Section 1: Product & Company Identification

Product Name:	Tersus DEF™ Diesel Exhaust Fluid
Synonyms:	Diesel Exhaust Fluid; Aqueous Urea Solution, DEF, AUS32
CAS No:	Mixture
Manufacturer:	Hartland Lubricants & Chemicals 914 Commercial Court Onalaska, WI 54650 800-658-9051
Revision Date:	4-4-2013

Emergency Telephone Number: PERS Professional Emergency Resource Services 800-633-8253

Section 2: Composition / Information on Ingredients

Ingredient	CAS Number	Approx. %	Exposure Limits
Water	7732-18-5	65 - 70	
Urea	57-13-6	30 - 35	None established

Section 3: Hazards Identification

Emergency Overview

Health Hazard: May cause irritation or reddening to skin and eyes. A single dose of 100 grams has reportedly caused mild symptoms of central nervous system depression, causing drowsiness and slow reflexes.

Fire & Explosion: Does not readily ignite. Flammability and Reactivity Rating is: 0 (NFPA)

Potential Health Effects

Eyes:	Splashes may cause mild irritation. Contact with heated material may cause thermal burns.
Skin:	Contact may irritate mildly with repeated or prolonged exposure.
Inhalation:	Vapor inhalation is generally not a problem unless heated or misted. Exposure to vapors over an extended time period may cause respiratory tract irritation.
Ingestion:	A single dose of 100 grams has reportedly caused mild symptoms of central nervous system depression (e.g. drowsiness, slow reflexes, and slurred speech). May cause gastrointestinal disturbances (symptoms may include irritation, nausea, vomiting and diarrhea).
Chronic Exposure:	No potential chronic effects known. Urea is a naturally occurring chemical in the body. It is an end product of protein metabolism and is excreted in the urine.

Carcinogenicity Lists: IARC Monograph: NO NTP: NO OSHA: NO

Section 4: First Aid Measures

Eyes:	Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.
Skin:	Remove contaminated clothing and shoes. Then wash with soap and water for at least 15 minutes. Clean contaminated clothing and shoes before reuse. Get medical attention if irritation develops or persists.
Inhalation:	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
Ingestion:	If swallowed, call a physician immediately. ONLY induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

Section 5: Fire Fighting Measures

Flash Point:	Not Applicable
Auto ignition:	Not Applicable
Flammability:	Flammable limits in air % by volume Lower: Not Applicable Upper: Not Applicable
Fire & Explosion:	Slight to moderate fire hazard when exposed to heat or flame. Above flash point, vapor – air mixtures are explosive within flammable limits noted above. Containers may explode when involved in a fire.
Extinguishing Media:	All standard extinguishing agents are acceptable. Water recommended.
Fire Fighting Instructions:	In the event of a fire, cool exposed equipment with water spray until well after fire is out. Do not scatter spilled material with high-pressure water streams. Dike fire-control water for later disposal. Self-contained breathing apparatus (SCBA) and firefighter's full protective clothing should be worn.

Section 6: Accidental Release Measures

Contain the spill and clean up using sorbent materials. Contain and recover liquid when possible. Dispose of in accordance with local, state, provincial and federal laws and regulations. Do not contaminate any lakes, streams, ponds, groundwater, or soil. Do not flush to sewer. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the National Response Center is (800) 424-8802.

Section 7: Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Avoid storing in freezing conditions. Observe all warnings and precautions listed for the product. Avoid containers, piping or fittings made of brass, bronze, or other copper bearing alloys, or galvanized metal.

Section 8: Exposure Control / Personal Protection Information

Airborne Exposure Limits:	OSHA Permissible Exposure Limit (PEL): Not Established.
ACGIH Threshold Limit Value (TLV):	None Established
Engineering Controls:	Ordinarily, natural ventilation is adequate. Mechanical ventilation is recommended if handling in such a manner as to cause mist or vapors to form.
Personal Protection:	
Eye:	Safety glasses with side shields or chemical goggles. Do not wear contact lenses.
Protective Clothing:	Wear impervious gloves. If potential for significant exposure to liquid exists, use full protective clothing and impervious boots.
Respiratory Protection:	Respiratory protection is normally not required except in emergencies or when misting occurs. Select the appropriate NIOSH-approved mist / organic vapor air-purifying respirator. Warning: Air-purifying respirators do not protect workers in oxygen deficient atmospheres.

Section 9: Physical and Chemical Properties

Appearance:	Clear
Odor:	Mild ammonia odor
Vapor Pressure:	220 mmHg at 20°C
Vapor Density:	N/A
Water Solubility:	Complete 100%
Viscosity:	N/A
Physical State:	Liquid
Boiling Point:	N/A
Boiling Point (50% urea sol'n)	106°C
Specific Gravity:	32.5%: 1.090@ 68°F
pH:	Typically 10.0
%Volatiles:	Not Applicable

Section 10: Stability and Reactivity

Stability / Conditions to Avoid:	Stable under normal conditions of use and storage. Avoid incompatibles.
Incompatibility:	May react with strong oxidizers. (e.g. chlorine, peroxide, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fire or explosions or release toxic fumes.
Hazardous Decomposition:	If the evaporation residue is heated to the melting point or above, Ammonia and Carbon Dioxide are formed. Some Ammonia and CO2 are given off on heating the aqueous product. Under some conditions or pressure and temperature, some Ammonium Cyanate has also been reported.
Hazardous Polymerization:	Should not occur.

Section 11: Toxicological Information

Significant Routes of Exposure:	Eyes, Digestive Tract, Respiratory Tract Skin	
Toxicity To Animals:	Acute Oral Toxicity:	(rat); LD 50 = 14,300 – 15,000 mg/kg; mouse: 11,500 – 13,000 mg/kg cattle: 510 mg/kg
	Acute Inhalation Toxicity:	No data available
	Acute Toxicity: Other Routes:	No data available
	Acute Dermal Toxicity:	No data available
	Repeated Dose Toxicity:	Rat; 24 wks; dermal – NOAEL = 40% in ointment
	Eye & Skin Irritation / Corrosion:	Skin: Mouse – Not irritating (10% sol'n); Eye: Rabbit – Not Irritating (50% sol'n)
Special Remarks on Toxicity to Animals:	Not found to be toxic by oral exposure as defined by OSHA. Based on toxicity data for another compound (i.e., ammonium nitrate), not expected to be toxic by dermal and inhalation exposure as defined by OSHA.	
	Developmental Toxicity / Teratogenicity:	Not Teratogenic
	Bacterial Genetic Toxicity In- Vitro: Gene Mutation:	(Salmonella typhimurium) – Bacterial reverse mutation assay – Negative; Chinese Hamster – Chromosomal aberration test – positive 9 very high dose); Mouse – Mouse lymphone TK locus
	Non-Bacterial Genetic Toxicity In-Vitro: Chromosomal aberration:	Mouse – Bone marrow cytogenetic test – positive (extremely high dose)
	Toxicity to Reproduction:	No toxic effects on mouse gonads up to 6750 mg/kg day. No toxic effects on rat gonads up to 2250 mg/kg day
	Carcinogenicity:	No data available
Other Effects on Humans:		May cause gastrointestinal disturbances (symptoms may include irritation, nausea, vomiting and diarrhea).
Special remarks on Chronic Effects on Humans:		No Chronic effects known.
Special Remarks on Other Effects on Humans:		May be irritating at >10% concentration; not a skin sensitizer. Despite extensive medical use, no significant side effects on humans have been noted.

Section 12: Ecological Information

Ecotoxicity	EPA Ecological Toxicity rating:	
	Acute Toxicity to Fish:	96-h: (Barillius barna) LC50>9100 mg/L
	Chronic Toxicity to Fish:	No data available
	Acute Toxicity to Aquatic Invertebrates:	(Daphnia magna): 24 – h EC50=>10,000mg/L
	Chronic Toxicity to Aquatic Invertebrates:	No data available
	Acute Toxicity to Aquatic Plants:	(Scenadesmus quadricauda) 192-hr cell multiplication inhibition test-TT>10,000 mg/L. T
	Toxicity to Other Non-Mammalian Terrestrial Species:	(Pigeon)- Subcutaneous-LDLO=16,000 mg/kg.
	Toxicity to Terrestrial Plants:	No data available
Environmental Fate	Stability in Water:	T1/2>1 year. Since Urea is a fertilizer, it may promote eutrophication in waterways. Non-toxic to aquatic organisms as defined by USEPA.
	Stability in Soil:	No data available
	Transport and Distribution:	Transport: 0.16% in air; 99.84% in water
Toxicity	No Known Toxicity	
Degradation Products:	Biodegradation:	Ultimately biodegradable
	Photodegradation:	No data available

Section 13: Disposal Considerations

Special Instructions: Dispose of container and unused contents in accordance with federal, state and local requirements. Users of this product should review their operations in terms of applicable federal, state and local laws and regulations, prior to disposal of waste material.

Section 14: Transport Information

DOT Description:	Not Regulated
TDG Canada:	Not Regulated

Section 15: Regulatory Information

United States Regulations

TSCA Inventory Listing:	All intentional ingredients listed on the TSCA inventory
SARA 302 Status:	Urea 57-13-6: No CERCLA RQ, or TPQ
SARA 311/312:	Acute: Yes Chronic: No Fire: No Pressure: No Reactivity: No
SARA 313 Chemicals:	NA

Canadian Regulations

WHMIS:	This product is not WHMIS controlled.
Ingredient Disclosure list:	This product does contain ingredient(s) on this list.
Environmental Protection:	All intentional ingredients are listed on the DSL (Domestic Substance List)
EINECS#	Urea 200-315-5
California: Prop 65:	This is not a chemical known to cause cancer, nor is it listed.

Section 16: Other Information

Hazard Ratings	NFPA
Health	1
Flammability	0
Reactivity	0

Comment: This product is TSE/BSE (Transmissible Spongiform Encephalopathy / Bovine Spongiform Encephalopathy) free. There are no animal constituents used in the manufacture of this product. This product is created through a chemical process.

Original Date of Preparation: 3-25-2013

This MSDS was prepared by Hartland Lubricants & Chemicals. For general information about this product call (800) 658-9051.

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