



CORPORATE STANDARD

AA 067 36 01

Rev. No. 08

PAGE 1 OF 9

PROCESS FOR CLEANING AND PREPARATION OF METAL SURFACES PRIOR TO ELECTROPLATING

1.0 GENERAL :

This standard details the processes for the preparation of metal parts prior to electroplating, with particular reference to ferrous, copper and copper alloy parts.

Note :

Parts fabricated by riveting, spot welding, etc. where difficulty will be experienced in removing the entrapped electrolytes, should not be electroplated.

2.0 COMPLIANCE WITH NATIONAL STANDARDS :

There is no National Standard covering this process.

3.0 MATERIALS :

<u>Material</u>	<u>CPS No./IS No./Available From</u>
3.1 Sulphuric Acid (Technical)	: AA 541 01
3.2 Nitric Acid	: AA 541 02
3.3 Hydrochloric Acid (Technical)	: AA 541 03
3.4 Chromic Acid-Electroplating Grade :	AA 541 04
3.5 Caustic Soda (Technical)	: AA 542 01
3.6 Potassium Cyanide For Electroplating	: AA 556 09
3.7 Sodium Cyanide for Electroplating	: AA 556 10
3.8 Trichloroethylene (Technical)	: AA 567 06
3.9 Cleaner S-20	} M/S. Platewel Processes Chemicals Ltd., Vadodara
3.10 Cleaner SE-11	
3.11 Cleaner ADA-1D	: M/s. ACCI, Rishra Kolkata
3.12 Metaclean ZX	: M/s CMP Pvt.Ltd, Mumbai
Steelex K-20	:
3.13 Inhibitor - 11	} M/s.Grauer & Weil (I) Limited, Mumbai
3.14 Pickle Aid Accelerator	
3.14.1 Acitex Accelerator	: Artek sufir chemicals (P) Ltd. Mumbai

Revisions :

CI 34.11.4 of MOM of MRC (CPO)

APPROVED :

INTERPLANT MATERIAL RATIONALISATION
COMMITTEE-MRC (CPO)

Rev. No. 08

Amd.No.

Reaffirmed

Prepared
HEEP
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Corp. R&DDt. of 1st Issue
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Dt :

Year :

CORPORATE STANDARD



3.15 Pickle Aid Additive	:	
3.16 Rodine - 50	:	
3.17 Rodine - 119	:	M/s. Agromore Limited Bangalore
3.18 Pickelwel-S	:	
3.19 Remogal HDS	:	
3.20 Pickelwel - H	:	M/s Mascot Chemical Works, Bangalore.
3.21 Uniclean HD	:	M/s. Srinivasa Industrial Chemicals, Bangalore
3.22 Sureclean EC-504	:	
3.23 Ginbond 808	:	
3.24 Surfolin EC-54	:	M/s. Artek Surfin
3.25 Surfolin EL-80	:	Chemicals (P) Ltd., Mumbai
3.26 Stainless Steel Anode	:	IS : 6911, Grade 07 Cr 18; Ni 19
3.27 Common salt	:	IS : 253 (Nacl 96% minimum)

4.0 EQUIPMENT :**4.1 Vapour degreasing plant :**

Any standard plant for the purpose

4.2 Alkaline degreasing vat :

Mild steel tank provided with suitable steam coils or electrical heating for heating the vat solution with thermostatic control.

4.3 Electrolytic (Anodic) Degreasing Tank :

Mild steel tank provided with suitable steam coils or electrical heating for heating the vat solution with thermostatic control and provided with anode and cathode bus bar.

4.4 Acid pickling vats :

Rubber / PVC / FRP / Lead lined M.S. Tank or PVC tank.

4.5 Bright dip pickling vat :

Stainless steel tank.

4.6 Rinsing Vats :

Rubber / PVC / FRP lined M.S. Tank.

4.7 Cyanide dip vat :

M.S.tank / Rubber lined / plastic lined / Enamel lined / Stone ware.



CORPORATE STANDARD

AA 067 36 01

Rev. No. 08

PAGE 3 OF 9

5.0 COMPOSITION OF SOLUTIONS AND OPERATING CONDITIONS :

5.1 Alkaline Degreasing Solution :

Sl. No.	Material	Quantity g/litre	Temperature °C	Duration Time minutes (Recommended)	Current Density A/DM ²	Voltage V
1.	Cleaner S-20	30-50	90±5	10-12	--	--
2.	Cleaner SE-11	50-90	60-90	2-8	--	--
3.	Steelex K-20/ Metaclaen ZX	45-75	90±5	1-5	--	--
4.	Cleaner ADA-1D	30-50	90-95	1-2	--	--
5.	Uniclean HD	50-100	80-90	10-15	--	--
6.	Remogal HDS	20-30	60-65	3-5	--	--
7.	Surclean EC-504 and Sodiumhydroxide	50-100 (ml/l) 20-60	65-70 --	2-5 --	-- --	-- --
8.	Surfolin EC-54 and Sodiumhydroxide	50-100 (ml/l) 20-60	65-70 --	2-5 --	-- --	-- --
9.	Gin Bond 808	80-100	60-65	2-4	5-10	5-9 (Rack) 10-14 (Barrel)
10.	Surfolin EL-80	80-100	60-65	2-4	5-10	5-9 (Rack) 10-14 (Barrel)

NOTE :

- The time duration (recommended) can vary with the condition of the job.
- In case jobs do not get cleaned then the solution shall be checked for pointage and rectified.

5.1.1 The tank shall be filled with water to about two-thirds of its capacity and then the necessary quantity of material shall be added to the bath with stirring as per clause 5.1. After proper mixing, the solution shall be brought to the working level by adding more water with stirring and heated to the operating temperature.



5.1.2 Analysis and replenishment of alkaline degreasing solution :

The solution shall be analyzed at suitable intervals and deficiency if any, shall be replenished with required chemicals.

The concentration of bath solution shall be maintained as given below :

Material	Pointage
Cleaner S.20	30-50
Cleaner SE-11	50-100
Steelex K-20	45-75
Cleaner ADA 10	30-50
Uniclean HD	50-55
Remogal HDS	20 minimum for 5 ml sample
Surclean EC 504 OR	50-155
Surfolin EC 54	
Gin Bond 808 OR surfolin EL 80	100 - 130

5.2 Acid Pickling Solutions :

5.2.1 HCL Pickling Solution :

Hydrochloric Acid	:	400 - 500 ml/litre
Inhibitor - 11	:	2 to 6 ml/litre of the volume of the acid mixture
or		
Rodine-50	:	0.1 to 0.5% of the acid used
or		
Pickelwel-H	:	0.25 to 0.5% of the acid used
Temperature	:	Shop temperature
Time	:	2 to 10 minutes or as required

The tank shall be filled with water to about two-thirds of its capacity and then the necessary quantity of hydrochloric acid shall be added to the water slowly with stirring. The required quantity of Inhibitor-II or Rodine-50 (mixed with some concentrated hydrochloric acid) or Pickelwel-H shall then be added to the acid mixture.

After all additions, the bath solution shall be brought to the working level by adding more water with stirring. The bath shall be operated at shop temperature.



CORPORATE STANDARD

AA 067 36 01

Rev. No. 08

PAGE 5 OF 9

5.2.2 HCl Pickling Solution-For Heat Treated Ferrous Component/Annealed Oxide Pickling (Optional) :

Hydrochloric Acid	:	400 to 500 ml / litre
Pickle Aid Additive	:	20 ml / litre
Pickle Aid Accelerator	:	100 gm/litre
Temperature	:	Shop temperature
Time	:	2 to 10 minutes or as required

5.2.3 Sulphuric Acid Pickling Solution :

Sulphuric acid	:	100 - 125 ml/litre
Rodine - 119	:	0.125 to 0.375% of the acid used
or		
Pickelwel - S	:	0.25 to 0.5% of the acid used
or		
Inhibitor 11	:	2 - 6 ml/litre
Temperature	:	60 - 70° C

The tank shall be filled with water to about two-thirds of its capacity and then the necessary quantity of sulphuric acid shall be added to the water slowly with stirring. The required quantity of Rodine - 119 (mixed with some concentrated sulphuric acid) or Pickelwel - S or inhibitor 11 shall be added to the acid mixture.

After all additions, the bath solution shall be brought to the working level by adding more water with constant stirring and heated to the operating temperature.

5.2.4 Chromic-Sulphuric Acid Pickling Solution (For Heat treated / annealed Non-ferrous component)

Chromic acid	:	30 to 40 g / litre
Sulphuric acid	:	50 to 70 ml / litre
Temperature	:	Shop temperature
Time	:	1-2 minutes or as required

The tank shall be filled with water to about two-thirds of its capacity and then the necessary quantity of sulphuric acid shall be added to the water slowly with stirring. The required quantity of chromic acid shall then be added to the acid mixture. After complete dissolution, the bath solution shall be brought to the working level by adding more water with constant stirring.

The bath shall be operated at shop temperature.

**5.3 Bright Dip Pickling Solution (Optional) :****5.3.1 Composition I : (Composition by Volume) :**
(For Ferrous Components)

Sulphuric acid	:	1 part
Nitric acid	:	1 part
Water	:	1 part
Temperature	:	Shop temperature
Time	:	10 secs to 1 minute or as required

5.3.2 Composition II : (Composition by Volume) :
(For Non-Ferrous Components)

Sulphuric acid	:	2 parts
Nitric acid	:	1 part
Water	:	1 part
Sodium Chloride (cl.3.27)	:	1 to 1.5 g/litre
Temperature	:	Shop temperature
Time	:	10 secs to 1 minute or as required

5.4 Cyanide Dip Solution for Ferrous Components :

Sodium Cyanide	:	80 to 100 g/litre
Water	:	To make up the volume
Temperature	:	Shop temperature
Time	:	1-2 minutes or as required

5.5 Cyanide Dip Solution - for Non-ferrous components:

Potassium Cyanide	:	25 to 35 g / litre
Water	:	To make up the volume
Temperature	:	Shop temperature
Time	:	1-2 minutes or as required

Whenever required, the ferrous pickled components be given passivation dip in a solution with

Chromic Acid	:	5 to 10 g / litre
Sulphuric Acid	:	0.4 to 1 ml / litre

6.0 ANALYSIS AND REPLENISHMENT:
(of acid pickling and cyanide dip solution)

The solution in clauses 5.2 to 5.5 (except 5.3) shall be analyzed regularly at suitable intervals and deficiency, if any, shall be replenished with the required chemicals. The concentration of bath solution shall be maintained as given in Cl 6.1.



CORPORATE STANDARD

AA 067 36 01

Rev. No. 08

PAGE 7 OF 9

6.1 Maintenance of Acid Pickling and cyanide dip solution :

The concentration of acid pickling and cyanide dip solutions shall be maintained as given below :

6.1.1 HCL Pickling Solution (Cl. 5.2.1 and 5.2.2)

Strength (Hydrochloric acid content) grams / litre 120 to 150

6.1.2 Sulphuric Acid Pickling Solution (Cl. 5.2.3)

Strength (Sulphuric acid content) grams / litre 180 to 220

6.1.3 Chromic Sulphuric Acid Pickling Solution (Cl.5.2.4)

Chromic acid grams / litre 30 to 40

strength (sulphuric Acid content) ml / litre 50 to 60

6.1.4 Cyanide dip Solution (Ferrous) (Cl. 5.4)

Sodium Cyanide content grams / litre 80 to 100

6.1.5 Cyanide dip solution (Copper and Copper Alloy) (Cl. 5.5)

Potassium Cyanide content grams / litre 25 to 35

7.0 PROCESS FOR FERROUS PARTS :

7.1 Mechanical Cleaning :

Where parts are heavily scaled, mechanical cleaning such as scratch brushing polishing or shot-blasting shall be resorted to. Care must be taken to avoid distortion of light gauge articles.

7.2 Solvent Degreasing :

Excess grease, oil or cutting lubricants shall be removed by means of a suitable organic solvent such as trichloroethylene.

7.3 Degreasing :

Parts shall be degreased by immersion in any one of the alkaline degreasing solutions mentioned at clause 5.1.

7.4 Rinsing :

After degreasing, the parts shall be rinsed in clean cold running water. The surface of the parts at this stage shall provide a continuous water film over it. A break in the water film indicates that the surface is not clean, in which case, the alkaline degreasing process shall be repeated.

7.5 Pickling :

If required, acid pickling may be done as per clauses 5.2.1, 5.2.3 and 5.2.4 till clean metallic surface is produced. Over pickling shall be avoided.

**7.6 Rinsing :**

After pickling, the parts shall be rinsed in clean cold running water.

7.7 Electrolytic (Anodic) Cleaning :

After rinsing the parts shall be degreased electrolytically in solution as mentioned in Clause 5.1 Sl.No. 9 or 10.

7.8 Hot Water Rinse :

After electrolytic (Anodic) cleaning parts shall be rinsed in Hot Water (50 - 60°C)

7.9 Cold Water Rinse :

After hot water rinse parts shall be rinsed in cold running water.

The surface of the parts at this stage shall provide 9 continuous water film over it. A break in water film indicate that surface is not clean, in which case, the process shall be repeated.

7.10 Bright Dip Pickling:

The parts shall be dipped in bright dip solution at room temperature for few seconds till a uniform bright surface free from scale is obtained.

7.11 Rinsing :

After the bright dip, the parts shall be rinsed in clean cold running water.

7.12 Cyanide Dip:

Parts shall be dipped in sodium cyanide solution till stains are removed from the articles. Parts shall be rinsed in clean cold water if subsequent plating is not a cyanide one.

7.13 Electroplating :

Electroplating shall be done in line with the appropriate BHEL Standard.

8.0 PROCESS FOR NON-FERROUS COMPONENTS:**8.1 Mechanical Cleaning :**

Where necessary, the parts shall be cleaned by scratch brushing polishing. Care must be taken to avoid distortion of light gauge articles.

8.2 Solvent Degreasing :

Excess grease, oil or cutting lubricants shall be removed by means of a suitable organic solvent such as trichloroethylene.

8.3 Alkaline Degreasing :

Parts shall be degreased by immersing in cleaner SE11 or Steelex K20 alkaline degreasing solutions mentioned at clause 5.1 till the parts are free from any oil or grease.

8.4 Rinsing :

After degreasing, the parts shall be rinsed in clean cold running water. The surface of the parts at this stage shall provide a continuous water film over it.



CORPORATE STANDARD

AA 067 36 01

Rev. No. 08

PAGE 9 OF 9

8.5 Acid Pickling :

8.5.1 Hydrochloric Or Sulphuric Acid Pickling :

If required, pickling may be done as per clauses 5.2.1, and 5.2.3 till clean metallic surface is produced. Over pickling shall be avoided.

8.5.2 Chromic Sulphuric Acid pickling (optional) for Non - Ferrous:

All surface residues formed during annealing, the parts shall be pickled by dipping in chromic sulphuric acid solution of following strength for a few minutes at shop temperature. Prolonged pickling shall be avoided, otherwise the surface will become etched and pitted.

Same composition as mentioned in clause No. 5.2.4.

8.5.3 Rinsing :

After pickling, the parts shall be rinsed in clean cold running water.

8.6 Bright Dip Pickling:

Parts shall be dipped in any one of the bright dip solutions mentioned at clause 5.3 at room temperature for a short duration till a uniform bright surface free from scale marks is obtained.

8.7 After the bright dip, the parts shall be rinsed in clean cold running water.

8.8 Cyanide Dip:

Parts shall be dipped in potassium cyanide solution till stains are removed from the articles.

8.9 Rinsing :

Parts shall be rinsed in clean cold running water if subsequent plating is not a cyanide one.

8.10 Electroplating :

Parts shall be electroplated in line with the appropriate BHEL Standard.

8.11 Optional Test:

Passivation.

9.0 INSPECTION :

The surface shall be examined visually for bright and clean finish free from grease and rust.

10.0 REFERRED STANDARDS (Latest Publications Including Amendments):

- | | | |
|--------------|---------------|--------------|
| 1) AA 541 01 | 2) AA 541 02 | 3) AA 541 03 |
| 4) AA 541 04 | 5) AA 54201 | 6) AA 556 09 |
| 8) AA 567 06 | 9) IS : 253 | 7) AA 556 10 |
| | 10) IS : 6911 | |

	AMENDMENT -NOTIFICATION		AA 067 36 11		REV. No. 03					
			PAGE 1 OF 1							
AA 067 36 11 : PROCESS FOR ELECTROPLATING BRIGHT TIN FORM ACID BATH ON FERROUS AND NON-FERROUS METAL PARTS PAGE 1 OF 6; CI 4.0 MATERIAL: Activated carbon powder - pure mentioned at third line is modified as follows: <table border="0" style="width: 100%;"> <tr> <td style="text-align: center; width: 50%;"><u>MATERIAL</u></td> <td style="text-align: center; width: 50%;"><u>AVAILABLE FROM</u></td> </tr> <tr> <td style="vertical-align: top;">Activated carbon pure (for Electroplating)</td> <td style="vertical-align: top;">1) M/s Grauer & Weil (I) Ltd., Mumbai 2) M/s Artek surfen chemicals (P) Ltd., Mumbai</td> </tr> </table>							<u>MATERIAL</u>	<u>AVAILABLE FROM</u>	Activated carbon pure (for Electroplating)	1) M/s Grauer & Weil (I) Ltd., Mumbai 2) M/s Artek surfen chemicals (P) Ltd., Mumbai
<u>MATERIAL</u>	<u>AVAILABLE FROM</u>									
Activated carbon pure (for Electroplating)	1) M/s Grauer & Weil (I) Ltd., Mumbai 2) M/s Artek surfen chemicals (P) Ltd., Mumbai									
Please see Instructions on the reverse.										
Ref : CI. NO. 28.16.14 of 28 th MOM of MRC(C)		Amd No. 01	Approved MRC (C)	Issued CORP. R&D	Date 15.10.2000	Cum.Sr.No. A 2869f				

	AMENDMENT -NOTIFICATION		AA 067 36 11		Rev. No. 03	
			PAGE 1 OF 1			
AA 067 36 11: PROCESS FOR ELECTROPLATING BRIGHT TIN FROM ACID BATH ON FERROUS & NON-FERROUS METAL PARTS Amendment 01 (Cum.Sl.No. 2869) : The word 'FORM' mentioned in the title is corrected as 'FROM'.						
Please see Instructions on the reverse.						
Ref : CI. 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



AMENDMENT -NOTIFICATION

AA 067 36 11

Rev. No. 03

PAGE 1 OF 1

AA 067 36 11: PROCESS FOR ELECTROPLATING BRIGHT TIN FROM ACID BATH ON FERROUS & NON-FERROUS METAL PARTS

PAGE 1 OF 6; CI 3.0 COMPLIANCE WITH NATIONAL STANDARDS

Year of IS reference is modified as follows:

IS:1359-92 (Reaffirmed 2001)

Please see Instructions on the reverse.

Ref : CI; 31.11.14 of MOM of MRC-C	Amd No. 03	Approved MRC- C	Issued CORP. R&D	Date 15.10.2002	Cum.Sr.No. A 3165
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CORPORATE STANDARD

AA 067 36 11

Rev. No. 03

PAGE : 1 OF 6

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:

Material	IS No. / Available From
Sulphuric Acid (C.P. Grade)	: IS : 266
Tin Anodes	: IS : 2384
Activated Carbon Powder-Pure	: IS : 8366
Stannous Sulphate (Electroplating Grade)	: M/s Grauer & Weil (I) Ltd and 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.

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	Issued	Dt. Of 1 st Issue
Dt. :15-08-99	Dt :	Year :	BANGALOR	Corp. R&D	Sep. '87

CORPORATE STANDARD

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

CORPORATE STANDARD



Teknolume Carrier Additive, ml/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/dm ²	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 13
Sulphuric acid as H ₂ SO ₄ , ml/l	70 to 100	80 to 120

CORPORATE STANDARD

**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

CORPORATE STANDARD**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 50-70°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.

CORPORATE STANDARD

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 INSPECTION AND QUALITY OF DEPOSIT:

When tested in accordance with the test methods shown against each, the deposit shall conform to the norms specified below:

9.1 Sampling:

A minimum of 1% of each batch of vat/barrel load or part thereof shall be taken at random for testing.

9.2 Condition Of Surface:

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 Thickness Of Deposit (IS:3203):

The minimum Thickness shall be as specified on the purchase order or drawing.

9.4 Adhesion (IS:1359):

Flaking and blistering of the coating is not acceptable.

9.5 Solderability (IS:1359):

The actual soldering on the component may be done on shop floor and observations be made. If uniform coating free from breaks and discontinuities when seen with unaided eye, sample be considered solderable.

10.0 REJECTION:

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 REFERRED STANDARDS (Latest Publications Including Amendments) :

1) IS : 266

2) IS : 1359

3) IS : 2384

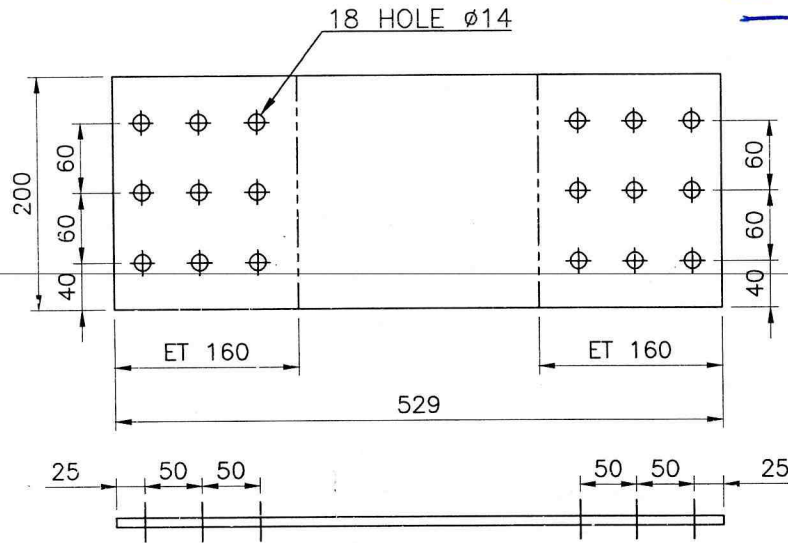
4) IS : 3203

5) IS : 8306

6) AA 067 36 01

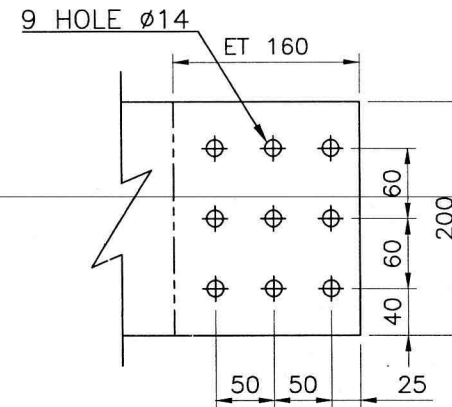
32131626005

DRAWING NO.

SAMPLE DRAWING

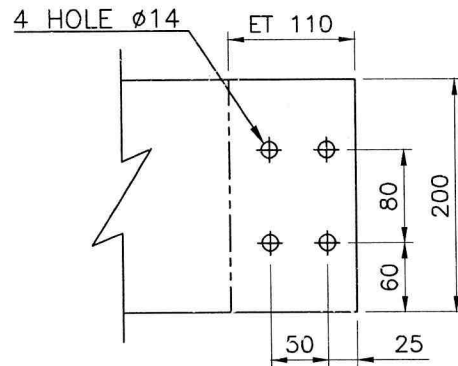
ITEM-001

(ET AREA OF ITEM-001 = 1371 SQ.CM.)



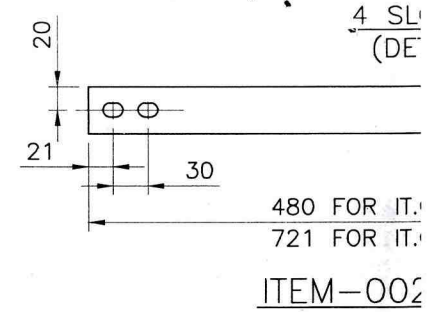
DETAIL-A

(ET AREA OF DETAIL-A= 686 SQ.CM.)



DETAIL-C

(ET AREA OF DETAIL-C= 475 SQ.CM.)

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IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

NO.

--	--	--	003	CU. PLATE 6TKx40x721 LG.
--	--	--	002	CU. PLATE 6TKx40x480 LG.
--	--	--	001	CU. PLATE 8TKx200x529 LG.
VAR 01	VAR 00	REMARKS	ITEM NO.	DESCRIPTION