

## 安全データシート (Safety Data Sheet)

<材料製造会社 : POSCO Co., Ltd.>

### 1. 製品及び会社情報

- ・製品の名称 : Cold Rolled Coil (CR)
- ・会社名 : 株式会社スチールセンター
  - ・住所 : 東京都千代田区内神田 3-6-2  
アーバンネット神田ビル 6 階
- ・担当部門 : 品質保証部
- ・連絡先 : 品質保証部 武田
  - 電話 048-507-3693
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以降の項目については、次ページ以下をご参照願います



#### ご注意願いたい事項

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POSCO Code Number: F022

## Material Safety Data Sheet (MSDS)

[This material is prepared according to Article 41 of the Occupation Safety and Health Act]

### 1. Chemical Product & Company Information

A. Product Name: **Cold Rolled Coil (CR)**

B. Recommended Product Use and Limitations of Use

Recommended Product Use      N/A

Limitations of Use                N/A

C. Producer/Importer/Distributor Information

Company Name            POSCO

Address                    6261 Donghaean-ro (Dongchon-dong) Nam-gu Pohang-si Gyeongsangbuk-do  
396 Geumho-ro (Guemho-dong) Gwangyang-si Jeollanam-do (061-790-0114)

Emergency Contact Info.   Pohang Steel Plant Health Promotion Team Jo Gi-hyeon (054-220-7044)  
Gwangyang Steel Plant Health Promotion Team Seo Mun-hee (061-790-2635)

### 2. Risk & Danger

A. Risk & Danger Category      Acute Toxicity (oral): Class 4  
Skin Corrosivity/Skin Irritation: Class 2  
Reproduction Toxicity: Class 1B

B. Warning Signs with Preventive Measures  
Pictorial Symbols



Signal

Danger

Risk Statement      H302 Harmful when consumed  
H315 Causes skin irritation  
H360 Can damage fetus or reproductive ability

Preventive  
Measure Statement

Statement      P201 Refer to instruction manual before use.  
P202 Do not use the product before fully understanding every preventive measures.  
P264 Make sure to thoroughly wash your hands after use.  
P270 Do not eat, drink or inhale while using the product.  
P280 Wear protective equipment such as gloves, goggles and masks.  
P281 Wear appropriate protective equipment.

Measures      P301+P312 If you feel uncomfortable after consuming, visit a medical institute (doctor) for help.  
P302+P352 If your skin comes in contact with the substance, wash the area thoroughly with soap and large quantities of water.  
P308+P313 If there is risk of coming in contact with the substance, receive medical suggestions or consultation



P321 Receive treatment.  
 P330 Wash your mouth.  
 P332+P313 Receive medical consultation if skin irritation occurs.  
 P362 Remove contaminated clothes and wash it before using it again.

Storage P405 Seal the product for storage.

Disposal P501 Dispose the content of the product (according to related regulations).

C. Miscellaneous Risks not included in the Risk & Danger Standards (NFPA)

Manganese

Health 1  
 Fire 3  
 Response 1

Iron

Health 1  
 Fire 3  
 Response 0

3. Name of Components & Contents

Name	Synonym (Trivial Name)	CAS No.	Content (%)
Iron	Ferrium	7439-89-6	Balance
Manganese	Colloidal Manganese	7439-96-5	5.0% max

- Small content may be included (Silicon 0.4%, Aluminum 0.07%, Chrome 0.03% etc.)
- This product is a solidified complete product MSDS complete solidified product that does not expose any chemicals included, so it is not a subject of MSDS composition, but the content may be exposed in melted form

4. Emergency Measurements

- A. When eye comes in contact with content  
 Receive emergency medical treatment  
 Wash the eye with flowing water for more than 20 minutes.
- B. When skin comes in contact with content  
 When skin irritations occur, receive medical consultation.  
 Remove contaminated clothes and wash it before using again.  
 If the substance is hot, wash the area of contact with large quantity of cold water to cool it down.  
 Receive emergency medical treatment.  
 Remove contaminated clothes and shoes, then isolate the contaminated area.  
 When coming in contact with the content wash the eye and skin with flowing water for 20 minutes.  
 When small area is contaminated, take measures to prevent spreading.
- C. When inhaled  
 If there is risk of exposure, receive medical consultation.  
 Move to a location with fresh air  
 Keep the body warm and stable.
- D. When consumed  
 If there is risk of exposure, receive medical consultation.  
 Wash your mouth.  
 If you consumed or inhaled the substance, do not perform mouth-to-mouth but use proper respiratory equipment.
- E. Miscellaneous Medical Cautions  
 When exposed, contact medical help and implement special measurements such as investigation

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Have medical personnel to identify the substance and take protective measures.

## 5. Measures for Explosion or Fire

### A. Appropriate (Inappropriate) Fire Extinguisher

When extinguishing fire related to this material, use alcohol resistant foam, carbon dioxide or water spraying

When smothering, use dried sand or gravel

### B. Risk occurring from chemical substances

Stimulating and harmful gas may occur due to pyrolysis or combustion

Container may explode when heated

Portion may burn but it does not burn easily

Nonflammable, the substance itself does not burn but can produce corrosive, toxic fume as the substance decomposes during combustion

### C. Protective equipment to wear and preventive measures during fire extinguishing

#### Manganese

Rescuer must wear appropriate protective equipment.

Extinguish the fire away from the area while maintaining safe distance

Take caution as some are supplied in a flammable liquid

Remove the container from the fire area when there is no danger

If extinguishing is impossible, protect the surrounding and let the fire extinguish by itself

#### Iron

Rescuer must wear appropriate protective equipment.

Extinguish the fire away from the area while maintaining safe distance

Take caution as some are supplied in a flammable liquid

Remove the container from the fire area when there is no danger

If extinguishing is impossible, protect the surrounding and let the fire extinguish by itself

## 6. Measures for Leaking

### A. Measures and protective equipment to protect human body

Clean leaked substance immediately and follow the measures indicated on the equipment instructions.

Isolate contaminated area.

Individuals not related and individuals without protective equipment should not enter the contaminated area.

Eliminate every leaking point.

Stop the leaking if there is no danger.

Do not touch the damaged container or leaked substance without wearing proper protective equipment

Cover the leak with plastic sheet to prevent spread

Take caution of substance and conditions to avoid

### B. Measures to protect the environment

Prevent substance from entering sewage, basements or confined space.

### C. Purify or Removal Method

Absorb the leaked substance with inactive substances (e.g. dried sand or gravel), then collect it in a chemical waste container.

Wash the area of leaked substance and contaminated area with detergent and water.

## 7. Handling & Storage Method

### A. Safety Handling

Do not handle the product before reading and understanding every safety measure.

Thoroughly wash your hands after handling the product.



Do not consume, drink or inhale the product while using.  
 Content may remain in the container even after emptying, so follow every preventive measure of the MSDS/label  
 Take caution in handling/storing.  
 Carefully open the lid before opening.  
 Prevent long-term or continuous skin contact.  
 Do not inhale the steam produced from the heated substance.  
 Do not enter the storage area if the room is not equipped with ventilation  
 Take caution in substances and conditions to avoid

**B. Safe Storage Method**  
 Completely seal the container for storing.  
 Empty container must be completely drained and sealed, and must be immediately returned to the drum controller or positioned appropriately.  
 Keep away from food and drinks.

## 8. Exposure Prevention & Personal Protective Equipment

### A. Chemical substance exposure standard, biological exposure standard, etc.

#### Korean Regulations

Manganese TWA - 1mg/m<sup>3</sup> Manganese and inorganic compound  
 TWA - 1mg/m<sup>3</sup> STEL - 3mg/m<sup>3</sup> Fume

Iron TWA - 1mg/m<sup>3</sup>

#### ACGIH Regulations

Manganese TWA 0.2 mg/m<sup>3</sup>

Iron N/A

#### Biological Exposure Standard

Manganese N/A

Iron N/A

**B. Appropriate Engineering Management**  
 Implement process isolation, use local ventilation or perform other engineering management to control the air exposure level below a certain level.  
 Facilities storing or using this substance must be installed with washing and safety shower equipment

### C. Personal Protective Equipment

#### Respiratory Protection

**Manganese** Manganese and inorganic compound

Wear protective respiratory equipment appropriate for the physicochemical characteristics of the exposed particles and certified by the Korea Occupational Safety and Health Agency.

If the exposure concentration is lower than 10mg/m<sup>3</sup>, wear half-facial respiratory protection equipment with appropriate filter

If the exposure concentration is lower than 25mg/m<sup>3</sup>, wear loose-fitting hood/helmet type respiratory protection equipment with appropriate filter or continuous dust mask

If the exposure concentration is lower than 50mg/m<sup>3</sup>, wear full-facial respiratory protection equipment or air supply continuous flow/pressure required type half-facial equipment

If the exposure concentration is lower than 1000mg/m<sup>3</sup>, wear full-facial/helmet or hood type/pressure required type/air supplied respirator with appropriate filter

If the exposure concentration is lower than 10000mg/m<sup>3</sup>, wear self air supplied (SCBA) or pressure required self air supplied (SCBA) respiratory protection equipment with appropriate filter

Fume



Wear protective respiratory equipment appropriate for the physicochemical characteristics of the exposed particles and certified by the Korea Occupational Safety and Health Agency.  
 If the exposure concentration is lower than 10mg/m3, wear half-facial respiratory protection equipment with appropriate filter  
 If the exposure concentration is lower than 25mg/m3, wear loose-fitting hood/helmet type respiratory protection equipment with appropriate filter or continuous dust mask  
 If the exposure concentration is lower than 50mg/m3, wear full-facial respiratory protection equipment or air supply continuous flow/pressure required type half-facial equipment  
 If the exposure concentration is lower than 1000mg/m3, wear full-facial/helmet or hood type/pressure required type/air supplied respirator with appropriate filter  
 If the exposure concentration is lower than 10000mg/m3, wear self air supplied (SCBA) or pressure required self air supplied (SCBA) respiratory protection equipment with appropriate filter

**Iron**      Wear protective respiratory equipment appropriate for the physicochemical characteristics of the exposed particles and certified by the Korea Occupational Safety and Health Agency.  
 If the exposure concentration is lower than 10mg/m3, wear half-facial respiratory protection equipment with appropriate filter  
 If the exposure concentration is lower than 25mg/m3, wear loose-fitting hood/helmet type respiratory protection equipment with appropriate filter or continuous dust mask  
 If the exposure concentration is lower than 50mg/m3, wear full-facial respiratory protection equipment or air supply continuous flow/pressure required type half-facial equipment  
 If the exposure concentration is lower than 1000mg/m3, wear full-facial/helmet or hood type/pressure required type/air supplied respirator with appropriate filter  
 If the exposure concentration is lower than 10000mg/m3, wear self air supplied (SCBA) or pressure required self air supplied (SCBA) respiratory protection equipment with appropriate filter

## 9. Physicochemical Characteristics

A. Appearance	
Physiology	Solid (Liquid >2800°F)
Color	Metallic Gray
B. Scent	None
C. Odor	N/A
D. pH	7.4
E. Melting/Freezing Point	N/A
F. Initial Boiling Point & Boiling Range	N/A
G. Ignition Point	N/A
H. Evaporating Rate	N/A
I. Flammability (Solid, Liquid)	N/A
J. Upper/Lower Limit of Ignition or Explosion Range	N/A
K. Vapor Pressure	N/A
L. Solubility	Insolubility
M. Vapor Density	N/A
N. Specific Gravity	N/A
O. n- Octanol-Water Partition Coefficient	N/A
P. Self-Ignition Temperature	N/A
Q. Decomposition Temperature	2750°F
R. Viscosity	N/A
S. Molecular Volume	N/A



## 10. Stability & Reactivity

### A. Chemical Stability & Possibility of Adverse Reaction

Manganese	Flammable solid Can produce toxic gas from decomposing at high temperatures Intense polymerization may cause fire and explosion Container may explode when heated May ignite through friction, spark or flame Substance may re-ignite after being extinguished Produces intense reactions with water Some substance combust at high heat Dust, fume can form explosive compound Coming in contact or inhaling vapor, substance, decomposed substance may cause serious injury or even death The oxidation product produced through metal combustion can cause serious health issues
Iron	Container may explode when heated May ignite through friction, spark or flame Substance may re-ignite after being extinguished Produces intense reactions with water Some substance combust at high heat Dust, fume can form explosive compound Irritating, corrosive, toxic gas may be produced when combusted Coming in contact or inhaling vapor, substance, decomposed substance may cause serious injury or even death The oxidation product produced through metal combustion can cause serious health issues

### B. Conditions to Avoid

Manganese	Avoid heat, spark and high temperature – No smoking Friction, heat, spark, fire
Iron	Friction, heat, spark, fire Heat

### C. Substances to Avoid

Manganese	Water
Iron	Water

### D. Harmful Substance produced at Decomposition

Manganese	Irritative, corrosive, toxic gas
Iron	Irritative, toxic gas may be produced during pyrolysis or combustion

## 11. Information about Toxicity

### A. Information about Highly Possible Exposure Route

Manganese	May cause irritation, low temperature or fever, nausea, vomiting, diarrhea or headache
Iron	N/A

### B. Health Risk Information

#### Acute Toxicity

##### Oral

Manganese	LD50 9000 mg/kg Rat
Iron	LD50 984 mg/kg Rat

##### Percutaneous



	Manganese	N/A
	Iron	LD50 20000 mg/kg Guinea pig
Inhale		
	Manganese	N/A
	Iron	N/A
Skin Corrosivity or Irritation		
	Manganese	Mild irritation was found from skin irritation test with rabbits (3)
	Iron	Test Species: Rabbit Irritation Present
Serious Eye Damage or Irritation		
	Manganese	Mild irritation was found from eye irritation test with rabbits (3)
	Iron	N/A
Hypersensitive Respiratory		
	Manganese	N/A
	Iron	N/A
Hypersensitive Skin		
	Manganese	N/A
	Iron	N/A
Carcinogenicity		
Occupational Safety and Health Act		
	Manganese	N/A
	Iron	N/A
Announcement of Ministry of Labor		
	Manganese	N/A
	Iron	N/A
IARC		
	Manganese	N/A
	Iron	N/A
OSHA		
	Manganese	N/A
	Iron	N/A
ACGIH		
	Manganese	N/A
	Iron	N/A
NTP		
	Manganese	N/A
	Iron	N/A
EU CLP		
	Manganese	N/A
	Iron	N/A
Germ Cell Mutagenicity		
	Manganese	N/A
	Iron	N/A
Reproductive Toxicity		
	Manganese	Teratogenic test with mouse showed fetus death and abnormal fetus (exencephalus ) (4)





Iron	N/A
Organ Targeting Toxicity (single exposure)	
Manganese	Causes pneumonia (4)
Iron	N/A
Organ Targeting Toxicity (repeated exposure)	
Manganese	Causes respiratory and neural issues (4)
Iron	N/A
Absorption Toxicity	
Manganese	N/A
Iron	N/A

## 12. Environmental Influences

### A. Ecotoxicology

#### Fish

Manganese	LC50 > 50 mg/l 96 hr
Iron	LC50 13.6 mg/l 96 hr

#### Crustacean

Manganese	N/A
Iron	N/A

#### Bird

Manganese	N/A
Iron	N/A

### B. Residual & Degradable

#### Residual

Manganese	N/A
Iron	(none)

#### Degradable

Manganese	N/A
Iron	N/A

### C. Bio Enrichment

#### Enrichment

Manganese	N/A
Iron	N/A

#### Biodegradable

Manganese	N/A
Iron	N/A

### D. Soil Mobility

Manganese	N/A
Iron	N/A

### E. Miscellaneous Harmful Effects

Manganese	N/A
Iron	N/A

## 13. Caution during Disposal

### A. Disposal

Manganese	Dispose the content and container according to waste management regulations.
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Iron Dispose the content and container according to waste management regulations.

B. Caution during Disposal

Manganese Dispose content (according to related regulations).  
 Iron Dispose content (according to related regulations).

**14. Information needed for Transportation**

A. UN No.

Manganese 3089  
 Iron 3089

B. Appropriate Cargo Name

Manganese Metal powder (flammable) (excluding products without product name) (METAL POWDER, FLAMMABLE, N.O.S.)  
 Iron Metal powder (flammable) (excluding products without product name) (METAL POWDER, FLAMMABLE, N.O.S.)

C. Risk Level during Transportation

Manganese 4.1  
 Iron 4.1

D. Container Classification

Manganese 2  
 Iron 2

E. Marine Pollutant

Manganese N/A  
 Iron N/A

F. Information or Special Safety Measures for Transportation or Transportation Method the User must be aware of

Emergency Measures for Fire

Manganese F-G  
 Iron F-G

Emergency Measures for Leaking

Manganese S-G  
 Iron S-G

**15. Legal Regulation Status**

A. Regulations according to Occupation Safety and Health Act

Manganese Control Substance  
 Work Environment Measurement Substance (measurement cycle: 6 months)  
 Special Health Inspection Substance (inspection cycle: 12 months)  
 Exposure Standard Setting Substance  
 Iron Control Substance  
 Work Environment Measurement Substance (measurement cycle: 6 months)  
 Exposure Standard Setting Substance

B. Regulations according to Harmful Chemical Substance Management Act

Manganese N/A  
 Iron N/A

C. Regulations according to Safety Control of Dangerous Substances Act

Manganese N/A



Iron	N/A
D. Regulations according to Wastes Control Act	
Manganese	N/A
Iron	Designated Waste
E. Miscellaneous Domestic & Overseas Regulations	
Domestic Regulations	
Persistent Organic Pollutants Control Act	
Manganese	N/A
Iron	N/A
Overseas Regulations	
US Management Information (OSHA Regulations)	
Manganese	N/A
Iron	N/A
US Management Information (CERCLA Regulation)	
Manganese	N/A
Iron	N/A
US Management Information (EPCRA 302 Regulation)	
Manganese	N/A
Iron	N/A
US Management Information (EPCRA 304 Regulation)	
Manganese	N/A
Iron	N/A
US Management Information (EPCRA 313 Regulation)	
Manganese	Applicable
Iron	N/A
US Management Information (Substance defined by Rotterdam Convention)	
Manganese	N/A
Iron	N/A
US Management Information (Substance defined by Stockholm Convention)	
Manganese	N/A
Iron	N/A
US Management Information (Substance defined by Montreal Protocol)	
Manganese	N/A
Iron	N/A
EU Classification Information (Finalized Classification Result)	
Manganese	N/A
Iron	N/A
EU Classification Information (Danger Sentence)	
Manganese	N/A
Iron	N/A
EU Classification Information (Safety Sentence)	
Manganese	N/A
Iron	N/A

**16. Miscellaneous References**

A. Source of References Edited MSDS provide by the Korea Occupational Safety and Health Agency



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B. Initial Issue      2000-10-11

C. Revision & Final Revision

    Number of Revisions      5 revisions

    Final Revision            2013-05-30

D. Miscellaneous

- Composer: POSCO Pohang Steel Plant Environment & Health Group Health Promotion Team(Ha Tae-chil, Jo Gi-hyeon)
- Technical Review: - Cold Rolled Product Service Group, Kim Jung-ho