1. Identification

1.1. Product identifier

Trade name: DL-Methionine, Feed Grade 99%

CAS-No.: 59-51-8

1.2. Recommended use of the chemical and restrictions on use

Relevant applications identified: Feed additive

1.3. Details of the supplier of the safety data sheet

Company: Evonik Corporation USA
299 Jefferson Road
Parsippany,NJ 07054-0677
USA

Telephone: 973-929-8000

Telefax: 973-929-8040

Email address: Product-Regulatory-Services@Evonik.com

1.4. 24 HOUR EMERGENCY TELEPHONE NUMBERS:

CHEMTREC - US & CANADA: 800-424-9300

CHEMTREC MEXICO: 01-800-681-9531

CHEMTREC INTERNATIONAL: +1 703-527-3887 **(collect calls accepted)**

Product Regulatory Services : 973-929-8060

2. Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation 29CFR 1910.1200

Remarks: Not a hazardous substance or mixture.

2.2. Label elements

Statutory basis: Classification according to Regulation 29CFR 1910.1200
Remarks: Not a hazardous substance or mixture.

2.3. Other hazards

Dust may form explosive mixture in air.

Inhalation: No hazard expected in normal use.
Skin: No hazard expected in normal use.
Eyes: No hazard expected in normal use.
Ingestion: No hazard expected in normal use.

3. Composition/information on ingredients

3.1. Substances

• DL-Methionine	>= 99%
CAS-No.	59-51-8
Remarks	Not a hazardous substance or mixture.

Other information
This material is classified as not hazardous under OSHA regulations.
This product is intended for FDA regulated uses only.

3.2. Mixtures
not applicable
No hazardous ingredients

4. First aid measures

4.1. Description of first aid measures

Inhalation
In case product dust is released:
Possible discomfort: cough, sneezing
Move victims into fresh air.

Skin contact
No hazards which require special first aid measures.

Eye contact
Possible discomfort is due to foreign substance effect.
Rinse thoroughly with plenty of water keeping eyelid open.
In case of persistent discomfort: Consult an ophthalmologist.

Ingestion
Have the mouth rinsed with water.
After absorbing large amounts of substance:
Consult a physician.

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

Symptoms
None known

Hazards
None known

4.3. Indication of any immediate medical attention and special treatment needed
After absorbing large amounts of substance:
Possible discomfort: nausea, vomiting
Treatment of symptoms, administration of activated charcoal, acceleration of the gastro-intestinal tract.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media:	Water, Foam, mist
Unsuitable extinguishing media:	Carbon dioxide (CO_2)

5.2. Special hazards arising from the substance or mixture
May be released in case of fire: hydrocyanic acid, flammable smouldering gases, NOX.
sulphur oxides, carbon monoxide, carbon dioxide.

5.3. Advice for firefighters

Contaminated fire-extinguishing water must be disposed of in accordance with the regulations issued by the appropriate local authorities.
Fire residues should be disposed of in accordance with the regulations.
In the event of fire, wear self-contained breathing apparatus.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Wear personal protective equipment. Keep unauthorized persons away.

6.2. Environmental precautions

Obey relevant local, state, provincial and federal laws and regulations. Do not contaminate any lakes, streams, ponds, groundwater or soil.

6.3. Methods and material for containment and cleaning up

Absorb mechanically avoiding production of dust.

7. Handling and storage

7.1. Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion
Take precautionary measures against static charges, keep away from sources of ignition.
Avoid dust formation.
Combustible

Storage
Store in a cool and shaded area.
Keep containers dry and tightly closed to avoid moisture absorption and contamination.

German storage class
11 - Combustible Solids

Dust explosion class
St1

Method:	VDI Guideline 2263 sheet 1
Maximum rate of pressure rise:	88 bar/s
Standardized max. rate of pressure increase, KSt:	85bar·m/s

8. Exposure controls/personal protection

8.1. Control parameters

• exposure limit for dust		
CAS-No.		
Control parameters type of exposure	3 mg/m3 Respirable fraction. Suitable measuring processes are: NIOSH method 0500 NIOSH method 0600	Time Weighted Average (TWA):(ACGIH)
Control parameters type of exposure	10 mg/m3 Inhalable particulate.	Time Weighted Average (TWA):(ACGIH)

Control parameters	15 mg/m3	Time Weighted Average (TWA) Permissible Exposure Limit (PEL)(OSHA Z1)
type of exposure	Total dust.	
Control parameters	5 mg/m3	Time Weighted Average (TWA) Permissible Exposure Limit (PEL)(OSHA Z1)
type of exposure	Respirable fraction. Suitable measuring processes are: NIOSH method 0500 NIOSH method 0600	

Other information

Contains no substances with occupational exposure limit values.

DNEL/DMEL values

Remarks — No substance-related safety assessment is necessary / has been conducted for this product.

PNEC values

Remarks — No substance-related safety assessment is necessary / has been conducted for this product.

8.2. Exposure controls

Engineering measures

Use process enclosures, local exhaust ventilation or other engineering controls to control airborne exposure.
Take measures to prevent the build up of electrostatic charge.

Personal protective equipment

Respiratory protection

A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 or applicable federal/provincial requirements must be followed whenever workplace conditions warrant respirator use. NIOSH's "Respirator Decision Logic" may be useful in determining the suitability of various types of respirators.

Hand protection

Glove material	Nitrile, for example, Dermatril 740, Kächele-Cama Latex GmbH (KCL), Germany
Material thickness	0.11 mm
Break through time	8 h
Method	DIN EN 374
Glove material	Natural rubber (NR), for example, Cama Clean 708, Kächele-Cama Latex GmbH (KCL), Germany
Material thickness	0.5 mm
Break through time	8 h
Method	DIN EN 374

The above mentioned hand protection is based on knowledge of the chemistry and anticipated uses of this product but it may not be appropriate for all workplaces. A hazard assessment should be conducted prior to use to ensure suitability of gloves for specific work environments and processes prior to use.

Eye protection

Safety glasses with side-shields
If dust occurs: basket-shaped glasses

Skin and body protection

No special protective equipment required.

Hygiene measures
Wash face and/or hands before break and end of work.
Cleanse and apply cream to skin after work.

Protective measures
Handle in accordance with good industrial hygiene and safety practice.
If there is the possibility of skin/eye contact, the indicated hand/eye/body protection should be used.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

physical state	solid		
Colour	white to light brown		
Form	solid		
Odour	characteristic		
Odour Threshold	<1 ppb		
pH	5.6 - 6.1	(10 g/l)	(25 °C)
Melting point/range	281 °C decomposition		
Boiling point/range	not applicable		
Flash point	not applicable solid		
Evaporation rate	No data available		
Flammability (solid, gas)	1200 s Method: UN method N.1 Burning Time		
Lower explosion limit	dust: 30 g/m3		
Upper explosion limit	No data available		
Vapour pressure	< 0.0000001 hPa Method: calculated Modified Grain Method		
Vapour density	No data available		
Relative vapour density	No data available		
Relative density	No data available		
Water solubility	33.5 g/l Related to substance:	(25 °C)	pure substance
Partition coefficient: n-octanol/water	log Pow: -1.87 Related to substance:		pure substance
Autoignition temperature	330 °C		

	Method: VDI Guideline 2263 sheet 1 (BAM-furnace) Standard commercial product with characteristic grain size distribution is normally flammable.
Thermal decomposition	215 °C TG (thermal gravimetric analysis)
Viscosity, dynamic	not applicable

9.2. Other information

Explosiveness	Not to be expected in view of the structure
carbonisation point	210 °C
Bulk density	610 - 750 kg/m3
glow temperature	> 400 °C Method: VDI 2263
Minimum ignition energy	> 10 mJ (140 °C) Classification: Normal combustability Method: VDI Guideline 2263 sheet 1 mean grain size: 48 µm sieve fraction without inductance
maximum absolute explosive pressure	7.8 bar
Metal corrosion	No data available
speed of hydrolysis	half-life period: 1 years (25 °C)
Burning number	BZ 5 - burns out with flames or shower of sparks. Method: VDI 2263

10. Stability and reactivity

10.1. Reactivity
No further information available

10.2. Chemical stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions
Possibility of hazardous reactions: Dust can form an explosive mixture in air.

10.4. Conditions to avoid
See chapter
7.2. Conditions for safe storage, including any incompatibilities

10.5. Incompatible materials
No further information available

10.6. Hazardous decomposition products

No hazardous decomposition products known.

11. Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity	LD50 Rat: > 10000 mg/kg
Acute inhalation toxicity	LC0 Rat: 5.25 mg/l / 4 h Method: OECD Test Guideline 403
Acute dermal toxicity	No data available
Skin irritation	Rabbit No skin irritation Method: OECD Test Guideline 404
Eye irritation	Rabbit slightly eye irritation Method: OECD Test Guideline 405
Sensitization	Guinea pig: Does not cause skin sensitisation. Method: OECD Test Guideline 406
Repeated dose toxicity	Oral Rat(male) / 90-day NOAEL: 1253 mg/kg Method: OECD TG 408 Test substance: comparable product Oral Rat(female) / 90-day NOAEL: 1423 mg/kg Method: OECD TG 408 Test substance: comparable product
Assessment of STOT single exposure	Assessment: No data available
Assessment of STOT repeat exposure	Assessment: The classification criteria are not met based on the available data.
Risk of aspiration toxicity	No data available
Gentoxicity in vitro	Microorganisms, cell cultures none mutagenic / genotoxic effects Method: literature Ames test Salmonella typhimurium negative Method: OECD TG 471
Carcinogenicity	No data available
carcinogenicity assessment	Contains no carcinogenic substances as defined by NTP, IARC and/or

OSHA.

Toxicity to reproduction

Rat
NOEL (No Observed Effect Level) of parents: 300 mg/kg
Method: OECD Test Guideline 415
No evidence of effects of reprodutive / developmental toxicity.

Human experience

gastro-intestinal symptoms: nausea, vomiting
Side-effects were observed in the event of higher dosage (10 g)

12. Ecological information

12.1. Toxicity

Toxicity to fish

LC50 (Brachydanio rerio): > 3200 mg/l / 96 h
Method: OECD 203

NOEC (Brachydanio rerio): 3200 mg/l / 96 h
Method: OECD 203

Toxicity in aquatic invertebrates

NOEC Daphnia magna: 220 mg/l / 48 h
Method: OECD TG 202

EC50 Daphnia magna: 324 mg/l / 48 h
Method: OECD TG 202

Toxicity to algae

EC50 static test Desmodesmus subspicatus: > 1000 mg/l / 72 h
End point: Biomass
Analytical monitoring: yes
Method: OECD TG 201

EC50 static test Desmodesmus subspicatus: > 1000 mg/l / 72 h
End point: growth rate
Analytical monitoring: yes
Method: OECD TG 201

Toxicity to bacteria

EC10 Pseudomonas putida: 2000 mg/l / 18 h
Method: UBA method

12.2. Persistence and degradability

Biodegradability

Result: rapidly biodegradable
Method: OECD TG 301 A

Biochemical Oxygen Demand (BOD)

480 mg/g
Concentration: (BOD5)

12.3. Bioaccumulative potential

Bioaccumulation

low
log Pow: see chapter 9

12.4. Mobility in soil

Mobility — No data available

12.5. Other adverse effects

Further Information — No further information available

13. Disposal considerations

13.1. Waste treatment methods

Product

Waste must be disposed of in accordance with federal, provincial and local regulations.

Uncleaned packaging

Packaging material should be recycled or disposed of in accordance with federal, state and local regulations.

14. Transport information

Not dangerous according to transport regulations.

14.1.	UN number:	--
14.2.	UN proper shipping name:	--
14.3.	Transport hazard class(es):	--
14.4.	Packing group:	--
14.5.	Environmental hazards (Marine pollutant):	--
14.6.	Special precautions for user:	Yes

Not dangerous according to transport regulations.

15. Regulatory information

US Federal Regulations

OSHA

If listed below, chemical specific standards apply to the product or components:

- None listed

Clean Air Act Section (112)

If listed below, components present at or above the de minimus level are hazardous air pollutants:

- None listed

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

Remarks This material does not contain any components with a SARA 302 RQ.

SARA 304 - Emergency Release Notification

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

US. EPA CERCLA Hazardous Substances (40 CFR 302)

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

SARA Title III Section 311/312 Hazard Categories

The product meets the criteria only for the listed hazard classes:

- No SARA Hazards

SARA Title III Section 313 Reportable Substances

If listed below, components are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

- None listed

Toxic Substances Control Act (TSCA)

If listed below, non-proprietary substances are subject to export notification under Section 12 (b) of TSCA:

- None listed

Other US Federal Regulatory Information

Observe national regulations.

State Regulations

California Proposition 65

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

International Chemical Inventory Status

Unless otherwise noted, this product is in compliance with the inventory listing of the countries shown below. For information on listing for countries not shown, contact the Product Regulatory Services Department.

Europe (EINECS/ELINCS)	listed/registered
USA (TSCA)	listed/registered
Canada (DSL)	listed/registered

Australia (AICS)	listed/registered
Japan (MITI)	listed/registered
Philippines (PICCS)	listed/registered
China	listed/registered
Switzerland	not listed/registered

An employer using HMIS/NFPA labeling must through training ensure that its employees are fully aware of the hazards of the chemicals used.

HMIS Ratings

Health :	0
Flammability :	1
Physical Hazard :	0

16. Other information

Further information

Revision date 10/15/2016

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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Legend

ACC	American Chemistry Council
ACGIH	American Conference of Governmental Industrial Hygenists
ACS	Advisory Committee on Sustainability
ADI	Acceptable Daily Intake
ASTM	American Society for Testing and Materials
ATP	Adaptation to Technical Progress
BCF	Bioconcentration factor
BOD	Biochemical oxygen demand
c.c.	closed cup
CAO	Cargo Aircraft Only
Carc	Carcinogen
CAS	Chemical Abstract Services
CDN	Canada
CEPA	Canadian Environmental Protection Act
CERCLA	Comprehensive Environmental Response – Compensation and Liability Act
CFR	Code of Federal Regulations
CMR	carcinogenic-mutagenic-toxic for reproduction

COD	Chemical oxygen demand
DIN	German Institute for Standardization
DMEL	Derived minimum effect level
DNEL	Derived no effect level
DOT	Department of Transportation
EC50	half maximal effective concentration
EPA	Environmental Protection Agency
ErC50	Reduction of Growth Rate
ERG	Emergency Response Guide Book
FDA	Food and Drug Administration
GHS	Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
GLP	Good Laboratory Practice
GMO	Genetic Modified Organism
HCS	Hazard Communication Standard
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBC	Intermediate Bulk Container
ICAO-TI	International Civil Aviation Organization- Technical Instructions
ICCA	International Council of Chemical Association
ID	Identification number
IMDG	International Maritime Dangerous Goods
IUPAC	International Union of Pure and Applied Chemistry
ISO	International Organization For Standardization
LC50	50 % Lethal Concentration
LD50	50 % Lethal Dose
L(E)C50	LC50 or EC50
LOAEL	Lowest observed adverse effect level
LOEL	Lowest observed effect level
MARPOL	International Convention for the Prevention of Pollution from Ships
NFPA	National Fire Protection Association
NOAEL	No observed adverse effect level
NOEC	no observed effect concentration
NOEL	no observed effect level
o. c.	open cup
OECD	Organisation for Economic Cooperation and Development
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PBT	Persistent, bioaccumulative, toxic
PEC	Predicted effect concentration
PNEC	Predicted no effect concentration
RQ	Reportable Quantity
SDS	Safety Data Sheet
STOT	Specific Target Organ Toxicity
UN	United Nations
vPvB	very persistent, very bioaccumulative
voc	volatile organic compounds
WHMIS	Workplace Hazardous Materials Information System
WHO	World Health Organization