

[METRIC]  
A-A-59260  
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SUPERSEDING  
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## COMMERCIAL ITEM DESCRIPTION

### CORROSION REMOVING COMPOUND, SODIUM HYDROXIDE BASE; FOR ELECTROLYTIC OR IMMERSION APPLICATION

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. **SCOPE.** This commercial item description (CID) covers one type of alkaline corrosion removal compound suitable for rust removal by simple immersion of the article or by electrolytic action without causing material change in the dimensional characteristics of the treated article.

#### 2. SALIENT CHARACTERISTICS

2.1 Physical form. The raw materials used shall be intimately assembled and processed to produce either a dry, fine, granular or dry, fine, flake compound. It shall be uniform in composition and there shall be no evidence of segregation or caking during handling or storage.

2.2 Composition. The corrosion removing compound shall conform to the requirements of table I when tested as specified therein.

2.3 Solubility (turbidity). When a solution of the corrosion removing compound is made according to the manufacturer's instructions, it shall be completely soluble in water and there shall be no visible turbidity.

Beneficial comments, recommendations, additions, deletions, clarifications, etc., and any data which may improve this document should be sent by letter to: Defense Supply Center Richmond (DSCR), ATTN: DSCR-VBD, 8000 Jefferson Davis Highway, Richmond, VA 23297-5610.
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AMSC N/A

FSC 6850

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TABLE I. Composition.

Ingredient	Percentage by weight	Test paragraph
Sodium hydroxide	54.0 max.	2.4
Trisodium salt of N-hydroxyethyl-ethylenediaminetriacetic acid* (3Na EDTAOH)	13.0 min.	2.5
Sodium gluconate	25.0 min.	2.6
Phosphorus and silica, total as PO <sub>4</sub> plus SiO <sub>2</sub>	0.25 max.	2.7
Others, including foamers	7.0 max.	2.8

\*N-hydroxyethylethylenediaminetriacetic acid may be used instead of the trisodium salt if the amount of acid, when calculated as the trisodium salt, meets the requirements of this commercial item description.

## 2.4 Sodium hydroxide content.

2.4.1 Preparation of sample. Carefully weigh 660 grams (g) of the corrosion removing compound in a 1000 milliliter (mL) beaker. Add, while stirring, enough distilled water to have approximately 800 mL of solution. Heat the mixture near boiling, and stir the solution to completely dissolve all of the compound. Cool the solution to room temperature. Transfer the solution to a 1000 mL volumetric flask. Wash the beaker several times with distilled water and transfer the washings to the flask. Fill the flask to the 1000 mL mark with distilled water and mix well.

2.4.2 Preparation of color blank. Immediately before performing the test for sodium hydroxide content, prepare a color blank by dissolving 1 g of sodium cyanide in 80 mL distilled water in a 125 mL Erlenmeyer flask and then adding 16 drops of LaMotte sulfo-orange indicator.

2.4.3 Test procedure. Pipette 10 mL of the corrosion removing compound solution into a 250 mL conical flask and add 10 mL of distilled water, 1 g of sodium cyanide and 16 drops of LaMotte sulfo-orange indicator. Titrate with the standardized 1 N HCL solution to the identical color of the blank.

2.4.4 Calculation. Calculate the sodium hydroxide content by the following formula:

$$\text{Percent NaOH} = 0.600 \times \text{mL of HCL used.}$$

## 2.5 Trisodium salt of n-hydroxyethylethylenediaminetriacetic acid (3Na EDTAOH) content.

2.5.1 Preparation of ZnSO<sub>4</sub>·7H<sub>2</sub>O solution. Dissolve approximately 0.5 g, accurately weighed, of ZnSO<sub>4</sub>·7H<sub>2</sub>O in distilled water and dilute to 100 mL in a volumetric flask.

2.5.2 Indicator. Dissolve 0.56 g of hydroxylamine hydrochloride and 0.025 g of erichrome black T in 25 mL of methanol.

### 2.5.3 Test procedure.

2.5.3.1 Preparation. Add 10 g, weighed to the third decimal, of well mixed corrosion removing compound to a 100 mL volumetric flask. Add 50 mL of distilled water and swirl to dissolve. Dilute with methanol to the 100 mL volume mark and mix thoroughly. Pipette 10 mL of solution to a 250 mL round distillation flask and add 50 mL of methanol. Evaporate the solution on a 70°C (158°F) bath under a gentle flow of air. Then evaporate to dryness at 70°C (158°F) under vacuum.

2.5.3.2 Test. Remove the flask from the bath, add 50 mL of methanol, and attach a 46 cm (18 inch) water-cooled condenser. Reflux 1/2 hour using a 70°C (158°F) bath. Filter through medium filter paper, transferring and washing filter paper three times with 5 mL of methanol each washing. Add 50 mL of water to the filtrate and mix. Using a pH meter, adjust the filtrate to a pH of about 8.5 with 3N HCL and then to a pH 7.0 with 0.1N HCL. Add 5 g of Na<sub>4</sub>Cl and dissolve. Add four drops of indicator (2.5.2) and titrate with ZnSO<sub>4</sub>·7H<sub>2</sub>O to a purple end point.

2.5.4 Calculation. Calculate the percentage concentration of hydrated 3NaEDTAOH from the following equation:

$$C = 1.35(AB/W)$$

where A= weight of the ZnSO<sub>4</sub>·7H<sub>2</sub>O per 100 mL

B= mL of ZnSO<sub>4</sub>·7H<sub>2</sub>O

W= weight of test sample

### 2.6 Sodium gluconate content.

2.6.1 Internal standard solution. Accurately weigh approximately 0.5 g of L-ascorbic acid, dissolved in pyridine, and dilute with pyridine to 100 mL in a volumetric flask.

2.6.2 Silylating solution. Trimethylsilylimidazole in a concentration of 1.5 milliequivalents per mL of pyridine solution.

2.6.3 Test procedure. Dissolve approximately 10 g (weighed to the third decimal) of the corrosion removing compound with water and dilute to volume in a 500 mL volumetric flask with water. Pipette 1 mL of the thoroughly-mixed solution to a 2 mL vial. Add six drops of concentrated HCL, and evaporate to the loss of chlorine odor at 65°C (149°F) with a gentle flow of nitrogen. Pipette 1 mL of the internal standard solution (2.6.1) into the vial. Close the vial with a Teflon-coated septum and heat at 65-70°C (149-158°F) for 30 minutes. After settling, decant the liquid into a second vial, and evaporate at 60°C (140°F) under a flow of nitrogen. Close the vial and, with a syringe, add 500 microliters (µL) of the silylating solution through the septum. Heat for 20 minutes at 65-70°C (149-158°F). Inject 1 µL of the solution into a gas-liquid chromatograph equipped with a 1.8 meters (6 foot) x 50 millimeters (mm) (1/8 inch) stainless steel column packed with 5 percent silicone OV-225 on 80-100 mesh chromsorb W-HP. Allow the chromatogram to develop for 30 minutes under the following conditions:

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Inject port	230°C (446°F)
Column oven	165°C (329°F)
Flame ionization detector	300°C (572°F)
Carrier (helium) flow	60 mL per minute

2.6.4 Calculation. Calculate the percentage of sodium gluconate in the corrosion removing compound as follows:

$$\text{Sodium gluconate} = 500 (A_X W_{IS} F) / (A_{IS} W_S)$$

where  $A_X$  = area of the gluconic acid derivative peak

$A_{IS}$  = area of the L-ascorbic acid derivative peak

$W_{IS}$  = weight of the L-ascorbic acid per 100 mL of solution

$W_S$  = weight of sample of corrosion removing compound per 500 mL

$F$  = correction factor determined with known concentrations

2.7 Phosphorus and silica content. The combined phosphorus and silica content shall be determined by spectrographic analysis.

## 2.8 Foaming characteristics.

2.8.1 Preparation of steel panels. Prepare two steel panels. The panels, each measuring 25 x 100 x 3.175 mm (1 x 4 x 1/8 inches), shall be made of SAE 1020 cold-rolled steel. A 5 mm (3/16 inch) hole shall be drilled in one corner of each panel for attaching power leads by means of a steel bolt and nut. The surface of the panels shall be abraded to a surface roughness not greater than 0.8 micrometers (32 microinches).

2.8.2 Preparation of compound. Carefully weigh 660 g of the corrosion removing compound in a 1000 mL beaker. Add, while stirring, enough distilled water to have approximately 800 mL of solution. Heat the mixture near boiling, and stir the solution to completely dissolve all of the compound. Cool the solution to room temperature. Transfer the solution to a 1000 mL volumetric flask. Wash the beaker several times with distilled water and transfer the washings to the flask. Fill the flask to the 1000 mL mark with distilled water and mix well.

2.8.3 Test procedure. Pour 500 mL of the thoroughly-mixed solution into a 600 mL standard form beaker. Place the two steel panels from 2.8.1 on opposite sides in the beaker, immersing them to a depth of 50 mm (2 inches). Attach a suitable direct current source, making one panel anodic (positive) and the other cathodic (negative). Apply a current of 4 amperes and hold steady for 30 minutes at a temperature between 27 - 54°C (80 - 130°F) (by means of a water bath if necessary.) After the current has been off for 2 minutes, the height of the foam at the center of the beaker shall be measured. The foam head shall be between 50 mm (1/8 inch) and 100 mm (1/4 inch).

### 3. REGULATORY REQUIREMENTS

3.1 Marking, packaging, and labeling. Material shall be labeled, packed, and marked in accordance with Title 49, Code of Federal Regulations (CFR) paragraphs 100 to 185.

3.2 Recycled materials. The offeror/contractor is encouraged to use recovered materials to the maximum extent practical, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

3.3 Material safety data sheet (MSDS). An MSDS shall be prepared and furnished in accordance with 29 CFR, paragraph 1910.1200.

### 4. QUALITY ASSURANCE PROVISIONS

4.1 Product conformance. The product provided shall meet the salient characteristics of this commercial item description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial market. The government reserves the right to require proof of such conformance.

4.2 Market acceptability. The item offered must have been sold to the government or commercial market.

5. **PACKAGING**. Preservation, packing, and marking shall be as specified in the contract or order.

6. **NOTES**. This section contains information of a general or explanatory nature that is helpful, but is not mandatory.

6.1 Source of documents. The Code of Federal Regulations and Federal Acquisition Regulation may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001.

6.2 Ordering data. Acquisition documents must specify the following:

- a. Title, number, and date of this CID.
- b. Unit and quantity required.
- c. Packaging requirements.

6.3 National stock number (NSN). NSN 6850-00-550-5565 corresponds to this CID. It may not be indicative of all possible NSNs associated with this document.

6.4 Sources of supply. The following are suppliers whose products are known to meet the requirements of this CID. Competition is not limited to these sources.

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Name of Company

Fine Organics Corporation  
205 Main Street  
Lodi, NJ 07644  
(201) 472-6800

Oakite Products Incorporated  
P.O. Box 602  
50 Valley Road  
Berkeley Heights, NJ 07922  
(800) 526-4473

MacDermid Incorporated  
245 Freight Street  
Waterbury, Conn. 06702  
(203) 575-5700

MILITARY INTERESTS:

Custodians

Army - MR  
Air Force - 68  
Navy - AS

Reviewers

Army - CR4, MI  
Air Force - 11  
Navy - SA, SH

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - 10FTE

Preparing Activity:

DLA - GS

(Project 6850-1257)