Date Prepared 18 Nov 2009
Date Amended

Material Safety Data Sheet (MSDS)

1.Chemical and Company Information

Product Name	: Nanoemer GFA-001
Company Name	: Nanomizer Inc.
Address	: 1-1-40 Tsurumi-ku Yokohama-shi Kanagawa-ken Yokohama Joint Research Center
Telephone	: 045-508-6380
Fax	: 045-508-6382
Emergency Contact	: 045-508-6380
Recommended Use & Restriction	: Fuel Emulsification Agent

2.Hazards Identification

GHS Classification

Physical & Chemical Hazard	: No classification

Health Hazards

Acute Toxicity (Oral)	: No classification
Acute Toxicity (Skin)	: Un-classifiable
Acute Toxicity (Inhalation	: Un-classifiable
Acute Toxicity (Inhalation	: Un-classifiable
Skin Corrosivity/Irritation	: Class 2
Severe Eye Injury/Irritation	: Class 2A
Respiratory Organ Sensiti	: Un-classifiable
Skin Sensitivity	: Un-classifiable
Reproductive Cell Mutage	: Class 2
Carcinogenicity	: Class 2
Reproductive Toxicity	: Un-classifiable
Specific Target Organ Systemic Toxicity (Single Exposure)	: Un-classifiable
Specific Target Organ Systemic Toxicity (Repeat Exposure)	: Un-classifiable
Absorptive Respiratory Or	: Un-classifiable

Environmental Hazards

Acute Aquatic Environmer	: Class 2
Chronic Aquatic Environm	: Class 2

Label Elements

Symbols

Warning Signal : Warning

Hazardous Informatic : Skin irritation
: Severe eye irritation
Flammable liquid
Carcinogenic effects possible
Harmful effects on foetus and reproductive ability possible
Toxic to aquatic organisms
Toxic to aquatic organisms due to long -term effect

Instructions

【Precautions】

: Wear protective gloves, goggles and mask.
: Clean thoroughly after use.
: Keep away from open flames and high temperatures.
Do not eat or drink when using this product.
:

【Measures】

: Eye Contact: Clean carefully using water for a few minutes and remove contact lenses before continuing.
: Skin contact: Wash thoroughly with soap and water.
: Wash stained clothing before use.
: Consult a doctor if skin irritation occurs.

【Storage】

: Store in a tightly-closed container

【Disposal】

: Dispose container and contents in accordance with governing rules and regulations concerning the disposal and cleaning of such waste products.

【Caution during use】

: Please refer to the Material Safety Data Sheet (MSDS)

3.Composition, Information on Ingredients

Single Substance or Compound : Compound (hydrated compound)

Composition and Contents

Ingredient	eference Number in Official Gazet	CAS Number	Content (%)
Surfactant	Listing	------	------
Fossil oil-based hydrocarbons	Listing	------	------

4.First Aid Measures

Consult a doctor after applying first aid measures below. If the victim is unconscious, move the victim to a safe location and seek immediate medical treatment.

Inhalation : Move to a location with fresh air and rest after rinsing.

Skin Contact : Wash away thoroughly using soap and water.

Eye Contact : Open the eyelids widely using your fingers and wash the eyeballs and all parts of the eye thoroughly for 15 minutes and above. Do not move the victim until the eyes have been washed.

Ingestion : Make the victim drink 1-2 cups of water and induce vomiting.

5.Fire Fighting Measures

Take appropriate measures to ensure product does not flow into the river and drainage when fire fighting.

Extinguishing Media : Dry chemical extinguisher, foam extinguisher, carbon dioxide, sand, water spray.

Prohibited Media : Cylinder-shaped water

Specific Hazards : Avoid inhaling smoke when firefighting as there is a risk that toxic gases may occur in the combustion gas.

Specific Fire Fighting Method : Generally, it does not burn easily as it is a hydrated substance. If the water vaporises and a fire occurs, use an appropriate extinguisher to cut off the supply to the fire source.

Protection for Firefighters : Wear appropriate protective gear (gloves, goggles, mask etc) when firefighting.

6.Leak Measures

Personal Precautions, Protective Gear and Emergency	: Always wear protective gear (gloves, goggles, mask etc) when working.
Environmental Precautions	: Do not allow leaked substances to flow directly into rivers and drainage.
Methods of Removal	: For small amounts, first remove by using a adsorbent such as sawdust, soil, sand or rag and then wipe away the rest using a rag or cloth. For large amounts, prevent the leaked substance from flowing out by surrounding it with an inflammable material like sand or soil and then direct it to a safe location for collection using drums or ther containers. Do not neutralize the residue from the leaked locations using acids due to the risk of toxic gases being generated.For minute amounts of residue, wash away using a lot of water only after adequate environmental precautions have been taken.
Prevention of Secondary Hazards	: Get ready the extinguisher while removing promptly all flammable materials in the vicinity. Take measures to prevent entry because of the danger of the risk spreading. Clearly mark the contents of the substances that have been leaked and recovered on the containers and then store them in an appropriate location until the

7.Handling and Storage Precautions

Handling

Technical Measures	: Take measures to ensure that no dispersal occurs during use.
Precautions	: Wear appropriate protective gear.
Precautions for Safe Handling	: Avoid contact with acids and oxidizing agents. Ensure adequate ventilation at the workplace. Wash hands and face thoroughly after handling and rinse mouth if

Storage

Appropriate Storage Conditions	: Store in a tightly-closed container in a location with good ventilation. Do not store together with acids and oxidizing agents.
Safety Container & Packing	: Do not use containers made of materials that can be corroded through direct contact with alkalis.

8.exposure Controls and Protection Measures

Protective Equipment	: Install ventilation equipment when a large amount of mist occurs or over a long period depending on the situation. Provide facilities for washing eyes and body nearby. Ensure facilities meet governing rules and regulations and product characteristics.
Control Concentrations	: Not set
Permissible Concentrations	
Japan Society for Occupational H	: 3mg/m^3 (mineral oil mist) 5ppm(Hydrogen Sulphide)
ACGIH(Yerar 2004 Edition)	: Time-Weighted Average (TWA) 2mg/m^3(Di-ethanolamine)
ACGIH(Year 2009 Edition)	Time-Weighted Average (TWA) 5mg/m^3(Mineral Oil Mist) 10ppm(Hydrogen Sulphide) Short-Time Exposure Limit (STEL) 10mg/m^3(Mineral Oil Mist) 15ppm(Hydrogen Sulphide)

Protective Equipment

Respiratory Protection	: Not required for normal handling
Hand Protection	: Impermeable protective gloves
Eye Protection	: Goggles-type protective eyewear
Skin and Body Protection	: Long-sleeved work clothes

Appropriate Hygiene Measures : Rest, wash hands and rinse mouth after finishing work

9.Physical and Chemical Properties

Physical State

Appearance	: Brackish brown liquid
Odor	: Mild oil odor
pH (Measurement Condition)	: No data

Specific temperature/temperature range for changes in physical state

Boiling Point	: No data
Melting Point	: No data
Flashpoint (Measuremer	: 140℃(Clevelend Open-Cup Tester)
Evaporation Rate	: No data
Flammability (Solid, Gas)	: No data
Combustion or Explosion Characte	
Combustion or Explosion Limits	: No data
Vapour Pressure	: No data
Vapour Density	: No data
Relative Density(25℃)	: 0.99
Solubility: Water Solubil	: No data
Solvent Solubilit	: No data
n-Octanol/Water Partit	: No data
Pour PointTemperature	: -10℃
Viscosity(25℃)	: 211cSt(mm^2/s)
Ignition Point	: No data
Auto-Ignition Temperature	: No data
Decomposition Temperature	: No data

10.Stability and Reactivity

Stability	: Stable under normal conditions.
Reactivity	: No self-reactivity under normal conditions.
Conditions to avoid	: Do not randomly mix with organic and inorganic acids.
Materials to avoid	: Do not allow contact with materials that will be corroded by alkalis.
Reaction Hazards	: Strong alkalis, oxidizing agents
Hazardous Decomposition Produ	: Nothing in particular for normal handling

11.Toxicological Information

Acute Toxicity (Oral)	: No data
Acute Toxicity (Skin)	: No data
Acute Toxicity (Inhalation: Gas)	: No data
Acute Toxicity (Inhalation: Vapo	: No data
Acute Toxicity (Inhalation: Dust)	: No data

Skin Corrosivity/Irritation : ・Moderate irritation for diesel oil based on Draize test results [1)]
・Long-term or repeated contact will result in skin dryness, cracks, fat removal and sometimes dermatitis. [2)] (as a petroleum hydrocarbon)

Severe Eye Injury/Irritation : ・Mild eye irritation [3)] (as a petroleum hydrocarbon)

Respiratory Organ Sensitivity or : No data

Reproductive Cell Mutagenicity : ・For the salmonella typhimurium test, reports indicate that using the suspension method to ascertain metabolic activity shows mild mutagenicity but using the plate method shows no mutagenicity. [4)] (as a petroleum hydrocarbon)

Carcinogenic Effects

IARC : ・Classed under IARC Group 2B as a Residual (Heavy) Fuel Oil
: ・Classed under IARC Group 3 as a Light Distillate Fuel Oil

Reproductive Toxicity : No data

Specific Organ/Whole Body : No data

Specific Organ/Whole Body : No data

Absorptive Respiratory : No data

12.Ecological Information

Ecotoxicity

Acute Toxicity[5)] : As a petroleum hydrocarbon
・Fish (Oncorhynchus mykiss)のLL50: 21-230mg/L/96h
・Fish (Oncorhynchus mykiss)のLL50: >1000mg/L/96h
・Fish (Brachydanion rerio)のLL50: 31mg/L/96h
・Fish (Brachydanion rerio)のLL50: 48mg/L/96h
・Crustacean (water flea) EL50: >1000mg/L/48h
・Crustacean (water flea) EL50: 6.2-210mg/L/48h
・Algae (Rahidocelis subcapitata) IrL50: >10-78mg/L/72h
・Algae (Rahidocelis subcapitata) IrL50: 100-300mg/L/72h

Chronic Toxicity[5)] : As a petroleum hydrocarbon
log Kow 3.9-6
Above 6 for log Kow 2.7-6 range

Persistence/Degradability : No data

Bio-Accumulation : No data

Soil Mobility : No information needs to be recorded but from the physical and chemical characteristics, there is a possibility of water or soil mobility.

13.Disposal Considerations

Residues : This product needs to be disposed in accordance with governing rules and regulations. Appropriate treatment has to be carried out in accordance with related laws and regulations concerning the treatment and cleaning of waste under the Waste Disposal Act by a transport, collection or processing company who is licensed by the municipal authorities to do so.

Polluted Container & Packing : To be properly disposed in accordance with related laws and regulations under the Waste Disposal Act by a transport, collection or processing company who is licensed by the municipal authorities to do so after the contents have been

14.Transport Information

Domestic Regulations

Land Transportation	: In accordance with transport laws under the Fire Service Act and Occupational Safety and Health Act.
Sea Transportation	: In accordance with transport laws under the Ship Safet Act
Air Transportation	: In accordance with transport laws under the Civil Aeronautics Act
International Regulations	: In accordance with IMDG regulations for sea transport and IATA regulations for air transport.
UN Class・UN Number	: Not Applicable
Specific Precautionary Transport Measures and Conditions	: Check that there is no damage, corrosion or leaks in the container before shipping. Ensure that the load does not collapse, topple over, drop or get damaged when
Emergency Measure Guideline N	: Not Applicable

15.Regulatory Information

Domestic Regula

Law for Promotion of Chemic	: Not Applicable
Chemical Substances Control	: Not applicable as a specific or controlled chemical.
Occupational Safety & Health	: Annex 9 List of Specified Substances Item No. 136 Substances containing xyl : Annex 9 List of Specified Substances Item No. 168 Substances containing mir : Annex 9 List of Specified Substances Item No. 219 Substances containing die
Poisonous and Deleterious Su	: Not Applicable
Fire Service Act	: Article 2 Dangerous Goods Class 4 Flammable Liquid 3rd Petroleum Class
High Pressure Gas Safety Law	: Not Applicable
Explosives Control Act	: Not Applicable
Ship Safety Act	: Bulletin on Transportation Standards of Dangerous Goods by Sea Flammable Liquic
Civil Aeronautics Act	: Bulletin on Transportation Standards of Explosive Materials by Air Flammable Liqu

16.Other Information

Enquiry Contact	: Stated in 1.Chemical and Company Information
References	1) ICSC(2004) 2) CONCAWE product dossier no.95/107″gas oil(diesel fuels/heating oils)″ 3) API ReportNo.30 32347,31987(1982) 4) IARC Monographs on the evaluation of carcinogenic risks to humans.Vol.45(1989) 5) CONCAWE report No.01/54environmental classification of petrolem substances-summary data and rationale

This Material Safety Data Sheet has been prepared based upon data considered to be reliable but Nanomizer Inc. does not guarantee the accuracy or completeness thereof. Caution needs to be exercised when handling all chemicals due to any unknown hazards. It is the user's responsibility to determine the safe conditions for use. In special cases, adequate safety measures and precautions suitable for the particular application or use must be taken before use. This MSDS has been prepared based on Japanese Rules and Regulations.