Chromicoat T3A / T3B

Chromate Conversion Coating System.

Applications

Chromicoat T3A is a liquid concentrate for initial bath make-up and maintenance for conversion coating of aluminium, aluminium alloys and zinc base diecast. Applied by either immersion or spray it provides iridescent golden coatings with excellent paint adhesion and corrosion resistance. Coatings on cast aluminium alloys will range from light gold to brown in colour.

Chromicoat T3B is a liquid replenisher for the T3A bath, used to maintain bath concentration in high production volume situations.

Chromicoat L26 and Chromicoat L27 are liquid concentrates designed to control the rate of coating formation in a Chromicoat T3A bath. Chromicoat L26 is preferred when only aluminium is processed. If more than a small quantity of zinc is processed through a bath containing Chromicoat L26, the L26 will be precipitated and deactivated, resulting in a poor quality coating.
Chromicoat L27 is used as the accelerator when both aluminium and zinc, are normally processed. However, the mix must include no more than 10% zinc if high quality coatings on aluminium are to be achieved. If more than 10% zinc is anticipated, either provide separate processing tanks, or consider using Gardal AL701 (chrome phosphate) process. For zinc alone, use Chromicoat Zn.

Chemical and Physical Characteristics

Chromicoat T3A and T3B:

Form	:	Dark red liquid concentrate. Orange colour in solution.
Odour	:	None
Specific Gravity	:	T3 A 1.28 – 1.3 @ 25°C; T3 B 1.24 – 1.25m
Flash Point	:	None
pH Concentrate	:	1.8 - 2.0
In use	:	1.5 -1.7 (see note on L27 in “Bath Maintenance” below)

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Chromicoat L26:

Form	:	Dark yellow liquid concentrate. Light orange solution.
Specific Gravity	:	1.12
pH Concentrate	:	7.7

Chromicoat L27:

Form	:	Hazy solution
Specific Gravity	:	1.10
pH Concentrate	:	10.8

Coating Characteristics

Optimum paint adhesion and corrosion resistance for both painted and unpainted aluminium plus zinc base diecast is obtained with coatings within the range 400-1200mg/m² . These coatings will range from iridescent gold to brown in colour.

The quality of Chromicoat T3A/B coatings is largely affected by the cleaning/etching/desmutting process as well as concentration, pH, time and temperature in the conversion bath.

Generally, aluminium must be cleaned, and etched before Chromicoat treatment. In accordance with industry Standards, there should be at least 1g/ m² of metal and oxide removal in the etching stage.

Equipment

Should be either Koroseal lined or constructed from 316 stainless steel.

Directions for Use

(1) Immersion process for extruded aluminium:

(a) Bath preparation:

- Fill bath with clean water at ambient temperature.
- Add Chromicoat T3A at a rate of 5 litres per 1000 litres of bath solution.

- Add Chromicoat L26 or (L27) at a rate of 0.5 litres per 1000 litres of bath solution.
- Heat to operating temperature.
- The bath may be used immediately.

(b) Stage Sequence:

#1: Acid Etch Cleaner:
Metall-Etch 291L:

Concentration	:	3 - 6% v/v
Temperature	:	ambient
Time	:	2 - 10 mins

#2: Clean overflowing water rinse.

#3: Conversion Coating:
Chromicoat T3A (plus Chromicoat L26 or L27)

Concentration T3A	:	0.5-2% v/v
Concentration L26 or L27	:	0.05-0.2% v/v (Normally L26)
Temperature	:	ambient. (>25º C preferred when using Chromicoat L27)
Time	:	1-3 minutes

#4: Static Water Rinse.

#5: Clean overflowing water rinse, ambient temperature.

#6: D.I. Water rinse.

#7 Hot air dry off. Maximum 60ºC. NB. Do not touch surface as coating will be damaged if wiped or brushed while wet.

(2) Immersion process for cast aluminium and zinc base diecast.

(a) Bath preparation: (as for extruded aluminium)

(b) Stage Sequence:

Either: (i) as for extruded aluminium or
(ii) as follows:

#1: Inhibited alkaline cleaner: (Aluminium Cleaner 166).

#2: Clean overflowing water rinse

#3: Conversion coating:
Chromicoat T3A (plus Chromicoat L27)

Concentration T3A	:	0.5-2% v/v
Concentration L27	:	0.05-0.2% v/v
Temperature	:	>25º C.
Time	:	1-2 mins

#4: Static water rinse, ambient temperature.

#5: Clean overflowing water rinse; ambient temperature

#6 D.I. water rinse

#7 Hot air dry off. Maximum 60ºC. NB. Do not touch surface as coating will be damaged if wiped or brushed while wet.

Bath Maintenance

Determine the bath concentration as follows:-

(a) Take a 10 ml sample of the bath in a 250 ml flask and dilute to about 50ml.

(b) Add 20 ml of 20% sulphuric acid (or 10mls of 50% sulphuric acid) and 20 ml of 10% KI. or a 1/4 spoon of KI crystals.

(c) Titrate with 0.1N Thiosulphate to a straw colour.

(d) Add Vitex (starch) indicator and continue titration with 0.1N Thiosulphate until blue-black colour changes to clear blue-green.

Calculate bath concentration:

No. of mls x 0.1 = % v/v Chromicoat T3A

Bath concentration may be maintained by adding the required amount of T3A to bring concentration up to the required level. However long-term bath performance will be more effectively maintained if Chromicoat T3B is used for additions to a working bath.

When T3B Replenisher is used, the concentration of the bath is best expressed as “pointage”

Bath Control:

Test the bath concentration as above.
No. of mls of 0.1N thiosulphate = “points”
Maintain the bath between 5 and 10 points.
For each additional point required, add 1.3 litres of Chromicoat T3B per 1000L bath.

As bath ages, it may be beneficial to increase concentration to maintain coating speed.

Whenever additions of Chromicoat T3A or T3B are made to the bath, always add Chromicoat L26 or L27 at the rate of approximately 1 litre to 10 litres of T3A/B

Monitor bath pH and keep within the range 1.5 - 1.7. Adjust up with ammonia, down with nitric acid. Too low a pH may result in a soft, heavy coating. If the coating is soft, and the pH is within the correct range, an extra addition of Chromicoat L26 will make the coating more adherent. Too high a pH will produce too light a coating, or no coating at all.

Special Note on the use of Chromicoat L27:
Chromicoat L27 must be used if the bath is expected to process significant amounts of zinc, either alone, or together with aluminium. A Chromicoat L27 bath must be operated at a pH of 2.1-2.4 If lower, the coating may be soft and powdery. The coating formation is relatively slow unless the temperature is raised to >25 deg.C. If heating is not available, then concentration may be raised and immersion time extended. Lower pH must not be reduced to accelerate the bath.

Bath Exhaustion

As a bath ages and becomes contaminated with drag-in and reaction products, performance will decline. If bath exhaustion is suspected, it may be analysed for trivalent chrome, aluminium (reaction products), and sulphate (contaminant from acid etch).

Limits

Discard a bath containing more than 1000 ppm sulphate or aluminium.
Discard or dilute the bath when the trivalent chrome titration reaches 50% of the hexavalent chrome titration ie. the ratio is >0.5.

the ratio Cr^{3+} / Cr^{6+} should be <0.5

Methods for these determinations are available from Chemetall.

Packaging

Available in 25, 200 and 1000 litre containers.

Safety, Transport and Storage Information

Please refer to the Material Safety Data Sheet.

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