SECTION 1. IDENTIFICATION

Identification of the company:

Clariant Corporation
4000 Monroe Road
Charlotte, NC, 28205
Telephone No.: +1 704-331-7000

Information of the substance/preparation:
BU Industrial & Consumer Specialties
Product Stewardship, +1-704-331-7710

Emergency tel. number: +1 800-424-9300(CHEMTREC)

Trade name: **Safewing TKS 406B**
Material number: 288910

Primary product use: Aircraft de-icing

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Flammable liquids	:	Category 3
Acute toxicity (Oral)	:	Category 4
Eye irritation	:	Category 2A
Specific target organ toxicity - repeated exposure (Oral)	:	Category 2 (Kidney)

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements :
H226 Flammable liquid and vapour.
H302 Harmful if swallowed.
H319 Causes serious eye irritation.
H373 May cause damage to organs (Kidney) through prolonged or repeated exposure if swallowed.

Precautionary statements :

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/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/ eye protection/ face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
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.
P314 Get medical advice/ attention if you feel unwell.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

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

Disposal:

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

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Ethanol	64-17-5	1 - 5
Methanol	67-56-1	< 0.5
Ethanediol	107-21-1	60 - 100

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

SECTION 4. FIRST AID MEASURES

General advice : Remove/Take off immediately all contaminated clothing.

If inhaled : Move the victim to fresh air.

		Give oxygen or artificial respiration if needed. Get immediate medical advice/ attention. Never give anything by mouth to an unconscious person.
In case of skin contact	:	Immediately flush skin under running water for at least fifteen minutes. Seek medical attention if irritation or chemical burn is present.
In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention immediately if irritation develops and persists.
If swallowed	:	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
Most important symptoms and effects, both acute and delayed	:	The possible symptoms known are those derived from the labelling (see section 2). No additional symptoms are known.
Notes to physician	:	None known.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	Hazardous decomposition products: Carbon monoxide and carbon dioxide In case of fires, hazardous combustion gases are formed: Carbon monoxide (CO) Burning produces noxious and toxic fumes.
Further information	:	Wear full protective clothing and self-contained breathing apparatus. Remove product from areas of fire, or otherwise cool containers with water in order to avoid pressure being build up due to heat. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Wear positive pressure self-contained breathing apparatus (SCBA) and full protective equipment.
Special protective equipment for firefighters	:	Self-contained breathing apparatus

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Wear suitable protective equipment. Only trained personnel should be involved in spill operations. Wear suitable protective equipment. Ensure adequate ventilation. Remove all ignition sources. Contain spill and pump into proper containers using explosion-proof equipment. Smaller spills may be recovered using an inert non-combustible absorbent material (sand, kieselguhr) and collected into suitable containers. Do not use organic absorbent material. Containers in which spilt substance has been collected must be properly labelled. Spill may be covered with an appropriate foam to hinder the formation of explosive vapours. Wash spill area. Do not allow to enter sewers, storm drains, surface waters or the soil. Formation of explosive gas/air mixtures. Wearing appropriate personal protective equipment, contain spill, collect onto inert absorbent, and place in a suitable container. Contain spill and pump into proper containers using compatible equipment. Smaller spills may be recovered using inert absorbent material. Wash spill area. Wear prescribed protective gear.
Environmental precautions	:	Do not allow to enter drains or waterways
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Can be landfilled or incinerated, when in compliance with local regulations.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Observe the general rules of industrial fire protection
Advice on safe handling	:	Avoid contact with skin, eyes and clothing. Use only with adequate ventilation and proper protective eyewear, gloves, and clothing. Avoid contact with skin and eyes.
Technical measures/Precautions	:	Keep containers tightly closed in a cool, well-ventilated place. Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Ethanol	64-17-5	STEL	1,000 ppm	ACGIH
		TWA	1,000 ppm 1,900 mg/m3	NIOSH REL
		TWA	1,000 ppm 1,900 mg/m3	OSHA Z-1
		TWA	1,000 ppm 1,900 mg/m3	OSHA P0
Methanol	67-56-1	TWA	200 ppm	ACGIH
		STEL	250 ppm	ACGIH
		TWA	200 ppm 260 mg/m3	NIOSH REL
		ST	250 ppm 325 mg/m3	NIOSH REL
		TWA	200 ppm 260 mg/m3	OSHA Z-1
		STEL	250 ppm 325 mg/m3	OSHA P0
		TWA	200 ppm 260 mg/m3	OSHA P0
Ethanediol	107-21-1	C	50 ppm 125 mg/m3	OSHA P0
		TWA (Vapour)	25 ppm	ACGIH
		STEL (Vapour)	50 ppm	ACGIH
		STEL (Inhalable fraction, Aerosol only)	10 mg/m3	ACGIH

Engineering measures : Local ventilation recommended - mechanical ventilation may be used.

Personal protective equipment

Respiratory protection : Wear an approved respirator when exposed to vapours or to mists beyond the TLV. Use appropriate filters. Do not exceed filters limitations. TLV = Threshold Limit Value

If airborne concentrations pose a health hazard, become irritating or exceed recommended limits, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements under 29 CFR 1910.134

Wear an approved respirator when exposed to vapours or to

mists beyond the TLV. Use appropriate filters. Do not exceed filters limitations. TLV = Threshold Limit Value

Hand protection
Material : Impervious gloves
Remarks : Impervious gloves

Butyl Rubber, PVC Or Neoprene.

Eye protection : Safety goggles
Depending on the risk, wear sufficient eye protection (safety glasses with side protection or goggles, and if necessary, face shield.)
Safety goggles

Skin and body protection : Wear suitable protective clothing.
Protective clothing to minimize skin contact should be worn. Chemically resistant safety shoes. Wash contaminated clothing with soap and water and dry before reuse. Safety showers and eyewash stations should be provided in all areas where this material is handled.
Wear suitable protective clothing.

Protective measures : Avoid contact with skin and eyes.

Hygiene measures : Keep away from food and drink.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour : colourless, clear

Odour : odourless

none

Odour Threshold : not tested.

pH : not tested.

Freezing point : -60 °C

Boiling point : 120 °C
(1,013.25 hPa)

Flash point : 54 °C
Method: closed cup

Evaporation rate : not tested.

Flammability (solid, gas)	:	Not applicable
Self-ignition	:	The substance or mixture is not classified as self heating.
Burning number	:	Not applicable
Upper explosion limit / upper flammability limit	:	not tested.
Lower explosion limit / Lower flammability limit	:	not tested.
Vapour pressure	:	9.33 hPa (0 °C)
Relative vapour density	:	2
Density	:	1.092 - 1.097 g/cm3 (20 °C)
Bulk density	:	Not applicable
Solubility(ies)		
Water solubility	:	completely miscible (20 °C)
Solubility in other solvents	:	not tested.
Partition coefficient: n-octanol/water	:	Not applicable
Auto-ignition temperature	:	365 °C
Decomposition temperature	:	No decomposition if used as directed. not available
Viscosity		
Viscosity, dynamic	:	not tested.
Viscosity, kinematic	:	11 - 13 mm2/s (20 °C)
Explosive properties	:	no data available
Oxidizing properties	:	Not applicable
Metal corrosion rate	:	< 6.25 mm/a
Minimum ignition energy	:	not tested.
Particle size	:	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.

Chemical stability	:	Stable Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use. Stable
Conditions to avoid	:	Strong oxidizers and strong acids. Heated surfaces, sparks, open flames and other sources of ignition. None known.
Incompatible materials	:	Strong acids and oxidizing agents
Hazardous decomposition products	:	Hazardous decomposition products: Carbon monoxide and carbon dioxide When handled and stored appropriately, no dangerous decomposition products are known

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

None known.

Acute toxicity

Product:

Acute oral toxicity	:	LC50 (Rat): 8,000 mg/kg Acute toxicity estimate: 606.43 mg/kg Method: Calculation method
Acute inhalation toxicity	:	LC50: 200 mg/l Acute toxicity estimate: > 40 mg/l Exposure time: 4 h Test atmosphere: vapour Method: Calculation method
Acute dermal toxicity	:	Acute toxicity estimate: 120,000 mg/kg Method: Calculation method Acute toxicity estimate: 4,084 mg/kg Method: Calculation method

Components:

Ethanol:

Acute oral toxicity	:	LD50 (Rat, male and female): 10,470 mg/kg Method: OECD Test Guideline 401 GLP: no

Acute inhalation toxicity : LC50 (Rat, male and female): 124.7 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403
GLP: no

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Method: OECD Test Guideline 402

Methanol:

Acute oral toxicity : LD50 (Rat, male and female): 1,187 - 2,769 mg/kg
Method: BASF test
GLP: no
Assessment: The component/mixture is toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat, male and female): 87.5 mg/l
Exposure time: 6 h
Test atmosphere: vapour
Method: BASF test
GLP: no
Assessment: The component/mixture is toxic after short term inhalation.

Acute dermal toxicity : Assessment: The component/mixture is toxic after single contact with skin.

Ethanediol:

Acute oral toxicity : LD50 (Rat, male and female): 22,000 mg/kg
Method: Other
GLP: no

Acute inhalation toxicity : LC50 (Rat, male and female): > 2.5 mg/l
Exposure time: 6 h
Test atmosphere: dust/mist
Method: Other
GLP: yes

Acute dermal toxicity : LD50 (Mouse, male and female): > 3,500 mg/kg
Method: Other
GLP: yes

Skin corrosion/irritation

Product:

Result: Repeated exposure may cause skin dryness or cracking.

Components:

Ethanol:

Species: Rabbit
Exposure time: 24 h
Method: OECD Test Guideline 404
Result: No skin irritation
GLP: yes

Methanol:

Species: Rabbit
Exposure time: <= 20 h
Method: Other
Result: No skin irritation
GLP: no

Ethanediol:

Species: Rabbit
Exposure time: 20 h
Method: Other
Result: No skin irritation
GLP: no

Serious eye damage/eye irritation

Product:

Result: irritating

Components:

Ethanol:

Species: Rabbit
Result: Irritating to eyes.
Method: OECD Test Guideline 405
GLP: No information available.

Methanol:

Species: Rabbit
Result: No eye irritation
Method: Other
GLP: no

Ethanediol:

Species: Rabbit
Result: No eye irritation
Exposure time: 24 h
Method: Other
GLP: no

Respiratory or skin sensitisation

Product:

Remarks: not tested.

Components:

Ethanol:

Exposure routes: Dermal
Species: Mouse
Method: Other
Result: Not a skin sensitizer.
GLP: No information available.

Methanol:

Test Type: Maximisation Test
Exposure routes: Dermal
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Not a skin sensitizer.
GLP: no

Assessment: Toxic if swallowed, in contact with skin or if inhaled.

Ethanediol:

Test Type: Maximisation Test
Exposure routes: Dermal
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Not a skin sensitizer.
GLP: yes

Assessment: Harmful if swallowed.

Germ cell mutagenicity

Product:

Germ cell mutagenicity - Assessment : No information available.

Components:

Ethanol:

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: No information available.

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
GLP: No information available.

Test Type: Chromosome aberration test in vitro
Test system: Human lymphocytes
Metabolic activation: without
Method: OECD Test Guideline 473
Result: negative
GLP: No information available.

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Rat (male)
Strain: Other
Cell type: Bone marrow
Application Route: Drinking water
Method: OECD Test Guideline 474
Result: negative
GLP: No information available.

Germ cell mutagenicity - Assessment : It is concluded that the product is not mutagenic based on evaluation of several mutagenicity tests.

Methanol:

Genotoxicity in vitro : Test Type: Micronucleus test
Test system: Chinese hamster lung cells
Concentration: 40 mg/ml
Metabolic activation: without
Method: Other
Result: negative
GLP: No information available.

Test Type: HGPRT assay
Test system: Chinese hamster lung cells
Concentration: 15,8 - 63,3 mg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: No information available.

Test Type: In vitro gene mutation study in bacteria
Test system: Salmonella typhimurium
Concentration: 5 - 5000 µg/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: No information available.

Genotoxicity in vivo : Test Type: Chromosome Aberration Test
Species: Mouse (male)
Strain: C57BL/6 x DBA/2

Cell type: Erythrocytes
Application Route: Inhalation
Exposure time: 5 d, 6 h/day
Dose: 1,04 - 5,3 mg/l
Method: Other
Result: negative
GLP: No information available.

Germ cell mutagenicity - Assessment : It is concluded that the product is not mutagenic based on evaluation of several mutagenicity tests.

Ethanediol:

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Concentration: 33 - 5000 µg/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

Test Type: Ames test
Test system: Escherichia coli
Concentration: 33 - 5000 µg/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: Other
Result: negative
GLP: yes

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
GLP: yes

Genotoxicity in vivo : Test Type: Dominant lethal assay
Species: Rat (male and female)
Strain: Fischer F344
Application Route: oral (feed)
Exposure time: 3 generation
Dose: 40 - 200 - 1000 mg/kg
Method: Other
Result: negative
GLP: no

Germ cell mutagenicity - : It is concluded that the product is not mutagenic based on

Assessment		evaluation of several mutagenicity tests.

Carcinogenicity

Product:

Carcinogenicity - Assessment	:	No information available.

Components:

Ethanol:

Species: Mouse, (female)
Application Route: Drinking water
Exposure time: 105 weeks
Dose: 0, 2.5 and 5% in drinking wate
Group: yes
4,400 mg/kg bw/day
Method: OPPTS 870.4200
GLP: yes

Carcinogenicity - Assessment	:	Not classifiable as a human carcinogen.

Methanol:

Species: Rat, (male and female)
Application Route: Inhalation
Exposure time: 24
Dose: 0,013 - 0,13 - 1,3 mg/l
Group: yes
Frequency of Treatment: 20 h/day
NOAEL: >= 1.3 mg/l
Method: OECD Test Guideline 453
GLP: No information available.

Carcinogenicity - Assessment	:	Not classifiable as a human carcinogen.

Ethanediol:

Species: Mouse, (male and female)
Application Route: oral (feed)
Exposure time: 2 a
Dose: 6250-12500-25000-50000 ppm
Group: yes
Frequency of Treatment: daily
NOAEL: 1,500 mg/kg bw/day
Method: Other
GLP: yes

Carcinogenicity - Assessment	:	Not classifiable as a human carcinogen.

IARC	Not listed
OSHA	Not listed
NTP	Not listed

Reproductive toxicity

Product:

Reproductive toxicity - Assessment : No information available.

No information available.

Components:

Ethanol:

Effects on fertility : Test Type: Two-generation study
Species: Mouse, male and female
Strain: CD1
Application Route: Drinking water
Dose: 5, 10 and 15% v/v in water
Duration of Single Treatment: 126 d
General Toxicity - Parent: NOAEL: 15 %
General Toxicity F1: NOAEL: 10 %
General Toxicity F2: NOAEL: < 15 %
Method: OECD Test Guideline 416
GLP: No information available.

Effects on foetal development : Test Type: Pre-natal
Species: Rat, female
Strain: Sprague-Dawley
Application Route: Inhalation
Dose: 10000, 16000, 20000 ppm nom.
Duration of Single Treatment: 19 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 16,000 ppm
Teratogenicity: NOAEL: 20,000 ppm
Method: OECD Test Guideline 414
GLP: No information available.

Reproductive toxicity - Assessment : No reproductive toxicity to be expected.
No teratogenic effects to be expected.

Methanol:

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Strain: Sprague-Dawley
Application Route: Inhalation
Dose: 0,013 - 0,13 - 1,3 mg/l
Duration of Single Treatment: 20 h
General Toxicity - Parent: NOAEC: 1.3 mg/l

General Toxicity F1: NOAEC: 0.13 mg/l
General Toxicity F2: NOAEC: 0.13 mg/l
Method: OECD Test Guideline 416
GLP: No information available.

Effects on foetal development : Test Type: Pre-natal
Species: Rat, female
Strain: Sprague-Dawley
Application Route: Inhalation
Dose: 0,27 - 1,33 - 6,65 mg/l
Duration of Single Treatment: 22.7 h
General Toxicity Maternal: NOAEC: 1.33 mg/l
Teratogenicity: NOAEC F1: 1.33 mg/l
Method: OECD Test Guideline 414
GLP: No information available.

Test Type: Pre-natal
Species: Rat
Strain: Long-Evans
Application Route: oral (gavage)
Dose: 1027 - 2054 - 4108 mg/kg
Frequency of Treatment: 1
General Toxicity Maternal: LOAEL: 1,027 mg/kg body weight
Teratogenicity: LOAEL F1: 1,027 mg/kg body weight
Method: OECD Test Guideline 414
GLP: No information available.

Reproductive toxicity - Assessment : No reproductive toxicity to be expected.
No teratogenic effects to be expected.

Ethanediol:

Effects on fertility : Test Type: Three-generation study
Species: Rat, male and female
Strain: Fischer F344
Application Route: oral (feed)
Dose: 40 - 200 - 1000
General Toxicity - Parent: NOAEL: > 1,000 mg/kg body weight
General Toxicity F1: NOAEL: > 1,000 mg/kg body weight
General Toxicity F2: NOAEL: > 1,000 mg/kg body weight
Method: Other
GLP: no

Effects on foetal development : Test Type: reproductive and developmental toxicity study
Species: Rat, female
Strain: Sprague-Dawley
Application Route: oral (gavage)
Dose: 150 - 500 - 1000 - 2500 mg/kg
Duration of Single Treatment: 9 d
General Toxicity Maternal: NOEL: 1,500 mg/kg body weight
Teratogenicity: NOEL: 150 mg/kg body weight
Method: Other
GLP: yes

Reproductive toxicity - Assessment : No reproductive toxicity to be expected.
No teratogenic effects to be expected.

STOT - single exposure

Product:

Remarks: not tested.

Components:

Ethanol:

Assessment: The substance or mixture is not classified as specific target organ toxicant, single exposure.

Methanol:

Target Organs: Eyes, Central nervous system
Assessment: Causes damage to organs.

Ethanediol:

Assessment: The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure

Components:

Ethanol:

Remarks: no data available

Methanol:

Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Ethanediol:

Target Organs: Kidney
Assessment: May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Product:

Remarks: not tested.

Components:

Ethanol:

Species: Rat, male and female
LOAEL: ca. 3200 mg/kg
Application Route: oral (gavage)
Exposure time: 7 weeks or 14 weeks

Number of exposures: twice daily, 7 days a week
Dose: 5, 10, 20 ml/kg
Group: yes
Method: OECD Test Guideline 408
GLP: No information available.

Species: Rat, male
NOEL: > 20 mg/l
Application Route: inhalation (vapour)
Exposure time: 3, 6, 9, 26 day groups
Number of exposures: continuous
Dose: 20 mg/l
Group: yes
Method: Other
GLP: No information available.

Methanol:

Species: Monkey, male
LOAEL: 2,340 mg/kg
Application Route: oral (gavage)
Exposure time: 3 d
Number of exposures: daily
Dose: 2340 mg/kg
Group: no data available
Method: Other
GLP: No information available.
Remarks: Significant toxicity observed in testing

Species: Rat, male and female
NOEL: 0.13 mg/l
LOAEL: 1.3 mg/l
Application Route: Inhalation
Test atmosphere: vapour
Exposure time: 12 m
Number of exposures: 20 h/day
Dose: 0,013 - 0,13 - 1,3 mg/l
Group: yes
Method: OECD Test Guideline 453
GLP: No information available.

Species: Rat, male and female
NOAEL: 6.66 mg/l
Application Route: Inhalation
Test atmosphere: vapour
Exposure time: 4 w
Number of exposures: 6 h/d, 5 d/wk
Dose: 0,663 - 2,65 - 6,63 mg/l
Group: yes
Method: OECD Test Guideline 412
GLP: No information available.

Application Route: Skin contact
Remarks: not tested.

Repeated dose toxicity - Assessment : Toxic if swallowed, in contact with skin or if inhaled.

Ethanediol:

Species: Rat, male
NOAEL: 150 mg/kg bw/day
Application Route: oral (feed)
Exposure time: 16 w
Number of exposures: daily
Dose: 50 - 150 - 500 - 1000 mg/kg
Group: yes
Method: OECD Test Guideline 408
GLP: No information available.

Species: Dog, male
NOAEL: 2.200 - 4.400 mg/kg bw/day
Application Route: Dermal
Exposure time: 4 w
Number of exposures: daily
Dose: 2 - 4 mL/kg bw
Group: yes
Method: OECD Test Guideline 410
GLP: yes

Repeated dose toxicity - Assessment : Harmful if swallowed.

Aspiration toxicity

Product:

no data available

Components:

Ethanol:

No aspiration toxicity classification

Methanol:

No aspiration toxicity classification

Ethanediol:

No aspiration toxicity classification

Experience with human exposure

Product:

General Information : The possible symptoms known are those derived from the labelling (see section 2).

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish :
Remarks: not available

Components:

Ethanol:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 15,300 mg/l
End point: mortality
Exposure time: 96 h
Test Type: flow-through test
Analytical monitoring: yes
Method: Other
GLP: No information available.

LC50 (Oncorhynchus mykiss (rainbow trout)): 11,200 mg/l
End point: mortality
Exposure time: 24 h
Test Type: flow-through test
Analytical monitoring: no
Method: Other
GLP: No information available.

Toxicity to daphnia and other aquatic invertebrates : LC50 (Ceriodaphnia dubia (water flea)): 5,012 mg/l
End point: mortality
Exposure time: 48 h
Test Type: static test
Analytical monitoring: no
Method: Other
GLP: No information available.

EC50 (Daphnia magna (Water flea)): > 10,000 mg/l
End point: Immobilization
Exposure time: 48 h
Method: DIN 38412
GLP: no

Toxicity to algae : EC50 (Chlorella vulgaris (Fresh water algae)): 275 mg/l
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201

EC10 (Chlorella vulgaris (Fresh water algae)): 11.5 mg/l
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC (Danio rerio (zebra fish)): 250 mg/l
End point: Other

Exposure time: 120 h
Test Type: semi-static test
Method: OECD Test Guideline 212
GLP: No information available.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: no data available
Toxicity to microorganisms	:	EC50 (Natural microorganism): 5,800 mg/l Exposure time: 4 h Test Type: static test
Toxicity to soil dwelling organisms	:	Remarks: Not applicable
Plant toxicity	:	Remarks: Not applicable
Sediment toxicity	:	Remarks: Not applicable
Toxicity to terrestrial organisms	:	Remarks: Not applicable

Methanol:

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): 15,400 mg/l End point: mortality Exposure time: 96 h Test Type: flow-through test Analytical monitoring: yes Method: EPA GLP: No information available.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 18,260 mg/l End point: Immobilization Exposure time: 96 h Test Type: semi-static test Analytical monitoring: no data available Method: OECD Test Guideline 202 GLP: No information available. Remarks: The details of the toxic effect relate to the nominal concentration.
Toxicity to algae	:	ErC50 (Pseudokirchneriella subcapitata (microalgae)): ca. 22,000 mg/l End point: Growth rate Exposure time: 96 h Test Type: static test Analytical monitoring: no data available Method: OECD Test Guideline 201 GLP: No information available.
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 446.7 mg/l Exposure time: 28 d

Method: Other
GLP: no
Remarks: The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 208 mg/l
End point: Reproduction rate
Exposure time: 21 d
Method: calculated
GLP: no
Remarks: The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.

Toxicity to microorganisms : IC50 (activated sludge): > 1,000 mg/l
End point: Bacteria toxicity (growth inhibition)
Exposure time: 3 h
Test Type: aquatic
Analytical monitoring: yes
Method: OECD Test Guideline 209
GLP: No information available.

Toxicity to soil dwelling organisms : Test Type: filter paper
LC50 (Eisenia fetida (earthworms)): > 1 mg/cm2
Exposure time: 48 h
End point: mortality
Method: OECD Test Guideline 207
GLP: No information available.

Test Type: Other
NOEC (Folsomia candida): 10000 mg/kg dry weight (d.w.)
Exposure time: 28 d
End point: mortality
Method: Other
GLP: No information available.

Plant toxicity : IC50 (Lactuca sativa (lettuce)): ca. 41,000 mg/l
Exposure time: 3 d
End point: emergence
Analytical monitoring: no data available
Method: Other
GLP: no

Sediment toxicity : Remarks: Not applicable

Ethanediol:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 72,860 mg/l
Exposure time: 96 h
Test Type: static test
Analytical monitoring: yes
Method: EPA
GLP: no

Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae : EC50 (Pseudokirchneriella subcapitata (green algae)): 6,500 - 13,000 mg/l
End point: Growth rate
Exposure time: 7 d
Test Type: static test
Analytical monitoring: no data available
Method: EPA
GLP: No information available.

Toxicity to fish (Chronic toxicity) : Chronic Toxicity Value (Fish): 2,629 mg/l
End point: Other
Exposure time: 30 d
Method: Other
GLP: no
Remarks: The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Ceriodaphnia spec.): 8,590 mg/l
End point: Reproduction rate
Exposure time: 7 d
Test Type: semi-static test
Analytical monitoring: yes
Method: Other
GLP: No information available.
Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to microorganisms : EC20 (activated sludge, domestic): > 1,995 mg/l
End point: Bacteria toxicity (respiration inhibition)
Exposure time: 0.5 h
Analytical monitoring: no
Method: ISO 8192
GLP: no

Persistence and degradability

Product:

Biodegradability : Remarks: Expected to be biodegradable

Remarks: not tested.

Biochemical Oxygen : Remarks: not tested.

Demand (BOD)

Components:

Ethanol:

Biodegradability : aerobic
Result: Readily biodegradable.
Biodegradation: 84 %
Exposure time: 20 d

Methanol:

Biodegradability : aerobic
Inoculum: activated sludge, domestic, non-adapted
Concentration: 3 - 10 mg/l
BOD in % of theoretical OD
Result: Readily biodegradable.
Biodegradation: 95 %
Exposure time: 20 d
Method: Closed Bottle test
GLP: no

aerobic
Inoculum: domestic sewage
Concentration: 4 - 200 g/l
BOD in % of theoretical OD
Result: Readily biodegradable.
Biodegradation: 82.7 %
Exposure time: 5 d
Method: Respirometertest
GLP: no

Photodegradation : Rate constant: 9.32E-13 cm3/s
Degradation (indirect photolysis): 50 % Degradation half life: 17.2 d
Method: other (measured)
GLP: no

Ethanediol:

Biodegradability : aerobic
Inoculum: activated sludge
Concentration: 53 mg/l
Dissolved organic carbon (DOC)
Result: Readily biodegradable.
Biodegradation: 90 - 100 %
Exposure time: 10 d
Method: OECD Test Guideline 301A
GLP: yes

Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: not tested.

Components:

Ethanol:

Bioaccumulation	:	Bioconcentration factor (BCF): 0.66 Method: calculated Remarks: Does not bioaccumulate.
Partition coefficient: n-octanol/water	:	log Pow: -0.35 (24 °C) pH: 7.4 Method: OECD Test Guideline 107

Methanol:

Bioaccumulation	:	Species: Leuciscus idus (Golden orfe) Bioconcentration factor (BCF): < 10 Exposure time: 72 h Method: Other GLP: No information available.
Partition coefficient: n-octanol/water	:	log Pow: -0.77 Method: No information available. GLP: No information available.

Ethanediol:

Bioaccumulation	:	Remarks: Due to the low logPow bioaccumulation is not expected
Partition coefficient: n-octanol/water	:	log Pow: -1.36 Method: estimated GLP: no

Mobility in soil

Product:

Distribution among environmental compartments	:	Remarks: not tested.

Components:

Ethanol:

Distribution among environmental compartments	:	adsorption Medium: water - soil Remarks: Not expected to adsorb on soil.

Methanol:

Distribution among	:	Adsorption/Soil

environmental compartments		Medium: water - soil Koc: 1 Method: other (calculated)

Ethanediol:

Distribution among environmental compartments	:	Adsorption/Soil Medium: water - soil log Koc: 0 Method: other (calculated)

Other adverse effects

Product:

Environmental fate and pathways	:	Remarks: no data available
Results of PBT and vPvB assessment	:	Remarks: no data available
Additional ecological information	:	Biologically degradable, when diluted may be degraded in biological purification plants Harmful effects to fish and bacteria: not harmful

Components:

Ethanol:

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
Additional ecological information	:	The product should not be allowed to enter drains, water courses or the soil.

Methanol:

Environmental fate and pathways	:	not available
Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
Additional ecological information	:	Do not allow to enter ground water, waterways or waste water.

Ethanediol:

Environmental fate and pathways	:	not available
Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

Additional ecological information	:	Do not allow to enter ground water, waterways or waste water.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

RCRA - Resource Conservation and Recovery Authorization Act	:	No -- Not as sold.
Waste Code	:	NONE
Waste from residues	:	In accordance with local authority regulations, take to chemical/physical treatment plant Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.
Contaminated packaging	:	Packaging that cannot be cleaned should be disposed of as product waste

SECTION 14. TRANSPORT INFORMATION

DOT Regulation:

Proper shipping name:	Combustible liquid, n.o.s.
Hazard class:	C
Packing group:	III
UN/NA-number:	NA 1993
Technical Name:	Ethanol Methanol
Emergency Response Guide:	128
Reportable Quantity:	2,835.000 kg Ethylene Glycol

IATA

Proper shipping name:	Flammable liquid, n.o.s.
Class:	3
Packing group:	III
UN/ID number:	UN 1993
Primary risk:	3
Remarks:	Shipment permitted
Hazard inducer(s):	Ethanol Methanol

IMDG

Proper shipping name:	Flammable liquid, n.o.s.
Class:	3
Packing group:	III
UN no.:	UN 1993
Primary risk:	3

Hazard inducer(s): Ethanol
Methanol
EmS: F-E S-E

Further information:

Not regulated for surface transportation in non-bulk containers under 119gallons.

SECTION 15. REGULATORY INFORMATION

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

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Ethanediol	107-21-1	5000	6250

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

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

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Acute toxicity (any route of exposure)
Serious eye damage or eye irritation
Specific target organ toxicity (single or repeated exposure)

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

Methanol	67-56-1	< 0.5 %
Ethanediol	107-21-1	60 - 100 %

Clean Water Act

Contains no known priority pollutants at concentrations greater than 0.1%.

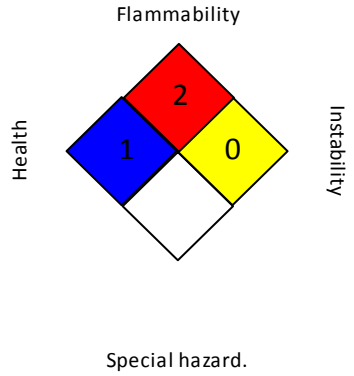
The components of this product are reported in the following inventories:

TSCA : All components of this product are listed or excluded from listing on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) Inventory.

SECTION 16. OTHER INFORMATION

Further information

NFPA:



Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA P0 / C	:	Ceiling limit
OSHA Z-1 / TWA	:	8-hour time weighted average

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50

- Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Observe national and local legal requirements
None known.

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