



SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name: In-Process Electric Arc Furnace (EAF) Steelmaking Slag (“IP Slag”)

CAS Number: NA

Synonyms: Slag, EAF slag, Fresh slag

Use/Description: Liquid, Aggregate. This Safety Data Sheet (SDS) is limited to processing of electric arc furnace steelmaking slag prior to distribution for consumer use.

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) 939-5596 (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 Brandenburg 100 Ronnie Greenwell Commerce Rd. Brendenburg, KY 40108 Safety Officer: (270) 422-8200 (8:00 am – 5:00 pm)		

In-Process Electric Arc Furnace (EAF) Steelmaking Slag

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

2. HAZARDS IDENTIFICATION

Emergency Overview

In-Process Electric Arc Furnace Steelmaking Slag (IP Slag) is generated at temperatures near 3,000°F therefore can be at a high temperature during processing. When near or handling liquid slag caution must be used to prevent thermal burns/injuries through radiant heat or direct contact. Additional caution is required when handling near water to prevent steam formation and instantaneous explosion caused by liquid slag direct contact with water.

Dust and Steam from IP Slag is a respiratory tract and eye irritant at high concentrations, as with any dust.

IP Slag Water may have a pH>11.5, which is considered to be a hazard for skin and eye irritation or serious damage if data do not exist to indicate otherwise.

GHS Classification

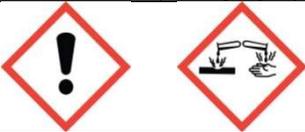
In-Process Electric Arc Furnace Steelmaking Slag (IP Slag), if liquid

	Health	Environmental	Physical
	Skin Irritation (Category 1)	Not Classified	Explosion (Category 1)
Pictogram			
Signal Word	Danger		Danger

Dust and Steam from IP Slag

	Health	Environmental	Physical
	Eye Irritation (Category 2B) Respiratory Irritation (Category 3)	Not Classified	Not Classified
Pictogram			
Signal Word	Warning		

IP Slag Process Water, if pH>11.5

	Health	Environmental	Physical
	Eye Irritation (Category 1) Skin Irritation (Category 1)	Not Classified	Not Classified
Pictogram			
Signal Word	Warning Danger		

Hazard Statements

In-Process Electric Arc Furnace Steelmaking Slag (IP Slag), if liquid

H314 Causes severe skin burns

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H204 Projection hazard

Dust and Steam from IP Slag

H320 Causes eye irritation

H335 May cause respiratory irritation

IP Slag Process Water, if pH>11.5

H318 Causes serious eye damage

H314 Causes severe skin burns

Precautionary Statements

In-Process Electric Arc Furnace Steelmaking Slag (IP Slag), if liquid

P223 Do not allow contact with water.

P280 In conditions where splashing of slag may occur: Wear protective gloves, protective clothing including boots, eye protection, and face protection.

P380 If contact with water is imminent evacuate area.

P310 If injury sustained immediately seek medical attention.

Dust and Steam from IP Slag

P261 Avoid breathing dust

P271 Use only outdoors or in a well-ventilated area

P340 + P313 + P312 If irritation or discomfort from dust occurs: Remove person to fresh air and keep comfortable for breathing. Seek medical attention if you feel unwell.

P262 Avoid contact with eyes

P305 + P351 + P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 If eye irritation persists, get medical advice/attention.

IP Slag Process Water, if pH>11.5

P280 In conditions where splashing of process water may occur: Wear protective gloves, eye protection, and face protection.

P264 Wash thoroughly after handling

P303 + P361 + P353 If on skin: Take off immediately all contaminated clothing. Rinse skin with water.

P304 + P340 Wash contaminated clothing before reuse.

P305 + P351 + P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 If eye irritation/pain persists: immediately seek medical attention.

IMMEDIATE EFFECTS

Skin Contact: IP Slag may be at a high temperature during processing and may cause severe thermal burns. Water that comes into contact with IP Slag may have a pH>11.5. If so, prolonged skin contact with this water may cause irritation, redness, pain, and/or burns. The amount of irritation or damage depends on the amount of material, properties of the material, conditions of exposure, and duration and extent of skin contact.

Eye Contact: Water that comes into contact with IP Slag may have a pH>11.5. If so, this water may cause eye irritation, tearing, burning, redness, pain, or serious damage. The amount of irritation or damage depends on the amount of material and duration of contact.

Inhalation: High concentrations of any dust may cause respiratory irritation, coughing, or difficulty breathing. The amount of irritation depends on the amount of material and extent of contact.

Ingestion: Not expected to be a normal route of exposure.

DELAYED/LONG-TERM EFFECTS

Respiratory Effects: May contain crystalline silica. Prolonged respiratory exposure to high levels of crystalline silica dust over many years may cause lung disease. Symptoms may include shortness of breath, coughing and heart enlargement

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or 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. 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.

Specific Target Organ Effects: No product specific data.

Signs and Symptoms of Overexposure: Coughing or irritation to the eye or skin.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	CAS No.	% Weight
Calcium oxide (CaO)	1305-78-8	0-40%
Ferrous oxide (FeO)	1345-25-1	0-40%
Magnesium oxide (MgO)	1309-48-4	0-20%
Silicon Dioxide (SiO ₂)	14808-60-7	0-25%
Aluminum oxide (Al ₂ O ₃)	1344-28-1	0-15%
Manganese oxide (MnO)	1344-43-0	0-10%
Chromium (III) oxide (Cr ₂ O ₃)	1308-38-9	<2.5%
Phosphorous pentoxide (P ₂ O ₅)	1314-56-3	<1%
Sulfur trioxide (SO ₃)	7446-11-9	<1%
Titanium dioxide (TiO ₂)	13463-67-7	<1.5%
Sodium oxide (Na ₂ O)	12401-86-4	<0.1%
Zinc oxide (ZnO)	1314-13-2	<0.1%

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

4. FIRST AID MEASURES

IP Slag may be at high temperature during most of processing and may cause severe thermal burns. High concentrations of dust may cause respiratory irritation, coughing, or difficulty breathing. Prolonged skin or eye contact with high pH substances may cause eye irritation, tearing, burning, redness, pain, or serious damage.

Eye contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical attention if symptoms persist.

Skin contact

If damage from contact with hot IP Slag occurs, seek appropriate medical attention.

If contact high pH process water occurs, wash affected area with soap and water. Seek medical attention if irritation or other symptoms continue.

Inhalation

Remove to fresh air if symptoms of respiratory irritation or distress occur from dust inhalation. If irritation or other symptoms continue, seek medical attention.

5. FIRE-FIGHTING MEASURES

Flash Point (Closed Cup): Not Applicable
Flammable Limits: Not Applicable
Auto-Ignition Temperature: No Information

Flammability Classification: Not Applicable

Specific Hazards of Combustion: Material will not support combustion. However, if the material is involved in a fire it may give off metal vapors or fumes and oxides of carbon.

Extinguishing Information: No unusual or unique fire properties. Use extinguishing media suitable for surroundings.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Wear protective equipment. Keep unprotected persons away.

Environmental Precautions: None

Methods and Material for Containment and Cleaning Up: Pick up mechanically or by hand tools and reuse or dispose of as a common non-hazardous material in accordance with applicable federal, state and local regulations. Pick up dusts with broom, dustpan or shovel. Avoid creating airborne dust; wetting materials prior to clean up may be necessary to suppress dust.

7. HANDLING AND STORAGE

Handling: Use personal protective equipment as described in Section 8. Respirable dust may be generated during processing, handling, and storage. Wetting materials is recommended to suppress dust. After handling, wash hands with soap and water.

Storage: No special storage requirements.

Waste Disposal: Dispose of used or unused product in accordance with applicable federal, state, and local regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits

Dust – Particulates not otherwise regulated	
Total particulates	
OSHA PEL	15 mg/m ³
ACGIH TLV	10 mg/m ³
Respirable particulates	
OSHA PEL	5 mg/m ³
ACGIH TLV	5 mg/m ³
Respirable crystalline silica	
OSHA PEL	0.05 mg/m ³
ACGIH TLV	0.025 mg/m ³

Eye and Face Protection

Wear ANSI approved safety glasses with side shields or goggles to prevent eye contact. Splash shields should be worn in conditions where splashing of process water may occur. Wearing contact lenses in dusty conditions is not recommended.

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Skin Protection

Under normal use, wear work gloves to prevent direct skin contact. Apply skin barrier products, if extended contact is anticipated. Wear water impervious gloves and boots for contact with process water and/or prolonged contact with wet IP Slag

Respiratory Protection

A respiratory protection program that meets OSHA's 29 CFR 1910.134 or ANSI/ASSE Z88.2 requirements must be followed whenever workplace conditions warrant respirator use. NIOSH/OSHA or EN approved respiratory protection should be used if airborne concentrations exceed exposure limits.

Engineering Controls

General room ventilation is adequate for processing that does not generate dusts or fumes. For processes that generate dusts or fumes, a local exhaust system or misting to reduce dust is recommended.

Personal Protective Equipment (PPE)

Immediately remove all soiled and contaminated clothing and wash before reuse. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.

Body protection

Wear hard hats, protective clothing, and hard toed shoes to protect from impact and abrasion.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Granular solid or aggregate. No appreciable odor.

Boiling Point: Not known

Melting Point: Not known

pH: Ranges from 9.5 to 12.5 in water

Specific Gravity: Not applicable

Density (at 15.6 °C): 3.2 – 3.6

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

%Volatile, by Volume:

Solubility in water: Insoluble

Evaporation Rate: Not applicable

Other Physical and Chemical Data

Flash point: Not applicable

Flammability: Not flammable

Upper/lower explosive limits: Not applicable

Relative density: Not determined

Partition coefficient (n-octanol/water): Not determined

Auto-ignition temperature: Not applicable

Decomposition temperature: Not determined

Viscosity: Not applicable

10. STABILITY AND REACTIVITY

Stability: Stable

Reactivity: Not reactive. Process water may have high pH; avoid contact with strong acids.

Conditions to Avoid: Process water may have high pH; avoid contact with strong acids.

Incompatibility: Avoid contact with strong acids.

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Hazardous decomposition products: Under fire conditions, product may release toxic metal oxide fumes and/or carbon monoxide or carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

No product specific data. Not expected to be acutely toxic

Skin Irritation/Sensitization

The product is not a skin irritant or corrosive (OECD 431/439). The product is not a skin sensitizer (OECD 404/406). Water that comes into contact with IP Slag may have pH>11.5 and, thus, may irritate skin or cause serious damage with prolonged contact.

Eye Irritation

No product specific information. Water that comes into contact with IP Slag may have pH>11.5 and, thus, may irritate skin or cause serious damage with prolonged contact.

Respiratory Irritation

No product specific Information. High concentrations of any dust may cause respiratory irritation, coughing, or difficulty breathing.

Reproductive Toxicity

No product specific data found.

Carcinogenicity

No product specific information. Product 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".

Radiation

This product is normally free of radiation.

12. ECOLOGICAL INFORMATION

Ecotoxicology Information: No product specific information.

Persistence and degradability: Product is a stable aggregate

Bioaccumulative potential: Not applicable

Other adverse effects: No further relevant information

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.

14. TRANSPORT INFORMATION

Not a regulated material.

Special considerations: Follow federal, state, and local regulations for containment of dust.

15. REGULATORY INFORMATION

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

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 and 40 CFR 372:

SECTION 313 REPORTABLE INGREDIENTS:

Chemical Name	CAS Number	Concentration (% by weight)
Aluminum Oxide	1344-43-0	<10%
Chromium Compounds	NA	<1.5%
Lead	7439-92-1	0-0.01%
Manganese Compounds	NA	<10%
Zinc Compounds	NA	<0.1%

16. OTHER INFORMATION

The information in this SDS is, to the best of our knowledge, accurate as of the date of issue. However, the information is provided without any representation of 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.

Abbreviations and Acronyms

ACGIH	American College of Governmental Industrial Hygienists
ANSI	American National Standards Institute
ASSE	American Society of Safety Engineers
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
IARC	International Agency for Research on Cancer
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OECD	Organisation for Economic Co-operation and Development
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
TLV	Threshold Limit Value