



Technical Process Bulletin

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RODINE® 103

Inhibitor For Industrial Cleaning

1. Introduction:

RODINE 103 is a very unique liquid inhibitor designed specifically for use in industrial cleaning operations to prevent acid attack on mild steel, stainless steel and copper or brass.

RODINE 103 is an effective inhibitor for phosphoric, sulfuric, hydrochloric, acetic, citric, oxalic, sulfamic, tartaric and sodium bisulfate acids.

RODINE 103 is added to the above acids for the protection of equipment during chemical cleaning operations and descaling operations, such as:

- a. Chemical cleaning of industrial systems (e.g. boilers).
- b. Compounding of janitorial, industrial and vehicle cleaning products.

RODINE 103 consists of ingredients that are listed in the Code of Federal Regulations, Title 40 (Protection of Environment), under Section 178 (Emulsifiers and/or Surface Active Agents), Section 180 (Tolerance and exemptions from tolerances for pesticide chemicals in or on raw agriculture commodities) and Title 21, Section 170 (Food Additives). Section 182 and 582 (Substance Generally Recognized as Safe), Section 184 (Direct Food Substances Affirmed as GRAS), Section 172 (Food Additives Permitted for Direct Additions to Food for Human Consumption).

2. Materials:

RODINE 103 is used at a concentration of 2 gallons of inhibitor per 1000 gallons of diluted acid solution.

3. Buildup:

RODINE 103 may be added to either the diluted or the concentrated hydrochloric acid. For all other acids, RODINE 103 must be added to the diluted acid solution.

The dilute acid, inhibited with RODINE 103 is best circulated through the equipment to be cleaned. When circulation cannot be accomplished, the equipment should be filled with the inhibited acid and sufficient time allowed for the acid to remove the objectionable deposits.

If heating of acid or equipment is desired to speed up the operation, it should be done prior to the cleaning.

NOTE: RODINE 103 is soluble in concentrated 20° Be' hydrochloric acid. A change in appearance from a clear, light orange solution to a hazy dark orange solution will occur with time of the RODINE 103 in concentrated 20° Bé HCl without a loss in inhibitor performance.

4. Operation:

The maximum protection afforded by the RODINE 103 is dependent on the specific acid being used, the composition of the metal surface and the temperature of the cleaning bath. The following table lists the maximum cleaning bath temperature allowed for each metal and specific acid:

<u>Metal</u>	<u>Acid*</u>	<u>Maximum Cleaning Temperature, ° F</u>
Cold and Hot Rolled Steel	All acids	100
Copper	All acids	150
304SS	All acids	150
316SS	All acids except Hydrochloric	150
316SS	Hydrochloric acid	100

* The information used to prepare this table was based on testing the following acid compositions:

3% (wt.) Citric Acid
 5% (V) Glacial Acetic Acid
 6% (wt.) Oxalic Acid
 6% (wt.) Tartaric Acid
 6% (wt.) Sulfamic Acid
 6% (wt.) Hydrochloric Acid
 6% (wt.) Sodium Bisulfate Solution.
 10% (V) Phosphoric Acid (75%)
 10% (V) Sulfuric Acid (66°Be)

5. Storage Requirements:

RODINE 103 will freeze at 23° Fahrenheit. Freezing is detrimental to the product. It is recommended that the product be stored indoors where the temperature will not go lower than 32° Fahrenheit.

6. Waste Disposal Information:

Applicable regulations concerning disposal and discharge of chemicals should be consulted and followed.

Disposal information for RODINE 103 is given on the Material Safety Data Sheet for each product.

The industrial cleaning bath is acidic and contains organic RODINE inhibitor components.

The industrial cleaning bath and sludge can contain ingredients other than those in the chemical as supplied and analysis of the solution and/or sludge is required before waste treatment and disposal.

7. Precautionary Information:

Before handling the chemical products used in the process, the first aid and handling recommendations on the Material Safety Data Sheet for the product should be read, understood and followed.

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