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March 11, 2022

Ms. Gwen Saliaries
Hydrogeologist
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
625 East County Road Y, Suite 700, Oshkosh, WI 54901

Subject: Absence of PFAS Compounds in the Former Manufacturing Process at the former FV Steel and Wire Company site at 111 North Douglas Street, Hortonville, Outagamie County, Wisconsin — BRRTS No. 02-45-560221. AECOM Project No. 60428891

Dear Ms. Saliaries,

This letter provides an evaluation of the potential historical use of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) as emerging contaminants at the above referenced facility in response to Wisconsin Department of Natural Resources (WDNR) letter to the FV Steel and Wire Company (FVSW) dated August 2020 and WDNR's letter dated May 19, 2021 regarding outstanding items of the Site Investigation. This evaluation considers the history of the facility, knowledge of the processes formerly used in the nail galvanization process, and the media used in those processes.

The nail cleaning and galvanizing processes conducted at the above referenced FV Steel & Wire facility are described in detail in the following paragraphs. The nail cleaning and galvanizing process are divided into two constituent groups based on the historical timeline of the facility. These include: 1) chlorinated solvents used for the nail cleaning process prior to mid-1990's, and 2) caustic and ammonia solutions used for nail cleaning after a process change in the mid-1990's.

1) Chlorinated Solvents use for Nail Cleaning

Prior to the mid-1990's, chlorinated solvents were used in the vapor degreasing process, which is generally referred to as Nail Cleaning. The chlorinated solvents used included tetrachloroethene (PCE) and trichloroethene (TCE). Nails would be cleaned in a large, enclosed tub using the vapor from chlorinated solvents. The heated vapor from the chlorinated solvents would remove the grease, oil and drawing lube that was on the surface of the nails. The use of chlorinated solvents resulted in a quick dry time between the cleaning process and galvanizing, which was the next step in the process. Nail galvanizing was performed by using molten zinc. Following the galvanizing process, nails may have been coated using a water-based paint, such as *WR Green Nail Coating*. The Material Safety Data Sheet (MSDS) for *WR Green Nail Coating* is including in Attachment 1.

2) Caustic and Ammonia use for Nail Cleaning

Chlorinated solvents were eliminated from use in the mid-1990's. Nail cleaning was then accomplished using caustic and ammonia solutions. The grease, oil, and drawing lube was removed from the surface of the nails by using an enclosed tub which contained a caustic solution with a defoaming agent added. Examples of defoaming agents included *Parco Cleaner 39L*, *NCI-B sodium hydroxide and potassium hydroxide solutions*, and *Defoamer* (MSDSs in Attachment 1). Following the caustic solution cleaning, an ammonia solution was used to

promote a quick dry time between cleaning and galvanizing. The ammonia solution *Zaclon Galvanizing Flux* (see MSDS in Attachment 1) was used to achieve quick drying times. The nail galvanizing and painting processes remained the same, using molten zinc and the water-based paint *WR Green Nail Coating*, respectively.

Furthermore, ventilation systems were used to collect and remove acidic vapors generated during the cleaning and galvanizing process. The ventilated air was discharged outside the building. Workers used the appropriate personal protective equipment (PPE). No wetting agents or fume suppressant additives, besides the aforementioned defoaming agents were used.

These processes, products, and facility-use descriptions are based on first-hand observation from former FVSW staff, research on the historical site operations, and assessment of similar facilities to the former FVSW site. Therefore, there is no evidence to suggest PFAS compounds were ever present at the site for use in the galvanization process or present on-site as a foaming agent for fume suppressant, and therefore do not warrant further consideration for Site Investigations under Wisconsin Administrative Code chapter NR-716.

If you have any comments or questions regarding the communications summarized above, please do not hesitate to contact Gary at (414) 526-6224.

Respectfully,

AECOM Technical Services, Inc.



Gary M. Braun, P.G. (IL)
Senior Hydrogeologist/Project Manager



Andrew Mott, P.G. (WI)
Senior Project Manager

cc Mr. Chad Erdmann, Environmental Manager, FVSW
Mr. Howard Law, General Counsel, GFG Alliance

Attachment 1
Material Safety Data Sheets

WR Green Nail Coating

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MATERIAL SAFETY DATA SHEET

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 | SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION |
 =====|

PRODUCT NAME : W/R GREEN NAIL COATING
 IDENTIFICATION NUMBER: 160-G-28 DATE PRINTED: 04/11/03
 PRODUCT USE/CLASS :

SUPPLIER:
 NATIONAL COATINGS, INC.
 604 US HWY 150 EAST
 GALESBURG, IL.
 61402

MANUFACTURER:
 NATIONAL COATINGS, INC.
 604 US HWY 150 EAST
 GALESBURG, IL.
 61402

EMERGENCY TELEPHONE: 800-535-5053
 24 HRS

EMERGENCY TELEPHONE: 800-535-5053
 24 HRS

PREPARER: NCI, PHONE: 309-342-4184, PREPARE DATE: 04/11/03

=====|
 | SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS |
 =====|

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % EQUAL TO
01	WATER	7732-18-5	59.8 %

ITEM	EXPOSURE LIMITS				SKIN
	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-CEILING	
01	NONE	NONE			NO

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

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 | SECTION 3 - HAZARDS IDENTIFICATION |
 =====|

*** EMERGENCY OVERVIEW ***: MAY BE IRRITATING IF SWALLOWED, INHALED,
 ABSORBED THROUGH SKIN, OR INGESTED.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: SEVERE IRRITATION, REDNESS, TEARING
 AND BLURRED VISION.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: SLIGHT IRRITATION. PROLONGED OR
 REPEATED EXPOSURE CAN CAUSE DERMATITIS. REPEATED EXPOSURE TO HIGH
 CONCENTRATIONS THROUGH ABSORPTION MAY CAUSE INJURY TO BONE MARROW AND BLOOD
 CELLS, KIDNEY, LIVER AND TESTES.

EFFECTS OF OVEREXPOSURE - INHALATION: EXCESSIVE INHALATION OF VAPORS CAN
 CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE,

(CONTINUED ON PAGE 2)

SECTION 3 - HAZARDS IDENTIFICATION

NAUSEA, AND HEADACHE. HIGH CONCENTRATIONS MAY RESULT ON NARCOSIS.

EFFECTS OF OVEREXPOSURE - INGESTION: CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING AND DIARRHEA.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: THIS MATERIAL MAY AGGRAVATE AN EXISTING DERMATITIS. BREATHING OF VAPOR AND/OR MIST MAY AGGRAVATE ASTHMA AND INFLAMMATORY FIBROSIS PULMONARY DISEASE.

PRIMARY ROUTE(S) OF ENTRY: INGESTION

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT: FLUSH WITH CLEAN, LUKEWARM WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE EYELIDS. OBTAIN MEDICAL ATTENTION.

FIRST AID - SKIN CONTACT: REMOVE CONTAMINATED CLOTHING. WASH AFFECTED SKIN AREAS THOROUGHLY WITH SOAP AND WATER. WAS CONTAMINATED CLOTHING THOROUGHLY BEFORE RE-USE.

FIRST AID - INHALATION: REMOVE TO FRESH AIR. APPLY ARTIFICIAL RESPIRATION OR ADMINISTER OXYGEN, IF NECESSARY. CALL A PHYSICIAN IMMEDIATELY.

FIRST AID - INGESTION: IMMEDIATELY GIVE TWO GLASSES OF WATER AND INDUCE VOMITING EITHER BY GIVING IPECAC SYRUP OR BY PLACING FINGER AT BACK OF THROAT. NEVER ADMINISTER ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 230 F
(SETAFLASH CLOSED CUP)

LOWER EXPLOSIVE LIMIT: N.A.
UPPER EXPLOSIVE LIMIT: N.A.

AUTOIGNITION TEMPERATURE:

EXTINGUISHING MEDIA: WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS: COMBUSTIBLE LIQUID. CAN FORM EXPLOSIVE MIXTURES AT TEMPERATURES AT OR ABOVE THE FLASHPOINT. THE USE OF SELF-CONTAINED BREATHING APPARATUS IS RECOMMENDED FOR FIREFIGHTERS. AVOID SPREADING BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES.

SPECIAL FIREFIGHTING PROCEDURES: THE USE OF SELF-CONTAINED BREATHING APPARATUS IS RECOMMENDED FOR FIREFIGHTERS. WATER SPRAY MAY BE USED FOR COOLING CONTAINERS TO PREVENT POSSIBLE PRESSURE BUILD-UP AND POSSIBLE AUTOIGNITION OR EXPLOSION WHEN EXPOSED TO EXTREME HEAT. AVOID SPREADING BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES.

(CONTINUED ON PAGE 3)

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: ABSORB SPILL WITH INERT MATERIAL (E.G. DRY SAND OR EARTH), THEN PLACE IN A CHEMICAL WASTE CONTAINER. AVOID RUNOFF INTO STORM SEWERS AND DITCHES WHICH LEAD TO WATERWAYS. WEAR A SELF-CONTAINED BREATHING APPARATUS AND APPROPRIATE PROTECTIVE EQUIPMENT.

SECTION 7 - HANDLING AND STORAGE

HANDLING: WASH THOROUGHLY AFTER HANDLING. ALL EQUIPMENT SHOULD BE GROUNDED AND BONDED TO REDUCE STATIC ELECTRICITY HAZARD. USE NON-SPARKING TOOLS.

STORAGE:

DRUMS: STORAGE ABOVE 32 DEGREES FAHRENHEIT IS PREFERRED. ALTHOUGH THIS MATERIAL IS COMBUSTIBLE WITH A FLASHPOINT ABOVE 200 DEGREES FAHRENHEIT, VAPORS CAN COLLECT ABOVE THE LIQUID IN CLOSED CONTAINERS. PROTECT AGAINST PHYSICAL DAMAGE. CLOSE CONTAINERS AFTER EACH USE. ISOLATE CONTAINERS FROM EXTREME HEAT, ELECTRICAL EQUIPMENT, SPARKS, AND OPEN FLAMES. CLOSED CONTAINERS MAY RUPTURE (DUE TO BUILD-UP OF PRESSURE) WHEN EXPOSED TO EXTREME HEAT.

BULK: STORAGE SHOULD BE IN STANDARD BULK LIQUID STORAGE TANKS ABOVE 32 DEGREES FAHRENHEIT IS PREFERRED. ALTHOUGH THIS MATERIAL IS COMBUSTIBLE WITH A FLASHPOINT ABOVE 200 DEGREES FAHRENHEIT, VAPORS CAN COLLECT ABOVE THE LIQUID IN CLOSED STORAGE VESSELS. STORAGE TANKS SHOULD BE ISOLATED FROM EXTREME HEAT, ELECTRICAL EQUIPMENT, SPARKS, AND OPEN FLAMES.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: LOCAL EXHAUST VENTILATION MAY BE NECESSARY TO CONTROL ANY AIR CONTAMINANTS TO WITHIN THEIR TLVS DURING THE USE OF THIS PRODUCT.

RESPIRATORY PROTECTION: LOCAL EXHAUST MUST BE SUFFICIENT TO KEEP AIRBORNE VAPOR CONCENTRATIONS BELOW THE TLV LIMIT. EXHAUST AIR MAY NEED TO BE CLEANED BY SCRUBBERS OR FILTERS TO REDUCE ENVIRONMENTAL CONTAMINATION.

SKIN PROTECTION: BUTYL RUBBER

EYE PROTECTION: SAFETY GLASSES WITH SIDE SHIELDS.

OTHER PROTECTIVE EQUIPMENT: EYE BATH AND SAFETY SHOWER. TO PREVENT REPEATED OR PROLONGED SKIN CONTACT, WEAR IMPERVIOUS CLOTHING, BOOTS, AND PROTECTIVE CREAM IF NECESSARY.

HYGIENIC PRACTICES: WASH HANDS BEFORE EATING, SMOKING, BREAKS, OR USING RESTROOM.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE	: N.A.	VAPOR DENSITY	: IS HEAVIER THAN AIR
ODOR	:	ODOR THRESHOLD	:
APPEARANCE	:	EVAPORATION RATE:	IS SLOWER THAN BUTYL
SOLUBILITY IN H2O	:		ACETATE
FREEZE POINT	:	SPECIFIC GRAVITY:	1.0580
VAPOR PRESSURE	:	PH @ 0.0 %	:
PHYSICAL STATE	:	VISCOSITY	:

COEFFICIENT OF WATER/OIL DISTRIBUTION:

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: PROTECT AGAINST PHYSICAL DAMAGE. OUTSIDE OR DETACHED STORAGE PREFERRED. KEEP AWAY FROM HEAT, SPARKS, OPEN FLAME. CLOSE CONTAINERS AFTER EACH USE.

INCOMPATIBILITY: INCOMPATIBLY WITH NON-WATER SOLUBLE SOLVENTS

HAZARDOUS DECOMPOSITION PRODUCTS: IF THERMAL DECOMPOSITION OCCURS IT MAY YIELD CARBON DIOXIDE AND / OR CARBON MONOXIDE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: WASTE MATERIAL MUST BE DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATORY CONTROLS. WE RECOMMEND THAT CONTAINERS BE EITHER PROFESSIONALLY RECONDITIONED FOR REUSE BY CERTIFIED FIRMS OR PROPERLY DISPOSED OF BY CERTIFIED FIRMS TO HELP REDUCE THE POSSIBILITY OF AN ACCIDENT.

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:

THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA 'HAZARD CATEGORIES' PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:

NONE

(CONTINUED ON PAGE 5)

SECTION 15 - REGULATORY INFORMATION

SARA SECTION 313:

THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

----- CHEMICAL NAME -----	CAS NUMBER	WT/WT %
NO SARA SECTION 313 COMPONENTS EXIST IN THIS PRODUCT.		

TOXIC SUBSTANCES CONTROL ACT:

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICAL SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF TSCA 12(B) IF EXPORTED FROM THE UNITED STATES:

----- CHEMICAL NAME -----	CAS NUMBER
NO INFORMATION IS AVAILABLE.	

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: THIS MSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTROLLED PRODUCT REGULATIONS EXCEPT FOR USE OF THE 16 HEADINGS.

CANADIAN WHMIS CLASS: NO INFORMATION AVAILABLE.

SECTION 16 - OTHER INFORMATION

HMIS RATINGS - HEALTH: 1 FLAMMABILITY: 1 REACTIVITY: 0

PREVIOUS MSDS REVISION DATE: 10/11/02

VOLATILE ORGANIC COMPOUNDS (VOCs): 0.98 LBS/GAL EXCLUDING WATER

LEGEND: N.A. - NOT APPLICABLE, N.E. - NOT ESTABLISHED,
N.D. - NOT DETERMINED

WHILE NATIONAL COATINGS, INC., BELIEVES THE INFORMATION CONTAINED HEREIN IS, ACCURATE AND DERIVED FROM RELIABLE SOURCES. THE DATA IS PROVIDED WITHOUT REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED REGARDING ITS ACCURACY OR CORRECTNESS. THE DATA IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND CERTIFICATION.

THE INFORMATION CONTAINED HEREIN IS, TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE. HOWEVER, SINCE THE CONDITIONS OF HANDLING AND USE ARE BEYOND OUR CONTROL, WE MAKE NO GUARANTEE OF RESULTS, AND ASSUME NO LIABILITY FOR DAMAGES INCURRED BY USE OF THIS MATERIAL. IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

<END OF MSDS>

Parco Cleaner 39L

Material Safety Data Sheet

5939300

Material Name: PARCO CLEANER 39L

ID: 238545PST330 / IDH No. 621385

*** Section 1 - Chemical Product and Company Identification ***

Product Trade Name PARCO CLEANER 39L

Manufacturer Information

Henkel Technologies
Henkel Corporation
32100 Stephenson Highway
Madison Heights, MI 48071

Contact Phone: (248) 583-9300

Chemtrec Emergency # (800) 424-9300

*** Section 2 - Composition / Information on Ingredients ***

CAS #	Component	Percent
1310-73-2	Sodium hydroxide	10-30
1310-58-3	Potassium hydroxide	1-10
6834-92-0	Sodium metasilicate	1-10
527-07-1	Sodium gluconate	1-10

*** Section 3 - Hazards Identification ***

Emergency Overview:

DANGER! Contact with this material will cause burns to the skin, eyes and mucous membranes.

Potential Health Effects:

Skin contact and inhalation are expected to be the primary routes of occupational exposure to this material. Based on its composition, it is anticipated to be slightly toxic if swallowed or absorbed through skin and corrosive to the eyes, skin, and respiratory tract. This material may produce burns which are not immediately painful or visible. Dusts or mists may produce lung injury and chemical pneumonia. Lower concentrations may produce irritation of eyes, nose or upper respiratory tract with coughing, sore throat and shortness of breath. Prolonged exposure may result in ulceration of the nasal passages. If swallowed, this material may cause mild to severe burns of the mouth, throat and digestive tract. Medical conditions which may be aggravated by exposure to this material include lung disease or limited respiratory capacity.

*** Section 4 - First Aid Measures ***

Eye Contact:

In case of contact with the eyes, rinse immediately with plenty of water for 15 minutes, and seek immediate medical attention.

Skin Contact:

For skin contact flush with large amounts of water while removing contaminated clothing. If irritation persists, get medical attention. Discard any shoes or clothing items that cannot be decontaminated.

Ingestion:

If the material is swallowed, get immediate medical attention or advice -- Do not induce vomiting. Give one to two glasses of water or milk. Never give anything by mouth to a victim who is unconscious or is having convulsions.

Inhalation:

If mist or vapor of this product is inhaled, remove person immediately to fresh air. Seek medical attention if symptoms develop or persist.

*** Section 5 - Fire Fighting Measures ***

Flash Point: NA

Method Used:

Flammability
Classification:

Upper Flammable
Limit (UFL): NA

Lower Flammable
Limit (LFL): NA

Material Safety Data Sheet

5939300

Material Name: PARCO CLEANER 39L

ID: 238545PST330 / IDH No. 621385

Fire & Explosion Hazards:

This product is an aqueous mixture which will not burn. If evaporated to dryness, the solid residue may pose a moderate fire hazard.

Extinguishing Media:

Use methods for the surrounding fire.

Fire-Fighting Instructions:

This material is not flammable. However, as in fighting any fire, fire fighters and others who may be exposed to products of combustion should wear full fire fighting gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved of equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

*** Section 6 - Accidental Release Measures ***

Clean-Up Procedures:

Collect spilled material with an inert absorbent such as sand or vermiculite. Place in properly labeled closed container. Dispose of collected material according to regulation.

*** Section 7 - Handling and Storage ***

Handling Procedures:

Do not get in eyes, on skin or clothing. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Storage Procedures:

This material is not hazardous under normal storage conditions; however, material should be stored in closed containers, in a secure area to prevent container damage and subsequent spillage.

*** Section 8 - Exposure Controls / Personal Protection ***

Component Exposure Limits

Sodium hydroxide (1310-73-2)

ACGIH: 2 mg/m3 Ceiling

OSHA: 2 mg/m3 TWA

NIOSH: 2 mg/m3 Ceiling

Potassium hydroxide (1310-58-3)

ACGIH: 2 mg/m3 Ceiling

NIOSH: 2 mg/m3 Ceiling

Engineering Controls:

Ventilation should effectively remove and prevent buildup of any vapor or mist generated from the handling of this product.

PERSONAL PROTECTIVE EQUIPMENT

As prescribed in the OSHA Standard for Personal Protective Equipment (29 CFR 1910.132), employers must perform a Hazard Assessment of all workplaces to determine the need for, and selection of, proper protective equipment for each task performed.

Eyes/Face Protective Equipment:

Wear chemical goggles; face shield (if splashing is possible).

Skin Protection:

Use impervious gloves. Use of impervious apron and boots are recommended.

Respiratory Protection:

If ventilation is not sufficient to effectively prevent buildup of aerosols or vapors, appropriate NIOSH/MSHA respiratory protection must be provided.

*** Section 9 - Physical & Chemical Properties ***

Material Safety Data Sheet

5939300

Material Name: PARCO CLEANER 39L

ID: 238545PST330 / IDH No. 621385

Physical State: Liquid
Odor:
Vapor Density: NA
Melting Point: NE
pH: NE
VOC:

Appearance: Clear amber liquid
Vapor Pressure: Nil
Boiling Point: NE
Specific Gravity: 1.41
Viscosity:
Solubility Water: Soluble

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability:

This material is chemically stable under normal and anticipated storage and handling conditions.

Incompatibility:

Strong Acids: Avoid contact with acids, aluminum, tin and zinc, as a violent or explosive eruption could occur.

Decomposition Products:

Oxides of carbon; nitrogen compounds.

Hazardous Polymerization:

Does not occur.

*** Section 11 - Toxicological Information ***

Acute Toxicity:

A: General Product Information

No information available for the product.

B: Component Analysis - LD50/LC50

Sodium hydroxide (1310-73-2)

Dermal LD50 Rabbit: 1350 mg/kg

Potassium hydroxide (1310-58-3)

Oral LD50 Rat: 214 mg/kg

Sodium metasilicate (6834-92-0)

Oral LD50 Rat: 600 mg/kg

Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Chronic Toxicity

No information available for the product.

Epidemiology:

No information available for the product.

Neurotoxicity:

No information available for the product.

Mutagenicity:

No information available for the product.

Teratogenicity:

No information available for the product.

*** Section 12 - Ecological Information ***

Ecotoxicity:

A: General Product Information

No information available for the product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Potassium hydroxide (1310-58-3)

Test & Species

Conditions

Material Safety Data Sheet

5939300

Material Name: PARCO CLEANER 39L

ID: 238545PST330 / IDH No. 621385

24 Hr LC50 mosquito fish

80.0 mg/L

Environmental Fate:

No data is available concerning the environmental fate, biodegradation or bioconcentration for this product.

*** Section 13 - Disposal Considerations ***

US EPA Waste Numbers & Descriptions:

A: General Product Information

Recover, reclaim or recycle when practical. Dispose of in accordance with federal, state and local regulations.

Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: Please refer to the container label for transportation information.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Sodium hydroxide (1310-73-2)

CERCLA: 1000 lb final RQ; 454 kg final RQ

Potassium hydroxide (1310-58-3)

CERCLA: 1000 lb final RQ; 454 kg final RQ

SARA 311/312: Acute: Y Chronic: N Fire: N Pressure: N Reactive: N

State Regulations

A: General Product Information

No additional information available.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Sodium hydroxide	1310-73-2	Yes	No	Yes	Yes	Yes	Yes
Potassium hydroxide	1310-58-3	Yes	No	Yes	Yes	Yes	Yes

Other Regulations

A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

Material Safety Data Sheet

5939300

Material Name: PARCO CLEANER 39L

ID: 238545PST330 / IDH No. 621385

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Sodium hydroxide	1310-73-2	Yes	Yes	Yes
Potassium hydroxide	1310-58-3	Yes	Yes	Yes
Sodium metasilicate	6834-92-0	Yes	Yes	Yes
Sodium gluconate	527-07-1	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Sodium hydroxide	1310-73-2	1 %
Potassium hydroxide	1310-58-3	1 %
Sodium metasilicate	6834-92-0	1 %

*** Section 16 - Other Information ***

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; NFPA = National Fire Protection Association; HMIS = Hazardous Material Identification System; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act

The information presented herein is believed to be factual as it has been derived from the works and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warranty or representation for which Henkel Surface Technologies bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.

Contact: Regulatory Affairs and Product Acceptance

Contact Phone: (248) 583-9300

This is the end of MSDS # 238545PST330 / IDH No. 621385

NCI-B Caustic Nail Cleaner

NCI-B

MATERIAL SAFETY DATA SHEET

NFPA Ratings (scale 0-4) Health=3 Fire=0 Reactivity=1

SECTION I: ----- IDENTIFICATION-----

Effective Date: 7-15-93

Revised: 09-16-96

Name and Address:

Phone: (317) 845-0045

Emergency Phone: CHEMTREC (800)424-9300

CROWN TECHNOLOGY, INC.

7513 E. 96th St.

Indianapolis, IN 46256

Chemical Description: solution of sodium and potassium hydroxide

Synonyms: N/A

D.O.T.: Corrosive, liquid, basic, inorganic, n.o.s., 8, UN 3266, II, RQ,
(sodium hydroxide)

SECTION II: ----- INGREDIENTS-----

	CAS #	%	TLV (ACGIH)
Potassium hydroxide	1310-58-3	10-15	2mg/m3
Sodium hydroxide	1310-73-2	30-40	2mg/m3

- Hazardous under OSHA Hazard communication standard, 29 CFR 1910.1200
- Not listed as toxic chemicals under SARA 313

SECTION III: ----- PHYSICAL PROPERTIES-----

Specific gravity: 1.51-1.53

Percent Volatile (volume): < 5

pH (10% v/v): >12.0

Appearance and odor: Colorless liquid with no noticeable odor

Solubility in water: completely soluble

SECTION IV: ----- FIRE AND EXPLOSION HAZARD DATA-----

Flash Point (method used): None Known

Flammable Limits in Air (lower): N/A

(upper): N/A

Extinguishing Media: Appropriate to surrounding fire

Special Firefighting procedures: Firefighters should wear normal protective equipment. Self-contained breathing apparatus should be used in confined areas.

Unusual Fire or Explosion Hazards: Contact with reactive metals may produce hydrogen gas

SECTION VIII: ----- ENVIRONMENTAL DATA-----

- A. Spill or leak procedures: Small spills should be contained with an absorbent material. Shovel material into a suitable container. Large spills should be diked and pumped into suitable containers.
- B. Waste Disposal: This material is considered a hazardous waste if it becomes a waste material. Material must be solidified with a stabilizing agent so that no free liquid remains before disposing to a hazardous waste landfill. Obey all federal, state, and local regulations.
- C. Other Environmental Data: The product should not be discharged directly into streams or waterways.

SECTION IX: ----- SPECIAL PRECAUTIONS-----

- A. Handling and Storage: Keep containers tightly closed when not in use. Product should be pumpable to 5 degrees F.
- B. Other Precautions: This product has been designed for use in specific types of applications and should be used only in accordance with the instructions provided by the technical representative servicing the facility. Use in vicinity of eyewash and safety shower.

Judgements as to the suitability of information herein for purchaser's purposes are purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Crown Technology, Inc. extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for the consequences of its use.

Defoamer

M A T E R I A L S A F E T Y D A T A S H E E T

=====

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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PRODUCT NAME : DEFOAMER
IDENTIFICATION NUMBER: NCM-45

SUPPLIER:
NATIONAL COATINGS, INC.
604 US HWY 150 EAST
GALESBURG, IL.
61402

MANUFACTURER:
NATIONAL COATINGS, INC.
604 US HWY 150 EAST
GALESBURG, IL.
61402

EMERGENCY TELEPHONE: 800-535-5053
24 HRS

EMERGENCY TELEPHONE: 800-535-5053
24 HRS

PREPARER: NCI, PHONE: 309-342-4184, PREPARE DATE: 02/23/07

=====

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

=====

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % EQUAL TO
01	LOW AROMATIC MINERAL SPIRITS	64742-47-8	38.5 %
02	2-BUTOXYETHANOL	111-76-2	7.3 %

EXPOSURE LIMITS

ITEM	ACGIH		OSHA		COMPANY TLV-TWA	SKIN
	TLV-TWA	TLV-STEL	PEL-TWA	PEL-CEILING		
01	100 PPM	NO INFO				NO
02	25 PPM	NO INFO				NO

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

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SECTION 3 - HAZARDS IDENTIFICATION

=====

*** EMERGENCY OVERVIEW ***: MAY BE IRRITATING IF SWALLOWED, INHALED,
ABSORBED THROUGH SKIN, OR INGESTED.

EFFECTS OF OVEREXPOSURE - EYE CONTACT: SEVERE IRRITATION, REDNESS, TEARING
AND BLURRED VISION.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: SLIGHT IRRITATION. PROLONGED OR
REPEATED EXPOSURE CAN CAUSE DERMATITIS. REPEATED EXPOSURE TO HIGH
CONCENTRATIONS THROUGH ABSORPTION MAY CAUSE INJURY TO BONE MARROW AND BLOOD
CELLS, KIDNEY, LIVER AND TESTES.

(CONTINUED ON PAGE 2)

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=====|
| SECTION 3 - HAZARDS IDENTIFICATION |
=====|

EFFECTS OF OVEREXPOSURE - INHALATION: EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, AND HEADACHE. HIGH CONCENTRATIONS MAY RESULT ON NARCOSIS.

EFFECTS OF OVEREXPOSURE - INGESTION: CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING AND DIARRHEA.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: THIS MATERIAL MAY AGGRAVATE AN EXISTING DERMATITIS. BREATHING OF VAPOR AND/OR MIST MAY AGGRAVATE ASTHMA AND INFLAMMATORY FIBROSIS PULMONARY DISEASE.

PRIMARY ROUTE(S) OF ENTRY: INHALATION

=====|
| SECTION 4 - FIRST AID MEASURES |
=====|

FIRST AID - EYE CONTACT: FLUSH WITH CLEAN, LUKEWARM WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE EYELIDS. OBTAIN MEDICAL ATTENTION.

FIRST AID - SKIN CONTACT: REMOVE CONTAMINATED CLOTHING. WASH AFFECTED SKIN AREAS THOROUGHLY WITH SOAP AND WATER. WASH CONTAMINATED CLOTHING THOROUGHLY BEFORE RE-USE.

FIRST AID - INHALATION: REMOVE TO FRESH AIR. APPLY ARTIFICIAL RESPIRATION OR ADMINISTER OXYGEN, IF NECESSARY. CALL A PHYSICIAN IMMEDIATELY.

FIRST AID - INGESTION: IMMEDIATELY GIVE TWO GLASSES OF WATER AND INDUCE VOMITING EITHER BY GIVING IPECAC SYRUP OR BY PLACING FINGER AT BACK OF THROAT. NEVER ADMINISTER ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET IMMEDIATE MEDICAL ATTENTION.

=====|
| SECTION 5 - FIRE FIGHTING MEASURES |
=====|

FLASH POINT: 140 F
(SETAFLASH CLOSED CUP)

LOWER EXPLOSIVE LIMIT: 0.9 %
UPPER EXPLOSIVE LIMIT: 10.6 %

AUTOIGNITION TEMPERATURE:

EXTINGUISHING MEDIA: CO2 DRY CHEMICAL FOAM

UNUSUAL FIRE AND EXPLOSION HAZARDS: ALTHOUGH THIS MATERIAL IS COMBUSTIBLE WITH FLASH POINT ABOVE 100 AND BELOW 200 DEGREES FAHRENHEIT, VAPORS CAN COLLECT ABOVE THE LIQUID IN CLOSED CONTAINERS AND STORAGE VESSELS. KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE CONTAINERS FROM EXTREME HEAT, ELECTRICAL EQUIPMENT, SPARKS, AND OPEN FLAMES. CLOSED CONTAINERS MAY RUPTURE (DUE TO BUILD-UP OF PRESSURE) WHEN EXPOSED TO EXTREME HEAT.

SPECIAL FIREFIGHTING PROCEDURES: THE USE OF SELF-CONTAINED BREATHING APPARATUS IS RECOMMENDED FOR FIREFIGHTERS. WATER SPRAY MAY BE USED FOR COOLING CONTAINERS TO PREVENT POSSIBLE PRESSURE BUILD-UP AND POSSIBLE AUTOIGNITION OR EXPLOSION WHEN EXPOSED TO EXTREME HEAT. AVOID SPREADING

(CONTINUED ON PAGE 3)

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=====|
| SECTION 5 - FIRE FIGHTING MEASURES |
=====|

BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES.

=====|
| SECTION 6 - ACCIDENTAL RELEASE MEASURES |
=====|

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: ABSORB SPILL WITH INERT MATERIAL (E.G. DRY SAND OR EARTH), THEN PLACE IN A CHEMICAL WASTE CONTAINER. AVOID RUNOFF INTO STORM SEWERS AND DITCHES WHICH LEAD TO WATERWAYS. WEAR A SELF-CONTAINED BREATHING APPARATUS AND APPROPRIATE PROTECTIVE EQUIPMENT.

=====|
| SECTION 7 - HANDLING AND STORAGE |
=====|

HANDLING: WASH THOROUGHLY AFTER HANDLING. ALL EQUIPMENT SHOULD BE GROUNDED AND BONDED TO REDUCE STATIC ELECTRICITY HAZARD. USE NON-SPARKING TOOLS.

STORAGE: DRUMS: STORAGE ABOVE 32 DEGREES FAHRENHEIT IS PREFERRED. KEEP MATERIAL FROM FREEZING. ALTHOUGH THIS MATERIAL IS COMBUSTIBLE WITH A FLASH POINT ABOVE 100 AND BELOW 200 DEGREES FAHRENHEIT, VAPORS CAN COLLECT ABOVE THE LIQUID IN CLOSED CONTAINERS. PROTECT AGAINST PHYSICAL DAMAGE. CLOSE CONTAINERS AFTER EACH USE. ISOLATE CONTAINERS FROM EXTREME HEAT, ELECTRICAL EQUIPMENT, SPARKS, AND OPEN FLAMES. CLOSED CONTAINERS MAY RUPTURE (DUE TO BUILD-UP OF PRESSURE) WHEN EXPOSED TO EXTREME HEAT. BULK: STORAGE SHOULD BE IN STANDARD BULK LIQUID STORAGE TANKS ABOVE 32 DEGREES FAHRENHEIT. KEEP MATERIAL FROM FREEZING. ALTHOUGH THIS MATERIAL IS COMBUSTIBLE WITH FLASH POINT ABOVE 100 AND BELOW 200 DEGREES FAHRENHEIT, VAPORS CAN COLLECT ABOVE THE LIQUID IN CLOSED STORAGE VESSELS. STORAGE TANKS SHOULD BE ISOLATED FROM EXTREME HEAT, ELECTRICAL EQUIPMENT, SPARKS, AND OPEN FLAMES.

=====|
| SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION |
=====|

ENGINEERING CONTROLS: LOCAL EXHAUST VENTILATION MAY BE NECESSARY TO CONTROL ANY AIR CONTAMINANTS TO WITHIN THEIR TLVS DURING THE USE OF THIS PRODUCT.

RESPIRATORY PROTECTION: LOCAL EXHAUST MUST BE SUFFICIENT TO KEEP AIRBORNE VAPOR CONCENTRATIONS BELOW THE TLV LIMIT. EXHAUST AIR MAY NEED TO BE CLEANED BY SCRUBBERS OR FILTERS TO REDUCE ENVIRONMENTAL CONTAMINATION.

SKIN PROTECTION: BUTYL RUBBER

EYE PROTECTION: SAFETY GLASSES WITH SIDE SHIELDS.

OTHER PROTECTIVE EQUIPMENT: EYE BATH AND SAFETY SHOWER. TO PREVENT REPEATED OR PROLONGED SKIN CONTACT, WEAR IMPERVIOUS CLOTHING, BOOTS, AND PROTECTIVE CREAM IF NECESSARY.

HYGIENIC PRACTICES: WASH HANDS BEFORE EATING, SMOKING, BREAKS, OR USING RESTROOM.

(CONTINUED ON PAGE 4)

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=====|
| SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES |
=====|

BOILING RANGE : 318 - 386 F VAPOR DENSITY : IS HEAVIER THAN AIR
ODOR : ODOR THRESHOLD :
APPEARANCE : EVAPORATION RATE: IS SLOWER THAN BUTYL
SOLUBILITY IN H2O : ACETATE
FREEZE POINT : SPECIFIC GRAVITY:
VAPOR PRESSURE : PH @ 0.0 % :
PHYSICAL STATE : VISCOSITY :
COEFFICIENT OF WATER/OIL DISTRIBUTION:

(SEE SECTION 16 FOR ABBREVIATION LEGEND)

=====|
| SECTION 10 - STABILITY AND REACTIVITY |
=====|

CONDITIONS TO AVOID: PROTECT AGAINST PHYSICAL DAMAGE. OUTSIDE OR DETACHED STORAGE PREFERRED. KEEP AWAY FROM HEAT, SPARKS, OPEN FLAME. CLOSE CONTAINERS AFTER EACH USE.

INCOMPATIBILITY: INCOMPATIBLY WITH NON-WATER SOLUBLE SOLVENTS

HAZARDOUS DECOMPOSITION PRODUCTS: IF THERMAL DECOMPOSITION OCCURS IT MAY YIELD CARBON DIOXIDE AND / OR CARBON MONOXIDE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR UNDER NORMAL CONDITIONS.

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

=====|
| SECTION 13 - DISPOSAL CONSIDERATIONS |
=====|

DISPOSAL METHOD: WASTE MATERIAL MUST BE DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATORY CONTROLS. WE RECOMMEND THAT CONTAINERS BE EITHER PROFESSIONALLY RECONDITIONED FOR REUSE BY CERTIFIED FIRMS OR PROPERLY DISPOSED OF BY CERTIFIED FIRMS TO HELP REDUCE THE POSSIBILITY OF AN ACCIDENT.

=====|
| SECTION 15 - REGULATORY INFORMATION |
=====|

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:

THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA 'HAZARD CATEGORIES' PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:

NONE

(CONTINUED ON PAGE 5)

=====

=====|
SECTION 15 - REGULATORY INFORMATION
=====|

SARA SECTION 313:

THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

----- CHEMICAL NAME -----	CAS NUMBER	WT/WT %
2-BUTOXYETHANOL	111-76-2	7.3 %

TOXIC SUBSTANCES CONTROL ACT:

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICAL SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF TSCA 12(B) IF EXPORTED FROM THE UNITED STATES:

----- CHEMICAL NAME -----	CAS NUMBER
NO INFORMATION IS AVAILABLE.	

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: THIS MSDS HAS BEEN PREPARED IN COMPLIANCE WITH CONTROLLED PRODUCT REGULATIONS EXCEPT FOR USE OF THE 16 HEADINGS.

CANADIAN WHMIS CLASS: NO INFORMATION AVAILABLE.

=====|
SECTION 16 - OTHER INFORMATION
=====|

HMIS RATINGS - HEALTH: 2 FLAMMABILITY: 2 REACTIVITY: 0

PREVIOUS MSDS REVISION DATE: 11/10/03

VOLATILE ORGANIC COMPOUNDS (VOC): 3.41 LBS/GAL, 408 GRAMS/LTR

LEGEND: N.A. - NOT APPLICABLE, N.E. - NOT ESTABLISHED,
N.D. - NOT DETERMINED

=====

WHILE NATIONAL COATINGS, INC., BELIEVES THE INFORMATION CONTAINED HEREIN IS, ACCURATE AND DERIVED FROM RELIABLE SOURCES. THE DATA IS PROVIDED WITHOUT REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED REGARDING ITS ACCURACY OR CORRECTNESS. THE DATA IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND CERTIFICATION.

THE INFORMATION CONTAINED HEREIN IS, TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE. HOWEVER, SINCE THE CONDITIONS OF HANDLING AND USE ARE BEYOND OUR CONTROL, WE MAKE NO GUARANTEE OF RESULTS, AND ASSUME NO LIABILITY FOR DAMAGES INCURRED BY USE OF THIS MATERIAL. IT IS THE RESPONSIBILITY OF THE USER TO COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

=====

<END OF MSDS>

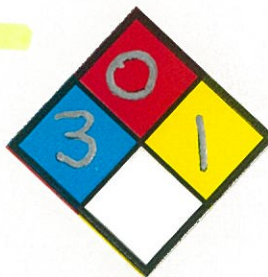
Zalcon Galvanizing Flux

REPORT NUMBER: 703
MSDS NO: P15685VS
MAINFRAME UPLOAD DATE: 02/05/97

VAN WATERS & ROGERS INC.
MATERIAL SAFETY DATA SHEET

PAGE: 001
VERSION: 004

PRODUCT: ZACLON GALVANIZING FLUXES (C-R)



ORDER NO: 145791
PROD NO : 670596

KEYSTONE STEEL & WIRE
DIV
7000 S W ADAMS ST

PEORIA ,IL 61605

VAN WATERS & ROGERS INC. , A ROYAL VOPAK COMPANY (425)889-3400
6100 CARILLON POINT , KIRKLAND , WA 98033

----- EMERGENCY ASSISTANCE -----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC
(800)424-9300

SECTION I PRODUCT IDENTIFICATION

PRODUCT NAME: ZACLON GALVANIZING FLUXES (C-R)
MSDS #: P15685VS
DATE ISSUED: 6/96
ISSUED BY: 005983

GRADE
C; C-GRAN; CS; CS-GRAN;
K; F; FP; FP-RODS; 2N-REG;
2NP; 2N-NF; 2N-RODS; R
8 DRY PREFLUX; 6 DRY PREFLUX

CAS REGISTRY NO.
SEE PAGE 2

CAS NAME
ZINC AMMONIUM CHLORIDE

CHEMICAL FAMILY
INORGANIC SALT MIXTURES

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PRODUCT: ZACLON GALVANIZING FLUXES (C-R)

ORDER NO: 145791

PROD NO : 670596

FORMULA
PROPRIETARY

SARA/TITLE III STATUS
SEE ADDITIONAL INFORMATION AND
HAZARDOUS COMPONENTS SECT. PG 2

PHYSICAL DATA

BOILING POINT, 760 M HG
DECOMPOSES

BULK DENSITY
SEE PAGE 2.

VAPOR DENSITY
NOT APPLICABLE.'

PH INFORMATION
NOT DETERMINED.

FORM
SOLID

COLOR
WHITE TO OFF-WHITE.

MELTING POINT
APPROX. 343 C (APPROX. 650 F)

VAPOR PRESSURE
NIL

SOLUBILITY IN WATER
NOT DETERMINED.

EVAPORATION RATE (BUTYL ACETATE=I)
0

APPEARANCE
GRANULAR

ODOR
ODORLESS

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PRODUCT: ZACLON GALVANIZING FLUXES (C-R)

ORDER NO: 145791

PROD NO : 670596

GRADE	CAS. NO	BULK DENSITY (LB/CU;)
C	14639-97-5	67
C-GRAN	14639-97-5	65
CS	14639-97-5	67
CS-GRAN	14639-97-5	65
K	14639-98-6	61
K6	14639-98-6	60
F	14639-98-6	61
FP	14639-98-6	61
FP-RODS	14639-98-6	59
2N-REG	14639-98-6	59
2NP	14639-98-6	59
2N-NF	14639-98-6	59
2N-RODS	14639-98-6	57
R	14639-98-6	63
8&6 DRY PREFLUX	14639-98-6	60

COMPONENTS:

MATERIALS	CAS NUMBER	APPROXIMATE %
ZINC CHLORIDE*	7646-85-7	25 TO 60
AMMONIUM CHLORIDE	12125-02-9	40 TO 75

* REGULATED AS A TOXIC CHEMICAL UNDER SECTION 313 OF TITLE III/SARA, AND 40 CFR PART 372.

HAZARDOUS REACTIVITY:

INSTABILITY
STABLE.

INCOMPATIBILITY
INCOMPATIBLE WITH CYANIDES AND SULFIDES (MAY RELEASE TOXIC GASES).

DECOMPOSITION
AT HIGH TEMPERATURES, (APPPROX. 343 C; APPROX.650 F) AS IN INTENDED USE, AMMONIUM CHLORIDE FUMES, ZINC OXIDE FUMES, ZINC CHLORIDE FUMES, AND AMMONIA AND HYDROGEN CHLORIDE GASES MAY BE RELEASED.

POLYMERIZATION
WILL NOT OCCUR.

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PRODUCT: ZACLON GALVANIZING FLUXES (C-R)

ORDER NO: 145791

PROD NO : 670596

FIRE AND EXPLOSION DATA:

FLASH POINT WILL NOT BURN. FLAMMABLE LIMITS IN AIR, % BY VOL.
LOWER NOT APPLICABLE.
AUTOIGNITION TEMPERATURE UPPER NOT APPLICABLE.
NOT APPLICABLE.

AUTODECOMPOSITION TEMPERATURE
SEE "DECOMPOSITION"

FIRE AND EXPLOSION HAZARDS

MAY RELEASE AMMONIUM CHLORIDE FUMES, ZINC OXIDE FUMES, ZINC CHLORIDE FUMES,
AND AMMONIA AND HYDROGEN CHLORIDE GASES IN A FIRE.

EXTINGUISHING MEDIA
AS APPROPRIATE FOR COMBUSTIBLES IN AREA.

SPECIAL FIRE FIGHTING INSTRUCTIONS
NONE.

HEALTH HAZARD INFORMATION

PRINCIPAL HEALTH HAZARDS (INCLUDING SIGNIFICANT ROUTES, EFFECTS, SYMPTOMS
OF OVER-EXPOSURE, AND MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE)

CAUSES EYE BURNS. CAUSES SKIN IRRITATION OR BURNS. CAUSES IRRITATION OF
LUNGS AND UPPER RESPIRATORY PASSAGES.

INHALATION 10 MINUTE LC50 FOR ZINC CHLORIDE: 2000 MG/M3 IN RATS.

ORAL LD50 FOR ZINC CHLORIDE: 1100 MG/KG IN RATS.
ORAL LD50 FOR AMMONIA CHLORIDE: 1650 MG/KG IN RATS.

THE PRODUCT IS CORROSIVE TO THE EYES AND CORROSIVE OR IRRITATING TO SKIN.
TOXIC EFFECTS DESCRIBED IN ANIMALS FROM SHORT EXPOSURES INCLUDE CORROSION
OF MUCOSAL SURFACES, LIVER EFFECTS, AND KIDNEY EFFECTS. TOXIC EFFECTS IN
ANIMALS OCCURRING ONLY WITH INHALATION EXPOSURES ARE LOWER RESPIRATORY
INFECTION WITH PULMONARY EDEMA. TESTS IN BACTERIAL OR MAMMALIAN CELL
CULTURES DEMONSTRATE MUTAGENIC ACTIVITY. TESTS IN SOME ANIMALS INDICATE
THAT THE COMPOUND MAY HAVE EMBRYOTOXIC ACTIVITY.

HUMAN HEALTH EFFECTS OF OVEREXPOSURE BY INHALATION, INGESTION, OR SKIN OR
EYE CONTACT MAY INITIALLY INCLUDE: EYE IRRITATION WITH DISCOMFORT,
TEARING, OR BLURRING OF VISION; SKIN IRRITATION WITH DISCOMFORT OR RASH;
OR IRRITATION OF THE UPPER RESPIRATORY PASSAGES. HIGHER EXPOSURES MAY LEAD

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PRODUCT: ZACLON GALVANIZING FLUXES (C-R)

ORDER NO: 145791

PROD NO : 670596

TO THESE EFFECTS: SKIN AND EYE BURNS OR ULCERATION; TEMPORARY LUNG IRRITATION EFFECTS WITH COUGH, DISCOMFORT, DIFFICULTY BREATHING, OR SHORTNESS OF BREATH; POSSIBLY MODEST INITIAL SYMPTOMS, FOLLOWED IN HOURS BY SEVERE SHORTNESS OF BREATH, REQUIRING PROMPT MEDICAL ATTENTION; FATALITY FROM GROSS OVEREXPOSURE BY FUME INHALATION OR BY SIGNIFICANT INGESTION. THERE ARE INCONCLUSIVE OR UNVERIFIED REPORTS OF HUMAN SENSITIZATION. INDIVIDUALS WITH PREEXISTING DISEASES OF THE LUNGS MAY HAVE INCREASED SUSCEPTIBILITY TO THE TOXICITY OF EXCESSIVE EXPOSURES.

WHEN THE PRODUCTS ARE HEATED TO HIGH TEMPERATURES AS THOSE ENCOUNTERED IN THE GALVANIZING PROCESS, IRRITATING ZINC CHLORIDE FUMES AND GASEOUS HYDROGEN CHLORIDE MAY BE RELEASED. SEVERE EXPOSURES MAY CAUSE PULMONARY EDEMA. HEATING MAY ALSO RELEASE ZINC OXIDE FUMES WHICH MAY CAUSE METAL FUME FEVER.

CARCINOGENICITY

NO INGREDIENT LISTED AS A CARCINOGEN BY IARC, NTP, OSHA, OR ACGIH.

EXPOSURE LIMITS (PEL (OSHA), TLV (ACGIH), ETC.)

ZACLON FLUXES ARE NOT LISTED AS HAZARDOUS MATERIALS BY OSHA OR ACGIH. HOWEVER, ZINC CHLORIDE, ZINC OXIDE AND AMMONIUM CHLORIDE FUMES AND HYDROGEN CHLORIDE GAS MAY BE RELEASED AT HIGH TEMPERATURES. THE OSHA 8-HOUR TIME WEIGHTED AVERAGE (TWA) AND ACGIH TLV - TWA LIMITS FOR THESE PRODUCTS ARE: ZINC CHLORIDE = 1 MG/M³; ZINC OXIDE = 5 MG/M³; HYDROGEN CHLORIDE = 5 PPM OR 7 MG/M³ (CEILING). EXPOSURE LIMITS FOR AMMONIUM CHLORIDE HAVE NOT BEEN ESTABLISHED BY OSHA THE ACGIH 8-HOUR TLV-TWA IS 10 MG/M³ FOR AMMONIUM CHLORIDE FUMES AND THE ACGIH SHORT TERM EXPOSURE LIMIT (STEL) IS 20 MG/M³ FOR AMMONIUM CHLORIDE FUMES.

SAFETY PRECAUTIONS

DO NOT GET IN EYES, ON SKIN, ON CLOTHING.

AVOID BREATHING DUSTS, MISTS, OR FUMES.

WASH THOROUGHLY AFTER HANDLING.

FIRST AID

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN. WASH CONTAMINATED CLOTHING BEFORE REUSE AND DISCARD SHOES.

IF INHALED, REMOVE TO FRESH AIR IMMEDIATELY. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. CALL A PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

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VAN WATERS & ROGERS INC.

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PRODUCT: ZACLON GALVANIZING FLUXES (C-R)

ORDER NO: 145791

PROD NO : 670596

NOTE TO PHYSICIAN

EMESIS SHOULD BE INITIATED UNLESS THERE IS EVIDENCE OF BURNS OF THE ORAL MUCOSA. GASTRIC LAVAGE MAY BE ADVISABLE. IN SOME CASES OF EXCESS BODY LOADS OF ZINC, TREATMENT WITH CALCIUM DISODIUM ACETATE MAY BE EFFECTIVE.

PROTECTION INFORMATION

GENERALLY APPLICABLE CONTROL MEASURES

GOOD VENTILATION SHOULD BE PROVIDED TO KEEP DUST AND FUME CONCENTRATIONS BELOW THE EXPOSURE LIMITS.

PERSONAL PROTECTIVE EQUIPMENT

HAVE AVAILABLE AND WEAR AS APPROPRIATE TO PREVENT ANY POSSIBILITY OF EYE CONTACT OR REASONABLE PROBABILITY OF SKIN CONTACT: COVERALL CHEMICAL SPLASH GOGGLES; NEOPRENE OR PVC RUBBER GLOVES, APRON, BOOTS; LONG SLEEVE SHIRT AND PANTS. IF CONSIDERABLE CONTACT IS LIKELY, WEAR IMPERVIOUS NEOPRENE OR PVC RUBBER CLOTHING OR ACID SUIT. IF AIR CONCENTRATIONS EXCEED EXPOSURE LIMITS, USE OSHA-PERMISSIBLE RESPIRATORY EQUIPMENT.

DISPOSAL INFORMATION

SPILL, LEAK OR RELEASE

SWEEP UP SPILLAGE AND PLACE IN A PLASTIC LINED CONTAINER FOR DISPOSAL . FLUSH SPILL AREA TO CHEMICAL SEWER WITH PLENTY OF WATER. COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS OR REPORTING RELEASES.

WASTE DISPOSAL

COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS. IF APPROVED, MAY BE FLUSHED TO CHEMICAL SEWER OR TRANSFERRED TO A LICENSED DISPOSAL CONTRACTOR.

SHIPPING INFORMATION

NOT REGULATED BY DOT, IMO, OR IATA IN CONTAINERS LESS THAN 1000 POUNDS.

SHIPPING INFORMATION

DOT/IMO

(BULK CONTAINERS OVER 1,000 LBS)

PROPER SHIPPING NAME

NOT REGULATED AS A
HAZARDOUS MATERIAL
IN CONTAINERS LESS
1,000 POUNDS

PROPER SHIPPING NAME

RQ, ENVIRONMENTALLY HAZARDOUS

REPORT NUMBER: 703

MSDS NO: P15685VS

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PRODUCT: ZACLON GALVANIZING FLUXES (C-R)

ORDER NO: 145791

PROD NO : 670596

SUBSTANCES SOLID, N.O.S.
(CONTAINS ZINC AMMONIUM
CHLORIDE)

HAZARD CLASS

9

I.D. NUMBER:

UN 3077

PACKING GROUP:

PG III

REPORTABLE QUANTITY:

1,000 LBS. (ZINC AMMONIUM
CHLORIDE)

OTHER INFORMATION

SHIPPING CONTAINERS

50 LB. BAGS, FIBER DRUMS AND "SUPER SACKS".

STORAGE CONDITIONS

STORE IN A TIGHTLY CLOSED CONTAINER IN A DRY PLACE. DO NOT STORE WITH
CYANIDES OR SULFIDES.

NPCA - HMIS RATINGS

HEALTH 3

FLAMMABILITY 0

REACTIVITY 1

PERSONAL PROTECTION-

PERSONAL PROTECTION RATINGS TO BE SUPPLIED BY USER DEPENDING ON USE
CONDITIONS.

REPORT NUMBER: 703

VAN WATERS & ROGERS INC.

PAGE: 008

MSDS NO: P15685VS

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 02/05/97

VERSION: 004

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----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR VAN WATERS & ROGERS INC.
 DURING BUSINESS HOURS, PACIFIC TIME (425)889-3400

06/28/00 07:41 PRODUCT: 670596 CUST NO: 169434 ORDER NO: 145791

----- NOTICE -----

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