Safety Data Sheet

GEOTHERMAL-M HEAT TRANSFER FLUID

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

1. Identification

1.1. Product identifier

Product Identity	**GEOTHERMAL-M HEAT TRANSFER FLUID**
Alternate Names	01-160, Blended Formula, Geothermal Methanol Heat Transfer Fluid- 55 gallon

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

Intended use	Concentrated methanol-based heat transfer fluid is specially formulated for geothermal systems. Flammable. Contains metal corrosion inhibitor and particle suspenders to protect aluminum system components.
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 and vapor.
ACUTE TOXICITY, ORAL, 3: H301	Toxic if swallowed
ACUTE TOXICITY, DERMAL, 3; H311	Toxic in contact with skin
H311ACUTE TOXICITY, INHALATION, 3; H331	Toxic if inhaled
SPECIFIC TARGET ORGAN TOXICITY-SINGLE EXPOSURE, 1; EYES, CENTRAL NERVOUS SYSTEM, H370	Causes damage to organs (Eyes, Central nervous system)

2.2. Label elements

SIGNAL WORD

Danger

Hazard statement (s):

H225: Highly flammable liquid and vapor
H302: Toxic if swallowed
H311: Toxic in contact with skin
H331: Toxic if inhaled
H370: Causes damage to organs (Eyes, Central nervous system)

[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.

P260: Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.

P264: Wash skin thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/ eye protection/ face protection.

P301+P310+P330: If swallowed: Immediately call a poison center/ doctor. Rinse mouth.

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

P304 + P340 + P311: If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center / doctor.

P307 + P311: IF exposed: Call a poison center or doctor/ physician.

P362: Take off contaminated clothing and wash before reuse.

P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

[Response]:

P312 Call a poison center or doctor / physician if you feel unwell.

P340 Remove victim to fresh air and keep at rest in a position comfortable for breathing.

[Storage]:

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

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

P405: Store locked up.

[Disposal]:

P501: Dispose of contents/ container to an approved waste disposal plant.

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
Methanol CAS# 67-56-1	>95	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301, H331, H311, H370	
Corrosion & Particle Suspension Pkg N/A	<5		

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 No data available

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

Overview 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
No data available

5. Fire-fighting measures

5.1. Extinguishing media

No data available

5.2. Special hazards arising from the substance or mixture

Carbon oxides

Combustible

5.3. Advice for fire-fighters

No data available

5.4. Further information

No data available

ERG Guide No. ---

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Put on appropriate personal protective equipment (see section 8).

6.2. Environmental precautions

No data available

6.3. Methods and material for containment and cleaning up

No data available

6.4. Reference to other sections

For disposal see section 13.

7. Handling and storage

7.1. Precautions for safe handling

For precautions see section 2.2.

7.2. Conditions for safe storage, including any incompatibilities

No data available

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

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Methanol	67-56-1	TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Danger of cutaneous absorption		
		STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Danger of cutaneous absorption		
		TWA	200 ppm 260 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		

	ST 250 ppm 325 mg/m3	USA. NIOSH Recommended Exposure Limits
	Potential for dermal absorption	
	TWA 200 ppm 260 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	STEL 250 ppm 325mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
	Skin notation	
	TWA 200 ppm 260 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
	Skin notation	
	C 1,000 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
	Skin	
	PEL 200 ppm 260 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
	Skin	
	STEL 250 ppm 325 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methanol	67-56-1	Methanol	15 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Workers	Skin contact	Long-term systemic effects	
Consumers	Skin contact	Long-term systemic effects	
Consumers	Ingestion	Long-term systemic effects	
Workers	Skin contact	Acute systemic effects	
Consumers	Skin contact	Acute systemic effects	
Consumers	Ingestion	Acute systemic effects	
Workers	Inhalation	Acute systemic effects	

Workers	Inhalation	Acute systemic effects	
Workers	Inhalation	Long-term systemic effects	
Workers	Inhalation	Long-term local effects	
Consumers	Inhalation	Acute systemic effects	
Consumers	Inhalation	Acute local effects	
Consumers	Inhalation	Long-term systemic effects	
Consumers	Inhalation	Long-term local effects	

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	23.5 mg/kg
Sea water	15.4 mg/l
Fresh water	15.4 mg/l
Fresh water sediment	570.4 mg/kg
Onsite sewage treatment plant	100 mg/kg

8.2. Exposure controls

Personal protective equipment

Skin protection
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: Viton®
Minimum layer thickness: 0.7 mm
Break through time: 120 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Control of environmental exposure
Prevent product from entering drains.

9. Physical and chemical properties

Appearance	Liquid
Odor	Slight odor
Odor threshold	10 ppm
pH	No data available
Melting point / freezing point	-98 °C (-144 °F)
Initial boiling point and boiling range	64.7 °C 148.5 °F
Flash Point	9.7 °C (49.5 °F) - closed cup - Regulation (EC) No. 440/2008, Annex, A.9
Evaporation rate (Ether = 1)	6.3 - Diethyl ether1.9 - n-butyl acetate
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	**Lower Explosive Limit:** 5.5 %(V) **Upper Explosive Limit:** 44 %(V)
Vapor pressure (Pa)	169.27 hPa at 25 °C (77 °F)
Vapor Density	1.11
Relative density	0.79 - 0.8 at 20 °C (68 °F)
Water solubility	1,000 g/l at 20 °C (68 °F) - completely miscible soluble
Specific Gravity	> 2 (H20 = 1)
Partition coefficient n-octanol/water (Log Kow)	log Pow: -0.77 - (Lit.), Bioaccumulation is not expected.
Auto-ignition temperature	455.0 °C (851.0 °F) at 1,013 hPa - DIN 51794
Decomposition temperature	Distillable in an undecomposed state at normal pressure.
Viscosity (cSt)	0.54 - 0.59 mm2/s at 20 °C (68 °F) -
Volatiles (% by weight)	NA
Octanol/Water Partition Coefficient	NA
9.2. Other information	
Minimum ignition energy	0.14 mJ
Conductivity	< 1 µS/cm
Relative vapor density	1.11

10. Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

No data available

10.3. Possibility of hazardous reactions

Risk of explosion with: Oxidizing agents, perchloric acid, perchlorates, salts of oxyhalogenic acids, chromium (VI) oxide, halogen oxides, nitrogen oxides, nonmetallic oxides, chromo sulfuric acid, chlorates, hydrides, zinc diethyl,

halogens, powdered magnesium, hydrogen peroxide, Nitric acid, sulfuric acid, permanganic acid, sodium hypochlorite,
Exothermic reaction with: acid halides, Acid anhydrides, Reducing agent, acids, Bromine, Chlorine, Chloroform, magnesium, tetrachloromethane,
Risk of ignition or formation of inflammable gases or vapours with: Fluorine, Oxides of phosphorus, Raney-nickel,
Generates dangerous gases or fumes in contact with:
Alkaline earth metals
Alkali metals

10.4. Conditions to avoid

No data available.

10.5. Incompatible materials

Various plastics, magnesium, zinc alloys

10.6. Hazardous decomposition products

In the event of fire: see section 5

11. Toxicological information

Acute toxicity

Acute toxicity estimate Oral - 100.1 mg/kg (Expert judgment)
Symptoms: Nausea, Vomiting
Acute toxicity estimate Inhalation - 4 h - 3.1 mg/l (Expert judgment)
Symptoms: Irritation symptoms in the respiratory tract.
Acute toxicity estimate Dermal - 300.1 mg/kg (Expert judgment)

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation
Remarks: (ECHA)
Drying-out effect resulting in rough and chapped skin.

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
Remarks: (ECHA)

Respiratory or skin sensitization
Sensitization test: - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Based on available data the classification criteria are not met.
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: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity
Did not show carcinogenic effects in animal experiments.

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

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
Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure
Causes damage to organs. - Eyes, Central nervous system
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information
RTECS: PC1400000 To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Systemic effects: acidosis drop in blood pressure agitation, spasms inebriation Dizziness Drowsiness Headache Impairment of vision Blindness narcosis Coma

Symptoms may be delayed.
Damage to: Liver Kidney Cardiac Irreversible damage of the optical nerve.

Other dangerous properties cannot be excluded.

This substance should be handled with particular care.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

12. Ecological information

12.1 Toxicity

Toxicity to fish flow-through test LC50 - Lepomis macrochirus (Bluegill) - 15,400.0 mg/l - 96 h (US-EPA)

Toxicity to daphnia and other aquatic invertebrates semi-static test EC50 - Daphnia magna (Water flea) - 18,260 mg/l - 96 h (OECD Test Guideline 202)

Toxicity to algae static test ErC50 - Pseudokirchneriella subcapitata (green algae) - ca. 22,000.0 mg/l - 96 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 Result: 99 % - Readily biodegradable. (OECD Test Guideline 301D)

Biochemical Oxygen Demand (BOD) 600 - 1,120 mg/g Remarks: (IUCLID)

Chemical Oxygen Demand (COD) 1,420 mg/g Remarks: (IUCLID)

Theoretical oxygen demand 1,500 mg/g Remarks: (Lit.)

Ratio BOD/ThBOD 76 % Remarks: Closed Bottle test(IUCLID)

12.3 Bioaccumulative potential
Bioaccumulation Cyprinus carpio (Carp) - 72 d at 20 °C - 5 mg/l(Methanol) Bioconcentration factor (BCF): 1.0

12.4 Mobility in soil
Will not adsorb on soil.

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
Additional ecological information Avoid release to the environment.

13. Disposal considerations

13.1. Waste treatment methods

Observe all federal, state and local regulations when disposing of this substance.

14. Transport information

DOT (US)
UN number: 1230
Class: 3
Packing group: II
Proper shipping name: Methanol
Reportable Quantity (RQ): 5000 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1230
Class: 3 (6.1)
Packing group: II EMS-No: F-E, S-D
Proper shipping name: METHANOL

IATA
UN number: 1230
Class: 3 (6.1)
Packing group: II
Proper shipping name: Methanol

15. Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III,

Section 313:
Methanol CAS-No. 67-56-1

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right to Know Components
No components are subject to the Massachusetts Right to Know Act.

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.

End of Document