Technical Process Bulletin

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TURCO® ALKALINE RUST REMOVER (T-4181)

1. Introduction:

TURCO ALKALINE RUST REMOVER (T-4181) is a free flowing granular product formulated to simultaneously strip paint, dissolve rust and light heat sale from jet engine parts. Used during routine maintenance; TURCO ALKALINE RUST REMOVER (T-4181) removes carbonatious deposits, phosphate coatings and Sermetal W as well as light oils and unwanted lubricant residues. TURCO ALKALINE RUST REMOVER (T-4181) was formulated for use on precision surfaces where dimensional change and hydrogen embrittlement must be avoided. TURCO ALKALINE RUST REMOVER (T-4181) contains low foaming surfactants and, therefore, it can be used with mechanical agitation for faster soil removal. These surfactants also increase the rinsability with cold and hot rinse water. This product and its solutions are non flammable at room temperature and when heated.

Since TURCO ALKALINE RUST REMOVER (T-4181) is highly alkaline, it should not be used on tin, aluminum, zinc and any alloys containing these metals as a major constituent.
TURCO ALKALINE RUST REMOVER (T-4181) will not attack ferrous alloys, magnesium alloys, stainless steels, bronze and monel alloys when used as directed. TURCO ALKALINE RUST REMOVER (T-4181) can be used on titanium alloys at up to 8 ozs. gal. (60 g/L) of water at no higher than temperature of 168° F(75° C).

A.A.R. (T-418) meets the cleaning requirements of U.S. Federal specification TT-C-490 C, Method V.

2. Operating Summary:

Chemical:	Bath Preparation per 100 Gallons:	
General Immersion Clean:	200 to 300 pounds 24 to 36 Kgs/100 L	
Titanium Immersion Cleaning:	37.5 to 50 pounds maximum 4.5 to 6 Kgs/100 L maximum	
Operation and Control:		
Time, minutes:		
General Cleaning:	15 to 30 (or as needed)	
Titanium Cleaning:	15 to 30	
Temperature, °Fahrenheit:		
General Cleaning:	185 to 205° F	90 to 95°C
Titanium Cleaning:	168° F maximum	75°C

3. Materials:

TURCO ALKALINE RUST REMOVER (T-4181)
Testing Reagents and Apparatus

4. Equipment:

Tank:
The process tanks, pumps and piping for use with this solution must be constructed of stainless steel (300 series). The heat exchanger plates should be polished 316 stainless steel. All process circulating pump seals, valve seats, door seals, and other elastomers which come in contact with the working process solution should be Buna-N, Teflon™ or Viton™. EPDM elastomers should be avoided.

Sludge Removal:
Insoluble particles accumulating in the TURCO ALKALINE RUST REMOVER (T-4181) should be regularly removed to extend the life of the solution. The use of a sludge basket in the tank bottom or "rough" of filtration the solution is recommended.

Our sales representative should be consulted for information on Henkel Surface Technologies automatic process control equipment for this process and any additional questions. In addition, the Henkel Surface Technologies Equipment Design Manual" may be consulted.

5. Descaling and Stripping with TURCO ALKALINE RUST REMOVER (T-4181):

Note: Do not mix TURCO ALKALINE RUST REMOVER (T-4181) with any chemicals other than water, or add any other chemicals to TURCO ALKALINE RUST REMOVER (T-4181) except as directed in the Technical Process Bulletin or the control (titration) procedures.

Never add TURCO ALKALINE RUST REMOVER (T-4181) to hot water. Never "dump" large quantities of powder into water since excessive heat may generate local pockets of steam which may lead to a steam eruption.

Always add TURCO ALKALINE RUST REMOVER (T-4181) slowly and in controlled quantities by sprinkling the product close to and over the surface of the water or cooled solution. Agitation of the water or solution is highly beneficial in dissolving the product. Continue to mix thoroughly until all the product added completely dissolves.

Buildup:
Fill the tank ¾ full with cool to lukewarm water and add the required amount of TURCO ALKALINE RUST REMOVER (T-4181) per 100 gallons of solution.

General cleaning: 200 to 300 pounds (24 to 36 Kgs/100 L).
Titanium cleaning: 37.5 to 50 pounds (4.5 to 6 Kgs/100 L).

The correct concentration and temperature are best determined by the specific application, including equipment, and types of soils to be removed. Always ensure that all the product (TURCO ALKALINE RUST REMOVER (T-4181) has completely dissolved before heating.

Fill the tank and heat to the desired operating temperature.

Operation:
Time:
General cleaning: 15 to 30 minutes (or as required)
Titanium cleaning: 15 to 30 minutes

Temperature:
General cleaning: 185° to 205° Fahrenheit (90 to 95°C)

Titanium cleaning: 158° to 168° Fahrenheit (70 to 75° C max)

The proper solution level must be maintained by the periodic addition of clean, cold tap water for optimum results.

After cleaning, the parts are thoroughly rinsed with hot water. A high pressure rinse helps to remove loosened carbonatious deposits, paint residues, rust and scale. The rinse should be overflowed continuously at a rate which will keep it clean and free from scum and other contamination.

The solution will gradually accumulate grease and soil and should be discarded when contamination interferes with cleaning. If excessive contamination floats on the surface, it should be skimmed to eliminate re-deposition.

6. Apparatus:

- Pipet, 25 mL, 50 mL
- Buret, 50 mL
- Volumetric Flask, 250 mL
- Beaker, 250 mL
- pH meter

Reagents:
Standard Sulfuric Acid 1.0N

Procedure:
1. Obtain a sample from the tank and allow to cool to room temperature **(Danger! Warning: Check MSDS).**
   Note: Never pipet by mouth, use a pipet filler.
   For concentration above 16 lb ozs./gal.
2. Pipet a 25 mL of the sample into a 250 mL volumetric flask and dilute to the mark. Mix well. This will be the working solution.

2a. Pipet a 50 ml of the working solution from Step 2 above, into a 250 mL beaker. Add 100 mL DI water.
   For concentration below 16 oz/gal:

2b. Pipet 50 mL of the undiluted sample from Step 1 above, into a 250 mL beaker. Add 100 mL DI water.

For all concentrations:
3. Titrate to pH 11.4 with 1.0 N Sulfuric Acid **(Danger! Warning: Check MSDS)**

Calculation:
For concentration above 16 oz/gal (Steps 2 and 2a, above):
mL of 1.0N Sulfuric Acid x 1.66 = oz/gal TURCO ALKALINE RUST REMOVER (T-4181)

For concentration below 16 oz/gal (Step 2b, above):
mL of 1.0 Sulfuric Acid x 0.166 = oz/gal TURCO ALKALINE RUST REMOVER (T-4181)

7. Waste Disposal Information:

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

Disposal information for the chemical, in the form as supplied, is given on the Material Safety Data Sheet for the chemical.

The processing bath is alkaline. Neutralization may be required prior to discharge. Refer to Waste Treatment Information Bulletin WT1007, available on request.

The processing bath and sludge which accumulates in the bath can contain

ingredients other than those present in the chemical as supplied and analysis of the solution and/or sludge may be required prior to disposal.

8. Storage Requirements:

Keep containers sealed when not in use. Transport and store in closed containers below 132° F (55° C).

9. Precautionary Information:

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

TURCO ALKALINE RUST REMOVER (T-4181) contains sodium hydroxide. Avoid contact with eyes, skin and clothing. Do not take internally. Use with adequate (equivalent to outdoor) ventilation.

Protective clothing such as a chemical face shield or goggles and gloves, apron and boots, made from alkali resistant materials must be worn when handling and using this product. A NIOSH approved respirator should be worn during mist conditions or when using this product in confined areas.

Add product to tepid water with care to prevent formation of local pockets of steam which may lead to steam eruption. Keep containers sealed when not in use.

Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and can be fatal. Follow appropriate tank entry procedures (see ANSI Z117.1 - 1977).

NOTICE:

The above information and recommendations concerning this product are based upon our laboratory tests and field use experience with this or similar products. However, since conditions of actual use are beyond our control, any recommendations or suggestions are made without warranty, express or implied. Manufacturer's and seller's sole obligation shall be to replace that portion of the product shown to be defective. Neither shall be liable for any loss, damage, or injury, direct or consequential, arising out of the use of this product.

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