

UNISTAR HARD CHROME SALT

UNISTAR HARD CHROME SALT process is high speed mixed catalysts bath developed to meet modern hard chrome plating requirements. The process give high rate of deposition and high hardness of the deposited chrome layer.

ADVANTAGES OVER CONVENTIONAL CHROME SYSTEMS:

Higher current efficiency.

Better hardness.

Low initial make up.

Better covering and throwing power.

Lower co-efficient of friction and higher wear resistance of chromium plate as a result of controlled formation of cracks.

Works over a wide current density range.

High tolerance to metallic contamination

BATH MAKE UP

	RANGE	OPTIMUM
UNISTAR HARD CHROME SALT	200 - 300 g/ltr	250 g/ltr

OPERATING CONDITIONS:

Density	18 – 22 Be	19Be
Temperature	55° - 60°C	55°C
Cathode current density	20 - 60 A/dm ²	25 A/dm ²
Anode current density	10 - 30 Adm ²	10 A/dm ²
Voltage	6 - 15 Volts	6 volts

BATH PREPARATION:

Fill the plating tank approximately 2/3rd of its final volume with warm water (50°C) preferably deionised water. Gradually add calculated amount of UNISTAR HARD CHROME SALT and stir to dissolve. The salt must be completely dissolved. Add water to make up the level.

Place the anodes in the tank and electrolyse the bath for few hours at 55°C and at a current density of 25 - 35 A/dm² and now the bath is ready for plating.

EQUIPMENT

PVC tanks reinforced with FRP, PVC lined or tin lead alloy (containing 7% tin) lined MS tanks are suitable. Suitable exhaust system with scrubbing facilities should be provided. For heating the bath, lead tin alloy, tantalum or Teflon coils are recommended. Rise in temperature because of higher voltage and operational current requires proper cooling arrangements to be made.

ANODES

7% tin lead alloy anodes are recommended. Round anodes are preferred over flat anodes. During idling period the anodes becomes passive and this can be cleaned mechanically or by immersing in alkaline cleaner.

When the solution is to be idle for more than a few days, the anodes may be removed from the solution and kept outside. On resumption of plating, anodes should be electrolysed to form the protective lead peroxide film on anodes.

POWER SUPPLY

Usually 10 - 15 volt units are used. Oil immersed 3 phase rectifiers with residual ripple below 5% is recommended.

BATH MAINTENANCE

The solution concentration can be controlled with the help of density measurement. Periodic analysis of the bath should be carried out to determine the chromic acid and sulphate content. Addition of commercial chromic acid to maintain the solution is not recommended as this will change the ratio of chromic acid to special catalyst.

The sulphate content should be maintained between 1.4 - 1.8 g/ltr. and sulphate is determined by standard gravimetric analysis in case of increase in sulphate a good quality Barium carbonate is to be used to reduce the sulphate. To reduce the sulphate by 1.0 g/ltr., 2 - 3 g/ltr. of Barium carbonate is to be added.

Density measurement gives an approximate idea about chromic acid concentration. The following table gives an idea about the concentration acid and corresponding density.

Concentration of Chrome Salt(g/ltr.)	Density in Degree Baume at 250°C
152.00	14.00
164.00	15.00
177.00	16.00
190.00	17.00
203.00	18.00
216.00	19.00
229.00	20.00
242.00	21.00
256.00	22.00
270.00	23.00
286.00	24.00
300.00	25.00

CONVERSION

The conventional chromic sulphuric bath can be easily converted to UNISTAR HARD CHROM SALT system by adjusting the sulphate and adding the required quantity of conversion additive. It is advisable to send a one liter sample of the existing bath to PATEL laboratory for recommendations regarding the additions to be made.

CAUTION

While handling contact with eyes, skin and clothing should be avoided. Care should be taken to avoid breathing dust from the product or dust from the solution containing chromic acid. Protective clothing, rubber gloves and safety goggles should be provided. In the event of eye contact wash with plenty of water. For skin contact flush skin with plenty of water for 15-20 min.

NOTE

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