Safety Data Sheet

RTU GEOTHERMAL-E HEAT TRANSFER FLUID

SDS Revision Date: **11/10/2021**

1. Identification

1.1. Product identifier

Product Identity	RTU GEOTHERMAL-E HEAT TRANSFER FLUID
Alternate Names	01-305, Blended Formula, RTU Geothermal Ethanol Heat Transfer Liquid Fluid- 5 gallon

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use	Ready to use ethanol-based heat transfer fluid is specially formulated for geothermal systems.
Application Method	Read all precautions and instructions carefully before and after use.

1.3. Details of the supplier of the safety data sheet

Company Name	ComStar International Inc. 20-47 128th Street, College Point, NY 11356
Telephone No.	718-445-7900 800-328-0142 Fax: 718-353-5998

2. Hazard(s) identification

2.1. Classification of the substance or mixture

Flammable Liquids, 2; H225 Highly flammable liquid or vapor

Eye Irritation, 2A; H319 Serious eye damage/eye irritation

2.2. Label elements

Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows.

Danger

Hazard statement (s):

H225: Highly flammable liquid and vapor

H319: Causes serious eye irritation

[Prevention]:

P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking

P233: Keep container tightly closed

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/ eye protection/ face protection

P303 + P361 + P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower

P305 + P351 + P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

[Response]:

P337+P313 If eye irritation persists: Get medical advice/attention

P370+P378 In case of fire: Use sand, carbon dioxide or powder extinguisher for extinction

[Storage]:

P403+P235 Store in a well-ventilated place. Keep cool

[Disposal]:

P501 Dispose of contents/container to industrial combustion plant

2.3. Other hazards

Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
PARTICLE SUSPENSION PACKAGE PROPRIETARY, No CAS #	<10	Not classified	
DENATURED ALCOHOL, CAS # 64-17-5	>25	Flam. Liq. 2; Eye Irrit. 2A; H225, H319 Concentration limits: >= 50 %: Eye Irrit. 2A, H319;	
CORROSION INHIBITORS TSR#80100075-5002P	<15	Not classified	
COLOR DYE FOOD QUALITY DYES CAS#: N/A	<1	Not classified	
De-IONIZED WATER CAS#: (N/A)	Balance	Not classified	

In accordance with paragraph (i) of §1910.1200, the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.
*The full texts of the phrases are shown in Section 16.

4. First aid measures

4.1. Description of first aid measures

General	Show this material safety data sheet to the doctor in attendance. Take off contaminated clothing.
Inhalation	After inhalation: fresh air.
Eyes	After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.
Skin	In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.
Ingestion	If swallowed obtain immediate medical attention. Keep at rest. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3. Indication of any immediate medical attention and special treatment needed

None

5. Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media

Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

5.2. Special hazards arising from the substance or mixture

Carbon oxides
Combustible.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
Development of hazardous combustion gases or vapours possible in the event of fire.
Forms explosive mixtures with air at ambient temperatures.

5.3. Advice for fire-fighters

In the event of fire, wear self-contained breathing apparatus.

5.4 Further information

Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

ERG Guide No. **---**

6. Accidental release measures

6.1. Personal precautions, protective equipment, and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2. Environmental precautions

Keep away from drains. Danger of explosion.

6.3. Methods and material for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4. Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

7. Handling and storage

7.1. Precautions for safe handling

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces, and sources of ignition. Take precautionary measures against static discharge.

Hygiene measures
Change contaminated clothing. Wash hands after working with substance. For precautions see section 2.2.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Hygroscopic.
Storage class (TRGS 510): 3: Flammable liquids

See section 2 for further details. - [Storage]:

7.3. Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. Exposure controls and personal protection

8.1. Control parameters

Exposure

Component	CAS-No.	Value	Control parameters	Basis
DENATURED ALCOHOL	64-17-5	TWA	1,000 ppm 1,900 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

		TWA	1,000 ppm 1,900 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		STEL	1,000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks Confirmed animal carcinogen with unknown relevance to humans			
		TWA	1,000 ppm 1,900 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	1,000 ppm 1,900 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Carcinogen Data

CAS No.	Ingredient	Source	Value
N/A	PARTICLE SUSPENSION PACKAGE	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
64-17-5	DENATURED ALCOHOL	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
N/A	CORROSION INHIBITORS	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
N/A	FOOD QUALITY DYES	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
N/A	De- IONIZED WATER	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;

8.2. Exposure controls

Respiratory	Respiratory protection required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.
Eyes/face protection	Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses
Skin	This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de). Full contact Material: butyl-rubber Minimum layer thickness: 0.7 mm Break through time: 480 min Material tested:Butoject® (KCL 898) This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de). Splash contact Material: Nitrile rubber Minimum layer thickness: 0.4 mm Break through time: 120 min Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)
Body Protection	Flame retardant antistatic protective clothing.
Engineering Controls	Change contaminated clothing. Wash hands after working with substance.
Control of environmental exposure	Do not let product enter drains. Risk of explosion.

See section 2 for further details. - [Prevention]:

9. Physical and chemical properties

Appearance	Green Liquid
Odor	pungent
Odor threshold	0.1 ppm
pH	7.0 at 10 g/l at 20 °C (68 °F)
Melting point / freezing point	-114 °C (-173 °F)
Initial boiling point and boiling range	78 °C 172 °F
Flash Point	13 °C (55 °F) - closed cup
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	**Lower Explosive Limit:** 2.5 %(V) **Upper Explosive Limit:** 13.5 %(V)
Vapor pressure (Pa)	0.57 hPa at 19.6 °C (67.3 °F)
Vapor Density	1.6
Specific Gravity	> 2 (H20 = 1)

Solubility in Water	1,000 g/l at 20 °C (68 °F) - completely miscible
Partition coefficient n-octanol/water (Log Kow)	-0.35 at 24 °C (75 °F) - Bioaccumulation is not expected.
Auto-ignition temperature	455 °C (851 °F) at 1,013 hPa - DIN 51794
Decomposition temperature	Distillable in an undecomposed state at normal pressure.
Viscosity (cSt)	No data available
Explosive properties	No data available
Oxidizing properties	No data available

9.2. Other information

Conductivity < 1 µS/cm

Surface tension 72.75 mN/m at 20 °C (68 °F)

Relative vapor density 1.6

10. Stability and reactivity

10.1. Reactivity

Vapors may form explosive mixture with air.

10.2. Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3. Possibility of hazardous reactions

Risk of explosion/exothermic reaction with: hydrogen peroxide perchlorates perchloric acid Nitric acid mercury(II) nitrate permanganic acid Nitriles peroxide compounds Strong oxidizing agents nitrosyl compounds Peroxides sodium Potassium halogen oxides calcium hypochlorite nitrogen dioxide metallic oxides uranium hexafluoride iodides Chlorine Alkali metals Alkaline earth metals alkali oxides Ethylene oxide silver with Nitric acid silver compounds with Ammonia potassium permanganate with conc. sulfuric acid Risk of ignition or formation of inflammable gases or vapours with: halogen-halogen compounds chromium(VI) oxide chromyl chloride Fluorine hydrides Oxides of phosphorus platinum Nitric acid with potassium permanganate

10.4. Conditions to avoid

Warming.

10.5. Incompatible materials

rubber, various plastics

10.6. Hazardous decomposition products

In the event of fire: see section 5

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - 10,470 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Rat - male and female - 4 h - 124.7 mg/l
(OECD Test Guideline 403)
Dermal: No data available No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 24 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Causes serious eye irritation.
(OECD Test Guideline 405)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)
Remarks: (in analogy to similar products)
The value is given in analogy to the following substances: Methanol

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Test Type: dominant lethal test
Species: Mouse

Application Route: Oral
Method: OECD Test Guideline 478
Result: Positive results were obtained in some in vivo tests.

Carcinogenicity
No data available
IARC: 1 - Group 1: Carcinogenic to humans (ethanol)
NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Rat - male - Oral - NOAEL (No observed adverse effect level) - 1,730 mg/kg - LOAEL (Lowest observed adverse effect level) - 3,200 mg/kg RTECS: KQ6300000 irritant effects, respiratory paralysis, Dizziness, narcosis, inebriation, euphoria, Nausea, Vomiting
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

12. Ecological information

12.1. Toxicity

No additional information provided for this product. See Section 3 for chemical specific data.

Aquatic Ecotoxicity

Toxicity to fish
flow-through test LC50 - Pimephales promelas (fathead minnow) - 15,300 mg/l - 96 h (US-EPA)

Toxicity to daphnia and other aquatic invertebrates
static test LC50 - Ceriodaphnia dubia (water flea) - 5,012 mg/l - 48 h Remarks: (ECHA)

Toxicity to algae static test ErC50 - Chlorella vulgaris (Fresh water algae) - 275 mg/l - 72 h (OECD Test Guideline 201)

Toxicity to bacteria static test IC50 - activated sludge - > 1,000 mg/l - 3 h (OECD Test Guideline 209)

12.2. Persistence and degradability

Biodegradability

aerobic - Exposure time 15 d Result: ca.95 % - Readily biodegradable. (OECD Test Guideline 301E) Biochemical Oxygen Demand (BOD) 930 - 1,670 mg/g Remarks: (Lit.)
Theoretical oxygen demand 2,100 mg/g Remarks: (Lit.)

12.3. Bioaccumulative potential

Due to the distribution coefficient n-octanol/water, accumulation in organisms is not expected.

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available.

13. Disposal considerations

13.1. Waste treatment methods

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

14. Transport information

	DOT (Domestic Surface Transportation)	IMO / IMDG (Ocean Transportation)	ICAO/IATA
14.1. UN number	UN 1170	UN 1170	UN 1170
14.2. UN proper shipping name	Ethanol or Ethyl Alcohol or Ethanol Solution	Ethanol or Ethyl Alcohol or Ethanol Solution	Ethanol
14.3. Transport hazard class(es)	**DOT Hazard Class:** Flammable liquid 3	**IMDG:** Flammable liquid 3	**Air Class:** Flammable liquid 3
14.4. Packing group	II	II	II

14.5. Environmental hazards

IMDG No

14.6. Special precautions for user

No further information

15. Regulatory information

Regulatory Overview	The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented.
Toxic Substance Control Act (TSCA)	All components of this material are either listed or exempt from listing on the TSCA Inventory.
WHMIS Classification	Class B-2 Flammable Liquid/Class D-2B: Material causing other toxic effects
US EPA Tier II Hazards	**Fire:** Yes
	Sudden Release of Pressure: No
	Reactive: No
	Immediate (Acute): No
	Delayed (Chronic): No

EPCRA 311/312 Chemicals and RQs:

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

EPCRA 302 Extremely Hazardous:

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

EPCRA 313 Extremely Hazardous:

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Carcinogens (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Developmental Toxins (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Female Repro Toxins (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Male Repro Toxins (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

New Jersey RTK Substances (>1%): Listed

Pennsylvania RTK Substances (>1%): Listed

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The opinions expressed are those of qualified experts within ComStar International Inc. We believe that the information contained is current as of the date of the Safety Data Sheet. Since the use of this information and of these opinions and the conditions of the use of the product are not within the control of ComStar International Inc., it is the user's obligation to determine the conditions of safe use of the product.

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