

GROUT SYSTEMS INC.



SAFETY DATA SHEETS



Material Safety Data Sheet

MSDS ID NO.: 0162MAR019
Revision date: 12/07/2010

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product name: Marathon Multipower-3 15W-40 Motor Oil
Synonym: Multipower-3 15W-40 Motor Oil; Multipower-3 15W-40 Heavy Duty Motor Oil
Chemical Family: Motor/Lube Oil
Formula: Mixture

Manufacturer:
Marathon Petroleum Company LP
539 South Main Street
Findlay OH 45840

Other information: 419-421-3070
Emergency telephone number: 877-627-5463

2. COMPOSITION/INFORMATION ON INGREDIENTS

Motor oil is a complex mixture of highly refined lubricating oil base stocks and additives.

Product information:

Name	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA - Vacated PELs - Time Weighted Ave	Other:
Marathon Multipower-3 15W-40 Motor Oil	Mixture	100			

Component Information:

Name	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA - Vacated PELs - Time Weighted Ave	Other:
Distillates, Petroleum Solvent- Refined Heavy Paraffinic	64741-88-4	89-93			Mineral Oil Mist (MOM) =5 mg/m ³ TWA = 10 mg/m ³ STEL
Additives	Not specified	7-11			
Zinc Dialkyl Dithiophosphate	68457-79-4	1.2-1.5			

Notes: The manufacturer has voluntarily elected to reflect exposure limits contained in OSHA's 1989 air contaminants standard in its MSDS's, even though certain of those exposure limits were vacated in 1992.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

MOTOR OIL IS A NON-VOLATILE AND NON-COMBUSTIBLE, AMBER COLORED LIQUID, BUT WILL IGNITE AND BURN AT ELEVATED TEMPERATURES.

Inhalation:

No acute effects expected from routine operations. Overheating of product may produce vapors which can cause respiratory irritation, dizziness and nausea.

Ingestion:

Product has a low order of acute toxicity. This is based on data from components or similar products.

Skin contact:

Prolonged or repeated liquid contact can cause dermatitis, folliculitis or oil acne.

Eye contact:

Liquid or vapor contact may result in slight eye irritation.

Carcinogenic Evaluation:

Product information:

Name	IARC Carcinogens:	NTP Carcinogens:	ACGIH - Carcinogens:	OSHA - Select Carcinogens:
Marathon Multipower-3 15W-40 Motor Oil Mixture	NE			

Notes:

The International Agency for Research on Cancer (IARC) has determined that there is no evidence that severely solvent-refined oils are carcinogenic to experimental animals.

Component Information:

Name	IARC Carcinogens:	NTP Carcinogens:	ACGIH - Carcinogens:	OSHA - Select Carcinogens:
Distillates, Petroleum Solvent- Refined Heavy Paraffinic 64741-88-4	Supplement 7 [1987], Monograph 33 [1984]			Present

4. FIRST AID MEASURES

Eye Contact:

Flush eyes with large amounts of tepid water for at least 15 minutes. If symptoms or irritation occur, call a physician.

Skin Contact:

Wash with soap and large amounts of water. Remove contaminated clothing. If symptoms or irritation occur, call a physician.

If product is accidentally injected into or under the skin, regardless of wound size or initial absence of symptoms, the individual should be evaluated immediately by a physician as a surgical emergency.

Ingestion:

Not expected to be acutely toxic. If large amounts are swallowed, immediately call a physician.

Inhalation:

4. FIRST AID MEASURES

If affected, move person to fresh air. If breathing is difficult, administer oxygen. If not breathing or if no heartbeat, give artificial respiration or cardiopulmonary resuscitation (CPR). Immediately call a physician. If symptoms or irritation occur with any exposure, call a physician.

NOTES TO PHYSICIAN:

No data available.

Medical Conditions

Aggravated
By Exposure:

Skin contact could aggravate an existing skin disorder or dermatitis condition.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media:

For small fires, Class B fire extinguishing media such as CO₂, dry chemical, foam (AFFF/ATC) or water spray can be used. For large fires, water spray, fog or foam (AFFF/ATC) can be used. Fire fighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

Specific hazards:

This material is not combustible per the OSHA Hazard Communication Standard, but will ignite and burn at elevated temperatures.

Special protective equipment for firefighters:

Avoid using straight water streams. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Avoid excessive water spray application. Use water spray to cool exposed surfaces from as far a distance as possible. Keep run-off water out of sewers and water sources.

Flash point:

>425 F, 218.3 C

Autoignition temperature:

No data available.

Flammable limits in air - lower (%):

No data available.

Flammable limits in air - upper (%):

No data available.

NFPA rating:

Health: 1

Flammability: 1

Instability: 0

Other: -

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:

Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Advise authorities and National Response Center (800-424-8802) if the product has entered a water course or sewer. Advise local and state emergency services agencies, if appropriate. Contain liquid with sand or soil. Recover and return free product to proper containers. Use suitable absorbent materials such as vermiculite, sand, or clay to clean up residual liquids.

7. HANDLING AND STORAGE

Handling:

7. HANDLING AND STORAGE

Comply with all applicable EPA, OSHA, NFPA and consistent state and local requirements. Use appropriate grounding and bonding practices. Store in properly closed containers that are appropriately labeled and in a cool well-ventilated area. Do not cut, drill, grind or weld on empty containers since they may contain explosive residues. Do not pressurize or expose to heat, open flames, strong oxidizers or other sources of ignition.

Avoid repeated and prolonged skin contact. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT

Engineering measures:	Local or general exhaust required when using at elevated temperatures that generate vapors or mists.
Respiratory protection:	Not required under normal conditions and adequate ventilation. Approved organic vapor chemical cartridge or supplied air respirators should be worn when significant vapors are generated. Observe respirator assigned protection factors (APFs) criteria cited in federal OSHA 1910.134. Self-contained breathing apparatus should be used for fire fighting.
Skin and body protection:	Use chemical resistant gloves such as neoprene, nitrile, or PVA to prevent prolonged or repeated skin contact.
Eye protection:	No special eye protection is normally required.
Hygiene measures:	No data available.

9. PHYSICAL AND CHEMICAL PROPERTIES:

Appearance:	Amber Liquid
Physical state (Solid/Liquid/Gas):	Liquid
Substance type (Pure/Mixture):	Mixture
Color:	Amber
Odor:	Hydrocarbon
Molecular weight:	Not determined.
pH:	Neutral
Boiling point/range (5-95%):	>425 F, >218.3 C
Melting point/range:	Not determined.
Decomposition temperature:	Not applicable.
Specific gravity:	0.890 @ 60 F
Density:	7.44 lbs/gal @ 60 F
Bulk density:	No data available.
Vapor density:	No data available.
Vapor pressure:	<1 mm Hg @ 100 F
Evaporation rate:	No data available.
Solubility:	<1%
Solubility in other solvents:	No data available.
Partition coefficient (n-octanol/water):	>4.9
VOC content(%):	No data available.
Viscosity:	118.1 cSt @ 40 C 15.0 cSt @ 100 C

10. STABILITY AND REACTIVITY

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Stability:	The material is stable at 70 F, 760 mm pressure.
Polymerization:	Will not occur.
Hazardous decomposition products:	Carbon monoxide, carbon dioxide, hydrogen sulfide, oxides of sulfur, oxides of nitrogen, oxides of phosphorous, oxides of magnesium, boric oxide, calcium oxide and zinc oxide. , Thermal decomposition may produce hydrogen sulfide and other sulfur-containing gases at temperatures greater than 150 F.
Materials to avoid:	Strong oxidizers such as nitrates, chlorates, peroxides.
Conditions to avoid:	Heat and open flames.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:

Product information:

Name	CAS Number	Inhalation:	Dermal:	Oral:
Marathon Multipower-3 15W-40 Motor Oil	Mixture	LD50 = 2.18 to > 4mg/l [Rat]	LD50 > 2 gm/kg [Rabbit]	LD50 > 5 ml/kg [Rat]

Toxicology Information:

Based on data from components this product is considered to have a low order of acute oral and dermal toxicity. Chronic skin painting studies with severely solvent refined neutral oils did not produce evidence of skin cancer in mice.

This product contains approximately 0-1.5% of a zinc alkyl dithiophosphate (ZDDP) additive. ZDDP has been found to have weak mutagenic activity in cultured cells. Repeated dermal exposures of ZDDP produced severe skin irritation, significant weight loss and testicular atrophy in male rabbits but not male rats at high concentrations. Subsequent research showed that the testicular effect was due to the severe stress and weight loss as seen with other caustic materials and not a direct effect of ZDDP. The concentration of ZDDP in this product is significantly lower than exposure levels that produced these effects in rabbits.

Used motor oil applied to the skin of rabbits at doses of 8 ml/kg/day, 5 days/wk, for two weeks, produced significant weight loss and skin irritation but no mortality. Used motor oil was found to produce skin tumors in mice in lifetime skin painting studies. Solvent extracts of used motor oils were found to be positive in the Ames mutagenicity test.

12. ECOTOXICOLOGICAL INFORMATION

Mobility:

No data available.

Ecotoxicity:

No data available.

Bioaccumulation:

No data available.

12. ECOTOXICOLOGICAL INFORMATION

Persistence/Biodegradation:

Water accomated fractions (WAF) of highly refined base oils did not produce acute toxicity in fish (100-1000 mg/l), fresh water algae (500 mg/l) or daphnia (10,000 mg/l) in 48-96 hour LC50 studies.

Used motor and/or lube oils can be toxic to birds and fish.

13. DISPOSAL CONSIDERATIONS

Cleanup Considerations:

This material as supplied and by itself, when discarded or disposed of, is not an EPA RCRA hazardous waste according to federal regulations. This material could become a hazardous waste if mixed or contaminated with a hazardous waste or other substance(s). It is the responsibility of the user to determine if disposal material is hazardous according to federal, state and local regulations.

Don't pollute. Conserve resources. Send used product to recycling center. Dispose of cleanup materials in accordance with applicable local, state and federal regulations.

14. TRANSPORT INFORMATION

49 CFR 172.101:

DOT:

Transport Information: This material when transported via US commerce is NOT REGULATED by DOT regulations.

Packing group: Not applicable.

DOT reportable quantity (lbs): Not applicable.

15. REGULATORY INFORMATION

US Federal Regulatory Information:

US TSCA Chemical Inventory Section 8(b): This product and/or its components are listed on the TSCA Chemical Inventory.

OSHA Hazard Communication Standard: This product has been evaluated and determined not to be hazardous as defined in OSHA's Hazard Communication Standard.

EPA Superfund Amendment & Reauthorization Act (SARA):

SARA Section 302:

This product contains the following component(s) that have been listed on EPA's Extremely Hazardous Substance (EHS) List:

Name	CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs
Distillates, Petroleum Solvent-Refined Heavy Paraffinic	NA
Additives	NA
Zinc Dialkyl Dithiophosphate	NA

SARA Section 304:

This product contains the following component(s) identified either as an EHS or a CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements:

Name	CERCLA/SARA - Hazardous Substances and their Reportable Quantities
Distillates, Petroleum Solvent-Refined Heavy Paraffinic	NA
Additives	NA
Zinc Dialkyl Dithiophosphate	NA

SARA Section 311/312

The following EPA hazard categories apply to this product:

None

SARA Section 313:

This product contains the following component(s) that may be subject to reporting on the Toxic Release Inventory (TRI) From R:

Name	CERCLA/SARA 313 Emission reporting:
Distillates, Petroleum Solvent-Refined Heavy Paraffinic	None
Additives	None
Zinc Dialkyl Dithiophosphate	= 1.0 % de minimis concentration

State and Community Right-To-Know Regulations:

The following component(s) of this material are identified on the regulatory lists below:

Distillates, Petroleum Solvent-Refined Heavy Paraffinic

Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	Not Listed.
Pennsylvania Right-To-Know:	Not Listed.
Massachusetts Right-To Know:	Not Listed.
Florida substance List:	Not Listed.
Rhode Island Right-To-Know:	Not Listed
Michigan critical materials register list:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	carcinogen
New Jersey - Environmental Hazardous Substances List:	Not Listed
Illinois - Toxic Air Contaminants	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed

Additives

Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed

Distillates, Petroleum Solvent-Refined Heavy Paraffinic

New Jersey Right-To-Know:	Not Listed.
Pennsylvania Right-To-Know:	Not Listed.
Massachusetts Right-To Know:	Not Listed.
Florida substance List:	Not Listed.
Rhode Island Right-To-Know:	Not Listed
Michigan critical materials register list:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Not Listed
New Jersey - Environmental Hazardous Substances List:	Not Listed
Illinois - Toxic Air Contaminants	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed

Zinc Dialkyl Dithiophosphate

Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	sn 3012
Pennsylvania Right-To-Know:	Environmental hazard
Massachusetts Right-To Know:	Not Listed.
Florida substance List:	Not Listed.
Rhode Island Right-To-Know:	Not Listed
Michigan critical materials register list:	= 100 lb Annual usage threshold
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Not Listed
New Jersey - Environmental Hazardous Substances List:	SN 3012 TPQ 500 lb (Category Code N982. Includes any unique chemical substance that contains the named metal as part of that chemical structure)
Illinois - Toxic Air Contaminants	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed

Canadian Regulatory Information:

Canada DSL/NDL Inventory: This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

NOTE: Not Applicable.

16. OTHER INFORMATION

Additional Information: No data available.

Prepared by: Mark S. Swanson, Manager, Toxicology and Product Safety

The information and recommendations contained herein are based upon tests believed to be reliable. However, Marathon Petroleum Company LP (MPC) does not guarantee their accuracy or completeness nor shall any of this information constitute a warranty, whether expressed or implied, as to the safety of the goods, the merchantability of the goods, or the fitness of the goods for a particular purpose. Adjustment to conform to actual conditions of usage maybe required. MPC assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied.

End of Safety Data Sheet

146 Readily Biodegradable Hydraulic Fluid

Section 1 Chemical Product and Company Information

RSC Bio Solutions
9609 Jackson Street
Mentor, Ohio 44060
Phone: 440-639-8633
Fax: 440-639-4414

PRODUCT TRADE NAME: EnviroLogic® 146
CAS NO: Not applicable for mixtures.
SYNONYMS: None.
GENERIC/CHEMICAL NAME: Mixture.
PRODUCT TYPE: Readily Biodegradable Hydraulic Fluid
PREPARATION/REVISION DATE: 01/24/2014
TRANSPORTATION EMERGENCY PH NO: 1-800-661-3558

Section 2 Hazards Identification

PRINCIPAL HAZARDS: This material has no known hazards.

ODOR: Mild
APPEARANCE: Golden Fluid
TARGET ORGANS: None

See Section 11 for complete health hazard information.

Section 3 Composition/Information On Ingredients

NAME
Proprietary Information

This material has no known hazards under applicable laws.

Section 4 First Aid Measures

ORAL: DO NOT INDUCE VOMITING. If conscious, give 2 glasses of water. Get immediate medical attention.

EYE: Flush with water at least 15 minutes. Get medical attention if eye irritation develops or persists.

SKIN: Wash with soap and water. Get medical attention if irritation develops. Launder contaminated clothing before reuse.

INHALATION: Remove exposed person to fresh air if adverse effects are observed.

ADDITIONAL: Note to physician: Treat symptomatically.

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Section 5 Firefighting Measures

FLASH POINT (Typical): 270 °C, 518 °F (Typical) (COC)

EXTINGUISHING MEDIA: CO₂, dry chemical, or foam. Water can be used to cool and protect exposed material.

Section 6 Accidental Release Measures

SPILL PROCEDURES: Personal Protective Equipment must be worn, see Personal Protection Section for PPE recommendations. Ventilate area if spilled in confined space or other poorly ventilated areas. Pick up free liquid for recycle and/or disposal. Residual liquid can be absorbed on inert material.

Check under Transportation and Labeling (DOT/CERCLA) and Other Regulatory Information Section (SARA) for hazardous substances to determine regulatory reporting requirements for spills.

Section 7 Handling and Storage

HANDLING PROCEDURES: Keep containers closed when not in use. Wash thoroughly after handling. Empty container contains product residue which may exhibit hazards of product.

MAXIMUM HANDLING TEMPERATURE: 60°C (140°F)

MAXIMUM STORAGE TEMPERATURE: 45°C (113°F)

MAXIMUM LOADING TEMPERATURE: 60°C (140°F)

STORAGE PROCEDURES: Store inside in a cool, dry and well ventilated location that is free of contaminants. Do not allow product to freeze or store at maximum storage temperature for extended periods of time.

Section 8 Exposure Controls/Personal Protection

VENTILATION PROCEDURE: Use with adequate ventilation.

GLOVES PROTECTION: Use nitrile or neoprene gloves.

EYE PROTECTION: Safety Glasses.

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RESPIRATORY PROTECTION: Under normal use conditions, respirator is not usually required. Use NIOSH/MSHA approved disposable dust/mist mask if the recommended exposure limit is exceeded.

CLOTHING RECOMMENDATION: Long sleeve shirt is recommended.

EXPOSURE LIMIT: Contains natural ester base oil. Under conditions which may generate mists, observe the OSHA PEL of 5 mg per cubic meter, ACGIH STEL of 10 mg per cubic meter

OTHER EXPOSURE LIMITS: None

ENGINEERING CONTROLS: Use local exhaust ventilation to control mists or vapors.

Section 9 Physical And Chemical Properties

VAPOR PRESSURE: Not Determined.

FLASH POINT: 270°C (518°F)

AUTOIGNITION TEMPERATURE: Not Determined.

VOC: None.

POUR POINT: -36°C (-33°F)

PH: Not Determined.

SPECIFIC GRAVITY: 0.92 at 15.6 °C

WATER SOLUBILITY: Insoluble.

PERCENT VOLATILE: Not Determined.

VAPOR DENSITY: Not Determined.

EVAPORATION RATE: Not Determined.

ODOR: Mild

APPEARANCE: Golden

VISCOSITY: 46.0 Centistokes at 40 °C (Typical)

ODOR THRESHOLD: Not Determined.

BOILING POINT: Not Determined.

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FREEZING POINT: Not Determined.

MOLECULAR WEIGHT: Not Determined

Section 10 Stability And Reactivity

STABILITY: Material is normally stable at moderately elevated temperatures and pressures.

INCOMPATIBILITY: Oxidizing agents.

DECOMPOSITION TEMPERATURE: Not Determined.

POLYMERIZATION: Will not occur.

THERMAL DECOMPOSITION: Smoke, carbon monoxide, aldehydes and other products of incomplete combustion.

CONDITIONS TO AVOID: Do not expose to excessive heat, ignition sources, or oxidizing materials. Avoid contact with strong oxidizers. Avoid contact with strong caustic agents.

Section 11 Toxicological Information

ORAL TOXICITY: - ACUTE EXPOSURE -
The LD50 in rats is > 5000 mg/kg. Based on data from components or similar materials.

EYE IRRITATION: Not expected to cause eye irritation. Based on data from components or similar materials.

SKIN IRRITATION: Not expected to be a primary skin irritant. Based on data from components or similar materials. Prolonged or repeated skin contact as from clothing wet with material may cause dermatitis. Symptoms may include redness, edema, drying, defatting and cracking of the skin.

DERMAL TOXICITY: The LD50 in rabbits is > 2000 mg/Kg. Based on data from components or similar materials.

INHALATION TOXICITY: No data available to indicate product or components may be a toxic inhalation hazard.

RESPIRATORY IRRITATION: If material is misted or if vapors are generated from heating, exposure may cause irritation of mucous membranes and the upper respiratory tract similar to that observed with mineral oil. Based on data from components or similar materials. Under good industrial hygiene practices where all exposure limits are observed, respiratory irritation should not be a problem.

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DERMAL SENSITIZATION:	No data available to indicate product or components may be a skin sensitizer.
INHALATION SENSITIZATION:	No data available to indicate product or components may be respiratory sensitizers.
CHRONIC TOXICITY:	- CHRONIC EXPOSURE - No data available to indicate product or components present at greater than 1% are chronic health hazards.
CARCINOGENICITY:	No data available to indicate any components present at greater than 0.1% may present a carcinogenic hazard.
MUTAGENICITY:	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
REPRODUCTIVE TOXICITY:	No data available to indicate either product or components present at greater than 0.1% that may cause reproductive toxicity.
TERATOGENICITY:	No data available to indicate product or any components contained at greater than 0.1% may cause birth defects.
OTHER:	- ADDITIONAL INFORMATION - No other health hazards known.
EXPOSURE LIMITS:	EXPOSURE LIMITS: Contains natural ester base oil. Under conditions which may generate mists, observe the OSHA PEL of 5 mg per cubic meter, ACGIH STEL of 10 mg per cubic meter.

Section 12 Ecological Information

SALTWATER INVERTEBRATES TOXICITY:	Not Determined.
FRESHWATER FISH TOXICITY:	Fathead minnow, 96h LC50, ppm >10,000
FRESHWATER INVERTEBRATES TOXICITY:	Daphnia magna, 48h, EC50, ppm >110
ALGAE TOXICITY:	Algae EC50, ppm >120
BACTERIA TOXICITY:	Sludge respiration inhibition, EC50, ppm >7,000 based on component data.

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	- ENVIRONMENTAL FATE -
BIODEGRADATION:	Product shows a biodegradability of > 60% as measured by ASTM D7373 test.
BIOACCUMULATION:	Product has no potential for bioaccumulation.
SOIL MOBILITY:	Not Determined

Section 13 Disposal Considerations

WASTE DISPOSAL:	Material, if discarded, is not expected to be a characteristic hazardous waste under RCRA. Waste management should be in compliance with federal, state, and local laws.
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Section 14 Transport Information

U.S.DOT BULK SHIPPING DESCRIPTION:	Not applicable.
U.S.DOT NON-BULK SHIPPING DESCRIPTION:	Not applicable.
IMDG SHIPPING DESCRIPTION:	Not applicable.
ICAO SHIPPING DESCRIPTION:	Not applicable.
ADR/RID HAZARD CLASS:	Not applicable.

Section 15 Regulatory Information

U.S. TSCA INVENTORY:	All components of this material are on the US TSCA Inventory OR are exempt..
SARA EXT. HAZ. SUBST.:	This product does not contain greater than 1.0% of any chemical substance on the SARA Extremely Hazardous Substances list.
SARA SECTION 313:	This product does not contain greater than 1.0% (greater than 0.1% for carcinogenic substance) of any chemical substances listed under SARA Section 313.
CERCLA HAZARDOUS SUBSTANCES:	None known.
CAL. PROP. 65:	This product does not contain chemical(s) known to the state of California to cause cancer and/or birth defects based on maximum impurity levels of components.
U.S. FUEL REGISTRATION:	Not applicable.
U.S. DEPT. OF AGRICULTURE:	This product has not been filed with the USDA to support H2 approvals.

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FDA APPROVAL:	Not applicable.
EEC EINECS:	All components are in compliance with the EC Seventh amendment Directive 92/32/EEC.
JAPAN MITI:	All components are in compliance with the Chemical Substances Control Law of Japan.
AUSTRALIA:	All components are in compliance with chemical notification requirements in Australia.
CANADA:	All components are in compliance with the Canadian Environmental Protection Act.
AUSTRIA:	All components are in compliance with the Austrian Chemical Laws.
EU:	All components are in compliance with the EC Seventh amendment Directive 92/32/EEC.
TAIWAN:	All components of this product are listed on the Taiwan inventory.
KOREA:	All components are in compliance in Korea.
PHILIPPINES:	All components are in compliance with the Philippines Toxic Substances and Hazardous Nuclear Waste Control Act of 1990 (R.A. 6969).
CHINA:	All components of this product are listed on the Inventory of Existing Chemical Substances in China.

Section 16 Other Information

NFPA CODE: Health: 1 Fire: 1 Reactivity: 0

HMIS CODE: Health: 1 Fire: 1 Reactivity: 0

PRECAUTIONARY LABELS: This material has no known hazards.

While RSC Bio Solutions believes this data is accurate as of the revision date, we make no warranty with respect to the data and we expressly disclaim all liability for reliance thereon. The data is offered solely for information, investigation, and verification. Various government agencies may have specific regulations regarding the transportation, handling, storage, use, or disposal of this product which may not be covered by this SDS. The user is responsible for full compliance.

SAFETY DATA SHEET

Acetylene

Section 1. Identification

GHS product identifier	: Acetylene
Chemical name	: acetylene
Other means of identification	: Ethyne; Ethine; Narcylen; C ₂ H ₂ ; Acetylen; UN 1001; Vinylene
Product use	: Synthetic/Analytical chemistry.
Synonym	: Ethyne; Ethine; Narcylen; C ₂ H ₂ ; Acetylen; UN 1001; Vinylene
SDS #	: 001001
Supplier's details	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
Emergency telephone number (with hours of operation)	: 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Compressed gas

GHS label elements

Hazard pictograms



Signal word

: Danger

Hazard statements

: Extremely flammable gas.
May form explosive mixtures with air.
Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary statements

General

: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Fusible plugs in top, bottom, or valve melt at 98°C to 107°C (208°F to 224°F). Do not discharge at pressures above 15psig (103kpa). Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Approach suspected leak area with caution.

Prevention

: Never Put cylinders into unventilated areas of passenger vehicles. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use and store only outdoors or in a well ventilated place.

Response

: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Date of issue/Date of revision

: 4/26/2015.

Date of previous issue

: 10/14/2014.

Version : 0.04

1/12

Section 2. Hazards identification

- Storage** : Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.
- Disposal** : Not applicable.
- Hazards not otherwise classified** : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

Section 3. Composition/information on ingredients

- Substance/mixture** : Substance
- Chemical name** : acetylene
- Other means of identification** : Ethyne; Ethine; Narcylen; C₂H₂; Acetylen; UN 1001; Vinylene

CAS number/other identifiers

- CAS number** : 74-86-2
- Product code** : 001001

Ingredient name	%	CAS number
acetylene	100	74-86-2

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Contact with rapidly expanding gas may cause burns or frostbite.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Contact with rapidly expanding gas may cause burns or frostbite.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Section 4. First aid measures

- Eye contact** : No specific data.
Inhalation : No specific data.
Skin contact : No specific data.
Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments : No specific treatment.
Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Section 6. Accidental release measures

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
acetylene	NIOSH REL (United States, 1/2013). CEIL: 2662 mg/m ³ CEIL: 2500 ppm

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Section 8. Exposure controls/personal protection

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas.
Color : Colorless.
Molecular weight : 26.04 g/mole
Molecular formula : C2-H2
Melting/freezing point : -81°C (-113.8°F)
Critical temperature : 35.25°C (95.5°F)
Odor : Mild. Ethereal.
Odor threshold : Not available.
pH : Not available.
Flash point : Closed cup: -18.15°C (-0.67°F)
Burning time : Not applicable.
Burning rate : Not applicable.

Section 9. Physical and chemical properties

Evaporation rate	: Not available.
Flammability (solid, gas)	: Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and oxidizing materials.
Lower and upper explosive (flammable) limits	: Lower: 2.3% Upper: 100%
Vapor pressure	: 635 (psig)
Vapor density	: 0.907 (Air = 1)
Specific Volume (ft³/lb)	: 14.7058
Gas Density (lb/ft³)	: 0.0691
Relative density	: Not applicable.
Solubility	: Not available.
Solubility in water	: 1.2 g/l
Partition coefficient: n-octanol/water	: 0.37
Auto-ignition temperature	: 305°C (581°F)
Decomposition temperature	: Not available.
SADT	: Not available.
Viscosity	: Not applicable.

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
Incompatibility with various substances	: Extremely reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Date of issue/*Date of revision* : 4/26/2015. *Date of previous issue* : 10/14/2014. *Version* : 0.04 6/12

Section 11. Toxicological information

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Contact with rapidly expanding gas may cause burns or frostbite.
Inhalation : No known significant effects or critical hazards.
Skin contact : Contact with rapidly expanding gas may cause burns or frostbite.
Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.
Inhalation : No specific data.
Skin contact : No specific data.
Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.
Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.
Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.
Carcinogenicity : No known significant effects or critical hazards.

Section 11. Toxicological information

- Mutagenicity** : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
acetylene	0.37	-	low

Mobility in soil






- Soil/water partition coefficient (K_{oc})** : Not available.

- Other adverse effects** : No known significant effects or critical hazards.

Section 13. Disposal considerations

- Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1001	UN1001	UN1001	UN1001	UN1001
UN proper shipping name	ACETYLENE, DISSOLVED	ACETYLENE, DISSOLVED	ACETYLENE, DISSOLVED	ACETYLENE, DISSOLVED	ACETYLENE, DISSOLVED
Transport hazard class(es)	2.1 	2.1 	2.1 	2.1 	2.1 
Packing group	-	-	-	-	-
Environment	No.	No.	No.	No.	No.
Additional information	<u>Limited quantity</u> Yes. <u>Packaging instruction</u> Passenger aircraft Quantity limitation: Forbidden. Cargo aircraft Quantity limitation: 15 kg	<u>Explosive Limit and Limited Quantity Index</u> 0 <u>Passenger Carrying Ship Index</u> 75 <u>Passenger Carrying Road or Rail Index</u> Forbidden <u>Special provisions</u> 38, 42	-	-	<u>Passenger and Cargo Aircraft</u> Quantity limitation: 0 Forbidden <u>Cargo Aircraft Only</u> Quantity limitation: 15 kg

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

- U.S. Federal regulations** : TSCA 8(a) CDR Exempt/Partial exemption: Not determined
 United States inventory (TSCA 8b): This material is listed or exempted.
 Clean Air Act (CAA) 112 regulated flammable substances: acetylene
- Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed
- Clean Air Act Section 602 Class I Substances** : Not listed
- Clean Air Act Section 602 Class II Substances** : Not listed
- DEA List I Chemicals (Precursor Chemicals)** : Not listed
- DEA List II Chemicals (Essential Chemicals)** : Not listed

Section 15. Regulatory information

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Fire hazard
Sudden release of pressure

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
acetylene	100	Yes.	Yes.	No.	No.	No.

State regulations

Massachusetts : This material is listed.
New York : This material is not listed.
New Jersey : This material is listed.
Pennsylvania : This material is listed.
Canada inventory : This material is listed or exempted.

International regulations

International lists : **Australia inventory (AICS)**: This material is listed or exempted.
China inventory (IECSC): This material is listed or exempted.
Japan inventory: This material is listed or exempted.
Korea inventory: This material is listed or exempted.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): This material is listed or exempted.
Philippines inventory (PICCS): This material is listed or exempted.
Taiwan inventory (CSNN): Not determined.

Chemical Weapons Convention List Schedule I Chemicals : Not listed

Chemical Weapons Convention List Schedule II Chemicals : Not listed

Chemical Weapons Convention List Schedule III Chemicals : Not listed

Canada

WHMIS (Canada) : Class A: Compressed gas.
Class B-1: Flammable gas.
Class F: Dangerously reactive material.
CEPA Toxic substances: This material is not listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Section 16. Other information

Canada Label requirements : Class A: Compressed gas.
Class B-1: Flammable gas.
Class F: Dangerously reactive material.

Hazardous Material Information System (U.S.A.)

Health	1
Flammability	4
Physical hazards	2

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Note: The instability hazard rating for acetylene, dissolved (stabilized acetylene) is 2.

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

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Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations
ACGIH – American Conference of Governmental Industrial Hygienists
AIHA – American Industrial Hygiene Association
CAS – Chemical Abstract Services
CEPA – Canadian Environmental Protection Act
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (EPA)

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11/12

Section 16. Other information

CFR – United States Code of Federal Regulations
CPR – Controlled Products Regulations
DSL – Domestic Substances List
GWP – Global Warming Potential
IARC – International Agency for Research on Cancer
ICAO – International Civil Aviation Organisation
Inh – Inhalation
LC – Lethal concentration
LD – Lethal dosage
NDSL – Non-Domestic Substances List
NIOSH – National Institute for Occupational Safety and Health
TDG – Canadian Transportation of Dangerous Goods Act and Regulations
TLV – Threshold Limit Value
TSCA – Toxic Substances Control Act
WEEL – Workplace Environmental Exposure Level
WHMIS – Canadian Workplace Hazardous Material Information System

References : Not available.

 Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

NUCOR

SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: Sheet Steel

CAS Number: Not applicable

Synonyms: Hot Band, Cold Rolled, P&O, Galvanized

Use/Description: Steel for thin gauge products and sheet steel for Castrip®

Company Identification: Nucor Steel – Arkansas 7301 E. County Road 142 Blytheville, AR 72315	24 Hour Contact – CHEMTREC 1-800-424-9300 Safety Officer [8:00 am – 5:00 pm]: 1-(870) 762-2100
Nucor Steel – Berkeley 1455 Hagan Avenue Huger, SC 29450	Safety Officer [8:00 am – 5:00 pm]: 1-(843) 336-6000
Nucor Steel Decatur, LLC 4301 Iverson Boulevard Trinity, AL 35673	Safety Officer [8:00 am – 5:00 pm]: 1-(256) 301-3500
Nucor Steel – Indiana Castrip 4537 South Nucor Road Crawfordsville, IN 47933	Safety Officer [8:00 am – 5:00 pm]: 1-(765) 364-1323
Nucor Steel Gallatin 4831 U.S. Hwy 42 West Ghent, KY 41045	Safety Officer [8:00 am – 5:00 pm]: 1-(859) 567-3100

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

STEEL PRODUCTS AS SOLD BY NUCOR ARE NOT HAZARDOUS PER OSHA GHS 29 CFR 1910, 1915, 1926. However, individual customer processes, (such as welding, sawing, brazing, grinding, abrasive blasting, and machining) may result in the formation of fumes, dust (combustible or otherwise), and/or particulate that may present the following hazards:

OSHA Hazards: Carcinogen
Skin Sensitizer
Target Organ Effect – Lungs

GHS Classification: Carcinogenicity (Category 2)
Skin Sensitization (Category 1)
Specific Target Organ Toxicity-Repeated Exposure (Category 1)

Pictogram(s):



Signal Word: Danger

Sheet Steel

Hazard Statement(s)

H317: Dust/fumes may cause an allergic skin reaction.

H351: Dust/fumes suspected of causing cancer via inhalation.

H372: Inhalation of dust/fumes causes damage to respiratory tract through prolonged or repeated exposure

Precautionary Statement(s)

P202: Do not handle until all safety precautions have been read and understood.

P261: Avoid breathing dust/fumes.

P281: Use personal protective equipment as required.

P308+P313: If exposed or concerned: Get medical advice/attention.

Potential Health Effects

Eye Contact

Dusts or particulates may cause mechanical irritation including pain, tearing, and redness. Scratching of the cornea can occur if eye is rubbed. Fumes may be irritating. Contact with the heated material may cause thermal burns.

Skin Contact

Dusts or particulates may cause mechanical irritation due to abrasion. Coated steel may cause skin irritation in sensitive individuals (see Section 16 for additional information.) Some components in this product are capable of causing an allergic reaction, possibly resulting in burning, itching and skin eruptions. Contact with heated material may cause thermal burns.

Inhalation

Dusts may cause irritation of the nose, throat, and lungs. Excessive inhalation of metallic fumes and dusts may result in metal fume fever, an influenza-like illness. It is characterized by a sweet or metallic taste in the mouth, accompanied by dryness and irritation of the throat, cough, shortness of breath, pulmonary edema, general malaise, weakness, fatigue, muscle and joint pains, blurred vision, fever and chills. Typical symptoms last from 12 to 48 hours.

Ingestion

Not expected to be acutely toxic via ingestion based on the physical and chemical properties of the product. Swallowing of excessive amounts of the dust may cause irritation, nausea, and diarrhea.

Potential Fire and Explosion Hazards

Under normal conditions, steel products do not present fire or explosion hazards, and dust generated by handling steel products is oxidized and not combustible. Processing of steel product by some individual customers may produce potentially combustible dust that may represent a fire or explosion hazard.

Chronic or Special Toxic Effects

Repeated exposure to fine dusts may inflame the nasal mucosa and cause changes to the lung. In addition, a red-brown pigmentation of the eye and/or skin may occur. Welding fumes have been associated with adverse health effects. Contains components that may cause cancer or reproductive effects. The following components are listed by NTP, OSHA, or IARC as carcinogens: Nickel, chromium (hexavalent), cobalt, lead, cadmium, antimony (trioxide), arsenic, beryllium. See Section 11, for additional, specific information on effects noted above.

Target Organs

Overexposure to specific components of this product that are generated in dusts or fumes may cause adverse effects to the following organs or systems: eyes, skin, liver, kidney, central nervous system, cardiovascular system, respiratory system,.

Medical Conditions Aggravated by Exposure

Diseases of the skin such as eczema may be aggravated by exposure. Also, disorders of the respiratory system including asthma, bronchitis, and emphysema. Long-term inhalation exposure to agents that cause pneumoconiosis (e.g. dust) may act synergistically with inhalation of oxide fumes or dusts of this product.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS No.	% Weight	Exposure Limits			
			ACGIH TLV (mg/m ³)		OSHA PEL (mg/m ³)	
Base Metal:						
Iron (Fe)	7439-89-6	Balance	5	Oxide Dust/Fume	10	Oxide Dust/Fume

Sheet Steel

Components	CAS No.	% Weight	Exposure Limits			
			ACGIH TLV (mg/m ³)		OSHA PEL (mg/m ³)	
<u>Alloying Elements</u>						
Aluminum	(Al) 7429-90-5	0-3.0	10 5	Dust Fume	15 5	Dust Respirable fraction
Antimony	(Sb) 7440-36-0	<0.9	0.5	As Antimony	0.5	As Antimony
Arsenic	(As) 7440-38-2	<0.09	0.01	As Arsenic (A1 Carcinogen)	0.01	As Arsenic
Beryllium	(Be) 7440-41-7	<0.09	0.002 0.01	As Beryllium (A1 Carcinogen) As Beryllium (STEL)	0.002 0.005	As Beryllium As Beryllium (Ceiling)
Boron	(B) 7440-42-8	<1.1	10	Oxide Dust	15	Oxide Dust
Cadmium	(Cd) 7440-43-9	<0.01	0.01 0.002	As Cadmium (A2 Carcinogen) Respirable fraction	0.005 0.0025	As Cadmium As Cadmium (Action Level)
Calcium	(Ca) 1305-78-8	<0.9	2	Oxide Dust	5	Oxide Dust
Carbon	(C) 7440-44-0	<1.0		Not Established		Not Established
Chromium	(Cr) 7440-47-3	0.01-12.5	0.5	Metal	1	Metal
Cobalt	(Co) 7440-48-4	<0.09	0.02	As Cobalt (A3 Carcinogen)	0.1	Metal/Dust/Fume
Copper	(Cu) 7440-50-8	<3.5	1 0.2	Dust Fume	1 0.1	Dust Fume
Lead	(Pb) 7439-92-1	0.0-0.04	0.05	Dust / Fume (A3 Carcinogen)	0.05	Dust / Fume
Magnesium	(Mg) 7439-95-4	<0.9		Not Established		Not Established
Manganese	(Mn) 7439-96-5	<12.5	0.2	Elemental Mn and Inorg Compounds	5	Fume (Ceiling)
Molybdenum	(Mo) 7439-98-7	<1.1	10	Insoluble Compounds	15	Insoluble Compounds
Niobium	(Nb) 7440-03-1	<0.9		Not Established		Not Established
Nickel	(Ni) 7440-02-0	0.01-3.0	1.5	Metal	1	Metal and Insoluble Compounds
Nitrogen	(N) 7727-37-9	<0.9		Simple Asphyxiant		Simple Asphyxiant
Phosphorus	(P) 7723-14-0	<0.9	0.1	Phosphorus	0.1	Phosphorus
Selenium	(Se) 7782-49-2	<0.9	0.2	Selenium	0.2	Selenium
Silicon	(Si) 7440-21-3	0.0-5.0	10	Dust	15	Dust
Sulfur	(S) 7446-09-05	<0.9	5.2 13	Sulfur Dioxide Sulfur Dioxide (STEL)	13	Sulfur Dioxide
Tin	(Sn) 7440-31-5	<0.9	2	Metal, Oxide and Inorganic Compounds	2	Inorganic Compounds
Titanium	(Ti) 7440-32-6	<0.9		Not Established		Not Established
Tungsten	(W) 7440-33-7	<0.9	5 10	Insoluble Compounds as W Insoluble Compounds as W (STEL)		Not Established
Vanadium	(V) 7440-62-2	<0.9	0.05	Oxide Dust/Fume	0.5 0.1	Oxide Dust (Ceiling) Oxide Fume (Ceiling)
Zinc	(Zn) 7440-66-6	0.0-0.1	10 5 10	Oxide Dust Oxide Fume Oxide Fume (STEL)	5 10	Oxide Fume Oxide Dust
<u>Coatings and Finishing Treatments:</u>						
Hydrochloric Acid	(HCl) 7647-01-0	<3				
Petroleum, Natural or Synthetic oils	Mixture	<0.1	5	Mist	5	Mist
Anhydrous Potassium Hydroxide	1310-58-3	<0.01	2	Ceiling	2	Ceiling
Glycine, nn-1,2-	60-00-4	<0.01				

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Components	CAS No.	% Weight	Exposure Limits			
			ACGIH TLV (mg/m ³)		OSHA PEL (mg/m ³)	
ethanediybis Polyalkylene glycol Sodium nitrite	Mixture 7632-00-0	<0.01 <0.01	10	Oxide Dust OxideFume Oxide Fume (STEL)	5 10	Oxide Fume Oxide Dust
			5 10			
Zinc (galvanized)	7440-66-6	0.4 - 10				

NOTE: No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steel over all. The above listing is a summary of elements used in normal Nucor Steel Products. **Various grades of steel will contain different combinations of these elements and/or trace materials. Exact specifications for specific products may be available upon request.**

4. FIRST AID MEASURES

Eye Contact- In case of overexposure to dusts or fumes, immediately flush eyes with plenty of water for at least 15 minutes occasionally lifting the eye lids. Get medical attention if irritation persists. Thermal burns should be treated as medical emergencies.

Skin Contact - In case of overexposure to dusts or particulates, wash with soap and plenty of water. Get medical attention if irritation develops or persists. If thermal burn occurs, flush area with cold water and get immediate medical attention.

Inhalation - In case of overexposure to dusts or fumes, remove to fresh air. Get immediate medical attention if symptoms described in this SDS develop.

Ingestion - Not considered an ingestion hazard. However, if excessive amounts of dust or particulates are swallowed, treat symptomatically and supportively. Get medical attention.

Notes to Physician - Inhalation of metal fume or metal oxides may produce an acute febrile state, with cough, chills, weakness, and general malaise, nausea, vomiting, muscle cramps, and remarkable leukocytosis. Treatment is symptomatic, and condition is self limited in 24-48 hours. Chronic exposure to dusts may result in pneumoconiosis of mixed type.

5. FIRE FIGHTING MEASURES

Flash Point (Method) - Not applicable

Flammable Limits (% volume in air) - Not applicable

Auto ignition Temperature - Not applicable

Extinguishing Media - For molten metal, use dry powder or sand. For steel dust use or dry sand, water, foam, argon or nitrogen.

Special Fire Fighting Procedures - Do not use water on molten metal. Do not use Carbon Dioxide (CO₂). Firefighters should not enter confined spaces without wearing NIOSH/MSHA approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

Unusual Fire or Explosion Hazards - Steel products do not present fire or explosion hazards under normal conditions. Any non-oxidized fine metal particles/ dust generated by grinding, sawing, abrasive blasting, or individual customer processes may produce materials that the customer should test for combustibility and other hazards in accordance with applicable regulations. High concentrations of combustible metallic fines in the air may present an explosion hazard.

6. ACCIDENTAL RELEASE MEASURES

Precautions if Material is Spilled or Released - Emergency response is unlikely unless in the form of combustible dust. Avoid inhalation, eye, or skin contact of dusts by using appropriate precautions outlined in this SDS (see section 8). Fine turnings and small chips should be swept or vacuumed and placed into appropriate disposable containers. Keep fine dust or powder away from sources of ignition. Scrap should be reclaimed for recycling. Prevent materials from entering drains, sewers, or waterways.

Fire and Explosion Hazards - Some customer processes may generate combustible dust that may require specific precautions when cleaning spills or releases of dust.

Sheet Steel

Environmental Precautions - Some grades of steel may contain reportable quantities of alloying elements. See Section 15 for additional information.

Waste Disposal Methods - Dispose used or unused product in accordance with applicable Federal, State, and Local regulations. Please recycle.

7. HANDLING AND STORAGE

Storage Temperatures - Stable under normal temperatures and pressures.

Precautions to be Taken in Handling and Storing - Store away from strong oxidizers. Dusts and/or powders, alone, or combined with process specific fluids, may form explosive mixtures with air. Applicable Federal, state and local laws and regulations may require testing dust generated from processing of steel products to determine if it represents a fire or explosion hazard and to determine appropriate protection methods. Avoid breathing dusts or fumes.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Operations with potential for generating high concentrations of airborne particulates or fumes should be evaluated and controlled as necessary.

Eye Protection - Use safety glasses. Dust resistant safety goggles are recommended under circumstances where particles could cause mechanical injury such as grinding or cutting. Face shield should be used when welding or cutting.

Skin - Appropriate protective gloves should be worn as necessary. Good personal hygiene practices should be followed including cleansing exposed skin several times daily with soap and water, and laundering or dry cleaning soiled work clothing.

Respiratory Protection - NIOSH/MSHA approved dust/fume/mist respirator should be used to avoid excessive exposure. See Section 3 for component material information exposure limits. If such concentrations are sufficiently high that this respirator is inadequate, or high enough to cause oxygen deficiency, use a positive pressure self-contained breathing apparatus (SCBA). Follow all applicable respirator use, fitting, and training standards and regulations.

Ventilation - Provide general and/or local exhaust ventilation to control airborne levels of dust or fumes below exposure limits.

Exposure Guidelines - No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steel. See Section 3 for component materials. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor - Silver grey to grey black with metallic luster.

Boiling Point - Not applicable

Melting Point - Approximately 2800 °F

pH - Not applicable

Specific Gravity (at 15.6°C) - Not applicable

Density (at 15.6 °C) - Not applicable

Vapor Pressure - Not applicable

Vapor Density (air = 1) - Not applicable

% Volatile, by Volume - Not applicable

Solubility in Water - Insoluble.

Evaporation Rate (Butyl Acetate = 1) - Not applicable

Other Physical and Chemical Data - None

10. STABILITY AND REACTIVITY

Stability - Stable

Conditions to Avoid - Steel at temperatures above the melting point may liberate fumes containing oxides of iron and alloying elements. Avoid generation of airborne fume.

Hazardous Polymerization - Will not occur.

Incompatibility (Materials to Avoid) - Reacts with strong acids to form hydrogen gas. Do not store near strong oxidizers.

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Hazardous Decomposition Products - Metallic fumes may be produced during welding, burning, grinding, and possibly machining or any situation with the potential for thermal decomposition. Refer to ANSI Z49.1

11. TOXICOLOGICAL INFORMATION

The primary component of this product is iron. Long-term exposure to iron dusts or fumes can result in a condition called siderosis which is considered to be a benign pneumoconiosis. Symptoms may include chronic bronchitis, emphysema, and shortness of breath upon exertion. Penetration of iron particles in the skin or eye may cause an exogenous or ocular siderosis which may be characterized by a red-brown pigmentation of the affected area. Ingestion overexposures to iron may affect the gastrointestinal, nervous, and hematopoietic system and the liver. Iron and steel founding, but not iron or iron oxide, has been listed as carcinogenic (Group 1) by IARC.

When this product is welded, fumes are generated. Welding fumes may be different in composition from the original welding product, with the chief component being ordinary oxides of the metal being welded. Chronic health effects (including cancer) have been associated with the fumes and dusts of individual component metals (see above), and welding fumes as a general category have been listed by IARC as a carcinogen (Group 2B). There is also limited evidence that welding fumes may cause adverse reproductive and fetal effects. Evidence is stronger where welding materials contain known reproductive toxins, e.g., lead which may be present in the coating material of this product.

Breathing fumes or dusts of this product may result in metal fume fever, which is an illness produced by inhaling metal oxides. These oxides are produced by heating various metals including cadmium, zinc, magnesium, copper, antimony, nickel, cobalt, manganese, tin, lead, beryllium, silver, chromium, aluminum, selenium, iron, and arsenic. The most common agents involved are zinc and copper.

This product may contain small amounts of manganese. Prolonged exposure to manganese dusts or fumes is associated with "manganism", a Parkinson-like syndrome characterized by a variety of neurological symptoms including muscle spasms, gait disturbances, tremors, and psychoses.

This product may contain small amounts of cadmium. Primary target organs for cadmium overexposure are the lung and the kidney. Because of its cumulative nature, chronic cadmium poisoning can cause serious disease which takes many years to develop and may continue to progress despite cessation of exposure. Progression of the disease may not reflect current exposure conditions. It is also capable of causing a painful osteomalacia called "Itai-Itai" in postmenopausal women, and has caused developmental effects and/or reproductive effects in male and female animals. Cadmium is a listed carcinogen by NTP, OSHA, and IARC (Group 1).

This product may contain small amounts of chromium. Prolonged and repeated overexposure to chromium dusts or fumes may cause skin ulcers, nasal irritation and ulceration, kidney damage and cancer of the respiratory system. Chromium is skin sensitizer. Cancer is generally attributed to the hexavalent (+6) form of chromium which is listed as a carcinogen by NTP and IARC (Group 1).

This product may contain small amounts of nickel. Prolonged and repeated contact with nickel may cause sensitization dermatitis. Inhalation of nickel compounds has caused lung damage as well as sinus, nasal and lung cancer in laboratory animals. Nickel is a listed carcinogen by NTP and IARC (Group 1).

This product may contain small amounts of vanadium. Adverse effects from dermal, inhalation or parenteral exposure to various vanadium compounds have been reported. The major target for vanadium pentoxide toxicity is the respiratory tract. Fumes or dust can cause severe eye and respiratory irritation, and systemic effects. Chronic bronchitis, green tongue, conjunctivitis, pharyngitis, rhinitis, rales, chronic productive cough, and tightness of the chest have been reported following overexposure. Allergic reactions resulting from skin and inhalation exposures have also been reported. A statistical association between vanadium air levels and lung cancer has been suggested, but vanadium currently is not regarded as a human carcinogen.

This product may contain small amounts of lead. Lead can accumulate in the body. Consequently, exposure to fumes or dust may produce signs of polyneuritis, diminished vision and peripheral neuropathy, such as tingling and loss of feeling in fingers, arms and legs. Lead is a known reproductive and developmental toxin.

Sheet Steel

It is also associated with central nervous system disorders, anemia, kidney dysfunction and neurobehavioral abnormalities. The brain is a major target organ for lead exposure. Elemental lead is listed as an IARC 2B carcinogen.

The product may contain small amounts of copper. Copper dust and fumes can irritate the eyes, nose and throat causing coughing, wheezing, nosebleeds, ulcers and metal fume fever. Other effects from repeated inhalation of copper fumes include a metallic or sweet taste, and discoloration of skin, teeth or hair. Copper also may cause an allergic skin reaction. Overexposure to copper can affect the liver.

12. ECOLOGICAL INFORMATION

Aquatic Ecotoxicological Data - No specific information available on this product.

Environmental Fate Data - No specific information available on this product.

13. DISPOSAL CONSIDERATIONS

Recovery and reuse, rather than disposal, should be the ultimate goal of handling efforts. Dispose in accordance with federal, state, and local health and environmental regulations. Prevent materials from entering drains, sewers, or waterways.

14. TRANSPORT INFORMATION

DOT Proper Shipping Name - Not regulated

DOT Hazard Classification - Not regulated

UN/NA Number - Not applicable

DOT Packing Group - Not applicable

Labeling Requirements - Not applicable

Placards - Not applicable

DOT Hazardous Substance - Not applicable

DOT Marine Pollutant - Not applicable

15. REGULATORY INFORMATION

This product is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. However, dusts and fumes from this product may be combustible or hazardous and require protection to comply with applicable Federal, state and local laws and regulations.

California Proposition 65: This product contains chemicals (antimony [oxide], arsenic, beryllium, chromium [hexavalent], cobalt, cadmium, lead, nickel) known to the State of California to cause cancer and chemicals (cadmium, lead) known to the State of California to cause birth defects or other reproductive harm.

Massachusetts Substance List: Aluminum, Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Hydrochloric acid, Lead, Magnesium, Manganese, Molybdenum, Nickel, Nitrogen, Phosphorus, Selenium, Silicon, Sulfur, Tin, Titanium, Tungsten, Vanadium, Zinc

Pennsylvania Hazardous Substance List: Aluminum, Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Hydrochloric acid, Lead, Magnesium, Manganese, Molybdenum, Nickel, Nitrogen, Phosphorus, Selenium, Silicon, Sulfur, Tin, Titanium, Tungsten, Vanadium, Zinc

New Jersey Hazardous Substance List: Aluminum, Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Hydrochloric acid, Lead, Magnesium, Manganese, Molybdenum, Nickel, Nitrogen, Phosphorus, Selenium, Silicon, Sulfur, Tin, Titanium, Tungsten, Vanadium, Zinc

Toxic Substances Control Act (TSCA)

Components of this product are listed on the TSCA Inventory.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

Steel is not reportable, however, it contains hazardous substances that may be reportable if released in pieces with diameters less than or equal to 0.004 inches (RQ marked with a “*”).

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<u>Chemical Name</u>	<u>Reportable Quantity (in lb)</u>
Antimony	5000*
Arsenic	1*
Beryllium	10*
Cadmium	10*
Chromium	5000*
Copper	5000*
Lead	10*
Nickel	100*
Phosphorus	1
Selenium	100*
Zinc	1000*

Superfund Amendments and Reauthorization Act of 1986 (SARA), Title III

SECTION 311/312 HAZARD CATEGORIES: Immediate Health Effect, Delayed Health Effect

This product contains the following EPCRA Section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right – To – Know Act of 1986 (40 CFR 372):

SECTION 313 REPORTABLE INGREDIENTS:

<u>Chemical Name</u>	<u>CAS Number</u>	<u>Concentration (% by weight)</u>	<u>Reportable</u>
Aluminum	7429-90-5	0.0-0.01 Some grades up to 3.0%	Yes – Greater than 1%
Antimony	7440-36-0	<0.9	No – Less than 1%
Arsenic	7440-38-2	<0.09	No – Less than 0.1%
Beryllium	7440-41-7	<0.09	No – Less than 0.1%
Cadmium	7440-43-9	<0.01	No – Less than 0.1%
Chromium	7440-47-3	0.01-1.0 Some grades up to 12.5%	Yes – Greater than 0.1%
Cobalt	7440-48-4	<0.09	No – Less than 0.1%
Copper	7440-50-8	<0.9 Some grades up to 3.5%	Yes – Greater than 1%
Lead	7439-92-1	0.0-0.04	Yes
Manganese	7439-96-5	0.2-2 Some grades up to 12.5%	Yes – Greater than 1%
Nickel	7440-02-0	0.01-0.1 Some grades up to 3.0%	Yes – Greater than 0.1%
Phosphorus	7723-14-0	<0.9	No – Less than 1%
Selenium	7782-49-2	<0.9	No – Less than 1%
Vanadium	7440-62-2	<0.9	No – Less than 1%
Zinc	7440-66-6	<0.01	No – Less than 1%

Concentrations based on analytical data and process knowledge of typical products distributed by the facility.

16. OTHER INFORMATION

This SDS covers Nucor product as delivered from the Nucor facility, but does not include chemicals that may be applied by subsequent handlers and/or distributors of this product. This could include a variety of materials including oils, paints, galvanization, etc. that are not included in this SDS. Additionally, specialty orders may require application of coating material not listed in this SDS. SDSs for any Nucor-applied specialty coating will be provided separately. During welding, precautions should be taken for airborne contaminants that may originate from components of the welding rod. Arc or spark generated when welding or burning could be a source of ignition for combustible and/or flammable materials. The information in this Safety Data Sheet (SDS) was obtained from sources which we believe are reliable; however, the information is provided without any representation or warranty, expressed or implied, regarding the accuracy or correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of this product.

Sheet Steel

*** Section 1 - Product and Company Identification ***

Material Name: Carbon and Alloy Steels
Common Alloy/Grade: Bar, Sheet, Plate, Tubing, Pipe, Structural
Recommended Use: Solid product, various forms and uses

Manufacturer Information

Joseph T. Ryerson & Son, Inc.
227 W Monroe Street
27th Floor
Chicago, IL 60606

Phone: (312) 292-5000

Emergency # CHEMTREC (US Transportation): (800) 424-9300
CANUTEC (Canadian Transportation): (613) 996-6666

*** Section 2 - Hazards Identification ***

General Hazard Statement: Solid metallic products are generally classified as "articles" and do not constitute a hazardous material in solid form under the definitions of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Any articles manufactured from these solid products would be generally classified as non-hazardous. However some hazardous elements contained in these products can be emitted under certain processing conditions such as but not limited to: burning, melting, cutting, sawing, brazing, grinding, machining, milling, and welding. Products in the solid state present no fire or explosion hazard. Small chips, fines, and dust may ignite readily, though. The following classification information is for the hazardous elements which may be released during processing.

GHS Classification:

Flammable Solid – Category 1
Eye Damage/Irritation - Category 2B
Respiratory Sensitizer - Category 1
Skin Sensitizer - Category 1
Germ Cell Mutagenicity - Category 2
Carcinogenicity - Category 1B
Toxic to Reproduction - Category 1A
Specific Target Organ Toxicity (Repeated Exposure) - Category 1
Hazardous to the Aquatic Environment - Acute Hazard - Category 1

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

Danger

Hazard Statements

Flammable solid.
Causes eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
Suspected of causing genetic defects.
May cause cancer.
May damage fertility or the unborn child.
Causes damage to respiratory system through prolonged or repeated exposure.

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Material Name: Carbon and Alloy Steels

Very toxic to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Use explosion proof electrical/ventilating/lighting equipment.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not breathe dust/fume.
In case of inadequate ventilation wear respiratory protection
Contaminated work clothing should not be allowed out of the workplace.
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Avoid release to the environment

Response

In case of fire: Use Class D agent to extinguish.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists get medical advice/attention.
IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a poison center/doctor.
IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.
If exposed or concerned: Get medical advice/attention.
Get medical advice/attention if you feel unwell.
Collect spillage.

Storage

Store locked up

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
7439-89-6	Iron	>80
7440-47-3	Chromium	0-11*
7440-66-6	Zinc	0-10
7440-02-0	Nickel	0-9.5
7440-44-0	Carbon	0-5.5
7439-98-7	Molybdenum	0-5
7440-21-3	Silicon	0-4
7439-96-5	Manganese	0-3
7440-50-8	Copper	0-2.5
7429-90-5	Aluminum	0-2
7704-34-9	Sulfur	0-2
7440-69-9	Bismuth	0-1.5
7440-32-6	Titanium	0-1
7440-62-2	Vanadium	0-1
7440-42-8	Boron	0-0.9
7440-36-0	Antimony	0-0.9
7440-70-2	Calcium	0-0.9
7439-95-4	Magnesium	0-0.9
7727-37-9	Nitrogen	0-0.9

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7723-14-0	Phosphorus	0-0.9
7782-49-2	Selenium	0-0.9
7440-31-5	Tin	0-0.9
7440-33-7	Tungsten	0-0.9
7440-03-1	Niobium	0-0.9
13494-80-9	Tellurium	0-0.5

The above listing is a summary of elements used in carbon and alloy steels. Various grades will contain different combinations of these elements. Other trace elements may also be present in minute amounts. These small quantities (less than 0.1%) are frequently referred to as "trace" or "residual" elements; generally they originate in the raw material used. Such elements would include arsenic (As), beryllium (Be), cadmium (Cd), cobalt (Co), lead (Pb), mercury (Hg), oil mist (mineral¹), oxygen (O), selenium (Se), tellurium (Te), and zirconium (Zr). Various byproducts of processing from these trace elements may include lead chromate, ozone, polybrominated biphenyls (PBB), and polybrominated diphenyl ether (PBDE), and these byproducts may also be considered trace. If listed in the above table, the ingredient is considered to be a component rather than trace.

*Carbon and alloy steel products as provided contain chromium metal in the zero valence state. As such, chromium metal does not present any unusual health hazard. However, welding, torch cutting, brazing, or grinding of chromium metal in carbon and alloy steel may generate airborne concentrations of hexavalent chromium.

Footnotes:

1. The product may have a light coating of oil to prevent corrosion.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Consult a physician.

First Aid: Skin

Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician.

First Aid: Ingestion

Do NOT induce vomiting. Call a physician or Poison Control Center immediately. Drink plenty of water. Never give anything by mouth to an unconscious person.

First Aid: Inhalation

Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Consult a physician.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

This product does not present fire or explosion hazards as shipped. Small chips, fines, and dust from processing may be readily ignitable.

Hazardous Combustion Products

Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do not breathe fumes. May cause sensitization by inhalation and skin contact.

Extinguishing Media

Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and fines.

Unsuitable Extinguishing Media

DO NOT use halogenated extinguishing agents on small chips or fines. DO NOT use water for fires involving molten metal. These fire extinguishing agents will react with burning material.

Fire Fighting Equipment/Instructions

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

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Material Name: Carbon and Alloy Steels

*** Section 6 - Accidental Release Measures ***

Recovery and Neutralization

Avoid dust formation. Collect scrap for recycling.

Materials and Methods for Clean-Up

If product is molten, contain the flow using dry sand or salt flux as a dam. All tools and containers which come in contact with molten metal must be preheated or specially coated and rust free. Allow the spill to cool before remelting as scrap.

Emergency Measures

Keep people away from and upwind of spill/leak.

Personal Precautions and Protective Equipment

Wear appropriate protective clothing and respiratory protection for the situation.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.

Prevention of Secondary Hazards

None

*** Section 7 - Handling and Storage ***

Handling Procedures

Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Avoid dust formation. Keep material dry. Avoid contact with sharp edges or heated material.

Storage Procedures

Keep container tightly closed in a dry and well-ventilated place.

Incompatibilities

Acids. Alkalis. Water. Halogenated compounds. Metal oxides.

*** Section 8 - Exposure Controls / Personal Protection ***

Component Exposure Limits

Chromium (7440-47-3)

ACGIH: 0.5 mg/m3 TWA

OSHA: 1 mg/m3 TWA

NIOSH: 0.5 mg/m3 TWA

Nickel (7440-02-0)

ACGIH: 1.5 mg/m3 TWA (inhalable fraction)

OSHA: 1 mg/m3 TWA

NIOSH: 0.015 mg/m3 TWA

Molybdenum (7439-98-7)

ACGIH: 10 mg/m3 TWA (inhalable fraction); 3 mg/m3 TWA (respirable fraction)

OSHA: 10 mg/m3 TWA

Silicon (7440-21-3)

OSHA: 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

NIOSH: 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)

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Material Name: Carbon and Alloy Steels

Manganese (7439-96-5)

ACGIH: 0.2 mg/m³ TWA
OSHA: 1 mg/m³ TWA (fume)
3 mg/m³ STEL (fume)
5 mg/m³ Ceiling
NIOSH: 1 mg/m³ TWA (fume)
3 mg/m³ STEL

Copper (7440-50-8)

ACGIH: 0.2 mg/m³ TWA (fume)
OSHA: 0.1 mg/m³ TWA (dust, fume, mist, as Cu)
NIOSH: 1 mg/m³ TWA (dust and mist); 0.1 mg/m³ TWA (fume)

Aluminum (7429-90-5)

ACGIH: 1 mg/m³ TWA (respirable fraction)
OSHA: 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
NIOSH: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable dust)

Vanadium (7440-62-2)

OSHA: 0.05 mg/m³ TWA (respirable dust, as V₂O₅); 0.05 mg/m³ TWA (fume, as V₂O₅)
NIOSH: 1 mg/m³ TWA (listed under Ferrovandium dust)
3 mg/m³ STEL (listed under Ferrovandium dust)

Tin (7440-31-5)

ACGIH: 2 mg/m³ TWA
OSHA: 2 mg/m³ TWA
NIOSH: 2 mg/m³ TWA

Tungsten (7440-33-7)

ACGIH: 5 mg/m³ TWA
10 mg/m³ STEL
OSHA: 5 mg/m³ TWA
10 mg/m³ STEL
NIOSH: 5 mg/m³ TWA
10 mg/m³ STEL

Antimony (7440-36-0)

ACGIH: 0.5 mg/m³ TWA
OSHA: 0.5 mg/m³ TWA
NIOSH: 0.5 mg/m³ TWA

Phosphorus (7723-14-0)

OSHA: 0.1 mg/m³ TWA
NIOSH: 0.1 mg/m³ TWA

Selenium (7782-49-2)

ACGIH: 0.2 mg/m³ TWA
OSHA: 0.2 mg/m³ TWA
NIOSH: 0.2 mg/m³ TWA

Tellurium (13494-80-9)

ACGIH: 0.1 mg/m³ TWA
OSHA: 0.1 mg/m³ TWA
NIOSH: 0.1 mg/m³ TWA

Safety Data Sheet

Material Name: Carbon and Alloy Steels

Engineering Measures

Where feasible, enclose processes to prevent dust dispersion into the work area. Provide local exhaust when possible, and general ventilation as necessary, to keep airborne concentrations below exposure limits and as low as possible.

Personal Protective Equipment: Respiratory

If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

Personal Protective Equipment: Hands

Use impervious gloves such as neoprene, nitrile, or rubber for hand protection.

Personal Protective Equipment: Eyes

Wear safety glasses with side shields and/or goggles as necessary to prevent dust from entering eyes.

Personal Protective Equipment: Skin and Body

Use body protection appropriate for task.

Hygiene Measures

Do not breathe vapors/dust. When using, do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feeding stuffs.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Gray-Metallic	Odor:	None
Physical State:	Solid	pH:	NA
Vapor Pressure:	ND	Vapor Density:	ND
Boiling Point:	ND	Melting Point:	~1538 (°C) / ~2800 (°F)
Solubility (H2O):	Insoluble	Specific Gravity:	~7.6-7.8
Evaporation Rate:	ND	VOC:	ND
Octanol/H2O Coeff.:	ND	Flash Point:	NA
Flash Point Method:	NA	Upper Flammability Limit (UFL):	NA
Lower Flammability Limit (LFL):	NA	Burning Rate:	NA
Auto Ignition:	NA		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

Stable under recommended storage conditions.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Dust formation. Heat, flames and sparks. Protect from water.

Incompatible Products

Acids. Alkalis. Water. Halogenated compounds. Metal oxides.

Hazardous Decomposition Products

Toxic metal oxides and carbon and nitrogen oxides may be produced during a fire involving metal alloys. Alloys with nickel may also produce poisonous nickel carbonyl.

Safety Data Sheet

Material Name: Carbon and Alloy Steels

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

Component Analysis - LD50/LC50

Iron (7439-89-6)

Oral LD50 Rat 984 mg/kg

Nickel (7440-02-0)

Oral LD50 Rat >9000 mg/kg

Carbon (7440-44-0)

Oral LD50 Rat >10000 mg/kg

Silicon (7440-21-3)

Oral LD50 Rat 3160 mg/kg

Manganese (7439-96-5)

Oral LD50 Rat 9 g/kg

Sulfur (7704-34-9)

Inhalation LC50 Rat >9.23 mg/L 4 h; Oral LD50 Rat >3000 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

Bismuth (7440-69-9)

Oral LD50 Rat 5 g/kg

Boron (7440-42-8)

Oral LD50 Rat 650 mg/kg

Magnesium (7439-95-4)

Oral LD50 Rat 230 mg/kg

Antimony (7440-36-0)

Oral LD50 Rat 7 g/kg

Phosphorus (7723-14-0)

Inhalation LC50 Rat 4.3 mg/L 1 h; Oral LD50 Rat 3.03 mg/kg; Dermal LD50 Rat 100 mg/kg

Selenium (7782-49-2)

Oral LD50 Rat 6700 mg/kg

Tellurium (13494-80-9)

Inhalation LC50 Rat >2420 mg/m³ 4 h; Oral LD50 Rat 83 mg/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Contact with dust can cause mechanical irritation or drying of the skin. Contact with oils from processing may cause irritation. Prolonged skin contact may defat the skin and produce dermatitis. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Dust contact with the eyes can lead to mechanical irritation.

Potential Health Effects: Ingestion

May be harmful if swallowed. May cause additional affects as listed under "Inhalation".

Safety Data Sheet

Material Name: Carbon and Alloy Steels

Potential Health Effects: Inhalation

May be harmful if inhaled. Inhalation of dust in high concentration may cause irritation of respiratory system.

Respiratory Organs Sensitization/Skin Sensitization

May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

Generative Cell Mutagenicity

Suspected of causing genetic defects.

Carcinogenicity

A: General Product Information

May cause cancer.

B: Component Carcinogenicity

Chromium (7440-47-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 49 [1990] (listed under Chromium and Chromium compounds); Supplement 7 [1987] (Group 3 (not classifiable))

Nickel (7440-02-0)

ACGIH: A5 - Not Suspected as a Human Carcinogen

NIOSH: potential occupational carcinogen

NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)

IARC: Monograph 49 [1990]; Supplement 7 [1987] (Group 2B (possibly carcinogenic to humans))

Aluminum (7429-90-5)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Selenium (7782-49-2)

IARC: Supplement 7 [1987]; Monograph 9 [1975] (Group 3 (not classifiable))

Reproductive Toxicity

May damage fertility or the unborn child.

Specified Target Organ General Toxicity: Single Exposure

Causes damage to organs (kidneys, respiratory system)

Specified Target Organ General Toxicity: Repeated Exposure

May cause damage to organs through prolonged or repeated exposure (respiratory system). Repeated contact may cause allergic reactions in very susceptible persons. Avoid repeated exposure. Prolonged exposure may cause chronic effects. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.

Elevated temperature processing such as welding and plasma arc cutting may release hazardous fumes.

Overexposure to metal fumes may cause pulmonary edema (fluid in the lungs) and methemoglobinemia. May also cause pulmonary fibrosis and lung cancer.

Aspiration Respiratory Organs Hazard

None

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Very toxic to aquatic organisms.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Iron (7439-89-6)

Test & Species

96 Hr LC50 *Morone saxatilis*

13.6 mg/L [static]

Conditions

Safety Data Sheet

Material Name: Carbon and Alloy Steels

96 Hr LC50 Cyprinus carpio 0.56 mg/L [semi-static]

Zinc (7440-66-6)

Test & Species

96 Hr LC50 Pimephales promelas 2.16-3.05 mg/L [flow-through]
 96 Hr LC50 Pimephales promelas 0.211-0.269 mg/L [semi-static]
 96 Hr LC50 Pimephales promelas 2.66 mg/L [static]
 96 Hr LC50 Cyprinus carpio 30 mg/L
 96 Hr LC50 Cyprinus carpio 0.45 mg/L [semi-static]
 96 Hr LC50 Cyprinus carpio 7.8 mg/L [static]
 96 Hr LC50 Lepomis macrochirus 3.5 mg/L [static]
 96 Hr LC50 Oncorhynchus mykiss 0.24 mg/L [flow-through]
 96 Hr LC50 Oncorhynchus mykiss 0.59 mg/L [semi-static]
 96 Hr LC50 Oncorhynchus mykiss 0.41 mg/L [static]
 96 Hr EC50 Pseudokirchneriella subcapitata 0.11 - 0.271 mg/L [static]
 72 Hr EC50 Pseudokirchneriella subcapitata 0.09 - 0.125 mg/L [static]
 48 Hr EC50 Daphnia magna 0.139 - 0.908 mg/L [Static]

Conditions

Nickel (7440-02-0)

Test & Species

96 Hr LC50 Brachydanio rerio >100 mg/L
 96 Hr LC50 Cyprinus carpio 1.3 mg/L [semi-static]
 96 Hr LC50 Cyprinus carpio 10.4 mg/L [static]
 72 Hr EC50 Pseudokirchneriella subcapitata 0.18 mg/L
 96 Hr EC50 Pseudokirchneriella subcapitata 0.174 - 0.311 mg/L [static]
 48 Hr EC50 Daphnia magna >100 mg/L
 48 Hr EC50 Daphnia magna 1 mg/L [Static]

Conditions

Copper (7440-50-8)

Test & Species

96 Hr LC50 Pimephales promelas 0.0068 - 0.0156 mg/L
 96 Hr LC50 Pimephales promelas <0.3 mg/L [static]
 96 Hr LC50 Pimephales promelas 0.2 mg/L [flow-through]
 96 Hr LC50 Oncorhynchus mykiss 0.052 mg/L [flow-through]
 96 Hr LC50 Lepomis macrochirus 1.25 mg/L [static]
 96 Hr LC50 Cyprinus carpio 0.3 mg/L [semi-static]
 96 Hr LC50 Cyprinus carpio 0.8 mg/L [static]
 96 Hr LC50 Poecilia reticulata 0.112 mg/L [flow-through]
 72 Hr EC50 Pseudokirchneriella subcapitata 0.0426 - 0.0535 mg/L [static]

Conditions

Safety Data Sheet

Material Name: Carbon and Alloy Steels

96 Hr EC50 Pseudokirchneriella subcapitata 0.031 - 0.054 mg/L [static]
48 Hr EC50 Daphnia magna 0.03 mg/L [Static]

Sulfur (7704-34-9)

Test & Species

96 Hr LC50 Brachydanio rerio 866 mg/L [static]
96 Hr LC50 Lepomis macrochirus <14 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss >180 mg/L [static]

Conditions

Phosphorus (7723-14-0)

Test & Species

96 Hr LC50 Lepomis macrochirus 0.0017-0.0035 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus 0.001-0.004 mg/L [static]
96 Hr LC50 Brachydanio rerio >100 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss 0.015-0.032 mg/L [static]
96 Hr LC50 Pimephales promelas 0.011-0.028 mg/L [static]
48 Hr EC50 Daphnia magna 0.03 mg/L
48 Hr EC50 Daphnia magna 0.025 - 0.037 mg/L [Static]

Conditions

Persistence/Degradability

Metal powders may cause ecological damage through silting or sedimentation effect in water depriving organisms of habitat and mobility, and/or fouling of gills, lungs and skin thus limiting oxygen uptake.

Bioaccumulation

Metal powders in water or soil may form metal oxides or other metal compounds that could become bioavailable and harm aquatic or terrestrial organisms.

Mobility in Soil

Metal powder would be relatively immobile in soils but some metal compounds may be transported with ground water.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Copper	7440-50-8	DOT regulated severe marine pollutant (powder)

DOT Information

Shipping Name: Not Regulated

Safety Data Sheet

Material Name: Carbon and Alloy Steels

IATA Information

Shipping Name: Not Regulated

ICAO Information

Shipping Name: Not Regulated

IMDG Information

Shipping Name: Not Regulated

* * * Section 15 - Regulatory Information * * *
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Regulatory Information

A: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Chromium (7440-47-3)

SARA 313: 1.0 % de minimis concentration

CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

Zinc (7440-66-6)

SARA 313: 1.0 % de minimis concentration (dust or fume only)

CERCLA: 454 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 1000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

Nickel (7440-02-0)

SARA 313: 0.1 % de minimis concentration

CERCLA: 100 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 45.4 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

Manganese (7439-96-5)

SARA 313: 1.0 % de minimis concentration

Copper (7440-50-8)

SARA 313: 1.0 % de minimis concentration

CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

Aluminum (7429-90-5)

SARA 313: 1.0 % de minimis concentration (dust or fume only)

Safety Data Sheet

Material Name: Carbon and Alloy Steels

Antimony (7440-36-0)

CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

Phosphorus (7723-14-0)

SARA 302: 100 lb TPQ (This material is a reactive solid. The TPQ does not default to 10000 pounds for non-powder, non-molten, non-solution form)

CERCLA: 1 lb final RQ; 0.454 kg final RQ

Selenium (7782-49-2)

CERCLA: 100 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 45.4 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

B: Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Copper (7440-50-8)

0-2.5 DOT regulated severe marine pollutant (powder)

State Regulations

A: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Iron	7439-89-6	Yes	No	No	No	No	No
Chromium	7440-47-3	Yes	Yes	Yes	Yes	Yes	Yes
Zinc	7440-66-6	Yes	Yes	No	Yes	Yes	Yes
Nickel	7440-02-0	Yes	Yes	Yes	Yes	Yes	Yes
Carbon	7440-44-0	No	No	No	No	No	Yes
Molybdenum	7439-98-7	Yes	Yes	Yes	Yes	Yes	Yes
Silicon	7440-21-3	No	Yes	Yes	Yes	Yes	Yes
Manganese	7439-96-5	Yes	Yes	Yes	Yes	Yes	Yes
Copper	7440-50-8	Yes	Yes	Yes	Yes	Yes	Yes
Aluminum	7429-90-5	Yes	Yes	Yes	Yes	Yes	Yes
Sulfur	7704-34-9	Yes	Yes	No	Yes	Yes	Yes
Titanium	7440-32-6	Yes	No	No	Yes	No	No
Vanadium	7440-62-2	Yes	Yes	No	Yes	Yes	No
Boron	7440-42-8	No	No	No	Yes	No	No
Magnesium	7439-95-4	Yes	Yes	No	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes	Yes	Yes	Yes
Tungsten	7440-33-7	Yes	Yes	Yes	Yes	Yes	Yes
Calcium	7440-70-2	Yes	Yes	No	Yes	Yes	Yes
Antimony	7440-36-0	Yes	Yes	Yes	Yes	Yes	Yes
Phosphorus	7723-14-0	Yes	Yes	Yes	Yes	Yes	Yes
Nitrogen	7727-37-9	No	Yes	Yes	Yes	Yes	Yes
Selenium	7782-49-2	Yes	Yes	No	Yes	Yes	Yes
Tellurium	13494-80-9	No	Yes	Yes	Yes	Yes	Yes

WARNING! This product contains a chemical known to the state of California to cause cancer.

Safety Data Sheet

Material Name: Carbon and Alloy Steels

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Chromium	7440-47-3	0.1 %
Nickel	7440-02-0	0.1 %
Molybdenum	7439-98-7	1 %
Manganese	7439-96-5	1 %
Copper	7440-50-8	1 %
Aluminum	7429-90-5	1 %
Selenium	7782-49-2	0.1 %

Additional Regulatory Information

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Iron	7439-89-6	Yes	DSL	EINECS
Chromium	7440-47-3	Yes	DSL	EINECS
Zinc	7440-66-6	Yes	DSL	EINECS
Nickel	7440-02-0	Yes	DSL	EINECS
Carbon	7440-44-0	Yes	DSL	EINECS
Molybdenum	7439-98-7	Yes	DSL	EINECS
Silicon	7440-21-3	Yes	DSL	EINECS
Manganese	7439-96-5	Yes	DSL	EINECS
Copper	7440-50-8	Yes	DSL	EINECS
Aluminum	7429-90-5	Yes	DSL	EINECS
Sulfur	7704-34-9	Yes	DSL	EINECS
Bismuth	7440-69-9	Yes	DSL	EINECS
Titanium	7440-32-6	Yes	DSL	EINECS
Vanadium	7440-62-2	Yes	DSL	EINECS
Boron	7440-42-8	Yes	DSL	EINECS
Magnesium	7439-95-4	Yes	DSL	EINECS
Niobium	7440-03-1	Yes	DSL	EINECS
Tin	7440-31-5	Yes	DSL	EINECS
Tungsten	7440-33-7	Yes	DSL	EINECS
Calcium	7440-70-2	Yes	DSL	EINECS
Antimony	7440-36-0	Yes	DSL	EINECS
Phosphorus	7723-14-0	Yes	DSL	EINECS
Nitrogen	7727-37-9	Yes	DSL	EINECS
Selenium	7782-49-2	Yes	DSL	EINECS
Tellurium	13494-80-9	Yes	DSL	EINECS

Safety Data Sheet

Material Name: Carbon and Alloy Steels

* * * Section 16 - Other Information * * *

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

Literature References

Available on request.

End of Sheet

MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet (MSDS) is for welding consumables and related products and may be used to comply with OSHA's Hazard Communication standard, 29 CFR 1910.1200, and Superfund Amendments and Reauthorization Act (SARA) of 1986 Public Law 99-499. The OSHA standard must be consulted for specific requirements. This Safety Data Sheet complies with European Commission Directive 89/106/EEC, 91/155/EEC, ISO 11014-1 and ANSI Z400.1. This document is translated in several languages and available on our website at www.hobartbrothers.com, from your sales representative or by calling customer service at 1 (937) 332-4000.

SECTION 1 – IDENTIFICATION

Manufacturer/Supplier Name: HOBART BROTHERS COMPANY Telephone No: +1 (937) 332-4000
 Address: 101 TRADE SQUARE EAST, TROY, OH 45373 Emergency No: +1 (800) 424-9300
 Website: www.hobartbrothers.com

Product Type: COVERED ARC WELDING ELECTRODES AND BARE RODS

Trade Name: HARDALLOY COBALT BASED COVERED ELECTRODES AND BARE RODS

SECTION 2 – IDENTIFICATION OF HAZARDS

IMPORTANT - This section covers the hazardous materials from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are also addressed in Section 8. The term "hazardous" in this section should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

HAZARDOUS INGREDIENT	CAS	EINECS ^f	REGULATORY HAZARD CLASSIFICATION/DESIGNATION 67/548/EEC ^Δ	IARC ^E	NTP ^Z	OSHA ^H	65 ^Θ
CALCIUM CARBONATE	1317-65-3	215-279-6	None	---	---	---	---
CHROMIUM	7440-47-3	231-157-5	O - R9; Carc 1 ^Θ - R45; Muta 2 - R46; Repr 3 - R62; T+ - R26; T - R24/25, R48/23 C - R35, R42/43; N - R50, R53 ^{ΣΣΣ}	1 ^{ΣΣ} , 3 ^{ΣΣ}	K ^{ΣΣ}	X ^{ΣΣ}	X ^{ΣΣ}
COBALT	7440-48-4	231-158-0	Xn; R42/43, R53	2B	---	X	X
FLUORSPAR	7789-75-5	232-188-7	None	---	---	---	---
IRON	7439-89-6	231-096-4	None	---	---	---	---
NICKEL	7440-02-0	231-111-4	Carc 3 ^Θ - R40; T - R43, R48/23	1	K	X	X
POTASSIUM OXIDE	12136-45-7	235-227-6	None	---	---	---	---
SILICA	14808-60-7	238-878-4	Xn - R48/20, R40/20	1 ^Ω	K	X	X
(Amorphous Silica Fume)	69012-64-2	273-761-5	None	3	K	---	X
SODIUM OXIDE	1313-59-3	215-208-9	None	---	---	---	---
TITANIUM DIOXIDE	13463-67-7	236-675-5	None	2B	---	---	---
TUNGSTEN	7440-33-7	231-143-9	None	---	---	---	---

Γ – European Inventory of Existing Chemical Substances Number Δ - European Union Directive 67/548/EEC – Annex 1 E – International Agency for Research on Cancer (1 – Human Carcinogen, 2A – Probably Carcinogenic to Humans, 2B – Possibly Carcinogenic to Humans, 3 – Unclassifiable as to Carcinogenicity in Humans, 4 Probably Not Carcinogenic to Humans) Z – US National Toxicology Program (K – Known Carcinogen, S – Suspected Carcinogen) H – OSHA Known Carcinogen List Θ – California Proposition 65 (X – On Proposition 65 list) --- Dashes indicate the ingredient is not listed with the IARC, OSHA or 65 Φ – Carcinogen, Mutagen or Reproductive Category per European Council Directive 67/548/EEC Annex I Σ – Metal and Chromium III Compounds ΣΣ – Chromium VI Compounds ΣΣΣ – Chromium (VI) Trioxide EU 67/548/EEC Classification/Designation Y – Manganese Dioxide EU 67/548/EEC Classification/Designation Ψ – Silica Crystalline α-Quartz

The following symbols correspond with the EU 67/548/EEC column above are in European Union Directive 67/548/EEC Annex 1 and EC 1272/2008 Annex VI – Table 3.2:

 Xn – Harmful	 O - Oxidizer	 C – Corrosive	 N – Dangerous for the Environment
 T – Toxic	 T+ - Extremely Toxic		

WARNING! - Avoid breathing welding fumes and gases, they may be dangerous to your health. Always use adequate ventilation. Always use appropriate personal protective equipment.

PRIMARY ROUTES OF ENTRY: Respiratory System, Eyes and/or Skin.
ELECTRIC SHOCK: Arc welding and associated processes can kill. See Section 8.

ARC RAYS: The welding arc can injure eyes and burn skin.
FUMES AND GASES: Can be dangerous to your health.

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures and electrodes used. Most fume ingredients are present as complex oxides and compounds and not as pure metals. When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation of the materials shown in this section, plus those from the base metal and coating, etc., as noted above. Monitor for the materials identified in the list within this section.

Fumes from the use of this product may contain complex oxides or compounds of the following elements and molecules: amorphous silica fume, calcium oxide, chromium, cobalt, fluor spar or fluorides, manganese, nickel and silica. Other reasonably expected constituents of the fume would also include complex oxides of iron and titanium. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1, available from the "American Welding Society", P.O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide", which gives additional advice on sampling.

SECTION 3 – HAZARDOUS INGREDIENTS

CONTENT PERCENTAGE BY INGREDIENTS

INGREDIENT	CAS	EINECS	%WEIGHT	INGREDIENT	CAS	EINECS	%WEIGHT
CALCIUM CARBONATE	1317-65-3	215-279-6	0-10	POTASSIUM OXIDE	12136-45-7	235-227-6	0-2
CHROMIUM	7440-47-3	231-157-5	7-35	SILICA	14808-60-7	238-878-4	0-7
COBALT	7440-48-4	231-158-0	30-50	(Amorphous Silica Fume)	69012-64-2	273-761-5	
FLUORSPAR	7789-75-5	232-188-7	0-5	SODIUM OXIDE	7681-49-5	215-208-9	0-2
IRON	7439-89-6	231-096-4	0-5	TITANIUM DIOXIDE	13463-67-7	236-675-5	5-15
NICKEL	7440-02-0	231-111-4	0-3	TUNGSTEN	7440-33-7	231-143-9	0-10

--- Dashes indicate the ingredient is not present within the group of products

SECTION 4 – FIRST AID MEASURES

INHALATION: If breathing is difficult provide fresh air and contact physician.

EYE/SKIN INJURIES: For radiation burns, see physician.

Section 11 of this MSDS covers the acute effects of overexposure to the various ingredients within the welding consumable. Section 8 of this MSDS lists the exposure limits and covers methods for protecting yourself and your co-workers.

SECTION 5 - FIRE AND EXPLOSION HAZARD DATA

Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, nonexplosive and essentially nonhazardous until welded. Welding arcs and sparks can ignite combustibles and flammable products. Unused welding consumables may remain hot for a period of time after completion of a welding process. See American National Standard (ANSI) Z49.1 for further general safety information on the use and handling of welding consumables and associated procedures.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Solid objects can be picked up and placed into a container. Wear proper personal protective equipment while handling. Do not discard as general trash.

SECTION 7 - HANDLING AND STORAGE

HANDLING: No specific requirements in the form supplied. Handle with care to avoid cuts. Wear gloves when handling welding consumables. Avoid exposure to dust. Do not ingest. Some individuals can develop an allergic reaction to certain materials. Retain all warning and product labels.

STORAGE: Keep separate from acids and strong bases to prevent possible chemical reactions.

SECTION 8 - EXPOSURE CONTROL AND PERSONAL PROTECTION

Read and understand the instructions and the labels on the packaging. Welding fumes do not have a specific OSHA PEL or ACGIH TLV. The OSHA PEL for Particulate – Not Otherwise Classified (PNOC) is 5 mg/m³ – Respirable Fraction, 15 mg/m³ – Total Dust. The ACGIH TLV for Particles – Not Otherwise Specified (PNOS) is 3 mg/m³ – Respirable Particles, 10 mg/m³ – Inhalable Particles. The individual complex compounds within the fume may have a lower OSHA PEL or ACGIH TLV than the OSHA Particulate – Not Otherwise Classified (PNOC) and ACGIH Particles – Not Otherwise Specified (PNOS). An Industrial Hygienist, the OSHA Permissible Exposure Limits for Air Contaminants (29 CFR 1910.1000), and the ACGIH Threshold Limit Values should be consulted to determine the specific fume constituents present and their respective exposure limits. European Union Occupational Exposure Limits (EU OEL) are listed with the most stringent limit among the EU member nations. All exposure limits are in milligrams per cubic meter (mg/m³).

INGREDIENT	CAS	EINECS	OSHA PEL	ACGIH TLV	EU OEL
CALCIUM CARBONATE	1317-65-3	215-279-6	5 R*, 5 (as CaO)	3 R*, 2 (as CaO)	10 I* (Aerosol) – UK; 3 R* (Aerosol) - Switzerland
CHROMIUM#	7440-47-3	231-157-5	1 (Metal) 0.5 (Cr II & Cr III Cpnds) 0.005 (Cr VI Cpnds)	0.5 (Metal) {A4} 0.5 (Cr III Cpnds) {A4} 0.05 (Cr VI Sol Cpnds) {A1} 0.01 (Cr VI Insol Cpnds) {A1}	0.1 I* (Aerosol) - Switzerland 0.005; 0.01*** - Denmark 0.005 (Total Aerosol); 0.015*** (Total Aerosol) - Sweden
COBALT	7440-48-4	231-158-0	0.1 (Dust and Fume)	0.02 {A3}	0.01 I*; 0.02*** - Denmark
FLUORSPAR	7789-75-5	232-188-7	2.5 (as F)	2.5 (as F) {A4}	1 I* (Aerosol as F); 4*** (Aerosol as F) - Germany
IRON+	7439-89-6	231-096-4	5 R*	5 R* (Fe ₂ O ₃) {A4}	3 R* (Aerosol as Fe ₂ O ₃) – Switzerland 7*** (as Fe ₂ O ₃) - Denmark
NICKEL#	7440-02-0	231-111-4	1 (Metal) 1 (Sol Cpnds) 1 (Insol Cpnds)	1.5 I* (Ele) {A5} 0.1 I* (Sol Cpnds) {A4} 0.2 I* (Insol Cpnds) {A1}	0.05; 0.1*** - Denmark
POTASSIUM OXIDE	12136-45-7	235-227-6	5 R*	3 R*	1.5 R* (Dust NOS - Aerosol) - Germany
SILICA++	14808-60-7	238-878-4	0.1 R*	0.025 R* {A2}	0.1 (Fused, Respirable Dust) - Denmark 0.2*** (Fused, Respirable Dust) - Denmark
(Amorphous Silica Fume)	69012-64-2	273-761-5	0.8	3 R*	2 I*; 4 I*** - Denmark
SODIUM OXIDE	7681-49-5	215-208-9	5 R*	3 R*	1.5 R* (Dust NOS - Aerosol) - Germany
TITANIUM DIOXIDE	13463-67-7	236-675-5	15 (Dust)	10 {A4}	1.5 R* - Germany
TUNGSTEN	7440-33-7	231-143-9	5 R*	5, 10 STEL*** (Insol Cpnds) 1, 3 STEL*** (Sol Cpnds)	1 I* (Aerosol); 2 I*** (Aerosol) - Austria

R* - Respirable Fraction R*** - Respirable Fraction - Short Term Exposure Limit I* - Inhalable Fraction I*** - Inhalable Fraction - Short Term Exposure Limit ** - Ceiling Limit *** - Short Term Exposure Limit + - As a nuisance particulate covered under "Particulates Not Otherwise Regulated" by OSHA or "Particulates Not Otherwise Classified" by ACGIH ++ - Crystalline silica is bound within the product as it exists in the package. However, research indicates silica is present in welding fume in the amorphous (noncrystalline) form # - Reportable material under Section 313 of SARA ■ - NIOSH REL TWA and STEL ◆ - Listed under ACGIH Notice of Intended Changes for Mn in 2010 ◆◆ - Limit of 0.02 mg/m³ is proposed for Respirable Mn in 2011 by ACGIH Ele – Element Sol – Soluble Insol – Insoluble Inorg – Inorganic Cpnds – Compounds NOS – Not Otherwise Specified {A1} - Confirmed Human Carcinogen per ACGIH {A2} - Suspected Human Carcinogen per ACGIH {A3} - Confirmed Animal Carcinogen with Unknown Relevance to Humans per ACGIH {A4} - Not Classifiable as a Human Carcinogen per ACGIH {A5} - Not Suspected as a Human Carcinogen per ACGIH (noncrystalline) form

VENTILATION: Use enough ventilation, local exhaust at the arc or both to keep the fumes and gases below the PEL/TLV/OELs in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

RESPIRATORY PROTECTION: Use NIOSH approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the regulatory limits.

EYE PROTECTION: Wear helmet or use face shield with filter lens. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others from the weld arc flash.

PROTECTIVE CLOTHING: Wear hand, head and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection as well as dark nonsynthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable

SPECIAL PRECAUTIONS (IMPORTANT): Maintain exposure below the PEL/TLV/OEL. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV/OEL. Always use exhaust ventilation. Refer to the following sources for important additional information: American National Standard (ANSI) Z49.1; Safety in Welding and Cutting published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29 CFR 1910), U.S. Government Printing Office, Washington, DC 20402.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, nonexplosive and essentially nonhazardous until welded.

PHYSICAL STATE: Cored Wire

COLOR: Gray

ODOR: N/A

FORM: Round Wire

SECTION 10 – STABILITY AND REACTIVITY

GENERAL: Welding consumables applicable to this sheet are solid and nonvolatile as shipped. This product is only intended for use per the welding parameters it was designed for. When this product is used for welding, hazardous fumes may be created. Other factors to consider include the base metal, base metal preparation and base metal coatings. All of these factors can contribute to the fume and gases generated during welding. The amount of fume varies with the welding parameters.

STABILITY: This product is stable under normal conditions.

REACTIVITY: Contact with acids or strong bases may cause generation of gas.

SECTION 11 – TOXICOLOGICAL INFORMATION

SHORT-TERM (ACUTE) OVEREXPOSURE EFFECTS: **Welding Fumes** - May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes. **Calcium Oxide** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Chromium** - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory tract, lung damage and asthma-like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dust on skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions may occur in some people. **Cobalt** - Pulmonary irritation, cough, dermatitis, weight loss. **Fluorides** - Fluoride compounds evolved may cause skin and eye burns, pulmonary edema and bronchitis. **Iron, Iron Oxide** - None are known. Treat as nuisance dust or fume. **Nickel, Nickel Compounds** - Metallic taste, nausea, tightness in chest, metal fume fever, allergic reaction. **Potassium Oxide** - Dust or fumes may cause irritation of the respiratory system, skin and eyes.

Silica (Amorphous) - Dust and fumes may cause irritation of the respiratory system, skin and eyes. **Sodium Oxide** - Dust or fumes may cause irritation of the respiratory system, skin and eyes. **Titanium Dioxide** - Irritation of respiratory system. **Tungsten** - Dust may cause irritation of the skin and eyes. Inhalation of dust may cause acute airways obstructive asthma which is reversible following overexposure. Symptoms are tightening chest and productive cough.

LONG-TERM (CHRONIC) OVEREXPOSURE EFFECTS: Welding Fumes - Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis." **Calcium Oxide** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Chromium** - Ulceration and perforation of nasal septum. Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) compounds. **Cobalt** - Repeated overexposure to cobalt compounds can produce reduced pulmonary function, diffuse nodular fibrosis of lungs and respiratory hypersensitivity. **Fluorides** - Serious bone erosion (Osteoporosis) and mottling of teeth. **Iron, Iron Oxide Fumes** - Can cause siderosis (deposits of iron in lungs) which some researchers believe may affect pulmonary function. Lungs will clear in time when exposure to iron and its compounds ceases. Iron and magnetite (Fe₃O₄) are not regarded as fibrogenic materials. **Manganese** - Long-term overexposure to manganese compounds may affect the central nervous system. Symptoms may be similar to Parkinson's disease and can include slowness, changes in handwriting, gait impairment, muscle spasms and cramps and less commonly, tremor and behavioral changes. Employees who are overexposed to manganese compounds should be seen by a physician for early detection of neurologic problems. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait. **Nickel, Nickel Compounds** - Lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers. **Potassium Oxide** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Silica (Amorphous)** - Research indicates that silica is present in welding fume in the amorphous form. Long term overexposure may cause pneumoconiosis. Noncrystalline forms of silica (amorphous silica) are considered to have little fibrotic potential. **Sodium Oxide** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia. **Titanium Dioxide** - Pulmonary irritation and slight fibrosis. **Tungsten** - Long term overexposure may cause pulmonary fibrosis characterized by a rapid onset of cough, sputum and dyspnea on exertion.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with pre-existing impaired lung functions (asthma-like conditions). Persons with a pacemaker should not go near welding and cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device. Respirators are to be worn only after being medically cleared by your company-designated physician.

EMERGENCY AND FIRST AID PROCEDURES: Call for medical aid. Employ first aid techniques recommended by the American Red Cross. If irritation or flash burns develop after exposure, consult a physician.

CARCINOGENICITY: Chromium VI compounds, nickel compounds and silica (crystalline quartz) are classified as IARC Group 1 and NTP Group K carcinogens. Titanium dioxide compounds are classified as IARC Group 2B carcinogens. Chromium VI compounds, cobalt compounds, nickel compounds, silica (crystalline quartz) and welding fumes must be considered as carcinogens under OSHA (29 CFR 1910.1200).

CALIFORNIA PROPOSITION 65: WARNING: These products contain or produce a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq.)

SECTION 12 – ECOLOGICAL INFORMATION

Welding processes can release fumes directly to the environment. Welding wire can degrade if left outside and unprotected. Residues from welding consumables and processes could degrade and accumulate in the soil and groundwater.

SECTION 13 – DISPOSAL CONSIDERATIONS

Use recycling procedures if available. Discard any product, residue, packaging, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

SECTION 14 – TRANSPORT INFORMATION

No international regulations or restrictions are applicable. No special precautions are necessary.

SECTION 15 – REGULATORY INFORMATION

Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label and the material safety data sheet. Observe all local and federal rules and regulations. Take all necessary precautions to protect yourself and others.

United States EPA Toxic Substance Control Act: All constituents of these products are on the TSCA inventory list or are excluded from listing.

CERCLA/SARA TITLE III: Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs):

Ingredient name	RQ(lb)	TPQ (lb)
Products on this MSDS are a solid solution in the form of a solid article.	--	--

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to your Local Emergency Planning Committee.

Section 311 Hazard Class

As shipped:	Immediate	In use:	Immediate delayed
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EPCRA/SARA TITLE III 313 TOXIC CHEMICALS: The following metallic components are listed as SARA 313 "Toxic Chemicals" and potentially subject to annual SARA 312 reporting: Chromium, Cobalt and Nickel. See Section 3 for weight percentage.

CANADIAN WHMIS CLASSIFICATION: Class D; Division 2, Subdivision A

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): All constituents of these products are on the Domestic Substance List (DSL).

SECTION 16 – OTHER INFORMATION

The following Risk and Safety Phrase Texts and Hazard Statements correspond with the columns labeled - EU 67/548/EEC within Section 2 of this material safety data sheet. Take appropriate precautions and protective measures to eliminate or limit the associated hazard.

EU Directive 67/548/EEC - Risk Phrase Texts

R9 – Explosive when mixed with combustible material
R24/25 – Toxic in contact with skin and if swallowed
R26 – Very toxic by inhalation
R35 – Causes severe burns
R40 – Limited evidence of a carcinogenic effect
R40/20 – Harmful: possible risk of irreversible effects through inhalation
R42/43 – May cause sensitization by inhalation and skin contact
R43 – May cause sensitization by skin contact
R45 – May cause cancer

R46 – May cause heritable genetic damage
R48/20 – Harmful: danger of serious damage to health by prolonged exposure through inhalation
R48/23 – Toxic: danger of serious damage to health by prolonged exposure through inhalation
R50 – Very toxic to aquatic organisms
R53 – May cause long-term adverse effects in the aquatic environment
R62 – Possible risk of impaired fertility

For additional information please refer to the following sources:

USA: **American National Standard (ANSI) Z49.1** "Safety in Welding and Cutting", **ANSI/American Welding Society (AWS) F1.5** "Methods for Sampling and Analyzing Gases from Welding and Allied Processes", **ANSI/AWS F1.1** "Method for Sampling Airborne Particles Generated by Welding and Allied Processes", **AWSF3.2M/F3.2** "Ventilation Guide for Weld Fume", American Welding Society, 550 North Le Jeune Road, Miami, Florida 33135. Safety and Health Fact Sheets available from AWS at www.aws.org. **OSHA Publication 2206 (29 C.F.R. 1910)**, U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. **Threshold Limit Values and Biological Exposure Indices**, American Conference of Governmental Hygienists (ACGIH), 6500 Glenway Ave., Cincinnati, Ohio



MATERIAL SAFETY DATA SHEET

45211, USA. **NFPA 51B** "Standard for Fire Prevention During Welding, Cutting and Other Hot Work" published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.

UK: **WMA Publication 236 and 237**, "Hazards from Welding Fume", "The arc welder at work, some general aspects of health and safety".

Canada: **CSA Standard CAN/CSA-W117.2-01** "Safety in Welding, Cutting and Allied Processes".

Hobart Brothers Company strongly recommends the users of this product study this MSDS, the product label information and become aware of all hazards associated with welding. Hobart Brothers Company believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Hobart Brothers Company cannot make any expressed or implied warranty as to this information.



Material Safety Data Sheet

MSDS ID NO.: 0279MAR019
Revision date: 12/07/2010

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product name: Marathon No. 2 Low Sulfur Diesel Dyed 500 ppm Sulfur Max
Synonym: Diesel No. 2 Dyed 500 ppm Sulfur Max; No. 2 Diesel, Non-Road Use, Dyed; No. 2 Diesel Dyed 500 ppm Sulfur Max; No. 2 NR 500 Diesel Dyed; No. 2 Diesel Dyed (0.05% Sulfur Max)

Chemical Family: Petroleum Hydrocarbon
Formula: Mixture

Manufacturer:
Marathon Petroleum Company LP
539 South Main Street
Findlay OH 45840

Other information: 419-421-3070
Emergency telephone number: 877-627-5463

2. COMPOSITION/INFORMATION ON INGREDIENTS

No. 2 Diesel is a complex mixture of paraffins, cycloparaffins, olefins, and aromatic hydrocarbons having hydrocarbon chain lengths predominately in the range of C11 through C20. May contain a trace amount of benzene (<0.01%). Can contain small amounts of red dye and additives (<0.15%) which are not considered hazardous at the concentrations used.

Note: May contain up to 5% Renewable Diesel, CASN 928771-01-1.

Product information:

Name	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA - Vacated PELs - Time Weighted Ave	Other:
Marathon No. 2 Diesel	68476-30-2	100	Skin - potential significant contribution to overall exposure by the cutaneous route 100 mg/m ³ TWA		

Component Information:

Name	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA - Vacated PELs - Time Weighted Ave	Other:
Saturated Hydrocarbons	Mixture	54-85			

Name	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA - Vacated PELs - Time Weighted Ave	Other:
Aromatic Hydrocarbons	Mixture	15-45			
Unsaturated Hydrocarbons	Mixture	1-6			
Naphthalene	91-20-3	0.01-0.5	Skin - potential significant contribution to overall exposure by the cutaneous route 10 ppm TWA 15 ppm STEL	= 10 ppm TWA = 50 mg/m ³ TWA = 15 ppm STEL = 75 mg/m ³ STEL	

Notes:

The manufacturer has voluntarily elected to reflect exposure limits contained in OSHA's 1989 air contaminants standard in its MSDS's, even though certain of those exposure limits were vacated in 1992.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION!

VAPORS, FUMES, OR MISTS MAY CAUSE RESPIRATORY TRACT IRRITATION
MAY BE HARMFUL OR FATAL IF SWALLOWED
MAY CAUSE LUNG DAMAGE
OVEREXPOSURE MAY CAUSE CNS DEPRESSION

MAY CAUSE CANCER BASED ON ANIMAL DATA
SEE TOXICOLOGICAL INFORMATION SECTION FOR MORE INFORMATION

COMBUSTIBLE LIQUID AND VAPOR
VAPOR MAY CAUSE FLASH FIRE
MATERIAL MAY ACCUMULATE STATIC CHARGE

STABLE

Inhalation:

Breathing high concentrations may be harmful.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure. Overexposure to this material may cause systemic damage including target organ effects listed under "Toxicological Information."

Ingestion:

Swallowing this material may be harmful.

May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage. Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

Skin contact:

Contact may cause reddening, itching and inflammation. Effects may become more serious with repeated or prolonged contact. Skin contact may cause harmful effects in other parts of the body.

Eye contact:

Contact may cause pain and severe reddening and inflammation of the conjunctiva. Effects may become more serious with repeated or prolonged contact.

Carcinogenic Evaluation:

Product information:

Name	IARC Carcinogens:	NTP Carcinogens:	ACGIH - Carcinogens:	OSHA - Select Carcinogens:
Marathon No. 2 Diesel 68476-30-2	NE			

Notes:

The International Agency for Research on Cancer (IARC) has determined that there is inadequate evidence for the carcinogenicity of diesel fuel/fuel oil in humans. IARC determined that there was limited evidence for the carcinogenicity of marine diesel fuel in animals. Distillate (light) diesel fuels were not classifiable as to their carcinogenicity to humans (Group 3A).

IARC has determined that there is sufficient evidence for the carcinogenicity in experimental animals of diesel engine exhaust and extracts of diesel engine exhaust particles. IARC determined that there is only limited evidence for the carcinogenicity in humans of diesel engine exhaust. However, IARC's overall evaluation has resulted in the IARC designation of diesel engine exhaust as probably carcinogenic to humans (Group 2A) because of the presence of certain engine exhaust components.

The International Agency for Research on Cancer (IARC) has also determined that there is sufficient evidence for the carcinogenicity in experimental animals of light and heavy vacuum distillates, of light and heavy catalytically cracked distillates and of cracked residues (including heavy thermocracked distillates/residues) derived from the refining of crude oil.

Component Information:

Name	IARC Carcinogens:	NTP Carcinogens:	ACGIH - Carcinogens:	OSHA - Select Carcinogens:
Naphthalene 91-20-3	Monograph 82 [2002]	Reasonably Anticipated To Be A Human Carcinogen male rat-clear evidence; female rat-clear evidence; male mice-no evidence; female mice-some evidence	A4 - Not Classifiable as a Human Carcinogen	Present

Notes:

The International Agency for Research on Cancer (IARC) and the Environmental Protection Agency (EPA) have determined that naphthalene is a possible human carcinogen.

4. FIRST AID MEASURES

Eye Contact:

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. GET IMMEDIATE MEDICAL ATTENTION.

Skin Contact:

Immediately wash exposed skin with plenty of soap and water while removing contaminated clothing and shoes. Get medical attention if irritation persists. Place contaminated clothing in closed container until cleaned or discarded. If clothing is to be laundered, inform the person performing the operation of contaminant's hazardous properties.

Ingestion:

Do not induce vomiting. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down. Never give anything by mouth to an unconscious person. Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

Inhalation:

Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear and give oxygen. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

NOTES TO PHYSICIAN:

INGESTION: If ingested this material represents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended.

Medical Conditions

Aggravated

By Exposure:

skin,

5. FIRE FIGHTING MEASURES

Suitable extinguishing media:

For small fires, Class B fire extinguishing media such as CO₂, dry chemical, foam (AFFF/ATC) or water spray can be used. For large fires, water spray, fog or foam (AFFF/ATC) can be used. Fire fighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

Specific hazards:

This product has been determined to be a combustible liquid per the OSHA Hazard Communication Standard and should be handled accordingly. For additional fire related information, see NFPA 30 or the North American Emergency Response Guide 128.

Special protective equipment for firefighters:

Avoid using straight water streams. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Avoid excessive water spray application. Keep surrounding area cool with water spray from a distance and prevent further ignition of combustible material. Keep run-off water out of sewers and water sources.

Flash point:

130-190 F

Autoignition temperature:

637 F

Flammable limits in air - lower (%):

0.7

MSDS ID NO.: 0279MAR019

Product name: Marathon No. 2 Low Sulfur Diesel
Dyed 500 ppm Sulfur Max

5. FIRE FIGHTING MEASURES

Flammable limits in air - upper (%): 5.0

NFPA rating:

Health: 1
Flammability: 2
Instability: 1
Other: -

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources. Advise authorities and National Response Center (800-424-8802) if the product has entered a water course or sewer. Notify local health and pollution control agencies, if appropriate. Contain liquid with sand or soil. Recover and return free product to proper containers. Use suitable absorbent materials such as vermiculite, sand, or clay to clean up residual liquids.

7. HANDLING AND STORAGE

Handling:

Comply with all applicable EPA, OSHA, NFPA and consistent state and local requirements. Use appropriate grounding and bonding practices. Store in properly closed containers that are appropriately labeled and in a cool well-ventilated area. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. Do not cut, drill, grind or weld on empty containers since they may contain explosive residues.

Avoid repeated and prolonged skin contact. Never siphon this product by mouth. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT

- Engineering measures:** Local or general exhaust required when using at elevated temperatures that generate vapors or mists.
- Respiratory protection:** Use approved organic vapor chemical cartridge or supplied air respirators when material produces vapors that exceed permissible limits or excessive vapors are generated. Observe respirator assigned protection factors (APFs) criteria cited in federal OSHA 1910.134. Self-contained breathing apparatus should be used for fire fighting.
- Skin and body protection:** Neoprene, nitrile, polyvinyl alcohol (PVA), polyvinyl chloride and polyurethane gloves to prevent skin contact.
- Eye protection:** No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields.
- Hygiene measures:** No special protective clothing is normally required. Select protective clothing depending on industrial operations. Use mechanical ventilation equipment that is explosion-proof.

9. PHYSICAL AND CHEMICAL PROPERTIES:

Appearance: Red Liquid

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Product name: Marathon No. 2 Low Sulfur Diesel
Dyed 500 ppm Sulfur Max

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9. PHYSICAL AND CHEMICAL PROPERTIES:

Physical state (Solid/Liquid/Gas):	Liquid
Substance type (Pure/Mixture):	Mixture
Color:	Red
Odor:	Slight Hydrocarbon
Molecular weight:	180
pH:	Neutral
Boiling point/range (5-95%):	400-640 F
Melting point/range:	Not determined.
Decomposition temperature:	Not applicable.
Specific gravity:	C.A. 0.8
Density:	6.76 lbs/gal
Bulk density:	No data available.
Vapor density:	4-5
Vapor pressure:	1-10 mm Hg @ 100 F
Evaporation rate:	No data available.
Solubility:	Negligible
Solubility in other solvents:	No data available.
Partition coefficient (n-octanol/water):	No data available.
VOC content(%):	10%
Viscosity:	1.9-3.4 @ 40 C

10. STABILITY AND REACTIVITY

Stability:	The material is stable at 70 F, 760 mm pressure.
Polymerization:	Will not occur.
Hazardous decomposition products:	Combustion produces carbon monoxide, aldehydes, aromatic and other hydrocarbons.
Materials to avoid:	Strong oxidizers such as nitrates, perchlorates, chlorine, fluorine.
Conditions to avoid:	Excessive heat, sources of ignition and open flames.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:

Product information:

Name	CAS Number	Inhalation:	Dermal:	Oral:
Marathon No. 2 Diesel	68476-30-2	No data available	No data available	No data available

Toxicology Information:

MIDDLE DISTILLATES, PETROLEUM: Long-term repeated (lifetime) skin exposure to similar materials has been reported to result in an increase in skin tumors in laboratory rodents. The relevance of these findings to humans is not clear at this time.

MIDDLE DISTILLATES WITH CRACKED STOCKS: Light cracked distillates have been shown to be carcinogenic in animal tests and have tested positive with in vitro genotoxicity tests. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function.

ISOPARAFFINS: Studies in laboratory animals have shown that long-term exposure to similar materials (isoparaffins) can cause kidney damage and kidney cancer in male laboratory rats. However, in-depth research indicates that these findings are unique to the male rat, and that these effects are not relevant to humans.

NAPHTHALENE: Severe jaundice, neurotoxicity (kernicterus) and fatalities have been reported in young children and infants as a result of hemolytic anemia from overexposure to naphthalene. Persons with Glucose 6-phosphate dehydrogenase (G6PD) deficiency are more prone to the hemolytic effects of naphthalene. Adverse effects on the kidney have been reported in persons overexposed to naphthalene but these effects are believed to be a consequence of hemolytic anemia, and not a direct effect. Hemolytic anemia has been observed in laboratory animals exposed to naphthalene. Laboratory rodents exposed to naphthalene vapor for 2 years (lifetime studies) developed non-neoplastic and neoplastic tumors and inflammatory lesions of the nasal and respiratory tract. Cataracts and other adverse effects on the eye have been observed in laboratory animals exposed to high levels of naphthalene. Findings from a large number of bacterial and mammalian cell mutation assays have been negative. A few studies have shown chromosomal effects (elevated levels of Sister Chromatid Exchange or chromosomal aberrations) in vitro. Naphthalene has been classified as Possibly Carcinogenic to Humans (2B) by IARC, based on findings from studies in laboratory animals.

DIESEL EXHAUST: Chronic inhalation studies of whole diesel engine exhaust in mice and rats produced a significant increase in lung tumors. Combustion of kerosine and/or diesel fuels produces gases and particulates which include carbon monoxide, carbon dioxide, oxides of nitrogen and/or sulfur and hydrocarbons. Significant exposure to carbon monoxide vapors decreases the oxygen carrying capacity of the blood and may cause tissue hypoxia via formation of carboxyhemoglobin.

TARGET ORGANS:

central nervous system, skin, respiratory system, lungs, kidney, liver, thymus, reproductive organs,

12. ECOTOXICOLOGICAL INFORMATION

Mobility:

May partition into air, soil and water.

Ecotoxicity:

Toxic to aquatic organisms.

Bioaccumulation:

Not expected to bioaccumulate in aquatic organisms.

Persistence/Biodegradation:

Readily biodegradable in the environment.

13. DISPOSAL CONSIDERATIONS

Cleanup Considerations:

This product as produced is not specifically listed as an EPA RCRA hazardous waste according to federal regulations (40 CFR 261). However, when discarded or disposed of, it may meet the criteria of an "characteristic" hazardous waste. This material could become a hazardous waste if mixed or contaminated with a hazardous waste or other substance(s). It is the responsibility of the user to determine if disposal material is hazardous according to federal, state and local regulations.

14. TRANSPORT INFORMATION

49 CFR 172.101:

DOT:

Transport Information: This material when transported via US commerce would be regulated by DOT Regulations.

Proper shipping name:	Fuel Oil, No. 2
UN/Identification No:	NA 1993
Hazard Class:	3
Packing group:	III
DOT reportable quantity (lbs):	Not applicable.

Proper shipping name:	Fuel Oil, No. 2
UN/Identification No:	NA 1993
Hazard Class:	3
Packing group:	III

15. REGULATORY INFORMATION

US Federal Regulatory Information:

MSDS ID NO.: 0279MAR019

Product name: Marathon No. 2 Low Sulfur Diesel Dyed 500 ppm Sulfur Max

US TSCA Chemical Inventory Section 8(b):

This product and/or its components are listed on the TSCA Chemical Inventory.

OSHA Hazard Communication Standard:

This product has been evaluated and determined to be hazardous as defined in OSHA's Hazard Communication Standard.

EPA Superfund Amendment & Reauthorization Act (SARA):

SARA Section 302:

This product contains the following component(s) that have been listed on EPA's Extremely Hazardous Substance (EHS) List:

Name	CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs
Saturated Hydrocarbons	NA
Aromatic Hydrocarbons	NA
Unsaturated Hydrocarbons	NA
Naphthalene	NA

SARA Section 304:

This product contains the following component(s) identified either as an EHS or a CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements:

Name	CERCLA/SARA - Hazardous Substances and their Reportable Quantities
Saturated Hydrocarbons	NA
Aromatic Hydrocarbons	NA
Unsaturated Hydrocarbons	NA
Naphthalene	= 100 lb final RQ = 45.4 kg final RQ

SARA Section 311/312

The following EPA hazard categories apply to this product:

- Acute Health Hazard
- Fire Hazard
- Chronic Health Hazard

SARA Section 313:

This product contains the following component(s) that may be subject to reporting on the Toxic Release Inventory (TRI) From R:

Name	CERCLA/SARA 313 Emission reporting:
Saturated Hydrocarbons	None
Aromatic Hydrocarbons	None
Unsaturated Hydrocarbons	None
Naphthalene	= 0.1 % de minimis concentration

State and Community Right-To-Know Regulations:

The following component(s) of this material are identified on the regulatory lists below:

Saturated Hydrocarbons

- Louisiana Right-To-Know: Not Listed
- California Proposition 65: Not Listed
- New Jersey Right-To-Know: Not Listed.
- Pennsylvania Right-To-Know: Not Listed.
- Massachusetts Right-To Know: Not Listed.
- Florida substance List: Not Listed.
- Rhode Island Right-To-Know: Not Listed
- Michigan critical materials register list: Not Listed.

Saturated Hydrocarbons

Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Not Listed
New Jersey - Environmental Hazardous Substances List:	Not Listed
Illinois - Toxic Air Contaminants	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed

Aromatic Hydrocarbons

Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	Not Listed.
Pennsylvania Right-To-Know:	Not Listed.
Massachusetts Right-To Know:	Not Listed.
Florida substance List:	Not Listed.
Rhode Island Right-To-Know:	Not Listed
Michigan critical materials register list:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Not Listed
New Jersey - Environmental Hazardous Substances List:	Not Listed
Illinois - Toxic Air Contaminants	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed

Unsaturated Hydrocarbons

Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	Not Listed.
Pennsylvania Right-To-Know:	Not Listed.
Massachusetts Right-To Know:	Not Listed.
Florida substance List:	Not Listed.
Rhode Island Right-To-Know:	Not Listed
Michigan critical materials register list:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Not Listed
New Jersey - Environmental Hazardous Substances List:	Not Listed
Illinois - Toxic Air Contaminants	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed

Naphthalene

Louisiana Right-To-Know:	Not Listed
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Saturated Hydrocarbons

California Proposition 65:	carcinogen, initial date 4/19/02
New Jersey Right-To-Know:	sn 1322
Pennsylvania Right-To-Know:	Environmental hazard
Massachusetts Right-To Know:	Present
Florida substance List:	Not Listed.
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan critical materials register list:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	carcinogen
New Jersey - Environmental Hazardous Substances List:	SN 1322 TPQ 500 lb
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	= 1 lb RQ land/water = 100 lb RQ air

Canadian Regulatory Information:

Canada DSL/NDSL Inventory: This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

Name	Canada - WHMIS: Classifications of Substances:	Canada - WHMIS: Ingredient Disclosure:
Naphthalene	B4, D2A	1 %

NOTE: Not Applicable.

16. OTHER INFORMATION

Additional Information: No data available.

Prepared by: Mark S. Swanson, Manager, Toxicology and Product Safety

The information and recommendations contained herein are based upon tests believed to be reliable. However, Marathon Petroleum Company LP (MPC) does not guarantee their accuracy or completeness nor shall any of this information constitute a warranty, whether expressed or implied, as to the safety of the goods, the merchantability of the goods, or the fitness of the goods for a particular purpose. Adjustment to conform to actual conditions of usage maybe required. MPC assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied.

End of Safety Data Sheet

Safety data sheet for hot rolled and cold rolled sheet steel

Hot rolled and cold rolled sheet steel are defined as articles conforming to Regulation (EC) No 1907/2006 "REACH" and are thus not subject to the requirement of a safety data sheet. Relevant parts of equivalent information are nevertheless presented.

1. NAME OF PRODUCT AND COMPANY

Product	Domex and Docol
Description	Hot rolled and cold rolled sheet steel
Field of application	Structural sheet steel, mainly for the engineering industry and the transport sector.
Manufacturer/Supplier	SSAB EMEA AB
Address	781 84 Borlänge
Phone	+46 243 70 000
Issued in	November 2012
Responsible for the information	SSAB EMEA AB
Address	SE-781 84 Borlänge
Phone	+46 243 70 000
E-mail	info@ssab.com

2. IDENTIFICATION OF HAZARDS

Description of hazards

Dust and fumes may be generated during working, e.g. during welding, cutting or grinding. Long term over-exposure to air pollutants in the form of dust or fumes may affect health and cause, for instance, chronic bronchitis.

A thin coat of anti-corrosion oil is applied to certain materials. This should be taken into account during handling and working. Heating and working of materials that have been coated with anti-corrosion oil may cause irritating and hygienically harmful fumes. Skin irritation may be caused by repeated or extended contact with anti-corrosion oil.

3. COMPOSITION/INFORMATION ON CONSTITUENTS

Iron alloy with up to 1,5% carbon.

Other alloying elements			
Element	CAS No.	Conc %	Classification according to Regulation (EU) No 1272/2008 "CLP"
Manganese	7439-96-5	<2,5	-
Silicon	7440-21-03	<2,5	-
Chromium	7440-47-3	<1,25	-
Nickel	7440-02-0	<1*	Carc. 2; H351 STOT RE 1; H372 Skin Sens. 1; H317
Molybdenum	7439-98-7	<0,7	-
Copper	7440-50-8	<0,5	-

Comments on composition: Other elements that may occur as minor quantities of alloying elements are phosphorus, niobium, titanium, aluminium, vanadium, boron, silicon. The sheet steel may be coated with anti-corrosion oil as specified by the customer.

*In Domex 960 and Domex 1200 the Conc% of Ni is less than 2.

In accordance with the CLP Regulation mixtures containing $\geq 1,0\%$ nickel should be classified as carcinogen category 2 and as a skin sensitizer category 1. Mixtures containing $\geq 1,0\%$ - $<10\%$ nickel should be classified as specific target organ toxic category 2. Mixtures containing less than 1% Ni are not classified.

Metals in massive form do not require a label according to the CLP Regulation if they do not present a hazard in the form in which they are placed on the market.

Safety data sheet for hot rolled and cold rolled sheet steel

4. FIRST AID MEASURES

Inhalation

Not applicable to steel in solid form. In the event of inhalation of dust and fumes during working, ensure good supply of fresh air. If complaint persists, consult a doctor.

Skin

There are no specific symptoms associated with steel in solid form. In the event of contact with anti-corrosion oil, wash the skin with soap and water. Suitable care should be sought in the event of injury to skin.

Eyes

If the eyes are exposed to grinding dust/particles, carefully rinse with water and consult a doctor if the irritation persists. Immediately visit a doctor if a metal chip has penetrated the eye.

Ingestion

Not applicable.

5. FIRE FIGHTING MEASURES

Not applicable to steel in solid form. Not combustible. Finely dispersed material in the form of powder involves a risk of ignition and dust explosion in air. Use an extinguishing agent suitable for the surrounding fire and environment.

6. ACCIDENTAL RELEASE MEASURES

Not applicable to steel in solid form. To avoid the spreading of dust when collecting dust and fine particles, use a vacuum cleaner or wet the spillage with water and remove it. Use safety equipment in accordance with section 8 of the safety data sheet.

7. HANDLING AND STORAGE

Care should be taken to avoid injury caused by products delivered as stacked cut-to-length sheet or in the form of coils that may have sharp edges. Certain products are strapped with steel straps. The straps must not be used for lifting the products. Coils or bundled products may whip out and cause injuries when the strap is removed or if it should fail. The outer turn of a coil may be loose, which increases the risk of the straps failing. Suitable protective equipment, e.g. gloves and goggles, should be used and working routines should be introduced which take into account the risks that may arise if the straps should fail or when the strapping is removed.

Store away from acids.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Technical measures

Dust and fumes may be generated during working, e.g. during welding, cutting or grinding. The fumes may contain dust and particles covered by exposure limitations. Adequate ventilation and/or extraction should be installed to ensure that these limit values are not exceeded. If anti-corrosion oil has been applied to the sheet steel, consider washing before working

Personal protective equipment

Respiratory protection:

If the ventilation is insufficient, a suitable approved respirator should be used during welding and mechanical working and in other situations in which dust and particles may occur.

Eye protection:

Use protective goggles during welding and mechanical working and in other situations in which dust and particles may occur.

Skin protection:

Use protective gloves of a suitable material as protection against the risk of cutting injuries.

Exposure limits:

For exposure limits refer to the national legislation of the country where the product is used.

Safety data sheet for hot rolled and cold rolled sheet steel

9. PHYSICAL AND CHEMICAL PROPERTIES

Colour:	Metallic grey
Smell:	None
Form/state:	Solid
Density:	7700 - 7870 kg/m ³
Melting point:	1460 °C - 1530 °C

10. STABILITY AND REACTIVITY

Stability

Stable in normal condition.

Reacts with

Reacts with strong acids, and hydrogen is then one of the substances emitted.

Other information

Metal fumes may occur when the material is heated to high temperatures, e.g. during cutting, welding and melting.

11. TOXICOLOGICAL INFORMATION

Inhalation

Not applicable to steel in the product forms delivered. Dust or fumes containing complex and mixed oxides of iron and alloying elements may occur on mechanical working, cutting and welding of steel. Some of the metal oxides may be hygienically harmful, toxic or give rise to metal fume fever. Long term over-exposure to air pollutants in the form of dust or fumes may affect health and cause, for instance, chronic bronchitis. Heating and working of material that has been coated with anti-corrosion oil may give rise to irritating and hygienically harmful fumes.

Skin

Not applicable to steel in the product forms delivered. Repeated or long term exposure of the skin to anti-corrosion oil may give rise to inflammation of the skin (dermatitis).

Eyes

Not applicable to steel in the product forms delivered. Dust or fumes may be formed during mechanical working, cutting or welding of steel, and these may cause eye irritation. Metal chips may cause eye injuries and give rise to the risk of permanent vision impairment.

Ingestion

Not applicable.

Other information

Risk of cutting or crushing injuries during handling.

12. ECOLOGICAL INFORMATION

No ecotoxicological effects are known for the product as a whole. Environmentally harmful compounds may form during working, e.g. welding.

13. WASTE MANAGEMENT

Steel scrap is a recyclable material. There are established procedures for waste management and recycling. Contact an authorized company.

Safety data sheet for hot rolled and cold rolled sheet steel

14. TRANSPORT INFORMATION

The products are heavy and it is therefore important to provide secure lashing.

15. REGULATIONS - CLASSIFICATION AND IDENTIFICATION

Defined as an article conforming to Regulation (EC) No 1907/2006 "REACH"

The full text of the hazard indications are as follows

Carc. 2; H351 - Suspected of causing cancer
STOT RE 1; H372 - Causes damage to organs through prolonged or repeated exposure
Skin Sens. 1; H317 - May cause an allergic skin reaction

16. OTHER INFORMATION

References to EU legislation

- Regulation 1907/2006 on the registration, evaluation, authorization and restriction of chemical substances, "REACH".
- Regulation 1272/2008 on classification, labelling and packaging of substances and mixtures "CLP".
- Directive 67/548/EEC on the classification, packaging and labelling of dangerous substances.
- Directive 99/45/EC on the classification, packaging and labelling of dangerous preparations.

General information

The information in this safety data sheet is based on the knowledge and experience now accumulated at SSAB. The safety data sheet describes the products with regard to safety aspects.

SSAB EMEA AB
SE-781 84 Borlänge
Sweden

Tel +46 243 700 00
Fax +46 243 720 00

help@ssab.com



Product Name: MOBILGREASE XHP 222
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MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: MOBILGREASE XHP 222
Product Description: Base Oil and Additives
Product Code: 530436-85
Intended Use: Grease

COMPANY IDENTIFICATION

Supplier: Southern Cross Oil Pty Ltd
Trading as Southern Cross Lubes
A.B.N. 43 121 686 253
Level 1/121 Fairbairn Road
Sunshine
Victoria 3020 Australia

24 Hour Environmental / Health Emergency Telephone	1800 023 005
Product Technical Information	1300 4 MOBIL (66245)
Supplier General Contact	1300 552 861

SECTION 2 HAZARDS IDENTIFICATION

HAZARD CLASSIFICATION: NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOOD.

Classified in accordance with Approved Criteria for Classifying Hazardous Substances NOHSC:1008 & according to Australian Dangerous Goods Code.

POISON SCHEDULE NUMBER: None Allocated.

HEALTH HAZARDS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.



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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*	Symbols/Risk Phrases
ZINC DIALKYL DITHIOPHOSPHATE	68457-79-4	< 2.5%	Xi;R38, Xi;R41
BENZENAMINE, N-PHENYL-, REACTION PRODUCTS WITH 2,4,4-TRIMETHYLPENTENE	68411-46-1	1 - 5%	None

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. Other ingredients determined not to be hazardous up to 100%.

SECTION 4 FIRST AID MEASURES

INHALATION

Under normal conditions of intended use, this material is not expected to be an inhalation hazard.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulphur oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES



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Flash Point [Method]: >204C (400F) [EST. FOR OIL, ASTM D-92 (COC)]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D

SECTION 6	ACCIDENTAL RELEASE MEASURES
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NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

SPILL MANAGEMENT

Land Spill: Allow spilled material to solidify and shovel it up into a suitable container for recycle or disposal. Scrape up spilled material with shovels into a suitable container for recycle or disposal.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Skim from surface

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted.

Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7	HANDLING AND STORAGE
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HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is not a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8	EXPOSURE CONTROLS / PERSONAL PROTECTION
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NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

Biological limits



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No biological limits allocated.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:
No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No protection is ordinarily required under normal conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Viton, Nitrile

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.



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SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Solid
Form: Semi-fluid
Colour: Dark Blue
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.91
Flash Point [Method]: >204C (400F) [EST. FOR OIL, ASTM D-92 (COC)]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D
Boiling Point / Range: > 316C (600F)
Vapour Density (Air = 1): N/D
Vapour Pressure: < 0.013 kPa (0.1 mm Hg) at 20 C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 220 cSt (220 mm²/sec) at 40 C | >16 cSt (16 mm²/sec) at 100C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: >260°C (500°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

NOTE: Most physical properties above are for the oil component in the material.

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

INCOMPATIBLE MATERIALS: Strong oxidisers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS REACTIONS: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION



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ACUTE TOXICITY

<u>Route of Exposure</u>	<u>Conclusion / Remarks</u>
Inhalation	
Toxicity: No end point data.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals. C.I. Solvent blue: Positive in the Ames and Mouse Lymphoma mutagenicity assay.

Additional information is available by request.

IARC Classification:

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = IARC 1

2 = IARC 2A

3 = IARC 2B

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY



Product Name: MOBILGREASE XHP 222
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Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13	DISPOSAL CONSIDERATIONS
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Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. **DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.**

SECTION 14	TRANSPORT INFORMATION
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LAND (ADG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15	REGULATORY INFORMATION
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Material is not hazardous as defined by the Approved Criteria for Classifying Hazardous Substances NOHSC:1008.

Product is not regulated according to Australian Dangerous Goods Code.

No Poison Schedule number allocated by the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) established under the Therapeutic Goods Act.



Product Name: MOBILGREASE XHP 222
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REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

Complies with the following national/regional chemical inventory requirements: AICS, IECSC, EINECS, ENCS, PICCS, TSCA

Special Cases:

Inventory	Status
KECI	Restrictions Apply
NDSL	Restrictions Apply

SECTION 16 OTHER INFORMATION

KEY TO ABBREVIATIONS AND ACRONYMS:

N/D = Not determined, N/A = Not applicable, STEL = Short-Term Exposure Limit, TWA = Time-Weighted Average

KEY TO THE RISK CODES CONTAINED IN SECTION 2 AND 3 OF THIS DOCUMENT (for information only):

R38; Irritating to skin.

R41; Risk of serious damage to eyes.

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:

Section 11: Acute Toxicity Table Header was modified.

Section 09: Physical State was modified.

Section 09: Colour was modified.

Section 11: Ingestion Acute Lethality - Header was modified.

Section 11: Inhalation - Header was modified.

Section 09: Evaporation Rate - Header was modified.

Section 05: Hazardous Combustion Products was modified.

Section 06: Accidental Release - Spill Management - Water was modified.

Section 09: Viscosity was modified.

Section 09: Viscosity was modified.

Section 14: Sea (IMDG) - Header was modified.

Section 14: Air (IATA) - Header was modified.

Section 14: Sea (IMDG) - Default was modified.

Section 14: Air (IATA) - Default was modified.

Hazard Identification: Hazards Note was modified.

Section 15: Special Cases Table was modified.

Composition: Component Table was modified.

Section 16: RCode Key was modified.

Section 08: Hand Protection CEN Standards - AP was modified.

Section 16: Prepared By was modified.

Section 09: Section 9 Footnotes was modified.

Section 09: Oxidizing Properties was modified.

Section 11: Tox Table - Header was modified.

Composition: Australia Hazardous Substance/Dangerous Good Statements - Header was modified.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and



Product Name: MOBILGREASE XHP 222

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examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

DGN: 2006153XAU (550268)

Prepared by: Exxon Mobil Corporation
EMBSI, Clinton NJ USA

Contact Point: See Section 1 for Local Contact number

End of (M)SDS

Safety data sheet

Nitrogen, refrigerated, liquid.

Creation date : 27.01.2005
Revision date : 20.12.2010

Version : 3.0

DE / E

SDS No. : 8348
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1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

Product name

Nitrogen, refrigerated, liquid.
EC No (from EINECS): 231-783-9
CAS No: 7727-37-9
Index-Nr. -

Chemical formula N₂

REACH Registration number:

Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.

Known uses

Not known.

Company identification

Linde AG, Linde Gas Division, Seitnerstraße 70, D-82049 Pullach
E-Mail Address Info@de.linde-gas.com
Emergency phone numbers (24h): 089-7446-0

2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

Classification acc. to Regulation (EC) No 1272/2008/EC (CLP/GHS)

Press. Gas - Contains refrigerated gas; may cause cryogenic burns or injury.

Classification acc. to Directive 67/548/EEC & 1999/45/EC

Not classified as hazardous to health.
Asphyxiant in high concentrations.

Risk advice to man and the environment

Refrigerated liquefied gas. Contact with product may cause cold burns or frostbite.

In high concentrations may cause asphyxiation.

Label Elements

- Labelling Pictograms



- Signal word

Warning

- Hazard Statements

H281 Contains refrigerated gas; may cause cryogenic burns or injury.
EIGA-As Asphyxiant in high concentrations.

- Precautionary Statements

Precautionary Statement Prevention

P282 Wear cold insulating gloves/face shield/eye protection.

Precautionary Statement Reaction

P336+P315 Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

Precautionary Statement Storage

P403 Store in a well-ventilated place.

Precautionary Statement Disposal

3 COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation: Substance.

Components/Impurities

Nitrogen, refrigerated, liquid.

CAS No: 7727-37-9

Index-Nr.: -

EC No (from EINECS): 231-783-9

REACH Registration number:

Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.

Contains no other components or impurities which will influence the classification of the product.

4 FIRST AID MEASURES

Inhalation

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Skin/eye contact

Immediately flush eyes thoroughly with water for at least 15 minutes. In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

Ingestion

Ingestion is not considered a potential route of exposure.

5 FIRE FIGHTING MEASURES

Specific hazards

Exposure to fire may cause containers to rupture/explode. Non flammable.

Hazardous combustion products

None.

Suitable extinguishing media

All known extinguishants can be used.

Specific methods

If possible, stop flow of product. Move container away or cool with water from a protected position.

Special protective equipment for fire fighters

In confined space use self-contained breathing apparatus.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions

Evacuate area. Use protective clothing. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.

Environmental precautions

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Try to stop release.

Clean up methods

Ventilate area.

7 HANDLING AND STORAGE

Handling

Suck back of water into the container must be prevented. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.

Safety data sheet

Nitrogen, refrigerated, liquid.

Creation date : 27.01.2005
Revision date : 20.12.2010

Version : 3.0

DE / E

SDS No. : 8348
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Storage

Keep container below 50°C in a well ventilated place. Observe "Technische Regeln Druckgase (TRG) 280 Ziffer 5"

8 EXPOSURE CONTROLS/PERSONAL PROTECTION**Personal protection**

Protect eyes, face and skin from liquid splashes. Ensure adequate ventilation.

9 PHYSICAL AND CHEMICAL PROPERTIES**General information**

Appearance/Colour: Colourless liquid.

Odour: None.

Important information on environment, health and safety

Molecular weight: 28 g/mol

Melting point: -210 °C

Boiling point: -196 °C

Critical temperature: -147 °C

Autoignition temperature: Not applicable.

Flammability range: Not applicable.

Relative density, gas: 0,97

Relative density, liquid: 0,8

Solubility mg/l water: 20 mg/l

Other data

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10 STABILITY AND REACTIVITY**Stability and reactivity**

Stable under normal conditions. Liquid spillages can cause embrittlement of structural materials.

11 TOXICOLOGICAL INFORMATION**General**

No known toxicological effects from this product.

12 ECOLOGICAL INFORMATION**General**

Can cause frost damage to vegetation.

13 DISPOSAL CONSIDERATIONS**General**

Do not discharge into any place where its accumulation could be dangerous. Contact supplier if guidance is required.

EWC Nr. 16 05 05

14 TRANSPORT INFORMATION**ADR/RID**

Class 2 Classification Code 3A

UN number and proper shipping name

UN 1977 Nitrogen, refrigerated, liquid

UN 1977 Nitrogen, refrigerated, liquid

Labels 2.2 Hazard number 22

Packing Instruction P203

IMDG

Class 2.2

UN number and proper shipping name

UN 1977 Nitrogen, refrigerated, liquid

Labels 2.2

Packing Instruction P203

EmS FC,SV

IATA

Class 2.2

UN number and proper shipping name

UN 1977 Nitrogen, refrigerated, liquid

Labels 2.2

Packing Instruction P202

Other transport information

Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Ensure adequate ventilation. Avoid transport on vehicles where the load space is not separated from the driver's compartment. Before transporting product containers ensure that they are firmly secured. Ensure compliance with applicable regulations.

15 REGULATORY INFORMATION**Water pollution class**

Not polluting to waters according to VwVwS from 27.07.2005.

TA-Luft

Not classified according to TA-Luft.

16 OTHER INFORMATION

Ensure all national/local regulations are observed. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Advice

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press.

Further information

Linde safety advice

No. 1 Handling of refrigerated liquid gases

No. 3 Oxygen deficiency

No. 11 Transport of gas receptacles in vehicles

End of document

SAFETY DATA SHEET

Oxygen

Section 1. Identification

GHS product identifier	: Oxygen
Chemical name	: oxygen
Other means of identification	: Molecular oxygen; Oxygen molecule; Pure oxygen; O ₂ ; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)
Product use	: Synthetic/Analytical chemistry.
Synonym	: Molecular oxygen; Oxygen molecule; Pure oxygen; O ₂ ; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)
SDS #	: 001043
Supplier's details	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
Emergency telephone number (with hours of operation)	: 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: OXIDIZING GASES - Category 1 GASES UNDER PRESSURE - Compressed gas

GHS label elements

Hazard pictograms



Signal word

: Danger

Hazard statements

: May cause or intensify fire; oxidizer.
Contains gas under pressure; may explode if heated.

Precautionary statements

General

: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Open valve slowly. Use only with equipment cleaned for Oxygen service.

Prevention

: Keep away from clothing, incompatible materials and combustible materials. Keep reduction valves free from grease and oil. Use and store only outdoors or in a well ventilated place.

Response

: In case of fire: Stop leak if safe to do so.

Storage

: Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

Disposal

: Not applicable.

Date of issue/Date of revision

: 10/16/2014.

Date of previous issue

: 9/29/2014.

Version : 0.02

1/12

Section 2. Hazards identification

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : oxygen

Other means of identification : Molecular oxygen; Oxygen molecule; Pure oxygen; O₂; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)

CAS number/other identifiers

CAS number : 7782-44-7

Product code : 001043

Ingredient name	%	CAS number
oxygen	100	7782-44-7

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : May cause eye irritation. Contact with rapidly expanding gas may cause burns or frostbite.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : May cause skin irritation. Contact with rapidly expanding gas may cause burns or frostbite.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : No specific data.

Section 4. First aid measures

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. Oxidizing material. This material increases the risk of fire and may aid combustion. Contact with combustible material may cause fire. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous thermal decomposition products : No specific data.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Section 6. Accidental release measures

- Large spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Keep away from clothing, incompatible materials and combustible materials. Keep reduction valves free from grease and oil. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Separate from acids, alkalis, reducing agents and combustibles. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

- Appropriate engineering controls** : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Date of issue/Date of revision : 10/16/2014. **Date of previous issue** : 9/29/2014. **Version** : 0.02 4/12

Section 8. Exposure controls/personal protection

- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

- Physical state** : Gas. [Compressed gas.]
- Color** : Colorless. Blue.
- Molecular weight** : 32 g/mole
- Molecular formula** : O₂
- Boiling/condensation point** : -183°C (-297.4°F)
- Melting/freezing point** : -218.4°C (-361.1°F)
- Critical temperature** : -118.15°C (-180.7°F)
- Odor** : Odorless.
- Odor threshold** : Not available.
- pH** : Not available.
- Flash point** : [Product does not sustain combustion.]
- Burning time** : Not applicable.
- Burning rate** : Not applicable.
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Extremely flammable in the presence of the following materials or conditions: reducing materials, combustible materials and organic materials.
- Lower and upper explosive (flammable) limits** : Not available.
- Vapor pressure** : Not available.
- Vapor density** : 1.1 (Air = 1)
- Specific Volume (ft³/lb)** : 12.0482
- Gas Density (lb/ft³)** : 0.083
- Relative density** : Not applicable.
- Solubility** : Not available.
- Solubility in water** : Not available.
- Partition coefficient: n-octanol/water** : 0.65
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.

Section 9. Physical and chemical properties

SADT : Not available.

Viscosity : Not applicable.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Hazardous reactions or instability may occur under certain conditions of storage or use. Conditions may include the following:
contact with combustible materials
Reactions may include the following:
risk of causing fire

Conditions to avoid : No specific data.

Incompatibility with various substances : Extremely reactive or incompatible with the following materials: oxidizing materials, reducing materials and combustible materials.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Section 11. Toxicological information

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

- Eye contact** : May cause eye irritation. Contact with rapidly expanding gas may cause burns or frostbite.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : May cause skin irritation. Contact with rapidly expanding gas may cause burns or frostbite.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : No specific data.
- Ingestion** : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Potential chronic health effects

Not available.

- General** : No known significant effects or critical hazards.
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
oxygen	0.65	-	low

Mobility in soil



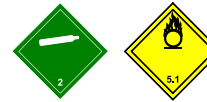
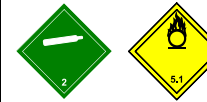
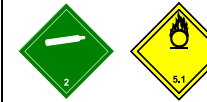
Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1072	UN1072	UN1072	UN1072	UN1072
UN proper shipping name	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED
Transport hazard class(es)	2.2 (5.1) 	2.2 (5.1) 	2.2 (5.1) 	2.2 (5.1) 	2.2 (5.1) 
Packing group	-	-	-	-	-
Environment	No.	No.	No.	No.	No.
Additional information	Limited quantity Yes. Packaging instruction Passenger aircraft Quantity limitation: 75 kg Cargo aircraft	Explosive Limit and Limited Quantity Index 0.125 ERAP Index 3000 Passenger Carrying Ship Index	-	-	Passenger and Cargo Aircraft Quantity limitation: 75 kg Cargo Aircraft Only Quantity limitation: 150 kg

Section 14. Transport information

	Quantity limitation: 150 kg	50			
	Special provisions A52	Passenger Carrying Road or Rail Index 75			
		Special provisions 42			

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Special precautions for user : **Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption:** This material is listed or exempted.
United States inventory (TSCA 8b): This material is listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Sudden release of pressure

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
oxygen	100	No.	Yes.	No.	No.	No.

State regulations

Massachusetts : This material is listed.

Section 15. Regulatory information

- New York** : This material is not listed.
- New Jersey** : This material is listed.
- Pennsylvania** : This material is listed.
- Canada inventory** : This material is listed or exempted.
- International regulations**
- International lists** :
- Australia inventory (AICS)**: This material is listed or exempted.
 - China inventory (IECSC)**: This material is listed or exempted.
 - Japan inventory**: Not determined.
 - Korea inventory**: This material is listed or exempted.
 - Malaysia Inventory (EHS Register)**: Not determined.
 - New Zealand Inventory of Chemicals (NZIoC)**: This material is listed or exempted.
 - Philippines inventory (PICCS)**: This material is listed or exempted.
 - Taiwan inventory (CSNN)**: Not determined.
- Chemical Weapons Convention List Schedule I Chemicals** : Not listed
- Chemical Weapons Convention List Schedule II Chemicals** : Not listed
- Chemical Weapons Convention List Schedule III Chemicals** : Not listed

Canada

- WHMIS (Canada)** : Class A: Compressed gas.
Class C: Oxidizing material.
- CEPA Toxic substances**: This material is not listed.
- Canadian ARET**: This material is not listed.
- Canadian NPRI**: This material is not listed.
- Alberta Designated Substances**: This material is not listed.
- Ontario Designated Substances**: This material is not listed.
- Quebec Designated Substances**: This material is not listed.

Section 16. Other information

- Canada Label requirements** : Class A: Compressed gas.
Class C: Oxidizing material.

Hazardous Material Information System (U.S.A.)

Health	0
Flammability	0
Physical hazards	3

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Section 16. Other information



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

Date of printing : 10/16/2014.

Date of issue/Date of revision : 10/16/2014.

Date of previous issue : 9/29/2014.

Version : 0.02

Key to abbreviations

: ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 IATA = International Air Transport Association
 IBC = Intermediate Bulk Container
 IMDG = International Maritime Dangerous Goods
 LogPow = logarithm of the octanol/water partition coefficient
 MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
 UN = United Nations
 ACGIH – American Conference of Governmental Industrial Hygienists
 AIHA – American Industrial Hygiene Association
 CAS – Chemical Abstract Services
 CEPA – Canadian Environmental Protection Act
 CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (EPA)
 CFR – United States Code of Federal Regulations
 CPR – Controlled Products Regulations
 DSL – Domestic Substances List
 GWP – Global Warming Potential
 IARC – International Agency for Research on Cancer
 ICAO – International Civil Aviation Organisation
 Inh – Inhalation
 LC – Lethal concentration
 LD – Lethal dosage
 NDSL – Non-Domestic Substances List
 NIOSH – National Institute for Occupational Safety and Health
 TDG – Canadian Transportation of Dangerous Goods Act and Regulations
 TLV – Threshold Limit Value
 TSCA – Toxic Substances Control Act
 WEEL – Workplace Environmental Exposure Level
 WHMIS – Canadian Workplace Hazardous Material Information System

References : Not available.

▣ Indicates information that has changed from previously issued version.

Date of issue/Date of revision : 10/16/2014. **Date of previous issue** : 9/29/2014. **Version** : 0.02 11/12

Section 16. Other information

[Notice to reader](#)

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



SAFETY DATA SHEET

Section 1: IDENTIFICATION

1.1 PRODUCT IDENTIFIER

Product Name: PB Penetrating Catalyst (Aerosol)
Product Code: 16-PB, 8-PB, 8-PBS, PBTS, 20-PB

1.2 RECOMMENDED USE OF CHEMICAL AND RESTRICTIONS ON USE

Use: Lubricant

1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Name/Address: The Blaster Corporation
8500 Sweet Valley Drive
Valley View, Ohio 44125 – USA

Telephone Number: T (216) 901-5800
F (216) 901-5801

1.4 EMERGENCY TELEPHONE NUMBER

Emergency Telephone Number: CHEMTREC: (800) 424-9300
Date of Preparation: May 26, 2014 **Version #:** 1.0

Section 2: HAZARD(S) IDENTIFICATION

2.1 CLASSIFICATION OF THE CHEMICAL ACCORDING TO OSHA HAZCOM 2012

Hazard class

Flammable Aerosol 2
Gases Under Pressure (Dissolved Gas)
Serious Eye Irritation 2A
Carcinogenicity 2
Aspiration Hazard 1

2.2 LABEL ELEMENTS ACCORDING TO OSHA HAZCOM 2012

Hazard Pictogram:



Signal Word: Danger

Hazard Statement: Flammable aerosol. Contains gas under pressure; may explode if heated. Causes serious eye irritation. Suspected of causing cancer. May be fatal if swallowed and enters airways.

Prevention: Keep away from heat/sparks/open flames/hot surfaces. -No smoking. Do not spray on an open flame or other ignition source. Pressurized container: Do not pierce or burn, even after use. Wash hands thoroughly after handling. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.



SAFETY DATA SHEET

Response: If exposed or concerned: Get medical advice/attention. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.

Storage: Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F. Store in a well-ventilated place. Store locked up.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

2.3 ADDITIONAL INFORMATION

Hazards not otherwise classified: Not applicable.

8 % of the mixture consists of ingredient(s) of unknown acute toxicity.

This product is a hazardous chemical as defined by NOM-018-STPS-2000.

Mexico Classification:



Blue = Health Red = Flammability Yellow = Reactivity White = Special

Hazard Rating: 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 MIXTURES

Ingredient	UN #	H / F / R / *	CAS No	Wt. %
Distillates (petroleum), hydrotreated light	Not available	Not available	64742-47-8	50 - 60
Solvent naphtha (petroleum), heavy aromatic	UN1270	Not available	64742-94-5	20 - 30
Distillates (petroleum), hydrotreated heavy naphthenic	Not available	Not available	64742-52-5	20 - 30
Carbon dioxide	UN1013	1/0/0	124-38-9	1 - 5
Naphthalene	UN1334/ UN2304	2/2/0	91-20-3	2 - 3
Dinonylphenol, ethoxylated, phosphated	Not available	Not available	39464-64-7	0.5 - 1.5

The exact percentage (concentration) of composition has been withheld as a trade secret in accordance with paragraph (i) of §1910.1200.

* Per NOM-018-STPS-2000



SAFETY DATA SHEET

Section 4: FIRST- AID MEASURES

4.1 DESCRIPTION OF THE FIRST AID MEASURE

- Eye:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses, if worn. If irritation persists, get medical attention.
- Skin:** In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician if irritation develops and persists.
- Inhalation:** If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.
- Ingestion:** If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get immediate medical advice/attention.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

- Eye:** Causes serious eye irritation. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva.
- Skin:** May cause skin irritation. Symptoms may include redness, drying, defatting and cracking of the skin.
- Inhalation:** May be fatal if swallowed and enters airways. This product may be aspirated into the lungs and cause chemical pneumonitis. May cause stomach distress, nausea or vomiting.
- Ingestion:** May cause respiratory tract irritation.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENTS NEEDED

- Note to Physicians:** Symptoms may not appear immediately.
- Specific Treatments:** In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).

Section 5: FIRE-FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

- Suitable Extinguishing Media:** Dry chemical, carbon dioxide or foam.
- Unsuitable Extinguishing Media:** Water may be ineffective for extinguishing fire.

5.2 SPECIAL HAZARDS ARISING FROM THE CHEMICAL

- Products of Combustion:** May include, and are not limited to: oxides of carbon, hydrocarbons.

5.3 SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE FIGHTERS

Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA). Cool closed containers exposed to fire with water. Do not use a solid water stream as it may scatter and spread fire. Containers may explode when heated.



SAFETY DATA SHEET

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Eliminate sources of ignition.

6.2 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING - UP

Methods for Containment: Contain and/or absorb spill with inert material (e.g. sand, vermiculite), then place in a suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE).

Methods for Cleaning-Up: Scoop up material and place in a disposal container. Vapors may be heavier than air and may travel along the ground to a distant ignition source and flash back. Provide ventilation.

Section 7: HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

Handling: Keep away from sources of ignition. - No smoking. Avoid contact with skin and eyes. Avoid breathing dust/fume/gas/mist/vapours/spray. Do not swallow. When using do not eat, drink or smoke. Do not spray on an open flame or other ignition source. Use only outdoors or in a well-ventilated area. Pressurized container: Do not pierce or burn, even after use. (See section 8)

General Hygiene Advice: Launder contaminated clothing before reuse. Wash hands before eating, drinking, or smoking.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Storage: Keep locked up and out of reach of children. Do not expose to temperatures exceeding 50 °C/ 122 °F. Store in dry, cool, well-ventilated area. (See section 10)

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 CONTROL PARAMETERS

Exposure Guidelines

Occupational Exposure Limits		
Ingredient	OSHA-PEL	ACGIH-TLV
Distillates (petroleum), hydrotreated light	100 ppm	200 mg/m ³
Solvent naphtha (petroleum), heavy aromatic	Not available.	Not available.
Distillates (petroleum), hydrotreated heavy naphthenic	5 mg/m ³ (mist)	5 mg/m ³ (mist)
Carbon dioxide	5000 ppm; 9000 mg/m ³	5000 ppm
Naphthalene	10 ppm; 50 mg/m ³	10 ppm
Dinonylphenol, ethoxylated, phosphated	Not available.	Not available.



SAFETY DATA SHEET

8.2 EXPOSURE CONTROLS

Engineering Controls: Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, etc.) below recommended exposure limits.

8.3 INDIVIDUAL PROTECTIVE MEASURES

Personal Protective Equipment:

Eye/Face Protection: Safety glasses with side-shields.

Skin Protection:

Hand Protection: Wear chemically resistant protective gloves.

Body Protection: Wear suitable protective clothing.

Respiratory Protection: A NIOSH approved respirator is recommended in poorly ventilated areas or when permissible exposure limits may be exceeded. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

General Health and Safety Measures: Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking. Handle according to established industrial hygiene and safety practices. Ensure that eyewash stations and safety showers are close to the workstation location.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Viscous / Oily.
Color:	Orange.
Odor:	Heavy aromatic.
Odor Threshold:	Not available.
Physical State:	Gas/pressurized liquid.
pH:	Not available.
Melting Point/Freezing Point:	Not available.
Initial Boiling Point and Boiling Range:	177.8 °C (352 °F)
Flash Point:	65.6 °C (150 °F)
Evaporation Rate:	<1 (n-butyl acetate = 1)
Flammability:	Flammable.
Lower Flammability/Explosive Limit:	Not available.
Upper Flammability/Explosive Limit:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	>1 (Air = 1)
Relative Density/Specific Gravity:	0.91 (Water = 1)
Solubility:	Negligible.



SAFETY DATA SHEET

Partition coefficient: n-octanol/water:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Viscosity:	Not available.
Oxidizing Properties:	Not available.
Explosive Properties:	Not available.
VOC Content:	< 25%
Flame Projection:	0 cm
Heat of Combustion:	45.8 kJ/g

Section 10: STABILITY AND REACTIVITY

10.1 REACTIVITY

No dangerous reaction known under conditions of normal use.

10.2 CHEMICAL STABILITY

Stable under normal storage conditions. Flammable aerosol. Contents under pressure. Container may explode if heated. Do not puncture. Do not burn.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

No dangerous reaction known under conditions of normal use.

10.4 CONDITIONS TO AVOID

Heat. Incompatible materials. Sources of ignition. Excessive water.

10.5 INCOMPATIBLE MATERIALS

Strong oxidizing agents. Strong reducing agents. Moisture.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS

May include, and are not limited to: oxides of carbon, hydrocarbons.

Section 11: TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

Likely Routes of Exposure: Skin contact, eye contact, inhalation, and ingestion.

Symptoms related to physical/chemical/toxicological characteristics:

Eye: Causes serious eye irritation. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva.

Skin: May cause skin irritation. Symptoms may include redness, drying, defatting and cracking of the skin.

Ingestion: May be fatal if swallowed and enters airways. This product may be aspirated into the lungs and cause chemical pneumonitis. May cause stomach distress, nausea or vomiting.

Inhalation: May cause respiratory tract irritation.



SAFETY DATA SHEET

Acute Toxicity:

Ingredient	IDLH	LC50	LD50
Distillates (petroleum), hydrotreated light	Not available.	Inhalation >5.2 mg/L 4h rat	Oral >5000 mg/kg, rat; Dermal >2000 mg/kg, rabbit
Solvent naphtha (petroleum), heavy aromatic	Not available.	Inhalation >5.28 mg/L 4h, rat	Oral >5000 mg/kg, rat; Dermal >2000 mg/kg, rabbit
Distillates (petroleum), hydrotreated heavy naphthenic	Not available.	Inhalation >5.0 mg/L 4h, rat	Oral >5000 mg/kg, rat; Dermal >5000 mg/kg, rabbit
Carbon dioxide	40000 ppm	Not available.	Not available.
Naphthalene	250 ppm	Not available.	Oral 490 mg/kg, rat; Dermal >2500 mg/kg, rat; Dermal >20 g/kg, rabbit
Dinonylphenol, ethoxylated, phosphated	Not available.	Not available.	Not available.

Calculated overall Chemical Acute Toxicity Values

LC50 (inhalation)	LD50 (oral)	LD50 (dermal)
> 5 mg/L 4h, rat	> 2000 mg/kg, rat	> 2000 mg/kg, rabbit

Ingredient	Chemical Listed as Carcinogen or Potential Carcinogen (NTP, IARC, OSHA, ACGIH, CP65)*
Distillates (petroleum), hydrotreated light	Not listed.
Solvent naphtha (petroleum), heavy aromatic	Not listed.
Distillates (petroleum), hydrotreated heavy naphthenic	Not listed.
Carbon dioxide	Not listed.
Naphthalene	G-A4, I-2B, N-2, CP65
Dinonylphenol, ethoxylated, phosphated	Not listed.

* See Section 15 for more information.

11.2 DELAYED, IMMEDIATE, AND CHRONIC EFFECTS OF SHORT- AND LONG-TERM EXPOSURE

Skin Corrosion/Irritation: Based on available data, the classification criteria are not met.

Serious Eye Damage/Irritation: Causes serious eye irritation.

Respiratory Sensitization: Based on available data, the classification criteria are not met.

Skin Sensitization: Based on available data, the classification criteria are not met.

STOT-Single Exposure: Based on available data, the classification criteria are not met.

Chronic Health Effects:

Carcinogenicity: Possible carcinogen.

Germ Cell Mutagenicity: Based on available data, the classification criteria are not met.

Reproductive Toxicity:

Developmental: Based on available data, the classification criteria are not met.

Fertility: Based on available data, the classification criteria are not met.

STOT-Repeated Exposure: Based on available data, the classification criteria are not met.

Aspiration Hazard: May be fatal if swallowed and enters airways.





SAFETY DATA SHEET

Other Information: Not available.

Section 12: ECOLOGICAL INFORMATION

12.1 ECOTOXICITY

Acute/Chronic Toxicity: May cause long-term adverse effects in the aquatic environment.

12.2 PERSISTENCE AND DEGRADABILITY

Not available.

12.3 BIOACCUMULATIVE POTENTIAL

Bioaccumulation: Not available.

12.4 MOBILITY IN SOIL

Not available.

12.5 OTHER ADVERSE EFFECTS

Not available.

Section 13: DISPOSAL CONSIDERATIONS

13.1 WASTE TREATMENT METHODS

Disposal Method: This material must be disposed of in accordance with all local, state, provincial, and federal regulations. The generation of waste should be avoided or minimized wherever possible.

Other disposal recommendations: Flammable vapours may accumulate in the container. Do not incinerate empty containers.

Section 14: TRANSPORT INFORMATION

14.1 UN NUMBER

DOT	NOM-004-SCT2-1994
UN1950	UN1950

14.2 UN PROPER SHIPPING NAME

DOT	NOM-004-SCT2-1994
AEROSOLS, flammable, limited quantities	AEROSOLS, flammable, limited quantities

14.3 TRANSPORT HAZARD CLASS (ES)

DOT	NOM-004-SCT2-1994
2.1	2.1

14.4 PACKING GROUP

DOT	NOM-004-SCT2-1994
Not applicable.	Not applicable.





SAFETY DATA SHEET

14.5 ENVIRONMENTAL HAZARDS

Not available.

14.6 TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL 73/78 AND THE IBC CODE

Not available.

14.7 SPECIAL PRECAUTIONS FOR USER

Do not handle until all safety precautions have been read and understood. The Blaster Corporation does not recommend shipping their aerosol products by air.

Section 15: REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/ LEGISLATIONS SPECIFIC FOR THE CHEMICAL

US: SDS prepared pursuant to the Hazard Communication Standard (CFR29 1910.1200) HazCom 2012

Mexico: SDS prepared pursuant to NOM-018-STPS-2000.

SARA Title III				
Ingredient	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (lbs.)	CERCLA RQ (lbs.)	Section 313
Distillates (petroleum), hydrotreated light	Not listed.	Not listed.	Not listed.	Not listed.
Solvent naphtha (petroleum), heavy aromatic	Not listed.	Not listed.	Not listed.	Not listed.
Distillates (petroleum), hydrotreated heavy naphthenic	Not listed.	Not listed.	Not listed.	Not listed.
Carbon dioxide	Not listed.	Not listed.	Not listed.	Not listed.
Naphthalene	Not listed.	Not listed.	100	313
Dinonylphenol, ethoxylated, phosphated	Not listed.	Not listed.	Not listed.	Not listed.

State Regulations

California Proposition 65:

This product contains a chemical known to the State of California to cause cancer.

Global Inventories:

Ingredient	USA TSCA
Distillates (petroleum), hydrotreated light	Yes.
Solvent naphtha (petroleum), heavy aromatic	Yes.
Distillates (petroleum), hydrotreated heavy naphthenic	Yes.
Carbon dioxide	Yes.
Naphthalene	Yes.
Dinonylphenol, ethoxylated, phosphated	Yes.



SAFETY DATA SHEET

NFPA-National Fire Protection Association:	
Health:	2
Fire:	4
Reactivity:	0

HMIS-Hazardous Materials Identification System:	
Health:	2*
Fire:	4
Physical Hazard:	0

Hazard Rating: 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

SOURCE AGENCY CARCINOGEN CLASSIFICATIONS:

CP65 California Proposition 65

OSHA (O) Occupational Safety and Health Administration.

ACGIH (G) American Conference of Governmental Industrial Hygienists.

- A1 - Confirmed human carcinogen.
- A2 - Suspected human carcinogen.
- A3 - Animal carcinogen.
- A4 - Not classifiable as a human carcinogen.
- A5 - Not suspected as a human carcinogen.

IARC (I) International Agency for Research on Cancer.

- 1 - The agent (mixture) is carcinogenic to humans.
- 2A - The agent (mixture) is probably carcinogenic to humans; there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.
- 2B - The agent (mixture) is possibly carcinogenic to humans; there is limited evidence of carcinogenicity in humans in the absence of sufficient evidence of carcinogenicity in experimental animals.
- 3 - The agent (mixture, exposure circumstance) is not classifiable as to its carcinogenicity to humans.
- 4 - The agent (mixture, exposure circumstance) is probably not carcinogenic to humans.

NTP (N) National Toxicology Program.

- 1 - Known to be carcinogens.
- 2 - Reasonably anticipated to be carcinogens.

Section 16: OTHER INFORMATION

Date of Preparation: May 26, 2014

Version: 1.0

Revision Date: May 26, 2014

Disclaimer: We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind. The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for the user's own particular use.

Prepared by: Nexreg Compliance Inc.
 Phone: (519) 488-5126
www.nexreg.com

Prepared for: The Blaster Corporation

End of Safety Data Sheet





Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

Synonyms: Portland Cement; also known as Cement or Hydraulic Cement, Mortar, Class G

*** Section 1 - Product and Company Identification ***

Manufacturer Information

CALPORTLAND COMPANY
2025 E. Financial Way
Glendora, CA 91741
Phone: 626-852-6200
www.calportland.com

*** Section 2 - Hazards Identification ***

GHS Classification:

- Acute Toxicity Oral - Category 4
- Acute Toxicity Dermal - Category 4
- Acute Toxicity Inhalation - Category 3
- Skin Corrosion/Irritation - Category 1B
- Eye Damage - Category 1
- Respiratory Sensitization - Category 1
- Skin Sensitization - Category 1
- Carcinogenicity - Category 1A
- Specific Target Organ Toxicity Repeat Exposure - Category 1

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

Danger

Hazard Statements

- Harmful if swallowed.
- Harmful in contact with skin.
- Toxic if inhaled.
- Causes severe skin burns and eye damage.
- Causes serious eye damage.
- May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- May cause an allergic skin reaction.
- May cause cancer.
- Causes damage to organs through prolonged or repeated exposure (lungs).

Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

Precautionary Statements

Prevention

Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear protective gloves/protective clothing/eye protection/face protection.
Contaminated work clothing must not be allowed out of the workplace.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
In case of inadequate ventilation wear respiratory protection.

Response

If swallowed: Rinse mouth. Do NOT induce vomiting. Immediately call a poison center/doctor.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a poison center or doctor/physician. Wash contaminated clothing before reuse.
If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a poison center or doctor/physician.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor.

Storage

Store in a well-ventilated place.
Store in an appropriate container or containment structure.

Disposal

Dispose of contents/container in accordance with local/regional/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
65997-15-1	Cement, portland, chemicals	78-95
1317-65-3	Limestone	0-15
13397-24-5	Gypsum (Ca(SO ₄).2H ₂ O)	5-7
14808-60-7	Quartz	0-0.3

Component Information/Information on Non-Hazardous Components

General Product Information

Trace Elements: Portland cement is made from materials mined from the earth and is processed using energy provided by fuels. Trace amounts of naturally occurring, potentially harmful chemical might be detected during chemical analysis. For example, Portland cement may contain up to 1.50 % insoluble residue, some of which may be free crystalline silica. Other trace constituents may include calcium oxide, free magnesium oxide, potassium and sodium sulfate compounds, and trace metal compounds.

Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

*** Section 4 - First Aid Measures ***

First Aid: Eyes

Immediately flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician immediately.

First Aid: Skin

Wash skin with cool water and pH-neutral soap or a mild detergent intended for use on skin. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to the dry cement.

First Aid: Ingestion

Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

First Aid: Inhalation

Remove to fresh air. Seek medical help if coughing and other symptoms do not subside. (Inhalation of gross amounts of Portland cement requires immediate medical attention.)

*** Section 5 - Fire Fighting Measures ***

General Fire Hazards

See Section 9 for Flammability Properties.
Non-combustible.

Hazardous Combustion Products

None

Extinguishing Media

Use appropriate extinguishing media for surrounding fire.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Firefighters should wear full protective gear.

*** Section 6 - Accidental Release Measures ***

Recovery and Neutralization

Stop the flow of material, if this is without risk.

Materials and Methods for Clean-Up

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Scrape up wet material and place in an appropriate container. Allow the material to dry before disposal.

Emergency Measures

Isolate area. Keep unnecessary personnel away.

Personal Precautions and Protective Equipment

Wear appropriate personal protective equipment as described in Section 8.

Environmental Precautions

Do not attempt to wash Portland cement down sewers or storm drains.

Prevention of Secondary Hazards

None

Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

*** Section 7 - Handling and Storage ***

Handling Procedures

Avoid prolonged or repeated breathing of dust. Avoid contact with eyes and skin. Promptly remove dusty clothing or clothing which is wet with cement fluids and launder before reuse. Wash thoroughly after exposure to dust or wet cement mixtures.

Storage Procedures

Store product in a cool, dry, ventilated area. Protect against physical damage and moisture. Keep cement dry until used. Normal temperature and pressures do not affect the material.

Incompatibilities

Wet Portland cement is alkaline. As such it is incompatible with acids, ammonium salts and aluminum metal.

*** Section 8 - Exposure Controls / Personal Protection ***

Component Exposure Limits

Cement, portland, chemicals (65997-15-1)

ACGIH:	1 mg/m3 TWA (particulate matter containing no asbestos and <1% crystalline silica, respirable fraction)
OSHA (Final):	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
OSHA	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
(Vacated):	
NIOSH:	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)
Alberta:	10 mg/m3 TWA
British Columbia:	10 mg/m3 TWA (total particulate matter containing no Asbestos and <1% Crystalline silica, total particulate); 3 mg/m3 TWA (particulate matter containing no Asbestos and <1% Crystalline silica, respirable particulate)
Manitoba:	1 mg/m3 TWA (particulate matter containing no Asbestos and <1% Crystalline silica, respirable fraction)
New Brunswick:	10 mg/m3 TWA (particulate matter containing no Asbestos and <1% Crystalline silica)
NW Territories:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass)
Nova Scotia:	1 mg/m3 TWA (particulate matter containing no Asbestos and <1% Crystalline silica, respirable fraction)
Nunavut:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass)
Ontario:	10 mg/m3 TWA (containing no Asbestos and <1% Crystalline silica, total dust)
Quebec:	10 mg/m3 TWAEV (containing no Asbestos and <1% Crystalline silica, total dust); 5 mg/m3 TWAEV (containing no Asbestos and <1% Crystalline silica, respirable dust)
Saskatchewan:	10 mg/m3 TWA 20 mg/m3 STEL
Yukon:	30 mppcf TWA; 10 mg/m3 TWA 20 mg/m3 STEL

Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

Limestone (1317-65-3)

OSHA (Final): 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
OSHA 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
(Vacated):
NIOSH: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable dust)
Alberta: 10 mg/m³ TWA
British Columbia: 10 mg/m³ TWA (total dust); 3 mg/m³ TWA (respirable fraction)
Columbia: 20 mg/m³ STEL
New Brunswick: 10 mg/m³ TWA (particulate matter containing no Asbestos and <1% Crystalline silica)
NW Territories: 5 mg/m³ TWA (respirable mass); 10 mg/m³ TWA (total mass)
Nunavut: 5 mg/m³ TWA (respirable mass); 10 mg/m³ TWA (total mass)
Quebec: 10 mg/m³ TWAEV (Limestone, containing no Asbestos and <1% Crystalline silica, total dust)
Saskatchewan: 10 mg/m³ TWA
20 mg/m³ STEL
Yukon: 30 mppcf TWA; 10 mg/m³ TWA
20 mg/m³ STEL

Gypsum (Ca(SO₄).2H₂O) (13397-24-5)

ACGIH: 10 mg/m³ TWA (inhalable fraction, listed under Calcium sulfate)
OSHA (Final): 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
OSHA 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
(Vacated):
NIOSH: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable dust)
Alberta: 10 mg/m³ TWA (listed under Calcium sulphate)
British Columbia: 10 mg/m³ TWA (total dust); 3 mg/m³ TWA (respirable fraction)
Columbia: 20 mg/m³ STEL
Manitoba: 10 mg/m³ TWA (inhalable fraction, listed under Calcium sulfate)
NW Territories: 5 mg/m³ TWA (respirable mass); 10 mg/m³ TWA (total mass)
Nova Scotia: 10 mg/m³ TWA (inhalable fraction, listed under Calcium sulfate)
Nunavut: 5 mg/m³ TWA (respirable mass); 10 mg/m³ TWA (total mass)
Ontario: 10 mg/m³ TWA (inhalable, listed under Calcium sulfate)
Quebec: 10 mg/m³ TWAEV (containing no Asbestos and <1% Crystalline silica, total dust); 5 mg/m³ TWAEV (containing no Asbestos and <1% Crystalline silica, respirable dust)
Saskatchewan: 10 mg/m³ TWA
20 mg/m³ STEL
Yukon: 30 mppcf TWA; 10 mg/m³ TWA
20 mg/m³ STEL

Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

Quartz (14808-60-7)

ACGIH:	0.025 mg/m3 TWA (respirable fraction)
OSHA	0.1 mg/m3 TWA (respirable dust)
(Vacated):	
NIOSH:	0.05 mg/m3 TWA (respirable dust)
Alberta:	0.025 mg/m3 TWA (respirable particulate)
British Columbia:	ACGIH Category A2 - Suspected Human Carcinogen; IARC Category 1 - Human Carcinogen
Manitoba:	0.025 mg/m3 TWA (respirable)
New Brunswick:	0.025 mg/m3 TWA (respirable fraction)
NW Territories:	0.1 mg/m3 TWA (respirable mass); 0.3 mg/m3 TWA (total mass)
Nova Scotia:	0.025 mg/m3 TWA (respirable fraction)
Nunavut:	0.1 mg/m3 TWA (respirable mass); 0.3 mg/m3 TWA (total mass)
Ontario:	0.10 mg/m3 TWA (respirable fraction) 0.10 mg/m3 TWA (designated substance regulation, respirable)
Quebec:	0.1 mg/m3 TWAEV (respirable dust)
Saskatchewan:	0.05 mg/m3 TWA (respirable fraction, listed under Silica - crystalline)
Yukon:	300 particle/mL TWA (listed under Silica)

Engineering Measures

Avoid actions that cause dust to become airborne. Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Personal Protective Equipment: Respiratory

Use local or general ventilation to control exposures below applicable exposure limits. NIOSH or MSHA approved particulate filter respirators should be used in the context of respiratory protection program meeting the requirements of the OSHA respiratory protection standard [29 CFR 1910.134] to control exposures when ventilation or other controls are inadequate or discomfort or irritation is experienced. Respirator and/or filter cartridge selection should be based on American National Standards Institute (ANSI) Standards Z88.2 Practices for Respiratory Protection.

Personal Protective Equipment: Hands

Where prolonged exposure to unhardened concrete products might occur, wear impervious gloves to eliminate skin contact. Do not rely on barrier creams; barrier creams should not be used in place of gloves. Periodically wash areas contacted by wet cement or its dry ingredients with a pH neutral soap and water. Wash again at the end of the work. If irritation occurs, immediately wash the affected area and seek treatment.

Personal Protective Equipment: Eyes

When engaged in activities where wet concrete or its dry ingredients could contact the eye, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments, wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with Portland cement or fresh cement products.

Personal Protective Equipment: Skin and Body

Where prolonged exposure to unhardened concrete products might occur, wear impervious clothing to eliminate skin contact. Where required, wear boots that are impervious to water to eliminate foot and ankle exposure. If clothing becomes saturated with wet concrete, it should be removed and replaced with clean dry clothing.

Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

*** Section 9 - Physical & Chemical Properties ***

Appearance:	Gray powder.	Odor:	None
Physical State:	Solid	pH:	12-13 (in water)
Vapor Pressure:	Not Applicable	Vapor Density:	Not Applicable
Boiling Point:	Not Applicable	Melting Point:	Not Applicable
Solubility (H2O):	Slightly soluble	Specific Gravity:	3.15
Evaporation Rate:	Not Applicable	VOC:	Not Determined
Octanol/H2O Coeff.:	Not Determined	Flash Point:	None
Flash Point Method:	None	Upper Flammability Limit (UFL):	None
Lower Flammability Limit (LFL):	None	Burning Rate:	None
Auto Ignition:	Not Combustible		

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Unintentional contact with water.

Incompatible Products

Wet Portland cement is alkaline. As such it is incompatible with acids, ammonium salts and aluminum metal.

Hazardous Decomposition Products

Will not spontaneously occur. Adding water results in hydration and produces (caustic) calcium hydroxide.

*** Section 11 - Toxicological Information ***

Acute Toxicity

Component Analysis - LD50/LC50

Quartz (14808-60-7)

Oral LD50 Rat 500 mg/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Discomfort or pain cannot be relied upon to alert a person to a hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimizing skin contact, particularly contact with wet cement. Exposed persons may not feel discomfort until hours after the exposure has ended and significant injury has occurred. Exposure during the handling or mixing of the dry ingredients in Portland cement may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation of other conditions. Exposure to wet concrete may cause more severe skin effects including thickening, cracking or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of (caustic) chemical burns.

Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Exposure to airborne dust during the handling or mixing of the dry ingredients in Portland cement may cause immediate or delayed irritation or inflammation. Eye contact by splashes of wet concrete may cause effects ranging from moderate eye irritation to chemical burns and blindness. Such exposures require immediate first aid (see Section 4) and medical attention to prevent significant damage to the eye.

Potential Health Effects: Ingestion

Although inadvertent ingestion of small quantities of wet concrete or its dry ingredients are not known to be harmful, accidental ingestion of larger quantities can be harmful and requires immediate medical attention.

Potential Health Effects: Inhalation

Exposure to Portland cement in excess of the applicable TLV or PEL (see section 2) may cause or aggravate other lung conditions. The ingredients in Portland cement may contain trace amounts of crystalline silica. Exposure to these ingredients in excess of the applicable TLV or PEL (see Section 2) may cause or aggravate other lung conditions. Exposure to Portland cement may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

Respiratory Organs Sensitization/Skin Sensitization

May cause allergy or asthma symptoms or breathing difficulties if inhaled. Some individuals may exhibit an allergic response upon exposure to wet concrete. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers. Persons already sensitized may react to their first contact with the product. Other persons may first experience this effect after years of contact with Portland cement products.

Generative Cell Mutagenicity

This product is not reported to have any mutagenic effects.

Carcinogenicity

A: General Product Information

May cause cancer.

Prolonged and repeated exposure to airborne free respirable crystalline silica can result in lung disease and/or lung cancer. IARC states that crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1).

B: Component Carcinogenicity

Cement, portland, chemicals (65997-15-1)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Quartz (14808-60-7)

ACGIH: A2 - Suspected Human Carcinogen

NIOSH: potential occupational carcinogen

NTP: Known Human Carcinogen (respirable size) (Select Carcinogen)

IARC: Monograph 100C [2012] (listed under Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources); Monograph 68 [1997] (Group 1 (carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any single exposure specific target organ toxicity effects.

Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

Specified Target Organ General Toxicity: Repeated Exposure

Causes damage to organs through prolonged or repeated exposure (lungs).

Aspiration Respiratory Organs Hazard

This product is not reported to have any aspiration hazards.

***** Section 12 - Ecological Information *****

Ecotoxicity

A: General Product Information

This product is not reported to have any ecotoxicity effects.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Persistence/Degradability

No information available for the product.

Bioaccumulation

No information available for the product.

Mobility in Soil

No information available for the product.

***** Section 13 - Disposal Considerations *****

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

***** Section 14 - Transportation Information *****

DOT/TDG Information

Shipping Name: Not Regulated.

***** Section 15 - Regulatory Information *****

Regulatory Information

US Federal Regulations

Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Cement, portland, chemicals	65997-15-1	No	Yes	Yes	Yes	Yes	No
Limestone	1317-65-3	No	Yes	Yes	Yes	Yes	No
Gypsum (Ca(SO4).2H2O)	13397-24-5	No	No	Yes	Yes	Yes	No
Quartz	14808-60-7	No	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains chemicals known to the state of California to cause cancer, birth defects, or other reproductive harm.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Status under Workplace Hazardous Materials Information System (WHMIS), Canada

Unhardened Ready-Mix concrete is considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations (Class E - Corrosive Material) and is therefore subject to the labeling and MSDS requirements of the Workplace Hazardous Materials Information System (WHMIS).

Status under Canadian Environmental Protection Act

Not Listed

Additional Regulatory Information

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Cement, portland, chemicals	65997-15-1	Yes	DSL	EINECS
Limestone	1317-65-3	Yes	NDSL	EINECS
Gypsum (Ca(SO4).2H2O)	13397-24-5	No	DSL	No
Quartz	14808-60-7	Yes	DSL	EINECS

Safety Data Sheet

Material Name: Portland Cement (ASTM Type I/II, ASTM Type III, ASTM Type V, Block, Plastic, Fast Set, Low Heat of Hydration)

* * * Section 16 - Other Information * * *

Hazardous Material Information System (HMIS):	Health	1
	Flammability	0
	Physical Hazard	0
	Personal Protection	B

NFPA/HMIS Definitions: 0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme

Protective Equipment: Safety glasses, gloves

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY CALPORTLAND, except that the product shall conform to contracted specifications. The information provided herein was believed by CalPortland Company to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for nondelivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

End of Sheet




Safety Data Sheet

1 - Identification

Product Name: WD-40 Multi-Use Product Aerosol <i>NOT FOR SALE IN CALIFORNIA</i>	Manufacturer: WD-40 Company Address: 1061 Cudahy Place (92110) P.O. Box 80607 San Diego, California, USA 92138 -0607
Product Use: Lubricant, Penetrant, Drives Out Moisture, Removes and Protects Surfaces From Corrosion	Telephone: Emergency only: 1-888-324-7596 (PROSAR) Information: 1-888-324-7596 Chemical Spills: 1-800-424-9300 (Chemtrec) 1-703-527-3887 (International Calls)
Restrictions on Use: None identified	
SDS Date Of Preparation: 07/20/2014	

2 – Hazards Identification

<p>Hazcom 2012/GHS Classification: Flammable Aerosol Category 1 Gas Under Pressure: Compressed Gas Aspiration Toxicity Category 1</p> <p>Note: This product is a consumer product and is labeled in accordance with the US Consumer Product Safety Commission regulations which take precedence over OSHA Hazard Communication labeling. The actual container label will not include the label elements below. The labeling below applies to industrial/professional products.</p> <p>Label Elements:</p> <div style="text-align: center;">  </div> <p>DANGER! Extremely Flammable Aerosol. Contains gas under pressure; may explode if heated. May be fatal if swallowed and enters airways.</p> <p>Prevention Keep away from heat, sparks, open flames, hot surfaces – No smoking. Do not spray on an open flame or other ignition source. Pressurized container: Do not pierce or burn, even after use.</p> <p>Response IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.</p> <p>Storage Store locked up. Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F. Store in a well-ventilated place.</p> <p>Disposal Dispose of contents and container in accordance with local and national regulations.</p>

3 - Composition/Information on Ingredients

Ingredient	CAS #	Weight Percent	US Hazcom 2012/ GHS Classification
Aliphatic Hydrocarbon	64742-47-8	45-50	Flammable Liquid Category 3

			Aspiration Toxicity Category 1
Petroleum Base Oil	64742-56-9 64742-65-0 64742-53-6 64742-54-7 64742-71-8	<25	Not Hazardous
LVP Aliphatic Hydrocarbon	64742-47-8	12-18	Aspiration Toxicity Category 1
Carbon Dioxide	124-38-9	2-3	Simple Asphyxiant Gas Under Pressure, Compressed Gas
Non-Hazardous Ingredients	Mixture	<10	Not Hazardous

Note: The exact percentages are a trade secret.

4 – First Aid Measures

Ingestion (Swallowed): Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7596 immediately.

Eye Contact: Flush thoroughly with water. Remove contact lenses if present after the first 5 minutes and continue flushing for several more minutes. Get medical attention if irritation persists.

Skin Contact: Wash with soap and water. If irritation develops and persists, get medical attention.

Inhalation (Breathing): If irritation is experienced, move to fresh air. Get medical attention if irritation or other symptoms develop and persist.

Signs and Symptoms of Exposure: May cause eye and respiratory irritation. Inhalation may cause coughing, headache and dizziness. Skin contact may cause drying of the skin.

Indication of Immediate Medical Attention/Special Treatment Needed: Immediate medical attention is needed for ingestion.

5 – Fire Fighting Measures

Suitable (and unsuitable) Extinguishing Media: Use water fog, dry chemical, carbon dioxide or foam. Do not use water jet or flooding amounts of water. Burning product will float on the surface and spread fire.

Specific Hazards Arising from the Chemical: Contents under pressure. Keep away from ignition sources and open flames. Exposure of containers to extreme heat and flames can cause them to rupture often with violent force. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back. Combustion will produce oxides of carbon and hydrocarbons.

Special Protective Equipment and Precautions for Fire-Fighters: Firefighters should always wear positive pressure self-contained breathing apparatus and full protective clothing. Cool fire-exposed containers with water. Use shielding to protect against bursting containers.

6 – Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Wear appropriate protective clothing (see Section 8). Eliminate all sources of ignition and ventilate area.

Methods and Materials for Containment/Cleanup: Leaking cans should be placed in a plastic bag or open pail until the pressure has dissipated. Contain and collect liquid with an inert absorbent and place in a container for disposal. Clean spill area thoroughly. Report spills to authorities as required.

7 – Handling and Storage

Precautions for Safe Handling: Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use only with adequate ventilation. Keep away from heat, sparks, pilot lights, hot surfaces and open flames. Unplug electrical tools, motors and appliances before spraying or bringing the can near any source of electricity. Electricity can burn a hole in the can and cause contents to burst into flames. To avoid serious burn injury, do not let the can touch battery terminals, electrical connections on motors or appliances or any other source of electricity. Wash thoroughly with soap and water after handling. Keep containers closed when not in use. Keep out of the reach of children. Do not puncture, crush or incinerate containers, even when empty.

Conditions for Safe Storage: Store in a cool, well-ventilated area, away from incompatible materials Do not store above 120°F or in direct sunlight. U.F.C (NFPA 30B) Level 3 Aerosol. Store away from oxidizers.

8 – Exposure Controls/Personal Protection

Chemical	Occupational Exposure Limits
Aliphatic Hydrocarbon	1200 mg/m ³ TWA (manufacturer recommended)
Petroleum Base Oil	5 mg/m ³ TWA, 10 mg/m ³ STEL ACGIH TLV 5 mg/m ³ TWA OSHA PEL
LVP Aliphatic Hydrocarbon	1200 mg/m ³ TWA (manufacturer recommended)
Carbon Dioxide	5000 ppm TWA (OSHA/ACGIH), 30,000 ppm STEL (ACGIH)
Non-Hazardous Ingredients	None Established

The Following Controls are Recommended for Normal Consumer Use of this Product

Appropriate Engineering Controls: Use in a well-ventilated area.

Personal Protection:

Eye Protection: Avoid eye contact. Always spray away from your face.

Skin Protection: Avoid prolonged skin contact. Chemical resistant gloves recommended for operations where skin contact is likely.

Respiratory Protection: None needed for normal use with adequate ventilation.

For Bulk Processing or Workplace Use the Following Controls are Recommended

Appropriate Engineering Controls: Use adequate general and local exhaust ventilation to maintain exposure levels below that occupational exposure limits.

Personal Protection:

Eye Protection: Safety goggles recommended where eye contact is possible.

Skin Protection: Wear chemical resistant gloves.

Respiratory Protection: None required if ventilation is adequate. If the occupational exposure limits are exceeded, wear a NIOSH approved respirator. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.

Work/Hygiene Practices: Wash with soap and water after handling.

9 – Physical and Chemical Properties

Appearance:	Light amber liquid	Flammable Limits: (Solvent Portion)	LEL: 0.6% UEL: 8%
Odor:	Mild petroleum odor	Vapor Pressure:	95-115 PSI @ 70°F
Odor Threshold:	Not established	Vapor Density:	Greater than 1 (air=1)
pH:	Not Applicable	Relative Density:	0.8 – 0.82 @ 60°F
Melting/Freezing Point	Not established	Solubilities:	Insoluble in water
Boiling Point/Range:	361 - 369°F (183 - 187°C)	Partition Coefficient; n-octanol/water:	Not established
Flash Point:	122°F (49°C) Tag Closed Cup (concentrate)	Autoignition Temperature:	Not established
Evaporation Rate:	Not established	Decomposition Temperature:	Not established
Flammability (solid, gas)	Flammable Aerosol	Viscosity:	2.79-2.96 cSt @ 100°F
VOC:	412 grams/liter (49.5%)	Pour Point:	-63°C (-81.4°F) ASTM D-97

10 – Stability and Reactivity

Reactivity: Not reactive under normal conditions

Chemical Stability: Stable

Possibility of Hazardous Reactions: May react with strong oxidizers generating heat.
Conditions to Avoid: Avoid heat, sparks, flames and other sources of ignition. Do not puncture or incinerate containers.
Incompatible Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

11 – Toxicological Information

Symptoms of Overexposure:

Inhalation: High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.

Skin Contact: Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.

Eye Contact: Contact may be irritating to eyes. May cause redness and tearing.

Ingestion: This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product is an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis, severe lung damage and death.

Chronic Effects: None expected.

Carcinogen Status: None of the components are listed as a carcinogen or suspect carcinogen by IARC, NTP, ACGIH or OSHA.

Reproductive Toxicity: None of the components is considered a reproductive hazard.

Numerical Measures of Toxicity:

The oral toxicity of this product is estimated to be greater than 5,000 mg/kg and the dermal toxicity greater than 2,000 mg/kg based on an assessment of the ingredients. This product is not classified as toxic by established criteria. It is an aspiration hazard.

12 – Ecological Information

Ecotoxicity: No specific aquatic toxicity data is currently available, however components of this product are not expected to be harmful to aquatic organisms

Persistence and Degradability: Component are readily biodegradable.

Bioaccumulative Potential: Bioaccumulation is not expected based on an assessment of the ingredients.

Mobility in Soil: No data available

Other Adverse Effects: None known

13 - Disposal Considerations

If this product becomes a waste, it would be expected to meet the criteria of a RCRA ignitable hazardous waste (D001). However, it is the responsibility of the generator to determine at the time of disposal the proper classification and method of disposal. Do not puncture or incinerate containers, even empty. Dispose in accordance with federal, state, and local regulations.

14 – Transportation Information

DOT Surface Shipping Description:

UN1950, Aerosols, 2.1 Ltd. Qty (Note: Shipping Papers are not required for Limited Quantities unless transported by air or vessel – each package must be marked with the Limited Quantity Mark)

IMDG Shipping Description: Un1950, Aerosols, 2.1, LTD QTY

ICAO Shipping Description: UN1950, Aerosols, flammable, 2.1 NOTE: WD-40 does not test aerosol cans to assure that they meet the pressure and other requirements for transport by air. We do not recommend that our aerosol products be transported by air.

15 – Regulatory Information

U.S. Federal Regulations:

CERCLA 103 Reportable Quantity: This product is not subject to CERCLA reporting requirements, however, oil spills are reportable to the National Response Center under the Clean Water Act and many

states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

SARA TITLE III:

Hazard Category For Section 311/312: Acute Health, Fire Hazard, Sudden Release of Pressure

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III

Section 313 Reporting requirements: None

Section 302 Extremely Hazardous Substances (TPQ): None

EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on the TSCA inventory.

VOC Regulations: This product complies with the consumer product VOC limits of the US EPA and states adopting the OTC VOC rules but does not comply with CARB.

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): This product does not contain chemicals regulated under California Proposition 65.

Canadian Environmental Protection Act: One of the components is listed on the NDSL. All of the other ingredients are listed on the Canadian Domestic Substances List or exempt from notification.

Canadian WHMIS Classification: Class A (Compressed gas), Class B-5 (Flammable Aerosol)

This MSDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the MSDS contains all of the information required by the CPR.

16 – Other Information:

HMIS Hazard Rating:

Health – 1 (slight hazard), Fire Hazard – 4 (severe hazard), Reactivity – 0 (minimal hazard)

Revision Date: July 20, 2014

Supersedes: May 23, 2014

Revision Summary: Convert to Hazcom 2012. Changes in all sections.

Prepared by: Industrial Health & Safety Consultants, Inc. Shelton, CT, USA

APPROVED By: I. Kowalski

Regulatory Affairs Dept.