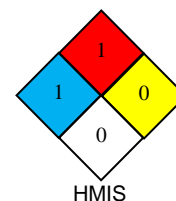


SAFETY DATA SHEET

Global Harmonized System



SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

| | | | | | |
|--|--|---|---|--|--|
| Product Identifier Tallow Fatty Acid TRT1, TRT1655, TRT1670, TRT1618, TRT1855 | | | | [HMIS Classification] Health - 1 Flammability - 1 Physical Hazard - 0 | |
| Product Use The most common uses for this product include being used for the production of soaps, emulsifiers, lubricants, carriers, and soap surfactants | | | | | |
| Manufacturer's Name Twin Rivers Technologies | | | Supplier's Name Twin Rivers Technologies | | |
| Street Address 780 Washington Street | | | Street Address 780 Washington Street | | |
| City Quincy | | Province MA | | City Quincy | |
| Postal Code 02169 | | Emergency Telephone 617-413-5339 | | Postal Code 02169 | |
| | | | | Emergency Telephone 617-413-5339 | |
| Date SDS Prepared Sept 15, 2017 | | SDS Prepared By Twin Rivers Technologies | | Phone Number 617-472-9200 | |

SECTION 2 — HAZARDS IDENTIFICATION

GHS – not a controlled product under Global Harmonized Systems

European Hazard Classification: This substance is not classified as dangerous according to Directive 67/548/EEC.

Emergency Overview: Potential combustible dust if flaked or powdered. Dust generated from flaked product will be combustible at sufficient concentration.

Potential Health Effects:

Eye - Accidental exposure to the eyes will cause only a mild but transient irritation.

Skin – Mild, primary skin irritation with prolonged or repeated contact.

Heated product may cause thermal burns if contacted.

Inhalation - Not applicable at ambient temperature. May elicit transient pulmonary irritation if inhaled.

Ingestion - May cause irritation of gastrointestinal tract.

If product is heated, vaporization can occur. Eye, skin, and upper respiratory irritation may occur.

Physical/Chemical Hazards: Potential combustible dust if flaked or powdered. Dust generated from flaked product will be combustible at sufficient concentration.

Environmental Hazards: None identified.

SECTION 3 — COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation (mixture): Substance

| Name | CAS No. | Wt/Wt % | EC No. | EC Symbols | EC R-phrases |
|---------------------------------------|------------|---------|---------|----------------|----------------|
| Fatty Acids, Tallow hydrogenated | 61790-38-3 | 100 | 2631309 | Not applicable | Not applicable |
| or | | | | | |
| Fatty Acids, C16-18 and C18 – unsatd. | 67701-08-0 | 100 | 2669327 | Not applicable | Not applicable |

Occupational exposure limits, if applicable, are listed in Section 8.

LC/LD50 information is listed in Section 11.

SECTION 4 — FIRST AID MEASURES

| | |
|---------------|--|
| Skin Contact: | Wash skin with soap and water upon contact. Remove contaminated clothing. If irritation develops, get medical attention. Wash clothing before reuse. |
| Eye Contact: | In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention. |
| Inhalation | Avoid breathing dust. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately. |
| Ingestion | If swallowed, do not induce vomiting. Get medical attention. Never give anything by mouth to an unconscious person. |

SECTION 5 - FIRE FIGHTING MEASURES

- Extinguishing media: SMALL FIRES: Use CO2 or dry chemical.
LARGE FIRES: Use foam.
- Unsuitable extinguishing media: Do not use water as an extinguishing media.
- Flash Point and method: ~356° F (>180° C) ASTM D 92
- Explosive limits in air:
Upper: Not available
Lower: Not available
- Auto-ignition temperature: Not available
- Sensitivity to mechanical impact/static discharge: Not available
- Special Protective Equipment: Wear self-contained breathing apparatus and full protective clothing.
- Other Fire Fighting Considerations: Cool containers with flooding quantities of water until well after fire is out. Potential combustible dust if flaked or powdered. Dust generated from flaked product will be combustible at sufficient concentration.
- Exposure hazards: Does not decompose up to 400° F (204° C). Thermal decomposition or burning may produce carbon monoxide and/or carbon dioxide.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

- Personal Precautions: An appropriate NIOSH/MSHA approved respirator should be used if a mist, vapor or dust is generated. Wear suitable gloves and eye/face protection. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Environmental Precautions: Minimize contamination of drains, surface and ground waters.
- Procedures for Spill/Leak Clean-up: Sweep or shovel solids. For liquid spills, neutralization is not required. Contain spill. Absorb or cover with dry earth, sand or other noncombustible material and transfer to containers for disposal. Dispose as any grease or oily material in compliance with Federal, State, and/or Local requirements.

Refer to Section 8 for additional personal protection information.

Refer to Section 13 for disposal considerations.

SECTION 7 - HANDLING AND STORAGE

- Handling: Handle in accordance with good hygiene and safety procedures. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Since empty containers contain product residue, follow all hazard warnings and precautions even after container is emptied. Keep away from sources of ignition.
- Storage: Keep away from possible contact with incompatible substances. Store in acid resistant vessels such as stainless steel, aluminum, or steel coated with resin lining such as Lithcote LC-19 or Kanigen.

Do not store near sources of ignition.

- Specific use(s): Follow bulk handling and storage procedures as noted above.

Refer to Section 6 for clean-up of spillages.

Refer to Section 13 for disposal considerations.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

- | | |
|--------------------------|---|
| • General Precautions: | Good industrial hygiene should be followed. Avoid breathing (heated) vapors. Avoid eye and skin contact. |
| • Exposure Limit Values: | Not established. |
| • Exposure Controls: | |

Engineering Controls: Ventilation: Local exhaust - preferred
 Mechanical - may be necessary if working at elevated temperatures or in enclosed areas.

Personal Protective Equipment:

Eye - Goggles or face shield with goggles, dependent upon potential exposure

Skin - Protective gloves: Rubber or plastic

Dependent upon degree of potential exposure, additional personal protective equipment may be required, such as chemical boots and full protective clothing.

Inhalation - None required for ambient temperature, although an appropriate NIOSH/MSHA approved air-purifying respirator should be used if a mist, vapor or dust is generated. A NIOSH/MSHA approved self-contained breathing apparatus or air-supplied respirator is recommended if the concentration exceeds the capacity of cartridge respirator.

WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Other Controls: Boots, eye wash fountain, safety shower, apron, protective clothing.

- **Environmental Exposure Controls:** Contact Twin Rivers Technologies Community information.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

- General Information:
Physical State @ 72° F (22° C): Solid
Appearance: Water white to yellowish
Odor: Musty, fatty
Odor Threshold: Not available
- Important health, safety and environmental information:
pH: 3 - 4
Boiling point/Boiling range: 464° F (240° C) @ 15 mm Hg
Flash Point & Method: ~356° F (>180° C) ASTM D 92
Flammability (solid, gas): Not available
Explosive properties: Not available
Oxidising properties: Not available
Vapor pressure: @ 212° F (100° C) <0.75 mm Hg
Relative density: ~0.84 @ 75/25° C
Freezing point: Not available
Solubility:
 Water solubility: Negligible @ 72° F (22° C)
 Fat solubility (solvent-oil to be specified): Not available
Partition coefficient: n-octanol/water: Not available
Viscosity: Not available
Vapor density: Not available

Evaporation Rate (nBuOAc=1): Not available
 Explosive Limits: Not available
 Auto ignition temperature: Not available
 Coefficient of water/oil distribution: Not available

SECTION 10 - STABILITY AND REACTIVITY

- Stability: Stable under normal operational conditions.
- Conditions to Avoid: Not available
- Materials to Avoid: Strong oxidizing agents.
- Hazardous Decomposition Products: Does not decompose up to 400° F (204° C). Thermal decomposition or burning may produce carbon monoxide and/or carbon dioxide.
- Hazardous Polymerization: Will not occur.

SECTION 11 - TOXICOLOGICAL INFORMATION

| | Palmitic Acid | Stearic Acid | |
|------------------|----------------|-------------------------------------|---------------|
| IRRITATION DATA: | | | |
| Eye, rabbit | Not irritating | Not irritating | |
| Skin, rabbit | Not irritating | Not irritating** 500 mg/24H MOD* | |
| Skin, human | 75 mg/3D-I MLD | 75 mg/3D-I MLD | |
| ACUTE TOXICITY: | Palmitic Acid | Stearic Acid | Myristic acid |
| Oral, rat LD50 | >10 gm/kg | >10 gm/kg | > 10 gm/kg |

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity:

| Fishes | Palmitic Acid | Stearic Acid |
|------------------------|------------------------|------------------------|
| Goldfish (lethal dose) | 11 mg/l (sodium salt) | 14 mg/l (sodium salt) |
| Red killifish 96h LD50 | 150 mg/l (sodium salt) | 125 mg/l (sodium salt) |

Aquatic Invertebrates

Daphnia magna: Palmitic and stearic acids; not acutely toxic to Daphnia Magna at concentrations within its aqueous solubility (water hardness of 215 & 54 mg/L CaCO₃).

| Algae | Palmitic Acid | Stearic Acid |
|------------------------------|---------------|--------------|
| Scenedesmus subspicatus EC50 | Not available | > 1016 mg/l |
| Scenedesmus subspicatus NOEC | Not available | > 1016 mg/l |

Biodegradation

Sodium stearate: 89% in 28 days "Sealed Vessel Test" (Modified Sturm Test)

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE/PROVINCIAL AND LOCAL REGULATIONS. Do not dispose of via sinks, drains or into the immediate environment.

Contaminated packaging: Observe local regulations.

SECTION 14 - TRANSPORT INFORMATION

U.S. DOT: Not regulated for transport

Not classified in RID/ADR - ADNR - IMDG - ICAO/IATA - DGR

SECTION 15 - ADDITIONAL REGULATORY INFORMATION

INVENTORY STATUS:

INVENTORY STATUS:

Octadecanoic acid TSCA, EINECS, DSL, AUSTRALIA, KOREA, ENCS, PHILIPPINES, CHINA

TRT1, TRT1655, TRT1618, TRT1855 WGK water endangering nwg, non-hazardous to waters class is based on the computation rule of VwVwS Annex 4 for mixtures.

EC LABELING AND CLASSIFICATION:

This product is not classified as dangerous according to Directive 67/548/EEC.

Canada

HAZARDOUS INGREDIENTS- WHMIS (Canadian Workplace Hazardous Materials Information System)

This product when tested as a whole is not a controlled substance within the meaning of the Hazardous Products Act.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

SECTION 16 - OTHER INFORMATION

EUROPE

This product safety data sheet was prepared in compliance with 2001/58/EC.

References: RTECS ACCESSION NUMBER RT4550000 – Palmitic acid
*RTECS ACCESSION NUMBER WI2800000 – Stearic acid
RTECS ACCESSION NUMBER QH4375000 – Myristic acid

**Acute toxicity and irritation studies on a series of fatty acids.

J. Am. Oil Chem. Soc., 56(1979), p. 760AK.

Verschueren. Handbook of environmental data on organic chemicals, 3rd ed. (1998).

The submission of the SDS may be required by law, but this is not an assertion that the substance is hazardous when used in accordance with proper safety practices and normal handling procedures. Data supplied are for use only in connection with occupational safety and health.

The information contained herein has been compiled from sources considered by Twin Rivers Technologies to be dependable and is accurate to the best of the Company's knowledge. The information relates to the specific product designated herein, and does not relate to use in combination with any other material of any other process. Twin Rivers Technologies assumes no responsibility for injury to the recipient or third persons, or for any damage to any property resulting from misuse of the controlled product.

Safety Data Sheet is in compliance with OSHA/EPA/EU Standards and Requirements

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300
International CHEMTREC, call: 1-703-527-3887