



## **DESMUT 51**

### **A Non-Chromated Deoxidizer/Desmutter for Aluminum & Aluminum Alloys**

#### **DESCRIPTION**

**DESMUT 51** is a highly concentrated and effective liquid non-chromated chemical deoxidizer/desmutter especially designed for desmutting and deoxidizing all wrought and extruded aluminum alloys. The **DESMUT 51** solution completely removes the smut and alloying constituents left by chemical etching or etch cleaning. The deoxidized surface is precisely prepared for spot welding, anodizing or for the application of a chromate conversion coating film.

#### **PRODUCT FEATURES & BENEFITS**

- **Highly Concentrated**- **Desmut 51** is the most concentrated product of its type in the market place---normally used at 5-12% by volume.
- **Economical**- When compared with plain nitric acid solutions, **Desmut 51** costs less to make-up and maintain while providing superior performance and much longer tank life.
- **Longer Tank Life**- Air agitation activates and reactivates the **Desmut 51** solutions. Tank life is almost indefinite with periodic additions to maintain chemical concentrations.
- **Ecologically Compatible**- **Desmut 51** does not contain any heavy metals, chrome or chromated products.
- **Complete & Rapid Deoxidization**- of aluminum surfaces prior to etching, anodizing or chemical film conversion coating.
- **Complete & Rapid Desmutting**- of aluminum surfaces following alkaline etching or etch cleaning.
- **Excellent for Resistance Welding**- Provides surface deoxidation comparable to chromated products for excellent "Holdover" properties.

- **Versatile**- **Desmut 51** can be used to deoxidize and desmut all wrought, extruded, sheet and forged aluminum alloys. **Desmut 51** is not recommended for cast aluminum alloys.
- **Etch Rate**- of **Desmut 51** is approximately 0.00005 to 0.0004 inch/surface/hour on 2025-T3 clad aluminum. Maintain using Replenisher or **Desmut 51** concentrate.
- **Maintenance**- of **Desmut 51** and or etch rate via the use of product concentrate or ARP's product **EXTENDER**, an inorganic granular water soluble fluoride salt composition. Approximate addition of 0.6-1.2 grams/liter will increase etch rate approximately 0.0001 inch/surface/hour.
- **Desmut 51**- has a high tolerance to control the build-up of soluble copper; up to 500 ppm.
- **Precise Control Procedures**- are available to insure superior performance with maximum economy of operation.

### **OPERATING CONDITIONS**

Concentration:	5-12% by volume
Temperature:	Ambient
Time:	30 seconds to 5 minutes
Agitation:	With clean compressed air will increase the efficiency and provide excellent bath life.

### **PHYSICAL PROPERTIES**

- Liquid dark brown color
- Strong pungent acid scent
- Contains both nitric and sulfuric acids
- D.O.T. Corrosive Liquid, N.O.S.
- Density 11.91 –lbs. /gal.
- Specific Gravity – 1.4310

## **EQUIPMENT**

Processing tanks racks and other equipment should be constructed of 300 series stainless steel; (Type 316 is preferable). Rigid polyethylene, polypropylene, PVC or Korseal lined tanks are also satisfactory. Titanium and aluminum hangers or racks may be used for fabricated work. The rinse tank following the bath should be made of the same materials.

## **SAFETY & HANDLING**

**Desmut 51** is a strong acid product containing nitric and sulfuric acids, **CORROSIVE TO ALL TISSUES**. Normal safety precautions for handling strong mineral acids should be observed. Additional handling and first-aid information is contained on drum labels in the MSDS bulletin.

## **MATERIALS REQUIRED:**

0.1/N Sodium Thiosulfate Solution  
50% Sulfuric Acid Solution  
Potassium Iodide Crystals  
Starch Indicator Solution (Saturated)

10 ml Pipette  
250 ml Erlenmeyer Flask and/or Beaker  
25 and/or 50 ml Automatic Burette Assembly

## **TITRATING PROCEDURES:**

1. Obtain 2-3 ounces of Desmut 51 bath in a small container for analyzing.
2. Place approximately 50 ml of water in an empty Erlenmeyer Flask.
3. Using a 10 ml pipette, carefully transfer 10 ml of Desmut 51 bath to the 250ml flask.
4. Add  $\frac{1}{4}$  to  $\frac{1}{2}$  teaspoon of Potassium Iodide crystals to the flask solution. It will turn Reddish/Orange.
5. Add 10 ml of 50% Sulfuric Acid Solution ( $H_2SO_4$ ) color will intensify.
6. Titrate using Automatic Burette Assembly and carefully add 0.1/N Sodium Thiosulfate Solution until solution turns from Reddish/Orange to a faint Yellow color. Do not change Burette setting. (You will continue in Step #8)
7. Add 5 ml of Starch Indicator. Solution will turn to a dark Blue/Black color.

8. Continue the titration from Step #6 until the Blue/Black color fades to colorless or a Light Yellow.
9. **Record the total number of mls used** of the 0.1/N Sodium Thiosulfate Solution to change the color from Black/Blue to colorless or Light Yellow.

**CONCENTRATION CALCULATION:**

Total number of mls of 0.1N Sodium Thiosulfate Solution used to turn the solution to Colorless or Light Yellow (times) x 0.67 (product factor) (equals) = % by Volume of Desmut 51 in solution of the operating bath.

**CONCENTRATION EXAMPLE:**

15 ml x 0.67 = 10.05% of Desmut 51 by volume. This is the active concentration of the Desmut 51 and is what is used as the concentration guideline.

<u>Sodium Thiosulfate mls Used</u>	<u>Percent by Volume (%)</u>
15 mls	10%
23 mls	15%
30 mls	20%
38 mls	20%