

SECTION 1: Identification

Product identifiers:

Product trade name: Kalama* Laevo-Citronellol
Company product number: LCITRONELL
Other means of identification: 32167; Citronellol

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
For further information about this SDS: Email: product.compliance@emeraldmaterials.com

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:

Acute Toxicity, Oral, category 5, H303
Acute Toxicity, Dermal, category 5, H313
Skin Irritation, category 2, H315
Skin Sensitizer, category 1, H317
Eye Irritation, category 2, H319
Hazardous to the aquatic environment, Acute, category 2, H401

Label elements:

Hazard pictogram(s):



Signal word:

Warning

Hazard statements:

H303 May be harmful if swallowed.
H313 May be harmful in contact with skin.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H401 Toxic to aquatic life.

Precautionary statements:

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.

SDS Name: Kalama* Laevo-Citronellol

P273 Avoid release to the environment.

P280 Wear protective gloves/eye protection/face protection.

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P312 Call a POISON CENTRE/doctor if you feel unwell.

P333+P313 If skin irritation or rash occurs: Get medical advice/attention.

P337+P313 If eye irritation persists: Get medical advice/attention.

P362+P364 Take off contaminated clothing and wash it before reuse.

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

Mixture:

<u>CAS-No.</u>	<u>Chemical Name</u>	<u>Weight%</u>
0007540-51-4	L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	55-<65
0000106-22-9	DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	35-<45
0000106-24-1	Geraniol	0.1-<1.0
0005392-40-5	Citral	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: Immediately flush eyes with plenty of clean water for an extended time, not less than fifteen (15) minutes. Flush longer if there is any indication of residual chemical in the eye. Ensure adequate flushing of the eyes by separating the eyelids with fingers and roll eyes in a circular motion. If eye irritation persists: Get medical advice/attention.

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. Pre-existing skin problems may be aggravated by prolonged or repeated contact. 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 water spray, ABC dry chemical, foam or carbon dioxide. Water or foam may cause frothing. Use water to keep

SDS Name: Kalama* Laevo-Citronellol

fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

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

Special hazards arising From the chemical:

Unusual fire/explosion hazards: Product is not considered a fire hazard, but will burn if ignited. Closed container may rupture (due to build up in pressure) when exposed to extreme heat.

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: 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. If spilled in an enclosed area, ventilate. Eliminate ignition sources. Personal Protective Equipment must be worn.

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

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.

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.

Conditions for safe storage, including any incompatibilities: Store cool and dry, under well-ventilated conditions. 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. Do not reuse empty container without commercial cleaning or reconditioning. Empty container contains residual product which may exhibit hazards of product.

SECTION 8: Exposure controls / personal protection

Control parameters:

Occupational exposure limits (OEL):

Chemical Name

L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)
Geraniol
Citral

ACGIH - TWA/Ceiling

N/E
N/E
N/E
5 ppm TWA (inhalable fraction and vapor) (skin)
(dermal sensitizer)

ACGIH - STEL

N/E
N/E
N/E
N/E

Chemical Name

L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)
Geraniol
Citral

Australia

N/E
N/E
N/E
N/E

New Zealand

N/E
N/E
N/E
N/E

Korea

N/E
N/E
N/E
N/E

Indonesia

N/E
N/E
N/E
N/E

Chemical Name

L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)

Japan ISHL

N/E
N/E

Japan JSOH

N/E
N/E

Taiwan

N/E
N/E

Malaysia

N/E
N/E

SDS Name: Kalama* Laevo-Citronellol

<u>Chemical Name</u>	<u>Japan ISHL</u>	<u>Japan JSOH</u>	<u>Taiwan</u>	<u>Malaysia</u>
Geraniol	N/E	N/E	N/E	N/E
Citral	N/E	N/E	N/E	N/E
<u>Chemical Name</u>	<u>Philippines</u>	<u>Singapore</u>		
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	N/E	N/E		
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	N/E	N/E		
Geraniol	N/E	N/E		
Citral	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.

Individual protection measures, such as personal protective equipment:

Eye/face protection: Safety glasses or goggles required.

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. In case of insufficient ventilation, wear suitable respiratory equipment.

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:	Clear, Colorless to light yellow	Relative density:	0.853-0.856
Odor:	Floral. Fruity.	Partition coefficient (n-octanol/water):	3.4-3.7
Odor threshold:	Not Available	% Volatile by weight:	Not Available
Solubility in water:	Negligible	VOC:	Not Available
Evaporation rate:	Not Available	Boiling point °C:	224 °C
Vapor pressure:	<0.1 kPa (<1 mm Hg) @ 20°C	Boiling point °F:	435 °F
Vapor density:	Not Available	Flash point:	>93.3 °C (>200 °F) Closed Cup
Viscosity:	Not Available	Auto-ignition temperature:	240 °C (464 °F)
Melting point/Freezing point:	Not Available	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		

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

SECTION 10: Stability and reactivity

Reactivity: None known.

Chemical stability: This product is stable.

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.

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: Causes serious eye irritation.

Skin: May be harmful in contact with skin. May cause allergic skin reaction. Causes 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: May be harmful if swallowed. Ingestion may cause irritation.

Acute toxicity information: May be harmful in contact with skin - Category 5. May be harmful if swallowed - Category 5. ATEmix (oral): >3000 - <5000 mg/kg. ATEmix (dermal): >2000 - 5000 mg/kg.

<u>Chemical Name</u>	<u>Inhalation LC50</u>	<u>Species</u>	<u>Oral LD50</u>	<u>Species</u>	<u>Dermal LD50</u>	<u>Species</u>
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	N/E	N/E	3450 mg/kg (similar materials)	Rat/ adult	2650 mg/kg (similar materials)	Rabbit/ adult
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	N/E	N/E	3450 mg/kg	Rat/ adult	2650 mg/kg	Rabbit/ adult
Geraniol	N/E	N/E	3600 mg/kg	Rat/ adult	>5000 mg/kg	Rabbit/ adult
Citral	N/E	N/E	6800 mg/kg	Rat/ adult	2250 mg/kg	Rabbit/ adult

Skin corrosion/irritation: Causes skin irritation - Category 2.

<u>Chemical Name</u>	<u>Skin irritation</u>	<u>Species</u>
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	Irritant (OECD 431)	In-Vitro, Read-across
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	Irritant	Rabbit/ adult
Geraniol	Irritant (OECD 404)	Rabbit/ adult
Citral	Irritant	Rabbit/ adult

Serious eye damage/irritation: Causes serious eye irritation - Category 2 (2A).

<u>Chemical Name</u>	<u>Eye irritation</u>	<u>Species</u>
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	Irritant (OECD 405)	Rabbit, Read-across
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	Moderate irritant	Rabbit/ adult
Geraniol	Severe irritant	Rabbit/ adult
Citral	Irritant	Rabbit/ adult

Respiratory or skin sensitization: Skin sensitization - Category 1.

<u>Chemical Name</u>	<u>Skin sensitisation</u>	<u>Species</u>
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	Sensitizer	Mouse/Local lymph node assay (similar materials)
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	Sensitizer	Mouse/Local lymph node assay
Geraniol	Sensitizer	Local Lymph Node Assay (OECD 429)
Citral	Sensitizer	Weight of evidence

Carcinogenicity: Not classified (no relevant information found). CITRONELLOL - READ-ACROSS (Geranyl acetate & Citronellyl acetate): NOEL (carcinogenicity), rat: >2000 mg/kg bw/day.

Germ cell mutagenicity: Not classified (based on available data, the classification criteria are not met). L-CITRONELLOL - READ-ACROSS (DL-CITRONELLOL): Ames tests, with and without activation: negative. Mutagenicity was negative in in-vivo genotoxicity assays. DL-CITRONELLOL: Ames tests, with and without activation: negative. Mutagenicity was negative in in-vivo genotoxicity assays.

Reproductive toxicity: Not classified (based on available data, the classification criteria are not met). L-CITRONELLOL - READ-ACROSS: Reproductive toxicity: oral, rat (reaction mass of geraniol and nerol) - NOEL (no-observed adverse-effect-level) of 1000 mg/kg bw/day; dermal, rat (Geraniol) - NOEL of 300 mg/kg bw/day. Developmental toxicity: oral, rat (reaction mass of geraniol and nerol) - NOEL of 100 mg/kg bw/day (maternal toxicity), 300 mg/kg bw/day (prenatal development toxicity); dermal, rat (Geraniol) - NOEL of 300 mg/kg bw/day. DL-CITRONELLOL: Reproductive toxicity - READ-ACROSS: oral, rat (reaction mass of geraniol and nerol) - NOEL (no-observed adverse-effect-level) of 1000 mg/kg bw/day; dermal, rat (Geraniol) - NOEL of 300 mg/kg bw/day. Developmental toxicity: oral, rat - NOEL of >= 750 mg/kg bw/day.

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

SDS Name: Kalama* Laevo-Citronellol

met).

Specific target organ toxicity (STOT) - repeated exposure: Not classified (based on available data, the classification criteria are not met). L-CITRONELLOL - READ-ACROSS (weight of evidence): Repeated dose oral toxicity studies showed NOAEL (No-Observed-Adverse-Effect-Level), oral: 1000 mg/kg bw/day (mouse); 2000 mg/kg bw/day (rat). DL-CITRONELLOL - READ-ACROSS (geraniol): Repeated dose oral toxicity studies showed a NOAEL (No-Observed-Adverse-Effect-Level), oral, rat - >550 mg/kg bw/day.

Aspiration hazard: Not classified (no relevant information found).

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>
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	Fish	LC50 14.66 mg/L (96 hours) (similar materials)	N/E	N/E
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	Invertebrates	EC50 17.48 mg/L (48 hours) (similar materials)	N/E	N/E
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	Algae	EC50 2.4 mg/L (72 hours) (similar materials)	N/E	EC20 1.1 mg/L(72 hours) (similar materials)
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	Micro-organisms	EC10 580 mg/L (30 minutes) (similar materials)		
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	Fish	LC50 14.66 mg/L (96 hours)	N/E	N/E
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	Invertebrates	EC50 17.48 mg/L (48 hours)	N/E	N/E
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	Algae	EC50 2.4 mg/L (72 hours)	N/E	EC20 1.1 mg/L(72 hours)
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	Micro-organisms	EC10 580 mg/L (30 minutes)		
Geraniol	Fish	LC50 22 mg/L (96 hours) (similar materials)	N/E	N/E
Geraniol	Invertebrates	EC50 10.8 mg/L (48 hours) (similar materials)	N/E	N/E
Geraniol	Algae	EC50 13.1 mg/L (72 hours) (similar materials)	N/E	EC10 3.77 mg/L(72 hours) (similar materials)
Geraniol	Micro-organisms	EC50 70 mg/L (30 minutes)		
Citral	Fish	LC50 6.78 mg/L (96 hours)	N/E	N/E
Citral	Invertebrates	EC50 6.8 mg/L (48 hours)	N/E	N/E
Citral	Algae	EC50 104 mg/L (72 hours)	N/E	N/E

Persistence and degradability:

<u>Chemical Name</u>	<u>Biodegradation</u>
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	Readily biodegradable (OECD 301F, read-across)
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	Readily biodegradable (OECD 301F)
Geraniol	Readily biodegradable (OECD 301A)
Citral	Readily biodegradable

Bioaccumulative potential:

<u>Chemical Name</u>	<u>Bioconcentration Factor (BCF)</u>	<u>Log Kow</u>
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	N/E	3.66 @ 40°C (OECD 117)
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	82.59 L/kg (calculated)	3.41 @ 25°C
Geraniol	N/E	2.6 (OECD 117)
Citral	N/E	2.76-2.9

Mobility in soil:

<u>Chemical Name</u>	<u>Mobility in soil (Koc/Kow)</u>
L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)	N/E
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	N/E
Geraniol	N/E
Citral	N/E

Other adverse effects: No additional information available.

SECTION 13: Disposal considerations

SDS Name: Kalama* Laevo-Citronellol

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: N/A

Canada TDG hazard class: N/A

Europe ADR/RID hazard class: N/A

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

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

L-Citronellol ((-)-3,7-Dimethyloct-6-en-1-ol)

DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)

Geraniol

Citral

Category

Group 4 - Flammable liquids

Group 4 - Flammable liquids

Group 4 - Flammable liquids

Group 4 - Flammable liquids

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

Korean regulations:

Korea Industrial Safety and Health Act:

Chemical name

No subject chemicals

Category

Threshold

Korea Act on Registration and Evaluation of Chemical Substances (K-REACH) - Substances subject to registration:

No subject chemicals

Korea Chemical Control Act (CCA):

SDS Name: Kalama* Laevo-Citronellol

<u>Chemical name</u>	<u>Category</u>	<u>Code</u>	<u>Threshold</u>
No subject chemicals			

Korea Safety Control of Dangerous Substances Act (MPSS):

<u>Chemical name</u>	<u>Class</u>	<u>Threshold</u>
DL-Citronellol ((±)-3,7-Dimethyloct-6-en-1-ol)	Class 4 Flammable Liquids	2000 L
Geraniol	Class 4 Flammable Liquids	2000 L
Citral	Class 4 Flammable Liquids	2000 L

Korea Waste Control Act: Waste disposal methods must comply with local and national laws.

<u>Chemical name</u>	<u>Notes</u>
No subject chemicals	

Other regulations: No Additional Information

Chemical inventories:

<u>Regulation</u>	<u>Status</u>
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.

Europe REACH (EC) 1907/2006: Applicable components are registered, exempt or otherwise compliant. REACH is only relevant to substances either manufactured or imported into the EU. Emerald Performance Materials has met its obligations under the REACH regulation. REACH information regarding this product is provided for informational purposes only. Each Legal Entity may have differing 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

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

Emerald Performance Materials, LLC

1499 SE Tech Center Place, Suite 300

Vancouver, WA 98683

United States