

NUCOR

SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: Carbon and Alloy Steels

CAS Number: Not applicable

Synonyms: Steels

Use/Description: Bar and structural steel products, SRTh(Special Round Threaded),billets (sheet steel for Castrip®)

Nucor Mill Locations

24 Hour Contact – CHEMTREC 1-800-424-9300

Nucor Steel – South Carolina
300 Steel Mill Road
Darlington, S.C. 29540
(843) 393-5841

Nucor Steel Kankakee, Inc.
One Nucor Way
Bourbonnais, IL 60914
(815) 939-5541

Nucor Steel Jackson, Inc.
3630 Fourth Street
Flowood, MS 39232
(601) 939-1623

Nucor Steel – Nebraska
2911 East Nucor Road
Norfolk, Nebraska 68701
(402) 644-0200

Nucor Steel – Auburn, Inc.
25 Quarry Road
Auburn, N.Y. 13021
(315) 253-4561

Nucor Steel – Utah
West Cemetery Road
Plymouth, Utah 84330
(435) 458-2300

Nucor Steel Birmingham, Inc.
2301 F.L. Shuttlesworth Drive
Birmingham, Alabama 35234
(205) 250-7400

Nucor Steel Seattle, Inc.
2424 SW Andover
Seattle, WA 98106
(206) 933-2222

Nucor Steel – Texas
U.S. Highway 79 South
Jewett, Texas 75846
(903) 626-4461

Nucor Steel Marion, Inc.
912 Cheney Avenue
Marion, Ohio 43302
(740) 383-4011

Nucor Steel – Berkeley
1455 Hagan Avenue
Huger, SC 29450
(843) 336-6000

Nucor Yamato Steel/ Nucor
Castrip Arkansas, LLC
5929 E. State Hwy 18
Armored, AR 72310
(870) 762-5500

Nucor Steel Connecticut, Inc.
35 Toelles Road
Wallingford, CT 06492
(203) 265-0615

Nucor Steel Kingman, LLC
3000 West Old Highway 66
Kingman, AZ 86413
(928) 718-7035

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

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

OSHA Hazards: Carcinogen
Skin Sensitizer
Target Organ Effect – Lungs

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

Pictogram(s):



Signal Word:
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Danger

Revision Date: 7/25/2013

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Hazard Statement(s)

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

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

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

Precautionary Statement(s)

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

P261: Avoid breathing dust/fumes.

P281: Use personal protective equipment as required.

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

Potential Health Effects

Eye Contact

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

Skin Contact

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

Inhalation

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

Ingestion

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

Potential Fire and Explosion Hazards

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

Chronic or Special Toxic Effects

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

Target Organs

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

Medical Conditions Aggravated by Exposure

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

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS No.	% Weight	Exposure Limits			
			ACGIH TLV (mg/m ³)		OSHA PEL (mg/m ³)	
Base Metal:						
Iron (Fe)	7439-89-6	Balance	5	Oxide Dust/Fume	10	Oxide Dust/Fume
Alloying Elements						
Aluminum (Al)	7429-90-5	<0.05	10 5	Dust Fume	15 5	Dust Respirable fraction
Antimony (Sb)	7440-36-0	<0.9	0.5	As Antimony	0.5	As Antimony
Arsenic (As)	7440-38-2	<0.09	0.01	As Arsenic (A1 Carcinogen)	0.01	As Arsenic
Beryllium (Be)	7440-41-7	<0.09	0.00 2 0.01	As Beryllium (A1 Carcinogen) As Beryllium (STEL)	0.002 0.005	As Beryllium As Beryllium (Ceiling)
Boron (B)	7440-42-8	<0.9	10	Oxide Dust	15	Oxide Dust
Cadmium (Cd)	7440-43-9	<0.09	0.01 0.00 2	As Cadmium (A2 Carcinogen) Respirable fraction	0.005 0.0025	As Cadmium As Cadmium (Action Level)
Calcium (Ca)	1305-78-8	<0.9	2	Oxide Dust	5	Oxide Dust
Carbon (C)	7440-44-0	<1.0		Not Established		Not Established
Chromium (Cr)	7440-47-3	0.01-1.0	0.5	Metal	1	Metal
Cobalt (Co)	7440-48-4	<0.09	0.02	As Cobalt (A3 Carcinogen)	0.1	Metal/Dust/Fume
Copper (Cu)	7440-50-8	<0.9	1 0.2	Dust Fume	1 0.1	Dust Fume
Lead (Pb)	7439-92-1	<0.05	0.05	Dust / Fume (A3 Carcinogen)	0.05	Dust / Fume
Magnesium (Mg)	7439-95-4	<0.9		Not Established		Not Established
Manganese (Mn)	7439-96-5	0.2-2	0.2	Elemental Mn and Inorg Compounds	5	Fume (Ceiling)
Molybdenum (Mo)	7439-98-7	<0.9	10	Insoluble Compounds	15	Insoluble Compounds
Niobium (Nb)	7440-03-1	<0.9		Not Established		
Nickel (Ni)	7440-02-0	<1.0	1.5	Metal	1	Metal and Insoluble Compounds
Nitrogen (N)	7727-37-9	<0.9		Simple Asphyxiant		Simple Asphyxiant
Phosphorus (P)	7723-14-0	<0.9	0.1	Phosphorus	0.1	Phosphorus
Selenium (Se)	7782-49-2	<0.9	0.2	Selenium	0.2	Selenium
Silicon (Si)	7440-21-3	<0.9	10	Dust	15	Dust
Sulfur (S)	7446-09-05	<0.9	5.2 13	Sulfur Dioxide Sulfur Dioxide (STEL)	13	Sulfur Dioxide
Tin (Sn)	7440-31-5	<0.9	2	Metal, Oxide and Inorganic Compounds	2	Inorganic Compounds
Titanium (Ti)	7440-32-6	<0.9		Not Established		Not Established
Tungsten (W)	7440-33-7	<0.9	5 10	Insoluble Compounds as W Insoluble Compounds as W (STEL)		Not Established
Vanadium (V)	7440-62-2	<0.9	0.05	Oxide Dust/Fume	0.5 0.1	Oxide Dust (Ceiling) Oxide Fume (Ceiling)
Zinc (Zn)	7440-66-6	0.0-0.10	10 5 10	Oxide Dust Oxide Fume Oxide Fume (STEL)	5 10	Oxide Fume Oxide Dust

NOTE: No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steel over all. The above listing is a summary of elements used in alloying Nucor Steel Products. Various grades of steel will contain different combinations of these elements and/or trace materials. Exact specifications may be found by calling the division and asking for a specifications sheet.

4. FIRST AID MEASURES

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

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

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

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

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

5. FIRE FIGHTING MEASURES

Flash Point (Method) - Not applicable

Flammable Limits (% volume in air) - Not applicable

Auto ignition Temperature - Not applicable

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

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

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

6. ACCIDENTAL RELEASE MEASURES

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

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

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

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

7. HANDLING AND STORAGE

Storage Temperatures - Stable under normal temperatures and pressures.

Precautions to be Taken in Handling and Storing - Store away from strong oxidizers. Dusts and/or powders, alone, or combined with process specific fluids, may form explosive mixtures with air. Applicable Federal, state and local laws and regulations may require testing dust generated from processing of steel

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products to determine if it represents a fire or explosion hazard and to determine appropriate protection methods. Avoid breathing dusts or fumes.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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

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

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

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

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

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

Boiling Point - Not applicable

Melting Point - Approximately 2800 °F

pH - Not applicable

Specific Gravity (at 15.6°C) - Not applicable

Density (at 15.6 °C) - Not applicable

Vapor Pressure - Not applicable

Vapor Density (air = 1) - Not applicable

% Volatile, by Volume - Not applicable

Solubility in Water - Insoluble.

Evaporation Rate (Butyl Acetate = 1) - Not applicable

Other Physical and Chemical Data - None

10. STABILITY AND REACTIVITY

Stability - Stable

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

Hazardous Polymerization - Will not occur.

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

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

11. TOXICOLOGICAL INFORMATION

The primary component of this product is iron. Long-term exposure to iron dusts or fumes can result in a condition called siderosis which is considered to be a benign pneumoconiosis. Symptoms may include chronic bronchitis, emphysema, and shortness of breath upon exertion. Penetration of iron particles in the skin or eye may cause an exogenous or ocular siderosis which may be characterized by a red-brown

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pigmentation of the affected area. Ingestion overexposures to iron may affect the gastrointestinal, nervous, and hematopoietic system and the liver. Iron and steel founding, but not iron or iron oxide, has been listed as carcinogenic (Group 1) by IARC.

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

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

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

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

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

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

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

This product may contain small amounts of lead. Lead can accumulate in the body. Consequently, exposure to fumes or dust may produce signs of polyneuritis, diminished vision and peripheral neuropathy, such as tingling and loss of feeling in fingers, arms and legs. Lead is a known reproductive and developmental toxin. It is also associated with central nervous system disorders, anemia, kidney dysfunction and neurobehavioral abnormalities. The brain is a major target organ for lead exposure. Elemental lead is listed as an IARC 2B carcinogen.

The product may contain small amounts of copper. Copper dust and fumes can irritate the eyes, nose and throat causing coughing, wheezing, nosebleeds, ulcers and metal fume fever. Other effects from repeated

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Inhalation of copper fumes include a metallic or sweet taste, and discoloration of skin, teeth or hair. Copper also may cause an allergic skin reaction. Overexposure to copper can affect the liver.

12. ECOLOGICAL INFORMATION

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

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

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

DOT Proper Shipping Name - Not regulated

DOT Hazard Classification - Not regulated

UN/NA Number - Not applicable

DOT Packing Group - Not applicable

Labeling Requirements - Not applicable

Placards - Not applicable

DOT Hazardous Substance - Not applicable

DOT Marine Pollutant - Not applicable

15. REGULATORY INFORMATION

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

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

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

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

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

Toxic Substances Control Act (TSCA)

Components of this product are listed on the TSCA Inventory.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

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

<u>Chemical Name</u>	<u>Reportable Quantity (in lb)</u>
Antimony	5000*
Arsenic	1*
Beryllium	10*
Cadmium	10*

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

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

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

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

SECTION 313 REPORTABLE INGREDIENTS:

<u>Chemical Name</u>	<u>CAS Number</u>	<u>Concentration (% by weight)</u>	<u>Reportable</u>
Aluminum	7429-90-5	<0.05	No – Less than 1%
Antimony	7440-36-0	<0.9	No – Less than 1%
Arsenic	7440-38-2	<0.09	No – Less than 0.1%
Beryllium	7440-43-9	<0.09	No – Less than 0.1%
Cadmium	7440-43-9	<0.09	No – Less than 0.1%
Chromium	7440-47-3	0.01-1.0	Yes – Greater than 0.1%
Cobalt	7440-48-4	<0.09	No – Less than 0.1%
Copper	7440-50-8	<0.9	No – Less than 1%
Lead	7439-92-1	<0.05	Yes
Manganese	7439-96-5	0.2-2	Yes – Greater than 1%
Nickel	7440-02-0	<1.0	Yes – Greater than 0.1%
Phosphorus	7723-14-0	<0.9	No – Less than 1%
Selenium	7782-49-2	<0.9	No – Less than 1%
Vanadium	7440-62-2	<0.9	No – Less than 1%
Zinc	7440-66-6	0-0.10	No – Less than 1%

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

16. OTHER INFORMATION

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

M A T E R I A L S A F E T Y D A T A S H E E T

MITCHELL-BRADFORD DIVISION
HUBBARD-HALL INC.
363 SOUTH LEONARD STREET
WATERBURY, CT 06708

PHONE NUMBER: 203-756-5521
EMERGENCY: 1-800-424-9300

DATE: January 1, 2004

PRODUCT CODE: KF0110000

TRADE NAME: LIQUID BLACK MAGIC ABM
CHEMICAL NAME: SODIUM HYDROXIDE
CHEMICAL FAMILY: INORGANIC ALKALI
PROPRIETARY FORMULATION

NFPA DESIGNATION 704

HAZARD-RATING:

- 4 - EXTREME
- 3 - HIGH
- 2 - MODERATE
- 1 - SLIGHT

FIRE: 0

HEALTH: 3 2 REACTIVITY

0 SPECIFIC

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

SODIUM HYDROXIDE (APPROX) 30-40 %, CAS 1310-73-2, TLV=2 MG/M3, REGULATED UNDER CWA/311, NIOSH CRITERIA DOCUMENTS, CERCLA, OSHA AIR CONTAMINANTS, ACGIH TLV CHEMICALS, DOT HAZARDOUS MATERIALS, CANADIAN IDL 1% CONC., MA SUBSTANCE LIST, NJ RIGHT-TO-KNOW HAZ SUBSTANCE LIST S, PA HAZARDOUS SUBSTANCE LIST E.

SODIUM NITRATE (LESS THAN) 10 %, CAS 7631-99-4, REGULATED UNDER DOT HAZARDOUS MATERIALS, CANADIAN IDL 1% CONC., MA SUBSTANCE LIST, NJ RIGHT-TO-KNOW HAZ SUBSTANCE LIST, PA HAZARDOUS SUBSTANCE LIST.

SODIUM NITRITE (LESS THAN) 10 %, CAS 7632-00-0, REGULATED UNDER CWA/311, CERCLA, NTP TESTING PROGRAM, DOT HAZARDOUS MATERIALS, CANADIAN IDL 1% CONC., MA SUBSTANCE LIST, NJ RIGHT-TO-KNOW HAZ SUBSTANCE LIST, PA HAZARDOUS SUBSTANCE LIST E.

* ETHYLENE THIOUREA (LESS THAN) 0.2%, CAS 96-45-7, TLV=545 MG/KG, REGULATED UNDER SDWA/PRIORITY LIST, NIOSH SPECIAL HAZARD REVIEWS, NIOSH CURRENT INTELLIGENCE BULLETINS, RCRA, RCRA SECOND THIRD WASTES, CERCLA, SARA TITLE III SECTION 313, NTP ANNUAL REPORT ON CARCINOGENS, IARC GROUP 1,2A,2B CARCINOGENS, EPA CARCINOGEN ASSESSMENT GROUP, NTP TESTING PROGRAM, DOT HAZARDOUS MATERIALS, CA PROP 65-CARCINOGENS, CANADIAN IDL 0.1% CONC., MA SUBSTANCE LISTS C E, NJ RIGHT-TO-KNOW HAZ SUBSTANCE LIST S, PA HAZARDOUS SUBSTANCE LISTS E S.

* THIS SUBSTANCE IS A CHEMICAL SUBJECT TO SARA TITLE III, SECTION 313 REPORTING REQUIREMENTS.

NO OTHER INGREDIENTS IN THIS MIXTURE ARE CONSIDERED TO BE HAZARDOUS ACCORDING TO ANY STATE OR FEDERAL REGULATIONS.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: NA
MELTING POINT: 280-285 F.
SPECIFIC GRAVITY: 1.5 @ 70 F.
VAPOR PRESSURE: NA
PERCENTAGE OF VOLATILITY BY VOLUME: NA
VAPOR DENSITY (AIR =1): NA
EVAPORATION RATE (BUTYL ACETATE = 1): NA
SOLUBILITY IN WATER: VERY SOLUBLE
APPEARANCE AND ODOR: SLIGHTLY TURBID VIOLET VISCOUS LIQUID
PH 10% BY WEIGHT AQUEOUS SOLUTION: 12+

SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT (F): NOT COMBUSTIBLE
AUTOIGNITION TEMPERATURE: NON FLAMMABLE
FLAMMABLE LIMITS IN AIR % BY VOLUME: UPPER: NA LOWER: NA
EXTINGUISHING MEDIA: THIS PRODUCT IS NOT COMBUSTIBLE. WATER SPRAY, FOAM, CARBON DIOXIDE, OR DRY CHEMICAL MAY BE USED IN AREAS WHERE THIS PRODUCT IS STORED.
SPECIAL FIRE FIGHTING MEDIA: WEAR FULL PROTECTIVE CLOTHING. AVOID DIRECT CONTACT OF THIS PRODUCT WITH WATER AS THIS CAN CAUSE VIOLENT EXOTHERMIC REACTION.
UNUSUAL FIRE AND EXPLOSION HAZARDS: SEE SECTION V - REACTIVITY

SECTION V - REACTIVITY DATA

INSTABILITY: UNDER NORMAL CONDITIONS OF USE, THIS MATERIAL IS STABLE.
INCOMPATIBILITY: AVOID CONTACT WITH WATER. THIS PRODUCT MAY BE ADDED SLOWLY TO WATER OR ACIDS WITH DILUTION AND CONSTANT STIRRING TO AVOID A VIOLENT EXOTHERMIC REACTION. WHEN HANDLING THIS PRODUCT, AVOID CONTACT WITH ALUMINUM, TIN, ZINC, AND ALLOYS CONTAINING THESE METALS. DO NOT MIX WITH STRONG ACIDS WITHOUT DILUTION AND AGITATION TO PREVENT VIOLENT OR EXPLOSIVE REACTION. AVOID CONTACT WITH LEATHER, WOOL, ACIDS, ORGANIC HALOGEN COMPOUNDS, AND ORGANIC NITRO COMPOUNDS.
DECOMPOSITION: AQUEOUS SOLUTIONS MAY LIBERATE HYDROGEN UPON REACTION WITH METALS LISTED ABOVE. CONTACT WITH ORGANIC HALOGEN COMPOUNDS WILL LIBERATE CHLORINE.
POLYMERIZATION: NOT KNOWN TO POLYMERIZE.
CONDITIONS TO AVOID: CONTACT WITH INCOMPATIBLE MATERIALS LISTED ABOVE.

SECTION VI - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE (TLV): UNKNOWN FOR MIXTURE-SEE SECTION 2
EFFECTS OF OVEREXPOSURE:
ACUTE: CORROSIVE TO ALL BODY TISSUES WHICH IT COMES IN CONTACT. THE EFFECT OF LOCAL DERMAL EXPOSURE MAY CONSIST OF MULTIPLE AREAS OF SUPERFICIAL DESTRUCTION OF THE SKIN OR OF PRIMARY IRRITANT DERMATITIS. SIMILARLY, INHALATION OF DUST, SPRAY, OR MIST MAY RESULT IN VARYING DEGREES OF IRRITATION OR DAMAGE TO THE RESPIRATORY TRACT TISSUES AND AN INCREASED SUSCEPTIBILITY TO RESPIRATORY ILLNESS.

CHRONIC: NO KNOWN CHRONIC EFFECTS.

HUMAN DERMAL EXPOSURE: REGARDLESS OF CONCENTRATION, THE SEVERITY OF DAMAGE AND EXTENT OF ITS IRREVERSIBILITY INCREASES WITH LENGTH OF CONTACT TIME. PROLONGED CONTACT WITH EVEN DILUTE SODIUM HYDROXIDE SOLUTION CAN CAUSE A HIGH DEGREE OF TISSUE DESTRUCTION. THE LATENT PERIOD, FOLLOWING SKIN CONTACT DURING WHICH NO SENSATION OF IRRITATION OCCURS, VARIES FROM SEVERAL HOURS FOR 0.4-4% SOLUTIONS TO 3 MINUTES WITH 25-50% SOLUTIONS.

EMERGENCY AND FIRST AID PROCEDURES:

EYES: OBJECT IS TO FLUSH MATERIAL OUT IMMEDIATELY THEN SEEK MEDICAL ATTENTION. IMMEDIATELY FLUSH EYES WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES, HOLDING LIDS APART TO ENSURE FLUSHING OF THE ENTIRE SURFACE. WASHING EYES WITHIN SEVERAL SECONDS IS ESSENTIAL TO ACHIEVE MAXIMUM EFFECTIVENESS. SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN: IMMEDIATELY WASH CONTAMINATED AREAS WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND FOOTWEAR AND WASH CLOTHING BEFORE REUSE. DISCARD FOOTWEAR WHICH CANNOT BE DECONTAMINATED. SEEK MEDICAL ATTENTION IMMEDIATELY.

INHALATION: REMOVE TO FRESH AIR; IF BREATHING IS DIFFICULT, HAVE TRAINED PERSON ADMINISTER OXYGEN. IF RESPIRATION STOPS, GIVE MOUTH-TO-MOUTH RESUSCITATION. GET MEDICAL ATTENTION.

INGESTION: NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. IF AVAILABLE, GIVE SEVERAL GLASSES OF MILK. IF VOMITING OCCURS SPONTANEOUSLY, KEEP AIRWAY CLEAR. SEEK MEDICAL ATTENTION IMMEDIATELY.

ROUTES OF EXPOSURE:

INHALATION: AIRBORNE CONCENTRATIONS OF DUST, MIST OR SPRAY OF THIS PRODUCT MAY CAUSE DAMAGE TO THE UPPER RESPIRATORY TRACT AND THE LUNG TISSUE WHICH COULD PRODUCE CHEMICAL PNEUMONIA DEPENDING UPON SEVERITY OF EXPOSURE.

SKIN: THIS PRODUCT IS DESTRUCTIVE TO TISSUES CONTACTED AND PRODUCES SEVERE BURNS. A LATENT PERIOD MAY EXIST BETWEEN EXPOSURE AND SENSE OF IRRITATION.

EYE CONTACT: THIS PRODUCT IS DESTRUCTIVE TO EYE TISSUES ON CONTACT. WILL CAUSE SEVERE BURNS THAT RESULT IN DAMAGE TO THE EYES AND EVEN BLINDNESS.

INGESTION: THIS PRODUCT, IF SWALLOWED, CAN CAUSE SEVERE BURNS AND COMPLETE TISSUE PERFORATION OF MUCOUS MEMBRANES OF THE MOUTH, THROAT, ESOPHAGUS, AND STOMACH.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

SPILL, LEAK OR RELEASE: IF TRAINED IN ACCORDANCE TO 29 CFR 1910.120, LEAKS SHOULD BE STOPPED. SPILLS SHOULD BE CONTAINED AND CLEANED UP IMMEDIATELY. LIQUID SPILLS SHOULD BE REMOVED BY USING A VACUUM TRUCK. SOLID SPILLS SHOULD BE SCOOPED UP AND PLACED IN APPROVED CONTAINERS FOR DISPOSAL. NEUTRALIZE REMAINING TRACES OF MATERIAL WITH AN DILUTE MINERAL ACID. THE SPILL AREA SHOULD THEN BE FLUSHED WITH WATER FOLLOWED BY LIBERAL COVERING OF SODIUM BICARBONATE. ALL CLEAN-UP MATERIAL SHOULD BE REMOVED AND PLACED IN APPROVED CONTAINERS, LABELED AND STORED IN A SAFE PLACE TO AWAIT PROPER TREATMENT OR DISPOSAL. SPILLS ON AREAS OTHER THAN PAVEMENT, E.G., DIRT OR SAND, MAY BE HANDLED BY REMOVING THE AFFECTED SOILS AND PLACING IN APPROVED CONTAINERS. PERSONS PERFORMING CLEAN-UP WORK SHOULD WEAR ADEQUATE PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING. SPILLS OR RELEASES SHOULD BE REPORTED, IF REQUIRED, TO THE APPROPRIATE LOCAL, STATE AND FEDERAL REGULATORY AGENCIES.

WASTE DISPOSAL: DISCHARGE TO A DISPOSAL SYSTEM. IN ORDER TO BE COMPLETELY INFORMED ON THE LATEST REGULATIONS FOR YOUR AREA, PLEASE CONTACT THE LOCAL AUTHORITIES.

HANDLING AND STORAGE: DO NOT GET INTO EYES, ON SKIN, OR CLOTHING. AVOID BREATHING DUST, MIST, OR SPRAY. DO NOT TAKE INTERNALLY. USE WITH ADEQUATE VENTILATION AND EMPLOY RESPIRATORY PROTECTION WHEN EXPOSURE TO DUST, MIST OR SPRAY IS POSSIBLE. WHEN HANDLING, WEAR CHEMICAL SPLASH GOGGLES, FACE SHIELD, RUBBER GLOVES AND PROTECTIVE CLOTHING. WASH THOROUGHLY AFTER HANDLING OR CONTACT - EXPOSURE CAN CAUSE BURNS WHICH ARE NOT IMMEDIATELY PAINFUL OR VISIBLE. KEEP CONTAINER CLOSED. PRODUCT CAN REACT VIOLENTLY WITH WATER, ACIDS, AND OTHER SUBSTANCES - READ SPECIAL MIXING AND HANDLING INSTRUCTIONS BELOW CAREFULLY BEFORE USING. PRODUCT IS CORROSIVE TO TIN, ALUMINUM, ZINC AND ALLOYS CONTAINING THESE METALS, AND WILL REACT VIOLENTLY WITH THESE METALS IN POWDER FORM.

SPECIAL MIXING AND HANDLING INSTRUCTIONS: PRODUCT CAN REACT VIOLENTLY WITH WATER. CONSIDERABLE HEAT IS GENERATED WHEN PRODUCT IS MIXED WITH WATER. THEREFORE, WHEN MAKING SOLUTIONS ALWAYS CAREFULLY FOLLOW THESE STEPS:

- ALWAYS WEAR ALL PROTECTIVE CLOTHING. NEVER ADD WATER TO PRODUCT. ALWAYS ADD PRODUCT - WITH CONSTANT STIRRING - SLOWLY TO SURFACE OF LUKEWARM (80-100 F.) WATER, TO ASSURE PRODUCT IS BEING COMPLETELY DISSOLVED AS IT IS ADDED.

- IF PRODUCT IS ADDED TOO RAPIDLY - OR WITHOUT STIRRING, AND BECOMES CONCENTRATED AT BOTTOM OF MIXING VESSEL, EXCESSIVE HEAT MAY BE GENERATED RESULTING IN DANGEROUS BOILING AND SPATTERING AND A POSSIBLE IMMEDIATE AND VIOLENT ERUPTION OF HIGHLY CAUSTIC SOLUTION.

PRODUCT CAN REACT EXPLOSIVELY WITH ACIDS, ALDEHYDES, AND MANY OTHER ORGANIC CHEMICALS - WHEN MIXING PRODUCT WITH SOLUTIONS CONTAINING SUCH CHEMICALS, FOLLOW ALL OF ABOVE MIXING INSTRUCTION, AND ADD PRODUCT VERY GRADUALLY, WHILE STIRRING CONSTANTLY.

ALWAYS EMPTY AND CLEAN CONTAINERS OF ALL RESIDUES BEFORE ADDING PRODUCT TO AVOID POSSIBLE EXPLOSIVE REACTION BETWEEN PRODUCT AND UNKNOWN RESIDUE.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: RESPIRATORY PROTECTION IS NOT REQUIRED UNDER NORMAL USE. USE NIOSH/MSHA APPROVED RESPIRATOR WHERE DUST, MIST, OR SPRAY MAY BE GENERATED.

VENTILATION: WORKING SOLUTION MECHANICAL 200CFM

SPECIAL: NA

OTHER: NA

PROTECTIVE GLOVES: CHEMICAL RESISTANT GLOVES SHOULD BE WORN AND MAY BE DECONTAMINATED BY WASHING WITH MILD SOAP AND WATER. NATURAL AND BUTYL RUBBER ARE SUGGESTED.

EYE PROTECTION: WEAR CHEMICAL SAFETY GLASSES PLUS FULL FACE SHIELD TO PROTECT AGAINST SPLASHING.

OTHER PROTECTIVE EQUIPMENT: IMPERVIOUS PROTECTIVE CLOTHING AND CHEMICALLY RESISTANT SAFETY SHOES SHOULD BE WORN TO MINIMIZE CONTACT. WASH CONTAMINATED CLOTHING WITH SOAP AND WATER AND DRY BEFORE REUSE. SHOWERS AND EYEWASH FACILITIES SHOULD BE IN CLOSE PROXIMITY.

SECTION IX - TRANSPORTATION REQUIREMENTS

PROPER SHIPPING NAME: CORROSIVE LIQUID, N.O.S. (SODIUM HYDROXIDE)
HAZARD CLASS: CORROSIVE MATERIAL
ID NUMBER: UN1760
DOT GUIDE NO: 60
OTHER: NA

SECTION X - SPECIAL PRECAUTIONS

WHEN REPLENISHING WORKING SOLUTIONS ADD MATERIAL VERY SLOWLY AND CAUTIOUSLY WITH CONTINUOUS STIRRING. NEVER ADD THIS MATERIAL TO SOLUTIONS OF TEMPERATURES OF 100 F. OR HIGHER. NEVER ADD THIS MATERIAL TO ANY SOLUTION OTHER THAN COOL WATER OR COOL SOLUTIONS OF THE MATERIAL.

WHEN ADDING WATER TO WORKING SOLUTIONS TO REPLENISH EVAPORATIVE LOSS ADD VERY SLOWLY AND CAUTIOUSLY AGAINST BACK WALL OF PROCESS TANK. UNDER NO CIRCUMSTANCES ADD WATER TO WORKING BATHS OF OPERATING TEMPERATURE UNLESS THE BATH IS BOILING MODERATELY OR IS MECHANICALLY AGITATED. ANY WATER ADDED TO WORKING SOLUTIONS SHOULD BE AT TEMPERATURES OF 90 F. OR LESS.

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