



Safety Data Sheet (SDS) North American (U.S. and Canada)

Revision date: 2018-06-21

SECTION 1: Identification

Product identifiers:

Product trade name: Kalama* Benzaldehyde, FCC, Low BT
Company product number: BZALDLOW
Other means of identification: Benzoic aldehyde, Benzenecarbonal, Benzenecarboxaldehyde

Recommended use of the chemical and restrictions on use:

Uses: Flavor and fragrance ingredient
Restrictions on use: None identified

Details of the supplier:

Manufacturer/Supplier: Emerald Performance Materials, LLC
1499 SE Tech Center Place, Suite 300
Vancouver, WA 98683
United States
Telephone: +1-360-954-7100
FAX: +1-360-954-7201
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

Information in accordance with U.S. 29 CFR 1910.1200 (Hazcom 2012) and Canada Hazardous Products Regulations (WHMIS 2015):

Classification of the product:

Flammable Liquid, category 4
Acute Toxicity, Oral, category 4
Skin Irritation, category 2
Eye Irritation, category 2
Acute Toxicity, Inhalation, category 4
STOT, single exposure, category 3, RTI

Label elements:

Hazard pictogram(s):



Signal word:

Warning

Hazard statements:

H227 Combustible liquid.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.

Precautionary statements:

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

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P261 Avoid breathing 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/eye protection/face protection.
P301+P312 IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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.
P330 Rinse mouth.
P332+P313 If skin irritation 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.
P370+P378 In case of fire: Use carbon dioxide, dry chemical, foam, water spray to extinguish.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local, regional and international regulations.
Supplemental information: Hazardous to the aquatic environment - Chronic Category 3, Harmful to aquatic life with long lasting effects. BENZALDEHYDE: Finely dispersed benzaldehyde may ignite spontaneously. May form peroxides in contact with air.

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.

Hazards not otherwise classified:

Physical hazards not otherwise classified: No Additional Information

Health hazards not otherwise classified: 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>
000100-52-7	Benzaldehyde	99-100

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: Dizziness, Drowsiness, Headache, Irritation, Nausea. Preexisting

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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

NFPA flammability class: IIIA

Extinguishing media:

Suitable: NFPA Class IIIA (Combustible liquid): Use dry chemical, "alcohol" foam, carbon dioxide or water spray.

Unsuitable: None known.

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. BENZALDEHYDE: Finely dispersed benzaldehyde may ignite spontaneously. Rags used to wipe up spills or activated carbon used to absorb vapors of benzaldehyde have been known to ignite spontaneously. Benzaldehyde has a low autoignition temperature and can be ignited by exposed low pressure steam piping or other heated surfaces. Explosion is possible above the upper explosion limit due to the partial oxidation of benzaldehyde to benzoic acid. May form peroxides in contact with air.

Hazardous combustion products: Irritating or toxic substances will 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.

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. Do not breathe dust, vapor, aerosol, mist or gas. Do not ingest, taste, or swallow. 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. 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

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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. Avoid storage in aluminum or iron containers. Product can easily oxidize. It is recommended that opened containers be padded with nitrogen. Protect from light. Storage tank openings should be inspected frequently since benzoic acid can form from oxidation of product and may clog openings.

SECTION 8: Exposure controls / personal protection

Control parameters:

Occupational exposure limits (OEL):

<u>Chemical Name</u>	<u>ACGIH - TWA/Ceiling</u>	<u>ACGIH - STEL</u>		
Benzaldehyde	N/E	N/E		
<u>Chemical Name</u>	<u>OSHA - PEL</u>	<u>OSHA - STEL</u>	<u>OSHA - Ceiling</u>	<u>AIHA - WEEL</u>
Benzaldehyde	N/E	N/E	N/E	2 ppm TWA, 4 ppm STEL (15-min. STEL) (Skin sensitizer)

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.). (Ventilation guidelines/techniques may be found in publications such as Industrial Ventilation: American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Cincinnati, OH, 45240-1634, USA.) (<http://www.acgih.org/home.htm>).

Individual protection measures, such as personal protective equipment (PPE):

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: In case of insufficient ventilation, wear suitable respiratory equipment. 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. Use respirator in accordance with manufacturer's use limitations and OSHA standard 1910.134 (29CFR).

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 light yellow	Relative density:	1.041-1.046 @ 25°C
Odor:	Almond	Partition coefficient (n-octanol/water):	1.4 @ 25°C
Odor threshold:	Not Available	% Volatile by weight:	100%
Solubility in water:	6.95 g/l @ 25°C	VOC:	100%
Evaporation rate:	0.04 (Butyl acetate=1)	Boiling point °C:	179 °C @760 mm Hg
Vapor pressure:	169 Pa @ 25°C	Boiling point °F:	354 °F @760 mm Hg
Vapor density:	3.66 (Air=1)	Flash point:	62-64 °C (144-147 °F) Closed Cup
Viscosity:	1.321 centipoise @ 25 °C	Auto-ignition temperature:	192 °C (378 °F)
Melting point/Freezing point:	-26 °C (-15 °F) @ 760 mm Hg	Flammability (solid, gas):	Not Applicable (liquid)
Oxidizing properties:	Not oxidizing	Flammability or explosive limits:	LFL/LEL 1.4%
Explosive properties:	Not explosive		UFL/UEL 8.5%

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Decomposition temperature: Not Available

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

SECTION 10: Stability and reactivity

Reactivity: BENZALDEHYDE: Benzaldehyde readily undergoes oxidation by air to form benzoic acid.

Chemical stability: This product is stable. BENZALDEHYDE: Stable at normal temperatures and pressures. Benzaldehyde readily undergoes oxidation by air, particularly in the presence of minute traces of iron or on exposure to light. May discolor on exposure to light or air.

Possibility of hazardous reactions: Hazardous polymerization will not occur. BENZALDEHYDE: May form peroxides in contact with air.

Conditions to avoid: BENZALDEHYDE: Avoid exposure to air, light, moisture, ignition sources and elevated temperatures.

Incompatible materials: Reacts violently with peroxyformic acid. Avoid contact with strong oxidizing agents, reducing agents, acids, bases, iron, phenol, aluminum, brass, copper, bronze, alkali metals and oxygen. Attacks some forms of plastics, rubbers, and coatings.

Hazardous decomposition products: Carbon monoxide, carbon dioxide, peroxides, benzoic acid.

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. BENZALDEHYDE: Liver, kidney, and central nervous system effects have been observed during testing in laboratory animals.

Eyes: Causes serious eye irritation.

Skin: Causes skin irritation. May be absorbed through the skin. Prolonged or repeated contact with skin may defat the skin and may cause contact dermatitis. Sensitive individuals may develop a rash from contact with benzaldehyde.

Inhalation: Harmful if inhaled. May cause respiratory tract irritation. May act as a local anesthetic and narcotic at high concentrations. Inhalation of concentrated vapors may irritate the nose and throat and may produce central nervous system depression with possible respiratory failure. Overexposure may cause nausea, headache and vomiting.

Ingestion: Harmful if swallowed. Overexposure may cause nausea, headache and vomiting.

Symptoms/effects, acute and delayed: Dizziness, Drowsiness, Headache, Irritation, Nausea

Acute toxicity information: Harmful if inhaled (Category 4). Harmful if swallowed (Category 4).

<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>
Benzaldehyde	>1-<5 mg/L (4 hours)	Rat/ adult	1430 mg/kg	Rat/ adult male	>2000 mg/kg (based on benzoic acid)	Rabbit/ adult

Skin corrosion/irritation: Causes skin irritation (Category 2).

<u>Chemical Name</u>	<u>Skin irritation</u>	<u>Species</u>
Benzaldehyde	Moderate irritant	Weight of evidence

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

<u>Chemical Name</u>	<u>Eye irritation</u>	<u>Species</u>
Benzaldehyde	Slight irritant	Rabbit/ adult

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

<u>Chemical Name</u>	<u>Skin sensitisation</u>	<u>Species</u>
Benzaldehyde	Non-sensitizer	Guinea pig and Human

Carcinogenicity: Not classified (based on available data, the classification criteria are not met). BENZALDEHYDE: Under the conditions of the two year gavage study, there was no evidence of carcinogenic activity of benzaldehyde for male or female 344/N rats receiving 200 or 400 mg/kg bw/day. NOAEL (carcinogenicity), rat: >400 mg/kg bw/day. Under the conditions of the two year gavage study, there was some evidence of carcinogenic activity of benzaldehyde for male and female mice at 300 mg/kg bw/day

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and above, as indicated by increased incidences of squamous cell papillomas (benign) and hyperplasia of the forestomach. LOAEL (chronic), mice: >300 mg/kg bw/day. No carcinomas were observed. It cannot be excluded that the observed effects on the forestomach are related to the irritant properties of benzaldehyde.

Carcinogenic status: Not listed or regulated by IARC (Group 1 or 2), NTP, OSHA, or ACGIH.

Germ cell mutagenicity: Not classified (based on available data, the classification criteria are not met). BENZALDEHYDE: Benzaldehyde was not mutagenic in several Ames assay and reverse mutation studies. Mutagenic effects have been observed on tests in the mouse lymphoma, sister chromatid exchanges (in Chinese hamster ovary (CHO) cells) and chromosome aberrations (in Chinese hamster lung (CHL) cells) assays. Mutagenicity was negative in in-vivo sex-linked recessive lethal mutation assays with *Drosophila melanogaster*. No adequate in vivo data are available that confirm the weakly positive in-vitro results.

Reproductive toxicity: Not classified (based on available data, the classification criteria are not met). BENZALDEHYDE - READ-ACROSS: Reproductive toxicity (benzoic acid), 4-generation oral study in rats: NOAEL (no-observed adverse-effect-level) of 500 mg/kg/day. Developmental toxicity (sodium benzoate), oral, rats and mice: NOAEL of ≥ 175 mg/kg bw/day can be established for developmental effects.

Specific target organ toxicity (STOT) - single exposure: May cause respiratory irritation (Category 3). BENZALDEHYDE: Based on acute inhalation toxicity studies on sensory irritation, it cannot be excluded that benzaldehyde induces sensory irritation in rodents.

Specific target organ toxicity (STOT) - repeated exposure: Not classified (based on available data, the classification criteria are not met). BENZALDEHYDE: Repeated dose toxicity study, rat, inhalation (vapor), 14 days: LOAEC (Lowest-Observed-Adverse-Effect-Concentration) - 2200 mg/m³. Repeated dose (long-term inclusive) oral toxicity studies showed a LOAEL (Lowest-Observed-Adverse-Effect-Level) of 300 mg/kg bw/day (mouse); NOAEL (No-Observed-Adverse-Effect-Level), oral, rat - 400 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: BENZALDEHYDE: Microorganism Toxicity (activated sludge): The acute EC₅₀ is 759 mg/L, 3 hours.

Chemical Name Benzaldehyde	Fish 96 hour LC50 1.07 mg/L	Fish 96 hour LC50 11.2 mg/L	Fish Chronic NOEC 0.12 mg/L (7 days)
Chemical Name Benzaldehyde	Invertebrates 48 hour EC50 16.2 mg/L	Invertebrates 24 hour EC50 50 mg/L	Invertebrates Chronic NOEC N/E
Chemical Name Benzaldehyde	Algae 96 hour EC50 23.1 mg/L (calculated)	Algae 72 hour EC50 N/E	Algae Chronic NOEC 20 mg/L (8 days, growth rate)

Persistence and degradability:

Chemical Name Benzaldehyde	Biodegradation Readily biodegradable (weight of evidence)
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Bioaccumulative potential:

Chemical Name Benzaldehyde	Bioconcentration Factor (BCF) N/E	Log Kow 1.4 @ 25°C
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Mobility in soil:

Chemical Name Benzaldehyde	Mobility in soil (Koc/Kow) 32.7 L/kg (calculated)
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Other adverse effects: No additional information available.

SECTION 13: Disposal considerations

For waste disposal purposes, this product is not known to be defined or designated as hazardous by current provisions of the Federal (EPA) Resource Conservation and Recovery Act (RCRA, 40CFR261). Incinerate waste product when in liquid form (i.e., as supplied) in a properly permitted (approved) incineration facility in accordance with federal, state and local regulations. Liquids cannot be disposed of in a landfill.

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

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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: UN1990

UN proper shipping name:

Benzaldehyde

Transport hazard class(es):

U.S. DOT hazard class: 9

Canada TDG hazard class: 9

Europe ADR/RID hazard class: 9

IMDG Code (ocean) hazard class: 9

ICAO/IATA (air) hazard class: 9

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

Packing group: III

Environmental hazards:

Marine pollutant: Not Applicable

Hazardous substance (USA): Not Applicable

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

Not Applicable

Special precautions for user: Not Applicable

SECTION 15: Regulatory information

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

U.S. federal and state regulations/legislation:

This SDS has been prepared in accordance with the hazard criteria of the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

U.S. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Reportable Quantity (RQ):

Not Applicable

U.S. Superfund Amendments and Reauthorization Act (SARA) - SARA Section 313:

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and 40 CFR 372:

None known

U.S. TSCA Section 12(b) Export Notification:

This product is not subject to TSCA 12(b) reporting requirements.

California Proposition 65:

The following ingredient(s) present in the product is [are] known to the State of California to cause cancer:

None known to be present or none in reportable amounts for occupational exposure as per OSHA's approval of the California Hazard Communication Standard, Federal Register, page 31159 ff, 6 June 1997.

The following ingredient(s) present in the product is [are] known to the State of California to cause birth defects or other reproductive harm:

None known to be present or none in reportable amounts for occupational exposure as per OSHA's approval of the California Hazard Communication Standard, Federal Register, page 31159 ff, 6 June 1997.

Notes: No additional information

Canada regulations/legislation:

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations and the SDS contains all the information required by the Hazardous Products Regulations.

Notes: No additional information

Chemical inventories:

<u>Regulation</u>	<u>Status</u>
Australian Inventory of Chemical Substances (AICS):	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):	Y

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

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HMIS (Hazardous Materials Identification System) Ratings:

Health: 2 **Flammability:** 2 **Physical hazard:** 0 **Personal Protection:** X

NFPA (National Fire Protection Association) Ratings:

Health: 2 **Flammability:** 2 **Instability:** 0

Key: 0=Insignificant; 1=Slight; 2=Moderate; 3=High; 4=Extreme. An asterisk appearing after the HMIS Health numerical rating denotes a chronic hazard.

Hazardous Materials Identification System (HMIS), National Paint and Coating Association, rating applies to product "as packaged" (i.e., ambient temperature). Ratings are based upon HMIS® III and NFPA 704 (2007). An asterisk appearing after the HMIS Health® III numerical rating denotes a chronic hazard. National Fire Protection Association (NFPA) rating identifies the severity of hazards of material during a fire emergency (i.e., "on fire").

Legend:

- * : Trademark owned by Emerald Performance Materials, LLC.
- ACGIH: American Conference of Governmental Industrial Hygienists
- AIHA WEEL: American Industrial Hygiene Association (AIHA) Workplace Environmental Exposure Level (WEEL)
- 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:

As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this product. Information contained herein is believed to be true and accurate but all statements or suggestions are made without warranty, expressed or implied, regarding accuracy of the information, the hazards connected with the use of the material or the results to be obtained from the use thereof. Compliance with all applicable federal, state, and local laws and local regulations remains the responsibility of the user.

This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of your operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained in this bulletin should be provided to your employees or customers. It is your responsibility to develop appropriate work practice guidelines and employee instructional programs for your operation.

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