

SPECIFICATION FOR THE USE OF THE E-CLPS® CHROME-FREE PRETREATMENT FOR ALUMINUM

Bulk Chemicals, Incorporated's E-CLPS® Chrome-Free process utilizes a five-stage pretreatment system as follows:

1. STAGE ONE ■ CLEANING

- 1.1 Aluminum to be pretreated with E-CLPS® must be cleaned with either an acid or an alkaline **BULK KLEEN™** product.
- 1.2 This cleaner will be specifically recommended by **BULK CHEMICALS** based upon the surface and soil load to be cleaned.

2. STAGE TWO ■ RINSE

- 2.1 The **BULK KLEEN™** stage must be followed by a fresh water rinse.
- 2.2 This rinse must be constantly overflowed by the addition of fresh water.
- 2.3 The cleaned metal cannot be allowed to dry before being rinsed in Stage Two.
- 2.4 Stage Two fresh water rinse cannot contain more than 2% build-up of the prior **BULK KLEEN™**.
- 2.5 The controls of this rinse will be by titration and a Total Dissolved Solids (TDS) meter.
- 2.6 A **BULK CHEMICALS** representative will establish specific limitations.
- 2.7 The TDS, as measured by a Cole Parmer (Catalog #E-19800-00) hand-held meter, should not exceed 1500.



3. STAGE THREE ■ SURFACE CONDITIONER

- 3.1 The selection of the surface conditioner will depend upon the construction materials of this stage.
- 3.2 This product needs to be operated in accordance with either the product data bulletin or the specific recommendations of **BULK CHEMICALS** technical personnel.

4. STAGE FOUR ■ WATER OVERFLOWING RINSE

- 4.1 The surface conditioner rinse must be overflowed by the addition of fresh water.
- 4.2 This rinse should be overflowed at a level to maintain a TDS as measured by a Cole Parmer (Catalog #C-19800-00) hand-held meter. TDS should be less than 500.

5. STAGE FIVE ■ E-CLPS® CHROME-FREE PRETREATMENT

- 5.1 This stage should be made up of deionized or reverse osmosis water. The incoming conductivity of this water should not exceed 25 microsiemens. pH range should be 4.5 – 7.0.
- 5.2 A **BULK CHEMICALS** technical representative will define specific bath concentration parameters.
- 5.3 The temperature range is 65° - 100°F, with 70° - 85°F as optimum.
- 5.4 The Stage 5 bath should not exceed the following contamination limits:*

Iron	<0.5 ppm
Sodium	<2.0 ppm
Calcium	<5.0 ppm
Potassium	<2.0 ppm
Chloride	<0.1 ppm
Sulfates	<0.1 ppm
Magnesium	<5.0 ppm

**These limits do not exclude other possible contaminants such as other metals or organics*

5.5 Construction materials of all contact areas (including holding tanks, silhouettes, piping & pumps) must be corrosion resistant materials such as 304 Stainless Steel, 316 Stainless Steel or PVC.

5.6 Coating weight of the E-CLPS® Chrome-Free shall be greater than 4 mg/ft² and less than 25 mg/ft².

5.7 E-CLPS® Chrome-Free product must be consumed within 6 months of the date of manufacture.

6. EXCLUSIONS

A four-stage operation would exclude Stage 3 and must be approved by a **BULK CHEMICALS** technical representative. For high performance coatings, a five-stage pretreatment system is required.

7. CONTROL CHARTS

7.1 Daily control charts must be maintained to include monitoring, testing, and recording of all concentrations, pHs, temperatures, spray pressure and conductivity herein prescribed and/or set down by **BULK CHEMICALS**.

7.2 This monitoring should be performed twice per shift on a low production line and once every two hours on a high production line.

8. PERFORMANCE

When properly top-coated, the painted aluminum will satisfy the performance requirements of the following specifications:

- A.A.M.A. 2603
- A.A.M.A. 2604
- A.A.M.A. 2605*
- Qualicoat
- GSB International
- Austrian Lacquer Institute

** Cannot meet Section 6.1
because it requires chrome*