Safety Data Sheet
Red-I Pt Cable Coating

Product Number: 50102-12
Revision Date: 01/28/2016

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier Red-I Pt Cable Coating

Product Code 50102

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Manufacturer LUBRICATING SPECIALTIES COMPANY
8015 PARAMOUNT BLVD.
PICO RIVERA, CA 90660

Telephone No. (562) 776-4000

1.4. Emergency telephone number

(800) 424-9300 24hr

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Not Classified

2.2. Label elements

Using the Toxicity Data listed in section 11 & 12 the product is labeled as follows.

Not Classified

HMIS	**Health:**	0	**NFPA**	**Health:**	0
	Fire:	1		**Fire:**	1

Physical Hazards:	0	**Reactivity:**	0
PPE:	C	**Special Hazards:**	--

2.3. Other hazards

This product contains no PBT/vPvB chemicals.

SECTION 3: Composition/information on ingredients

Ingredient/Chemical Designations	Weight %	EC No. 1272/2008 / GHS Classification
Distillate (petroleum) hydrotreated heavy naphthenic CAS Number: 0064742-52-5	<100	Not Classified
Octadecanoic acid, 12-hydroxy- CAS Number: 0000106-14-9	<10	Not Classified
Calcium Sulfonate CAS Number: Proprietary or N/A	<3	Not Classified

*The full texts of the phrases are shown in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General

In all cases of doubt, or when symptoms persist, seek medical attention.

Never give anything by mouth to an unconscious person.

Inhalation

If inhaled, remove person to fresh air and keep comfortable for breathing. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. If unconscious, place in the recovery position and seek medical attention immediately.

Skin

In case of contact, immediately rinse skin with plenty of water. Remove contaminated clothing and shoes. If skin irritation occurs, seek medical attention. Launder contaminated clothing before reuse.

Eye

In case of contact, immediately rinse eyes with plenty of fresh, clean water for at least 15 minutes. Remove contact lenses if present and continue rinsing. Seek medical attention immediately.

Ingestion

Do not induce vomiting. Call a physician or emergency medical facility immediately.

4.2. Most important symptoms and effects, both acute and delayed

No data available

4.3. Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Use Carbon dioxide (CO2), dry chemical, or foam to extinguish flames.

5.2. Special hazards arising from the substance or mixture

Hazardous Decomposition Products: May form CO and CO2.

5.3. Advice for fire-fighters

Self-contained full-face positive pressure breathing apparatus (SCBA) should be used. Water can be used to cool and protect exposed material. Do not allow runoff water and contaminants from fire fighting to enter drains or water courses.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid contact with spilled material. Use suitable personal protective equipment. Ventilate area if spilled in confined space or other poorly ventilated areas. Evacuate personnel to safe areas. Keep unnecessary personnel away.

6.2. Environmental precautions

Prevent entry into sewers and waterways. Report spills as required to appropriate authorities in accordance with all applicable regulations.

6.3. Methods and material for containment and cleaning up

Ventilate the area and avoid breathing vapors. Take the personal protective measures listed in section 8.

Contain and absorb spillage with non-combustible materials e.g. sand, earth, vermiculite. Place in closed containers outside buildings and dispose of according to the Waste Regulations. (See section 13).

Clean, preferably with a detergent. Do not use solvents.

Do not allow spills to enter drains or water courses.

If drains, sewers, streams or lakes are contaminated, inform the local water company immediately. In the case of contamination of rivers, streams or lakes the Environmental Protection Agency should also be informed.
Dispose of in accordance with all federal, state, and local environmental regulations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling

Avoid skin and eye contact. Wash thoroughly after handling. Avoid breathing vapor. Use with adequate ventilation.

In Storage

Store in a dry location at room temperature.

Keep this container and vapors from the container away from heat and flame. Keep container closed and maintain all original markings and labels.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from strong oxidizing and reducing agents.

CAUTION!!! Do not use cutting or welding torches on drums, even when empty. Do not reuse container.

Containers, even those that have been emptied will retain product residue and vapors. Always obey hazard warnings and handle empty containers as if they were full.

7.3. Specific end use(s)

There are no exposure scenarios, see details in section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

The following occupational exposure limits have been established.

CAS Number	Ingredient	Source	Value
0000106-14-9	Octadecanoic acid, 12-hydroxy-	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
0064742-52-5	Distillate (petroleum) hydrotreated heavy naphthenic	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
Proprietary or N/A	Calcium Sulfonate	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit

Contains mineral oil. The exposure limits for oil mist are 5 mg/m3 OSHA PEL and 10 mg/m3 ACGIH.

Carcinogen Data

CAS No.	Ingredient	Source	Value
0000106-14-9	Octadecanoic acid, 12-hydroxy-	OSHA	Select Carcinogen: No
		IARC	Group 1: No; Group 2A: No; Group 2B: No; Group 3: No; Group 4: No;
0064742-52-5	Distillate (petroleum) hydrotreated heavy naphthenic	OSHA	Select Carcinogen: No
		IARC	Group 1: No; Group 2A: No; Group 2B: No; Group 3: No; Group 4: No;
Proprietary or N/A	Calcium Sulfonate	OSHA	Select Carcinogen: No
		IARC	Group 1: No; Group 2A: No; Group 2B: No; Group 3: No; Group 4: No;

DNEL/PNEC values

No Data Available

8.2. Exposure controls

No special requirements under ordinary conditions of use and with adequate ventilation.

Eye/face protection

Wear safety glasses. If potential for splash or mist exists, wear chemical goggles or face shield.

Skin protection

Wear chemical resistant gloves. Gloves should be inspected before each use and discarded if they show tears, pinholes, or signs of wear.

Other
Gloves, overalls, apron, boots, or other suitable protective garments should be worn to minimize contact based on the task being performed.

Respiratory protection
Use NIOSH/OSHA approved respirator where high vapor concentrations are present.

Thermal hazards
No Data Available

SECTION 9: Physical and chemical properties

Appearance	AMBER GREASE
Odor	Petroleum Odor
Odor threshold	Not Determined
pH	Not Measured
Melting point / freezing point (C)	Not Determined
Initial boiling point and boiling range (C)	> 300
Flash point (C)	> 200
Evaporation rate (H20 = 1)	Not Determined
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	
Lower Explosive Limit:	Not Determined
Upper Explosive Limit:	Not Determined
Vapor pressure (Pa)	Not Determined
Vapor density	Heavier than air.
Relative density	0.9288
Solubility(ies)	negligible
Partition coefficient n-octanol/water (Log Kow)	Not Determined
Auto-ignition temperature (C)	Not Determined
Decomposition temperature	Not Determined
Viscosity (cSt)	
@ 100 C	Not Measured
@ 40 C	Not Measured
Pour point temperature (C)	Not Determined
Volatile Organic Compounds	nil
SADT	Not Determined

The data listed above are typical physical and chemical properties that do not constitute product specification.

9.2. Other information
DMSO extract by IP346: Less than 3.0 wt % (mineral oil component only)

SECTION 10: Stability and reactivity

10.1. Reactivity
No data available
10.2. Chemical stability
Material is normally stable at ambient temperature and pressure.
10.3. Possibility of hazardous reactions
May react with: oxidizing agents.
10.4. Conditions to avoid
High temperature, sparks, and open flames.
10.5. Incompatible materials
Keep away from strong oxidizing and reducing agents.
10.6. Hazardous decomposition products
Hazardous Decomposition Products: May form CO and CO2.

SECTION 11: Toxicological information

Acute toxicity

The preparation has been assessed using the Acute Toxicity Data listed below, and classified for toxicological hazards accordingly. See section 2 for details.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation vapor LD50, mg/L/4hr
Calcium Sulfonate - (Proprietary or N/A)	>5,000, Rat	>2,000, Rabbit	Not Available
Distillate (petroleum) hydrotreated heavy naphthenic - (0064742-52-5)	>5,000, Rat	5,000.00, Rabbit	Not Available
Octadecanoic acid, 12-hydroxy- - (0000106-14-9)	Not Available	Not Available	Not Available

Classification	Category	Hazard Description
Acute toxicity (oral)	Not Classified	Not Applicable
Acute toxicity (dermal)	Not Classified	Not Applicable
Acute toxicity (inhalation)	Not Classified	Not Applicable
Skin corrosion/irritation	Not Classified	Not Applicable
Serious eye damage/irritation	Not Classified	Not Applicable
Respiratory sensitization	Not Classified	Not Applicable
Skin sensitization	Not Classified	Not Applicable
Germ cell mutagenicity	Not Classified	Not Applicable
Carcinogenicity	Not Classified	Not Applicable
Reproductive toxicity	Not Classified	Not Applicable
STOT-single exposure	Not Classified	Not Applicable
STOT-repeated exposure	Not Classified	Not Applicable
Aspiration hazard	Not Classified	Not Applicable

SECTION 12: Ecological information

12.1. Toxicity

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is not classified as dangerous for the environment

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Distillate (petroleum) hydrotreated heavy naphthenic - (0064742-52-5)	5,000.00, Oncorhynchus mykiss	1,000.00, Daphnia magna	1,000.00 (96 hr), Scenedesmus subspicatus
Octadecanoic acid, 12-hydroxy- - (0000106-14-9)	Not Available	Not Available	Not Available
Calcium Sulfonate - (Proprietary or N/A)	Not Available	Not Available	Not Available

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Consult federal, state and local regulations regarding disposal methods, recycle used oil. Do not contaminate used oil with solvents or other chemicals.

SECTION 14: Transport information

14.1. UN number	Not applicable
14.2. UN proper shipping name	Not regulated
14.3. Transport hazard class(es)	
US DOT Label	Not regulated
ADR/RID	Not regulated

IMDG Not regulated

Sub Class Not applicable

14.4. Packing group Not applicable

14.5. Environmental hazards

ADR/RID Environmentally Hazardous: No - Not regulated

IMDG Marine Pollutant: No - Not regulated

14.6. Special precautions for user

No further information

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

The above transport information is provided to assist in the proper classification of this product and may not be suitable for all shipping conditions. Shipping description may vary based on mode of transport, quantities, temperature of the material, package size, and/or origin and destination. For information specific to your situation, consult your company's Hazardous Materials/Dangerous Goods expert.

SECTION 15: Regulatory information

National Legislation

United States:

The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented.

All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory or are not required to be listed on the TSCA Inventory.

SARA 311/312 (>0.1%):	Not applicable
SARA 313 (>0.1%):	Not applicable
CERCLA (>0.1%):	Not applicable
Inventory - Canada - Non-Domestic Substances List (NDSL):	Not applicable
California Proposition 65 Cancer:	Not applicable
California Proposition 65 Developmental:	Not applicable
California Proposition 65 Female Reproductive:	Not applicable
California Proposition 65 Male Reproductive:	Not applicable

Inventory - Australia - Inventory

of Chemical Substances (AICS):

Calcium Sulfonate
Distillate (petroleum) hydrotreated heavy naphthenic
Lithium hydroxide monohydrate
Octadecanoic acid, 12-hydroxy-

Inventory - Japan Existing and New Chemical Substances (ENCS):

Distillate (petroleum) hydrotreated heavy naphthenic ()
Octadecanoic acid, 12-hydroxy- (2-1340; 9-1676)

Korean Existing Chemicals Inventory:

Distillate (petroleum) hydrotreated heavy naphthenic
Octadecanoic acid, 12-hydroxy-

Inventory of Existing Chemical Substances in China:

Calcium Sulfonate

Philippines Inventory of Chemicals and Chemical Substances (PICCS) :

Calcium Sulfonate
Distillate (petroleum) hydrotreated heavy naphthenic
Lithium hydroxide monohydrate
Octadecanoic acid, 12-hydroxy-

Taiwan List of Toxic Chemical Substances regulated under Toxic Chemical Substances Control Act : Not applicable

EU REACH: Annex XVII, Dangerous Substances and Preparations:

Distillate (petroleum) hydrotreated heavy naphthenic

Inventory - European Union - European Inventory of Existing Commercial Chemical Substances (EINECS):

Calcium Sulfonate ()
Distillate (petroleum) hydrotreated heavy naphthenic (265-155-0)
Octadecanoic acid, 12-hydroxy- (203-366-1)

EU List of Notified Chemical Substances (ELINCS): Not applicable

Risk Phrases

Not Classified.

SECTION 16: Other information

This information has been compiled from sources considered to be dependable and is accurate to the best of Lubricating Specialties Company knowledge. Lubricating Specialties Company makes no warranty whatsoever, expressed or implied, of MERCHANTABILITY OR FITNESS FOR THE PARTICULAR PURPOSE, regarding the accuracy of such data or the results to be obtained from the use thereof. Lubricating Specialties Company assumes no responsibility for injury to recipient or third persons, or for any damage to any property and recipient assumes all such risks.

The full text of the phrases appearing in section 3 is:

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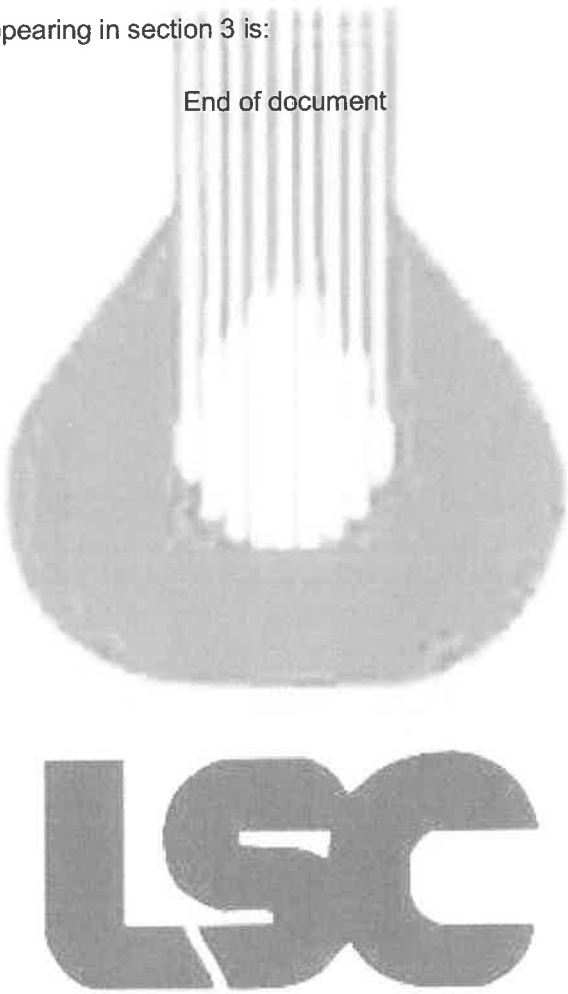


1. Identification of the substance or mixture and of the supplier

Identification of the substance or preparation
Product Code: **TPM9305**
Product Description: **BLACK**

Use of the substance/preparation
Masterbatch or compound for polymer industry

Company Identification
Techmer PM
#1 Quality Circle
Clinton, TN 37716 USA
Telephone: +1-865-457-6700
Fax: +1-865-457-3012

Emergency telephone
+1-865-457-6700

2. Hazards identification

Classification of the product
No need for classification according to GHS criteria for this product.

Label elements
This product does not require a hazard warning label in accordance with GHS criteria.

3. Composition/information on ingredients

This product contains a proprietary blend of components encapsulated within a polymer matrix. This product is not regarded as hazardous under 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200.

4. First aid measures

Inhalation
Move to fresh air. If irritation persists, get medical attention.

Skin contact
If molten material contacts the skin or in case of skin irritation, immediately flush with large amounts of water and get medical attention.

Eye contact
Wash immediately with plenty of water. If irritation persists, get medical attention.

Ingestion
If swallowed, do not induce vomiting. Get medical attention.

5. Firefighting measures

Suitable extinguishing media
Foam, CO_2, Dry Chemical and Water Fog

Hazardous combustion products
Burning may produce carbon monoxide, carbon dioxide, hydrocarbons and other possible toxic combustion products.

Special exposure hazards
In its present form, this product offers no unusual fire and explosion hazards. However, dust and fumes generated from this product could present an explosion hazard.

Special protective equipment for fire-fighters
Use self-contained breathing apparatus and chemical-protective clothing.

6. Accidental release measures

Personal precautions
Wear appropriate personal protective equipment. Eliminate all sources of ignition.

Environmental precautions
Do not allow entry to drains, water courses, soil or sewers.

Cleaning methods
Wearing appropriate personal protective equipment, sweep or vacuum and place in suitable container for disposal. Avoid creating dust.

7. Handling and storage

Handling
Avoid dust formation during handling. Provide appropriate local ventilation at machinery and at places where dust can be generated. In case of insufficient ventilation, wear suitable respiratory equipment.

Storage
Store in a cool, dry, well ventilated storage area. Keep container covered when not in use.

8. Exposure controls/personal protection

Engineering Controls
Work in well ventilated areas. Do not breathe dust, if generated. Physical processes such as grinding, high speed blending, etc may generate dust.

Personal protective equipment

Respiratory protection
Not required under normal process conditions and with adequate ventilation. However, should conditions exist that require respiratory protection, a NIOSH/MSHA approved respirator should be worn.

Eye protection
Wear safety glasses with side shields (or goggles).

Body protection
Wear protective gloves. Wear appropriate clothing to prevent repeated or prolonged contact with skin.

Hygiene measures
Wash thoroughly after handling and before eating, drinking or using tobacco products.

9. Physical and chemical properties

Appearance:	Pellets
Odor:	No significant odor
pH:	Not measured
Melting point:	Not measured
Boiling point/boiling range:	Not measured
Flash point:	Not measured
Evaporation Rate:	Not measured
Flammability (solid, gas):	Not flammable
Upper/Lower flammability limits:	Not measured
Vapor pressure:	Not measured
Vapor density:	Not measured
Relative density:	Available upon request
Solubility in water:	Not measured
Partition coefficient: n-octanol/water:	Not measured
Auto ignition temperature:	Not measured
Decomposition temperature:	Not measured

10. Stability and reactivity

Chemical stability
Stable

Conditions to avoid
Do not store near heat, flame nor strong oxidizing agents, acids or bases. Minimize dust generation and accumulation.

Hazardous decomposition products
Carbon monoxide, carbon dioxide, hydrocarbons and other possible toxic substances can be generated during thermal decomposition and combustion.

11. Toxicological information

Acute oral toxicity:	Not tested
Acute inhalation toxicity:	Not tested
Acute dermal toxicity:	Not tested
Skin irritation:	Not tested
Eye irritation:	Not tested
Skin sensitization:	Not tested
Chronic toxicity:	Not tested
Carcinogenicity:	This product is not classified as a carcinogen by IARC, NTP, OSHA or ACGIH.

12. Ecological information

Ecotoxicity
No information available

Persistence and degradability
No information available

Bioaccumulative potential
No information available

13. Disposal considerations

Dispose of in accordance with all local, regional, national and international regulations

14. Transport information

U.S. Department of Transportation (DOT)
Not classified as a dangerous good under transport regulations.

15. Regulatory information

U.S. Toxic Substances Control Act (TSCA):	All component(s) comprising this product are either exempt or listed on the TSCA inventory.
SARA Title III, Section 313:	This product does not contain any components that exceed the threshold reporting levels established by SARA Title III, Section 313.

16. Other information

HMIS ratings:	**Health:**	**0**
	Flammability:	**1**
	Physical Hazard:	**0**

Disclaimer: To the best of our knowledge, the information contained herein is accurate. It is obtained by Techmer PM from sources such as raw material suppliers and is believed to be true. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information on products referred to herein. No warranty of fitness for a particular purpose is made. This safety data sheet will supersede any that was previously received as it contains the most up to date information.

1. Identification of the substance or mixture and of the supplier

Identification of the substance or preparation
Product Code: **PM68903**
Product Description: **Safety Green UV CW**

Use of the substance/preparation
Masterbatch or compound for polymer industry

Company Identification
Techmer PM
#1 Quality Circle
Clinton, TN 37716 USA
Telephone: +1-865-457-6700
Fax: +1-865-457-3012

Emergency telephone
+1-865-457-6700

2. Hazards identification

Classification of the product
No need for classification according to GHS criteria for this product.

Label elements
This product does not require a hazard warning label in accordance with GHS criteria.

3. Composition/information on ingredients

This product contains a proprietary blend of components encapsulated within a polymer matrix. This product is not regarded as hazardous under 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200.

4. First aid measures

Inhalation
Move to fresh air. If irritation persists, get medical attention.

Skin contact
If molten material contacts the skin or in case of skin irritation, immediately flush with large amounts of water and get medical attention.

Eye contact
Wash immediately with plenty of water. If irritation persists, get medical attention.

Ingestion
If swallowed, do not induce vomiting. Get medical attention.

5. Firefighting measures

Suitable extinguishing media
Foam, CO_2, Dry Chemical and Water Fog

Hazardous combustion products
Burning may produce carbon monoxide, carbon dioxide, hydrocarbons and other possible toxic combustion products.

Special exposure hazards
In its present form, this product offers no unusual fire and explosion hazards. However, dust and fumes generated from this product could present an explosion hazard.

Special protective equipment for fire-fighters
Use self-contained breathing apparatus and chemical-protective clothing.

6. Accidental release measures

Personal precautions
Wear appropriate personal protective equipment. Eliminate all sources of ignition.

Environmental precautions
Do not allow entry to drains, water courses, soil or sewers.

Cleaning methods
Wearing appropriate personal protective equipment, sweep or vacuum and place in suitable container for disposal. Avoid creating dust.

7. Handling and storage

Handling
Avoid dust formation during handling. Provide appropriate local ventilation at machinery and at places where dust can be generated. In case of insufficient ventilation, wear suitable respiratory equipment.

Storage
Store in a cool, dry, well ventilated storage area. Keep container covered when not in use.

8. Exposure controls/personal protection

Engineering Controls
Work in well ventilated areas. Do not breathe dust, if generated. Physical processes such as grinding, high speed blending, etc may generate dust.

Personal protective equipment

Respiratory protection
Not required under normal process conditions and with adequate ventilation. However, should conditions exist that require respiratory protection, a NIOSH/MSHA approved respirator should be worn.

Eye protection
Wear safety glasses with side shields (or goggles).

Body protection
Wear protective gloves. Wear appropriate clothing to prevent repeated or prolonged contact with skin.

Hygiene measures
Wash thoroughly after handling and before eating, drinking or using tobacco products.

9. Physical and chemical properties

Appearance:	Pellets
Odor:	No significant odor
pH:	Not measured
Melting point:	Not measured
Boiling point/boiling range:	Not measured
Flash point:	Not measured
Evaporation Rate:	Not measured
Flammability (solid, gas):	Not flammable
Upper/Lower flammability limits:	Not measured
Vapor pressure:	Not measured
Vapor density:	Not measured
Relative density:	Available upon request
Solubility in water:	Not measured
Partition coefficient: n-octanol/water:	Not measured
Auto ignition temperature:	Not measured
Decomposition temperature:	Not measured

10. Stability and reactivity

Chemical stability
Stable

Conditions to avoid
Do not store near heat, flame nor strong oxidizing agents, acids or bases. Minimize dust generation and accumulation.

Hazardous decomposition products
Carbon monoxide, carbon dioxide, hydrocarbons and other possible toxic substances can be generated during thermal decomposition and combustion.

11. Toxicological information

Acute oral toxicity:	Not tested
Acute inhalation toxicity:	Not tested
Acute dermal toxicity:	Not tested
Skin irritation:	Not tested
Eye irritation:	Not tested
Skin sensitization:	Not tested
Chronic toxicity:	Not tested
Carcinogenicity:	This product is not classified as a carcinogen by IARC, NTP, OSHA or ACGIH.

12. Ecological information

Ecotoxicity
No information available

Persistence and degradability
No information available

Bioaccumulative potential
No information available

13. Disposal considerations

Dispose of in accordance with all local, regional, national and international regulations

14. Transport information

U.S. Department of Transportation (DOT)
Not classified as a dangerous good under transport regulations.

15. Regulatory information

U.S. Toxic Substances Control Act (TSCA):	All component(s) comprising this product are either exempt or listed on the TSCA inventory.
SARA Title III, Section 313:	This product does not contain any components that exceed the threshold reporting levels established by SARA Title III, Section 313.

16. Other information

HMIS ratings:	**Health:**	**0**
	Flammability:	**1**
	Physical Hazard:	**0**

Disclaimer: To the best of our knowledge, the information contained herein is accurate. It is obtained by Techmer PM from sources such as raw material suppliers and is believed to be true. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information on products referred to herein. No warranty of fitness for a particular purpose is made. This safety data sheet will supersede any that was previously received as it contains the most up to date information.

BAPOLENE®

HIGH DENSITY POLYETHYLENE
BAPOLENE® 2035
BLOW MOLDING

Description: **Bapolene® 2035** is a high density polyethylene copolymer resin. Product offers a balanced combination of superior top-load strength and ESCR properties. It complies with FDA 21CFR 177.1520[1].

Application: General purpose blow molding, household chemical and cosmetic containers.

Values reported are typical and should not be interpreted as specification.

All data are based on compression-molded plaques.

Resin	Nominal Value	ASTM
Melt Index[2] g/10 min.	0.35	D-1238
Density g/cm³	0.955	D-1505

GENERAL PROPERTIES		Nominal Value	ASTM
Tensile Strength @ Yld	psi	4,000	D-638
	MPa	28	
Flexural Modulus	psi	160,000	D-790
	MPa	1,100	
Elongation @ Brk	%	> 500	D-638
ESCR			D-1693

[1] End use and/or migration limitations may apply.
[2] 190°C / 2,160g

THIS PRODUCT DATA SHEET EFFECTIVE JUNE 2015 SUPERSEDES ALL DATA PREVIOUSLY PUBLISHED

BAMBERGER POLYMERS
Two Jericho Plaza, Jericho, New York, 11753, U.S.A. / Tel: 516-622-3600 / Fax: 516-622-3620 / Email: bpinfo@bapoly.com

Bamberger Polymers Inc.

12600 Featherwood Dr., Ste. 300
Houston, Texas 77034

SAFETY DATA SHEET
According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

SECTION 1
IDENTIFICATION

Product Name: Polyethylene (High Density Polyethylene)
Covers the following grade(s): **Bapolene 2035**

Product Type: Pellet/Flake
Use: Manufacture of various plastics articles.

Supplier:
Bamberger Polymers, Inc.
Two Jericho Plaza, Suite 109
Jericho, NY 11753

Business Phone: (800) 888-8959

SECTION 2
HAZARDS IDENTIFICATION

OSHA Classification of the substance or mixture (GHS-US):
- Combustible Dust

Label Elements
- Signal word (GHS-US): Warning
- Hazard Statement(s): If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air.

Acute Toxicity
No additional information available.

Additional Information
Keep container tightly closed and away from heat, hot surfaces, sparks, open flames and other ignition sources. Processing the polymer at high temperatures may form vapors that irritate the eyes and respiratory tract.

No smoking. Prevent dust accumulation. Airborne clouds of fine dust may form explosive mixtures with air. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.

Spilled pellets may create a slipping hazard. Sweep up spillage and dispose of properly.

SECTION 3

COMPOSITION / INFORMATION ON INGREDIENTS
Substance: NA
Mixture:

Ingredient Name	CAS #	% Wt.
Ethylene-1-butene	25087-34-7	≤ 100
Ethylene-1-hexene-1	25213-02-9	≤ 100
Ethylene-1-octene	26221-73-8	≤ 100
Polyethylene Homopolymer	9002-88-4	≤ 100
Additives	Proprietary/Trade Secret	NA

**** Compositions are typical values not part of any specification(s).***

To the best of our knowledge, 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 and require reporting in this section.

SECTION 4

FIRST AID MEASURES
Description of First Aid Measures

Eye Contact
Flush eyes with clean, cold, low-pressure running water for at least 15 minutes. Seek immediate medical attention.

Skin Contact
If molten material contacts skin, immediately flush skin with large amounts of cold water. No attempt should be made to peel polymer from the skin or to remove clothing attached with molten material. Thermal burns require immediate medical attention.

Inhalation
Remove victim to well-ventilated area. If not breathing, provide artificial respiration by trained personnel. If difficulty breathing, provide give oxygen and seek medical attention.

Ingestion
If swallowed, do not induce vomiting. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately.

Handling and/or processing of this material may generate dust which may cause mechanical irritation of the eyes, skin, nose and throat. High dust concentrations have a potential for combustion or explosion.

Most Important Symptoms/Effects, Acute and Delayed
Skin
No significant irritation expected. Heated material can cause serious thermal burns. At high process temperatures, fumes may cause irritation of the nose and throat.

Eyes
Possible mechanical irritation may manifest itself as local redness with possible discomfort. Heated material can cause thermal burns. When heated, vapors formed may irritate eyes. Material is dusty and may scratch surface of eye.

Inhalation
Exposure to high concentration of airborne particles may cause upper respiratory tract irritation. If heated, the product may form fumes which could cause irritation of the respiratory tract, coughing, nausea, and shortness of breath.

Ingestion
May cause choking, diarrhea, nausea, or discomfort in the abdominal region.

Indication of any immediate medical attention and special treatment
No additional information is available.

SECTION 5
FIRE FIGHTING MEASURES

Suitable Extinguishing Media
High dust concentrations have potential for combustion or explosion. In case of fire, use water spray (fog), foam, dry chemical or CO_2.

Unsuitable Extinguishing Media
Do *not* use water jet/stream.

Specific Hazards Arising from the Chemical
Fire- May be combustible at high temperature.

Explosion Hazards
Material is not explosive as defined by established regulatory criteria. May ignite if ignition source is available. Potential dust explosion hazard.

Hazardous Thermal Decomposition Products
Flammability

Products of Combustion
Combustion can produce carbon dioxide (C02), carbon monoxide (CO), hydrocarbons, aldehydes, organic vapors and other harmful products. Possible black smoke and soot.

Firefighting Protection
Wear NIOSH-approved positive pressure, self-contained breathing apparatus (SCBA) and full protective gear. Engage fire from a protected location. Avoid raising powdered materials into airborne dust, creating an explosion hazard. Apply aqueous extinguishing media carefully to prevent frothing/steam explosion. Prevent fire-fighting water from entering environment

May re-ignite after fire has been extinguished.

SECTION 6

ACCIDENTAL RELEASES MEASURES

Personal Precautions, Protective Equipment and Emergency procedures

Eliminate all ignition sources and contain spill. Granules spilled on the floor can cause slipping. Fine dust clouds may form explosive mixtures with air. Do not touch or walk through spilled material. Use suitable protective equipment.

Environmental and Clean-Up Methods

If emergency personnel are unavailable, vacuum or carefully collect spilled material(s), and place in an appropriate container for disposal. Recovered material should be packaged, labeled, transported, and disposed of in conformance to consistent with all applicable laws and regulations. If heated material is spilled, allow to cool before proceeding with cleanup methods. Avoid creating dusty conditions and prevent wind dispersal. Avoid contact of spilled material with soil and prevent runoff from entering sewers and waterways.

Personal Protection

Personnel should wear proper safety equipment.

SECTION 7

HANDLING AND STORAGE

Handling

Do not smoke, drink or eat when storing, handling or using this product. Always wash hands after handling the product.

Keep away from open flame or sources of ignition. There is a risk of being splashed with molten materials. At high temperatures, potentially toxic/irritating fumes may result from heated material - do not inhale fumes or vapor from molten product. Use with adequate ventilation. When handling hot material, wear protective gloves, clothing and face shield that are able to withstand the temperature of the molten product. After handling, always wash hands thoroughly with soap and water. Pneumatic conveying and other mechanical handling can generate combustible dust and static electrical charges. Earth all equipment.

High dust concentrations have a potential for combustion or explosion. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Electrostatic charges may be generated when emptying sacks. It is recommended that sacks are emptied away from explosive environments.

Storage

Keep container dry, tightly closed, and stored in a well-ventilated area. Avoid contact or proximity to strong oxidizing agents. Pallet stock slippage and forklift truck maneuvers can cause injury. It is recommended that adequate procedures covering storage handling of pallets are implemented and based on good manufacturing practices.

Store at room temperature and protect from heat and direct sunlight. Store in a dry, cool, well-ventilated area. Containers that have been opened must be properly resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate procedures to avoid environmental contamination

Incompatible materials: strong oxidizing agents.

SECTION 8

EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Ingredients	Type	Limit Value	Basis
Materials that can be formed when handling this product: Non-specified (inert or nuisance) dust	TWA	10 mg/m³ (Inhalable)	US (ACGIH) 2005
Materials that can be formed when handling this product: Non-specified (inert or nuisance) dust	TWA	3 mg/m³ (Respirable)	US (ACGIH) 2005
Materials that can be formed when handling this product: Non-specified (inert or nuisance) dust	TWA	15 mg/m³ (Total Dust)	US (OSHA) 2005
Materials that can be formed when handling this product: Non-specified (inert or nuisance) dust	TWA	5 mg/m³ (Respirable)	US (OSHA) 2005

Control Measures

Use enclosures around process, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If high concentrations of airborne matter or fumes are generated, use ventilation to ensure levels are kept below the exposure limit. Clothing and shoes should be dusted before re-used.

Personal protection

Eyes

Safety glasses with side shields are required as minimum requirements. Use full-face respirator if a high dust concentration is generated.

Skin

Minimize contact. The use of heat-resistant protective gloves and clothing and face shield is good industrial practice and recommended.

Respiratory

Product processing may produce dust, vapor or fumes. To minimize risk of overexposure to dust, vapor or fumes it is recommended to use process enclosures and a local exhaust system, and that the working area is properly ventilated. If ventilation is inadequate, use certified respirator that will protect against dust/mist. Do not consume food in the work area.

Hands

Use of heat-resistant protective gloves, clothing and face shield capable of withstanding temperature of molten product, is good industrial practice. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves. Since even the best chemically resistant glove will break down after repeated chemical exposures, gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Consult your local authorities, supervisor or standard operating procedures for special handling directions and acceptable exposure limits.

SECTION 9
PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state/form	Solid (pellets or powder)
Color	Opaque / Translucent / White
Odor	Mild to none
Safety Data	
Lower explosion limit	No data available
Upper explosion limit	No data available
Flammability (solid, gas)	Polymer will burn but does not easily ignite.
Oxidizing properties	Not considered an oxidizing agent.
Autoignition temperature	> 572 °F (300 °C)
Decomposition temperature	Not determined
pH	No data available
Approximate melting point range	122 - 338 °F (50 - 170 °C)
Boiling point/boiling range	No data available
Flash point	No data available
Vapor pressure	Not applicable
Density	< 1 g/cm^3
Water solubility	Negligible
Partition coefficient: n-octanol/water	No data available
Viscosity	No data available
Relative vapor density	No data available
Evaporation rate	No data available

SECTION 10
STABILITY AND REACTIVITY

Reactivity
No known reactivity hazards.

Chemical Stability
Stable under appropriate handling and storage conditions.

Conditions to avoid
Excessive temperatures, strong oxidizers, and all possible sources of ignition (spark or flame), heat, and direct sunlight. Avoid dust formation.

Incompatibility
Strong oxidizing materials, fluorine, halogens, benzene, aromatic and chlorinated hydrocarbons, nitric and perchloric acids and others.

Decomposition products (*not expected to decompose under normal conditions*)

Combustion can produce carbon monoxide and/or carbon dioxide and other toxic products (fumes). Decomposition can yield traces amount of hydrocarbons. Degradation products may include, among others, aldehydes, alcohols, ketones, and organic acids.

Hazardous polymerization is not expected to occur.

SECTION 11

TOXOLOGICAL INFORMATION

Likely Routes of Exposure: oral, dermal, inhalation, ingestion.

Acute toxicity: Not classified.

Acute Toxicity (Listed for components where information is available)			
PE	LD_{50} oral rat	> 8000 mg/kg	Based on polyethylene homopolymer
Polyethylene (25213-02-9 or 25087-34-7 or 9002-88-4)	LD_{50} oral rat	> 8000 mg/kg	Based on polyethylene homopolymer

- Skin corrosion/irritation: Not classified
- Acute oral toxicity: Not classified
- Acute inhalation toxicity: Not classified
- Acute dermal toxicity: Not classified
- Serious eye damage/irritation: Not classified. Mechanical irritation is possible.
- Respiratory or skin sensitization: Not classified
- Carcinogenicity: IARC Group 3 - Not classifiable
- Germ cell mutagenicity: Not classified
- Reproductive toxicity: Not classified
- Specific target organ toxicity (single exposure): Not classified
- Specific target organ toxicity (repeated exposure): Not classified
- Aspiration hazard: Not classified

This product is not considered a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard.

Other Information

During thermal processing polyolefins can release vapors and gases (aldehydes, ketones and organic acids) which are irritating to the mucous membranes of the eyes, mouth, throat, and lungs. Generally these irritant effects are all transitory. However, prolonged exposure to irritating off-gases can lead to pulmonary edema. Formaldehyde (an aldehyde) has been classified as a carcinogen based on animal data and limited epidemiological evidence.

SECTION 12

ECOLOGICAL INFORMATION

Ecotoxicology Assessment

The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment. Wildlife may ingest plastic pellets or bags. Although not toxic, such materials may physically obstruct the digestive system, causing starvation or death.

No testing has been performed by the manufacturer(s).

Acute aquatic toxicity: Not classified

Chronic aquatic toxicity: Not classified

Persistence and degradability
Biodegradability: Not inherently biodegradable.
Bioaccumulative potential: This material is not expected to bioaccumulate.

Mobility
This product is expected to float on water, and is not likely to move rapidly with surface or groundwater flows due to its low water solubility. This material is insoluble in water.

Results of PBT and vPvB assessment: Not applicable.

Other Information
This material is not volatile and insoluble in water. Avoid release to the environment.

SECTION 13
DISPOSAL CONSIDERATIONS

The information in this SDS pertains only to the product as shipped.

Waste Information
Avoid contact of spilled material and/or runoff with soil and surface waterways. Consult an environmental professional to determine if local, regional or national regulations would classify spilled or contaminated materials as hazardous waste. Use only approved transporters, recyclers, and treatment, storage or disposal facilities. Dispose of in accordance with all applicable Federal, State and local control regulations. Recycle the material to fullest extent possible.

Consult your local, regional and federal (EPA) authorities for all pertinent regulations and procedures.

SECTION 14
TRANSPORT INFORMATION

Polyethylene, other than liquid, is not regulated.

Regulatory Authority	Shipping Description
DOT (USA)	Not regulated as a hazardous material or dangerous goods for transportation.
IATA	Not regulated as a hazardous material or dangerous goods for transportation.
IMDG	Not regulated as a hazardous material or dangerous goods for transportation.

This information is not intended to convey all specific regulatory or operational requirements/ information relating to this product. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15
REGULATORY INFORMATION

TSCA
All components of this product are listed or exempted from listing on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

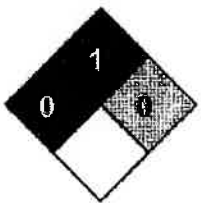
SARA 311/312 Hazard Classification
Fire

SECTION 16
OTHER INFORMATION
Label requirements

This product has been evaluated and does not require any hazard warning on the label under established regulatory criteria.

HMIS
Health Hazard: 0
Flammability: 1
Physical hazards: 0

NFPA
Health: 0
Fire Hazard: 1
Reactivity: 0



Rating Scale Information
HMIS: (0 = minimal hazard; 4 = severe hazard)
NFPA: (0 = minimal hazard; 4 = severe hazard)

NOTICE

This Safety Data Sheet is based upon data considered to be accurate at the time of its preparation. This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Bamberger Polymers.

Bamberger Polymers does not assume any liability whatsoever for the accuracy or completeness of the information, the use of the information, or the use of the product mentioned herein. Final determination of the suitability of any information or product contemplated, the manner of use, environmental protection, and the health and safety of its employees is the sole responsibility of the user. Bamberger Polymers shall not be responsible for any damage or injury resulting from abnormal use, from any failure to follow appropriate practices or from hazards inherent in the nature of the product. Although certain hazards may be described herein, we cannot guarantee that these are the only hazards which exist. All materials may present unknown hazards and should be used with caution. Except as stated in this document, no representations are made as to the physical properties or quality of this product.

Nothing herein waives or modifies any of the Seller's terms and conditions of sale as it pertains to this product.

Safety Data Sheet
Red-I Pt Cable Coating

Product Number: **50102-12**
Revision Date: **01/28/2016**

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier Red-I Pt Cable Coating

Product Code 50102

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Manufacturer LUBRICATING SPECIALTIES COMPANY
8015 PARAMOUNT BLVD.
PICO RIVERA, CA 90660

Telephone No. (562) 776-4000

1.4. Emergency telephone number

(800) 424-9300 24hr

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Not Classified

2.2. Label elements

Using the Toxicity Data listed in section 11 & 12 the product is labeled as follows.

Not Classified

HMIS	**Health:**	0	**NFPA**	**Health:**	0
	Fire:	1		**Fire:**	1

Physical Hazards:	0	**Reactivity:**	0
PPE:	C	**Special Hazards:**	--

2.3. Other hazards

This product contains no PBT/vPvB chemicals.

SECTION 3: Composition/information on ingredients

Ingredient/Chemical Designations	Weight %	EC No. 1272/2008 / GHS Classification
Distillate (petroleum) hydrotreated heavy naphthenic CAS Number: 0064742-52-5	<100	Not Classified
Octadecanoic acid, 12-hydroxy- CAS Number: 0000106-14-9	<10	Not Classified
Calcium Sulfonate CAS Number: Proprietary or N/A	<3	Not Classified

*The full texts of the phrases are shown in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General

In all cases of doubt, or when symptoms persist, seek medical attention.

Never give anything by mouth to an unconscious person.

Inhalation

If inhaled, remove person to fresh air and keep comfortable for breathing. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. If unconscious, place in the recovery position and seek medical attention immediately.

Skin

In case of contact, immediately rinse skin with plenty of water. Remove contaminated clothing and shoes. If skin irritation occurs, seek medical attention. Launder contaminated clothing before reuse.

Eye

In case of contact, immediately rinse eyes with plenty of fresh, clean water for at least 15 minutes. Remove contact lenses if present and continue rinsing. Seek medical attention immediately.

Ingestion

Do not induce vomiting. Call a physician or emergency medical facility immediately.

4.2. Most important symptoms and effects, both acute and delayed

No data available

4.3. Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Use Carbon dioxide (CO2), dry chemical, or foam to extinguish flames.

5.2. Special hazards arising from the substance or mixture

Hazardous Decomposition Products: May form CO and CO2.

5.3. Advice for fire-fighters

Self-contained full-face positive pressure breathing apparatus (SCBA) should be used. Water can be used to cool and protect exposed material. Do not allow runoff water and contaminants from fire fighting to enter drains or water courses.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid contact with spilled material. Use suitable personal protective equipment. Ventilate area if spilled in confined space or other poorly ventilated areas. Evacuate personnel to safe areas. Keep unnecessary personnel away.

6.2. Environmental precautions

Prevent entry into sewers and waterways. Report spills as required to appropriate authorities in accordance with all applicable regulations.

6.3. Methods and material for containment and cleaning up

Ventilate the area and avoid breathing vapors. Take the personal protective measures listed in section 8.

Contain and absorb spillage with non-combustible materials e.g. sand, earth, vermiculite. Place in closed containers outside buildings and dispose of according to the Waste Regulations. (See section 13).

Clean, preferably with a detergent. Do not use solvents.

Do not allow spills to enter drains or water courses.

If drains, sewers, streams or lakes are contaminated, inform the local water company immediately. In the case of contamination of rivers, streams or lakes the Environmental Protection Agency should also be informed.
Dispose of in accordance with all federal, state, and local environmental regulations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling

Avoid skin and eye contact. Wash thoroughly after handling. Avoid breathing vapor. Use with adequate ventilation.

In Storage

Store in a dry location at room temperature.

Keep this container and vapors from the container away from heat and flame. Keep container closed and maintain all original markings and labels.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from strong oxidizing and reducing agents.

CAUTION!!! Do not use cutting or welding torches on drums, even when empty. Do not reuse container.

Containers, even those that have been emptied will retain product residue and vapors. Always obey hazard warnings and handle empty containers as if they were full.

7.3. Specific end use(s)

There are no exposure scenarios, see details in section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

The following occupational exposure limits have been established.

CAS Number	Ingredient	Source	Value
0000106-14-9	Octadecanoic acid, 12-hydroxy-	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
0064742-52-5	Distillate (petroleum) hydrotreated heavy naphthenic	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
Proprietary or N/A	Calcium Sulfonate	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit

Contains mineral oil. The exposure limits for oil mist are 5 mg/m3 OSHA PEL and 10 mg/m3 ACGIH.

Carcinogen Data

CAS No.	Ingredient	Source	Value
0000106-14-9	Octadecanoic acid, 12-hydroxy-	OSHA	Select Carcinogen: No
		IARC	Group 1: No; Group 2A: No; Group 2B: No; Group 3: No; Group 4: No;
0064742-52-5	Distillate (petroleum) hydrotreated heavy naphthenic	OSHA	Select Carcinogen: No
		IARC	Group 1: No; Group 2A: No; Group 2B: No; Group 3: No; Group 4: No;
Proprietary or N/A	Calcium Sulfonate	OSHA	Select Carcinogen: No
		IARC	Group 1: No; Group 2A: No; Group 2B: No; Group 3: No; Group 4: No;

DNEL/PNEC values

No Data Available

8.2. Exposure controls

No special requirements under ordinary conditions of use and with adequate ventilation.

Eye/face protection

Wear safety glasses. If potential for splash or mist exists, wear chemical goggles or face shield.

Skin protection

Wear chemical resistant gloves. Gloves should be inspected before each use and discarded if they show tears, pinholes, or signs of wear.

Other

Gloves, overalls, apron, boots, or other suitable protective garments should be worn to minimize contact based on the task being performed.

Respiratory protection

Use NIOSH/OSHA approved respirator where high vapor concentrations are present.

Thermal hazards

No Data Available

SECTION 9: Physical and chemical properties

Appearance	AMBER GREASE
Odor	Petroleum Odor
Odor threshold	Not Determined
pH	Not Measured
Melting point / freezing point (C)	Not Determined
Initial boiling point and boiling range (C)	> 300
Flash point (C)	> 200
Evaporation rate (H20 = 1)	Not Determined
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	
Lower Explosive Limit:	Not Determined
Upper Explosive Limit:	Not Determined
Vapor pressure (Pa)	Not Determined
Vapor density	Heavier than air.
Relative density	0.9288
Solubility(ies)	negligible
Partition coefficient n-octanol/water (Log Kow)	Not Determined
Auto-ignition temperature (C)	Not Determined
Decomposition temperature	Not Determined
Viscosity (cSt)	
@ 100 C	Not Measured
@ 40 C	Not Measured
Pour point temperature (C)	Not Determined
Volatile Organic Compounds	nil
SADT	Not Determined

The data listed above are typical physical and chemical properties that do not constitute product specification.

9.2. Other information

DMSO extract by IP346: Less than 3.0 wt % (mineral oil component only)

SECTION 10: Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

Material is normally stable at ambient temperature and pressure.

10.3. Possibility of hazardous reactions

May react with: oxidizing agents.

10.4. Conditions to avoid

High temperature, sparks, and open flames.

10.5. Incompatible materials

Keep away from strong oxidizing and reducing agents.

10.6. Hazardous decomposition products

Hazardous Decomposition Products: May form CO and CO2.

SECTION 11: Toxicological information

Acute toxicity

The preparation has been assessed using the Acute Toxicity Data listed below, and classified for toxicological hazards accordingly. See section 2 for details.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation vapor LD50, mg/L/4hr
Calcium Sulfonate - (Proprietary or N/A)	>5,000, Rat	>2,000, Rabbit	Not Available
Distillate (petroleum) hydrotreated heavy naphthenic - (0064742-52-5)	>5,000, Rat	5,000.00, Rabbit	Not Available
Octadecanoic acid, 12-hydroxy- - (0000106-14-9)	Not Available	Not Available	Not Available

Classification	Category	Hazard Description
Acute toxicity (oral)	Not Classified	Not Applicable
Acute toxicity (dermal)	Not Classified	Not Applicable
Acute toxicity (inhalation)	Not Classified	Not Applicable
Skin corrosion/irritation	Not Classified	Not Applicable
Serious eye damage/irritation	Not Classified	Not Applicable
Respiratory sensitization	Not Classified	Not Applicable
Skin sensitization	Not Classified	Not Applicable
Germ cell mutagenicity	Not Classified	Not Applicable
Carcinogenicity	Not Classified	Not Applicable
Reproductive toxicity	Not Classified	Not Applicable
STOT-single exposure	Not Classified	Not Applicable
STOT-repeated exposure	Not Classified	Not Applicable
Aspiration hazard	Not Classified	Not Applicable

SECTION 12: Ecological information

12.1. Toxicity

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is not classified as dangerous for the environment

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Distillate (petroleum) hydrotreated heavy naphthenic - (0064742-52-5)	5,000.00, Oncorhynchus mykiss	1,000.00, Daphnia magna	1,000.00 (96 hr), Scenedesmus subspicatus
Octadecanoic acid, 12-hydroxy- - (0000106-14-9)	Not Available	Not Available	Not Available
Calcium Sulfonate - (Proprietary or N/A)	Not Available	Not Available	Not Available

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Consult federal, state and local regulations regarding disposal methods, recycle used oil. Do not contaminate used oil with solvents or other chemicals.

SECTION 14: Transport information

14.1. UN number Not applicable

14.2. UN proper shipping name Not regulated

14.3. Transport hazard class(es)

US DOT Label Not regulated

ADR/RID Not regulated

IMDG Not regulated

Sub Class Not applicable

14.4. Packing group Not applicable

14.5. Environmental hazards

ADR/RID Environmentally Hazardous: No - Not regulated

IMDG Marine Pollutant: No - Not regulated

14.6. Special precautions for user

No further information

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

The above transport information is provided to assist in the proper classification of this product and may not be suitable for all shipping conditions. Shipping description may vary based on mode of transport, quantities, temperature of the material, package size, and/or origin and destination. For information specific to your situation, consult your company's Hazardous Materials/Dangerous Goods expert.

SECTION 15: Regulatory information

National Legislation

United States:

The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented.

All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory or are not required to be listed on the TSCA Inventory.

SARA 311/312 (>0.1%): Not applicable

SARA 313 (>0.1%): Not applicable

CERCLA (>0.1%): Not applicable

Inventory - Canada - Non-Domestic Substances List (NDSL): Not applicable

California Proposition 65 Cancer: Not applicable

California Proposition 65 Developmental: Not applicable

California Proposition 65 Female Reproductive: Not applicable

California Proposition 65 Male Reproductive: Not applicable

Inventory - Australia - Inventory

of Chemical Substances (AICS):

Calcium Sulfonate
Distillate (petroleum) hydrotreated heavy naphthenic
Lithium hydroxide monohydrate
Octadecanoic acid, 12-hydroxy-

Inventory - Japan Existing and New Chemical Substances (ENCS):

Distillate (petroleum) hydrotreated heavy naphthenic ()
Octadecanoic acid, 12-hydroxy- (2-1340; 9-1676)

Korean Existing Chemicals Inventory:

Distillate (petroleum) hydrotreated heavy naphthenic
Octadecanoic acid, 12-hydroxy-

Inventory of Existing Chemical Substances in China:

Calcium Sulfonate

Philippines Inventory of Chemicals and Chemical Substances (PICCS) :

Calcium Sulfonate
Distillate (petroleum) hydrotreated heavy naphthenic
Lithium hydroxide monohydrate
Octadecanoic acid, 12-hydroxy-

Taiwan List of Toxic Chemical Substances regulated under Toxic Chemical Substances Control Act : Not applicable

EU REACH: Annex XVII, Dangerous Substances and Preparations:

Distillate (petroleum) hydrotreated heavy naphthenic

Inventory - European Union - European Inventory of Existing Commercial Chemical Substances (EINECS):

Calcium Sulfonate ()
Distillate (petroleum) hydrotreated heavy naphthenic (265-155-0)
Octadecanoic acid, 12-hydroxy- (203-366-1)

EU List of Notified Chemical Substances (ELINCS): Not applicable

Risk Phrases

Not Classified.

SECTION 16: Other information

This information has been compiled from sources considered to be dependable and is accurate to the best of Lubricating Specialties Company knowledge. Lubricating Specialties Company makes no warranty whatsoever, expressed or implied, of MERCHANTABILITY OR FITNESS FOR THE PARTICULAR PURPOSE, regarding the accuracy of such data or the results to be obtained from the use thereof. Lubricating Specialties Company assumes no responsibility for injury to recipient or third persons, or for any damage to any property and recipient assumes all such risks.

The full text of the phrases appearing in section 3 is:

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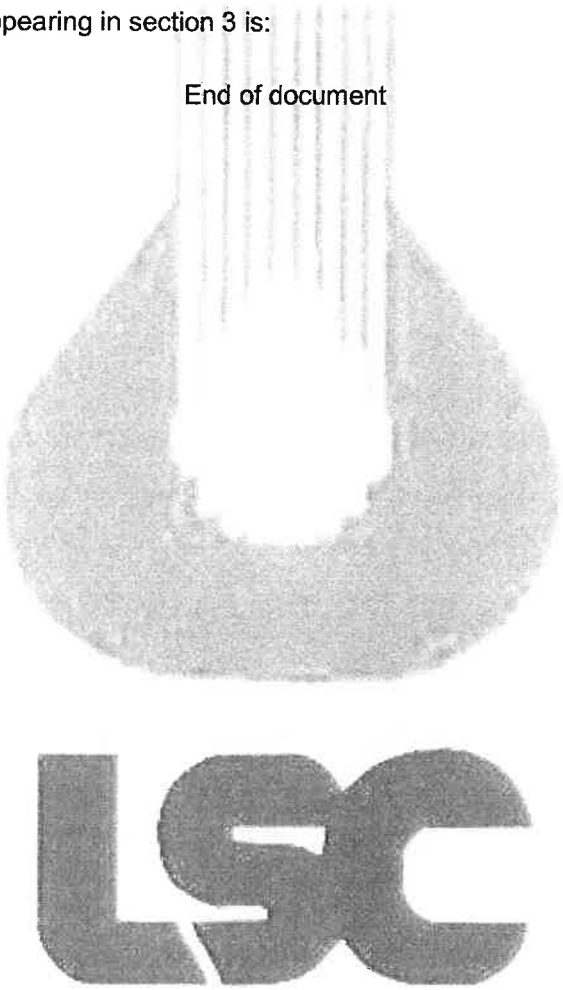


ArcelorMittal

SDS ID No.: AM USA - 007

Safety Data Sheet (SDS)

Section 1 – Identification

1(a) Product Identifier used on Label: Carbon and Alloy Steel Rod or Bar

1(b) Other means of identification: Refer to Section 16 for product synonyms.

1(c) Recommended use of the chemical and restrictions on use: These products are sold to all steel-consuming industries including automotive, heavy machinery, pipes and tubes, construction, packaging and appliances. The main markets for these products are construction and mechanical engineering, as well as energy and automotive applications.

1(d) Name, address, and telephone number:

ArcelorMittal USA LLC
1 South Dearborn Street
Chicago, IL 60603-9888

Phone number : 219-787-4901 or
email at: msdssupport@arcelormittal.com

1(e) Emergency phone number: 1-760-476-3962 (3E Company Code: 333211) or CHEMTREC (Day or Night): 1-800-424-9300

Section 2 – Hazard(s) Identification

2(a) Classification of the chemical: Carbon and Alloy Steel Rod or Bar is considered an article under Reach regulation (REACH REGULATION (EC) No 1907/2006) and is not subject to classification under CLP regulation (REGULATION (EC) No 1272/2008). However. **Carbon and Alloy Steel Rod or Bar** is not exempt as an article under OSHA's Hazard Communication Standard (29 CFR 1910.1200) due to its downstream use, thus this product is considered a mixture and a hazardous material. Therefore, the categories of Health Hazards as defined in "GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS), Third revised edition ST/SG/AC.10/30/Rev. 3" United Nations, New York and Geneva, 2009 have been evaluated. Refer to Section 3, 8 and 11 for additional information.

2(b) Signal word, hazard statement(s), symbols and precautionary statement(s):

Hazard Symbol	Hazard Classification	Signal Word	Hazard Statement(s)
	Carcinogenicity - 2 Reproductive Toxicity - 1 Single Target Organ Toxicity (STOT) Repeat Exposure - 1	**Danger**	Suspected of causing cancer. Suspected of damaging fertility or the unborn child. Causes damage to lungs and central nervous system through prolonged or repeated inhalation exposure.
	Skin Sensitization - 1 STOT Single Exposure - 3		May cause an allergic skin reaction. May cause respiratory irritation.
NA	Eye Irritation-2B		Causes eye irritation.

Precautionary Statement(s):

Prevention	Response	Storage/Disposal
Do not breathe dusts / fume / gas / mist / vapor / spray. Wear protective gloves / protective clothing / eye protection / face protection. Contaminated work clothing must not be allowed out of the workplace. Use only outdoors or in well ventilated areas. Wash thoroughly after handling. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not eat, drink or smoke when using this product.	If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: 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 on skin: Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off and wash contaminated clothing before reuse. Call a poison center/doctor if you feel unwell. .	Dispose of contents in accordance with federal, state and local regulations.

2(c) Hazards not otherwise classified: None Known

2(d) Unknown acute toxicity statement (mixture): None Known

Section 3 – Composition/Information on Ingredients

3(a-c) Chemical name, common name (synonyms), CAS number and other identifiers, and concentration:

Chemical Name	CAS Number	EC Number	% weight
Iron	7439-89-6	231-096-4	95-99
Carbon	7440-44-0	231-153-3	0-1.0

Section 3 – Composition/Information on Ingredients (continued)

3(a-c) Chemical name, common name (synonyms), CAS number and other identifiers, and concentration (continued):

Chemical Name	CAS Number	EC Number	% weight
Chromium	7440-47-3	231-157-5	0-1.2
Lead (inorganic)*	7439-92-1	231-100-4	0-0.35
Manganese	7439-96-5	231-105-1	0-2.5
Molybdenum	7439-98-7	231-107-2	0-1
Nickel	7440-02-0	231-111-4	0-2.1
Silicon	7440-21-3	231-130-8	0-1.6

EC - European Community

CAS - Chemical Abstract Service

*Certain products

- All commercial steel products contain small amounts of various elements in addition to those listed. These small quantities are frequently referred to as "trace" or "residual" elements that generally originate in the raw materials used. Steel products may contain the following trace or residual elements including typical percentages for the elements identified: Aluminum (typically < 0.1), bismuth (0.5 max), boron (≤0.005 max, typically 0.001%), calcium (≤ 0.005 max, typically 0.0003%), columbium (≤0.15 max, typically 0.002%), copper (0.5 max), phosphorous (≤0.1 max, typically 0.01%), selenium (0.06 max), sulfur (0.5 max), tin (≤ .03 max), tellurium (0.1 max), titanium (≤0.15 max, typically 0.002%), and vanadium (0.5 max). Other trace elements not frequently identified, may include antimony, arsenic, cadmium, cobalt, and zirconium.
- Percentages are expressed as typical ranges or maximum concentrations of trace elements for the purpose of communicating the potential hazards of the finished product. Consult product specifications for specific composition information.
- Product surfaces may be treated with small amounts of corrosion-inhibiting oil that may contain mineral oil or petroleum distillates, or paints, epoxies, laminates, etc., generally applied at the customer's request. Refer to the coating manufacturer's MSDS/SDS for hazards associated with coatings.

Section 4 – First-aid Measures

4(a) Description of necessary measures:

- **Inhalation: Carbon and Alloy Steel Rod or Bar** as sold/shipped is not a likely form of exposure. However during further processing (welding, grinding, burning, etc.), if inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: Get medical advice/attention.
- **Eye Contact: Carbon and Alloy Steel Rod or Bar** as sold/shipped is not a likely form of exposure. However during further processing (welding, grinding, burning, etc.), 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 exposed, concerned or feel unwell: Get medical advice/attention.
- **Skin Contact:** If on skin: Wash thoroughly after handling. Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off and wash contaminated clothing before reuse. If exposed, concerned or feel unwell: Get medical advice/attention.
- **Ingestion: Carbon and Alloy Steel Rod or Bar** as sold/shipped is not a likely form of exposure. However during further processing (welding, grinding, burning, etc.), if exposed, concerned or feel unwell: Get medical advice/attention.

4(b) Most important symptoms/effects, acute and delayed (chronic):

- **Inhalation: Carbon and Alloy Steel Rod or Bar** as sold/shipped is not likely to present an acute or chronic heath effect.
- **Eye: Carbon and Alloy Steel Rod or Bar** as sold/shipped is not likely to present an acute or chronic heath effect.
- **Skin: Carbon and Alloy Steel Rod or Bar** as sold/shipped is not likely to present an acute or chronic heath effect.
- **Ingestion: Carbon and Alloy Steel Rod or Bar** as sold/shipped is not likely to present an acute or chronic heath effect.

However during further processing (welding, grinding, burning, etc.) individual components may illicit an acute or chronic heath effect. Refer to Section 11-Toxicological Information.

4(c) Immediate Medical Attention and Special Treatment: None Known

Section 5 – Fire-fighting Measures

5(a) Suitable (and unsuitable) Extinguishing Media: Not Applicable for **Carbon and Alloy Steel Rod or Bar** as sold/shipped. Use extinguishers appropriate for surrounding materials.

5(b) Specific Hazards arising from the chemical: Not Applicable for **Carbon and Alloy Steel Rod or Bar** as sold/shipped. When burned, toxic smoke, fume and vapor may be emitted.

5(c) Special protective equipment and precautions for fire-fighters: Self-contained NIOSH approved respiratory protection and full protective clothing should be worn when fumes and/or smoke from fire are present. Heat and flames cause emittance of acrid smoke and fumes. Do not release runoff from fire control methods to sewers or waterways. Firefighters should wear full face-piece self-contained breathing apparatus and chemical protective clothing with thermal protection. Direct water stream will scatter and spread flames and, therefore, should not be used.

Section 6 - Accidental Release Measures

6(a) Personal Precautions, Protective Equipment and Emergency Procedures: Not Applicable for **Carbon and Alloy Steel Rod or Bar** as sold/shipped. For spills involving finely divided particles, clean-up personnel should be protected against contact with eyes and skin. If material is in a dry state, avoid inhalation of dust.

Section 6 - Accidental Release Measures (continued)

6(b) Methods and materials for containment and clean up: Not Applicable for **Carbon and Alloy Steel Rod or Bar** as sold/shipped. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations. Follow applicable OSHA regulations (29 CFR 1910.120) and all other pertinent state and federal requirements.

Section 7 - Handling and Storage

7(a) Precautions for safe handling: Not Applicable for **Carbon and Alloy Steel Rod or Bar** as sold/shipped, however further processing (welding, burning, grinding, etc.) with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoors or in well ventilated areas. Practice good housekeeping. Avoid breathing metal fumes and/or dust. Do not eat, drink or smoke when using this product. Cut resistant gloves and sleeves should be worn when working with steel products.

7(b) Conditions for safe storage, including any incompatibilities: Store away from acids and incompatible materials.

Section 8 - Exposure Controls / Personal Protection

8(a) Occupational Exposure Limits (OELs): Carbon and Alloy Steel Rod or Bar as sold/shipped in its physical form does not present an inhalation, ingestion or contact hazard, nor would any of the following exposure data apply. However, operations such as burning, welding (high temperature), sawing, brazing, machining, grinding, etc. may produce fumes and/or particulates. The following exposure limits are offered as reference for an experienced industrial hygienist to review.

Ingredients	OSHA PEL [1]	ACGIH TLV [2]	NIOSH REL [3]	IDLH [4]
Iron	10 mg/m³ (as iron oxide fume)	5.0 mg/m³ (as iron oxide dust and fume)	5.0 mg/m³ (as iron oxide dust and fume)	2,500 mg Fe/m³
Carbon	15 mg/m³ (as total dust, PNOR[5]) 5.0 mg/m³ (as respirable fraction, PNOR)	10 mg/m³ (as inhalable fraction,[6] PNOS)[7] 3.0 mg/m³ (as respirable fraction,[8] PNOS)	NE	NE
Chromium	0.5 mg/m³ (as Cr II & III, inorganic compounds) 1.0 mg/m³ (as Cr, metal) 0.005 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble) "AL" 0.0025 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble)	0.5 mg/m³ (as Cr III, inorganic compounds) 0.5 mg/m³ (as Cr, metal) 0.05 mg/m³ (as Cr VI, inorganic compounds) 0.01 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble)	0.5 mg/m³ (as Cr II & III, inorganic compounds) 0.5 mg/m³ (as Cr, metal) 0.001 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble)	250 mg/m³ (as Cr II & metal) 25 mg/m³ (as Cr III) 15 mg/m³ (as Cr VI)
Lead	0.05 mg/m³ [9] "AL" 0.03 mg/m³	0.05 mg/m³	0.05 mg/m³ [9]	100 mg/m³
Manganese	(C) 5.0 mg/m³ (as Fume & Mn compounds)	0.2 mg/m³	(C) 5.0 mg/m³ 1.0 mg/m³ (as fume) (STEL) 3.0 mg/m³	500 mg Mn/m³
Molybdenum	15 mg/m³ (as total dust, PNOR) 5.0 mg/m³ (as respirable fraction, PNOR)	10 mg/m³ (as Mo insoluble compounds, inhalable fraction) 3.0 mg/m³ (as Mo insoluble compounds, respirable fraction) 0.5 mg/m³ (as Mo soluble compounds, respirable fraction)	NE	NE
Nickel	1.0 mg/m³ (as Ni metal & insoluble compounds)	1.5 mg/m³ (as inhalable fraction Ni metal) 0.2 mg/m³ (as inhalable fraction Ni inorganic only insoluble and soluble compounds)	0.015 mg/m³ (as Ni metal & insoluble and soluble compounds)	10 mg/m³ (as Ni)
Silicon	15 mg/m³ (total dust, PNOR) 5.0 mg/m³ (as respirable fraction, PNOR)	10 mg/m³	10 mg/m³ (as total dust) 5.0 mg/m³ (as respirable dust)	NE

NE - None Established

1. OSHA Permissible Exposure Limits (PELs) are 8-hour TWA (time-weighted average) concentrations unless otherwise noted. A (C) designation denotes a ceiling limit, which should not be exceeded during any part of the working exposure unless otherwise noted. A Peak is defined as the acceptable maximum peak for a maximum duration above the ceiling concentration for an eight-hour shift. A skin notation refers to the potential significant contribution to the overall exposure by the cutaneous route, either by contact with vapors or, of probable greater significance, by direct skin contact with the substance. A Short Term Exposure Limit (STEL) is defined as a 15-minute exposure, which should not be exceeded at any time during a workday. An Action level (AL) is used by OSHA and NIOSH to express a health or physical hazard. They indicate the level of a harmful or toxic substance/activity, which requires medical surveillance, increased industrial hygiene monitoring, or biological monitoring. Action Levels are generally set at one half of the PEL but the actual level may vary from standard to standard. The intent is to identify a level at which the vast majority of randomly sampled exposures will be below the PEL.
2. Threshold Limit Values (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH) are 8-hour TWA concentrations unless otherwise noted. A Short Term Exposure Limit (STEL) is defined as the maximum concentration to which workers can be exposed for a short period of time (15 minutes) for only four times throughout the day with at least one hour between exposures. A "skin" notation refers to the potential significant contribution to the overall exposure by the cutaneous route, either by contact with vapors or, of probable greater significance, by direct skin contact with the substance. ACGIH-TLVs are only recommended guidelines based upon consensus agreement of the membership of the ACGIH. As such, the ACGIH TLVs are for guideline use purposes and are not legal regulatory standards for compliance purposes. The TLVs are designed for use by individuals trained in the discipline of industrial hygiene relative to the evaluation of exposure to various chemical or biological substances and physical agents that may be found in the workplace.

Section 8 - Exposure Controls / Personal Protection (continued)

8(a) Occupational Exposure Limits (OELs) (continued):

3. The National Institute for Occupational Safety and Health Recommended Exposure Limits (NIOSH-REL) - Compendium of Policy and Statements. NIOSH, Cincinnati, OH (1992). NIOSH is the federal agency designated to conduct research relative to occupational safety and health. As is the case with ACGIH TLVs, NIOSH RELs are for guideline purposes only and as such are not legal, regulatory limits for compliance purposes.
4. The "immediately dangerous to life or health air concentration values (IDLHs)" are used by NIOSH as part of the respirator selection criteria and were first developed in the mid-1970's by NIOSH. The Documentation for Immediately Dangerous to Life or Health Concentrations (IDLHs) is a compilation of the rationale and sources of information used by NIOSH during the original determination of 387 IDLHs and their subsequent review and revision in 1994.
5. PNOR (Particulates Not Otherwise Regulated). All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by a limit which is the same as the inert or nuisance dust limit of 15 mg/m^3 for total dust and 5 mg/m^3 for the respirable fraction.
6. Inhalable fraction. The concentration of inhalable particulate for the application of this TLV is to be determined from the fraction passing a size-selector with the characteristics defined in the ACGIH 2014 TLVs® and BEIs® (Biological Exposure Indices) Appendix D, paragraph A.
7. PNOS (Particulates Not Otherwise Specified). Particulates identified under the PNOS heading are "nuisance dusts" containing no asbestos and <1% crystalline silica. A TWA-TLV of 10 mg/m3 for inhalable particulate and 3 mg/m3 for respirable particulate has been recommended.
8. Respirable fraction. The concentration of respirable dust for the application of this limit is to be determined from the fraction passing a size-selector with the characteristics defined in ACGIH 2014 TLVs® and BEIs® Appendix D, paragraph C.
9. OSHA considers "Lead" to mean metallic lead, all inorganic lead compounds (lead oxides and lead salts), and a class of organic compounds called soaps; all other lead compounds are excluded from this definition. The OSHA PEL and other OSHA requirements can be found in 29 CFR 1910.1025. The OSHA PEL (8-hour TWA) for lead in "non-ferrous foundries with less than 20 employees" is 0.075 mg/m^3.

8(b) Appropriate Engineering Controls: Use controls as appropriate to minimize exposure to metal fumes and dusts during handling operations. Provide general or local exhaust ventilation systems to minimize airborne concentrations. Local exhaust is necessary for use in enclosed or confined spaces. Provide sufficient general/local exhaust ventilation in pattern/volume to control inhalation exposures below current exposure limits.

8(c) Individual Protection Measures:

- **Respiratory Protection:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use only a NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. Concentration in air of the various contaminants determines the extent of respiratory protection needed. Half-face, negative-pressure, air-purifying respirator equipped with P100 filter is acceptable for concentrations up to 10 times the exposure limit. Full-face, negative-pressure, air-purifying respirator equipped with P100 filter is acceptable for concentrations up to 50 times the exposure limit. Protection by air-purifying negative-pressure and powered air respirators is limited. Use a positive-pressure-demand, full-face, supplied air respirator or self-contained breathing apparatus (SCBA) for concentrations above 50 times the exposure limit. If exposure is above the IDLH (Immediately dangerous to life or health) for any of the constituents, or there is a possibility of an uncontrolled release or exposure levels are unknown, then use a positive-demand, full-face, supplied air respirator with escape bottle or SCBA.

  Warning! Air-purifying respirators both negative-pressure, and powered-air do not protect workers in oxygen-deficient atmospheres.
- **Eyes:** Wear appropriate eye protection to prevent eye contact. For operations which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use safety glasses to prevent eye contact. Contact lenses should not be worn where industrial exposures to this material are likely. Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations.
- **Skin:** Wear appropriate personal protective clothing to prevent skin contact. Cut resistant gloves and sleeves should be worn when working with steel products. For operations which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use protective clothing, and gloves to prevent skin contact. Protective gloves should be worn as required for welding, burning or handling operations. Contaminated work clothing must not be allowed out of the workplace.
- **Other protective equipment:** An eyewash fountain and deluge shower should be readily available in the work area.

Section 9 - Physical and Chemical Properties

9(a) Appearance (physical state, color, etc.): Solid, Metallic Gray

9(b) Odor: Odorless

9(c) Odor Threshold: NA

9(d) pH: NA

9(e) Melting Point/Freezing Point: ~2750 °F (~1510 C)

9(f) Initial Boiling Point and Boiling Range: ND

9(g) Flash Point: NA

9(h) Evaporation Rate: NA

9(i) Flammability (solid, gas): Non-flammable, non-combustible

9(j) Upper/lower Flammability or Explosive Limits: NA

9(k) Vapor Pressure: NA

9(l) Vapor Density (Air = 1): NA

9(m) Relative Density: 7.85

9(n) Solubility(ies): Insoluble

9(o) Partition Coefficient n-octanol/water: ND

9(p) Auto-ignition Temperature: NA

9(q) Decomposition Temperature: ND

9(r) Viscosity: NA

NA - Not Applicable

ND - Not Determined for product as a whole

Section 10 - Stability and Reactivity

10(a) Reactivity: Not Determined (ND) for product in a solid form. Do not use water on molten metal.

10(b) Chemical Stability: Steel products are stable under normal storage and handling conditions.

Section 10 - Stability and Reactivity (continued)

10(c) Possibility of hazardous reaction: None Known

10(d) Conditions to Avoid: Storage with strong acids or calcium hypochlorite

10(e) Incompatible Materials: Will react with strong acids to form hydrogen. Iron oxide dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

10(f) Hazardous Decomposition Products: Thermal oxidative decomposition of steel products can produce fumes containing oxides of iron and manganese as well as other alloying elements.

Section 11 - Toxicological Information

11 Information on toxicological effects: The following toxicity data has been determined for **Carbon and Alloy Steel Rod or Bar** when further processed using the information available for its components applied to the guidance on the preparation of an SDS under the GHS requirements of OSHA and the EU CPL:

Hazard Classification	Hazard Category		Hazard Symbols	Signal Word	Hazard Statement
	EU	OSHA			
Eye Damage/ Irritation (covers Categories 1, 2A and 2B)	NA*	2B[c]	No Pictogram	**Warning**	Causes eye irritation - Rating due to iron particulate generated from further processing (welding, grinding, burning, etc.).
Skin/Dermal Sensitization (covers Category 1)	NA*	1[d]		**Warning**	May cause an allergic skin reaction - Nickel is a skin sensitizer.
Carcinogenicity (covers Categories 1A, 1B and 2)	NA*	2[g]		**Warning**	Suspected of causing cancer. - Rating due to nickel particulate or fume that can enter the body generated when further processed (welding, grinding, burning, etc.).
Toxic Reproduction (covers Categories 1A, 1B and 2)	NA*	1[h]		**Danger**	Suspected of damaging fertility or the unborn child. - Rating due to nickel and lead particulate or fume that can enter the body generated when further processed (welding, grinding, burning, etc.).
Specific Target Organ Toxicity (STOT) Following Single Exposure (covers Categories 1-3)	NA*	3[i]		**Warning**	May cause respiratory irritation. - Rating due to iron particulate or fume that can enter the body generated when further processed (welding, grinding, burning, etc.).
STOT following Repeated Exposure (covers Categories 1 and 2)	NA*	1[j]		**Danger**	Causes damage to lungs and central nervous system through prolonged or repeated inhalation exposure. - Rating due to nickel, lead or manganese particulate or fume that can enter the body generated when further processed (welding, grinding, burning, etc.).

* Not Applicable - Semi-formed steel products are considered articles under Reach regulation (REACH REGULATION (EC) No 1907/2006) and are not subject to classification under CLP regulation (REGULATION (EC) No 1272/2008).

Toxicological data listed below are presented regardless to classification criteria. Individual hazard classification categories where the toxicological information has met or exceeded a classification criteria threshold are listed above.

a. No LC_{50} or LD_{50} has been established for **Carbon and Alloy Steel Rod or Bar.** The following data has been determined for the components:

- **Iron:** Rat LD_{50} =98.6 g/kg (REACH)
  Rat LD_{50} =1060 mg/kg (IUCLID)
  Rat LD_{50} =984 mg/kg (IUCLID)
  Rabbit LD_{50} =890 mg/kg (IUCLID)
  Guinea Pig LD_{50} =20 g/kg (TOXNET)
- **Nickel:** LD_{50} >9000 mg/kg (Oral/Rat)
- **Silicon:** L_{D50} = 3160 mg/kg (Oral/Rat)
- **Carbon:** LD_{50}= >10,000 mg/kg (Oral/ Rat)
- **Manganese:** Rat LD_{50} > 2000 mg/kg (REACH)
  Rat LD_{50} > 9000 mg/kg (NLM Toxnet)

b. No Skin (Dermal) Irritation data available for **Carbon and Alloy Steel Rod or Bar** as a as a mixture. The following Skin (Dermal) Irritation information was found for the components:

- **Molybdenum:** May cause skin irritation.

c. No Eye Irritation data available for **Carbon and Alloy Steel Rod or Bar** as a mixture. The following Eye Irritation information was found for the components:

- **Iron and Molybdenum:** Causes eye irritation.
- **Silicon:** Slight eye irritation in rabbit protocol.
- **Nickel:** Slight eye irritation from particulate abrasion only.

d. No Skin (Dermal) Sensitization data available **for Carbon and Alloy Steel Rod or Bar** as a mixture. The following Skin (Dermal) Sensitization information was found for the components:

- **Nickel:** May cause allergic skin sensitization.

e. No Respiratory Sensitization data available for **Carbon and Alloy Steel Rod or Bar** as a mixture or its components.

f. No Germ Cell Mutagenicity data available for **Carbon and Alloy Steel Rod or Bar** as a mixture. The following Mutagenicity and Genotoxicity information was found for the components:

- **Iron:** IUCLID has found some positive and negative findings in vitro.
- **Nickel:** EU RAR has found positive results in vitro and in vivo but insufficient data for classification.

Section 11 - Toxicological Information (continued)

11 Information on toxicological effects (continued):

g. Carcinogenicity: IARC, NTP, and OSHA do not list **Carbon and Alloy Steel Rod or Bar** as carcinogens. The following Carcinogenicity information was found for the components:

- **Welding Fumes** - IARC Group 2B carcinogen, a mixture that is possibly carcinogenic to humans.
- **Chromium (as metal and trivalent chromium compounds)** – IARC Group 3 carcinogens, not classifiable as to their human carcinogenicity.
- **Nickel and certain nickel compounds** – Group 2B - metallic nickel Group 1 - nickel compounds ACGIH confirmed human carcinogen. Nickel – EURAR Insufficient evidence to conclude carcinogenic potential in animals or humans: suspect carcinogen classification Category 2 Suspected of causing cancer.
- **Lead**: NTP-R, IARC - 2B, EPA - Probable human carcinogen and ACGIH - A3
- **Inorganic Lead Compounds** - IARC 2A.

h. No Toxic Reproduction data available for **Carbon and Alloy Steel Rod or Bar** as a mixture. The following Toxic Reproductive information was found for the components:

- **Nickel**: Effects on fertility.
- **Lead:** Male rats oral 60 day NOEL 250 mg/L. Effects on testes (lowest dose). Mouse Reproduction study effects at 0.5% only dose tested. Rat Teratology study LOEL 0.05% Birth weight, size and effects on testis. Reproductive, endocrine and growth effects have been reported.

i. No Specific Target Organ Toxicity (STOT) following a Single Exposure data available for **Carbon and Alloy Steel Rod or Bar** as a mixture. The following STOT following a Single Exposure data was found for the components:

- **Iron and Molybdenum**: Irritating to Respiratory tract.

j. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data was available **for Carbon and Alloy Steel Rod or Bar** as a whole. The following STOT following Repeated Exposure data was found for the components:

- **Nickel**: Rat 4 wk inhalation LOEL 4 mg/m^3 Lung and Lymph node histopathology. Rat 2 yr inhalation LOEL 0.1 mg/ m^3 Pigment in kidney, effects on hematopoiesis spleen and bone marrow and adrenal tumor. Rat 13 Week Inhalation LOAEC 1.0 mg/m^3 Lung weights, and Alveolar histopathology.
- **Manganese**: Inhalation of metal fumes - Degenerative changes in human Brain; Behavioral: Changes in motor activity and muscle weakness (Whitlock *et al.*, 1966).
- **Lead:** Rat Oral 6 mo NOEL 0.0015 mg/kg CNS Testes and Kidney Effects. Rat inhalation – immunosuppression, Dermal – percutaneous absorption

The above toxicity information was determined from available scientific sources to illustrate the prevailing posture of the scientific community. The scientific resources includes: The American Conference of Governmental Industrial Hygienist (ACGIH) Documentation of the Threshold Limit Values (TLVs) and Biological Exposure indices (BEIs) with Other Worldwide Occupational Exposure Values 2009, The International Agency for Research on Cancer (IARC), The National Toxicology Program (NTP) updated documentation, the World Health Organization (WHO) and other available resources, the International Uniform Chemical Information Database (IUCLID), European Union Risk Assessment Report (EU-RAR), Concise International Chemical Assessment Documents (CICAD), European Union Scientific Committee for Occupational Exposure Limits (EU-SCOEL), Agency for Toxic Substances and Disease Registry (ATSDR), Hazardous Substance Data Bank (HSDB), and International Programme on Chemical Safety (IPCS), European Union Classification, Labeling and Packaging. (EU CPL), Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), International Uniform Chemical Information Database (IUCLID), TOXicology Data NETwork (TOXNET), European Risk Assessment Reports (EU RAR).

The following health hazard information is provided regardless to classification criteria and is based on the individual component(s) and potential resultant components from further processing:

Acute Effects:

- **Inhalation:** Excessive exposure to high concentrations of metal dust may cause irritation to the eyes, skin and mucous membranes of the upper respiratory tract. Excessive inhalation of fumes of freshly formed metal oxide particles sized below 1.5 micrometer and usually between 0.02-0.05 micrometers from many metals can produce an acute reaction known as "metal fume fever". Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), metallic taste in the mouth, dryness and irritation of the throat followed by weakness and muscle pain. The symptoms come on in a few hours after excessive exposures and usually last from 12 to 48 hours. Long-term effects from metal fume fever have not been noted. Freshly formed oxide fumes of manganese have been associated with causing metal fume fever.
- **Eye:** Excessive exposure to high concentrations of metal dust may cause irritation to the eyes.
- **Skin:** Skin contact with metal dusts may cause irritation or sensitization, possibly leading to dermatitis. Skin contact with metallic fumes and dusts may cause physical abrasion.
- **Ingestion:** Ingestion of harmful amounts of this product as distributed is unlikely due to its solid insoluble form. Ingestion of metal dust may cause nausea or vomiting.

Acute Effects by component:

- **Iron and iron oxides:** Iron is harmful if swallowed, causes skin irritation, and causes eye irritation. Contact with iron oxide has been reported to cause skin irritation and serious eye damage. Particles of iron or iron compounds, which become imbedded in the eye, may cause rust stains unless removed fairly promptly.
- **Carbon:** Not Reported/ Not Classified
- **Chromium, chromium oxides and hexavalent chrome:** Hexavalent chrome causes damage to gastrointestinal tract, lung, severe skin burns and eye damage, serious eye damage, skin contact may cause an allergic skin reaction. Inhalation may cause allergic or asthmatic symptoms or breathing difficulties.
- **Lead and lead oxides:** Acute exposure to lead can be manifested as abdominal pain, nausea, constipation, anorexia, or vomiting; and, in severe cases coma or death
- **Manganese and manganese oxides:** Manganese and Manganese oxide are harmful if swallowed.
- **Molybdenum and oxides:** Molybdenum causes skin and eye irritation. Molybdenum oxide is toxic if swallowed, and causes eye irritation
- **Nickel and nickel oxides:** Nickel may cause allergic skin sensitization. Nickel oxide may cause an allergic skin.
- **Silicon and silicon oxides:** May be harmful if swallowed.

Section 11 - Toxicological Information (continued)

Delayed (chronic) Effects by component:

- **Iron and iron oxides:** Chronic inhalation of excessive concentrations of iron oxide fumes or dusts may result in the development of a benign pneumoconiosis, called siderosis, which is observable as an X-ray change. No physical impairment of lung function has been associated with siderosis. Inhalation of excessive concentrations of ferric oxide may enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens. Iron oxide is listed as a Group 3 (not classifiable) carcinogen by the International Agency for Research on Cancer (IARC).
- **Carbon:** Chronic inhalation may lead to decreased pulmonary function.
- **Chromium, chromium oxides and hexavalent chromium:** The health hazards associated with exposure to chromium are dependent upon its oxidation state. The metal form (chromium as it exists in this product) is of very low toxicity. The hexavalent form is very toxic. Repeated or prolonged exposure to hexavalent chromium compounds may cause respiratory irritation, nosebleed, ulceration and perforation of the nasal septum. Industrial exposure to certain forms of hexavalent chromium has been related to an increased incidence of cancer. NTP (The National Toxicology Program) Fourth Annual report on Carcinogens cites "certain Chromium compounds" as human carcinogens. ACGIH has reviewed the toxicity data and concluded that chromium metal is not classifiable as a human carcinogen. Hexavalent chromium may cause genetic defects and is suspected of damaging the unborn child. Developmental toxicity in the mouse, suspected of damaging fertility or the unborn child.
- **Lead and lead oxides:** Lead compounds can be toxic when ingested or inhaled. Lead is a cumulative poison. The predominant effects of excessive exposure are anemia, nervous system disorders, and kidney damage. Nervous system disorders may be displayed as irritability, headaches, insomnia, convulsions, muscular tremors, or palsy of the extremities. Excessive exposure can have adverse effects on human reproduction. Lead interferes with normal function of the adult and developing central nervous system in humans. Lead interferes with different enzyme systems. For this reason many organs or organ systems are potential targets for lead. Lead can damage fertility or the unborn child.
- **Manganese and manganese oxides:** Chronic exposure to high concentrations of manganese fumes and dusts may adversely affect the central nervous system with symptoms including languor, sleepiness, weakness, emotional disturbances, spastic gait, mask-like facial expression and paralysis. Animal studies indicate that manganese exposure may increase susceptibility to bacterial and viral infections. Occupational overexposure (Manganese) is a progressive, disabling neurological syndrome that typically begins with relatively mild symptoms and evolves to include altered gait, fine tremor, and sometimes, psychiatric disturbances. May cause damage to lungs with repeated or prolonged exposure. Neurobehavioral alterations in worker populations exposed to manganese oxides include: speed and coordination of motor function are especially impaired.
- **Molybdenum and oxides:** Certain handling operations, such as burning and welding, may generate both insoluble molybdenum compounds (metal and molybdenum dioxide) and soluble molybdenum compounds (molybdenum trioxide). Molybdenum compounds generally exhibit a low order of toxicity with the trioxide the more toxic. However, some reports indicate that the dust of the molybdenum metal, molybdenum dioxide and molybdenum trioxide may cause eye, skin, nose and throat irritation in animals. Also has been reported to cause induction of tumors in experimental animals, suspected of causing cancer. Molybdenum oxide is suspected of causing cancer in humans.
- **Nickel and nickel oxides:** Exposure to nickel dusts and fumes can cause sensitization dermatitis, respiratory irritation, asthma, pulmonary fibrosis, edema, and may cause nasal or lung cancer in humans. Nickel causes damage to lungs through prolonged or repeated inhalation exposure. IARC lists nickel and certain nickel compounds as Group 2B carcinogens (sufficient animal data). ACGIH 2014 TLVs® and BEIs® lists insoluble nickel compounds as confirmed human carcinogens. Nickel is suspected of damaging the unborn child.
- **Silicon and silicon oxides:** Silicon dusts are a low health risk by inhalation and should be treated as a nuisance dust. Eye contact with pure material can cause particulate irritation. Skin contact with silicon dusts may cause physical abrasion.

Section 12 - Ecological Information

12(a) Ecotoxicity (aquatic & terrestrial): No Data Available for **Carbon and Alloy Steel Rod or Bar** as sold/shipped. However, individual components of the product when processed have been found to be toxic to the environment. Metal dusts may migrate into soil and groundwater and be ingested by wildlife as follows:

- **Iron Oxide:** LC_{50}: >1000 mg/L; Fish 48 h-EC_{50} > 100 mg/L (Currenta, 2008k); 96 h-$LC_0 \geq$ 50,000 mg/L Test substance: Bayferrox 130 red (95 – 97% Fe_2O_3; < 4% SiO_2 and Al_2O_3) (Bayer, 1989a)
- **Hexavalent Chrome:** EU RAR listed as category 1, found acute EC_{50} and LD_{50} to algae and invertebrates < 1 mg.
- **Nickel Oxide:** IUCLID found LC_{50} in fish, invertebrates and algae > 100 mg/l.
- **Lead:** LC_{50} = 1170 µg/L (*Oncorhynchus mykiss);* LC_{50} > 4500 µg/L(*Limanda limanda);* 30 days NOEC 0.9 – 1102 µg/L (*Pimephales promelas)*

12(b) Persistence & Degradability: No Data Available for **Carbon and Alloy Steel Rod or Bar** as sold/shipped or individual components.

12(c) Bioaccumulative Potential: No Data Available for **Carbon and Alloy Steel Rod or Bar** as sold/shipped or individual components.

12(d) Mobility (in soil): No data available for **Carbon and Alloy Steel Rod or Bar** as sold/shipped. However, individual components of the product have been found to be absorbed by plants from soil.

12(e) Other adverse effects: None Known

Additional Information:

Hazard Category: Category 1

Signal Word: Warning

Hazard Symbol:

Hazard Statement: Very Toxic to aquatic life with long lasting effects.

Section 13 - Disposal Considerations

Disposal: Steel scrap should be recycled whenever possible. Product dusts and fumes from processing operations should also be recycled, or classified by a competent environmental professional and disposed of in accordance with applicable federal, state or local regulations.

Section 13 - Disposal Considerations (continued)

Container Cleaning and Disposal: Follow applicable federal, state and local regulations. Observe safe handling precautions. European Waste Catalogue (EWC): 16-01-17 (ferrous metals), 12-01-99 (wastes not otherwise specified), 16-03-04 (off specification batches and unused products), or 15-01-04 (metallic packaging).

Please note this information is for Carbon and Alloy Steel Rod or Bar in its original form. Any alterations can void this information.

Section 14 - Transport Information

14 (a-g) Transportation Information:

US Department of Transportation (DOT) under 49 CFR 172.101 **does not** regulate **Carbon and Alloy Steel Rod or Bar** as a hazardous material. All federal, state, and local laws and regulations that apply to the transport of this type of material must be adhered to.

Shipping Name: Not Applicable (NA) **Shipping Symbols:** NA **Hazard Class:** NA **UN No.:** NA **Packing Group:** NA **DOT/ IMO Label:** NA **Special Provisions (172.102):** NA	**Packaging Authorizations** **a) Exceptions:** NA **b) Group:** NA **c) Authorization:** NA	**Quantity Limitations** **a) Passenger, Aircraft, or Railcar:** NA **b) Cargo Aircraft Only:** NA **Vessel Stowage Requirements** **a) Vessel Stowage:** NA **b) Other:** NA **DOT Reportable Quantities:** NA

International Maritime Dangerous Goods (IMDG) and the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) classification, packaging and shipping requirements follow the US DOT Hazardous Materials Regulation.

Regulations Concerning the International Carriage of Dangerous Goods by Road (ADR) does not regulate Carbon and Alloy Steel Rod or Bar as a hazardous material.

Shipping Name: Not Applicable (NA) **Classification Code:** NA **UN No.:** NA **Packing Group:** NA **ADR Label:** NA **Special Provisions:** NA **Limited Quantities:** NA	**Packaging** **a) Packing Instructions:** NA **b) Special Packing Provisions:** NA **c) Mixed Packing Provisions:** NA	**Portable Tanks & Bulk Containers** **a) Instructions:** NA **b) Special Provisions:** NA

International Air Transport Association (IATA) does not regulate Carbon and Alloy Steel Rod or Bar as a hazardous material.

Shipping Name: Not Applicable (NA) **Class/Division:** NA **Hazard Label (s):** NA **UN No.:** NA **Packing Group:** NA **Excepted Quantities (EQ):** NA	**Passenger & Cargo Aircraft** **Limited Quantity (EQ)**		**Cargo Aircraft Only** **Pkg Inst:** NA **Max Net Qty/Pkg:** NA	**Special Provisions:** NA **ERG Code:** NA
	Pkg Inst: NA **Max Net Qty/Pkg:** NA	**Pkg Inst:** NA **Max Net Qty/Pkg:** NA		

Pkg Inst – Packing Instructions Max Net Qty/Pkg – Maximum Net Quantity per Package ERG – Emergency Response Drill Code

Transport Dangerous Goods (TDG) Classification: Carbon and Alloy Steel Rod or Bar does not have a TDG classification.

Section 15 - Regulatory Information

Regulatory Information: *The following listing of regulations relating to an ArcelorMittal product may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.*

This product and/or its constituents are subject to the following regulations:

OSHA Regulations: Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-2, Z-3): The product, **Carbon and Alloy Steel Rod or Bar** as a whole is not listed. However, individual components of the product are listed: Refer to Section 8, Exposure Controls and Personal Protection

EPA Regulations: The product, **Carbon and Alloy Steel Rod or Bar** is not listed as a whole. However, individual components of the product are listed:

Components	Regulations
Chromium	CERCLA, CWA, SARA 313, RCRA, SDWA
Lead Compounds	CAA, CWA, SARA 313, RCRA, SDWA
Manganese	CAA, SARA 313, SDWA
Nickel	CAA, CERCLA, CWA, SARA 313

SARA 311/312 Potential Hazard Categories: Immediate Acute Health Hazard; Delayed Chronic Health Hazard

Section 15 - Regulatory Information (continued)

EPA Regulations (continued):

Section 313 Supplier Notification: The product, **Carbon and Alloy Steel Rod or Bar** contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act and 40 CFR part 372:

CAS #	Chemical Name	Percent by Weight
7440-47-3	Chromium	1.2 max
7439-92-1	Lead Compounds	0.35 max
7439-96-5	Manganese	2.5 max
7440-02-0	Nickel	2.1 max

Regulations Key:

CAA	Clean Air Act (42 USC Sec. 7412; 40 CFR Part 61 [As of: 8/18/06])
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act (42 USC Secs. 9601(14), 9603(a); 40 CFR Sec. 302.4, Table 302.4, Table 302.4 and App. A)
CWA	Clean Water Act (33 USC Secs. 1311; 1314(b), (c), (e), (g); 136(b), (c); 137(b), (c) [as of 8/2/06])
RCRA	Resource Conservation Recovery Act (42 USC Sec. 6921; 40 CFR Part 261 App VIII)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III Section 302 Extremely Hazardous Substances (42 USC Secs. 11023, 13106; 40 CFR sec. 372.65) and Section 313 Toxic Chemicals (42 USC Secs. 11023, 13106; 40 CFR Sec. 372.65 [as of 6/30/05])
TSCA	Toxic Substance Control Act (15 U.S.C. s/s 2601 et seq. [1976])
SDWA	Safe Drinking Water Act (42 U.S.C. s/s 300f et seq. [1974])

State Regulations: The product, **Carbon and Alloy Steel Rod or Bar** as a whole is not listed in any state regulations. However, individual components of the product are listed in various state regulations:

Pennsylvania Right to Know: Contains regulated material in the following categories:

- Hazardous Substances: Manganese, Lead, Molybdenum and Silicon
- Environmental Hazards: Chromium, Manganese and Nickel
- Special Hazardous Substance: Chromium and Nickel

California Prop. 65: Contains elements known to the State of California to cause cancer or reproductive toxicity. This includes chromium compounds, lead, and nickel.

New Jersey: Contains regulated material in the following categories:

- Hazardous Substance: Lead, Chromium, Manganese, and Nickel

Minnesota: Lead, Chromium, Manganese, Molybdenum, Nickel and Silicon

Massachusetts: Lead, Chromium, Manganese, Molybdenum, and Nickel

Other Regulations:

WHMIS Classification (Canadian): The product, **Carbon and Alloy Steel Rod or Bar** is not listed as a whole. However individual components are listed.

Ingredients	WHMIS Classification
Iron	B4, D2B
Lead	D2A
Manganese	B4, D2A
Molybdenum	B4, D2B
Nickel	D2A, D2B

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

Section 16 - Other Information

Prepared By: ArcelorMittal USA LLC

Original Issue Date: 08/01/2004 **Revised Date:** 01/12/2015

Additional Information:

Hazardous Material Identification System (HMIS) Classification

Health Hazard	1
	0
Physical Hazard	0

HEALTH= 1, Denotes possible chronic hazard if airborne dusts or fumes are generated Irritation or minor reversible injury possible.

FIRE= 0, Materials that will not burn

PHYSICAL HAZARD= 0, Materials that are normally stable, even under fire conditions, and will not react with water, polymerize, decompose, condense, or self-react. Non-explosives.

National Fire Protection Association (NFPA)

HEALTH = 1, Exposure could cause irritation but only minor residual injury even if no treatment is given.

FLAMMABILITY = 0, Materials that will not burn

INSTABILITY = 0, Normally stable, even under fire exposure conditions, and are not reactive with water.

Section 16 - Other Information (continued)

ABBREVIATIONS/ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
BEIs	Biological Exposure Indices
CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Classification, Labelling and Packaging
CFR	Code of Federal Regulations
CNS	Central Nervous System
GI, GIT	Gastro-Intestinal, Gastro-Intestinal Tract
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
LC50	Median Lethal Concentration
LD50	Median Lethal Dose
LD_{Lo}	Lowest Dose to have killed animals or humans
LEL	Lower Explosive Limit
LOEL	Lowest Observed Effect Level
LOAEC	Lowest Observable Adverse Effect Concentration
$\mu g/m^3$	microgram per cubic meter of air
mg/m^3	milligram per cubic meter of air
mppcf	million particles per cubic foot
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association

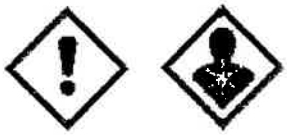
NIF	No Information Found
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
ORC	Organization Resources Counselors
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PNOR	Particulate Not Otherwise Regulated
PNOC	Particulate Not Otherwise Classified
PPE	Personal Protective Equipment
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
REACH	Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendment and Reauthorization Act
SCBA	Self-contained Breathing Apparatus
SDS	Safety Data Sheet
STEL	Short-term Exposure Limit
TLV	Threshold Limit Value
TWA	Time-weighted Average
UEL	Upper Explosive Limit

Disclaimer: This information is taken from sources or based upon data believed to be reliable. Our objective in sending this information is to help you protect the health and safety of your personnel and to comply with the OSHA Hazard Communication Standard and Title III of the Emergency Planning and Community Right-to-Know Act. ArcelorMittal USA LLC makes no warranty as to the absolute correctness, completeness, or sufficiency of any of the foregoing, or any additional, or other measures that may not be required under particular conditions. THIS ARCELORMITTAL USA LLC SDS MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY IMPLIED WARRANTIES OTHERWISE ARISING FROM COURSE OF DEALING OR TRADE.

Products covered for Carbon and Alloy Steel Rod or Bar include:

Inland DURA SPRING ™	Inland DURAGRIND
Inland FREE FORM ™	Inland INcut ™ (100 &200)
Inland INX	Inland LEDLOY ™
Inland LEDLOY ™ A	Inland LEDLOY ™ AX
Nonresulfurized Carbon Steel	Nonresulfurized Carbon Steel: Copper Bearing
Nonresulfurized Carbon Steel: Vanadium Bearing	Nonresulfurized Carbon Steel: Vanadium, Titanium, and Boron
Nonresulfurized Carbon Steel: Boron Bearing	Nonresulfurized Carbon Steel: Lead Bearing
Nonresulfurized Carbon Steel: Titanium Bearing	Nonresulfurized Carbon Steel: Bismuth Bearing
Nonresulfurized Carbon Steel: Tellurium Bearing	Resulphurized Carbon Steel
Resulphurized Carbon Steel: Bismuth Bearing	Resulphurized Carbon Steel: Tellurium Bearing
Resulphurized Carbon Steel: Vanadium Bearing	Resulphurized Carbon Steel: Lead Bearing
Resulphurized Carbon Steel: Lead & Tellurium Bearing	Rephosphurized and Resulfurized Carbon Steel
Standard Alloy Steel: Boron Treated	Standard Alloy Steel: Chromium Treated
Standard Alloy Steel: Manganese	Standard Alloy Steel: Molybdenum Bearing
Standard Alloy Steel: Molybdenum Bearing and Chromium	Standard Alloy Steel: Molybdenum, Chromium and Lead
Standard Alloy Steel: Molybdenum, Chromium and Nickel	Standard Alloy Steel: Molybdenum, Chromium, Nickel, Lead
Standard Alloy Steel: Molybdenum and Nickel	Standard Alloy Steel: Silicon and Chromium
Standard Alloy Steel: Vanadium, Titanium and Boron	Standard Alloy Steel: Selenium bearing
Inland DURA SPRING ™	Inland DURAGRIND
Inland INX	Inland INcut ™ (100 &200)
Inland LEDLOY ™	Inland LEDLOY ™ A
Inland LEDLOY ™ AX	

Carbon and Alloy Steel Rod or Bar

Signal Word: **DANGER** **Symbols:** 

HAZARD STATEMENTS:

Causes eye irritation.
May cause an allergic skin reaction.
Suspected of causing cancer.
Suspected of damaging fertility or the unborn child.
May cause respiratory irritation.
Causes damage to lungs and central nervous system through prolonged or repeated inhalation exposure.

PRECAUTIONARY STATEMENTS

Do not breathe dusts / fume / gas / mist / vapor / spray.
Wear protective gloves / protective clothing / eye protection / face protection.
Contaminated work clothing must not be allowed out of the workplace.
Use only outdoors or in well ventilated areas.
Wash thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not eat, drink or smoke when using this product.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
If exposed, concerned or feel unwell: 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 on skin: Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off and wash contaminated clothing before reuse.
Call a poison center/doctor if you feel unwell.
Dispose of contents in accordance with federal, state and local regulations.

SDS ID No.: AM USA - 007

ArcelorMittal USA LLC
1 South Dearborn Street
Chicago, IL 60603-9888
General Information: Phone: 219-787-4901 or email at: msdssupport@arcelormittal.com
CHEMTREC (Day or Night): 1-800-424-9300
Emergency Contact: 1-760-476-3962, (3E Company Code: 333211)
Original Issue Date: 08/01/2004 **Revised:** 01/12/2015

MATERIAL SAFETY DATA SHEET (MSDS)

DUCTILE IRON

MSDS SC-000-042 Rev. 11

DATE ISSUED: **10/10**

PART I *What is the material and what do I need to know in an emergency?*

SECTION 1 — PRODUCT IDENTIFICATION & COMPANY INFORMATION

PRODUCT NAME:
DUCTILE IRON

OTHER DESIGNATIONS:	PRODUCT IDENTIFICATION NUMBER(S)
ASTM: A395, A536, A842, A476, A874, A897, Compacted Graphite Iron	
MANUFACTURER'S NAME	STREET ADDRESS
EMERGENCY TELEPHONE NO.	MAILING ADDRESS
TELEPHONE NO.	CITY, STATE, ZIP CODE
FAX NO.	E-MAIL ADDRESS/WEB SITE:

SECTION 2 – HAZARD IDENTIFICATION

OVERVIEW:

There are no health hazards from these castings in solid form. The solid casting is not flammable.

Dust and fume from processing can cause irritation of eyes, skin and respiratory tract; lung disease and other systemic effects.

- Dust or fumes generated by machining, grinding, or welding of the casting may produce airborne contaminants, primarily chromium, copper, magnesium, manganese, nickel, tin and iron. Also, see the MSDS for the welding rod being used.
- Grinding castings that have not been cleaned or that contain embedded sand may generate significant amounts of dust containing free silica.
- Other metals in the alloy that are present in small amounts should not present a hazard if chromium, copper, manganese, nickel and iron dust and fume are adequately controlled.

Explosion / fire hazards:

- Magnesium turnings, chips & granules are highly flammable, are easily ignited and may reignite after fire is extinguished. Reacts with acids and water to form hydrogen gas which is highly flammable and explosive.

POTENTIAL HEALTH EFFECTS:

EYES:	Grinding or machining of castings may generate flying metal particles that may cause eye irritation or injury.
SKIN:	Dermatitis is possible from skin contact with nickel or chromium.
INGESTION:	Ingestion of particulate can occur during activities such as eating, drinking and smoking, etc. Not normally applicable.

REVIEWED

Signature [signature] Date 11-8-2010

REVIEWED

Signature Ronald J Klaine Date 11/8/2010

INHALATION:

Prolonged or repeated exposure to dust or fumes from these castings may cause the following health effects:

Respiratory Irritation

Overexposure to **iron oxide** fume over a long time can cause siderosis, sometimes called "iron pigmentation" of the lung. It can be seen on a chest x-ray but causes little or no disability.

Central nervous system effects such as sleepiness, weakness in the legs, spastic gait and emotional disturbances can occur with prolonged overexposure to manganese.

Inhalation of **hexavalent chromium or nickel** may cause lung or nasal cancer.

Inhalation of **copper fume and dust** may cause nose and throat irritation, metal fume fever and gastrointestinal tract irritation.

Inhalation of **tin dust and fume** may cause respiratory irritation. Prolonged inhalation of dust or fume may produce distinctive changes in the lungs with no apparent disability or complications.

Inhalation of **magnesium fume and dust** may cause irritation of respiratory tract. Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever)

Note: Prolonged breathing of excessive amounts of silica dust, which may be on or embedded in the surface of castings, can cause silicosis or other health effects including lung cancer.

ENVIRONMENTAL EFFECTS:

No known significant environmental effects from a solid casting.

SECTION 3 — COMPOSITION / INFORMATION ON INGREDIENTS

Section 3A–Information on Ingredients

MATERIAL	Wt %	CAS NUMBER	ACGIH TLV mg/m³	OSHA PEL mg/m³
Carbon (C)	3.0 – 4.3	7440-44-0	N/E	N/E
Chromium (Cr)	0.02 – 0.13	7440-47-3	0.5	1
Copper (Cu)	0.01-1.5	7440-50-8	1	1
Iron (Fe)	87.7 – 95.1	7439-89-6	N/E	N/E
Magnesium (Mg) Metal	0.0001-0.10	7439-95-4	N/E	N/E
Manganese (Mn)	<1.2	7439-96-5	0.2	5 (Ceiling)
Molybdenum (Mo)	0.01-0.50	7439-98-7	$10^{(I)}$ / $3^{(R)}$	15
Nickel (Ni)	0.1 – 2.0	7440-02-0	1.5	1
Silicon (Si)	1.8 – 4.0	7440-21-3		
Total dust			N/E	15
Respirable dust			N/E	5
Tin (Sn)	0.01-0.15	7440-31-5	2	2

Section 3B–Potential Byproducts of Welding, Cutting or Other Further Processing

Chromium Compounds (as Cr)				
Chromium (II) inorganic compounds		various	N/E	0.5
Chromium (III) inorganic compounds		various	0.5	0.5
Chromium (VI) inorganic compounds, certain water insoluble		various	0.01	0.005
Chromium (VI) inorganic compounds, water soluble		various	0.05	0.005
Chromium (VI) all forms and compounds		various	N/E	0.005
Copper Compounds Fume, as Cu Dusts and mists, as Cu		7440-50-8 various various	 0.2 1	 0.1 1

Iron Compounds				
Iron oxide (Fe_2O_3) fume		1309-37-1	N/E	10
Iron oxide (Fe_2O_3) respirable		1309-37-1	5	N/E
Magnesium Compounds Magnesium oxide		1309-48-4	$10^{(I)}$	15 (total dust)
Molybdenum Compounds (as Mo) Soluble compounds Insoluble compounds		various various	0.5 $10^{(I)}$ / $3^{(R)}$	5 15
Nickel Compounds (as Ni)				
Insoluble inorganic compounds		various	$0.2^{(I)}$	1
Soluble inorganic compounds		various	$0.1^{(I)}$	1
Nickel oxide		1313-99-1	$0.2^{(I)}$	1
Tin compounds (as Sn) Tin Oxide & inorganic compounds, except SnH_4 Inorganic compounds, except oxides, as Sn Tin Oxides, as Sn		various various 18282-10-5; 21651-19-4	2 N/E 2.0	N/E 2 N/E

TERMS

N/E = None Established

TLV = Threshold Limit Value/American Conference of Industrial Hygienists (ACGIH) 8-hr time weighted average

PEL = Permissible Exposure Limit / OSHA 8-hr time weighted average

mg/m^3 = milligrams per cubic meter

$\mu g/m^3$ = micrograms per cubic meter

(I) = Inhalable fraction

Section 3C–Carcinogen Classification of Ingredients/ Potential Byproducts

INGREDIENT/BYPRODUCT	OSHA	NTP	IARC	ACGIH	EPA	TARGET ORGAN
Carbon	NL	NL	NL	NL	NL	--
Chromium (metal)	NL	NL	3	A4	NL	Lung, Nasal
Chromium II, inorganic compounds	NL	NL	NL	NL	NL	
Chromium III, inorganic compounds	NL	NL	3	A4	D	
Chromium VI, (hexavalent)	Y	K	1	A1	NL	
Copper	NL	NL	NL	NL	D	
Iron	NL	NL	3	A4	NL	Lung
Manganese	NL	NL	NL	NL	D	Central Nervous System
Magnesium Oxide	NL	NL	NL	A4	NL	
Molybdenum	NL	NL	NL	A3	NL	Lower Respiratory Tract
Nickel (metal)	NL	R	2B	A5	NL	Lung, Nasal
Nickel, insoluble compounds	NL	K	NL	A1	NL	
Nickel, soluble compounds	NL	K	NL	A4	NL	
Nickel oxide	NL	K	1	A1	NL	
Silicon	NL	NL	NL	NL	NL	--
Tin						
Metal	NL	NL	NL	NL	NL	
Oxide & inorganic compounds except hydride	NL	NL	NL	NL	NL	

OSHA – Occupational Safety & Health Administration Y = Listed as a Human Carcinogen **NTP – National Toxicology Program** K = Know to be a Human Carcinogen R = Reasonably Anticipated to be a Human Carcinogen (RAHC) **IARC – International Agency for Research on Cancer** 1 = Carcinogen to Humans 2A = Probably Carcinogenic to Humans 2B = Possibly Carcinogenic to Humans 3 = Unclassifiable as to Carcinogenicity in Humans 4 = Probably not Carcinogenic to Humans NL = Not Listed	**ACGIH – American Conference of Governmental Industrial Hygienists** A1 = Confirmed Human Carcinogen A2 = Suspected Human Carcinogen A3 = Confirmed Animal Carcinogen A4 = Not Classifiable as a Human Carcinogen A5 = Not Suspected as a Human Carcinogen **EPA – U.S. Environmental Protection Agency** A = Human Carcinogen K = Known Human Carcinogen D = Not Classified as to Human Carcinogenicity. No Data Available B1 = Probable Human Carcinogen. Sufficient Evidence from Epidemiology Studies L = Likely to Produce Cancer in Humans B2 = Probable Human Carcinogen. Sufficient Evidence from Animal Studies.

PART II *What should I do if a hazardous situation occurs?*

SECTION 4 — FIRST AID MEASURES	
EYES:	Flush eyes with plenty of water or eye wash solution. Embedded metal particles should be removed by a trained individual such as a nurse or physician.
SKIN:	If a rash develops, seek medical attention.
INGESTION:	Not normally applicable.
INHALATION:	If problems develop move to fresh air and seek medical attention.

SECTION 5 — FIRE & EXPLOSION DATA

FLAMMABLE PROPERTIES:

Castings in a solid form will not burn or explode.

Solid castings will not burn or explode. However, finely divided metal dust and chips may burn or explode. Pieces over 3 mm (1/8 inch) thick are difficult to ignite but possible when sufficient heat is applied. Magnesium reacts with acid and water to produce hydrogen gas which is highly flammable and explosive.

EXTINGUISHING MEDIA :

Use fire extinguishing media that are appropriate for fire in surrounding area. Caution firefighters that the castings may contain a small amount of magnesium.

PROTECTION OF FIREFIGHTERS:

Firefighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate for surrounding fire.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

Accidental release measures do not apply to solid castings. Dust collected from machining, welding, etc. may be classified as a hazardous waste. Consult federal, state and local regulations.

PART III *How can I prevent hazardous situations from occurring?*

SECTION 7 — HANDLING & STORAGE

RECOMMENDED STORAGE:

Keep castings and magnesium materials dry. Avoid all possible sources of ignition (sparks and flame). Moisture sensitive. Dangerous when wet.

PROCEDURES FOR HANDLING:

For castings with sharp edges, wear appropriate work gloves. When handling heavy castings wear appropriate foot protection.

SECTION 8 — EXPOSURE CONTROLS & PERSONAL PROTECTION

ENGINEERING CONTROLS:

No specific controls are needed when the casting is in a solid state. If welding, grinding or machining, provide sufficient general ventilation and/or local exhaust to maintain concentrations below PEL's and TLV's. Refer to Section 3 for exposure guidelines.

If ventilation is not adequate, wear a NIOSH approved dust and fume respirator.

If work is to be done in a confined space use appropriate confined space program procedures (OSHA standard 29 CFR 1910.146).

Grinding castings that have not been cleaned or that contain embedded sand may generate significant amounts of dust containing free silica, which can cause silicosis. Good local ventilation is frequently required to prevent over-exposure in this situation. If good ventilation is not available, use a NIOSH approved respirator.

Other metals in the alloy that are present in small amounts should not present a hazard if chromium, iron, manganese and nickel dust and fume are adequately controlled.

PERSONAL PROTECTION:

Gloves:
Work gloves are advisable for handling castings.

Eye:
Safety glasses with side shields and/or face shield for particles (grinding). Welding goggles or welding helmet for cutting or welding.

Respiratory:
Wear a NIOSH approved respirator for dusts, fumes or welding gases if concentrations exceed the PEL or TLV.

Footwear:
Foot protection must be worn to protect against foot injury when heavy castings are handled.

Clothing:
Wear appropriate protective clothing if arc-air gouging or cutting or welding castings.

Other:
If noise is at or above 85dBA, hearing protection should be worn. Refer to OSHA Standard 29 CFR 1910.95.

SECTION 9 — PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE /PHYSICAL STATE: Solid, silver gray in color.	
ODOR: None	VAPOR DENSITY: Not applicable
MELTING POINT: Approximately 1300C (2350F)	SPECIFIC GRAVITY: 7.86 for iron
BOILING POINT: 2750C (5000F) for iron	VAPOR PRESSURE: Not applicable
FLASH POINT: Not applicable for solid castings	EVAPORATION RATE: Not applicable
FLAMMABILITY: Not flammable	SOLUBILITY IN WATER: Insoluble
UPPER AND LOWER FLAMMABILITY LIMITS: Not applicable for solid castings	pH: Not applicable
AUTO IGNITION TEMPERATURE: Not applicable	PERCENT VOLATILE BY VOLUME: Not applicable
DECOMPOSITION TEMPERATURE: Not applicable	PARTITION COEFFICIENT: Not applicable

SECTION 10 — STABILITY & REACTIVITY

CHEMICALLY STABLE?
Yes

CONDITIONS TO AVOID:
None

INCOMPATIBILITY:
Metal dust can burn or explode and must be protected from ignition sources such as grinding sparks, etc. Under some conditions, metal dust is incompatible with some oxidizing conditions and may be incompatible with oxidizers, acids and water and may ignite or explode.

CONDITIONS OF REACTIVITY: None	IMPACT/SHOCK SENSITIVITY: Not applicable
HAZARDOUS DECOMPOSITION PRODUCTS: None	HAZARDOUS POLYMERIZATION: Not applicable

PART IV *Is there any other useful information about this material?*

SECTION 11 — TOXICOLOGICAL INFORMATION

No toxicological information is available for solid castings. There are extensive toxicological data available on the various components of this material. An adequate representation of all these data is beyond the scope of this document.

SECTION 12 — ECOLOGICAL INFORMATION

No ecological information is available for solid castings. There are extensive ecological data available on the various components of this material. An adequate representation of all these data is beyond the scope of this document.

SECTION 13 — DISPOSAL CONSIDERATIONS

Recover or recycle if possible. Dispose of according to federal, state and local regulations.

SECTION 14 — TRANSPORTATION INFORMATION

USA DEPARTMENT OF TRANSPORTATION (DOT) - HM181: Not regulated	
CANADIAN TRANSPORT DANGEROUS GOODS (TDG): Not regulated	SHIPPING NAME: Not regulated
HAZARD CLASS: Not regulated	UN (United Nations) # / NA (North American) #: Not regulated
LABEL(S) REQUIRED? No	PACKING GROUP: Not regulated
INTERNATIONAL TRANSPORTATION REGULATIONS: Not applicable	SPECIAL SHIPPING INFORMATION: Not applicable

SECTION 15 — REGULATORY INFORMATION

USA - OSHA (Hazard Communication Standard):

Reference 29 CFR 1910.1200 and 1910.1000. A finished casting is an article as defined in the OSHA Hazard Communication Standard 29CFR 1910.1200 (c). Dust or fumes generated by cleaning, machining, grinding, or welding of the casting may produce airborne contaminants, such as chromium, copper, iron, magnesium, manganese, nickel, tin, and silica. For chromium references see 29 CFR 1910.1026.

USA - EPA (Toxic Substances Control Act – TSCA):

All components of these products are on the TSCA inventory list or are excluded from listing.

USA - EPA (SARA Title III)

The following components, **chromium, copper, manganese and nickel**, make this product subject to reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 72. Quantity threshold amounts are 25,000 pounds for manufacturing, importing or processing and 10,000 pounds for otherwise used.

CANADA – WHMIS (Workplace Hazardous Materials Information System):

This MSDS has been prepared according to the hazard criteria of the Controlled Product Regulations (CPR) and the MSDS contains the information required by the CPR.

CANADIAN (Domestic Substance List – DSL) Inventory Status

All components of these products are on the DSL Inventory.

CEPA (Canadian Environmental Protection Act):

The components of these products are not on the CEPA Priorities Substances Lists

EINECS No. (European Inventory of Commercial Chemical Substances):

All components of these products are on the EINECS list.

RoHS (Restriction of Certain Hazardous Substances) Compliance

Castings comply with RoHS

CALIFORNIA PROPOSITION 65 Compliance

WARNING: This product contains or produces chemicals known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code 25248.5 et seq.)

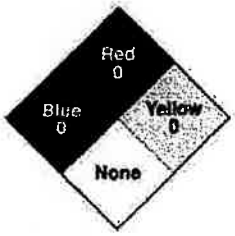
U.S. STATE REGULATORY INFORMATION

Some of the components listed in Section 3 may be covered under specific state regulations.

SECTION 16 — OTHER INFORMATION

National Fire Protection Association (NFPA) RATINGS:
For Castings in Solid Form

Health:	Fire:	Reactivity	Specific Hazard
0	0	0	None



Health Hazard: (Blue)
0–(material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials);
1– materials that on exposure under fire conditions could cause irritation or minor residual injury);
2–(materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury);
3–(materials that can on short exposure could cause serious temporary or residual injury);
4–(materials that under very short exposure causes death or major residual injury).

Flammability Hazard (Red)
0–(minimal hazard);
1–(materials that require substantial pre-heating before burning);
2–(combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]);
3–(Class IB and IC flammable liquids with flash points below 38°C [100°F]);
4–(Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F].

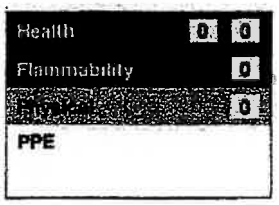
Reactivity Hazard: (Yellow)
0– (normally stable);
1–(material that can become unstable at elevated temperatures or which can react slightly with water);
2–(materials that are unstable but do not detonate or which can react violently with water);
3–(materials that can detonate when initiated or which can react explosively with water);
4–(materials that can detonate at normal temperatures or pressures).

Specific Hazard: (White)

Oxidizer	OXY
Acid	ACID
Alkali	ALK
Corrosive	COR
Use No Water	W
Radioactive	
Polymerizes	P

Hazardous Materials Information System (HMIS) RATINGS
For Castings in Solid Form

Health:	Flammability:	Physical Hazards
0	0	0



Health Hazard: (Blue)
0–(no significant risk to health);
1–(irritation or minor reversible injury possible);
2–(temporary or minor injury may occur);
3–(major injury likely unless prompt action is taken and medical treatment is given);
4–(life-threatening, major or permanent damage may result from single or repeated overexposures).
*–(chronic health hazard)

Flammability: (Red)
0—(materials that will not burn);
1—(materials that must be preheated before ignition will occur);
2—(materials which must be moderately heated or exposed to high ambient temperatures before ignition will occur);
3—(materials capable of ignition under almost all normal temperature conditions);
4—(flammable gases, or very volatile flammable liquids with flash points below 73°F and boiling points below 100°F. Materials may ignite spontaneously with air. (Class IA)).

Physical Hazards: (Orange)
0—(materials that are normally stable, even under fire conditions and will not react with water, polymerize, decompose, condense, or self-react. Non-explosives);
1—(materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors);
2—(materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air);
3—(materials that may form explosive mixtures with water and are capable of detonation or explosive reaction in the presence of a strong initiating source. Materials may polymerize, decompose, self-react, or undergo other chemical change at normal temperature and pressure with moderate risk of explosion);
4—(materials that are readily capable of explosive water reaction, detonation or explosive decomposition, polymerization, or self-reaction at normal temperature and pressure).

LABEL INFORMATION: The following hazard information is required for labels under OSHA Standard 29 CFR 1910.1200. Other label information may be added.

DUCTILE IRON

—*CAUTION*—

Grinding, welding or arc gouging of this casting creates dust or fumes containing substances listed below with corresponding possible health effects after prolonged or repeated overexposure.

Carbon: Respiratory and skin irritation.

Chromium, hexavalent: Dermatitis, lung and nasal cancer.

Copper: Nose and throat irritation, sweet or metallic taste, metal fume fever with flu-like symptoms, anemia.

Iron: Overexposure to iron oxide fume over a long time can cause siderosis, sometimes called "iron pigmentation" of the lung. It can be seen on a chest x-ray but causes little or no disability.

Magnesium: Irritation of eyes and respiratory tract. Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever)

Manganese: Central nervous system effects are: sleepiness, weakness in legs, spastic gait, or emotional disturbances.

Molybdenum: Lower respiratory irritation

Nickel: Dermatitis, lung and nasal cancer.

Silicon: Skin, eye and nose irritation.

Tin: Respiratory irritation. Prolonged inhalation of dust or fume may produce distinctive changes in the lungs with no apparent disability or complications.

Wear eye protection

Wear a NIOSH approved respirator if dust or fume concentrations are excessive.

NOTE:

This data is offered in good faith as typical values and not as a product specification. No warranty either expressed or implied is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review the recommendations in specific context of the intended use and determine if they are appropriate.

MSDS SHEET PREPARED BY:	DATE:
American Foundry Society, Inc. Occupational Safety & Health Committee (10-Q)	10/10

EBAA IRON INC

Wats: (800) 633-9190
Phone: (254) 629-1737
Fax: (254) 629-2910

19 Nov 2013

To:

To Whom It May Concern:

In response to your request for Material Safety Data Sheets (MSDS) for our ductile iron product line, please note the following: Under 29 CFR 1910.1200(b)(6)(iv) in conjunction with 29 CFR 1910.1200(c) – definition of the term "article", our product is an article and therefore not subject to the requirements of 29 CFR 1910.1200.

The attached MSDS for ductile iron applies to grade 80-55-06.

If you should have any further comments or questions, please contact me at the below address.

Thank you,

Joy L Cole
EHS Mgr.

Manufacturing Statement

Concerning:

American Recovery and Reinvestment Act of 2009 (ARRA) Compliance

and

Leadership in Energy and Environmental Design (LEED) Qualification

by:

EBAA Iron Incorporated, Eastland, Texas

Summary:

All products manufactured by EBAA Iron, Inc. are cast of ductile iron created from a minimum of 90% post-industrial recycled steel procured within the United States and within a 500 mile radius of the EBAA foundries located in Eastland and Albany, Texas.

Danny Norris **November 19, 2013**

Danny Norris, General Manager Foundries

Hazard Communication Label

Label information for MSDS SC-000-042 REV. 9 DATE 10/02

The following hazard information is required for labels under OSHA Standard 1910.1200 and applicable instructions. Other label information may be added.

DUCTILE IRON

CAUTION

Grinding, welding, or arc gouging of this casting creates dust or fumes containing substances listed below with corresponding possible health effects after prolonged or repeated overexposure:

Carbon: Respiratory and skin irritation.

Chromium, Hexavalent: Lung cancer.

Iron: Iron pigmentation of the lung, which can be seen in a chest x-ray but causes little or no disability.Siderosis-inflammation of the lungs.

Manganese: Central nervous system effects are: sleepiness, weakness in legs, spastic gait, emotional disturbances.

Nickel: Dermatitis, lung and nasal cancer.

Silicon: Skin, eye and nose irritation.

Wear eye protection. Wear approved dust and fume respirator if exposures exceed safe limits.

Material Safety Data Sheet (MSDS)

MSDS SC-000-042 REV. 9
DATE 10/02

Vendor name and address:

Conforms to requirements of OSHA standard 1910.1200 "Hazard Communication" and to various state "Employee Right to Know" Laws

Emergency phone number:

DUCTILE IRON

SECTION I — PRODUCT IDENTIFICATION

This MSDS supplied for: DUCTILE IRON

SECTION II — HAZARDOUS COMPONENTS

INGREDIENT	CAS NO.	PERCENT	TLV (mg/m³)	PEL (mg/m³)
Carbon (as C)	7440-44-0	3.0-4.3	N/E	N/E
Chromium*(as Cr)	7440-47-3	0.02-0.13		
Chromium (II) Compounds (as Cr)			0.5	N/E
Chromium (III) Compounds (as Cr)			0.5	0.5
Chromium Metal (as Cr)			0.5	1.0
Chromium (VI) Insoluble Compounds			0.01	N/E
Chromic Acid and Chromates (as CrO_3)			N/E	1.0 mg/10m³(C)
Chromium (VI) Compounds Water Soluble (as Cr)			0.05	0.1 (C)
Iron (as Fe_2O_3)	1309-37-1	87.7-95.1		
Iron Oxide Fume (Fe_2O_3)			N/E	10.0
Iron Oxide Dust and Fume (Fe_2O_3)			5.0	N/E
Manganese* (as Mn)	7439-96-5	<1.2		
Fume (as Mn)			N/E	5.0 (C)
Elemental and Inorganic Compounds (as Mn)			0.2	5.0(C)

SECTION II — HAZARDOUS COMPONENTS *(cont'd.)*

INGREDIENT	CAS NO.	PERCENT	TLV (mg/m³)	PEL (mg/m³)
Nickel*(as Ni)	7440-02-0	0.01-1.5		
Metal			1.5	1.0
Insoluble Compounds (as Ni)		0.2	1.0	
Soluble Compounds (as Ni)			0.1	1.0
Silicon (as Si)	7440-21-3	1.8-4.0		
Total Dust			10.0	15.0
Respirable Dust			N/E	5.0

N/E = none established. N/A = not applicable. N/D = no data available.
TLV = American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (8-hour time weighted average).
PEL = OSHA Permissible Exposure Limit.
mg/m³ = Milligrams per cubic meter of air.
NTP = National Toxicology Program.
C = Ceiling Limit.
STEL = Short Term Exposure Limit.

SARA Title III Information

*This constituent, a toxic chemical, makes this product subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. Quantity threshold amounts are 25,000 pounds for manufacturing, importing or processing and 10,000 pounds for otherwise using the listed chemical. Chemicals marked ** are reportable only if in the form of dust or fume. For purposes of SARA Title III Section 313 inventory and reporting, these alloys contain <0.005% lead.

CARCINOGEN CLASSIFICATION

INGREDIENT	OSHA	NTP	IRAC	EPA	TARGET ORGAN
Carbon	N	N	N	N	-
Chromium (Hexavalent)	N	K	1	A-K	Lung
Iron	N	N	3	N	Lung
Manganese	N	N	N	D	Central Nervous System
Nickel	N	R	2B	N	Lung, Nasal
Silicon	N	N	N	N	-

SECTION II — HAZARDOUS COMPONENTS *(cont'd.)*

OSHA—U.S. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
- N= Not listed as a Human Carcinogen
- Y= Listed as a Human Carcinogen

NTP—NATIONAL TOXICOLOGY PROGRAM
- K= Known to be a Human Carcinogen
- R= Reasonably anticipated to be a Human Carcinogen (RAHC)
- N= Not listed as a Human Carcinogen

IARC—INTERNATIONAL AGENCY FOR RESEARCH ON CANCER
- 1= Carcinogen to Humans
- 2B= Possibly Carcinogenic to Humans
- 3= Unclassified as Carcinogenicity in Humans
- N= Not listed as a Carcinogen

EPA—U.S. ENVIRONMENTAL PROTECTION AGENCY
- A= Human Carcinogen
- K= Known Human Carcinogen
- D= Not classified as to Human Carcinogenicity. No data available
- B1= Probable Human Carcinogen. Sufficient evidence from Epidemiologic Studies
- L= Likely to produce Cancer in Humans
- B2= Probable Human Carcinogen. Sufficient evidence from Animal Studies
- N= Not listed as a Human Carcinogen

SECTION III — OVERVIEW

There are no chemical hazards from these castings in solid form.

Dust or fumes generated by machining, grinding, or welding of the casting will put contaminants in the air. Since the casting is over 85% iron, most of the dust or fume will be iron or iron oxide. There is no TLV for iron dust, but available information indicates that the TLV for nuisance dust will serve as a guideline until a TLV is established.

High production dry machining of ductile iron castings usually requires local exhaust ventilation. Flame cutting, arc gouging, or welding of the casting generates iron oxide fume. Inhalation of too much iron oxide fume over a long time can cause siderosis, sometimes called "iron pigmentation" of the lung. It can be seen on a chest x-ray but causes little or no disability. Also see the MSDS for the welding rod being used.

Welding or flame cutting may convert a fraction of the chromium to the water insoluble hexavalent (carcinogenic) form, but the chromium content of the casting is so low that over-exposure is not likely.

Nickel has been shown to cause cancer in laboratory animals. However, its

SECTION III — OVERVIEW (cont'd.)

potential to cause cancer in humans has not been determined. The nickel content of the casting is so low that over-exposure is not likely.

Grinding castings that have not been cleaned or that contain embedded silica will generate significant amounts of dust containing free silica, which can cause silicosis.

Good local ventilation is frequently required to prevent over-exposure in this situation. If good ventilation is not available, use a NIOSH-approved dust respirator. IARC has listed crystalline silica as Class 2A, probably can cause lung cancer.

Other toxic metals in the alloy are present in small amounts that will not represent a hazard if iron dust and fume are adequately controlled.

SECTION IV — PHYSICAL DATA

PHYSICAL DESCRIPTION:	Solid, silver gray in color, no odor
BOILING POINT:	2750C for iron
VAPOR PRESSURE:	N/A
VAPOR DENSITY:	N/A
SOLUBILITY IN WATER:	N/A
SPECIFIC GRAVITY:	7.86 for iron
PERCENT VOLATILE BY VOLUME:	N/A
EVAPORATION RATE:	N/A

SECTION V — FIRE AND EXPLOSION DATA

Castings will not burn or explode.

SECTION VI — HEALTH HAZARD DATA

EYES: Metal particles in the eyes may cause irritation if not removed. Contact lenses should be worn with caution in a metalcasting environment. Obey work rules concerning contact lenses.

SKIN: Carbon: Skin irritation; **Nickel:** Dermatitis; **Silicon:** Skin irritation.

BREATHING: Prolonged or repeated overexposure to dust or fumes from

SECTION VI — HEALTH HAZARD DATA *(cont'd.)*

these castings may cause the following health effects:

Carbon: Respiratory irritation.

Chromium, Hexavalent: Lung cancer.

Iron: Iron pigmentation of the lung, which can be seen in a chest x-ray but causes little or no disability.Siderosis-inflammation of the lungs.

Manganese: Central nervous system effects are: sleepiness, weakness in legs, spastic gait, emotional disturbances.

Nickel: Lung and nasal cancer.

Silicon: Eye and nose irritation.

Breathing excessive amounts of silica dust for a long time can cause silicosis. Silicosis causes shortness of breath, reduced capacity to do work, and weakens the defenses against other lung diseases.

INGESTION: Hand, clothing, food and drink contact with metal dust, fume or powder can cause ingestion of particulate during hand to mouth activities such as eating, drinking, smoking, nail biting, etc.

NOISE: Grinding or machining castings is noisy. The OSHA limit for noise averaged over eight hours is 90 decibels (dBA). A hearing conservation program is required if exposure is over 85 dBA. If noise is at or above 90 dBA, you should wear ear muffs or ear plugs.

FIRST AID

IF IN EYES: Metal particles should be removed by trained individuals such as a nurse or physician.

IF ON SKIN: Use a mild hand cream if irritation develops.

IF BREATHED: (Fumes from welding): Move to fresh air.

IF INGESTED: Consult local physician.

SECTION VII — REACTIVITY DATA

HAZARDOUS POLYMERIZATION: Will not occur

STABILITY: Stable.

INCOMPATIBILITY: Metal dust can burn or explode and must be protected from ignition sources such as grinding sparks, etc. Under some conditions, metal dust is incompatible with some oxidizing conditions and may be incompatible with oxidizers, acids and water and may ignite or explode.

SECTION VIII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: If damaged, return castings to vendor or send to scrap reclaimer.

Collected dust from machining, welding, etc., may be classed as a "hazardous waste" depending on circumstances. Consult local authorities regarding disposal.

SECTION IX — PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: Wear a NIOSH approved respirator for dusts or fume if concentrations exceed the TLV or PEL.

VENTILATION: Provide general ventilation and/or local exhaust if necessary to maintain concentrations below the TLVs.

PROTECTIVE GLOVES: Work gloves advisable for handling castings.

EYE PROTECTION: Safety glasses with side shields and/or face shields for particles (grinding). Welding goggles or helmet for welding.

OTHER PROTECTIVE EQUIPMENT: Wear a protective apron and gauntlets if arc-air gouging or cutting, or welding castings. Safety shoes may be required during certain operations.

If noise is at or above 90 dBA, you should wear ear muffs or ear plugs.

SECTION X — SPECIAL PRECAUTIONS OR OTHER COMMENTS

STORAGE: Keep dry to reduce rusting.

THE INFORMATION HEREIN IS BASED ON THE VENDOR'S MSDS WITH ADDITIONS AS NECESSARY TO COMPLY WITH CURRENT REGULATIONS. THE INFORMATION IS BELIEVED TO BE ACCURATE BUT UNDER THE CIRCUMSTANCES IS NOT WARRANTED TO BE.

NOVA Chemicals®

PRODUCT RISK PROFILE

POLYETHYLENE

Product Summary

Polyethylene is a clear-to-white, solid, plastic product made by reacting molecules of ethylene gas into long polymer chains in carefully controlled manufacturing processes. Polyethylene is not known to occur naturally. British researchers first synthesized polyethylene in 1933.

NOVA Chemicals' polyethylene products are considered to be safe for humans and the environment in known and intended end uses.

Polyethylene products sold by NOVA Chemicals are identified as NOVAPOL®, SCLAIR® and SURPASS® resins. These products are manufactured in Canada at the Joffre, Alberta site and at the Moore and St. Clair River sites located in St. Clair Township and Corunna, Ontario respectively. These resins are shipped nationally and internationally in bags, bulk cartons, hopper trucks, rail hopper cars and marine containers for use as starting materials in the manufacture of a wide variety of industrial and consumer plastic products.

Product Use Information

Polyethylene resins are used in many product end-use markets, the largest of which is packaging. (Examples of typical end-use applications are listed and are not intended to be fully comprehensive.) They are sold as clear to white, solid pellets or as a granular powder. Polyethylene products are identified as very low, low, linear low, medium, linear medium and high-density resins. Very low-density polyethylene (VLDPE) resins are used in the production of boil-in food packages and heat sealed films and pouches. Low-density polyethylene (LDPE) resins are used in the production of grocery bags, squeezable bottles, and cable insulation. Linear low-density polyethylene ((s)LLDPE), linear medium-density polyethylene ((s)LMDPE) and medium-density polyethylene ((s)MDPE) resins are used in the production of flexible food packaging, shrink-wrap, stretch film and overwrap film. High-density polyethylene ((s)HDPE) resins are used in the production of industrial drums, children's toys, and pressure pipes. The U.S. Food and Drug Administration, Health Canada and other regulatory agencies have determined that plastics and the additives commonly used in plastics are suitable for such applications.

Human Exposure

Due to its use in a variety of consumer products such as packaging, there is exposure of the general public to polyethylene as well as to workers processing the raw pellets into products. Polyethylene has been extensively reviewed by regulatory authorities and determined to be non-hazardous by normal routes of exposure including skin contact, inhalation and ingestion.

Workers producing or processing polyethylene can be exposed to resin dusts when grinding plastics, and to irritating gases while heat processing plastic resins. Workplace air quality measurements made by NOVA Chemicals in typical polyethylene handling and use operations indicate that good equipment design, adequate ventilation, proper handling and personal hygiene procedures minimize these workplace exposures.

The public is exposed to solid polyethylene from everyday use of consumer products made from polyethylene resins. Swallowing small polyethylene plastic items can cause choking. Plastic film products can be an asphyxiation hazard if misused to cover the face.

Health Information

Thorough evaluation of human toxicological data of polyethylene demonstrates that this product poses a low risk under intended use conditions. In workplace processing of polyethylene, contact with fine dusts and heated fumes may cause eye, skin and respiratory system irritation. Contact with hot molten material may cause severe thermal burns, possible permanent injury or blindness. Inhalation of smoke under fire conditions is considered hazardous.

Environmental Exposure

Polyethylene will float on water and can be widely distributed and persistent in land and water systems. Polyethylene will not biodegrade readily in the environment unless it has first been chemically modified by heat or chemical action to reduce the molecular size. This product will slowly change in the presence of sunlight, but will not fully breakdown. Most polyethylene products can be collected and recycled. Waste polyethylene products can also be recovered and used as a high-energy fuel in industrial thermal energy recovery systems. Discarded polyethylene products can be disposed of in public landfills, as they do not break down into hazardous gases or other toxic compounds.

NOVA Chemicals®

PRODUCT RISK PROFILE

POLYETHYLENE

Ecological Information

Polyethylene is considered non-toxic in land and water systems. Polyethylene is not readily digestible; pellets may accumulate in the digestive systems of some sea birds and marine life causing possible death by starvation. Pellets do not degrade in soil or in landfill and should be fully recovered from land spills.

Physical Hazards

Polyethylene is an inert and chemically neutral material. Polyethylene is not considered hazardous and is not regulated in the workplace or in transportation. The product will burn if overheated to high temperatures, and can emit irritating smoke similar to that produced by burning wood. Buildup of fine dust may create an explosive mixture with air. In view of this, precautions should be taken to prevent buildup of static electricity in industrial processing. Spilled product may cause a slipping hazard. Industrial workers should avoid walking on top of deep piles of pellets in storage vessels or in a contained area to avoid risk of falling and possible suffocation.

Risk Management at NOVA Chemicals

NOVA Chemicals continues to carefully review all relevant information on the safety and suitability of our polyethylene resins for their known and intended end-uses. In addition, our polyethylene resins are constantly being improved and tailored to meet the ever-changing needs of our customers.

NOVA Chemicals is committed to sharing information on the safe handling and end-use of our products with customers and other interested parties. Material Safety Data Sheets (MSDS) are provided to our customers and can be accessed by interested members of the public electronically at the NOVA Chemicals' website at www.novachemicals.com. Technical information on processing polyethylene resins is also posted on this website.

NOVA Chemicals is a member of the Society of the Plastics Industry (SPI) and the Canadian Plastics Industry Association (CPIA). Through these and other industry associations, we actively monitor and participate in public regulatory processes impacting polyethylene products. We also seek to better understand and support sustainable solutions to plastic recycling and other health and environmental challenges. We actively support industry-sponsored product testing initiatives and other industry initiatives supporting responsible actions, sound science and life cycle stewardship of our products.

Updated: March 29, 2012

For detailed information on this product, please review the product Material Safety Data Sheet (MSDS). In the case of an emergency involving this product, please call our 24-hour hotline at 1-800-561-6682 or 1-403-314-8767.

For more information on this product risk profile, please contact us at 1-412-490-4063 or email us at stewardp@novachem.com .

For more information on any NOVA Chemicals' product, please contact us at the nearest location below during business hours or visit our website at www.novachemicals.com:

NOVA Chemicals Corporation
PO Box 2518, Station M
Calgary, Alberta
Canada T2P 5C6
Tel: 403-750-3600

NOVA Chemicals Inc.
1555 Coraopolis Heights Road
Moon Township, PA
USA 15108
Tel: 412-490-4000
Toll Free: 1-866-ASK-NOVA

NOVA Chemicals (International) S.A.
Avenue de la Gare 14
CH-1700 Fribourg
Switzerland
Tel: 41-26-426-57-57

NOVA Chemicals®

PRODUCT BACKGROUNDER

Polyethylene

Important! For detailed information on this product and emergency measures, obtain the applicable Material Safety Data Sheet (MSDS). In the case of an emergency, please call our 24-hour hotline at 1-800-561-6682 or 1-403-314-8767.

May also be called: NOVAPOL® resins, SCLAIR® resins, SURPASS® resins, (s)HDPE, LDPE, VLDPE, (s)LLDPE, (s)LMDPE, (s)MDPE, ethylene polymers, ethylene butene copolymers, ethylene hexene copolymers, and ethylene octene copolymers.

Product/Substance Use:

- This product is manufactured at NOVA Chemicals' Joffre, Alberta, St. Clair Township, Ontario (Moore Site) and Corunna, Ontario (St. Clair River Site) facilities. Polyethylene is shipped nationally and internationally in bags, bulk cartons, hopper trucks, rail hopper cars and marine containers.
- This plastic resin is used to make a wide range of extruded plastic films, sheet or pipe. It can also be moulded into bottles, containers, lids and other plastic items.

Characteristics and Safe Handling:

- This product is not hazardous and is not regulated in the workplace or in transportation.
- This product is a solid, white pellet or granular material, with a slight sweet odour.
- Buildup of fine dusts may form an explosive mixture in air. Any equipment used in areas of handling or storage of the product must be grounded for control of static electricity and kept free of powders and dust buildup. Product should be stored away from potential ignition sources.
- Product is not flammable but will burn on prolonged exposure to flame or high temperatures and produces irritating smoke. If heated, this product may emit various waxes and hydrocarbons as well as carbon dioxide, carbon monoxide and small amounts of irritating organic vapours.
- Material will float on water. Any release to land or water must be isolated, contained and recovered or cleaned up properly by trained and equipped personnel.

Health and Safety Information:

- Contact with fine dusts and heated fumes may cause irritation to eyes, skin and the respiratory system. Seek medical attention if symptoms develop or persist.
- Contact with hot, molten material may cause severe thermal burns and in extreme contact, possible permanent injury or blindness. Seek immediate medical attention if burned by molten polymer.
- If accidentally swallowed, DO NOT INDUCE VOMITING and seek immediate medical attention.
- Wear all recommended personal protective equipment if any contact with this material is likely. Immediately remove and clean any contaminated clothing prior to reuse.
- Spilled product may cause a slipping hazard. Clean up and recover any loose pellets. Do not walk on deep piles of pellets in storage vessels or in any contained area to avoid risk of falling and possible suffocation.
- Exposure to this product in inert form is not known to cause any long-term health effects.

Environmental Information:

- This product is non-toxic, is insoluble in water and has not been found to migrate through soils. Product will float on water and can become widely distributed and persistent in aquatic and terrestrial systems. Polyethylene pellets may accumulate in the digestive systems of birds and aquatic life, causing injury and possible death by starvation.
- Polyethylene will not biodegrade readily in the environment unless it has first been chemically modified by heat or chemical action to reduce the molecular size. This product will slowly change in the presence of sunlight, but will not fully breakdown. Product buried in landfill has been found to be stable over time. No toxic degradation products are known to be produced.
- Polyethylene pellets should be fully recovered from any land or water spills. Use appropriate tools to collect and place spilled material into recovery containers. Attempt to reuse/recycle where possible.
- Associated wastes may be regulated in Canada and in the United States. Ensure all applicable regulations are met.

Last update: December 20, 2011

For more information on this, or any other NOVA Chemicals' product, please contact us at the nearest location below during business hours or visit our website at www.novachemicals.com:

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NOVA Chemicals®

PRODUCT RISK PROFILE

POLYETHYLENE

Product Summary

Polyethylene is a clear-to-white, solid, plastic product made by reacting molecules of ethylene gas into long polymer chains in carefully controlled manufacturing processes. Polyethylene is not known to occur naturally. British researchers first synthesized polyethylene in 1933.

NOVA Chemicals' polyethylene products are considered to be safe for humans and the environment in known and intended end uses.

Polyethylene products sold by NOVA Chemicals are identified as NOVAPOL®, SCLAIR® and SURPASS® resins. These products are manufactured in Canada at the Joffre, Alberta site and at the Moore and St. Clair River sites located in St. Clair Township and Corunna, Ontario respectively. These resins are shipped nationally and internationally in bags, bulk cartons, hopper trucks, rail hopper cars and marine containers for use as starting materials in the manufacture of a wide variety of industrial and consumer plastic products.

Product Use Information

Polyethylene resins are used in many product end-use markets, the largest of which is packaging. (Examples of typical end-use applications are listed and are not intended to be fully comprehensive.) They are sold as clear to white, solid pellets or as a granular powder. Polyethylene products are identified as very low, low, linear low, medium, linear medium and high-density resins. Very low-density polyethylene (VLDPE) resins are used in the production of boil-in food packages and heat sealed films and pouches. Low-density polyethylene (LDPE) resins are used in the production of grocery bags, squeezable bottles, and cable insulation. Linear low-density polyethylene ((s)LLDPE), linear medium-density polyethylene ((s)LMDPE) and medium-density polyethylene ((s)MDPE) resins are used in the production of flexible food packaging, shrink-wrap, stretch film and overwrap film. High-density polyethylene ((s)HDPE) resins are used in the production of industrial drums, children's toys, and pressure pipes. The U.S. Food and Drug Administration, Health Canada and other regulatory agencies have determined that plastics and the additives commonly used in plastics are suitable for such applications.

Human Exposure

Due to its use in a variety of consumer products such as packaging, there is exposure of the general public to polyethylene as well as to workers processing the raw pellets into products. Polyethylene has been extensively reviewed by regulatory authorities and determined to be non-hazardous by normal routes of exposure including skin contact, inhalation and ingestion.

Workers producing or processing polyethylene can be exposed to resin dusts when grinding plastics, and to irritating gases while heat processing plastic resins. Workplace air quality measurements made by NOVA Chemicals in typical polyethylene handling and use operations indicate that good equipment design, adequate ventilation, proper handling and personal hygiene procedures minimize these workplace exposures.

The public is exposed to solid polyethylene from everyday use of consumer products made from polyethylene resins. Swallowing small polyethylene plastic items can cause choking. Plastic film products can be an asphyxiation hazard if misused to cover the face.

Health Information

Thorough evaluation of human toxicological data of polyethylene demonstrates that this product poses a low risk under intended use conditions. In workplace processing of polyethylene, contact with fine dusts and heated fumes may cause eye, skin and respiratory system irritation. Contact with hot molten material may cause severe thermal burns, possible permanent injury or blindness. Inhalation of smoke under fire conditions is considered hazardous.

Environmental Exposure

Polyethylene will float on water and can be widely distributed and persistent in land and water systems. Polyethylene will not biodegrade readily in the environment unless it has first been chemically modified by heat or chemical action to reduce the molecular size. This product will slowly change in the presence of sunlight, but will not fully breakdown. Most polyethylene products can be collected and recycled. Waste polyethylene products can also be recovered and used as a high-energy fuel in industrial thermal energy recovery systems. Discarded polyethylene products can be disposed of in public landfills, as they do not break down into hazardous gases or other toxic compounds.

NOVA Chemicals®

PRODUCT RISK PROFILE

POLYETHYLENE

Ecological Information

Polyethylene is considered non-toxic in land and water systems. Polyethylene is not readily digestible; pellets may accumulate in the digestive systems of some sea birds and marine life causing possible death by starvation. Pellets do not degrade in soil or in landfill and should be fully recovered from land spills.

Physical Hazards

Polyethylene is an inert and chemically neutral material. Polyethylene is not considered hazardous and is not regulated in the workplace or in transportation. The product will burn if overheated to high temperatures, and can emit irritating smoke similar to that produced by burning wood. Buildup of fine dust may create an explosive mixture with air. In view of this, precautions should be taken to prevent buildup of static electricity in industrial processing. Spilled product may cause a slipping hazard. Industrial workers should avoid walking on top of deep piles of pellets in storage vessels or in a contained area to avoid risk of falling and possible suffocation.

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Updated: March 29, 2012

For detailed information on this product, please review the product Material Safety Data Sheet (MSDS). In the case of an emergency involving this product, please call our 24-hour hotline at 1-800-561-6682 or 1-403-314-8767.

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Product Safety Summary

ExxonMobil Chemical

ESCORENE™ ULTRA EVA RESINS

This Product Safety Summary document is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, or to provide a discussion of all safety and health information. This document is not intended to replace the (Material) Safety Data Sheet. Warnings and handling precautions provided below are not intended to replace or supersede manufacturers' instructions and warning for their consumer products which may contain this chemical substance.

1. Chemical Identity

ExxonMobil Chemical's Escorene™ Ultra EVA Copolymer Resins and Polybilt™ Modifiers are specialty copolymer plastic materials. The predominant component is ethylene (C_2) that is catalytically polymerized with vinyl acetate.

CAS No.:	Chemical Name:	Other Names:
24937-78-8	Ethylene – Vinyl Acetate Copolymer	Polyethylene (Polymers, Copolymers)

2. Product Uses

Escorene™ Ultra EVA Resins can be found in a variety of end-uses including food packaging, wire and cables, car interior and greenhouse films. Polybilt™ modifiers are compatible with a large variety of bitumen materials, and can be found on road asphalts. Escorene™ Ultra EVA Resins are also the base polymers in many adhesion resin formulations which offer low seal-initiation temperatures, high hot-tack, very good impact strength and excellent optical properties.

3. Physical / Chemical Properties

ExxonMobil Chemical's Escorene™ Ultra EVA Resins (including the Polybilt™ Modifiers) are white to off-white solids, and can be clear or opaque and are stable solid polymers. These resins are considered hazardous in their base form, not as a final product, in the U.S. according to OSHA due to the possibility that they can form a combustible dust. If heated to excessive temperatures (such as in a fire), they may burn or decompose to flammable hydrocarbons, vinyl acetate and acetic acid. The melting point for is estimated to be 35°C (95°F) – 110°C (230°F).

4. Health Information

The health hazards of ExxonMobil Chemical's Escorene™ Ultra EVA Resins at ambient temperature are generally negligible due to their high molecular weight and general inertness. They do not exhibit the following effects – toxicity, primary irritation, sensitization, corrosiveness, reproductive toxicity, carcinogenicity, or target organ toxicity. Some of these resins may contain free vinyl acetate monomer (VAM) at concentrations between 0.1% and 1%. VAM is identified by the International Agency on the Research of Cancer as a Category 2B carcinogen – possibly carcinogenic to humans.

5. Additional Hazard Information

Hazard classifications for grades of this product which may contain VAM, will be identified on the Safety Data Sheet.

6. Food Contact Regulated Uses

Appropriate manufacturing and distribution practices are employed to ensure the quality of this product when offered for use in food contact applications.

7. Environmental Information

Based on data available for the material, the components of the material, and similar materials, ExxonMobil Chemical's Escorene™ Ultra EVA Resins biodegrade at a slow rate and may persist in the environment. They are not expected to cause short-term toxicity to fish or other aquatic or terrestrial organisms. Because of its low solubility in water, chronic aquatic toxicity is not expected.

8. Exposure Potential

- **Workplace exposure** – This refers to potential exposure in a manufacturing facility or in industrial workplaces handling these polymers. Generally, exposure of personnel in manufacturing facilities is relatively low due to the predominantly enclosed nature of the process, storage and handling operations. The Volatile Organic Compounds (VOCs) emissions measured from PE during thermal processing are low (8-157 ppm). The major emission components are aldehydes, ketones and organic acids. Exposure can also occur from inhalation of particulate dusts. The US Occupational Safety and Health Administration (OSHA) exposure limits for nuisance dust are 5 mg/m^3 (respirable dust) and 15 mg/m^3 (total dust). The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) are 10 mg/m^3 for inhalable particulates (total dust) and 3 mg/m^3 for respirable particulates (total dust) for nuisance dust.
- **Consumer use of products containing ExxonMobil Chemical's Escorene™ Ultra EVA Resins** – For the majority of consumers, exposure is expected to be infrequent, of short duration and of no significant consequence.
- **Environmental releases** – As a chemical manufacturer, we are committed to operating in an environmentally responsible manner everywhere we do business. Our efforts are guided by in-depth scientific understanding of the environmental impact of our operations, as well as by the social and economic needs of the communities in which we operate. Industrial spills or releases are rare. Our operational improvement targets and plans are based on driving incidents with real environmental impact to zero and delivering superior environmental performance.

9. Manufacture of Product

- **Process** – Produced by catalytic polymerization of olefins and vinyl acetate.

10. Risk Management

- **Workplace Risk Management** – If significant vapors/fumes are generated during thermal processing of this product, it is recommended that work stations be monitored for the presence of thermal degradation by-products which may evolve at elevated temperatures (for example, oxygenated components). When

handling hot molten material, wear heat resistant gloves to protect your hands and skin. Please refer to the (Material) Safety Data Sheet

- **Consumer Risk Management** - This product is not sold directly to the public for general consumer uses but may be incorporated by converters into consumer products as highlighted in Section 2. Although we do not control how the Escorene™ Ultra EVA Resins are used in the final consumer products, if they are manufactured properly, risk from chemical exposure to polymer material using these products are expected to be negligible when the product is used as intended and under normal conditions of use.

11. Regulatory Information

ExxonMobil Chemical's Escorene™ Ultra EVA Resin is considered a non-hazardous product from a human health perspective. Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of this product and may vary by city, state, country or geographic region. Additional helpful information may be found by consulting the relevant ExxonMobil (Material) Safety Data Sheet at:

- http://www.msds.exxonmobil.com

12. Concluding Statements

ExxonMobil Chemical's Escorene™ Ultra EVA Resins and Polybilt™ Modifiers…

- are widely used polymers
- are considered non-hazardous products from a human health perspective
- do not cause adverse health or environmental effects at levels typically found in the workplace or environment