



Safety Data Sheet

200ppm 2,3 Butanedione, balance Nitrogen

Section 1: Product and Company Identification

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Product Code: 200ppm 2,3 Butanedione, balance Nitrogen
Part Number: 200ppm 2,3 Butanedione, balance Nitrogen

Synonyms:

Recommended Use:

Usage Restrictions:

Section 2: Hazards Identification



Warning

Hazard Classification:

Gases Under Pressure

Hazard Statements:

Contains gas under pressure; may explode if heated

Precautionary Statements

Storage:

Protect from sunlight.
Store in well-ventilated place.

Section 3: Composition/Information on Ingredients

	CAS #	Concentration
2,3-Butanedione	431-03-8	200ppm
Nitrogen	7727-37-9	Balance

	Chemical Substance	Chemical Family	Trade Names
2,3-Butanedione	2,3-Butanedione	Ketones	2,3-Butanedione; Diacetyl; Biacetyl; Butane-2,3-dione; Dimethylglyoxal
Nitrogen	NITROGEN, COMPRESSED GAS	Inorganic gases	DIATOMIC NITROGEN; DINITROGEN; NITROGEN; NITROGEN-14; NITROGEN GAS; UN 1066; N2

Section 4: First Aid Measures

	Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
2,3-Butanedione	Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.	If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.	No data available
Nitrogen	Wash exposed skin with soap and water.	Flush eyes with plenty of water.	If a large amount is swallowed, get medical attention.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.

Section 5: Fire Fighting Measures

	Suitable Extinguishing Media	Products of Combustion	Protection of Firefighters
2,3-Butanedione	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.	Carbon oxides	<ul style="list-style-type: none"> Wear self-contained breathing apparatus for firefighting if necessary.
Nitrogen	Non-flammable. Use suitable extinguishing media for surrounding fire. Cylinders may rupture or explode if exposed to heat.	Non-flammable	<ul style="list-style-type: none"> Respiratory protection may be needed for frequent or heavy exposure.

Section 6: Accidental Release Measures

	Personal Precautions	Environmental Precautions	Methods for Containment
2,3-Butanedione	Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.	Prevent further leakage or spillage if safe to do so. Do not let product enter drains.	Contain spillage.
Nitrogen	Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.	No significant effects from contamination expected.	Stop leak if possible without personal risk.

	Methods for Cleanup	Other Information

	Methods for Cleanup	Other Information
2,3-Butanedione	Collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.	
Nitrogen	N/A	N/A

Section 7: Handling and Storage

	Handling	Storage
2,3-Butanedione	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Storage class (TRGS 510): Flammable liquids	Use with local exhaust ventilation. Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.
Nitrogen	Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.

Section 8: Exposure Controls/Personal Protection

	Exposure Guidelines
2,3-Butanedione	TWA 0.010000 ppm USA. ACGIH Threshold Limit Values (TLV). STEL 0.020000 ppm USA. ACGIH Threshold Limit Values (TLV).
Nitrogen	NITROGEN, COMPRESSED GAS: NITROGEN: ACGIH (simple asphyxiant)

Engineering Controls

Handle only in fully enclosed systems.

	Eye Protection	Skin Protection	Respiratory Protection
2,3-Butanedione	Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Long sleeved clothing, Preventive skin protection Complete suit protecting against chemicals, Flame retardant antistatic protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.	Wear self-contained breathing apparatus for firefighting if necessary.
Nitrogen	Eye protection not required, but recommended.	Protective clothing is not required.	Respiratory protection may be needed for frequent or heavy exposure.

General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

Section 9: Physical and Chemical Properties

	Physical State	Appearance	Color	Change in Appearance	Physical Form	Odor	Taste
2,3-Butanedione	Liquid	Clear	Dark yellow	No data available	Liquid	Form: clear, liquid Colour: dark yellow	No data available
Nitrogen	Gas	Clear	Colorless	N/A	Gas	Odorless	Tasteless

	Flash Point	Flammability	Partition Coefficient	Autoignition Temperature	Upper Explosive Limits	Lower Explosive Limits

	Flash Point	Flammability	Partition Coefficient	Autoignition Temperature	Upper Explosive Limits	Lower Explosive Limits
2,3-Butanedione	7 °C (45 °F) - closed cup	3		No data available	No data available	No data available
Nitrogen	Not flammable	Not available	Not available	Nonflammable	Nonflammable	Nonflammable

	Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity	Water Solubility	pH	Odor Threshold	Evaporation Rate	Viscosity
2,3-Butanedione	88 °C (190 °F)	No data available	69.6 hPa (52.2 mmHg) at 20 °C (68 °F)	3.45	No data available	200 g/l at 20 °C (68 °F) - soluble	3.2	No data available	No data available	No data available
Nitrogen	-321 F (-196 C)	-346 F (-210 C)	760 mmHg @ -196 C	0.967 (Air=1)	Not applicable	1.6% @ 20 C	Not applicable	Not available	Not applicable	0.01787 cP @ 27 C

	Molecular Weight	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
2,3-Butanedione	86.09 g/mol	C4H6O2	0.981 g/mL	No data available	No data available	No data available	No data available
Nitrogen	28.0134	N2	1.2506 g/L	Not available	100%	1	Soluble: Liquid ammonia

Section 10: Stability and Reactivity

	Stability	Conditions to Avoid	Incompatible Materials
2,3-Butanedione	No data available	No data available	Oxidizing agents, Strong bases, Reducing agents, Metals
Nitrogen	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Metals, oxidizing materials

	Hazardous Decomposition Products	Possibility of Hazardous Reactions
2,3-Butanedione	No data available	No data available
Nitrogen	Oxides of nitrogen	Will not polymerize.

Section 11: Toxicology Information

Acute Effects

	Oral LD50	Dermal LD50	Inhalation
2,3-Butanedione	1580 mg/kg	> 5000 mg/kg	H331 Toxic if inhaled. H335 May cause respiratory irritation.
Nitrogen	Not available	Not available	Nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma

	Eye Irritation	Skin Irritation	Sensitization
2,3-Butanedione	H318 Causes serious eye damage.	H315 Causes skin irritation.	Acute toxicity, Oral (Category 4), H302 Acute toxicity, Inhalation (Category 3), H331 Skin irritation (Category 2), H315 Serious eye damage (Category 1), H318
Nitrogen	Contact with rapidly expanding gas may cause burns or frostbite	No information on significant adverse effects	Difficulty breathing

Chronic Effects

	Carcinogenicity	Mutagenicity	Reproductive Effects	Developmental Effects
2,3-Butanedione	No data available	No data available	No data available	No data
Nitrogen	Not hazardous	Not available	Not available	No data

Section 12: Ecological Information

Fate and Transport

	Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
2,3-Butanedione	Fish toxicity: No data available Invertebrate toxicity: No data available Algal toxicity: No data available Phyto toxicity: No data available Other toxicity: No data available	No data available	No data available	No data available
Nitrogen	Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available

Section 13: Disposal Considerations

2,3-Butanedione	Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.
Nitrogen	Dispose in accordance with all applicable regulations.

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

DOT Information For This Mixture

Shipping Name	Compressed gas, n.o.s. (Nitrogen, 2,3-Butanedione)
UN Number	UN1956
Hazard Class	2.2
Hazard Information	Non-Flammable Gas

Individual Component Information

	Proper Shipping Name	ID Number	Hazard Class or Division	Packing Group	Labeling Requirements	Passenger Aircraft or Railcar Quantity Limitations	Cargo Aircraft Only Quantity Limitations	Additional Shipping Description
2,3-Butanedione	Butanedione	2346	3	II	Not available	Not available	Not available	Not available
Nitrogen	Nitrogen, compressed	UN1066	2.2	Not applicable	2.2	75 kg or L	150 kg	N/A

Canadian Transportation of Dangerous Goods

	Shipping Name	UN Number	Class	Packing Group / Risk Group
2,3-Butanedione	Not available	Not available	Not available	Not available
Nitrogen	Nitrogen, compressed	UN1066	2.2	Not applicable

Section 15: Regulatory Information

U.S. Regulations

	CERCLA Sections	SARA 355.30	SARA 355.40
2,3-Butanedione	Not regulated	Not regulated	Not regulated
Nitrogen	Not regulated.	Not regulated.	Not regulated.

SARA 370.21

	Acute	Chronic	Fire	Reactive	Sudden Release
2,3-Butanedione	Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
Nitrogen	Yes	No	No	No	Yes

SARA 372.65

2,3-Butanedione	Not regulated
Nitrogen	Not regulated.

OSHA Process Safety

2,3-Butanedione	Not regulated
Nitrogen	Not regulated.

State Regulations

	CA Proposition 65
2,3-Butanedione	Massachusetts Right To Know Components Butanedione CAS-No. 431-03-8 Revision Date 1993-04-24 Pennsylvania Right To Know Components Butanedione CAS-No. 431-03-8 Revision Date 1993-04-24 New Jersey Right To Know Components Butanedione CAS-No. 431-03-8 Revision Date 1993-04-24 California Prop. 65 Components This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
Nitrogen	Not regulated.

Canadian Regulations

	WHMIS Classification
2,3-Butanedione	Not regulated
Nitrogen	A

National Inventory Status

	US Inventory (TSCA)	TSCA 12b Export Notification	Canada Inventory (DSL/NDL)
2,3-Butanedione	Not listed	Not listed	Not determined
Nitrogen	Listed on inventory.	Not listed.	Listed on inventory.

Section 16: Other Information

	NFPA Rating
2,3-Butanedione	Health hazard: 3 Fire Hazard: 3 Reactivity Hazard: 0
Nitrogen	HEALTH=1 FIRE=0 REACTIVITY=0

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard