



# SAFETY DATA SHEET

Issue Date 11-Jun-2019

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Version 1

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

### Product identifier

**Product Name** Mill Scale

### Other means of identification

**Product Code** FRP104

**Synonyms** Quench Scale, Annealing Scale, Scale, Bosch Scale

### Recommended use of the chemical and restrictions on use

**Recommended Use** Reclamation.

**Uses advised against**

### Details of the supplier of the safety data sheet

#### **Manufacturer Address**

ATI, 1000 Six PPG Place, Pittsburgh, PA  
15222 USA

#### **Emergency telephone number**

**Emergency Telephone** Chemtrec: 1-800-424-9300

## 2. HAZARDS IDENTIFICATION

### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation	Category 2
Skin sensitization	Category 1
Carcinogenicity	Category 1A
Specific target organ toxicity (repeated exposure)	Category 2

### Label elements

#### Emergency Overview

#### **Danger**

#### **Hazard statements**

May cause an allergic skin reaction

May cause cancer

May cause damage to respiratory track through prolonged and repeated exposure if inhaled

Causes serious eye irritation



**Appearance** Flaky oxide

**Physical state** Solid

**Odor** Odorless

**Precautionary Statements - Prevention**

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

Use personal protective equipment as required

Wear protective gloves

Wash hands thoroughly after handling

Avoid breathing dust/fume

Wash contaminated clothing before reuse

If skin irritation or rash occurs: Get medical advice/attention

Contaminated clothing should not be allowed out of the workplace.

IF ON SKIN: Wash with plenty of soap and water

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

If eye irritation persists: Get medical advice/attention

**Precautionary Statements - Disposal**

Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**

Not applicable

**Other Information**

Zinc, copper, magnesium, or cadmium fumes may cause metal fume fever.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Synonyms**

Quench Scale, Annealing Scale, Scale, Bosch Scale.

Chemical Name	CAS No.	Weight-%
Diiron trioxide	1309-37-1	15 - 90
Iron	7439-89-6	5 - 25
Nickel monoxide	1313-99-1	0 - 3
Aluminum Oxide	1344-28-1	0 - 3
Nickel	7440-02-0	0 - 2.5
Calcium dihydroxide	1305-62-0	0 - 2.5
Copper	7440-50-8	0 - 2
Manganese	7439-96-5	0 - 2
Aluminum	7429-90-5	0 - 2

### 4. FIRST AID MEASURES

**First aid measures****Eye contact**

Flush with water for 15 minutes. See a physician.

**Skin Contact**

In the case of skin allergic reactions see a physician. Wash off immediately with soap and plenty of water.

**Inhalation**

If excessive amounts of smoke, fume, or particulate are inhaled during processing, remove to fresh air and consult a qualified health professional.

**Ingestion**

IF SWALLOWED. Call a POISON CENTER or doctor/physician if you feel unwell.

**Most important symptoms and effects, both acute and delayed****Symptoms**

May cause allergic skin reaction.

**Indication of any immediate medical attention and special treatment needed****Note to physicians**

Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

### Suitable extinguishing media

Product not flammable in the form as distributed, flammable as finely divided particles or pieces resulting from processing of this product. Isolate large fires and allow to burn out. Smother small fires with salt (NaCl) or class D dry powder fire extinguisher.

**Unsuitable extinguishing media** Do not spray water on burning metal as an explosion may occur. This explosive characteristic is caused by the hydrogen and steam generated by the reaction of water with the burning material.

### Specific hazards arising from the chemical

Intense heat. WARNING: Fine particles of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimize combustible dust hazard.

**Hazardous combustion products** Zinc, copper, magnesium, or cadmium fumes may cause metal fume fever.

### Explosion data

**Sensitivity to Mechanical Impact** None.

**Sensitivity to Static Discharge** None.

### Protective equipment and precautions for firefighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

**Personal precautions** Use personal protective equipment as required.

**For emergency responders** Use personal protective equipment as required.

### Environmental precautions

**Environmental precautions** Collect spillage to prevent release to the environment.

### Methods and material for containment and cleaning up

**Methods for containment** Prevent further leakage or spillage if safe to do so.

**Methods for cleaning up** Sweep or shovel material into dry containers. Avoid creating uncontrolled dust.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

**Advice on safe handling** WARNING: Fine particles of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimize combustible dust hazard.

### Conditions for safe storage, including any incompatibilities

**Storage Conditions** Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity).

**Incompatible materials** Dissolves in hydrofluoric acid.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control parameters

Chemical Name	ACGIH TLV	OSHA PEL
Diiron trioxide	-	-

1309-37-1		
Iron 7439-89-6	-	-
Nickel monoxide 1313-99-1	TWA: 0.2 mg/m <sup>3</sup> Ni inhalable fraction	TWA: 1 mg/m <sup>3</sup> Ni
Aluminum Oxide 1344-28-1	TWA: 1 mg/m <sup>3</sup> respirable fraction	TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction
Nickel 7440-02-0	TWA: 1.5 mg/m <sup>3</sup> inhalable fraction	TWA: 1 mg/m <sup>3</sup>
Calcium dihydroxide 1305-62-0	-	-
Manganese 7439-96-5	TWA: 0.02 mg/m <sup>3</sup> respirable fraction TWA: 0.1 mg/m <sup>3</sup> inhalable fraction TWA: 0.02 mg/m <sup>3</sup> Mn TWA: 0.1 mg/m <sup>3</sup> Mn	(vacated) STEL: 3 mg/m <sup>3</sup> fume (vacated) Ceiling: 5 mg/m <sup>3</sup> Ceiling: 5 mg/m <sup>3</sup> fume Ceiling: 5 mg/m <sup>3</sup> Mn
Copper 7440-50-8	TWA: 0.2 mg/m <sup>3</sup> fume TWA: 1 mg/m <sup>3</sup> Cu dust and mist	TWA: 0.1 mg/m <sup>3</sup> fume TWA: 1 mg/m <sup>3</sup> dust and mist
Aluminum 7429-90-5	TWA: 1 mg/m <sup>3</sup> respirable fraction	TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction

**Appropriate engineering controls**

**Engineering Controls** Avoid generation of uncontrolled particles.

**Individual protection measures, such as personal protective equipment**

<b>Eye/face protection</b>	When airborne particles may be present, appropriate eye protection is recommended. For example, tight-fitting goggles, foam-lined safety glasses or other protective equipment that shield the eyes from particles.
<b>Skin and body protection</b>	Wear protective gloves. Fire/flame resistant/retardant clothing may be appropriate during hot work with the product.
<b>Respiratory protection</b>	When particulates/fumes/gases are generated and if exposure limits are exceeded or irritation is experienced, proper approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

**General Hygiene Considerations** Handle in accordance with good industrial hygiene and safety practice.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

<b>Physical state</b>	Solid	<b>Odor</b>	Odorless
<b>Appearance</b>	Flaky oxide	<b>Odor threshold</b>	Not applicable
<b>Color</b>	gray		
<b>Property</b>	<b>Values</b>	<b>Remarks • Method</b>	
<b>pH</b>	-		
<b>Melting point / freezing point</b>	- °C / - °F		
<b>Boiling point / boiling range</b>	-		
<b>Flash point</b>	-		
<b>Evaporation rate</b>	-	Not applicable	
<b>Flammability (solid, gas)</b>	-	Product not flammable in the form as distributed, may be flammable as finely divided particles or pieces resulting from processing of this product	
<b>Flammability Limit in Air</b>			
<b>Upper flammability limit:</b>	-		
<b>Lower flammability limit:</b>	-		
<b>Vapor pressure</b>	-	Not applicable	
<b>Vapor density</b>	-	Not applicable	
<b>Specific Gravity</b>	-		

<b>Water solubility</b>	Insoluble	
<b>Solubility in other solvents</b>	-	
<b>Partition coefficient</b>	-	Not applicable
<b>Autoignition temperature</b>	-	Not applicable
<b>Decomposition temperature</b>	-	Not applicable
<b>Kinematic viscosity</b>	-	Not applicable
<b>Dynamic viscosity</b>	-	Not applicable
<b>Explosive properties</b>	Not applicable	
<b>Oxidizing properties</b>	Not applicable	

**Other Information**

<b>Softening point</b>	-
<b>Molecular weight</b>	-
<b>VOC Content (%)</b>	Not applicable
<b>Density</b>	-
<b>Bulk density</b>	-

## 10. STABILITY AND REACTIVITY

**Reactivity**

Not applicable

**Chemical stability**

Stable under normal conditions.

**Possibility of Hazardous Reactions**

None under normal processing.

**Hazardous polymerization**

Hazardous polymerization does not occur.

**Conditions to avoid**

Dust formation and dust accumulation.

**Incompatible materials**

Dissolves in hydrofluoric acid.

**Hazardous Decomposition Products**

Not applicable.

## 11. TOXICOLOGICAL INFORMATION

**Information on likely routes of exposure****Product Information****Inhalation**

May cause cancer by inhalation. Causes damage to the respiratory tract through prolonged or repeated exposure if inhaled.

**Eye contact**

Causes serious eye irritation.

**Skin Contact**

May cause sensitization by skin contact.

**Ingestion**

Product not classified.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Diiron trioxide 1309-37-1	> 5000 mg/kg bw	-	> 5 mg/L
Iron 7439-89-6	98,600 mg/kg bw	-	> 0.25 mg/L
Nickel monoxide 1313-99-1	> 11,000 mg/kg bw	-	> 5.08 mg/L

Aluminum Oxide 1344-28-1	15,900 mg/kg bw	-	7.6 mg/L
Nickel 7440-02-0	> 9000 mg/kg bw	-	> 10.2 mg/L
Calcium dihydroxide 1305-62-0	> 2000 mg/kg bw	> 2,500 mg/kg bw	> 6.04 mg/L
Manganese 7439-96-5	>2000 mg/kg bw	-	>5.14 mg/L
Copper 7440-50-8	481 mg/kg bw	>2000 mg/kg bw	>5.11 mg/L
Aluminum 7429-90-5	15,900 mg/kg bw	-	> 1 mg/L

### Information on toxicological effects

**Symptoms** May cause sensitization by skin contact.

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Acute toxicity** Product not classified.  
**Skin corrosion/irritation** Product not classified.  
**Serious eye damage/eye irritation** Causes serious eye irritation.  
**Sensitization** May cause sensitization by skin contact.  
**Germ cell mutagenicity** Product not classified.  
**Carcinogenicity** May cause cancer by inhalation.

Chemical Name	ACGIH	IARC	NTP	OSHA
Nickel monoxide 1313-99-1	A1	Group 1	Known	X
Nickel 7440-02-0		Group 1 Group 2B	Known Reasonably Anticipated	X

**Reproductive toxicity** Product not classified.  
**STOT - single exposure** Product not classified.  
**STOT - repeated exposure** Causes disorder and damage to the: Respiratory System.  
**Aspiration hazard** Product not classified.

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

This product as shipped is not classified for aquatic toxicity.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Diiron trioxide 1309-37-1	-	The 96 h LC50 of Diiron trioxide to Danio rerio was greater than or equal to 50,000 mg/L.	The 3 h EC50 of Diiron trioxide for activated sludge was greater than 10,000 mg/L.	The 48 h EC50 of Diiron trioxide to Daphnia magna was greater than or equal to 100 mg/L.
Iron 7439-89-6	-	The 96 h LC50 of 50% iron oxide black in water to Danio rerio was greater than 10,000 mg/L.	The 3 h EC50 of iron oxide for activated sludge was greater than 10,000 mg/L.	The 48 h EC50 of iron oxide to Daphnia magna was greater than 100 mg/L.
Nickel monoxide 1313-99-1	The 72 h EC50 of Nickel to Pseudokirchneriella subcapitata ranged from 81.5 to 148 µg/L.	The 96 h LC50 of Nickel dichloride to Oncorhynchus mykiss was 15.3 mg/L.	The 30 min EC50 of Nickel for activated sludge was 33 mg/L.	The 48h LC50 of Nickel range from 74.4 µg Ni/L to 276 µg Ni/L for Ceriodaphnia dubia.
Aluminum Oxide 1344-28-1	The 96-h EC50 values for reduction of biomass of Pseudokirchneriella subcapitata in AAP-Medium at pH 6, 7, and 8 were estimated as 20.1, 5.4, and 150.6 µg/L, respectively, for dissolved Al.	The 96 h LC50 of Aluminum chloride to Oncorhynchus mykiss ranged from 7.4 mg of Al/L at pH 6.5 to 14.6 mg of Al/L at pH 7.5. The 96-hr LC50 for Pimephales promelas exposed to Aluminum chloride ranged	-	The 48-hr EC50 for Ceriodaphnia dubia exposed to Aluminium chloride ranged from 1.9 to 2.6 mg/L with pH ranging from 7.42 to 8.13.

		from 1.16 to 44.8 mg/L with water hardness increasing from 25 to 200 mg/L.		
Nickel 7440-02-0	NOEC/EC10 values range from 12.3 µg/l for <i>Scenedesmus accuminatus</i> to 425 µg/l for <i>Pseudokirchneriella subcapitata</i> .	The 96h LC50s values range from 0.4 mg Ni/L for <i>Pimephales promelas</i> to 320 mg Ni/L for <i>Brachydanio rerio</i> .	The 30 min EC50 of nickel for activated sludge was 33 mg Ni/L.	The 48h LC50s values range from 0.013 mg Ni/L for <i>Ceriodaphnia dubia</i> to 4970 mg Ni/L for <i>Daphnia magna</i> .
Calcium dihydroxide 1305-62-0	The 72 h EC50 of Calcium Dihydroxide to <i>Pseudokirchneriella subcapitata</i> was 184.57 mg/L.	The 96 h LC50 of Calcium Dihydroxide to <i>Oncorhynchus mykiss</i> was 50.6 mg/L.	The 3 h EC50 of Calcium Dihydroxide for activated sludge was 300.4 mg/L.	The 48-hr EC50 of Calcium Dihydroxide for <i>Daphnia magna</i> was 49.1 mg/L.
Manganese 7439-96-5	The 72 h EC50 of manganese to <i>Desmodesmus subspicatus</i> was 2.8 mg of Mn/L.	The 96 h LC50 of manganese to <i>Oncorhynchus mykiss</i> was greater than 3.6 mg of Mn/L.	The 3 h EC50 of manganese for activated sludge was greater than 1000 mg/L.	The 48 h EC50 of manganese to <i>Daphnia magna</i> was greater than 1.6 mg/L.
Copper 7440-50-8	The 72 h EC50 values of copper chloride to <i>Pseudokirchneriella subcapitata</i> ranged between 30 µg/L (pH 7.02, hardness 250 mg/L CaCO <sub>3</sub> , DOC 1.95 mg/L) and 824 µg/L (pH 6.22, hardness 100 mg/L CaCO <sub>3</sub> , DOC 15.8 mg/L).	The 96-hr LC50 for <i>Pimephales promelas</i> exposed to Copper sulfate ranged from 256.2 to 38.4 µg/L with water hardness increasing from 45 to 255.7 mg/L.	The 24 h NOEC of copper chloride for activated sludge ranged from 0.32 to 0.64 mg of Cu/L.	The 48 h LC50 values for <i>Daphnia magna</i> exposed to copper in natural water ranged between 33.8 µg/L (pH 6.1, hardness 12.4 mg/L CaCO <sub>3</sub> , DOC 2.34 mg/L) and 792 µg/L (pH 7.35, hardness 139.7 mg/L CaCO <sub>3</sub> , DOC 22.8 mg/L).
Aluminum 7429-90-5	The 96-h EC50 values for reduction of biomass of <i>Pseudokirchneriella subcapitata</i> in AAP-Medium at pH 6, 7, and 8 were estimated as 20.1, 5.4, and 150.6 µg/L, respectively, for dissolved Al.	The 96 h LC50 of aluminum to <i>Oncorhynchus mykiss</i> was 7.4 mg of Al/L at pH 6.5 and 14.6 mg of Al/L at pH 7.5	-	The 48-hr LC50 for <i>Ceriodaphnia dubia</i> exposed to Aluminium chloride increased from 0.72 to greater than 99.6 mg/L with water hardness increasing from 25 to 200 mg/L.

**Other adverse effects****13. DISPOSAL CONSIDERATIONS****Waste treatment methods**

<b>Disposal of wastes</b>	Disposal should be in accordance with applicable regional, national and local laws and regulations.
<b>Contaminated packaging</b>	Disposal should be in accordance with applicable regional, national and local laws and regulations.

This product contains one or more substances that are listed with the State of California as a hazardous waste.

**14. TRANSPORT INFORMATION****DOT**

	Regulated per 49 CFR, if quantity with particles smaller than 100 micrometers (0.004 inches) in an individual package equals or exceeds the reportable quantity (RQ) of 5000 pounds of chromium, 5000 pounds of copper, or 100 pounds of nickel
<b>Proper shipping name</b>	UN/ID No. 3077 Environmentally hazardous substance, solid, n.o.s. (nickel alloy powder), RQ
<b>Hazard Class</b>	9
<b>Packing Group</b>	III
<b>Special Provisions</b>	8, 146, 335, A112, B54, B120, IB8, IP3, N20, N91, T1, TP33
<b>Emergency Response Guide</b>	Guide No. 171, Except for FIRE follow Guide No. 170

Number

**15. REGULATORY INFORMATION****International Inventories**

<b>TSCA</b>	Complies
<b>DSL/NDSL</b>	Complies
<b>EINECS/ELINCS</b>	Complies
<b>ENCS</b>	Complies
<b>IECSC</b>	Complies
<b>KECL</b>	Complies
<b>PICCS</b>	Complies
<b>AICS</b>	Complies

**Legend:**

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory  
**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List  
**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances  
**ENCS** - Japan Existing and New Chemical Substances  
**IECSC** - China Inventory of Existing Chemical Substances  
**KECL** - Korean Existing and Evaluated Chemical Substances  
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances  
**AICS** - Australian Inventory of Chemical Substances

**US Federal Regulations****SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No.	Weight-%	SARA 313 - Threshold Values %
Nickel monoxide - 1313-99-1	1313-99-1	0 - 3	0.1
Aluminum Oxide - 1344-28-1	1344-28-1	0 - 3	1.0
Nickel - 7440-02-0	7440-02-0	0 - 2.5	0.1
Manganese - 7439-96-5	7439-96-5	0 - 2	1.0
Copper - 7440-50-8	7440-50-8	0 - 2	1.0

**SARA 311/312 Hazard Categories**

<b>Acute health hazard</b>	Yes
<b>Chronic Health Hazard</b>	Yes
<b>Fire hazard</b>	No
<b>Sudden release of pressure hazard</b>	No
<b>Reactive Hazard</b>	No

**CWA (Clean Water Act)**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Nickel monoxide 1313-99-1		X		
Nickel 7440-02-0		X	X	
Copper 7440-50-8		X	X	

**CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs
Nickel 7440-02-0	100 lb



Copper 7440-50-8	5000 lb
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**US State Regulations****California Proposition 65**

This product contains the Proposition 65 chemicals listed below. Proposition 65 warning label available at ATImetals.com.

Chemical Name	California Proposition 65
Nickel monoxide - 1313-99-1	Carcinogen
Nickel - 7440-02-0	Carcinogen

**U.S. State Right-to-Know Regulations**

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Nickel monoxide 1313-99-1	X	X	X
Aluminum Oxide 1344-28-1	X	X	X
Nickel 7440-02-0	X	X	X
Manganese 7439-96-5	X	X	X
Copper 7440-50-8	X	X	X
Aluminum 7429-90-5	X	X	X

**U.S. EPA Label Information**

**EPA Pesticide Registration Number** Not applicable

**16. OTHER INFORMATION**

<b>NFPA</b>	Health hazards 1	Flammability 0	Instability 0	Physical and Chemical Properties -
<b>HMIS</b>	Health hazards 2*	Flammability 0	Physical hazards 0	Personal protection X
<i>Chronic Hazard Star Legend</i>	* = Chronic Health Hazard			

**Issue Date** 11-Jun-2019

**Revision Date** 11-Jun-2019

**Revision Note**

Updated to comply with GHS

**Note:**

The information provided in this safety data sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet**

**Additional information available from:** Safety data sheets and labels available at ATImetals.com