

Dendritech, Inc.

SAFETY DATA SHEET

Revision Date: 4June15

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product Name : Polyamidoamine (PAMAM) Dendrimer, hydroxy surface, methanol solution
(all generations)
Family Code : 211
Brand : Dendritech

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

Identified uses : Laboratory research chemical, manufacture of substances, no food use

1.3 Supplier Details

Company : Dendritech, Inc.
3110 Schuette Drive
Midland, Michigan
USA
Telephone: 989-496-2016
Fax: 989-496-2051

1.3 Emergency telephone number

Emergency Number : CHEMTREC™ 1-800-424-9300 (Outside USA: 703-527-3887)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 2), H225
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Specific target organ toxicity - single exposure (Category 1), H370
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram:



Signal word: Danger

Hazard statement(s)

H225 Highly flammable liquid and vapor.
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.
H370 Causes damage to organs.

Precautionary statement(s)

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.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P307 + P311	IF EXPOSED: Call a POISON CENTER or doctor/ physician.
P330	Rinse mouth.
P361	Remove/ Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/ container to an approved waste disposal plant.

For the full details of hazards of the H-Statements mentioned in this Section, see Section 16.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS – none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Mixtures

Description : Polyamidoamine (PAMAM), hydroxy surface, in methanol solution.
Molecular Weight : Variable depending on dendrimer product generation; from 3272 to 234,000

Hazardous components

Component	Classification	Concentration
Methanol (methyl alcohol)		
CAS-No. 67-56-1 EC-No. 200-659-6	NFPA ratings: Health 1 Fire 3 Reactivity 0	40-90 weight%

Nonhazardous components:

Polyamidoamine dendrimer, hydroxy (or amidoethanol) surface has no CAS numbers assigned for this family. The “base” primary amine surface is represented by CAS #93376-66-0 (Generation 2.0). The surface group for the hydroxy (amidoethanol) dendrimers is -CO-NH-CH₂CH₂-OH. A separate MSDS is available on aqueous solutions of this polymer from Dendritech.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Remove contaminated clothing. Consult a physician. Take victim immediately to hospital if there are signs of irritation.

In case of eye contact

Flush eyes with water for 15 minutes as a precaution. Consult a physician.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician immediately. Toxic effects may be delayed 18-24 hours after ingestion.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labeling (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. FIREFIGHTING MEASURES**5.1 Extinguishing media****Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Methanol vapors may burn with almost invisible flames in daylight. Toxic gases, carbon monoxide, carbon dioxide and formaldehyde may be generated. Methanol vapors are slightly more dense than air and may travel long distances to an ignition source.

5.3 Advice for firefighters

Wear self contained breathing apparatus and protective fire clothing.

5.4 Further information

Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

Wear full face respiratory protection and protective clothing (nitrile gloves recommended). Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. Methanol can burn without a visible flame.

Vapors can accumulate in low areas.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains, sewers or waterways.. Biodegrades in water.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an explosion proof vacuum cleaner or pump, or by wet-brushing and place in container for disposal according to local regulations (see section 13). Small spills can soaked up in noncombustible absorbent material like sand or silica gel.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.
Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge by proper grounding.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Avoid contact with copper and copper-bearing alloys.

Recommended storage temperature: 2 - 8 °C for long term storage of dendrimer solutions.

7.3 Specific end use(s)

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Note: The following control parameters are for methanol, CAS-No. 67-56-1. The polyamidoamine dendrimer component has no workplace control parameters established.

ACGIH Threshold Limit Value (TLV)-TWA	200 ppm, skin (262 mg/m ³)
TLV-STEL	250 ppm, skin (328 mg/m ³)
PEL-TWA	200 ppm, skin
PEL-STEL	250 ppm, skin (325 mg/m ³)
IDLH	6000 ppm, acute inhalation toxicity to animals
TLV basis	Critical effects: neuropathy, vision, central nervous system (CNS); headache; eye damage

Biological occupational exposure limits

Component	CAS-No	Parameters	Value	Biology	Basis
Methanol	67-56-1	Methanol	15 mg/l	Urine	ACGIH – Biological Exposure Indices (BEI)

8.2 Exposure controls

Appropriate engineering controls

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves, nitrile gloves preferred. 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.

Body Protection

Complete suit protecting against chemicals may be required for large quantity handling, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of methanol at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls (adequate ventilation). If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains or waterways.

9.0 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties (based on methanol)

a) Appearance	: clear yellow liquid
b) Odor	: characteristic alcohol odor
c) Odor Threshold	: 160 ppm (detection mean)
d) pH	: not applicable
e) Melting point/freezing point	: no data available
f) Initial boiling point	: 64.7 °C (148.5 °F)
g) Flash point	: 11 °C (52 °F)
h) Evaporation rate	: no data available
i) Flammability (solid, gas):	: no data available
j) Upper/lower flammability limits	: no data available
k) Vapour pressure	: no data available
l) Vapour density	: 1.105@ 15 ⁰ C (air=1)
m) Relative density	: 0.86 g/cm ³ at 25 °C (77 °F)
n) Water solubility	: highly water soluble
o) Partition coefficient: n-octanol/water	: no data available
p) Auto-ignition temperature	: no data available
q) Decomposition temperature	: no data available
r) Viscosity	: no data available
s) Explosive properties	: UEL= 36.5%; LEL= 6%
t) Oxidizing properties	: no data available

9.2 Other safety information

no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Vapors may form explosive mixture with air.

10.4 Conditions to avoid

Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials

Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids

10.6 Hazardous decomposition products

Other decomposition products – oxides of nitrogen

In the event of fire: see section 5.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects (based on methanol)

Note: The polyamidoamine dendrimer, hydroxy surface, has low acute toxicity. The hazardous component of the mixture is methanol. It is toxic if inhaled, swallowed, or with excessive skin contact.

Acute toxicity

Oral:

LD50/rat : 1187-2769 mg/kg

Inhalation:

LC50/4 h/rat : 1282 mg/l/4 hour

Dermal:

LD50/rabbit : 17000 mg/kg

Inhalation

High airborne concentrations can irritate mucous membranes, cause headaches, sleepiness, nausea, confusion, loss of consciousness, digestive and visual disturbances and even death.

Ingestion

Swallowing even small quantities could potentially cause blindness or death. Sub-lethal doses can cause headache, nausea, and abdominal pain.

Skin corrosion/irritation

Moderately irritating to the skin. Can be absorbed in harmful amounts.

Serious eye damage/eye irritation

Mild to moderate eye irritant. Liquids and vapors can cause irritation, burning, tearing.

Respiratory or skin sensitization

None reported.

Germ cell mutagenicity

no data available

Carcinogenicity

IARC: 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: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component 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 identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

Available information does not suggest methanol is a reproductive toxin.

Teratogenicity

Methanol has produced fetotoxicity in rats and teratogenicity in mice after inhalation to high concentrations of methanol vapors.

Specific target organ toxicity - single exposure

Mild central nervous system depressant. Severe vision effects including blindness possible.

Specific target organ toxicity - repeated exposure

May increase toxicity of other chemicals like liver toxins.

Aspiration hazard

Swallowing or vomiting may cause aspiration into the lungs.

Additional Information

Warning: contains methanol. May be fatal or cause blindness if swallowed. Cannot be made nonpoisonous.

12. ECOLOGICAL INFORMATION

Note: The summarized information below is for methanol in the mixture.

12.1 Toxicity

Do not discharge into sewers or waterways.

LC50/96h/fish : 15400-29400 mg/l

EC50/48h/daphnia : >10,000 mg/l

IC50/72h/algae : about 22,000 mg/l (Selenastrum carpicornutum)

12.2 Persistence and degradability

Readily biodegradable

12.3 Bioaccumulative potential

Does not bioaccumulate.

12.4 Mobility in soil

Mobile in soils. Will tend to remain in soil pore water.

12.5 Results of PBT and vPvB assessment

Methanol is not considered to be persistent, bioaccumulating nor toxic (PBT). Methanol is not considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects

Completely miscible with water and biodegradation will occur in aquatic environments.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number:1230

Hazard class: 3

Packing group: II

Proper shipping name: Methanol, solution

Reportable Quantity (RQ): 6250 lbs

Marine pollutant: No

Poison Inhalation Hazard: No

IMDG

UN number: 1230

Hazard class: 3 (6.1) Packing group: II

EMS-No: F-E, S-D

Proper shipping name: METHANOL, SOLUTION

Marine pollutant: No

IATA

UN number:1230

Hazard class: 3 (6.1) Packing group: II

Proper shipping name: Methanol, solution

Labels: 3- Flammable liquid; 6.1- Toxic Substance

15. REGULATORY INFORMATION

Labelling according to EC Directives

EC Label

Hazard Symbols

F Highly flammable

T Toxic

SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

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

Methanol CAS-No.67-56-1 Revision Date 2007-07-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Methanol CAS-No.67-56-1 Revision Date 2007-07-01

Pennsylvania Right To Know Components

Methanol CAS-No.67-56-1 Revision Date 2007-07-01

PAMAM (polyamidoamine) dendrimer, ethylenediamine core

New Jersey Right To Know Components

Methanol CAS-No.67-56-1 Revision Date 2007-07-01

PAMAM (polyamidoamine) dendrimer, ethylenediamine core

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Methanol CAS-No.67-56-1 Revision Date 2012-03-16

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H301+H311+H331	Toxic if swallowed, in contact with skin or if inhaled
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H370	Causes damage to organs.
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic health hazard:	*
Fire hazard:	3
Physical hazard:	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

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Preparation Information

Dendritech, Inc., 1-989-496-2016