



SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: Mill Scale
CAS Number: Not applicable
Synonyms: Mill Scale
Use/Description: Mill Scale

<i>Nucor Mill Locations</i>			24 Hour Contact – CHEMTREC 1-800-424-9300
Nucor Steel Arkansas 7301 E. County Road 142 Blytheville, Arkansas 72315 Safety Officer: (870) 762-2100 (8:00 am – 5:00 pm)	Nucor Steel Berkeley 1455 Hagan Avenue Huger, South Carolina 29450 Safety Officer: (843) 336-6000 (8:00 am – 5:00 pm)	Nucor Steel South Carolina 300 Steel Mill Road Darlington, S.C. 29540 Safety Officer: (843) 393-5841 (8:00 am – 5:00 pm)	
Nucor Steel Indiana 4537 South Nucor Road Crawfordsville, IN 47933 Safety Officer: (765) 364-1323 (8:00 am – 5:00 pm)	Nucor Steel Nebraska 2911 East Nucor Road Norfolk, Nebraska 68701 Safety Officer: (402) 644-0200 (8:00 am – 5:00 pm)	Nucor Steel Auburn 25 Quarry Road Auburn, N.Y. 13021 Safety Officer: (315) 253-4561 (8:00 am – 5:00 pm)	
Nucor Steel Texas U.S. Highway 79 South Jewett, Texas 75846 Safety Officer: (903) 626-4461 (8:00 am – 5:00 pm)	Nucor Steel Utah West Cemetery Road Plymouth, Utah 84330 Safety Officer: (435) 458-2300 (8:00 am – 5:00 pm)	Nucor Yamato Steel Intersection Hwy 18 East Blytheville, Arkansas 72316 Safety Officer: (870) 762-5500 (8:00 am – 5:00 pm)	
Nucor Steel Decatur 4301 Iverson Blvd. Trinity, Alabama 35673 Safety Officer: (256) 301-3500 (8:00 am – 5:00 pm)	Nucor Steel Hertford County 1505 River Road Cofield, N.C. 27922 Safety Officer: (252) 356-3700 (8:00 am – 5:00 pm)	Nucor Steel Birmingham 2301 F.L. Shuttlesworth Drive Birmingham, Alabama 35234 Safety Officer: (205) 250-7400 (8:00 am – 5:00 pm)	
Nucor Steel Kankakee One Nucor Way Bourbonnais, IL 60914 Safety Officer: (815) 939-5541 (8:00 am – 5:00pm)	Nucor Steel Jackson 3630 Fourth Street Flowood, MS 39232 Safety Officer (601) 939-1623 (8:00 am – 5:00pm)	Nucor Steel Seattle 2424 SW Andover Seattle, WA 98106 Safety Officer: (206) 933-2343 (8:00 am – 5:00 pm)	
Nucor Steel Marion 912 Cheney Avenue Marion, Ohio 43302 Safety Officer: (740) 383-4011 (8:00 am – 5:00pm)	Nucor Steel Tuscaloosa 1700 Holt Road, NE Tuscaloosa, Alabama 35404 Safety Officer: (205) 556-1310 (8:00 am – 5:00pm)	Nucor Steel Memphis 3601 Paul R. Lowry Road Memphis, TN 38109 Safety Officer: (901) 786-5900 (8:00 am – 5:00pm)	
Nucor Steel Connecticut 35 Toelles Road Wallingford, CT 06492 Safety Officer: (203) 265-0615 (8:00 am – 5:00pm)	Nucor Steel Kingman 3000 West Old Highway 66 Kingman, AZ 86413 Safety Officer: (928) 718-7035 (8:00 am – 5:00pm)	Nucor Steel Gallatin 4831 U.S. Hwy 42 West Ghent, KY 41045 Safety Officer: (859) 567-3100 (8:00 am – 5:00pm)	
Nucor Steel Longview 5400 W. Loop 281, Bldg 52 Longview, TX 75603 Safety Officer: (903) 653-1647 (8:00 am – 5:00pm)	Nucor Steel Florida 22 Nucor Drive Avon Park, Florida 33825 Safety Officer: (836) 546-5800 (8:00 am – 5:00pm)	Nucor Steel Brandenburg 100 Ronnie Greenwell Commerce Rd. Brandenburg, KY 40108 Safety Officer (270) 422-8200 (8:00 am – 5:00 pm)	

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For general product information, contact facility as listed above. For emergencies, use the 24 Hour Contact.

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER! HARMFUL IF INHALED. AVOID EYE CONTACT - MAY CAUSE SEVERE IRRITATION. AVOID SKIN CONTACT – MAY CAUSE IRRITATION AND/OR ALLERGIC REACTION. MAY CONTAIN CARCINOGENS, MUTAGENS, AND REPRODUCTIVE/DEVELOPMENTAL TOXICANTS. HOT MATERIAL MAY CAUSE THERMAL BURNS.

OSHA Hazards: Acute Toxicant
Irritant
Target Organ Toxicity – Lungs
Carcinogen
Reproductive Toxicant
Mutagen
Skin/Respiratory Sensitizer

GHS Classification: Acute Toxicity (Category 3)
Skin Irritation (Category 2)
Eye Damage (Category 1)
Specific Target Organ Toxicity – Repeat Exposure (Category 1)
Carcinogenicity (Category 1B)
Reproductive Toxicity (Category 1A)
Respiratory Sensitization (Category 1)
Skin Sensitization (Category 1)

Pictogram(s):



Signal Word: Danger

Hazard Statement(s):

H302+H332: Harmful if swallowed or inhaled.
H315: Causes skin irritation.
H318: Causes serious eye damage.
H372: Causes damage to lung, central nervous system, and reproductive system through prolonged or repeat exposure.
H350: May cause cancer by inhalation.
H360: May damage fertility or the unborn child.
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317: May cause an allergic skin reaction.

Precautionary Statement(s):

P201: Obtain special instructions before use.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P260: Do not breathe dust/fume/gas/mist/vapors/spray.
P305+P351+P310: IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a poison center or doctor/physician.
P302+P352: IF ON SKIN: Wash with soap and water.
P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

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Potential Health Effects

Primary routes of exposure: Eye and skin contact; inhalation.

Eye Contact

May be severely irritating to the eyes due to the presence of unhydrated lime. Symptoms may include pain, tears, burns, sensitivity to light, swelling and possible corneal damage. Scratching of the cornea can also occur if eye is rubbed. Fumes from hot material may be irritating. Contact with the heated material may cause thermal burns.

Skin Contact

May be irritating to the skin due to the presence of unhydrated lime. Repeated or prolonged skin contact may result in drying, reddening, itching, and cracking. May contain components that are capable of causing an allergic reaction. Contact with heated material may cause thermal burns

Inhalation

Dusts may cause irritation of the nose, throat, and lungs. Excessive inhalation of metallic fumes or 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

Swallowing large amounts may cause irritation of the digestive tract, resulting in nausea, and diarrhea.

Chronic or Special Toxic Effects

Repeated exposure to fine dusts may inflame the nasal mucosa and cause changes to the lung. The presence of iron oxide may cause a red-brown pigmentation of the eye and/or skin may occur.

May contain components that can 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.

Target Organs

Overexposure to specific components of this product may cause adverse effects to the following organs or systems: eyes, skin, liver, kidney, central nervous system, cardiovascular system, hematopoietic (blood) system, and respiratory system. See Section 11, for additional, specific information on effects noted above.

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 may be aggravated. Long-term inhalation exposure to agents that cause pneumoconiosis (e.g. dust) may act synergistically with inhalation of oxide fumes or dusts of this product.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS No.	% Weight	Exposure Limits			
			ACGIH TLV (mg/m3)		OSHA PEL (mg/m3)	
Antimony (Sb)	7440-36-0	0 – 1	0.5	As Antimony	0.5	As Antimony
Arsenic (As) †	7440-38-2	0 – 1	0.01	As Arsenic (A1 Carc.)	0.01	As Arsenic
Beryllium (Be)	7440-41-7	0 – 1	0.002	As Beryllium (A1 Carc.)	0.002	As Beryllium
Cadmium (Cd) †	7440-43-9	0 – 1	0.01	As Beryllium (STEL)	0.005	As Beryllium (Ceiling)
			0.01	As Cadmium (A2 Carc.)	0.005	As Cadmium
			0.002	Respirable fraction	0.0025	As Cadmium (Action Level)
Chromium (Cr)	7440-47-3	0.01 – 1.6	0.5	Metal	1	Metal
Cobalt (Co)	7440-48-4	0 – 1	0.02	As Cobalt (A3 Carc.)	0.1	Metal/Dust/Fume
Copper (Cu)	7440-50-8	0 – 3.25	1	Dust	1	Dust
			0.2	Fume	0.1	Fume

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Lead (Pb) [†]	7439-92-1	0 – 0.9	0.05	Dust / Fume (A3 Carc.)	0.05	Dust / Fume
Manganese (Mn)	7439-96-5	0 – 2	0.2	Elemental Mn and Inorg.	5	Fume (Ceiling)
Nickel (Ni)	7440-02-0	0.01 – 1	1.5	Metal	1	Metal & Insol. Compounds
Phosphorus (P)	7723-14-0	0 – 1	0.1	Phosphorus	0.1	Phosphorus
Selenium (Se)	7782-49-2	0 – 1	0.2	Selenium	0.2	Selenium
Vanadium (V)	7440-62-2	0 – 1	0.05	Oxide Dust / Fume	0.5	Oxide Dust (Ceiling)
					0.1	Oxide Fume (Ceiling)

[†] These substances are specifically regulated under OSHA. See “Regulatory Information” section for Code of Federal Regulations citations.

NOTE: Steelmaking Mill Scale is composed predominantly of oxides of iron with trace amounts of other metals and inorganic salts the composition of which can change due to changes in feedstock and the method used for manufacturing steel.

4. FIRST AID MEASURES

Eye Contact

In case of overexposure to dusts or fumes, immediately flush eyes with plenty of water for at least 20 minutes occasionally lifting the eye lids. Get medical attention. Thermal burns should be treated as medical emergencies.

Skin Contact

Wash skin with large amounts of water. Get medical attention if irritation develops or persists. If thermal burn occurs, flush area with cold water and get immediate medical attention.

If widespread contamination occurs, remove contaminated clothing under safety shower and wash exposed areas with soap and large quantities of water. Obtain medical attention immediately.

Inhalation

If the exposed person has been overcome, notify response personnel and place established emergency rescue procedures into effect. Remove to fresh air. Get immediate medical attention if symptoms described in this Safety Data Sheet (SDS) develop. If not breathing, begin rescue breathing. If breathing is difficult, ensure that airway is clear and give oxygen.

Ingestion

Rinse mouth. DO NOT INDUCE VOMITING. Give plenty of water to drink. Obtain medical attention immediately. Never give anything by mouth to an unconscious person. Treat symptomatically and supportively. Get medical attention.

Other

Understand the facility’s emergency rescue procedures and know the locations of rescue equipment before the need arises.

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: Product is noncombustible. Use firefighting measures for surrounding materials. Do not use water on product if it has become molten due to high temperatures.

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Special Fire Fighting Procedures: Vapors and fumes containing iron, nickel, manganese, chromium, aluminum, cadmium, zinc, and lead (or their oxides) may be formed at temperatures above the melting point. Exposure to unknown concentrations of fumes and vapors require the wearing of a pressure-demand airline respirator or pressure-demand self-contained breathing apparatus (SCBA).

Unusual Fire or Explosion Hazards: None known.

6. ACCIDENTAL RELEASE MEASURES

Precautions if Material is Spilled or Released: Avoid inhalation, eye, or skin contact of dusts by using appropriate precautions outlined in this SDS (see section 8). Keep unauthorized personnel away. Eliminate all sources of ignition. Reduce airborne dust with light water spray. Avoid getting water into containers. Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions. Vacuum type equipment is effective control and cleanup equipment. Vacuum and ventilation equipment should have HEPA type filters where appropriate. Material should be swept or vacuumed and placed into appropriate disposable containers. Prevent entry into drains, waterways, sewers, basements or confined areas. Unpermitted releases in excess of 10 pounds must be reported to the National Response Center.

7. HANDLING AND STORAGE

Storage Temperatures: Stable under normal temperatures and pressures.

Precautions to be Taken in Handling and Storing: Keep dust dry. Do not store on the ground. Store away from strong oxidizers. Avoid breathing dusts or fumes. Do not heat above 1575 C°. Use confined space entry procedures when entering baghouses, vessels, tanks, or other confined areas that contain mill scale. Dust must be stored in approved containers located in approved areas.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection

Avoid eye contact. Wear safety glasses or goggles. Dust resistant safety goggles are recommended under circumstances where particles could enter the eye.

Skin

Appropriate protective gloves and protective clothing (such as Tyvek®) 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

Avoid inhaling dust or fumes. NIOSH/MSHA approved dust/fume/mist respirators should be used to avoid excessive exposure. See Section 3 for component material exposure limits. Approved respirators must be used as specified by an Industrial Hygienist or other qualified professional. Respirator users must be medically evaluated to determine if they are physically capable of wearing a respirator. Quantitative and/or qualitative fit testing and respirator training must be satisfactorily completed by all personnel prior to respirator use. Users of any style respirator must be clean shaven on those areas of the face where the respirator seal contacts the face. Exposure to unknown concentrations of vapors or mists requires the wearing of a pressure-demand airline respirator or pressure-demand self-contained breathing apparatus.

Ventilation

Good ventilation (typically 10 air changes per hour) should be used when handling, in order to maintain airborne concentrations below the appropriate exposure limits for the components (See Section 3). Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation may be needed in some circumstances. Ventilation equipment should be checked regularly to ensure it is functioning properly. HEPA type filters should be used where appropriate.

Exposure Guidelines

No permissible OSHA exposure limits (PEL) or ACGIH threshold limit values (TLV) exist for steel mill scale. See Section 3 for component materials. Various grades of steel will contain different combinations of these elements and/or trace materials.

Recommended decontamination facilities

Eye wash, washing facilities, safety shower when handling large amounts of mill scale.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Black to reddish brown powder, granular or aggregate; odorless

Boiling Point: Not known

Melting Point: Not known

pH: Not applicable

Specific Gravity (at 15.6°C): Not applicable

Density (at 15.6 °C): 2.2 typical

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

% Volatile, by Volume: Not applicable

Solubility in Water: Partially soluble.

Evaporation Rate (Butyl Acetate = 1): Not applicable

Other Physical and Chemical Data: None

10. STABILITY AND REACTIVITY

Stability: Stable. Not reactive and non explosive unless contains oil or contamination of foreign fines.

Conditions to Avoid: Steel mill scale 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): Avoid contact with strong acids.

Hazardous Decomposition Products: Fumes containing iron, nickel, manganese, chromium, aluminum, zinc, and lead (or their oxides) may be formed at temperatures above the melting point. Refer to ANSI Z49.1

11. TOXICOLOGICAL INFORMATION

Toxicity Test Data: No product specific information.

Irritation: No product specific information. May cause mechanical or chemical irritation.

Chronic Exposure: No product specific data found. Long term inhalation exposure to iron has resulted in mottling of the lungs, visible on x-rays, a condition referred to as siderosis. This is considered a benign pneumoconiosis and does not ordinarily cause significant physiological impairment. Long term eye exposures may stain the eyes and leave a "rust ring". Long term inhalation of Tin will also result in a benign pneumoconiosis.

Chronic cadmium exposure may result in lung and prostate cancer, kidney damage, pulmonary emphysema, bone disease, teeth discoloration and loss of smell. Exposure to cadmium may also cause reproductive, embryotoxic, fetotoxic, mutagenic and teratogenic effects.

Chronic exposure to nickel can cause a sore or a hole in the septum of the nose. Chronic exposure to lead may result in accumulation of lead in the body resulting in headache, muscle weakness and mental changes.

Chronic exposure to lead may result in plumbism which is characterized by a lead line in the gum, headache, muscle weakness and mental changes.

Chronic exposure to antimony may damage respiratory and cardiovascular systems.

Sensitization: Contains skin and/or respiratory sensitizers, Nickel, Beryllium and Cobalt.

Carcinogenicity: Contains Known Carcinogens: Cadmium, Beryllium, Cobalt, Nickel, Arsenic and Chromium.

Reproductive Toxicity: Contains substances known to cause reproductive effects (Cadmium, Nickel, Lead, Arsenic, and Copper).

12. ECOLOGICAL INFORMATION

Some of the components of this product may be environmentally toxic. Do not discharge into drains, sewers, lakes, streams, ponds, or other bodies of water. Control dust and fume formation.

13. DISPOSAL CONSIDERATIONS

Please note that the following information pertains only to the unused, uncontaminated material.

Not considered a hazardous waste under RCRA 40 CFR 261. 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

Toxic Substances Control Act (TSCA)

Components of this product are listed on the TSCA Inventory.

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

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

This material may contain chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 (listed below).

SECTION 313 REPORTABLE INGREDIENTS:

<u>Chemical Name</u>	<u>CAS Number</u>	<u>Concentration (% weight)</u>	<u>SARA 313 Chemical</u>	<u>CERCLA RQ (lbs)</u>
Antimony	7440-36-0	0 – 1	x	5000
Arsenic	7440-38-2	0 – 1	x	1
Beryllium	7440-41-7	0 – 1	x	10
Cadmium	7440-43-9	0 – 1	x	10
Chromium	7440-47-3	0.01 – 1.6	x	5000
Cobalt	7440-48-4	0 – 1	x	na
Copper	7440-50-8	0 – 3.25	x	5000
Lead	7439-92-1	0 – 0.9	x	10
Manganese	7439-96-5	0 – 2	x	na
Nickel	7440-02-0	0.01 – 1	x	100
Phosphorus	7723-14-0	0 – 1	x	1
Selenium	7782-49-2	0 – 1	x	100
Vanadium	7440-62-2	0 – 1	x- except when contained in an alloy	na

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OSHA: The following components of this product are specifically regulated under OSHA. Refer to the Code of Federal Regulations (CFR) citations [available on the internet or in many public libraries] cited below for specific information regarding Personal and Respiratory Protection Equipment, Exposure and Medical Monitoring and other essential information.

Arsenic 29 CFR 1910.1018
Cadmium 29 CFR 1910.1027
Lead 29 CFR 1910.1025

Additional chemical specific information may also be found on the OSHA web page on the internet:
<http://www.osha.gov>

California Proposition 65:

⚠ WARNING: This product can expose you to chemicals including antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, and vanadium which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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

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

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

16. OTHER INFORMATION

Disclaimer of Liability

Legally required information is given in accordance with applicable OSHA regulations. Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses, which infringe valid patents, or as extending any license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Use or retransmission of the information contained herein in any other format than the format as presented is strictly prohibited. Nucor neither represents nor warrants that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.