



Safety Data Sheet

According to Regulation JIS Z 7253 (2012) Japan

LaserForm® Maraging steel

Revised on: Dec.20, 2017

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

Chemical product name : LaserForm® Maraging steel
Chemical product detail : Maraging steel
Supplier information (Japan)
Company name : 3D Systems Japan K.K.
Address : Ebisu Garden Place Tower 27F, 4-20-3, Ebisu,
Shibuya-ku, Tokyo 150-6027 Japan
Phone number : 03-5798-2500
E-mail address : moreinfo@3dsystems.com
Emergency phone number : 03-4520-9637 – Chemtrec

Manufacturer information

Company name (USA) : 3D Systems, Inc.
Address : 333 Three D Systems Circle
Rock Hill, South Carolina U.S.A.
Phone number : 803.326.3900
800.793.3669 (Toll free in the U.S.A)
E-mail address : moreinfo@3dsystems.com
Emergency phone number : 800.424.9300 – Chemtrec

Company name (UK) : 3D Systems Europe Ltd.
Address : Mark House, Mark Road
Hemel Hempstead
Herts HP2 7 United Kingdom
Phone number : +44 144-2282600
E-mail address : moreinfo@3dsystems.com
Emergency phone number : +1 703.527.3887 – Chemtrec

Company name (Australia) : 3D Systems / Australia
Address : 5 Lynch Street
Hawthorn, VIC 3122
Phone number : +1 03 9819-4422



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E-mail address	:	moreinfo@3dsystems.com
Emergency phone number	:	+(61) 29037.2994 – Aus Chemtrec
Recommended use	:	For use with 3D Systems DMP (Direct Metal Printing)
Restriction on use	:	Any other uses.

2. HAZARDS IDENTIFICATION

GHS Classification

Physicochemical hazards

Flammable solids	:	Classification not possible
Pyrophoric solids	:	Classification not possible
Self-heating chemicals	:	Classification not possible
Substances and mixtures which, in contact with water, emit flammable gases	:	Classification not possible

Health hazards

Acute toxicity (oral):	:	Not classified
Respiratory sensitization	:	Category 1
Skin sensitization	:	Category 1
Carcinogenicity:	:	Category 2
Specific target organ toxicity (single exposure)	:	Category 1 (Respiratory system, Kidney) Category 3 (Respiratory tract irritation)
Specific target organ toxicity (repeated exposure)	:	Category 1 (Respiratory system, Cardiovascular system, Thyroid, Hematopoietic system)

Environmental hazard

Hazard to the aquatic environment (acute)	:	Category 2
Hazard to the aquatic environment (long-term)	:	Category 2
Hazard to the ozone layer	:	Not applicable

Other hazards are either of 'Not applicable' or 'Classification not possible'.

GHS label elements



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Pictogram or symbol

:



Signal word

: Danger

Hazard statements

: H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317: May cause allergic skin reaction
H351: Suspected of causing cancer
H370: Causes damage to respiratory system, Kidney
H335: May cause respiratory irritation (when handling this product in a powdery form)
H372: Causes damage to respiratory system, cardiovascular system, thyroid, hematopoietic system through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements

Safety measures

: P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust/fume.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P272: Contaminated work clothing should not be allowed out of the workplace.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/ eye protection/face protection.
P284: [In case of inadequate ventilation] wear respiratory protection.

Response

: P302+P352: IF ON SKIN: Wash with plenty of soap and water.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P311+P313: IF exposed or concerned: Call a doctor and get medical advice/attention.
P312+P314: Call a doctor and get medical advice/attention if you feel unwell.
P333+P313: If skin irritation or rash occurs: Get medical advice/attention.
P342+P311: If experiencing respiratory symptoms: Call a physician.



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	P362+P364: Take off contaminated clothing and wash it before reuse.
	P391: Collect spillage.
Storage	: P405: Store locked up.
Disposal	: P501: Dispose of contents/container in accordance with local/regional/national/international regulation.
Other hazards	: Danger of dust explosion Handling and/or processing of this material may generate dust which can cause mechanical irritation of the eyes, skin, nose and throat.
Other regulatory information	: Group-2 Substances (Cobalt) under Ordinance on Prevention of Hazards due to Specified Chemical Substances. Fire Service Act: Category II, Combustible solids (metal powders)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical substance/mixture	: Mixture (Alloy)
Chemical name or generic name	: Maraging steel in powdery form

Chemical name	CAS number	Concentration or concentration range (%)	Reference number in gazetted list
Iron	7439-89-6	48.5 – 79.5	Not applicable
Nickel	7440-02-0	10 – 30	Not applicable
Cobalt	7440-48-4	7 – 13 (10% as a median for a PRTR report)	Not applicable
Molybdenum	7439-98-7	3 – 7	Not applicable
Titanium	7440-32-6	0.5 – 1.5	Not applicable

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

4. FIRST AID MEASURES

IF INHALED

- Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- If suspected that fumes are still present, if not breathing, if breathing is irregular, provide artificial respiration or oxygen by trained personnel.
- It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- If necessary, call a physician to get medical attention.
- If unconscious, place in recovery position and get medical attention immediately.



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Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In the event of any complaints or symptoms, avoid further exposure.

IF ON SKIN

Wash with plenty of soap and water. Continue to rinse the affected skin for at least 10 minutes.

Remove contaminated clothing and shoes. Wash clothing and shoes before reuse.

If necessary, get medical attention. In the event of any complaints or symptoms, avoid further exposure.

IF IN EYES

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids.

Check for and remove any contact lenses. Continue to rinse for at least 10 minutes.

Get medical attention if eye irritation persists.

IF SWALLOWED

Wash out mouth with water. Remove dentures if any.

Remove victim to fresh air and keep at rest in a position comfortable for breathing.

If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous.

Do not induce vomiting unless directed to do so by medical personnel.

If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

If necessary, get medical attention. Never give anything by mouth to an unconscious person.

If unconscious, place in recovery position and get medical attention immediately.

Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/ effects, acute and delayed

IF INHALED : Exposure to high concentrations may result in health complaints.

Irritating to respiratory system. Exposure may result in depressed respiration, coughing, nausea, sore throat, breathing difficulties, and asthma. Prolonged or repeated exposure to large amounts may cause damage to lungs (lung edema). May cause sensitization by inhalation (fever, pain). For oversensitive people even exposure to very small amounts causes allergic reactions. Reduced fetal weight, an increase in fetal deaths, and skeletal malformations may occur in a case of over-exposure.

IF ON SKIN : Exposure to high concentrations may result in health complaints.

Prolonged or repeated exposure may be irritating (redness, pain). May cause sensitization by skin contact (sweating, fever, pain). For oversensitive people even exposure to very small amounts causes allergic reactions. Reduced fetal weight, an increase in fetal deaths, and skeletal malformations may occur in a case of over-exposure.

IF IN EYES : Moderately irritating to eyes. Pain or irritation, watering and redness in a case of over-exposure.

IF SWALLOWED : Prolonged or repeated exposure may be irritating to mouth, throat and esophagus (sore throat, nausea). Reduced fetal weight, an increase in fetal deaths,



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and skeletal malformations may occur in a case of over-exposure.

Protection of the person who gives the first aid

No action shall be taken involving any personal risk or without suitable training.

If suspected that fumes are still present, the aider should wear an appropriate mask or respirator referred to SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION.

It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Special instructions to the medical doctor

Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Dry powder suitable for metal combustion (using hydrogen-carbonates, etc. specified by fire service Act), Dry sand, Dilatable vermiculite and/or Dilatable perlite.

This product is categorized as Category II, Combustible solids (metal powders) under Fire Service Act.

Unsuitable extinguishing media

Do not use water nor high volume water jets. Do not use Carbon dioxide (CO₂) or Halon.

Specific hazards arising from the substance or mixture

Fine dust clouds may form explosive mixtures with air. Harmful metal oxides are generated as a thermal decomposition products.

Specific fire fighting method

Try to extinguish an early stage fire with an extinguisher if without any risk.

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Fight fire from windward. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Protection for fire-fighter

In a large fire: Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Fireproof equipment (clothing for firefighters) should meet the official requirements.

Other information

Some metals comprising the alloy are considered as a water polluting substance.

Contaminated water (firefight water) with such metals should be contained in order to prevent from being discharged to rivers, lakes, sewer, drainage and soil.

6. ACCIDENTAL RELEASE MEASURES



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Personal precautions, protective equipment and emergency procedures

Nickel and its compounds, Molybdenum and its compounds, and Iron and its compounds are designated as substances subject to taking emergency measures and reporting in the event of a leaking accident by Water Pollution Control Act.

Therefore in such a leaking accident where such substances are discharged to public water area and/or ground water, thereby causing health hazard and degradation of living environment, temporary prevention measures should be taken, and if necessary the accident should be reported to the authorities.

When a leaking accident is found, immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Wear appropriate protective equipment and clothing. Remove all sources of ignition. Avoid dust formation. Do not touch or walk through spilt material.

For emergency responders: Refer to SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION about personal protective equipment.

Environmental precautions

Some metals contained in the alloy are a water polluting substance and also designated substance subject to taking emergency measures and reporting in the event of a leaking accident under Water Pollution Control Act.

Take measures not to contaminate the soil by the leaked product nor to enter sewer and/or drainage. Collect spillage.

Recovery, neutralisation and methods, materials for containment and cleaning up

Wear appropriate protective equipment and antistatic clothing.

For containment: Use non-sparking antistatic tools and containers. Do not use compressed air and avoid dust generation.

For cleaning up small spillage: Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

For cleaning up large spillage: Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor.

Prevention of secondary disaster

- (1) See Emergency contact in SECTION 1.
- (2) Use personal protective equipment if necessary, referring to SECTION 8.
- (3) Do not contaminate the natural environment by the product containing water polluting metals.
- (4) As there may be a risk of dust explosion, avoid to form a dust cloud.

7. HANDLING AND STORAGE

Safe handling



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Engineering measures

As the product falls into Group-2 Substances (Cobalt) under Ordinance on Prevention of Hazards due to Specified Chemical Substances (referring to Section 15), use wholly enclosing facility for sealing a dust emission source, or install a local exhaust or Push-pull ventilation system in accordance with specific requirements of the Ordinance.

As the product contains substances which subject to be assessed for risk, required by Industrial Safety and Health Act, the risk assessment shall be conducted, and depending on the result, take necessary facility measures for the risk of danger to the workers.

Prevent the formation of dust clouds and dust accumulation. Keep away hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges (e.g. earthing the container to dissipate static electricity during transfer).

Floor and other facilities at a working place should be structured for easy cleaning with water. Cleaning should be conducted one or more times per day in a way that the dusts are not dissipated.

Use appropriate containment measures (e.g. Air cleaner) to avoid environmental hazard.

Contact avoidance (Incompatible materials)

Combustible materials, acids, oxidising agents, halogenated hydrocarbons.

Hygienic measures

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

Persons with a history of skin sensitisation problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used.

Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest.

If ventilation cannot effectively keep dust concentrations below administrative levels and exposure limits, or if a high amount exposure risk occurs when performing temporary or maintenance works, an appropriate respiratory protection must be provided (see Section 8).

Wear protective gloves/protective clothing/ eye protection/face protection as needed (see Section 8).

Smoking and eating food in a work area is prohibited. Display this rules on a placard.

Wash hands, forearms and face thoroughly after working with the product, before eating/drinking/smoking, using the lavatory and at the end of the day.

Contaminated clothing should be removed and washed before re-use.

To install an eye washing station, safety shower, gargling fountain, dressing room and washing facility for cloth.

Do not blow dust off clothing or skin with compressed air.

Use good housekeeping and sanitation practices.

Storing conditions

Appropriate storing conditions

Keep all of the empty containers at a specified storage place.

Protected from direct sunlight, and store in a dry, cool and well ventilated area, away from incompatible materials (see Section. 10) and food and drink. No Fire. Store locked up.

Keep a container tightly closed and sealed until ready for use. After opening the container, it must be carefully resealed, and kept upright to prevent leakage.

As the product falls into a dangerous good which is Category II, Combustible solids



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(metal powders) under Fire Service Act, store the product in accordance with the requirements of the Act.

Appropriate container material

Use a container which is suitable for the danger characteristic of the product without any damage, corrosion, crack and etc.

It is preferable to store in original container.

The container should bear the GHS label.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit :

Substance	ISHL (Administrative level)	JSOH (Allowable exposure limit)	OSHA/PEL (US)	ACHIG/TLV (US)
Iron	None *	Class 3 dust **	None	None
Nickel	None *	1 mg/m ³	1 mg/m ³	1.5 mg/m ³ (Inhalable dust)
Cobalt	0.02 mg/m ³ as Cobalt	0.05 mg/m ³ as Cobalt	0.1 mg/m ³ as Cobalt	0.02 mg/m ³ as Cobalt
Molybdenum	None *	Class 3 dust **	Insoluble compound 15 mg/m ³ (Total dust)	None
Titanium	None *	Class 3 dust **	None	None

* In case of "Specified dusty work" stipulated by Ordinance on Prevention of Hazards Due to Dust, calculate an administrative level (E) by the following equation.

$$E = 3.0 / (1.19Q+1)$$

E : Administrative level (mg/m³), Q : Content of crystalline silica in dusts (%)

** Class 3 dust : 2 mg/m³ (Respirable dust), 10 mg/m³ (Total dust)

(1) As the product is designated as Group-2 Substances (Cobalt) under Ordinance on Prevention of Hazards due to Specified Chemical Substances (containing more than 1% of Cobalt), a working environment measurement for Cobalt at a working area dealing with the product shall be conducted.

(2) If a dusty work for the product falls into the "Specified dusty work" stipulated by Ordinance on Prevention of Hazards Due to Dust, a working environment measurement for dusts at such a dusty working area shall be conducted.

Facility measures



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The following facility measures shall be taken, and then the safety and hygiene controls shall be performed depending on the result of a working environment measurement for Cobalt.

As the product falls into Group-2 Substances (Cobalt) under Ordinance on Prevention of Hazards due to Specified Chemical Substances (referring to Section 15), use wholly enclosing facility for sealing a dust emission source, or install a local exhaust or Push-pull ventilation system in accordance with specific requirements of the Ordinance.

If a dusty work falls into the "Specified dusty work" stipulated by Ordinance on Prevention of Hazards Due to Dust, take facility measures for prevention of exposure to dusts in accordance with specific requirements of the Ordinance.

As the product contains substances which subject to be assessed for risk, required by Industrial Safety and Health Act, the risk assessment shall be conducted, and depending on the result, take necessary facility measures for protecting workers from health hazards.

To install an eye washing station, safety shower, gargling fountain, dressing room and washing facility for cloth.

Personal protection equipment

Respiratory protection

If the dust concentration (Cobalt concentration) in the air exceeds its administrative level even though taking these facility measures, use a suitable dust mask equipped with the national certificated filter of type RL2, RS2, DL2, DS2 or a more effective performance filter.

Hand protection

Depending on the result of the risk assessment, wear chemical-resistant and impervious gloves as necessary.

Consider the parameters specified by the glove manufacturer like the breakthrough time before use. Check during use that the gloves are still retaining their protective properties. If the gloves are damaged or tore, replace them.

For hygienic reasons rubber gloves should not be worn for more than 2 hours.

Eye protection

Safety glasses or goggles are recommended when handling this material.

Skin and body protection

Depending on the working conditions or possible risk, use long sleeved antistatic garments and antistatic safety shoes.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	:	Solid, Metal powder
Color	:	Gray
Odour	:	Odourless
Odour threshold	:	Not applicable
pH (20°C)	:	Not applicable



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Melting point (°C)	:	No data available
Boiling point, initial boiling point and boiling range (°C)	:	No data available
Flash point (°C)	:	No data available
Evaporation rate	:	No data available
Combustibility (solid, gas)	:	No data available Product does not sustain combustion. This product is categorized as Category II, Combustible solids (metal powders) under Fire Service Act.
Ignition/Explosion limit, Lower limit, Upper limit	:	No data available Find dust clouds may form explosive mixtures with air.
Vapour pressure (°C)	:	No data available
Vapour density	:	No data available
Density (g/cm³)	:	No data available
Bulk density (kg/m³)	:	No data available
Solubility	:	No data available
n-Octanol/water partition coefficient	:	Not applicable
Auto-ignition point (°C)	:	No data available
Decomposition point	:	No data available
Viscosity	:	Not applicable
Oxidizing property	:	No such property
Particle size	:	No data available

Reference: SDS with EU version for this product *1

10. STABILITY AND REACTIVITY

Chemical Stability

Stable under normal conditions and under recommended storage conditions.

Reactivity

No specific test data related to reactivity available for this product or its ingredients.

Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid



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Store and use away from heat, sparks, open flame or any other ignition source.

Incompatible materials

Avoid contact with combustible materials, acids, oxidising agents, halogenated hydrocarbons.

Hazardous decomposition products

None

11. TOXICOLOGICAL INFORMATION

Acute toxicity (oral)

【Product】Not classified

The alloy contains substances with unknown toxicity at 8.5% at most.

【Ingredient】

Nickel: Not classified (LD₅₀ (Rat))= 9000 mg/kg or higher, and 5000 mg/kg or higher *2

Cobalt: Not classified (LD₅₀ (Rat)) = 6171 mg/kg or higher, and 5000 mg/kg or higher *3

Acute toxicity (dermal)

【Product】Classification not possible due to lack of data.

Acute toxicity (Inhalation)

【Product】Classification not possible due to lack of data.

Product as shipped does not present inhalation hazard; however subsequent operations may create dusts or fumes which could be inhaled.

【Product】

Molybdenum: Not classified (Dust), in the inhalation study to Rats at 6.25~7.50mg/L (as a conversion value for 4 hours), no change was observed. (ACGIH) *4

Skin corrosion/irritation

【Product】Classification not possible due to lack of data.

Powders may cause skin irritation caused by their mechanical effect.

【Ingredient】

Molybdenum Category 2 (HSDB) *4

Serious eye damage/eye irritation

【Product】 : Classification not possible due to lack of data.

Powders and fumes may cause eye irritation caused by their mechanical effect.

【Ingredient】

Molybdenum Category 2 (HSDB) *4

Respiratory sensitization

【Product】Category 1

Since the alloy contains 1% or more of ingredients of Category 1, it is classified as Category 1.



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【Ingredient】

Nickel: Category 1 (JSOH, Group 2 of Occupational Airway Sensitizers) *2

Cobalt: Category 1 (JSOH, Group 2 of Occupational Airway Sensitizers) *3

Skin sensitization

【Product】Category 1

Since the alloy contains 1% or more of ingredients of Category 1, it is classified as Category 1.

【Ingredient】

Nickel Category 1 (JSOH, Group 1 of Occupational Skin Sensitizers) *2

Cobalt Category 1 (JSOH, Group 1 of Occupational Skin Sensitizers) *3

Germ cell mutagenicity

【Product】Classification not possible due to lack of data.

Carcinogenicity

【Product】Category 2

Since the alloy contains 1% or more of ingredients of Category 2, it is classified as Category 2.

【Ingredient】

Nickel Category 2(NTP, IARC) *2

Cobalt Category 2(IARC, ACGIH, JSOH) *3

Reproductive toxicity

【Product】Classification not possible due to lack of data.

Target organ systemic toxicity (Single exposure)

【Product】Category 1 (Respiratory system, Kidney), Category 3 (Respiratory tract irritation)

Since the alloy contains 10%-30% of Nickel of Category 1 (Respiratory system, Kidney), it is classified as Category 1(Respiratory system, Kidney)

Since the alloy contains total 20% of ingredients of Category 3 (Respiratory tract irritation) at most, it is classified as Category 3 (Respiratory tract irritation). Note: Category 3 can be applicable when handling powdery product with possible inhalation.

Powders and fumes may cause respiratory tract irritation caused by their mechanical effect.

【Ingredient】

Nickel Category 1(Respiratory system, Kidney) *2

Cobalt Category 3 (Respiratory tract irritation) *3

Molybdenum Category 3 (Respiratory tract irritation) *4

Target organ systemic toxicity (Repeated exposure)

【Product】Category 1 (Respiratory system, Cardiovascular system, Thyroid, Hematopoietic system)

Since the alloy contains 10%-30% of Nickel of Category 1 (Respiratory system) and at most 13% of Cobalt of Category 1 (Respiratory system, Cardiovascular system, Thyroid,



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Hematopoietic system), it is classified as Category 1 (Respiratory system, Cardiovascular system, Thyroid, Hematopoietic system). Note: The effect on the respiratory system can be applicable when handling powdery product with possible inhalation.

【Ingredient】

Nickel Category 1 (Respiratory system) *2

Cobalt Category 1 (Respiratory system, Cardiovascular system, Thyroid, Hematopoietic system) *3

Aspiration hazard

Not applicable

12. ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic hazard (acute) : 【Ingredient】
Cobalt Category 2, LC50 (Daphnia magna, 48h) = 4.4mg/l, LC50 (Fathead minnow, 96h) = 3.4mg/l
*1

Aquatic hazard (acute) : 【Product】Category 2 *1

Persistence and degradability : No data available

Bio-accumulative potential : Cobalt : BCF = 15600 *1

Mobility in soil : No data available

Hazard to the ozone layer : Not applicable. The ingredients of the product are not listed in annex of Montreal Protocol.

Additional information : Do not allow this product to enter drains.
Do not flush into surface water. Do not let product contaminate subsoil.

13. DISPOSAL CONSIDERATIONS

Residual product

Do not contaminate sewers, drains, soil or surface waters with this product.

Minimize a waste amount by attempting to use up the product completely.

Dispose of this container and its contents in accordance with Waste Management and Public Cleansing Act and local/prefectural regulations.

Contaminated container/packing

If there is a risk of the generation of airborne dusts coming from empty containers, take measures to prevent the dust formation.

Keep all of the empty containers at a specified storage place.

Do not reuse container for other purposes than storing this material.



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Dispose of a contaminated container/packing in accordance with Waste Management and Public Cleansing Act and local/prefectural regulations.

Additional information

Prior to disposal, it is recommended that you should consult your local waste disposal authority or an approved waste disposal firm to ensure regulatory compliance.

14. TRANSPORT INFORMATION

International regulations:

UN number	:	UN3077
UN proper shipping name	:	Environmentally hazardous substance, solid, n.o.s. (Cobalt)
UN class	:	9
Packing group	:	III
Marine pollutant	:	Yes
Transport in bulk according to Annex II of MARPOL73/78 and the IBC code	:	Not applicable

Domestic Japanese regulations

Land transport	:	Transport the product by following Fire Service Act, since classified as Category II, Combustible solids (metal powders) under the Act.
Marine transport	:	Transport the product by following Ship Safety Act, since classified as UN3077, Environmentally hazardous substance, solid, under the Act.
Air transport	:	Transport the product by following Civil Aeronautics Act, since classified as UN3077, Environmentally hazardous substance, solid, under the Act.

Emergency response guidance : 171

No.

Special safety measures : Always transport in closed containers that are upright and secure.
Load the product in a way that does not cause tumbling, falling or damaging.
Ensure to take measures to prevent load collapse.

15. REGULATORY INFORMATION

Industrial Safety and Health

Act : Nickel and its compounds (labelling (for metallic Nickel, only powdery state is applied): >=1wt%,



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Substance for labeling, etc. and deliver of documents, etc. (Article 57 and 57-2) and for risk assessment (Article 57-3)	SDS: $\geq 0.1\text{wt}\%$ Cobalt and its compounds (labelling (for metallic Cobalt, only powdery state is applied): $\geq 0.1\text{wt}\%$, SDS: $\geq 0.1\text{wt}\%$) Molybdenum and its compounds (labelling (for metallic Molybdenum, only powdery state is applied): $\geq 1\text{wt}\%$, SDS: $\geq 0.1\text{wt}\%$)
- Dangerous goods designated by Order of Industrial Safety and Health, Attached table.1	: '2. Combustible material No.12 (Metal powders excluding Manganese and Aluminum)'
- Ordinance on Prevention of Organic Solvent Poisoning	: Not applicable.
- Ordinance on Prevention of Hazards due to Specified Chemical Substances	: Group-2 Substances : Cobalt and its inorganic compounds (except from the case of 1% or less of Cobalt content and/or from the use of Cobalt and its inorganic compounds as catalyst)
- Ordinance on Prevention of Lead Poisoning	: Not applicable.
- Ordinance on Prevention of Hazards Due to Dust	: If a dusty work to be performed falls within a "dusty work (Table 1 and 2)" stipulated in this ordinance, handle the product in accordance with the ordinance. Especially the dusty works stipulated in table 2 should be monitored in accordance with Working Environment measurement Act.
Pneumoconiosis Act	: May be applicable if dust, fume generates.
Poison and Deleterious Substance Control Act	: Not applicable.
PRTR Act	: Class I Designated Chemical Substances : Nickel, Cobalt and its compounds, and Molybdenum and its compounds
Chemical Substances Control Law	: Not applicable. (this product does not contain Class I and II Specified Chemical Substances, Monitoring Chemical Substances, and Priority Assessment Chemical Substances)
Fire Service Act	: Category II, Combustible solids (metal powders)
Explosives Control Act	: Not applicable.
High Pressure Gas Safety Act	: Not applicable.
Ship Safety Act	: UN3077, Environmentally hazardous substance, solid
Civil Aeronautics Act	: UN3077, Environmentally hazardous substance, solid



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Basic Environment Act	Monitoring substances : Molybdenum Investigated substances : Cobalt and its compounds
Water Pollution Control Act	: Effluent standard : Dissolved iron Substances subject to taking emergency measures and reporting in the Event of Accident: Nickel and its compounds, Molybdenum and its compounds, and Iron and its compounds
Sewerage Act	: Restrictions on the Removal of Sewage from Specific Factories : Iron and its compounds (in dissolved states)
Air Pollution Control Act	: Hazardous air pollutants : Nickel and its compounds, Cobalt and its compounds, and Molybdenum and its compounds
Soil Contamination	: Not applicable.
Countermeasures Act	

16. OTHER INFORMATION

Reference:

- 1) SDS for LaserForm® Maraging Steel (A), EU version (Revised on Dec. 20, 2017, SDS revision No.: 00-A)
- 2) NITE classification for Nickel in Chemical Risk Information Platform (CHRIP)
- 3) NITE classification for Cobalt in Chemical Risk Information Platform (CHRIP)
- 4) NITE classification for Molybdenum in Chemical Risk Information Platform (CHRIP)

Classification was performed according to JIS Z7252: 2014. Description was performed according to JIS Z7253: 2012.

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