



Safety Data Sheet (SDS)

International (GHS)

Revision date: 6/3/2021

SECTION 1: Identification

Product identifiers:

Product trade name: Kalama* C-9 Aldehyde (Nonanal)
Company product number: C9AW
Other means of identification: 32511; 1-Nonanal; Nonyl aldehyde

Recommended use of the chemical and restrictions on use:

Uses: Fragrance ingredient; Industrial applications.
Restrictions on use: None identified

Details of the supplier:

Manufacturer/Supplier: Emerald Kalama Chemical Limited
 Dans Road
 Widnes, Cheshire WA8 0RF
 United Kingdom
 Telephone: +44 (0) 151 423 8000
 Email: product.compliance@emeraldmaterials.com

For further information about this SDS:

Emergency telephone number:

ChemTel (24 hours): 1-800-255-3924 (USA); +1-813-248-0585 (outside USA);
 1-300-954-583 (Australia); 000-800-100-4086 (India).

SECTION 2: Hazard(s) identification

Classification of the substance or mixture:

Flammable Liquid, category 4, H227
 Skin Irritation, category 3, H316
 Hazardous to the aquatic environment, Acute, category 2, H401
 Hazardous to the aquatic environment, Chronic, category 3, H412

Label elements:

Hazard pictogram(s): Not Applicable

Signal word:

Warning

Hazard statements:

H227 Combustible liquid.
 H316 Causes mild skin irritation.
 H401 Toxic to aquatic life.
 H412 Harmful to aquatic life with long lasting effects.

Precautionary statements:

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 P273 Avoid release to the environment.
 P280 Wear protective gloves/eye protection/face protection.
 P332+P313 If skin irritation occurs: Get medical advice/attention.
 P370+P378 In case of fire: Use carbon dioxide, dry chemical, foam to extinguish.
 P403+P235 Store in a well-ventilated place. Keep cool.
 P501 Dispose of contents/container in accordance with local, regional and international regulations.

Supplemental information: No Additional Information

Classification and hazards statements are listed according to the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS). Regulations in individual countries/regions may determine which classifications and hazard statements are applicable based on adopted hazard classes and categories. Precautionary statements are listed according to the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Annex III. Regulations in individual countries/regions may determine which statements are required on the product label. See product label for specifics.

Other hazards: No Additional Information

See Section 11 for toxicological information.

SECTION 3: Composition/information on ingredients

Substance:

<u>CAS-No.</u>	<u>Chemical Name</u>	<u>Weight%</u>
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<u>CAS-No.</u>	<u>Chemical Name</u>	<u>Weight%</u>
0000124-19-6	Nonanal	98-100
0010191-41-0	alpha Tocopherol	0.1-<1.0

Amounts specified are typical and do not represent a specification. Remaining components are proprietary, non-hazardous, and/or present at amounts below reportable limits.

SECTION 4: First-aid measures

Description of first aid measures:

General: If irritation or other symptoms occur or persist from any route of exposure, remove the affected individual from the area: see a physician/get medical attention.

Eye contact: Any material that contacts the eye should be washed out immediately with water. Get medical attention if symptoms occur.

Skin contact: Immediately remove contaminated clothing and shoes. Wash the affected area with plenty of soap and water until no evidence of the chemical remains (at least 15-20 minutes). Launder clothing before reuse. If skin irritation occurs: Get medical advice/attention.

Inhalation: If affected, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a POISON CENTER or doctor/physician if you feel unwell.

Ingestion: Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse out the mouth with water. Get medical attention immediately.

Protection of first aid responders: Wear proper personal protective clothing and equipment.

Most important symptoms and effects, both acute and delayed: Irritation. Preexisting sensitization, skin and/or respiratory disorders or diseases may be aggravated. See section 11 for additional information.

Indication of any immediate medical attention and special treatment needed, if necessary: Treat symptomatically.

SECTION 5: Fire-fighting measures

Extinguishing media:

Suitable: Use dry chemical, "alcohol" foam, carbon dioxide or water spray.

Unsuitable: Do not use direct water stream. May spread fire.

Special hazards arising From the chemical:

Unusual fire/explosion hazards: Issue warning: combustible liquid. Eliminate all ignition sources. Ventilate the area. If spill is large, be prepared to isolate the hazard area. Deny access to the spill area to persons who are not involved in the cleanup and/or who have not been properly trained in spill management of hazardous/flammable liquids. Vapors may explode if ignited in an enclosed area. Run off to sewer may cause a fire or explosion hazard. Protect product from flames of any kind; maintain proper clearance when using heat devices, etc. Closed container may rupture (due to build up in pressure) when exposed to extreme heat. Product may burn if an ignition source is present. Combustion hazard: waste soaked with this product may heat to temperatures causing self-ignition if improperly discarded. Many aldehydes readily oxidize exothermically when exposed to air. Any clean up materials, like rags, towels, etc. should be washed with water with mild soap or laundered with mild detergent before proper disposal to avoid the potential temperature rise from oxidation.

Hazardous combustion products: Irritating or toxic substances may be emitted upon burning, combustion or decomposition. See section 10 (Hazardous decomposition products) for additional information.

Special protective equipment and precautions for fire-fighters: Use water/water spray to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures and to dilute spills to non-combustible mixtures. Do not flush combustible liquids into sewer as a fire or vapor explosion hazard may result. Never direct a hose stream directly onto a burning flammable/combustible liquid. Solid or straight hose stream will cause fire to spread if directed onto a burning spill or into an open container of burning liquid. Wear self-contained breathing apparatus (SCBA) equipped with a full facepiece and operated in a pressure-demand mode (or other positive pressure mode) and approved protective clothing. Personnel without suitable respiratory protection must leave the area to prevent significant exposure to hazardous gases from combustion, burning or decomposition. In an enclosed or poorly ventilated area, wear SCBA during cleanup immediately after a fire as well as during the attack phase of firefighting operations.

See section 9 for additional information.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: See Section 8 for recommendations on the use of personal protective equipment. Eliminate ignition sources. Ventilate areas of spill. Personal Protective Equipment must be worn.

Environmental precautions: Do not flush liquid into public sewer, water systems or surface waters.

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Methods and materials for containment and cleaning up: Contain by diking with sand, earth or other non-combustible material. Wear proper personal protective clothing and equipment. Absorb spill with an inert material. Place into labeled, closed container; store in safe location to await disposal. Change contaminated clothing and launder before reuse. Combustion hazard: waste soaked with this product may heat to temperatures causing self-ignition if improperly discarded. Immediately after use, rags, steel wool or other waste should be wetted or cleaned with water with mild soap or laundered with mild detergent or placed into a water-filled metal container before proper disposal.

SECTION 7: Handling and storage

Precautions for safe handling: As with any chemical product, use good laboratory/workplace procedures. Do not cut, puncture, or weld on or near the container. Wash thoroughly after handling this product. Always wash up before eating, smoking or using the facilities. Use under well-ventilated conditions. Avoid eye and skin contact. Avoid inhalation of aerosol, mist, spray, fume or vapor. Avoid drinking, tasting, swallowing or ingesting this product. Wash contaminated clothing before reuse. Provide eyewash fountains and safety showers in the work area. Bond and ground all containers when transferring chemical. Eliminate ignition sources (e.g., sparks, static buildup, excessive heat, etc.). Use spark-proof tools and equipment. Vapors may travel to distant ignition sources.

Conditions for safe storage, including any incompatibilities: Store in combustible storage area and away from heat and open flame. Keep away from heat, sparks and open flames. Store under well-ventilated conditions. Keep container upright, when not in use, to prevent leakage. Avoid storing containers in direct sunlight as vapors may accumulate in the head space creating pressure. Store this material away from incompatible substances (see section 10). Do not store in open, unlabeled or mislabeled containers. Keep container closed when not in use. Emptied container may contain residual vapors or liquid which may ignite or explode. Do not reuse empty container without commercial cleaning or reconditioning. Bond and ground all containers when transferring chemical. Product can easily oxidize. It is recommended that opened containers be padded with nitrogen. Protect from light. Product can easily oxidize. It is recommended that opened containers be padded with nitrogen.

SECTION 8: Exposure controls / personal protection

Control parameters:

Occupational exposure limits (OEL):

Chemical Name	ACGIH - TWA/Ceiling		ACGIH - STEL		
Nonanal	N/E		N/E		
alpha Tocopherol	N/E		N/E		
Chemical Name	Australia	New Zealand	Korea	Indonesia	
Nonanal	N/E	N/E	N/E	N/E	
alpha Tocopherol	N/E	N/E	N/E	N/E	
Chemical Name	Japan ISHL	Japan JSOH	Taiwan	Malaysia	
Nonanal	N/E	N/E	N/E	N/E	
alpha Tocopherol	N/E	N/E	N/E	N/E	
Chemical Name	Philippines	Singapore			
Nonanal	N/E	N/E			
alpha Tocopherol	N/E	N/E			

N/E=Not established (no exposure limits established for the listed substances for listed country/region/organization).

Exposure controls:

Appropriate engineering controls: Always provide effective general and, when necessary, local exhaust ventilation to draw spray, aerosol, fume, mist and vapor away from workers to prevent routine inhalation. Ventilation must be adequate to maintain the ambient workplace atmosphere below the exposure limit(s) outlined in the SDS. Eliminate ignition sources (e.g., sparks, static buildup, excessive heat, etc.).

Individual protection measures, such as personal protective equipment:

Eye/face protection: Wear eye protection.

Skin and body protection: Wear chemical resistant (impervious) gloves. Use good laboratory/workplace procedures including personal protective clothing: labcoat, safety glasses and protective gloves.

Respiratory protection: Respiratory protection is not needed with proper ventilation. Wear an approved respirator (e.g., an organic vapor respirator, a full face air purifying respirator for organic vapors, or a self-contained breathing apparatus) whenever exposure to aerosol, mist, spray, fume or vapor exceed the applicable exposure limit(s) of any chemical substance listed in this SDS.

Further information: Eyewash fountains and safety showers are recommended in the work area.

SECTION 9: Physical and chemical properties

Form:	Liquid	pH:	Not Available
Appearance:	Colorless to pale yellow	Relative density:	0.819-0.827 (20°C)
Odor:	Aldehyde-like	Partition coefficient (n-octanol/water):	3.4 (OECD 117)
Odor threshold:	Not Available	% Volatile by weight:	Not Available
Solubility in water:	101 mg/L @ 20°C	VOC:	Not Available
Evaporation rate:	Not Available	Boiling point °C:	194 °C

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Vapor pressure:	2 hPa @ 20°C	Boiling point °F:	381 °F
Vapor density:	Not Available	Flash point:	69 °C (156 °F) Setflash
Viscosity:	1.9 mm ² /s @ 20°C; 1.4 mm ² /s @ 40°C	Auto-ignition temperature:	195-200 °C (383-392 °F)
Melting point/Freezing point:	-18.8 °C (-1.8 °F)	Flammability (solid, gas):	Not Applicable (liquid)
Oxidizing properties:	Not oxidizing	Flammability or explosive limits:	LFL/LEL: Not Available
Explosive properties:	Not explosive		UFL/UEL: Not Available
Decomposition temperature:	Not Available	Surface tension:	46.1 mN/m @ 20°C

Other information: Amounts specified are typical and do not represent a specification.

SECTION 10: Stability and reactivity

Reactivity: Presents no significant reactivity hazard. Neither pyrophoric nor reactive with water. Does not form explosive mixtures with other organic materials.

Chemical stability: This product is stable. Normally stable even at elevated temperatures and pressures. Does not undergo explosive decomposition; is shock stable; and is not an oxygen donor. Readily undergoes oxidation by air.

Possibility of hazardous reactions: Hazardous polymerization will not occur.

Conditions to avoid: Excessive heat and ignition sources.

Incompatible materials: Avoid strong acids, bases, and oxidizing agents. Avoid contact with reducing agents. Avoid contact with amines. May attack galvanized steel.

Hazardous decomposition products: Carbon dioxide, carbon monoxide and hydrocarbons.

SECTION 11: Toxicological information

Information on likely routes of exposure:

General: Caution must be exercised through the prudent use of protective equipment and handling procedures to minimize exposure.

Eyes: May cause eye irritation.

Skin: Causes mild skin irritation.

Inhalation: High airborne concentrations of vapors resulting from heating, misting or spraying may cause irritation of the respiratory tract and mucous membranes.

Ingestion: Ingestion may cause irritation.

Acute toxicity information: Not classified (based on available data, the classification criteria are not met).

Chemical Name	Inhalation LC50	Species	Oral LD50	Species	Dermal LD50	Species
Nonanal	N/E	N/E	>5000 mg/kg	Rat/ adult	>5000 mg/kg	Rabbit/ adult
alpha Tocopherol	N/E	N/E	>4000 mg/kg	Rat/ adult	>3000 mg/kg	Rat/ adult

Skin corrosion/irritation: Causes mild skin irritation - Category 3.

Chemical Name	Skin irritation	Species
Nonanal	Mild-moderate irritant	Rabbit/ adult
alpha Tocopherol	Mild irritant	Rabbit/ adult

Serious eye damage/irritation: Not classified (based on available data, the classification criteria are not met).

Chemical Name	Eye irritation	Species
Nonanal	Non-irritant	Rabbit/ adult
alpha Tocopherol	Slight irritant	Rabbit/ adult

Respiratory or skin sensitization: Not classified (based on available data, the classification criteria are not met).

Chemical Name	Skin sensitisation	Species
Nonanal	Non-sensitizer (read-across)	HRIPT (Human Repeat Insult Patch Test)
alpha Tocopherol	Sensitizer	Mouse/Local lymph node assay

Carcinogenicity: Not classified (no relevant information found).

Germ cell mutagenicity: Not classified (based on available data, the classification criteria are not met). NONANAL: Several In-vitro mutation (bacteria reverse mutation (Ames), mouse lymphoma, and DNA damage and repair) studies were negative with and without metabolic activation. Nonanal had a positive result for an in vitro sister chromatid exchange assay. An in-vivo mouse micronucleus

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study for an analogue (read-across) substance (OECD 474, Undec-10-enal) did not show any evidence of causing chromosome damage when administered orally.

Reproductive toxicity: Not classified (based on available data, the classification criteria are not met). NONANAL - READ-ACROSS/WEIGHT OF EVIDENCE: Reproductive toxicity, oral study in rats: NOAEL (no-observed adverse-effect-level) of 200-300 mg/kg bw/day.

Specific target organ toxicity (STOT) - single exposure: Not classified (based on available data, the classification criteria are not met).

Specific target organ toxicity (STOT) - repeated exposure: Not classified (based on available data, the classification criteria are not met). NONANAL-READ-ACROSS (DODECANAL): Repeated dose study, oral, rat: NOAEL (no-observed-adverse-effect-level) = 1409.7 mg/kg bw/day.

Aspiration hazard: Not classified (based on available data, the classification criteria are not met).

Other toxicity information: No additional information available.

SECTION 12: Ecological information

Ecotoxicity:

<u>Chemical Name</u>	<u>Species</u>	<u>Acute</u>	<u>Acute</u>	<u>Chronic</u>
Nonanal	Fish	LC50 1.45 mg/L (96 hours) (similar materials)	N/E	N/E
Nonanal	Invertebrates	EC50 1.54 mg/L (48 hours)	N/E	N/E
Nonanal	Algae	EC50 4.5 mg/L (72 hours)	N/E	NOEC 0.759 mg/L(72 hours)
Nonanal	Micro-organisms	EC50 70 mg/L (3 hours)		
alpha Tocopherol	Fish	LC50 >10 mg/L (96 hours)	N/E	N/E
alpha Tocopherol	Invertebrates	EC50 >100 mg/L (48 hours)	N/E	N/E
alpha Tocopherol	Algae	EC50 >25.8 mg/L (72 hours)	N/E	NOEC 25.8 mg/L(72 hours)
alpha Tocopherol	Micro-organisms	EC50 >927 mg/L (30 minutes) (similar materials)		

Persistence and degradability:

<u>Chemical Name</u>	<u>Biodegradation</u>
Nonanal	Readily biodegradable (OECD 301F)
alpha Tocopherol	Inherently biodegradable (OECD 301F)

Bioaccumulative potential:

<u>Chemical Name</u>	<u>Bioconcentration Factor (BCF)</u>	<u>Log Kow</u>
Nonanal	94 L/kg (calculated)	3.4 (OECD 117)
alpha Tocopherol	N/E	12.2 (calculated)

Mobility in soil:

<u>Chemical Name</u>	<u>Mobility in soil (Koc/Kow)</u>
Nonanal	692 (OECD 121)
alpha Tocopherol	N/E

Other adverse effects: No additional information available.

SECTION 13: Disposal considerations

Dispose of unused contents (incineration) in accordance with national and local regulations. Dispose of container in accordance with national and local regulations. Ensure the use of properly authorized waste management companies, where appropriate.

See Section 8 for recommendations on the use of personal protective equipment.

SECTION 14: Transport information

The information below is provided to assist in documentation. It may supplement the information on the package. The package in your possession may carry a different version of the label depending on the date of manufacture. Depending on inner packaging quantities and packaging instructions, it may be subject to specific regulatory exceptions.

UN number: N/A

UN proper shipping name:

Not regulated - See Bill of Lading for Details

Transport hazard class(es):

U.S. DOT hazard class: Combustible liquid

Canada TDG hazard class: N/A

Europe ADR/RID hazard class: N/A

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IMDG Code (ocean) hazard class: N/A

ICAO/IATA (air) hazard class: N/A

A "N/A" listing for the hazard class indicates the product is not regulated for transport by that regulation.

Packing group: N/A

Environmental hazards:

Marine pollutant: Not Applicable

Hazardous substance (USA): Not Applicable

Special precautions for user: Not Applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:

Not Applicable

Notes: For shipments within the United States, in containers of more than 119 gallons: Combustible liquid, N.O.S., NA 1993, PG III.

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question:

Japan regulations:

Japan Industrial Safety and Health Law:

Chemical name

No subject chemicals

Category

Japan Fire Service Law:

Chemical name

No subject chemicals

Category

Japan Poisonous and Deleterious Substances:

Chemical name

No subject chemicals

Category

Threshold

Japan Prevention of Marine Pollution and Disaster:

Chemical name

No subject chemicals

Category

Japan Chemical Substances Control Law:

Chemical name

No subject chemicals

Category

Notes

Other regulations: No Additional Information

Chemical inventories:

Regulation

Status

Australian Inventory of Industrial Chemicals (AIIC):

Y

Canadian Domestic Substances List (DSL):

Y

Canadian Non-Domestic Substances List (NDSL):

N

China Inventory of Existing Chemical Substances (IECSC):

Y

European EC Inventory (EINECS, ELINCS, NLP):

Y

Japan Existing and New Chemical Substances (ENCS):

Y

Japan Industrial Safety and Health Law (ISHL):

Y

Korean Existing and Evaluated Chemical Substances (KECL):

Y

New Zealand Inventory of Chemicals (NZIoC):

Y

Philippines Inventory of Chemicals and Chemical Substances (PICCS):

Y

Taiwan Inventory of Existing Chemicals:

Y

U.S. Toxic Substances Control Act (TSCA) (Active):

Y

A "Y" listing indicates all intentionally added components are either listed or are otherwise compliant with the regulation. A "N" listing indicates that for one or more components: 1) there is no listing on the public inventory (or is not on the ACTIVE inventory for U.S. TSCA); 2) no information is available; or 3) the component has not been reviewed. A "Y" for New Zealand may mean that a qualified group standard may exist for the components in this product.

Chemical inventory notes: New Zealand: One or more components may be covered by a group standard.

Europe REACH (EC) 1907/2006: Applicable components are registered, exempt or otherwise compliant. EU REACH is only relevant to substances either manufactured or imported into the EU. Emerald Performance Materials has met its obligations under the EU REACH regulation. EU REACH information regarding this product is provided for informational purposes only. Each Legal Entity may have differing EU REACH obligations, depending on their place in the supply chain. For material manufactured outside of the EU, the importer of record must understand and meet their specific obligations under the regulation.

SECTION 16: Other information

Legend:

* : Trademark owned by Emerald Performance Materials, LLC.

ACGIH: American Conference of Governmental Industrial Hygienists

N/A: Not Applicable

N/E: None Established

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STEL: Short Term Exposure Limit

TWA: Time Weighted Average (exposure for 8-hour workday)

Users Responsibility/Disclaimer of Liability:

The information set forth herein is based on our current knowledge, and is intended to describe the product solely with respect to health, safety and the environment. As such, it must not be interpreted as a guarantee of any specific property of the product. As a result, the customer shall be solely responsible for deciding whether said information is suitable and beneficial.

Safety Data Sheet Preparer:

Product Compliance Department

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United States