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Description: Alkaline Degreaser/Rust Remover for Engine Overall Process.
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Technical Process Bulletin

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Turco 4181-GL
Alkaline Degreaser/Rust Remover for Engine Overall Process.

1. INTRODUCTION:

TURCO 4181-GL is a concentrated liquid alkaline degreaser/rust remover formulated to remove rust, paints, lube oils, drawing pastes, cutting oils and protective oils from ferrous alloys. TURCO 4181-GL will not attack ferrous alloys, magnesium alloys, stainless steels, brass, bronze or Monel alloys when used as directed. It can be used on titanium alloys when diluted to 10% in water at a maximum of 82°C (180°F).

TURCO 4181-GL is highly alkaline and should not be used on tin, aluminum, zinc or any alloy containing these metals as the major constituents.

Turco 4181-GL works well alone. However, cleaning performance can be enhanced with the use of Turco 4181-GL ADDITIVE.

2. Operating Summary:

<u>Chemical:</u>	<u>Bath Preparation per 100.0 Gallons:</u>
General Cleaning or Rust Removal:	
Turco 4181-GL	24.0 to 35.0 gallons
Turco 4181-GL Additive (optional)	6 to 9 fl. oz
Titanium and Ti Alloys:	
Turco 4181-GL	7.0 to 10.0 gallons
Turco 4181-GL Additive (optional)	2.3 to 2.9 fl. oz
<u>Operation and Control:</u>	
Turco 4181-GL Titration:	
Concentration:	7.3 to 10.6 points (best - maintain \pm 1 point) 2.4 to 3.0 points (Ti and Ti Alloys)
Temperature:	82-93C (180-200F) (general cleaning/rust removal)
	77-82C (170-180F) (titanium and Ti alloys)
<u>Processing Time:</u>	
Cleaning & Rust Removal:	15 to 60 minutes
Titanium and Titanium Alloys:	10 to 20 minutes

3. Materials:

Turco 4181-GL
Turco 4181-GL ADDITIVE
Testing Solutions and Reagents

4. Equipment:

The process tank, housing, pumps and piping for use with this solution may be constructed of mild steel. The heat exchanger plates should be polished 316 stainless steel. If gas fired burner tubes are used, they should be made of schedule 10 316 stainless steel pipe. All process circulating pump seals, valve seats, door seals, and other elastomers which come in contact with the working process solution should be Teflon™ or Hypalon. Viton™ may be used but its life will be shorter. EPDM elastomers should be avoided.

Automatic process control equipment, which promotes consistent quality and controlled costs, is available for automatically controlling this process. Auxiliary equipment, which is engineered and specified for this process, include air operated chemical transfer pumps, chemical metering pumps, reliable level controls, solenoid valve assemblies and bulk storage tanks. All chemical pump seals, valve seats and other elastomers which come in contact with the concentrated solution should be Teflon or Hypalon™.

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. Use Instructions:

Precleaning: Heavily soiled parts should be precleaned to remove excessive oils and shop soils to reduce excessive contamination of the Turco 4181-GL bath. Your HST Sales Representative can recommend a suitable precleaner based upon the type of soils involved and your precleaning operations.

Charging Tanks: TURCO 4181-GL is normally used at 24% to 35% in water. To prepare this solution, charge tank with 3/4 the required amount of cool clean water. Start mechanical agitation and slowly add TURCO 4181-GL) to agitated tank. Add balance of cool clean water to operating level.

Processing Parts: Maintain tank at 82° to 93°C. Immerse parts completely for 15 to 60 minutes with mechanical agitation. Air agitation is not recommended, since introduction of carbon dioxide affects the solution chemistry adversely. Rinse with warm to hot water, overflowing rinse is preferred.

NOTE: When processing titanium alloys, dilute to 7% to 10% with water. Operate tank from 73° to 82°C for 10 to 20 minutes. Higher concentrations and higher temperature may attack titanium alloys.

NOTE: When used with a precleaner and for parts with little soil, the use of the Turco 4181-GL ADDITIVE is probably not needed. For heavily soiled parts, extra cleaning and wetting is achieved with the use of the TURCO 4181-GL ADDITIVE. To make up the additive, dissolve the proper amount in an excess of warm water and add slowly to the process tank. Do not add the TURCO 4181-GL ADDITIVE directly to the process tank as it will agglomerate and not dissolve. Maintain the additive through small additions on a periodic basis if the parts fail to have a water break free appearance.

CONTROL:

TURCO 4181-GL Titration

Apparatus:

1. 205943 - Pipet, 10 mL
2. 205700 - Buret, 25 mL
3. 205982 - Erlenmeyer Flask, 250 mL
4. 205402 - Beaker, 250 mL
5. pH meter
6. Volumetric Flask, 250 mL

Reagents:

1. Standard Sulfuric Acid 1.0 N
2. Alizarin yellow, 1 % in isopropanol

Procedure:

1. Obtain a sample from the tank and allow to cool to room temperature.
2. Pipet 10 mL of the cooled sample into a 250 mL volumetric flask and add about 100 ml of deionized water
3. Mix well and pipet 20 mL of the diluted sample into a 250 mL beaker. Add 100 mL DI water.
4. Titrate to pH 11.4 with 1.0 N Sulfuric Acid , or to the Alizarin Yellow

indicator end point (4 drops - color change from pink to yellow).
5. the mls of titrating solution used is referred to as "points"

Calculation:

points x 3.3 = % by volume TURCO 4181-GL

To increase value 1 point: Add 3.3 gallon of Turco 4181-GL per 100 gallons of solution volume.

NOTE: The ratio of using Turco 4181-GL to 4181-L is 0.45. For example, a 35% solution of Turco 4181-GL is equivalent to a 73.5% solution of Turco 4181-L

7. Storage Requirements:

Extreme temperatures should be avoided when storing Turco 4181-GL. Indoor storage at or near ambient temperature is recommended. DO not store below 40F.

8. Waste Disposal Information:

Dispose of spent solution per local, state, federal and regional regulations. Refer to your HENKEL TECHNOLOGIES MATERIAL SAFETY DATA SHEET for additional disposal information.

DANGER! Contact may cause severe burns to skin and eyes.

TURCO 4181-GL contains sodium hydroxide. Avoid contact with eyes, skin and clothing. Do not take internally. Always use with adequate (equivalent to outdoor) ventilation.

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

Add product to cold water with care to prevent local pockets of steam. Keep containers sealed when not in use. Transport and store in closed containers below 55°C (132°F).

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

Before using this product refer to container label and HENKEL TECHNOLOGIES MATERIAL SAFETY DATA SHEET for additional precautionary, handling and first aid information.

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.

Testing Reagents and Apparatus
(Order only those items, which are not already on hand)

<u>Code</u>	<u>Quantity</u>	<u>Item</u>
592477.....	1	Buret assembly, 25 mL automatic
592463.....	1.	Beaker, 250 mL
592488.....	2*	Flask, Erlenmeyer, 250 mL
592493.....	2*	Pipette, 25 mL volumetric
592494.....	1.	Pipette Filler
**	1.	pH Meter
595584.....	1.	Pocket Thermometer, (0-220°F)

*Includes one more than actually required, to allow for possible breakage.

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