TECHNICAL DATA SHEET

Hard Chrome Process (HC-3700-01)

Hard chrome plating process HC-3700-01 is a high-speed bath which employs a special mixed soluble catalyst and has been developed to meet the modern hard chrome plating requirements. Its outstanding features are, high rate of deposition and hardness of the deposited chrome layer. The thickness of the chromium deposit to be applied depends on the expected requirements, especially taking into consideration wear and corrosion resistance. Improved corrosion resistance achieved by depositing chromium thicker than 30 microns having a large number of cracks.

Salient Feature:

- Higher current density range.
- Excellent covering and throwing power.
- Harder chrome deposit (67-68 HRC / 1000-1100 HV)
- Low Initial Make-up concentration.
- Easy to operate and maintained.

Bath Make Up:-

- Fill the tank with 2/3rd of warm water.(55^{o}C)
- Add the required quantity of Chrome Salt and stir to dissolve.
- The salt must be completely dissolved.
- Add water and level the tank till operating level.
- Add required quantity of hard chrome catalysts.
- Place the anodes in the tank and dummy the bath for 2-3 hours at 55°C at 35-45 amp/dm2.

OPERATING CONDITIONS:

Parameters	RANGE	Optimum
Chrome Content	200-300 gm/litter	250 gm/litter
Hard Chrome Catalyst HC-3700 A	04-05 ml/ltr	05 ml/ltr
Hard Chrome Catalyst HC-3701 B	45-50 ml/ltr	50 ml/ltr
Density	20-24^{o}B	22^{o}B
Sulfate ratio	2.2-4 gm/ltr	2.5 gm/ltr
Temperature	53-58^{o}C	55^{o}C
Cathode current density	30-70 A/dm^2	50 A/dm^2
Anode current density	15-22 A/dm^2	17.5 A/dm^2
Voltage	8-15	12

Anodes:-

Tin-lead alloy anodes are recommended. Round and corrugated 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. Anode should be always in chocolate brown color, yellowish color anode means idle /passive anodes which not able to pas current properly.

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Plating Speed Comparison Table

Time in Minutes to Deposit 1 micron (Average)

Current Density Amp/dm2	HC-3700 Catalyst (Minutes)	Conventional Catalyst (minutes)
20	3.9	7.7
30	1.8	3.6
40	1.1	2.6
50	0.8	2.1
60	0.5	1.8

Process Flow:-

- Polishing/ Grinding
- Soak Degreasing
- Water rinse
- Electro cleaner
- Water rinse
- Water rinse
- Water rinse
- Hard Chrome plating
- Water rinse
- Water rinse
- Hot water rinse
- Anti-rust oil

Replenishment:-

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. Addition of commercial chromic acid can be maintain the solution concentration.Chrome Catalysts need to be added after the addition of chromic acid. 10% of chrome catalyst HC-3700 B addition is recommended with 50 kg regular addition of chromic acid. Add 1% hard chrome catalyst HC-3700 A of chrome addition. To increase in 01Bume/ density add 12gm/ltr chromic acid.

Addition of 1.5 ml/ltr Part A would increase 1.0 gm/l of sulfate in the operating solution. To decrease 1 gm/l of sulfate add 3-3.5 gm/l barium carbonate.

Equipment's:-

MS tanks recommended with FRP or PVC lined. Suitable exhaust system with scrubbing facilities should be provided. For heating the bath titanium or Teflon coils or heaters are recommended.

Caution:-

Must wear PP, Rubber Gloves and Apron. 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 mint.

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