NUCOR®
SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: Electric Arc Furnace (EAF) Steelmaking Slag
CAS Number: 91722-10-0 (EAF Steelmaking Slag from carbon steel production)
Synonyms: Slag
Use/Description: Aggregate, road base

Nucor Mill Locations **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 Memphis
3601 Paul R. Lowry Road
Memphis, TN 38109
Safety Officer: (901) 786-5900
(8:00 am – 5:00pm)

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 Gallatin
4831 U.S. Hwy 42 West
Ghent, KY 41045
Safety Officer: (859) 567-3100
(8:00 am – 5:00pm)

Nucor Steel Sedalia
500 Rebar Rd
Sedalia, MO 65301
Safety Officer: (660) 951-1700
(8:00 am – 5:00pm)

Nucor Steel Brandenburg
100 Ronnie Greenwell Commerce Rd
Brandenburg, KY 40108
Safety Officer: (270) 422-8200
(8:00 am – 5:00pm)

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

2. HAZARDS IDENTIFICATION

Emergency Overview
Electric Arc Furnace Slag is composed mainly of oxides of iron, calcium, magnesium, and manganese, and varying amounts of other metallic oxides. Electric arc furnace (EAF) Slag has components that are hazardous under OSHA's Hazard Communication Standard (29 CFR 19120.1200).

OSHA Hazards
Target Organ Effect - Lungs, Central Nervous System, Skin Irritation, Eye Irritation

GHS Classification

	Health		Environmental	Physical
	Eye Irritation (Category 2B) Skin Irritation (Category 2) Specific Target Organ Toxicity – Single Exposure (Category 3) Specific Target Organ Toxicity – Repeated Exposure (Category 1)		Not Classified	Not Classified
Pictogram				
Signal Word	Danger	Warning		

Hazard Statements

H315	Dust/fume may cause skin irritation
H320	Causes eye irritation.
H303	May be harmful if swallowed.
H335	May cause respiratory irritation.
H351	Inhalation of dust/fume suspected of causing cancer.
H372	Inhalation of dust/fume causes damage to respiratory system and central nervous system through prolonged or repeated exposure.

Precautionary Statements

P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/fume.
P262	Wash thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves / protective clothing / eye protection / face protection.
P308 + P313	If exposed or concerned: Get medical advice/attention.

Emergency Overview
Granular solid or aggregate with no appreciable odor. Skin Irritant, Possibly Corrosive.

Potential Health Effects
Routes of exposure: Skin Contact, Eye, Inhalation.

IMMEDIATE EFFECTS

Skin (Contact and Absorption): May cause mechanical or chemical irritation, redness and pain. Contains calcium oxide that may cause irritation or damage to the skin.

Eyes: May cause mechanical or chemical irritation, tearing, redness and pain. Contains calcium oxide that may cause severe irritation or permanent damage to the tissues of the eye.

Inhalation: May cause irritation, coughing. Contains substances that may cause severe irritation one of which is calcium oxide a corrosive. Contains manganese and its salts: Manganese inhalation may cause flu-like illness (metal fume fever), characterized by chills, fever, aching muscles, dryness in the throat and mouth and headache, possible resulting in fatal pneumonia.

Ingestion: Not expected to be a normal route of exposure. Ingestion may cause symptoms similar to inhalation.

DELAYED / LONG TERM EFFECTS

Chronic Exposure: Contains manganese and its salts: Chronic manganese exposure may affect the Lung, Kidney, Brain / Central Nervous System and Blood /Blood forming organs with early symptoms like sluggishness, sleepiness and weakness in legs. Advanced cases have shown fixed facial expression, emotional disturbances, and spastic gait. Illness closely resembles Parkinson's Disease. Kidney effects, blood changes, lung damage and manganese psychosis may result from chronic exposure.

May contain crystalline silica. Chronic respiratory exposure to silica may cause lung disease. Symptoms may include shortness of breath, coughing and right heart enlargement or heart failure. Not all individuals with silicosis will exhibit symptoms. Silicosis is progressive and symptoms can appear at any time, even after exposure has ceased. Tobacco smoking may increase the risk of developing lung disorders, including emphysema and lung cancer.

Carcinogenic Effects: May contain crystalline silica that can cause a disease called silicosis. Crystalline silica is classified by the International Agency for Research on Cancer (IARC) as carcinogenic to humans (Group 1). The National Toxicology Program (NTP) has characterized respirable silica as "known to be a human carcinogen".

Reproductive Effects: No product specific data.

TARGET ORGAN EFFECTS: LUNG, KIDNEY, BRAIN / CENTRAL NERVOUS SYSTEM AND BLOOD /BLOOD FORMING ORGANS.

SIGNS AND SYMPTOMS OF OVEREXPOSURE: COUGHING, IRRITATION TO THE EYE OR SKIN.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS No.	% Weight	Exposure Limits			
			ACGIH TLV (mg/m3)		OSHA PEL (mg/m3)	
Aluminum Oxide	1344-28-1	0 – 15	1	Respirable fraction	15	Respirable fraction
Chromium	7440-47-3	<1.5%	0.5	Metal	1	Metal

Some of these substances are specifically regulated under OSHA. See "Regulatory Information" section for additional Code of Federal Regulations citations.

Steelmaking Slag is a complex mixture that can change due to changes in feedstocks and the method used for manufacturing steel. Exact specifications for specific products may be available upon request.

4. FIRST AID MEASURES

Eye Contact
In case of overexposure to dusts or fumes, immediately flush eyes with plenty of water for at least 1 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.
Inhalation
Remove to fresh air if symptoms of respiratory distress occur from dust inhalation. If irritation continues, seek medical attention.
Ingestion
If appreciable quantities are swallowed, seek 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.
Special Fire Fighting Procedures: Vapors and fumes containing iron, manganese, aluminum, cadmium (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: Product is a solid. Shovel up and reuse or dispose of properly. Pick up dusts with broom, dustpan or shovel. Avoid making dust. Avoid inhalation, eye, or skin contact of dusts by using appropriate precautions outlined in this Safety Data Sheet (SDS) (see section 8).

Waste Disposal: Dispose used or unused product in accordance with applicable Federal, State, and Local regulations.

7. HANDLING AND STORAGE

Storage Temperatures: Stable under normal temperatures and pressures.
Precautions to take while handling: After handling, wash hands with soap and water.

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. A respiratory protection program that meets OSHA's 29 CFR 1910.134 or ANSI Z88.2 requirements must be followed whenever workplace conditions warrant respirator use. Where unknown concentrations are encountered or during an emergency, use NIOSH approved supplied air respirator. 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 slag. 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 steel mill slag.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Grey opaque solid pieces of various sizes, granuar solid or aggregate; odorless
Boiling Point: Not known **Melting Point:** Not known **pH**: Not applicable for a solid. Water runoff may exhibit a high pH and precautions should be taken.
Specific Gravity (at 15.6ºC): Not applicable
Density (at 15.6 ºC): 3.2 – 3.6 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.
Conditions to Avoid: Avoid contact with strong acids.
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 Under fire conditions, product may release toxic metal oxide fumes and / or carbon monoxide or carbon dioxide.
Other: This product is a mixture that contains a large percentage of hygroscopic, calcium salts. Changes in the moisture content of this product may change the density resulting in expansion and contraction of the material.

11. TOXICOLOGICAL INFORMATION

Toxicity Test Data: No product specific information. Contains manganese and its salts which may affect the Lung, Kidney, Brain / Central Nervous System and Blood /Blood forming organs.

Irritation*:* No product specific information. May cause irritation, possible severe. Contains calcium oxide or other calcium salts that may be corrosive to skin or eye. Contains substances may cause irritation to the lung if inhaled.

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”.

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.

Sensitization: May contain skin and/or respiratory sensitizers.

Carcinogenicity: May contain crystalline silica. Crystalline silica is classified by the International Agency for Research on Cancer (IARC) as carcinogenic to humans (Group 1). The National Toxicology Program (NTP) has characterized respirable silica as "known to be a human carcinogen". Contains Known Carcinogens: Cadmium.

Reproductive Toxicity: Contains substances known to cause reproductive effects (Cadmium).

12. ECOLOGICAL INFORMATION

Tests indicate product not to be environmentally toxic for normal uses as an aggregate product. However, due to the high residual calcium salts, the pH of water solutions of this product may be elevated. Prevent materials from entering drains, sewers, or waterways.

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.

US EPA Hazardous Waste Number: Not Applicable.

Disposal Recommendations: Reuse and recycle whenever possible. Unusable material may be disposed of with normal waste.

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 hazardous.

California Proposition 65:

⚠ **WARNING:** This product can expose you to chemicals including aluminum oxide and chromium 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.

Regulatory Lists

Some components of this product may be specifically listed by individual states; other product-specific health and safety data in other sections of the SDS may also be applicable for state requirements. For details on your regulatory requirements, you should contact the appropriate agency in your state.

Toxic Substances Control Act (TSCA)
Components of this product are listed on the TSCA Inventory.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
Slag 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 "*").

Chemical Name	Reportable Quantity (in lb)
Aluminum Oxide	na
Chromium	5000*

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:

Chemical Name	CAS Number	Concentration (% by weight)	Reportable
Aluminum Oxide	1344-28-1	0-15	Yes – Less than 1%
Chromium	7440-47-3	<1.5%	Yes – Greater than 0.1%
Lead	7439-92-1	0-0.01%	Yes – No de minimis level

Concentrations based on analytical data and process knowledge of typical products distributed by the facility. Additional chemical specific information may also be found on the OSHA web page on the internet: ***http://www.osha.gov***

Massachusetts Substance List: Aluminum, Chromium, Manganese
Pennsylvania Hazardous Substance List: Aluminum, Chromium, Manganese
New Jersey Hazardous Substance List: Aluminum, Chromium, Manganese

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.