SAFETY DATA SHEET
EDS-QR™

Revision date: 2020-06-16
Version 1.0

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name: EDS-QR™, Electron Donor Solution – Quick Release

Synonyms: 1,2,3-Propanetriol, Glycerol, Glycerine

Trade Name: Refined Glycerin 99.7% min purity

Product Form: Substance

Recommended use of the chemical and restrictions on use

Recommended Use: Remediation of contaminated groundwater and soils.
Identified Uses: Raw material for manufacturing oleochemical derivatives; used in synthesis and as a solvent
Restrictions on Use: Use as recommended by the label

Details of the supplier and of the safety data sheet

Supplier
Tersus Environmental, LLC
1116 Colonial Club Rd
Wake Forest, NC 27587
Phone: +1-919-453-5577
Email: info@tersusenv.com

Contact Person
David F. Alden
Phone: +1-919-453-5577 x2002
Email: david.alden@tersusenv.com

Emergency telephone number

For leak, fire, spill or accident emergencies, call:

+1-919-453-5577 (Tersus Office Hours, 8:00 AM to 5:00 PM Eastern)
+1-800-424-9300 (Chemtrec 24 Hour Service – Emergency Only)
+1-703-527-3887 (Chemtrec Outside United States 24 Hour Service – Emergency Only)
+1-919-638-7892 Gary M. Birk (Outside office hours)

2. HAZARD IDENTIFICATION

Relevant identified uses of the substance or mixture

No applicable GHS categories. Not a hazardous substance or mixture. This product is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Other hazards

None known.

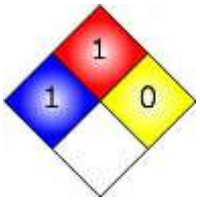
GHS Label elements

None

Potential Health Effects
Can be irritating to the eyes.
Can be harmful if ingested.
Can be harmful if inhaled. Avoid breathing mist.
Can be irritating to the skin.

Other Non-GHS Classification

NFPA 704



NFPA Scale (0 - 4)

HMIS® IV

HMIS® Ratings (0 – 4)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance Glycerin
Chemical Formula $C_3H_8O_3$

Chemical Name	CAS number	EC number	Concentration (%)	EU Classification	GHS Classification
Glycerin	56-81-5	200-289-5	99.7% min.	Not Classified	Not Classified

Impurities and Stabilizing Additives
There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and require reporting in this section.

Synonyms are provided in Section 1.
Occupational exposure limits, if available, are listed in Section 8.

4. FIRST AID MEASURES

General Information	Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). Take care to self-protect by avoiding becoming contaminated.
Eye Contact	Promptly wash eye with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention. Do not apply (chemical) neutralizing agents. In case of eye irritation consult an ophthalmologist. Remove any contact lenses and open eyelids wide apart.
Skin Contact	Wash off promptly and flush contaminated skin with water. Promptly remove clothing of soaked through and flush skin with water. Get medical attention if irritation persists after washing. Do not apply (chemical) neutralizing agents.
Inhalation	Move the exposed person to fresh air at once. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Perform artificial respiration if breathing has stopped. Keep the affected person warm and at rest. Get prompt medical attention.

Ingestion	Drink plenty of water. DO NOT induce vomiting. Get medical attention immediately. Never give anything by mouth to an unconscious person.	
Most important symptoms and effects, both acute and delayed	Symptoms/injuries after skin contact Symptoms/injuries after eye contact	Causes skin irritation Eye damage / irritation
Indication of any immediate medical attention and special treatment needed	If exposed or concerned, get medical advice and attention.	

Description of First Aid Measures
First-aid measures after inhalation: Remove the victim into fresh air. If signs/symptoms continue, get medical attention. Give oxygen or artificial respiration as needed.
First-aid measures after skin contact: Wash immediately with lots of water (15 minutes)/shower. Soap may be used. Remove clothing before washing.
First-aid measures after eye contact: Rinse immediately with plenty of water for 15 minutes. Take victim to an ophthalmologist if irritation persists.
First-aid measures after ingestion: DO NOT induce vomiting. If vomiting does occur, have victim lean forward to prevent aspiration. Rinse mouth with water. Seek medical attention. Never give anything by mouth to an unconscious individual.
Ingestion of large quantities: immediately to hospital.

Indication of Any Immediate Medical Attention and Special Treatment Needed
If medical advice is needed, have product container or label at hand. All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Use dry powder, foam, carbon dioxide for extinguishing.
Specific Hazards Arising from the chemical or mixture	**Fire hazard**: DIRECT FIRE HAZARD. Combustible keep away from open flame, no smoking. INDIRECT FIRE HAZARD. Temperature above flashpoint: higher fire/explosion hazard. **Explosion hazard**: No direct explosion hazard. **Reactivity**: Decomposes on exposure to temperature rise: release of toxic/corrosive/combustible gases/vapors (acrolein). Upon combustion CO and CO_2 are formed. May polymerize on exposure to temperature rise. Reacts violently with (strong) oxidizers: (increased) risk of fire/explosion. Reacts with (some) acids: (increased) risk of fire/explosion.
Advice for Firefighters	**Firefighting instructions**: Exercise caution when fighting any chemical fire. **Protection during firefighting**: Firefighters should wear full protective gear. Use self-contained breathing equipment if in confined place. Do not enter fire area without proper protective equipment, including respiratory protection.
Other Information	Refer to Section 9 for flammability properties.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Wear protective clothing as described in Section 8 of this safety data sheet. Do not smoke or use open fire or other sources of ignition. Contact with walking surface may result in formation of slippery film/falling hazard.
First Aid:	In case of contact with skin, wash with soap and water. If symptoms occur, seek medical attention. In case of contact with eyes, rinse with plenty of water for at least 15 minutes and see an eye specialist if irritation persists. In case of inhalation, remove to fresh air. In case of ingestion, drink water. If symptoms occur, seek medical assistance.
Environmental Precautions	Do not discharge into drains, sewers, or watercourses or onto the ground. Inform the relevant authorities if this occurs.
Methods for Containment and Clean Up	**For containment**: Collect leakage in sealable containers, soak up with sand or other inert absorbent and remove to safe place. Flush away remainder with water. **Methods for cleaning up**: Clear up spills immediately and dispose of waste safely

7. HANDLING AND STORAGE

Precautions for safe handling	**Prevention of user exposure**: Put on appropriate personal protective equipment. Use gloves and wear goggles when handling. Avoid breathing mist. **Prevention of fire and explosion**: Handling temperature ≥ 10 °C above melting point **Precautions while moving the product**: Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous.
Hygiene measures	Handle in accordance with good industrial hygiene and safety procedures. Workers should wash hands and face before eating, drinking, and smoking.
Conditions for safe storage, including any incompatibilities	**Storage precautions:** Keep in a cool and dry place. Keep separate from oxidants. Avoid extreme heat and cold. Avoid direct fire. Store in clean, dry, and preferably stainless steel or HDPE vessels. In bulk, store at ambient temperature. Temperature higher than necessary degrades quality at rate dependent on time and temperature of exposure. Exposure to ultraviolet light, especially sunlight, must be minimized to prevent quality loss. **Incompatible products**: KEEP SUBSTANCE AWAY FROM: heat sources, oxidizing agents, (strong) acids, (strong) bases. **Packaging materials**: Packaging should be closable, dry, clean, correctly labelled, and meet the legal requirements. Secure fragile packaging in solid containers. Suitable storage includes steel, aluminum, iron, synthetic material, glass.

8. EXPOSRE CONTROL / PERSONAL PROTECTION

Control parameters
Exposure guidelines, ingredients with workplace control parameters.

Occupational Exposure Controls: n/a
Technical measures: n/a
Occupational Exposure Limits:
Glycerin

Source	Type	Value	Note
US (OSHA)	TWA	15 mg/m^3	29 CFR 1910.1000 Table Z-1 Limits for Air Contaminants
US (ACGIH)	TWA	15 mg/m^3	ACGIH Threshold Limit Value

Exposure Control
Protective equipment

Appropriate engineering controls	Provide adequate general and local exhaust ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Observe any occupational exposure limits for the product or ingredients. Do not allow uncontrolled discharge of product into the environment.
Eye/face protection	Use protective goggles and/or a full-face shield where splashing is possible. Use equipment approved by appropriate government standards, such as NIOSH (US) or EN166 (EU). Maintain eye wash fountain and quick-drench facilities in work area.
Respiratory protection	Mist formation: aerosol mask with filter type P1. On heating: gas mask with filter type A.
Hand protection	Suitable protective gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
Other skin and body protection	Wear appropriate clothing to prevent any possibility of skin contact.
Hygiene measures	Wash promptly if skin becomes contaminated. Wash hands at the end of each work shift and before eating, smoking, and using the toilet. When using do not eat, drink, or smoke.
Environmental Exposure Controls	If exposure limits are exceeded or irritation is experienced, NIOSH approved respiratory protection should be worn.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

General Information

Physical State	Clear, colorless, hygroscopic viscous liquid
Color	colorless
Odor	odorless
Molecular Weight	92.09 g/mol

Safety Data

pH:	Neutral
Initial boiling point and boiling range:	290 - 295 °C @ 760mm Hg
Flash point:	>199 °C
Evaporation rate:	n/a
Flammability (solid, gas):	n/a
Upper/lower flammability or explosive limits:	n/a
Vapor pressure:	< 0.001 hPa @ 20°C
Vapor pressure:	0.0033 hPa @ 50°C
Vapor density:	3.2 (relative, air=1)
Relative density:	1.0 @ 20 °C at saturated mixture vapor/air (air=1)
pH:	Neutral
Solubility(ies):	Infinite g/100 ml in water @ 20 °C
Partition coefficient: n-octanol/water:	-2.6
Auto-ignition temperature:	429 °C
Decomposition temperature:	290 °C
Viscosity:	1400 mPas (20 °C)
Log Pow: -	1.76/2.6
Melting point/freezing point:	18 °C
Boiling Point:	290 °C

10. STABILITY AND REACTIVITY

Reactivity	Vapor mixes readily with air. Decomposes on exposure to temperature rise: release of toxic, corrosive, combustible gases/ vapors (acrolein). Upon combustion CO and CO_2 are formed. May polymerize on exposure to temperature rise. Reacts violently with (strong) oxidizers: (increased) risk of fire/explosion. Reacts with (some) acids: (increased) risk of fire/explosion.
Chemical stability	Hygroscopic. Able to polymerize above 149 °C. Decomposes when heated above 290 °C.
Possibility of hazardous reactions	None known
Conditions to avoid	None known
Incompatible materials	Reacts violently with strong oxidants
Hazardous decomposition products	Low toxicity in original state and not considered hazardous to human beings. On heating/burning release of toxic/combustible gases/vapors (acrolein).

11. TOXICOLOGICAL INFORMATION

Acute toxicity by oral route, inhalation, and dermal route: Not Classified

Product	Test	Species	Dose
Glycerin	LD50, Oral	Rat	12,600 mg/kg
	LC50, Inhalation	Rat	>570mg/m3/1Hr
	LD50, Dermal	Rabbit	> 10,000 mg/kg

Additional Toxicological Information
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us. The substance is not subject to classification.

Carcinogenic Categories

IRAC (International Agency for Research on Cancer): No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible, or confirmed human carcinogen by IARC.

ACGIH (American Conference of Governmental Industrial Hygienists): No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH.

NTP (National Toxicology Program): No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.

OSHA (Occupational Safety & Health Administration): No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

12. ECOLOGICAL INFORMATION

Ecotoxicity (aquatic and terrestrial, where available)

- **Ecology - General**: No supplementary information available.
- **Ecology - Air**: TA-Luft Klasse 5.2.5.
- **Ecology - Water**:
  - Mild water pollutant (surface water)
  - Not harmful to fishes (LC50 (96h) >1,000 mg/l)
  - Not harmful to aquatic organisms (EC50 >1,000 mg/l)
  - Not harmful to algae
  - Not harmful to bacteria
  - Bioaccumulation: not applicable
  - Sludge digestion is inhibited at >1,000 mg/l 50%
  - Readily biodegradable in water (OECD 301D: 82%; 20 days)

Organism/Biotic Test	Toxicity
LC50 fishes 1	54,000 mg/l (96 h, SALMO GAIRDNERI/ ONCORHYNCHUS MYKISS)
LC50 other aquatic organisms 1	> 1,000 mg/l (96 h)
LC50 other aquatic organisms 1	> 1,000 mg/l (BACTERIA, ACTIVATED SLUDGE)
LC50 fish 2	> 1,000 mg/l (96 h, PISCES)
EC50 Daphnia 2	> 10,000 mg/l (24 h, DAPHNIA MAGNA, LOCOMOTOR EFFECT)
TLM fish 1	> 1,000 ppm (96 h, PISCES)
TLM other aquatic organisms 1	> 1,000 ppm (96 h)
Threshold limit other aquatic organisms 1	2,900 mg/l (192 h, MICROCYSTIS AERUGINOSA, TOXICITY TEST)

Threshold limit other aquatic organisms 2	> 10,000 mg/l (16 h, PSEUDOMONAS PUTIDA, TOXICITY TEST)
Threshold limit algae 1	> 10,000 mg/l (168 h, SCENEDESMUS QUADRICAUDA, TOXICITY TEST)

Persistence and Degradability: Readily biodegradable, OECD 301
Biochemical oxygen demand (BOD): 0.87 g O2/g substance
Chemical oxygen demand (COD): 1.16 g O2/g substance (ISO 15705)
ThOD: 1.217 g O2/g substance
BOD: (% of ThOD) 71 % ThOD
Bioaccumulative Potential: Log P octanol /water = -1.76/2.6

Mobility in the Soil
Surface tension 0,063 N/m (20°C)
Ecology - biodegradability in soil: no data available.

Other Adverse Effects: None available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods	Dispose according to federal, state, and local laws. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Authority. Waste is suitable for incineration.
Methods of Disposal of Waste Residue:	Take up liquid spill into absorbent material, e.g.: sand, earth, vermiculite, or powdered limestone. Scoop absorbed substance into closing containers. See "Material-handling" for suitable container materials. Wash down leftovers with plenty of water. Wash clothing and equipment after handling. Do not discharge into surface water.
Disposal of Contaminated Packaging	Dispose according to federal, state, and local laws. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Authority. Waste is suitable for incineration.

14. TRANSPORTATION INFORMATION

U.S. (D.O.T.)

Proper Shipping Name:	Chemicals not otherwise indexed (NOI) nonhazardous.
Hazard Class:	Not applicable
UN/NA:	Not applicable
Labels:	Not applicable

Canada (T.D.G.)

Proper Shipping Name:	Chemicals not otherwise indexed (NOI) nonhazardous.
Hazard Class:	Not applicable
UN/NA:	Not applicable
Labels	Not applicable

IMDG

Proper Shipping Name:	Chemicals not otherwise indexed (NOI) nonhazardous.
Hazard Class:	Not applicable
UN/NA:	Not applicable
Labels:	Not applicable

IATA

Proper Shipping Name:	Chemicals not otherwise indexed (NOI) nonhazardous.
Hazard Class:	Not applicable
UN/NA:	Not applicable
Labels:	Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity
This material does not contain any components with a CERCLA RQ.

SARA 311/312 Hazards: No SARA Hazards

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:

CH INV:	On the inventory, or in compliance with the inventory
DSL:	All components of this product are on the Canadian DSL
AICS:	On the inventory, or in compliance with the inventory
NZIoC:	On the inventory, or in compliance with the inventory
ENCS:	On the inventory, or in compliance with the inventory
KECI:	Not in compliance with the inventory
PICCS:	On the inventory, or in compliance with the inventory
IECSC:	On the inventory, or in compliance with the inventory
TCSI:	On the inventory, or in compliance with the inventory
TSCA:	On the inventory, or in compliance with the inventory

National Regulations
Chemical inventories: Listed on AICS, DSL, ECL, ECST, ENCS, IECSC, NZIoC, PICCS, SWISS, TSCA, EC inventories Swiss Ordinance (RS 817.023.21) Annex 6: List of additives (part A), List of binders (part A), List of solvents (part A) WGK class: 1 (weak water endangering)

EU Regulations
No REACH Annex XVII restrictions
EU Regulation 10/2011 (Annex I): FCM 103 - (CAS 0000056-81-5) glycerol

TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

16. OTHER INFORMATION

Training advice: Before using/handling the product one must read carefully present SDS. Always work safely around open hatches on bulk tanks.

The information contained in this Safety Data Sheet, as of the issue date, is believed to be true and correct. However, the accuracy or completeness of this information and any recommendations or suggestions are made without warranty or guarantee. Since the conditions of use are beyond the control of our company, it is the responsibility of the user to determine the conditions of safe use of this product. The information in this sheet does not represent analytical specifications; for this information contact Tersus Environmental.

Disclaimer: This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. All recommendations for the use of our products, weather given by us, orally or to be implied from data or lab tests results by us, are based on the current state of our knowledge at the time those recommendations are made. When additional information is obtained, these recommendations may be updated. They may also be influenced by circumstances outside our control. Notwithstanding, such recommendation the user is responsible that the product as supplied by us is suitable to the process or purpose he intends to use it. The user of the product is solely responsible for compliance with all laws and regulations applying to the use of this product. Since we cannot control the application, use or processing of the product, we do not accept responsibility. Therefore, the user should assure that the intended use of the product will not infringe in any party's intellectual property right.

tersus environmental

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End of Safety Data Sheet