

Safety Data Sheet

10ppm Sulfur Dioxide, 52% LEL Propane, 50ppm Carbon Monoxide;

balance Air

Ideal Calibrations, LLC 2750 Oakwood Blvd. Melvindale, MI 48122 (734) 956-0539 http://www.idealcalibrations.com/

Section 1: Product and Company Identification

Ideal Calibrations, LLC 2750 Oakwood Blvd. Melvindale, MI 48122 (734) 956-0539 http://www.idealcalibrations.com/

Product Code: 10ppm Sulfur Dioxide, 52% LEL Propane, 50ppm Carbon Monoxide; balance Air

Part Number: 0401

Synonyms:

Recommended Use: Calibration of gas detection devices

Usage Restrictions: Do not use if current date is past expiration date on cylinder

Section 2: Hazards Identification



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.

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Section 3: Composition/Information on Ingredients

	CAS#	Concentration
Sulfur Dioxide	7446-09-5	0.001
Propane	74-98-6	1.092
Carbon Monoxide	630-08-0	0.005
Air	Not applicable	98.902

	Chemical Substance	Chemical Family	Trade Names
Sulfur Dioxide	SULFUR DIOXIDE	Inorganic gases	SULFUROUS ACID ANHYDRIDE; SULFUROUS OXIDE; SULPHUR DIOXIDE; SULFUROUS ANHYDRIDE; FERMENTICIDE LIQUID; SULFUR DIOXIDE(SO2); SULFUR OXIDE; SULFUR OXIDE(SO2); STCC 4904290; UN 1079; O2S
Propane	PROPANE	Hydrocarbons, Aliphatic, Saturated	N-PROPANE; DIMETHYLMETHANE; PROPYL HYDRIDE; R-290; PROPYLHYDRIDE; LIQUEFIED PETROLEUM GAS; LPG; >96% NATURAL GRADE; >99.9% PURE GRADE; UN 1978; C3H8
Carbon Monoxide	CARBON MONOXIDE	Inorganic gases	CARBON OXIDE; CARBON OXIDE (CO); UN 1016; CO
Air	AIR, COMPRESSED	Inorganic gases	AIR; UN 1002 Nitrogen CAS: 7727-37-9 Oxygen CAS: 7782-44-7

Section 4: First Aid Measures

	Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
Sulfur Dioxide	Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.	Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	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.
Propane	If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.	Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	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.
Carbon Monoxide	Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.	Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	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.
Air	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. Get medical attention.	

Section 5: Fire Fighting Measures

	Suitable Extinguishing Media	Products of Combustion	Protection of Firefighters	
Sulfur Dioxide	Non-flammable. Use suitable extinguishing media for surrounding fire.	None known	Non-flammableNon-flammable	

	Suitable Extinguishing Media Products of Combustion		Protection of Firefighters
Propane	Regular dry chemical, high expansion foam Large fires: Flood with fine water spray.	Carbon monoxide, carbon dioxide, water and toxic and irritating fumes	 Any self-contained breathing apparatus with a full facepiece. Any self-contained breathing apparatus with a full facepiece.
Carbon Monoxide	Carbon dioxide, regular dry chemical Large fires: Use regular foam or flood with fine water spray.	Carbon dioxide	 Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Air	Use extinguishing agents appropriate for surrounding fire.		 No respirator is required under normal conditions of use.

Section 6: Accidental Release Measures

	Personal Precautions	Environmental Precautions	Methods for Containment
Sulfur Dioxide	Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Ventilate closed spaces before entering. Evacuation radius: 150 feet.	Avoid contamination of environment.	Stop leak if possible without personal risk. Reduce vapors with water spray. Do not get water directly on material.
Propane	Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. Do not touch spilled material.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition.
Carbon Monoxide	Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering.	Avoid heat, flames, sparks and other sources of ignition. Keep out of water supplies and sewers.	Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition.
Air			Stop leak if possible without personal risk.

	Methods for Cleanup	Other Information
Sulfur Dioxide	Stop leak, evacuate area. Contact emergency personnel.	Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).
Propane	Contact emergency personnel	None
Carbon Monoxide	Stop leak, evacuate area. Wear protective equipment.	Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).
Air		

Section 7: Handling and Storage

	Handling	Storage
Sulfur Dioxide	Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125F (52C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.	Do not get liquid in eyes, on skin, or clothing. Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Open valve slowly. Close cylinder valve after each use; keep closed even when empty. If valve is hard to open, discontinue use and contact your supplier.
Propane	Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.
Carbon Monoxide	Keep separated from incompatible substances.	Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.
Air	Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	

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Section 8: Exposure Controls/Personal Protection

	Exposure Guidelines
Sulfur Dioxide	SULFUR DIOXIDE: 2 ppm (5 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 5 ppm (13 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993) 5 ppm (13 mg/m3) OSHA TWA 2 ppm ACGIH TWA 5 ppm ACGIH STEL 2 ppm (5 mg/m3) NIOSH recommended TWA 10 hour(s) 5 ppm (13 mg/m3) NIOSH recommended STEL
Propane	PROPANE: 1000 ppm (1800 mg/m3) OSHA TWA 1000 ppm (1800 mg/m3) NIOSH recommended TWA 10 hour(s) LIQUIFIED PETROLEUM GAS (LPG): 1000 ppm (1800 mg/m3) OSHA TWA 1000 ppm ACGIH TWA 1000 ppm (1800 mg/m3) NIOSH recommended TWA 10 hour(s) ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4): 1000 ppm ACGIH TWA
Carbon Monoxide	CARBON MONOXIDE: 50 ppm (55 mg/m3) OSHA TWA 35 ppm (40 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 200 ppm (229 mg/m3) OSHA ceiling (vacated by 58 FR 35338, June 30, 1993) 25 ppm ACGIH TWA 35 ppm (40 mg/m3) NIOSH recommended TWA 10 hour(s) 200 ppm (229 mg/m3) NIOSH recommended ceiling
Air	AIR, COMPRESSED: No occupational exposure limits established.

Engineering Controls

Handle only in fully enclosed systems.

	Eye Protection	Skin Protection	Respiratory Protection
Sulfur Dioxide	Wear splash resistant safety goggles with a face shield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	For the gas: Wear appropriate chemical resistant clothing. For the liquid: Wear appropriate protective, cold insulating clothing.	Non-flammable
Propane	For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.	Any self-contained breathing apparatus with a full facepiece.
Carbon Monoxide	Eye protection not required, but recommended.	Protective clothing is not required.	Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Air	Eye protection not required under normal conditions.	Protective clothing is not required under normal conditions.	No respirator is required under normal conditions of use.

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
Sulfur Dioxide	Gas	Clear	Colorless	N/A	Gas	Irritating odor	N/A
Propane	Gas	Clear	Colorless	N/A	Gas	Gasoline odor	N/A
Carbon Monoxide	Gas	Colorless	Colorless	N/A	Gas	Odorless	Tasteless
Air	Gas	Clear	Colorless		Gas	Not available	

	Flash Point	Flammability	Partition Coefficient	Autoignition Temperature	Upper Explosive Limits	Lower Explosive Limits
Sulfur Dioxide	Not flammable	Not available	Not available	Nonflammable	Nonflammable	Nonflammable
Propane	-157 F (-105 C)	Not available	Not available	842 F (450 C)	0.095	0.021
Carbon Monoxide	Flammable	Not available	1479.11 (log = 3.17) (estimated from water solubility)	1128-1202 F (609- 650 C)	0.74	12.0-12.5%
Air						

Point Point Pressure Density Gravity Solubility Threshold Rate	I	Boiling	Freezing	Vapor	Vapor	Specific	Water	pН	Odor	Evaporation	Viscosity
	L	Point	Point	Pressure	Density	Gravity	Solubility		Threshold	Rate	

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	Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity	Water Solubility	рН	Odor Threshold	Evaporation Rate	Viscosity
Sulfur Dioxide	14 F (- 10 C)	-99 F (-73 C)	2432 mmHg @ 20 C	2.26 (Air=1)	1.462 @ - 10 C	22.8% @ 0 C	Acidic in solution	3-5 ppm	>1 (butyl acetate=1)	Not available
Propane	-40 F (- 40 C)	-310 F (- 190 C)	6398 mmHg @ 21.1 C	1.55 (Air=1)	0.5853 @ -45 C	Very slightly soluble	Not applicable	5000- 20000 ppm	Not applicable	Not available
Carbon Monoxide	-312.7 F (- 191.5 C)	-326 F (- 199 C)	760 mmHg @ -191 C gas; cannot be liquefied at room temperature	0.968 (Air=1)	Not applicable	2.3% @ 20 C	Not applicable	Not available	Not applicable	0.01657 cP @ 0 C
Air	-317 F (-194 C)	Not available	760 mmHg @ -194 C	1	Not applicable	Slightly soluble	Not applicable	Not available	Not applicable	0.01853 cP @ 26.85 C

	Molecular Weight	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
Sulfur Dioxide	64.06	S-O2	0.169	Not available	Not available	Not applicable	Soluble: Alcohol, acetic acid, sulfuric acid, ether, chloroform, benzene, sulfuryl chloride, nitrobenzenes, toluene, acetone
Propane	44.11	C-H3-C-H2- C-H3	0.116	Not available	Not available	Not applicable	Soluble: Absolute alcohol, ether, chloroform, benzene, turpentine
Carbon Monoxide	28.01	C-O	1.250 g/L @ 0 C	Not available	100%	Not applicable	Soluble: Alcohol, benzene, acetic acid, ethyl acetate, chloroform, cuprous chloride solutions
Air			1.29 g/L @ 0 C			Not applicable	Slightly Soluble

Section 10: Stability and Reactivity

	Stability	Conditions to Avoid	Incompatible Materials
Sulfur Dioxide	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Combustible materials, metals, bases, oxidizing materials, halogens, metal carbide, metal oxides, peroxides, reducing agents, potassium, sodium, nitryl chloride, acrolein, metal oxides, carbide
Propane	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Oxidizing materials, combustible materials, halogen compounds,
Carbon Monoxide	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Oxidizing materials, halogens, metal oxides, metals, combustible materials, lithium
Air	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	None known

	Hazardous Decomposition Products	Possibility of Hazardous Reactions
Sulfur Dioxide	Forms sulfurous acid solution on reaction with water.	Will not polymerize.
Propane	Oxides of carbon	Will not polymerize.
Carbon Monoxide	Oxides of carbon	Will not polymerize.
Air	No hazard expected.	Will not polymerize.

Section 11: Toxicology Information

Acute Effects

	Oral LD50	Dermal LD50	Inhalation
Sulfur Dioxide	LC50, 1 hr, rat = 2520 ppm	Not available	Allergic reactions, burns, toxic

	Oral LD50	Dermal LD50	Inhalation
Propane	LC50 Inhalation Gas. Rat >800000 ppm 15 minutes	Not available	Central nervous system depression, difficulty breathing, nausea, vomiting, irregular heartbeat, headache, symptoms of drunkenness, disorientation, suffocation, convulsions, coma
Carbon Monoxide	LC50 Inhalation Gas. Rat 1807 ppm 4 hours	Not available	Changes in body temperature, changes in blood pressure, nausea, vomiting, chest pain, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, disorientation, hallucinations, pain in extremities, tremors, loss of coordination, hearing loss, visual disturbances, eye damage, suffocation, blood disorders, convulsions, coma
Air	Not available	Not available	

	Eye Irritation	Skin Irritation	Sensitization		
Sulfur Corrosive, burns Corrosive, burns Dioxide		Corrosive, burns	Acute toxicity, Category 3, inhalation; H331: Toxic if inhaled. Skin corrosion, Category 1B; H314: Causes severe skin burns and eye damage.		
Propane	Liquid: frostbite, blurred vision	Liquid: blisters, frostbite	No health hazards classified.		
Carbon Monoxide	No information on significant adverse effects	No information on significant adverse effects	Acute toxicity, Category 3, inhalation; H331: Toxic if inhaled. Reproductive toxicity, Category 1A; H360D: May damage the unborn child. Specific Target Organ Toxicity (repeated exposure), Category 1; H372: Causes damage to organs through prolonged or repeated exposure.		
Air No information is No information is available available			No significant target effects reported.		

Chronic Effects

	Carcinogenicity	Mutagenicity	Reproductive Effects	Developmental Effects
Sulfur Dioxide	IARC: Human Inadequate Evidence, Animal Limited Evidence, Group 3; ACGIH: A4 -Not Classifiable as a Human Carcinogen	Available.	Available.	No data
Propane	Not available	Not available	Not available	No data
Carbon Monoxide	Not available	Available.	Available.	No data
Air	Not available	Not available	No data	No data

Section 12: Ecological Information

Fate and Transport

	Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
Sulfur Dioxide	Fish toxicity: 3000 ug/L 0.667-0.833 hour(s) (Avoidance) Atlantic menhaden (Brevoortia tyrannus) Invertibrate toxicity: Not available Algal toxicity: 500 ug/L 6 day(s) (Cellular) Green algae (Rhizoclonium hieroglyphicum) Phyto toxicity: Not available Other toxicity: >=150 ug/L NR hour(s) (Biochemical) Duckweed (Lemna minor)	Not available	Not available	Not available
Propane	Fish toxicity: Not available Invertibrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available
Carbon Monoxide	Fish toxicity: 75000 ug/L 1 day(s) LC100 (Mortality) Orangespotted sunfish (Lepomis humilis) Invertibrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Relatively non-persistent in the environment. Highly volatile from water.	Not available	Not expected to leach through the soil or the sediment.
Air	Fish toxicity: Not available	Not available	Not available	Not available

Section 13: Disposal Considerations

Sulfur Dioxide	Dispose in accordance with all applicable regulations.		
Propane	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous		
	Waste Number(s): D001.		
Carbon	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous		
Monoxide	Waste Number(s): D001.		
Air	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. (Air, Propane)
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
Sulfur Dioxide	Sulfur dioxide	UN1079	2.3	Not applicable	2.3; 8	Forbidden	Forbidden	Toxic- Inhalation Hazard Zone C
Propane	Propane	UN1978	2.1	Not applicable	2.1	Forbidden	150 kg	N/A
Carbon Monoxide	Carbon monoxide, compressed	UN1016	2.3	Not applicable	2.3; 2.1	Forbidden	25 kg	Toxic- Inhalation Hazard Zone D
Air	Air, compressed	UN1002	2.2	Not available	2.2	Not available	Not available	Not available

Canadian Transportation of Dangerous Goods

	1			
	Shipping Name	UN Number	Class	Packing Group / Risk Group
Sulfur Dioxide	Sulfur dioxide	UN1079	2.3; 8	Not applicable
Propane	Propane	UN1978	2.1	Not applicable
Carbon Monoxide	Carbon monoxide, compressed	UN1016	2.3; 2.1	Not applicable
Air	Air, compressed	UN1002	2.2	Not available

Section 15: Regulatory Information

U.S. Regulations

	CERCLA Sections	SARA 355.30	SARA 355.40
Sulfur Dioxide	Not regulated.	500 LBS TPQ	500 LBS RQ
Propane	Not regulated.	Not regulated.	Not regulated.
Carbon Monoxide	Not regulated.	Not regulated.	Not regulated.
Air	Not regulated.	Not regulated.	Not regulated.

SARA 370.21

	Acute	Chronic	Fire	Reactive	Sudden Release
Sulfur Dioxide	Yes	Yes	No	No	Yes
Propane	Yes	No	Yes	No	Yes
Carbon Monoxide	Yes	No	Yes	No	Yes

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Air No	No	No	No	Yes
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SARA 372.65

Sulfur Dioxide	Not regulated.	
Propane	Not regulated.	
Carbon Monoxide	Not regulated.	
Air	Not regulated.	

OSHA Process Safety

Sulfur Dioxide	1000 LBS TQ	
Propane	Not regulated.	
Carbon Monoxide	Not regulated.	
Air	Not regulated.	

State Regulations

Otate Regui	ations
	CA Proposition 65
Sulfur Dioxide	WARNING: This product can expose you to chemicals including sulfur dioxide, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.
Propane	Not regulated.
Carbon Monoxide	WARNING: This product can expose you to chemicals including Carbon Monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.
Air	Not regulated.

Canadian Regulations

	WHMIS Classification
Sulfur Dioxide	AD1
Propane	A, B1.
Carbon Monoxide	A, B1, D1A, D2A.
Air	Α

National Inventory Status

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	US Inventory (TSCA)	TSCA 12b Export Notification	Canada Inventory (DSL/NDSL)		
Sulfur Dioxide	Listed on inventory.	Not listed.	Not determined.		
Propane	Listed on inventory.	Not listed.	Listed on inventory.		
Carbon Monoxide	Listed on inventory.	Not listed.	Listed on inventory.		
Air	Not listed on inventory.	Not listed.	Not determined.		

Section 16: Other Information

	NFPA Rating
Sulfur Dioxide	HEALTH=3 FIRE=0 REACTIVITY=0
Propane	HEALTH=2 FIRE=4 REACTIVITY=0
Carbon Monoxide	HEALTH=2 FIRE=4 REACTIVITY=0
Air	HEALTH=0 FIRE=0 REACTIVITY=0

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

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