PATEL CHEMICALS TECHNICAL DETA SHEET

SUB PLOT NO.31/3, LIBURTY BUSINESS PARK P-3, NEAR OKHA MAIN HIGHWAY JAMNAGAR-361006
E-MAIL-patelchemical11@gmail.com

UNISTAR ANODIZING BLACK COLORING PROCESS

1. PRODUCT DESCRIPTION:

Electrocolouring is two step process of which first step is anodizing followed by colouring. Unistar Ec-stabilizer is a modern high concentrated ready to use colour anodizing additive for colour shades from light bronze to dark bronze and black. Unistar Ec-stabilizer does not contain toxic chemical like cresol, phenol sulphonic acids.

Unistar Ec-stabilizer is characteristics by good throwing power, high stability, good reproducibility and easy to control by simple analytical method.

2. OTHER BENEFITS :

Economical and efficient electrocolouring.

Easy adoptation of the process on the existing aluminium anodizing process with little additional cost to modify the existing facility.

Wide range of colour shades from the same solution.

Weather resistant and non-fading colour

Uniform batch production with minimal rejection.

Use of additive eliminate pungent fumes and increases bath life.

3. PRODUCT CHARACTERISTICS :

Appearance	:	Reddish brown colour liquid.
Density	:	1.125 – 1.200

4. OPERATING PARAMETERS :

	Range	Desired value
Unistar coloring salt :	10 - 20 g/L	15 g/L
Sulphuric acid(density 1.84):	15 – 25 g/L	18 g/L
Unistar Ec-stabilizer :	16 – 20 ml/L	18 ml/L.
Temperature :	18 - 24^{0}C	20 – 22^{0}C
Electric power supply :	Alternating current, 50 HZ, 14 –20 V, 0.2 – 1.0 Amp/dm^2).	
Duration of colouring :	Approx. 0.5 – 15 min. depending on the desired depth of colour shade.	

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5. INITIAL BATH PREPARATION :

Clean and rinse tank and electrode.Fill up the tank (50 – 60% level) with demineralised water / distilled water.Add the required amount of sulphuric acid.Add required amount of Unistar Ec-stabilizer Mix well to get a homogeneous solution.Add calculated amount of Unistar coloring salt.Adjust volume to the operating level and mix the solution by stirring.Check solution temperature if not in operating range adjust accordingly.Analyse the solution as per analytical control (section 9.0) to cross check effective concentrated and bath volume. Adjust if requires.

The solution is new ready for operation.

6. PROCEDURE :

Colouring is carried out subsequent to anodizing and rinsing. At the end of the colouring time, the parts are thoroughly rinsed and sealed as usual. The depth of colour is dependant on many factors. Manual influencing of the colour may be necessary from case to case. The colour depth can be corrected by chemical removal in the colour bath or/in a weakly acidic rinsing bath or by additional colouring.

The uniformity of colour depends on the quality of the anodized surface. Hence it is always advisable to keep the anodizing conditions constant.

By Tin based electrocolouring system following colour can be obtained by adjusting time

Colour	Colouring Time (minutes.)	Example
Champagne	0.5 – 1.0	
Light Bronze	1 – 2	
Medium Bronze	2 – 5	
Dark Bronze	4 – 6	
Black	6 – 15	

Intermediate colours can be obtained by adjusting the time.

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7.TANK EQUIPMENTS AND OTHER MECHANICAL ACCESSORIES :

A) Tanks :

Plastic tank or tank coated with plastic or hard rubber is suitable.

B) Filtration :

The precipitated metal salts may cause disturbances, hence filtration is necessary. The filtration capacity should be 0.1 to 0.5 bath volume per hr.

C) Electrode :

The electrode is generally 316 stainless steel. The electrode should be cleaned periodically.

8. BATH MAINTENANCE :

Maintain the bath as per operating parameters (Section 4). Analyse the bath under analytical control and adjust the bath on the basis of analytical result.

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9. ANALYRICAL CONTROL :

a) Sulphuric acid concentration :

Reagent : 1 (N) caustic soda solution,

DM water.

Apparatus :

pH Meter

Magnetic stirrer

Burette

Pipette (50 ml)

Procedure :

Pipette 50 ml bath solution into a 250 ml conical flask.

Dilute with 100 ml distilled water.

Titrate with 1 (N) caustic soda from a burette until a pH value of 2.1 is reached. The solution must be stirred with a magnetic stirrer during titration.

Calculation :

g/L Sulphuric acid = ml of 1 (N) caustic soda solution consumed X 0.98

b) Getsal SN concentration :

Reagent : Concentrated hydrochloric acid solution

0.1(N) Iodine solution,

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Starch Indicator

Distilled water.

Apparatus :

Burette (50 ml)

Pipette. (50 ml)

Glass cylinder (100 ml)

Procedure :

Take exactly 5 ml of bath solution into a 250 ml conical flask.

Add 100 ml of distilled water.

Then add 25 ml of conc. hydrochloric acid.

Add few drops of starch indicator.

Titrate immediately using 0.1(N) iodine solution until the solution changes to blue.

Take this reading as 'B' .

Calculation :

g/L of Unistar coloring salt = ml of 0.1(N) Iodine consumed X 2.089.

c) Unistar Ec-stabilizer

Reagent :

Conc. hydrochloric acid,

Potassium bromate-bromide 0.1(N) solution,

Potassium iodide,

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Starch indicator

Sodium thiosulphate 0.1(N) solution.

Apparatus :

Stoppered conical flask (500 ml)

Burette (50 ml)

Pipette. (10 ml)

Analytical Balance

Procedure :

Take 5 ml of bath solution.

Add 100 ml of distilled water.

Add 50 ml of 0.1(N) potassium bromate-bromide solution.

Add 10 ml conc. hydrochloric acid

Store in a dark place for 10 minutes.

Add 1 g of potassium iodide.

Add starch indicator.

Titrate with 0.1(N) sodium thiosulphate solution until the bluish tinge disappears.

Read ml of 0.1(N) thiosulphate consumed as 'C'.

Calculation :

ml/L Unistar Ec-stabilizer = (50 - C – B) X 2.75

10. CONSUMPTION :

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The consumption depend on drag out and the depth of colour shade. Inspite of that an average consumption of Unistar Ec-stabilizer is expected to be 8 – 10 ml per square meter of aluminium processed.

11. SAFETY :

Unistar Ec-stabilizer is acidic in nature. Do take precautionary step for industrial acid handling equipment during handling. **Unistar Ec-stabilizer** is incompatible with oxidising agent and direct sunlight.

12. DISPOSAL :

Neutralize with alkali and filter. Store precipitate in protected place or as per local norm. The filtrate can be discharged after meeting local regulation.

13. PACKING :

1 Ltr, 5 Ltr., 20 Ltr. HDPE container.

14. BEST BEFORE END :

1 year from the date of manufacturing.

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