2 to 9.5, a further quantity not less than twice the number originally taken shall be subjected to these tests. If any one of these samples also fails, the whole batch shall be rejected.
11.0	<b>REFERRED STANDARDS (Latest Publications Including Amendments) :</b>  1) IS : 266                      2) IS : 1359                      3) IS : 2384                      4) IS : 3203  5) IS : 8306                      6) AA 067 36 01