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東洋鋼鉄株式会社

安全データシート(Safety Data Sheet)

〈材料製造会社：POSCO〉

1. 製品及び会社情報

- ・ 製品の名称：Pickled and oiled plate(PO)
- ・ 会社名：東洋鋼鉄株式会社
- ・ 住所：浦安市港 72 番地
- ・ 担当部門：技術管理室
- ・ 連絡先：技術管理室 横屋 電話：047-354-5891(代)
FAX：047-354-5894

「2.」以降の項目については、次ページ以降を参照下さい。

POSCO Code Number: F031

Material Safety Data Sheet (MSDS)

[This sheet was prepared based on the regulations in article 41 of the Industrial Safety and Health Act]

1. Identification of the preparation and the company

- A. Product name **Pickled and oiled plate (PO)**
- B. Recommended uses and restrictions on the use of product
- | | |
|------------------------------------|------------------------------|
| Recommended use of product | Steel products manufacturing |
| Restrictions on the use of product | Data not available |
- C. Manufacturer/Importer/Distributor information
- | | |
|--------------------------|---|
| Company name | POSCO Co., Ltd. |
| Address | (Dongchon-dong) 6261 Donghaean-ro Nam-gu, Pohang-si, Gyeongsangbuk-do, Korea (054-220-0114)
(Geumho-dong) 396 Geumho-ro, Gwangyang-si, Jeollanam-do, Korea
(061-790-0114) |
| Emergency contact number | Gi-hyeon Cho, Health Improvement Division, Pohang Steel Works (054-220-7044)
Mun-hi Seo, Health Improvement Division, Gwangyang Steel Works (061-790-2635) |

2. Hazards identification

- A. Hazards classification
- Acute toxicity (Oral): Category 4
 - Skin corrosion / skin irritation: Category 2
 - Severe eye damage / eye irritation: Category 2
 - Reproductive toxicity: Category 1B
 - Specific target organ toxicity (single exposure): Category 2
 - Specific target organ toxicity (repeated exposure): Category 2

B. Warning signs and prevention measure phrases

Signs



- | | |
|----------------------------|--|
| Signal words | Danger |
| Hazards phrases | H302 Harmful if swallowed.
H315 Causes skin irritation
H319 Causes serious eye irritation.
H360 May cause damage to the fetus or reproductive ability
H373 Prolonged or repeated exposure can cause body damage. |
| Prevention measure phrases | |
| Prevention | P201 Obtain the instruction manual before use.
P202 Read all prevention measure phrases and do not handle until you understand all the phrases. |

Response action	<p>P260 Do not inhale dust and fumes.</p> <p>P264 After handling, thoroughly wash the handled areas.</p> <p>P270 Do not eat, drink, or smoke when using this product.</p> <p>281 Wear appropriate personal protective equipment.</p> <p>P305 + P351 + P338 If it comes in contact with your eye, carefully rinse with water for several minutes. If possible, remove contact lenses and continue to rinse.</p> <p>P309 + P311 If you are exposed and feel uncomfortable, get medical attention (from a physician).</p> <p>P330 Wash your mouth out with water.</p> <p>P332 + P313 If your skin becomes irritated, get medical treatment and consultation.</p> <p>P337 + P313 If eye irritation persists, get medical treatment and consultation.</p> <p>P362 Take contaminated clothing off and wash them before reuse.</p>
Storage	<p>P402 Store in a dry place.</p> <p>P407 Maintain a distance between cargo items.</p>
Disposal	<p>P501 Dispose of the content containers as specified in the relevant legislation.</p>

C. Other hazards not included in the hazards category standards (NFPA)

Manganese

Hygiene	1
Fire	3
Reactivity	1
Iron	
Hygiene	1
Fire	3
Reactivity	0

3. name/content of ingredients

Ingredient name	Official name (Trivial name)	CAS number	Content (%)
Manganese	Colloidal manganese	7439-96-5	2.0% Max
Iron	Ferrum	7439-89-6	95% or higher

※ May also contain a small amount of other components. (Silicon 0.5% Max, Carbon 0.2% Max, Aluminum 0.1% Max, Copper 0.3% Max, Nickel 0.1% Max, Chrome 0.1% Max, Molybdenum 0.1% Max, phosphorus, sulfur, niobium, vanadium, boron, etc.)

※ As this is a finished product that has been solidified, there is no danger of the contained chemical substances being exposed. However, if it is cut, fused, or melted, some exposure might occur.

4. First aid measures

A. Eye contact	<p>If it comes in contact with the eyes, carefully rinse for several minutes with water. If possible, remove contact lenses and continue to rinse.</p> <p>If irritation persists, get medical treatment and consultation.</p>
B. Skin contact	<p>If skin is irritated, get medical treatment and consultation.</p> <p>Take contaminated clothing off. Wash them before reuse.</p> <p>In the case of a hot substance, to remove heat, immerse the affected area in a large amount of cold water or rinse with water.</p>

-
- | | |
|-----------------------|---|
| C. Inhalation | Remove the contaminated clothing and shoes and isolate the contaminated area.
If you are exposed or feel uncomfortable, get medical attention.
Move to an area with lots of fresh air. |
| D. Ingestion | If you feel uncomfortable, get medical attention.
Rinse your mouth out with water. |
| E. Notes to physician | When exposed, contact medical staff and take special first aid measures, such as a follow-up investigation.
The medical staff should become aware of the ingredients concerned and take protective measures. |

5. Explosion·Fire-fighting measures

- | | |
|--|--|
| A. Appropriate (inappropriate) extinguishing agent | When extinguishing a fire associated with this substance, please use water spray.
When extinguishing by smothering, use dry sand or soil. |
| B. Specific hazards arising from chemical substances | While burning, pungent or toxic gases may be produced due to pyrolysis or combustion
Containers may explode when heated
While some parts of it can burn, it doesn't ignite easily.
Nonflammable substances themselves do not burn but can produce
corrosive / toxic fumes through pyrolysis when heated. |
| C. Safety equipment worn while putting out fires and preventive measures | Firefighters should wear appropriate protective equipment
Keep a safe distance when putting out fires.
If it is deemed not dangerous, move the containers from the fire area. |

6. Accidental release measures

- | | |
|---|--|
| A. Corrective measures and protective equipment required to protect human lives | Do not inhale dust and fumes.
People who don't need to enter or those without protective equipment should not enter.
Remove all sources of ignition.
Do not touch damaged containers or leaked substance without wearing appropriate protective gear.
Be careful of substances and conditions that need to be avoided. |
| B. Measures required to protect the environment | Prevent inflow into waterways, sewers, basements and confined areas. |
| C. Decontamination or removal method | Gather the leaked substance. |

7. Handling and storage

- | | |
|---------------------------|---|
| A. Safe handling know-how | Read all prevention measure phrases and do not handle until you understand all the phrases.
After handling, thoroughly wash the handled areas.
Do not eat, drink, or smoke when using this product. |
|---------------------------|---|



Be careful when handling/storing and use carefully.
 Prevent prolonged or continuous skin contact.
 Pay attention to substances and conditions to avoid.
 Store in a dry place.
 Maintain a distance between cargo items.

B. Safe storage method

8. Exposure prevention and personal protection equipment

A. Exposure criteria of chemical substances, biological substances, etc.

Domestic regulations

Manganese TWA – 1mg/m3 Manganese and inorganic compounds

Iron Data not available

ACGIH regulations

Manganese TWA 0.2 mg/m3

Iron Data not available

Biological exposure limits

Manganese Data not available

Iron Data not available

B. Proper engineering management

When dust and fumes are generated, use local ventilation system and maintain below the exposure guideline.

C. Personal protection equipment

Respiratory protection

Wear respiratory protection equipment (dust mask) that has attained the certification of the Korea Occupational Safety and Health Agency.

Eye protection

Wear safety glasses to protect eyes from dust and arsenic substances.

Hand protection

Wear work gloves suited for the job.

Body protection

Wear work clothes suited for the job.

9. Physical and chemical properties

A. Appearance

Phase Solid

Color Metallic grey

B. Odor Nil

C. Odor threshold Data not available

D. pH Data not available

E. Melting point / freezing point Data not available

F. Initial boiling point and boiling point range Data not available

G. Flash point Data not available

H. Evaporation rate Data not available

I. Flammability (solid, gas) Data not available

J. Upper / lower limits of flammability or explosive limits Data not available

K. Vapor pressure Data not available

L. Solubility Data not available

M. Vapor density Data not available

N. Specific gravity Data not available

O. n-octanol / water partition coefficient Data not available

P. Self-ignition temperature	Data not available
Q. Decomposition temperature	Data not available
R. Viscosity	Data not available
S. Molecular weight	Data not available

Iron

A. Appearance	
Phase	Solid
Color	White or grey
B. Odor	
Nil	
C. Odor threshold	
Data not available	
D. pH	
(Not applicable)	
E. Melting point / freezing point	
1535 °C	
F. Initial boiling point and boiling point range	
2750 °C	
G. Flash point	
Data not available	
H. Evaporation rate	
Data not available	
I. Flammability (solid, gas)	
Data not available	
J. Upper / lower limits of flammability or explosive range	
- / -	
K. Vapor pressure	
1 mm Hg (at 1787 °C)	
(Water Solubility: Insolubility. Solvent solubility: Availability: Acid insolubility: alkali, alcohol, ether)	
L. Solubility	
Availability: Acid insolubility: alkali, alcohol, ether)	
M. Vapor density	
Data not available	
N. Specific gravity	
7.86 ((water=1))	
O. n-octanol / water partition coefficient	
(NA)	
P. Spontaneous ignition temperature	
Data not available	
Q. Decomposition temperature	
Data not available	
R. Viscosity	
Data not available	
S. Molecular weight	
55.85	

10. Stability and reactivity

A. Chemical stability and adverse reaction probability

Manganese

Flammable Solid

Can decompose and generate toxic gases at high temperatures

By vigorously polymerizing, it can cause a fire and an explosion

When heated, containers may explode.

Can be ignited by friction, heat, sparks, and flames.

Can reignite even after the fire is extinguished

Reacts violently and explosively with water

Some substances burn with intense heat

Dust and fumes can form an explosive mixture with air

Inhalation of and skin contact with vapor, substances, and decomposition products can cause serious injury or death.

During a metal fire, the oxide can pose serious health hazards

Iron	<p>When heated, containers may explode.</p> <p>Can be ignited by friction, heat, sparks, and flames.</p> <p>Can reignite even after the fire is extinguished</p> <p>Reacts violently and explosively with water</p> <p>Some substances burn with intense heat</p> <p>Dust and fumes can form an explosive mixture with air</p> <p>During a fire, irritating, corrosive and toxic gases may be generated</p> <p>Inhalation of and contact with vapor, substance and decomposition products can result in a serious injury or death.</p> <p>In a metal fire, the oxide can pose serious health hazards</p>
B. Conditions to avoid	
Manganese	Keep away from heat, sparks, flame, high heat, and no smoking
Iron	Friction, heat, sparks, flame
C. Substances to avoid	
Manganese	Water
Iron	Water
D. Hazardous substances produced during decomposition	
Manganese	Irritating, corrosive and toxic gas
Iron	While burning, pungent and very toxic gases may be produced due to pyrolysis or combustion

11. Toxicological information

A. Information on exposure routes with high probabilities	
Manganese	Can cause irritation, low body temperature, fever or nausea, vomiting, diarrhea, headaches
Iron	Data not available
B. Health hazard information	
Acute toxicity	
Oral	
Manganese	LD50 9000 mg/kg Rat
Iron	LD50 984 mg/kg Rat
Percutaneous	
Manganese	Data not available
Iron	LD50 20000 mg/kg Guinea pig
Inhalation	
Manganese	Data not available
Iron	Data not available
Skin corrosion or irritation	
Manganese	Shown a moderate stimulation in Rabbit skin irritation test (3)
Iron	Test species: Rabbit irritation showed
Serious eye injury or irritation	
Manganese	Shown a moderate stimulation in Rabbit's eyes irritation test (3)
Iron	Data not available

Hypersensitive respiratory system	Manganese	Data not available
	Iron	Data not available
Hypersensitive skin	Manganese	Data not available
	Iron	Data not available
Carcinogenicity		
Occupational Safety and Healthy Act	Manganese, Iron	Data not available
Ministry of Labor Notice	Manganese, Iron	Data not available
IARC	Manganese, Iron	Data not available
OSHA	Manganese, Iron	Data not available
ACGIH	Manganese, Iron	Data not available
NTP	Manganese, Iron	Data not available
EU CLP	Manganese, Iron	Data not available
Germ cell mutagenicity	Manganese	Data not available
	Iron	Data not available
Reproductive toxicity	Manganese	Showed embryonic lethality and fetal deformity (herniation of brain) in the results of the teratogenic test in mice (4)
	Iron	Data not available
Specific target organ toxicity (single exposure)	Manganese	Can cause pneumonia (4)
	Iron	Data not available
Specific target organ toxicity (repeated exposure)	Manganese	Affects the respiratory and nervous systems (4)
	Iron	Data not available
Aspiration hazards	Manganese	Data not available
	Iron	Data not available

12. Ecological information

A. Ecotoxicity

Fish

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

Shellfish

	Manganese	Data not available
	Iron	Data not available
Birds		
	Manganese	Data not available
	Iron	Data not available
B. Persistence and degradability		
Persistence		
	Manganese	Data not available
	Iron	(Nil)
Degradability		
	Manganese	Data not available
	Iron	Data not available
C. Bioaccumulation		
Accumulation		
	Manganese	Data not available
	Iron	Data not available
Biodegradability		
	Manganese	Data not available
	Iron	Data not available
D. Mobility in soil		
	Manganese	Data not available
	Iron	Data not available
E. Other adverse effects		
	Manganese	Data not available
	Iron	Data not available

13. Disposal considerations

A. Disposal method	If specified in the Waste Control Act, containers and contents should be disposed of in accordance with the regulations.
B. Disposal consideration	Disposal of contents and containers should comply with all the relevant regulations.

14. Transport information

A. UN No.	3089
B. Proper shipping name	Metal powder (flammable) (Items with specific names are excluded) (METAL POWDER, FLAMMABLE, N.O.S.)
C. Hazardous classification during transport	4.1
D. Container grades	2
E. Marine pollutants	Data not available
F. Special safety measures and information on shipping or transportation means users need to know	

Emergency measures during a fire	F-G
Emergency measures during release	S-G

15. Regulatory information

A. Regulations stipulated by the Industrial Safety and Health Act

Manganese	Hazardous substances subject to control
Manganese	Substances subject to work environment measurement (measurement period: 6 months)
	Substances subject to special medical examination (diagnosis period: 12 months)
	Substances to be the Exposure-limits
Iron	Hazardous substances subject to control
	Substances subject to work environment measurement (measurement period: 6 months)

B. Regulations stipulated by the Toxic Chemicals Control Act

Manganese	Data not available
Iron	Data not available

C. Regulations stipulated by the Dangerous Goods Safety Management Act

Manganese	Data not available
Iron	Data not available

D. Regulations stipulated by the Waste Management Act

Manganese	Data not available
Iron	Data not available

E. Regulations stipulated by other domestic and foreign regulations

Domestic regulations

Persistent Organic Pollutants Control Act

Manganese	Not applicable
Iron	Not applicable

Foreign regulations

U.S. managed info (OSHA regulations)

Manganese	Not applicable
Iron	Not applicable

U.S. managed info (CERCLA regulations)

Manganese	Not applicable
Iron	Not applicable

U.S. managed info (EPCRA 302 regulations)

Manganese	Not applicable
Iron	Not applicable

U.S. managed info (EPCRA 304 regulations)

Manganese	Not applicable
Iron	Not applicable

U.S. managed info (EPCRA 313 regulations)

Manganese	Applicable
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Iron	Not applicable
U.S. managed info (Rotterdam Convention Substances)	
Manganese	Not applicable
Iron	Not applicable
U.S. managed info (Stockholm Convention Substances)	
Manganese	Not applicable
Iron	Not applicable
U.S. managed info (Montreal Protocol Substances)	
Manganese	Not applicable
Iron	Not applicable
EU Classification info (Confirmed Classification Results)	
Manganese	Not applicable
Iron	Not applicable
EU Classification info (Hazards phrases)	
Manganese	Not applicable
Iron	Not applicable
EU Classification info (Safety Phrases)	
Manganese	Not applicable
Iron	Not applicable

16. Other information

A. Data source

Manganese

- 1(E. Melting point / freezing point)
- 1(F. Initial boiling point and boiling point range)
- 2(K. Vapor pressure)
- 1(N. Specific gravity)
- 3(Oral)
- (1) ISCS(2) HSDB(3) RTECS(4) CICAD

Iron

- IUCLID(Oral)
- IUCLID(Skin corrosiveness or irritation)
- IUCLID(fish)

B. First prepared 2014-10-07

C. Number of times of revision and final revision date

Number of times of revision 0
Final revision date 0

D. Others

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