



MATERIAL SAFETY DATA SHEET

COMBAT

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER'S NAME: ROCHESTER MIDLAND CORPORATION
MANUFACTURERS ADDRESS: 155 PARAGON DRIVE, ROCHESTER, NY 14624, USA
EMERGENCY PHONE NUMBER: INFOTRAC 1-800-535-5053
SUPPLIER IDENTIFIER: ROCHESTER MIDLAND LIMITED
SUPPLIER'S ADDRESS: 5353 JOHN LUCAS DRIVE, SUITE 103, BURLINGTON, ONTARIO
SUPPLIER EMERGENCY PHONE NUMBER: CANUTEC 613-996-6666
PRODUCT NAME: COMBAT
PRODUCT USE: HEAVY DUTY CITRUS CLEANER
WHMIS CATEGORY: D2B, B3, E
PREPARED BY: ROCHESTER MIDLAND CORP.
PHONE NUMBER OF PREPARER: (585) 336-2200
DATE PREPARED: MARCH 1, 2017



SECTION 02: COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS	%	CAS#	EXPOSURE LEVELS	LD (50), ROUTE, SPECIES	LC(50), ROUTE, SPECIES
DIETHYLENE GLYCOL BUTYL ETHER	3-7	112-34-5	NOT AVAILABLE	ORAL 3305 mg /Kg (RAT) DERMAL 2700 mg/ Kg (RABBIT)	NOT AVAILABLE
D-LIMONENE	1-5	5989-27-5	NOT AVAILABLE	ORAL 4400 mg/ Kg (RAT) DERMAL >5000 mg/ Kg (RABBIT)	NOT AVAILABLE
OTHER INGREDIENTS	%	CAS#	EXPOSURE LEVELS	LD (50), ROUTE, SPECIES	LC(50), ROUTE, SPECIES
SODIUM SILICATE	0.5-1.5	1344-09-8	NOT AVAILABLE	ORAL 1500 -3200 mg/ Kg (RAT) (100%) DERMAL 4640 mg/ Kg (RABBIT)	NOT AVAILABLE

SECTION 03: HAZARDS IDENTIFICATION

POTENTIAL ACUTE HEALTH EFFECTS:

ROUTE OF ENTRY: EYES, SKIN, INHALATION, INGESTION

SKIN CONTACT: PROLONGED SKIN CONTACT MAY CAUSE IRRITATION. DIRECT CONTACT MAY CAUSE SLIGHT BURNS. D-LIMONENE COMPONENT MAY CAUSE SKIN SENSITIZATION OR OTHER ALLERGIC RESPONSES

SKIN ABSORPTION: GLYCOL ETHER COMPONENT CAN BE ABSORBED THROUGH THE SKIN WITH WIDESPREAD EXPOSURE CAUSING CENTRAL NERVOUS EFFECTS. PROLONGED OR WIDESPREAD SKIN CONTACT MAY RESULT IN THE ABSORPTION OF POTENTIALLY HARMFUL AMOUNTS OF D-LIMONENE COMPONENT. NOT EXPECTED WHEN USED AS DIRECTED.

EYE: MAY CAUSE IRRITATION, BURNS, PERMANENT TISSUE DAMAGE.

INHALATION: EXCESSIVE VAPOURS INHALATION MAY CAUSE DIZZINESS, NAUSEA, HEADACHE; NASAL AND RESPIRATORY IRRITATION. NOT EXPECTED WHEN USED AS DIRECTED.

INGESTION: HARMFUL IF SWALLOWED. MAY CAUSE SEVERE IRRITATION AND NAUSEA, VOMITING, DIZZINESS AND CRAMPS. ASPIRATION OF MATERIAL INTO LUNGS DURING VOMITING CAN CAUSE CHEMICAL PNEUMONITIS. D-LIMONENE COMPONENT HAS BEEN SHOWN TO CAUSE KIDNEY EFFECTS IN MALE RATS THROUGH INGESTION. SIMILAR EFFECTS HAVE NOT BEEN REPORTED IN FEMALE RATS. KIDNEYS EFFECTS ARE NOT EXPECTED TO OCCUR IN HUMANS.

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SECTION 03: HAZARDS IDENTIFICATION

ACUTE OVER-EXPOSURE

EFFECTS: AS ABOVE. PREVIOUSLY EXISTING SKIN AND/OR RESPIRATORY CONDITIONS MAY BE AGGRAVATED BY PRODUCT EXPOSURE. ADVERSE OVEREXPOSURE TO GLYCOL ETHER COMPONENT CAN CAUSE SEVERE KIDNEY EFFECTS, RED BLOOD HEMOLYSIS, LIVER DAMAGE AND CNS DEPRESSION. D-LIMONENE COMPONENT MAY CAUSE ALLERGIC SKIN RESPONSES.

CHRONIC OVER EXPOSURE

EFFECTS: LONG TERM OVER EXPOSURE TO THE GLYCOL ETHER COMPONENT THROUGH INGESTION OR SKIN ABSORPTION MAY CAUSE LIVER, KIDNEY, SPLEEN AND BLOOD EFFECTS. NOT A LIKELY OCCURRENCE WHEN USED AS DIRECTED. D-LIMONENE COMPONENT MAY CAUSE SKIN SENSITIZATION OR OTHER ALLERGIC RESPONSES. INGESTION OVER TIME OF GRAM QUANTITIES OF SODIUM SILICATE COMPONENT MAY CAUSE KIDNEY STONES AND OTHER SILICEOUS URINARY STONES IN HUMANS. NOT EXPECTED WITH OCCUPATIONAL EXPOSURE.

SECTION 04: FIRST AID MEASURES

EYES: FLUSH EYES WITH ABUNDANT WATER FOR AT LEAST 20 MINUTES WHILE HOLDING EYELIDS OPEN TO ENSURE COMPLETE IRRIGATION OF THE ENTIRE EYE CAVITY. GET MEDICAL ATTENTION.

SKIN: WASH SKIN WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. IF SYMPTOMS PERSIST, GET MEDICAL ATTENTION.

INHALATION: IF SAFE TO ENTER VICTIMS AREA, REMOVE VICTIM TO FRESH AIR. ASSIST BREATHING AS NEEDED. IF SYMPTOMS PERSIST, GET MEDICAL ATTENTION.

INGESTION: **DO NOT INDUCE VOMITING.** IF VICTIM CONSCIOUS, GIVE 1 - 2 GLASSES OF WATER TO DILUTE STOMACH CONTENTS. **GET MEDICAL ATTENTION.** NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTES TO PHYSICIAN: ALL TREATMENTS SHOULD BE BASED ON OBSERVED SIGNS/SYMPTOMS OF DISTRESS IN THE PATIENT. THE POSSIBILITY OF OVEREXPOSURE TO MATERIALS OTHER THAN THIS PRODUCT SHOULD BE CONSIDERED

SECTION 05: FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD OF DETERMINATION: 53.9 °C (129 °F) TCC

UPPER EXPLOSION LIMIT (% BY VOLUME): NOT AVAILABLE

LOWER EXPLOSION LIMIT (% BY VOLUME): NOT AVAILABLE

AUTO-IGNITION TEMPERATURE: NOT AVAILABLE

FLAMMABILITY CLASSIFICATION: COMBUSTIBLE LIQUID

CONDITIONS OF FLAMMABILITY: KEEP AWAY FROM OPEN FLAMES, WELDING ARCS AND OTHER SOURCES OF IGNITION. PRODUCT CONTAINS A SMALL AMOUNT OF COMBUSTIBLE MATERIAL THAT IS SOLUBILIZED IN WATER. PRODUCT WILL NOT SUPPORT COMBUSTION.

MEANS OF EXTINCTION: USE FOAM, DRY CHEMICAL, WATER SPRAY OR FOG.

SPECIAL FIRE FIGHTING

PROCEDURES: FIREFIGHTERS SHOULD WEAR FULL PROTECTIVE EQUIPMENT AND USE APPROVED SELF CONTAINED BREATHING APPARATUS. USE WATER SPRAY TO COOL FIRE EXPOSED CONTAINERS TO PREVENT PRESSURE BUILDUP AND POSSIBLE RUPTURE. DO NOT SPATTER OR SPLASH PRODUCT. DIKE TO CONTAIN WATER USED IN FIGHTING FIRE. DO NOT ALLOW THIS WATER INTO OPEN WATERWAYS OR SEWERS

HAZARDOUS COMBUSTION

PRODUCTS: OXIDES OF CARBON, NITROGEN AND SULFUR.

EXPLOSION DATA: USE PROPER GROUNDING PROCEDURES AND EQUIPMENT. EMPTY CONTAINERS MAY RETAIN IGNITABLE PRODUCT RESIDUES (LIQUID AND/OR VAPOURS) AND CAN BE DANGEROUS. DO NOT PRESSURIZE, WELD, BRAZE, CUT SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY AND OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SENSITIVITY TO STATIC

DISCHARGE: PROBABLY NOT SENSITIVE BUT USE PROPER GROUNDING EQUIPMENT AND PROCEDURES.

SENSITIVITY TO MECHANICAL

IMPACT : NOT SENSITIVE

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SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK AND SPILL

PROCEDURES: EXTINGUISH ALL IGNITION SOURCES. CLEANUP PERSONNEL MUST USE FULL PROTECTIVE EQUIPMENT. REMOVE UNPROTECTED PERSONNEL AWAY FROM SPILL AREA. VENTILATE AREA. CAUTION: SPILL AREA MAY BE SLIPPERY.

SMALL SPILLS: MOP UP, AND FLUSH AREA WITH WATER.

LARGE SPILLS: DIKE SPILL. DO NOT ALLOW SPILL TO ENTER OPEN WATERWAYS OR SEWERS. RECLAIM ALL MATERIAL POSSIBLE. ABSORB REMAINDER WITH INERT MATERIAL AND PLACE IN SUITABLE CONTAINERS FOR DISPOSAL. FLUSH AREA WITH WATER.

SECTION 07: HANDLING AND STORAGE

HANDLING PROCEDURES

AND EQUIPMENT: CORROSIVE PRODUCT-HANDLE WITH CARE. AVOID CONTACT WITH EYES, SKIN OR CLOTHING. WASH SKIN THOROUGHLY AFTER HANDLING. DO NOT BREATHE MISTS/ SPRAYS. DO NOT SMOKE WHILE USING THIS PRODUCT. DO NOT USE IN THE PRESENCE OF AN IGNITION SOURCE. REMOVE CONTAMINATED CLOTHING AND LAUNDRY BEFORE RE-USE. KEEP CONTAINER CLOSED WHEN NOT IN USE. READ AND FOLLOW LABEL INSTRUCTIONS. DO NOT CONTAMINATE FOOD, WATER OR FEED DURING USE OR STORAGE OF THIS PRODUCT. MIX ONLY WITH WATER. ALWAYS ADD PRODUCT TO WATER: NEVER WATER TO PRODUCT. DO NOT PRESSURIZE, WELD, BRAZE, CUT SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY AND OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

STORAGE

REQUIREMENTS: KEEP CONTAINER CLOSED WHEN NOT IN USE. STORE IN A COOL WELL VENTILATED AREA AWAY FROM INCOMPATIBLE MATERIALS. KEEP FROM FREEZING. KEEP OUT OF REACH OF CHILDREN. DO NOT REUSE CONTAINER. STORE ONLY IN ORIGINAL CONTAINER.

SECTION 08: EXPOSURE CONTROLS/ PERSONAL PROTECTION

GENERAL ADVICE -THESE RECOMMENDATIONS PROVIDE GENERAL GUIDANCE FOR HANDLING THIS PRODUCT. PERSONAL PROTECTIVE EQUIPMENT SHOULD BE SELECTED FOR INDIVIDUAL APPLICATIONS AND SHOULD CONSIDER FACTORS WHICH AFFECT EXPOSURE POTENTIAL, SUCH AS HANDLING PRACTICES, CHEMICAL CONCENTRATIONS AND VENTILATION. IT IS ULTIMATELY THE RESPONSIBILITY OF THE EMPLOYER TO FOLLOW REGULATORY GUIDELINES ESTABLISHED BY LOCAL AUTHORITIES.

EYE PROTECTION: WEAR CHEMICAL SAFETY GOGGLES.

RESPIRATORY PROTECTION: NONE NORMALLY REQUIRED. USE WITH ADEQUATE VENTILATION. USE NIOSH APPROVED RESPIRATOR IF EXPOSURE LIMITS ARE EXCEEDED OR IRRITATION OCCURS. USE RESPIRATOR IN ENCLOSED SPACE.

GLOVES: WEAR BUTYL RUBBER GLOVES.

OTHER PROTECTIVE

EQUIPMENT: AS NEEDED TO PREVENT ALL CONTACT WITH PRODUCT.

SPECIFIC ENGINEERING

CONTROLS: NONE NORMALLY REQUIRED. USE GENERAL MECHANICAL AND / OR LOCAL EXHAUST IF EXPOSURE LIMITS ARE EXCEEDED OR IRRITATION OCCURS.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	LIQUID
ODOUR AND APPEARANCE:	CITRUS FRAGRANCE, CLEAR ORANGE LIQUID
ODOUR THRESHOLD:	NOT AVAILABLE
SPECIFIC GRAVITY:	1.02-1.03
VAPOUR PRESSURE :	NOT AVAILABLE
VAPOUR DENSITY (AIR=1):	NOT AVAILABLE
VOC CONTENT (%):	4 (EPA METHOD 24)
EVAPORATION RATE;	NOT AVAILABLE
BOILING POINT;	100° C (212 ° F)
PH:	12-12.5
FREEZING POINT:	NOT AVAILABLE
DENSITY (g/ ml):	1.02-1.03
COEFFICIENT OF WATER/OIL DISTRIBUTION:	COMPLETELY WATER SOLUBLE

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: STABLE WHEN USED AND STORED AS DIRECTED.

INCOMPATIBLE MATERIALS: AVOID STRONG ACIDS AND OXIDIZERS.

CONDITIONS OF REACTIVITY: AVOID HIGH TEMPERATURES AND OPEN FLAMES. ALWAYS ADD PRODUCT TO WATER: NEVER WATER TO PRODUCT- THERMAL REACTION MAY BE GENERATED

HAZARDOUS DECOMPOSITION PRODUCTS:

OXIDES OF CARBON, NITROGEN AND SULFUR.

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SECTION 11: TOXICOLOGICAL INFORMATION

IRRITANCY OF PRODUCT: MILD TO MODERATE IRRITANT
SENSITIZATION TO MATERIAL: D-LIMONENE COMPONENT MAY CAUSE SKIN SENSITIZATION OR OTHER ALLERGIC RESPONSES. GLYCOL ETHER COMPONENT DID NOT CAUSE ALLERGIC SKIN REACTIONS WHEN TESTED IN GUINEA PIGS.
CARCINOGENICITY: IARC HAS CLASSIFIED D-LIMONENE AS GROUP 3- NOT CLASSIFIABLE AS TO ITS CARCINOGENICITY TO HUMANS.
REPRODUCTIVE EFFECTS: NO ADVERSE REPRODUCTIVE EFFECTS ANTICIPATED FOR GLYCOL ETHER COMPONENT. D-LIMONENE COMPONENT MAY CAUSE REPRODUCTIVE EFFECTS BASED ON STUDIES IN LABORATORY ANIMALS BUT ONLY AT HIGH, GENERALLY TOXIC DOSES.
TERATOGENICITY: NO ADVERSE TERATOGENIC EFFECTS ANTICIPATED FOR GLYCOL ETHER COMPONENT. D-LIMONENE COMPONENT MAY CAUSE TERATOGENIC AND /OR EMBRYOTOXIC EFFECTS BASED ON LAB ANIMALS BUT ONLY AT HIGH, GENERALLY TOXIC DOSES.
MUTAGENICITY: MUTAGENIC TESTS ON D-LIMONENE COMPONENT HAVE BEEN NEGATIVE OR INCONCLUSIVE. TESTS ON GLYCOL ETHER COMPONENT USING BACTERIA AND CULTURED MAMMALIAN CELLS HAVE BEEN NEGATIVE FOR MUTAGENIC EFFECTS. NO HUMAN INFORMATION IS AVAILABLE. SODIUM SILICATE COMPONENT IS NOT MUTAGENIC TO E.COLI WHEN TESTED IN MUTAGENIC BIOASSAY.
TOXICOLOGICALLY SYNERGISTIC PRODUCTS: D-LIMONENE INCREASED THE SKIN ABSORPTION OF A DRUG, KETOPROFEN IN RATS AND RABBITS. GLYCOL ETHER COMPONENT MAY ENHANCE THE TOXICITY OF SOME CHLORINATED HYDROCARBONS, DITHIOCARBAMATES OR DIMETHYLNITROSAMINES.
OTHER INFORMATION: INGESTION OVER TIME OF GRAM QUANTITIES OF SODIUM SILICATE COMPONENT MAY CAUSE KIDNEY STONES AND OTHER SILICEOUS URINARY STONES IN HUMANS. NOT EXPECTED WITH OCCUPATIONAL EXPOSURE.

SECTION 12: ECOLOGICAL INFORMATION

THERE IS NO ECOLOGICAL INFORMATION AVAILABLE FOR PRODUCT. ECOTOXICOLOGICAL INFORMATION TO FOLLOW IS BASED LARGELY OR COMPLETELY ON INFORMATION FOR COMPONENTS.

AQUATIC TOXICITY:
FISH SPECIES DATA: D-LIMONENE, LC 50, 96 HR, FATHEAD MINNOW: 0.619-0.796 mg/ L
D-LIMONENE, LC 50, 96 HR, RAINBOW TROUT: 35 mg/ L
GLYCOL ETHER LC50, 96 HR, BLUEGILL SUNFISH: 1300 mg/ L
GLYCOL ETHER LC50, 48 HR, GOLDEN ORFE: 2250 mg/ L
GLYCOL ETHER LC 50, 24 HR, GOLDFISH: 2700 mg/ L
SODIUM SILICATE LC 50, 96 HR, BLUEGILL: 301-478 mg/ L
SODIUM SILICATE LC 50, 96 HR, MOSQUITO FISH: 2320 ppm
SODIUM SILICATE LC 50, 96 HR, ZEBRA FISH: 3185 mg/L
INVERTEBRATES: GLYCOL ETHER LC 50, 24 HR, DAPHNIA MAGNA: 2850 mg/L
GLYCOL ETHER LC 50, 48 HR, DAPHNIA MAGNA: >100 mg/L
SODIUM SILICATE LC 50, 96 HR: DAPHNIA 247 ppm
SODIUM SILICATE LC 50, 96 HR: SNAIL EGGS 632 ppm
SODIUM SILICATE LC 50, 96 HR: AMPHIPODA 160 ppm
MICROORGANISMS: GLYCOL ETHER,LC50,BACTERIA, 255mg/L
(GROWTH INHIBITION) PLANTS: GLYCOL ETHER EC 50, SCENEDESMUS SUBSPICATUS: 100 mg/ L

GLYCOL ETHER IS PRACTICALLY NON-TOXIC TO AQUATIC ORGANISMS. D-LIMONENE COMPONENT IS HIGHLY TOXIC TO AQUATIC LIFE. TOXICITY OF SODIUM SILICATE COMPONENT IS PRIMARILY ASSOCIATED WITH PH. AQUATIC ORGANISMS BECOME INCREASING STRESSED AS PH EXCEEDS 9, WITH MANY ORGANISMS BEING INTOLERANT OF PH LEVELS IN EXCESS OF 10. SODIUM SILICATE COMPONENT HAS EXHIBITED MODERATE TOXICITY TO AQUATIC ORGANISMS WHILE EXHIBITING SLIGHT TOXICITY TO TERRESTRIAL ORGANISMS.

BIODEGRADABILITY: GLYCOL ETHER COMPONENT IS READILY BIODEGRADABLE. GLYCOL ETHER COMPONENT: 89-93%, 28 DAY, OECD 301C TEST; 100% 28 DAY, OECD 302B TEST SODIUM SILICATE COMPONENT IS AN INORGANIC SUBSTANCE AND THEREFORE NOT AMENABLE TO BIODEGRADATION. IT HAS NO BOD. D-LIMONENE COMPONENT IS READILY AND RAPIDLY BIODEGRADABLE. COD 2850 mg O2 /L.

MOBILITY: SODIUM SILICATE COMPONENT SINKS AND DISSOLVES IN WATER. D-LIMONENE COMPONENT HAS LOW MOBILITY IN SOIL. D-LIMONENE COMPONENT WILL READILY BIODEGRADE IN SOIL. GLYCOL ETHER COMPONENT POTENTIAL FOR MOBILITY IN SOIL IS VERY HIGH.

PERSISTENCE: SODIUM SILICATE COMPONENT WILL PERSIST IN THE ENVIRONMENT

BIOACCUMULATIVE: SODIUM SILICATE COMPONENT DOES NOT BIOACCUMULATE EXCEPT IN SPECIES THAT USE SILICA AS A STRUCTURAL MATERIAL SUCH AS DIATOMS AND SILICEOUS SPONGES. D-LIMONENE COMPONENT DOES NOT BIOACCUMULATE- IT IS RAPIDLY EXCRETED (2-3 DAYS) BY HUMAN KIDNEY. GLYCOL ETHER COMPONENT DOES NOT BIOACCUMULATE

CHEMICAL FATE INFORMATION: SODIUM SILICATE COMPONENT YIELDS DISSOLVED SILICA THAT IS INDISTINGUISHABLE FROM NATURAL DISSOLVED SILICA.

OTHER INFORMATION: SODIUM SILICATE COMPONENT DOES NOT BIOCONCENTRATE UP THE FOOD CHAIN.

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SECTION 13: DISPOSAL CONSIDERATIONS

IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL AND FEDERAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

TDG: PRODUCT CODE 11233639: NOT REGULATED UNDER TDG
PRODUCT CODE 11233648: UN 1993,FLAMMABLE LIQUID ,N.O.S. (D-LIMONENE,GLYCOL ETHERS)
3, PACKING GROUP III

ADDITIONAL INFORMATION: NOT AVAILABLE
MARINE POLLUTANT: NO

SECTION 15: REGULATORY INFORMATION:

DSL STATUS: LISTED
HMIS CLASSIFICATION (H, F, R, PE): 2,2,0, B
WHMIS CLASSIFICATION: D2B, B3,E

PRODUCT CONTAINS APPROXIMATELY 0.1% PHOSPHOROUS AS P.

THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CPR(CONTROLLED PRODUCTS REGULATIONS) AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.

SECTION 16: OTHER INFORMATION

DISCLAIMER: THIS INFORMATION WAS COMPILED FROM CURRENT, RELIABLE SOURCES AND IS BELIEVED TO BE CORRECT. AS DATA AND/ OR REGULATIONS CHANGE, AND CONDITIONS OF USE ARE BEYOND OUR CONTROL, NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE AS TO COMPLETENESS OR CONTINUING ACCURACY OF THIS INFORMATION.