Coke Products

Safety Data Sheet (SDS)

ALGOMA STEEL INC.

Section 1: Identification	
1 (a) Product Identifier: Coke Products	
1 (b) Other means of Identification:	Metallurgical Coke, Nut Coke, Coke Breeze
1 (c) Recommended use and restrictions on use:	Use as a fuel for furnaces.
1 (d) Manufacturer's Name & Address	
Algoma Steel Inc. 105 West Street Sault Ste. Marie Ontario, Canada P6A 7B4	
1 (e) Emergency Telephone Numbers: 1 (705) 945-4058	

Section 2: Hazard Identification

2 (a) Classification of the substance or mixture:

The categories of Health Hazards defined in the "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 and are listed below. 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 -1A Single Target Organ Toxicity (STOT) Repeat Exposure -1 Specific Target Organ Toxicity (STOT) Single Exposure -1	Danger	May cause cancer. Causes damage to lungs, kidneys and immune system. Causes damage to the lungs.
	Eye irritation – 2A Skin irritation - 2	Warning	Causes serious eye damage. Causes skin irritation.
NA	Combustible Dust		May form combustible dust concentrations in air.

Section 2: Hazard Identification (continued)

Precautionary Statement(s):

Prevention	Response	Storage/Disposal
Do not breathe gas/fumes/vapor/dusts. Avoid contact with skin and eyes. Wear protective gloves / protective clothing / eye protection / face protection. Avoid exposure, obtain special instructions before use.	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 eye irritation persists: Get medical advice/attention. **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. **If swallowed:** Call a poison center or doctor/physician if you feel unwell. Rinse mouth	Dispose of contents in accordance with federal, provincial, 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, CAS Number and Other Identifiers, and Concentration:

Chemical Name	CAS Number	% By Weight
Carbon	7440-44-0	90.0
Ash	NA	8-9
Water	NA	2-5
Aluminum Oxide	1344-28-1	2.0
Silicon Dioxide (Quartz)	14808-60-7	1-2
Iron Oxide	1309-37-1	1.0
Volatile Matter (<0.01% CTPV)	NA	0.1-0.3

Section 4: First Aid Measures

4(a) Description of necessary measures: If exposed, concerned or feel unwell: Get medical advice/attention.

- **Inhalation:** If inhaled: Remove person to fresh air and keep comfortable for breathing. Seek medical advice if discomfort persists.
- **Eye Contact:** 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.
- **Skin Contact:** Wash thoroughly after handling. Wash with plenty of soap and water. If irritation or rash occurs: Get medical advice/attention. Take off and wash contaminated clothing before reuse.
- **Ingestion:** if swallowed: Get medical advice/attention. Call a poison center or doctor/physician if you feel unwell.

4(b) Most important symptoms/effects, acute and delayed (chronic):
Primary Entry Routes: Excessive total particulate exposure may cause irritation to the eyes, skin and respiratory tract. Operations which generate high dust concentrations may result in the following effects if exposures exceed recommended limits as listed in Section 8. Possible Cancer Hazard.

- **Inhalation:** May cause upper respiratory irritation. Prolonged inhalation of crystalline silica may cause silicosis, chronic lung disease or death.
- **Eye:** Eye contact with dry dust can cause abrasive irritation or eye damage.
- **Skin:** Skin contact with dust may cause irritation or sensitization, possibly leading to dermatitis. Skin contact with dusts may cause physical abrasion.
- **Ingestion:** Do not take internally. May cause nausea and/or vomiting.

See Section 11-Toxicological for further Information.

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

Section 5: Fire-fighting Measures

5(a) Suitable (and unsuitable) Extinguishing Media: Steam, water fog, dry chemical, sand or carbon dioxide. Small fires – Foam, CO_2, Dry Chemical, Water Spray. Large Fires – Water spray, fog or foam.

5(b) Specific Hazards arising from the chemical: Not applicable for solid product. When burned, toxic smoke or vapour may be emitted including, oxides of carbon, metal oxides and other toxic vapour. Coke dust may form combustible mixtures with air.

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.

Section 6: Accidental Release Measures

6(a) Personal Precautions, Protective Equipment and Emergency Procedures: Use only outdoors. 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.

6(b) Methods and materials for containment and clean up: Dry material should be removed by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid using compressed air. Do not release into sewers or waterways. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, provincial, state, and local regulations.

Section 7: Handling and Storage

7(a) Precautions for safe handling: Avoid generating dust. High concentrations of airborne particulates should be evaluated and controlled as necessary; local exhaust ventilation should be used to control the emission of air contaminants. 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 skin contact and breathing dust. Do not eat, drink or smoke when using this product. NIOSH approved respirators, impervious gloves and chemical goggles should be worn when working with if working in high concentrations of dust.

7(b) Conditions for safe storage, including any incompatibilities: Whenever feasible, store locked up. Avoid heat and flames.

Section 8: Exposure Controls/Personal Protection

8(a) Occupational Exposure Limits (OELs): The following exposure limits are offered as reference for an experienced industrial hygienist to review.

Ingredients	OSHA PEL [1]	OHSA OEL [2]	ACGIH TLV – TWA [3]	IDLH [4]
Carbon	15 mg/m^3 (total dust) 5 mg/m^3 (respirable particulate)	10 mg/m^3 (inhalable particulate)PNOS 3 mg/m^3 (respirable particulate)PNOS	10 mg/m^3 (inhalable particulate)PNOS 3 mg/m^3 (respirable particulate)PNOS	NA
ASH	ND	ND	ND	ND
Silicon Dioxide (Quartz)	(30 mg/m^3)/%SiO2 +2(total particulate) (10mg/m^3)/%Si02+2 (respirable particulate)	0.10 mg/m^3 (respirable fraction)	0.025 mg/m^3, (respirable fraction[7])	NA
Aluminum Oxide	5 mg/m^3 (respirable fraction)	1 mg/m^3 (respirable fraction)	1 mg/m^3 (respirable fraction)	NA
Volatile Matter (<.01% CTPV*)	NA	NA	NA	NA
Iron Oxide	10 mg/m^3 (fume)	5 mg/m^3 (respirable fraction)	5 mg/m^3 (respirable fraction)	NA

*CTPV = Coal Tar Volatile Matter

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. OEL's listed under the *Occupational Health and Safety Act* are 8-hour TWA (time-weighted average) concentrations, unless otherwise noted, as listed under section 4 of Ontario Regulation 833, Control of Exposure to Biological or Chemical Agents.
3. 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.
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. 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.
6. 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/m3 for total dust and 5 mg/m3 for the respirable fraction.
7. PNOS (Particulates Not Otherwise Specified). Particulates identified under the PNOS heading are "nuisance dusts" containing no asbestos and <1% crystalline silica.
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 the ACGIH 2015 TLVs ® and BEIs ® (Biological Exposure Indices) Appendix D.

8(b) Appropriate Engineering Controls: Use controls as appropriate to minimize exposure to dusts during handling operations. Provide general or local exhaust ventilation systems to minimize airborne concentrations in confined areas. Provide sufficient general/local exhaust ventilation in pattern/volume to control inhalation exposures below current exposure limits. Emergency eye wash stations and deluge safety showers should be available in the work area.

8(c) Individual Protection Measures:

- **Respiratory Protection:** If concentrations exceed established limits, 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. Contact lenses should not be worn where industrial exposures to this material are likely.
- **Skin**: Wear appropriate personal protective clothing to prevent skin contact. Work gloves and long sleeves should be worn when working with coke products. 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): Dark grey to black, Solid	**9 (j) Upper and Lower Flammability or Explosive Limits:** NA
9 (b) Odor: Odorless	**9 (k) Vapor Pressure:** NA
9 (c) Odor Threshold: NA	**9 (l) Vapor Density (Air = 1):**
9 (d) pH: NA	**9 (m) Relative Density:** Specific Gravity (1.6)
9 (e) Melting Point/Freezing Point: NA	**9 (n) Solubility:** Insoluble
9 (f) Initial Boiling Point and Boiling Range: NA	**9 (o) Partition Coefficient n-octanol/water:** ND
9 (g) Flash Point: >205 ^{0}F	**9 (p) Auto-ignition Temperature: ND**
9 (h) Evaporation Rate: NA	**9 (q) Decomposition Temperature:** ND
9 (i) Flammability (solid, gas): Combustible	**9 (r) Viscosity:** NA

Section 10: Stability and Reactivity

10(a) Reactivity: ND

10(b) Chemical Stability: Stable under normal storage and handling conditions.

10(c) Possibility of hazardous reaction: None Known

10(d) Conditions to Avoid: Ignition sources in dusty environments. Storage with incompatible materials.

10(e) Incompatible Materials: Strong acids and basis.

10(f) Hazardous Decomposition Products: Oxides of carbon, sulfur and aromatic hydrocarbons may be released at high temperatures.

Section 11: Toxicological Information

11(a-e) Information on toxicological effects: The following toxicity data has been determined for **Coke Products** using the information available for its components applied to the guidance on the preparation of an SDS under the GHS requirements of WHMIS, OSHA and the EU CPL:

Toxicological data listed below are presented regardless to classification criteria:

1. No LD50 or LC50 has been established for **Coke Products** as a mixture. The following data has been determined for the components:
   - **Silicon Dioxide (Quartz):** Oral Rat LD50 =>5000 mg/kg
     Dermal Rat LD50 =>5000 mg/kg
   - **Carbon:** Oral Rat LD50 =>10,000 mg/kg
   - **ASH:** LD50 = Not Available
   - **Aluminum Oxide:** LD50 = Not Available
2. No skin Irritation data available for **Coke Products**. The following data has been determined for the components:
   - **Iron Oxide:** Moderately irritating
3. No Eye Irritation data available for **Coke Products**. The following Eye Irritation information was found for the components:
   - **Crystalline Silica**: May cause abrasion of the cornea.
4. No Germ Cell Mutagenicity data available for **Coke Products.**
5. No Dermal/Respiratory Sensitization data available for **Coke Products**.
6. No Aspiration Hazard data available for **Coke Products**.
7. Carcinogenicity: IARC, and NTP do not list **Coke Products**. The following Carcinogenicity information was found for the components:
   - **Crystalline Silica -** IARC Group 1 carcinogen, carcinogenic to humans, ACGIH A2, suspected human carcinogen. NTP-1, TLV-A2, and OSHA
8. No Toxic Reproduction data available for **Coke Products**:

9. No Specific Target Organ Toxicity (STOT) following a Single Exposure data for **Coke Products** as a mixture. The following STOT following single exposure information was found for the components**:**
   - **Silicon Dioxide:** Single exposure to very high airborne levels may cause lung irritation in exposed humans

10. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data for **Coke Products** as a mixture. The following STOT following single exposure information was found for the components**:**
   - **Silicon Dioxide:** Repeated exposure to crystalline silica causes silicosis and kidney damage as well as increased incidence of autoimmune disorders in humans

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 Program on Chemical Safety (IPCS).

The following health hazard information is provided regardless of the classification criteria and is based on the individual component(s):
Target Organs: Respiratory system, eyes, skin.

Acute Effects:
- **Inhalation:** Excessive exposure to high concentrations of dust may cause irritation to the eyes, skin and mucous membranes of the upper respiratory tract.
- **Eye:** Coke particles are abrasive and may cause irritation to the eyes.
- **Skin:** Skin contact with dusts may cause irritation or sensitization, possibly leading to dermatitis. Skin contact with dust may cause physical abrasion.
- **Ingestion:** Ingestion of harmful amounts of this product may cause nausea or vomiting.

Acute Effects by component:
- **Carbon:** No acute effects reported.
- **Silicon Dioxide (Quartz):** Causes irritation and inflammation of the respiratory tract. May cause abrasion of the cornea. Inhalation may cause cough. A single exposure to very high airborne levels may cause lung irritation in exposed humans.
- **Aluminum Oxide:** Aluminum oxide may cause upper respiratory irritation. May be harmful if swallowed.

Delayed (chronic) Effects by component:
Individuals with chronic respiratory disorders (i.e., asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by any fume or airborne particulate matter exposure. Persons with pre-existing skin disorders may be more susceptible to dermatitis. Chronic inhalation of fumes and dusts are associated with the following conditions
- **Silicon Dioxide (Quartz):** Repeated overexposure to crystalline silica can cause chronic obstructive lung disease or silicosis. Crystalline silica has been designated by IARC as a confirmed human carcinogen and by the ACGIH as a suspected human carcinogen.
- **Carbon:** Prolonged inhalation may cause chronic lung disease, and decreased pulmonary function.

Long-term inhalation exposure to high concentrations (over-exposure) of agents that produce lung disorders may act synergistically with inhalation of oxides, vapors or dusts of this product to cause toxic effects.

Carcinogenicity: This product is not listed by IARC, NTP or OSHA as a carcinogen. However, IARC identifies Silica dust, crystalline, in the form of quartz or cristobalite as Group 1 - carcinogens that are carcinogenic to humans. ACGIH lists silica, crystalline, quartz or cristobalite as an A2 – suspected human carcinogen. NTP identifies Silica, Crystalline (Respirable Size), as known to be carcinogenic to humans, and OSHA identifies crystalline silica as a Group S carcinogen

Medical Conditions Aggravated by Long-Term Exposure: Individuals with chronic respiratory disorders (i.e., asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by any airborne particulate matter exposure.

SARA Potential Hazard Categories: Immediate Acute Health Hazard; Delayed Chronic Health Hazard

Section 12: Ecological Information

12(a) Ecotoxicity (aquatic & terrestrial): No Data Available for **Coke Products**.
12(b) Persistence & Degradability: No Data Available.
12(c) Bioaccumulative Potential: No Data Available.
12(d) Mobility (in soil): No data available.
12(e) Other adverse effects: None Known
Hazard Category: Not Reported
Signal Word: No Signal Word
Hazard Symbol: No Symbol
Hazard Statement: No Statement

Section 13: Disposal Considerations

Disposal: Dispose of material in accordance with applicable federal, state, provincial or local regulations.

Please note this information is for Coke Products in their original form. Any alterations can void this information.

Section 14: Transport Information

14 (a-g) Transportation Information: All provincial, federal, and state laws and regulations that apply to the transport of this type of material must be adhered to.

Transport Canada, *Transportation of Dangerous Goods (*TDG)

Not regulated for transport

US Department of Transportation (DOT)

Not regulated for transport

International Maritime Dangerous Goods (IMDG) and the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID)

Not regulated for transport

International Air Transport Association (IATA)

Not regulated for transport

Regulations Concerning the International Carriage of Dangerous Goods by Road (ADR)

Not regulated for transport

Section 15: Regulatory Information

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

OSHA Regulations: Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-2, Z-3): **Coke Products** 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, **Coke Products** is not listed.

Components	Regulations
Aluminum Oxide	TSCA (Toxic Substances Control Act) Inventory
Silicon Dioxide (<1% Quartz)	TSCA (Toxic Substances Control Act) Inventory

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

Section 313 Supplier Notification: This product does not contain any of the toxic chemicals 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.

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])

Other Regulations: WHMIS

(Crystalline Silica, Quartz) D2A

This is a list of some of the regulations to be followed and may not be complete. Ensure you verify compliance with all applicable Provincial, Federal, State and Local Laws and Regulations

Section 16: Other Information

Prepared By: Algoma Steel Inc.
Revised Date: 11/30/2018

Disclaimer

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