

Material Safety & Health Data Sheet

[This MSDS is compiled by the provisions of Korea's Industrial Safety and Health Law #41 specifies.]

1. Information about chemical product and manufacturer

- A. Product name 316L
(size : 0-15 μ m, 10-45(53) μ m, 15-45(53) μ m, 0-45(53) μ m, 45(53)-150 μ m, 45(53)-106 μ m)
- B. Recommended use of the chemical and restrictions on use
- a) Recommended use of the chemical No date
- b) Restrictions on use of the Product No date
- C. Manufacturer/Supplier/Distributor Information
- a) Name KOS GLOBAL,LTD.
- b) Address 25, Guryong-ro 4nam-gil, Uiryeong-eup, Gyeongsngnam-do, KOREA
- c) Emergency phone Number TEL : 82-55-570-8527
Fax : 82-55-570-8599

2. Hazards identification

- A. Hazard. Risk Classification
- Skin sensitization - Category 1
Carcinogenicity - Category 2
Specific target organ toxicity (repeated exposure) - Category 1
Chronic aquatic toxicity - Category 3
This material is considered hazardous by the OSHA hazard Communication Standard (29 CFR 1910.1200)
- B. Label elements including precautionary statements
- a) Symbol
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- b) Signal Word Danger
- c) Hazard. Risk Statement H317 May cause an allergic skin reaction
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

- H351 Suspected of causing cancer of lungs and respiratory tract.
 H372 Causes damage to organs (respiratory tract and lungs) through prolonged or repeated exposure by inhalation.

C. Precautionary Statement

- a) Precautionary
- P201 Obtain special instructions before use.
 P260 Do not breathe dust/fume/gas/mist/ vapourous/spray.
 P280 Wear protective gloves/protective clothing/eye protection/ face protection.
 P285 In case of inadequate ventilation wear respiratory protection.
- b) Response
- P302+P352 If on skin : Wash with plenty of soap and water.
 P304+P341 If inhaled : If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
 P308+P313 If exposed or concerned : Get medical advice/attention.
 P342+P311 If experiencing respiratory symptoms : Call a poison center or doctor/physician.
- c) Storage
- P405 Store locked up.
- d) Disposal
- P504 Dispose of contents/container in accordance with local/ regional/national/international regulations.
- e) Supplemental label elements
- No date.

3.Composition/Information on ingredients

Chemical Name	Other Name	CAS Number	Content((%)
Ni	Nickel	7440-02-0	12.5 ~ 13
Cr	Chromium	7440-47-3	17.5 ~ 18
Fe	Iron	7439-89-6	63 ~ 65
Mo	Molybdenum	7439-98-7	2.25 ~ 2.5

4.First aid measures

A. Eye contact

Do not rub eye and immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Get prompt medical attention.

B. Skin contact

Wash thoroughly with soap and water. Remove and properly dispose or launder contaminated clothing before wearing it again. Clean material from shoes and equipment. Seek medical attention.

C. Inhalation

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt.

D. Ingestion

Do not induce vomiting! Rinse mouth out and then drink plenty of water. Get medical attention if discomfort occurs.

5. Fire-Fighting measures

A. Suitable (and unsuitable) extinguishing media

Use approved Class D extinguisher or smother with dry sand, dry clay, dry limestone.

Do not use water, Carbon dioxide or Halon.

B. Special protective equipment and precautions for fire-fighters

Wear breathing protection in the presence of dust and suitable antistatic garments.

6. Accidental release measures

A. Personal precautions, protective equipment and emergency procedures

Contact emergency personnel. Wear appropriate protective equipment and clothing. Remove all sources of ignition.

B. Environmental precautions and protective procedures

Prevent from entering sewers or drainage system and contaminating ground.

C. Methods and materials for containment and cleaning up

Do not use compressed air to clean spills. Use non-sparking to clean up. Do not push powder long distances across the floor. Keep in small piles away from each other. Place collected material into non-sparking or anti-static containers, containing large quantities of sand, or other appropriate heat dissipation materials.

The use of plastic bags is not recommended, due to potential for static electricity build-up (inside plastic bags)

7. Handling and storage

A. Precautions for safe handling

Ensure good dust ventilation during handling. If necessary, use local exhaust ventilation. Use non-sparking tools when opening or closing containers. Avoid sources of sparks or other sources of ignition i.e. no grinding - naked flames - smoking etc. Protect against static electricity. HEPA vacuuming is recommended to clean up any dusts that may be generated during handling and processing. Use personal protective equipment, see Section 8. Avoid generation of dust clouds. Wash hands and face thoroughly before eating, drinking or smoking. Keep powder away from open flames and other sources of ignition. Maintain a supply of "coarse" salt and/or Class D fire extinguisher located near processing and storage area. Keep work areas clean and free of waste and minimise dust accumulation on surfaces. Standard industrial vacuum systems should not be used for cleaning.

B. Conditions for safe storage

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Container that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate container to avoid environmental contamination.

8. Exposure controls & personal protection

A. Control parameters (e.g. occupational exposure limit values, biological limit values)

a) Internal Regulations	No Data			
b) ACGIH Regular	Nickel	1.5 mg/m ³		
	Chromium	0.5 mg/m ³		
	Molybdenum	Inhalable fraction	10 mg/m ³	
		Respirable fraction	3 mg/m ³	
c) Biological exposure	No Data			

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d) OSHA/PEL Regular	Nickel	1 mg/m ³
	Chromium	1 mg/m ³

B. Appropriate engineering controls

Use process isolation, ventilation or another engineering management to lower level of air under leakage threshold.

Facilities which storage and use this material installs cleansing and shower devices.

C. Personal protective equipment

- a) Respiratory protection Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- b) Eye protection Wear safety glasses or chemical goggles.
- c) Hand protection Use impervious nitrile gloves.
- d) Body protection Use long sleeved antistatic garments and closed, antistatic safety shoes.
- e) Control parameters Measures to prevent exposure
Install and operate general and/or local exhaust ventilation systems of sufficient power to maintain airborne concentration below the defined or recommended limit.
Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Do not blow dust off clothing or skin with compressed air. Wash hands after handling and before eating, smoking and using the lavatory and at the end of the day.

9. Physical and chemical properties

A. Appearance

- a) physical state Solid metallic powder
- b) color Gray

B. Odour

Odourless

C. Odour threshold

No Data

D. pH

No Data

E. Melting point/freezing point	1370-1455 °C
F. Initial boiling point and boiling range	No Data
G. Flash point	No Data
H. Evaporation rate	No Data
I. Flammability (solid, gas)	No Data
J. Upper/lower flammability or explosive limits	No Data
K. Vapor pressure	No Data
L. Solubility	Insoluble
M. Vapor density	No Data
N. Relative density	8 g/cm ³
O. Partition coefficient n-octanol/water	No Data
P. Auto-ignition temperature	No Data
Q. Decomposition temperature	No Data

R. Viscosity

No Data

S. Molecular mass

No Data

10. Stability and reactivity

A. Chemical stability and possibility of hazardous reactions

Stable under normal conditions and under recommended storage conditions.

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

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

B. Conditions to avoid (e.g. static discharge, shock or vibration, etc)

Prevent formation of dust clouds and accumulation of fines.

C. Incompatible materials

Oxidizing agents, strong acids and strong bases, halogenated hydrocarbons and other combustible materials.

D. Hazardous decomposition products

No data

11. Toxicological information

A. Information on the likely routes of exposure

No data

B. Health hazards information

Acute toxic No data

a) Oral No data

b) Percutaneous No data

c) Inhalation No data

d) Skin corrosive/ irritant No data

e) Serious eye damage/
eye irritation No data

f) Respiratory sensitization No data

g) Skin sensitization May cause sensitization by skin contact.

h) Carcinogenicity May cause cancer. Risk of cancer depends on duration and level of expo

- i) Germ Cell Mutagenicity No data
- j) Specific target organ No data
toxicity(single exposure)
- k) Specific target organ No data
toxicity(repeated exposure)
- l) Aspiration hazard No data

12. Ecological information

A. Aquatic and terrestrial ecotoxicity

- a) Fishes No data
- b) Crustacean No data
- c) Birds No data

B. Persistence and degradability

- a) Persistence No data
- b) Degradability No data

C. Bioaccumulative potential

- a) Accumulation No data
- b) Biodegradable No data

D. Mobility in soil

No data

E. Other adverse effects

No data

13. Disposal considerations

A. Disposal method

Dispose of this container and its contents in accordance with all local, state, and federal regulations.

B. Disposal precaution

Dispose of contents/container to specified contents in relevant regulation

14. Transport information

A. UN number

Not regulated (IATA/IMDG)

B. UN proper shipping name

Not regulated (IATA/IMDG)

C. Transport hazard class

Not regulated (IATA/IMDG)

D. Packing group

Not regulated (IATA/IMDG)

E. Marine pollution (yes/no)

Not Applicable

F. Special precaution which a user to transport or conveyance either within or outside their premises be aware of or needs to comply with in connection with

a) In case of fire emergency Not Applicable

b) Emergency procedure in spill Not Applicable

15. Regulatory information

A. Industrial Safety and Health Act

Material of Working Environment Measurement(measuring period:Month)
Material of Exposure Criteria set-up

B. Toxic Chemical Control Act

Not Applicable

C. Dangerous Material Safety Control Act

Not Applicable

D. Wastes Management Act

specified waste

E. Other requirements in domestic and other countries

regulation of Domestic

a) Persistent organic pollutant management Act Not Applicable

Regulation of foreign

a) TSCA Regulation (American's) Not Applicable

b) SARA 302 EHS Reg` (American's) Not Applicable

c) SARA 313 Reg' (American's)	Nickel, Chromium
d) CERCLA (American's)	Nickel, Chromium
e) Decide Classification Resu (EU)	Not Applicable
f) Hazard Statement (EU)	Not Applicable
g) Safety Statement (EU)	Not Applicable
h) Industrial Health and Safety Law (Japanese)	Dangerous substances (Combustible substances : Titanium powder, Aluminium powder)
i) Fire Services Act (Japanese)	Flammable solid
j) Explosives Law (Japanese)	Explosive dust
k) Ship Safety Act (Japanese)	Combustible material, pyrophoric substance
l) Aviation Law (Japanese)	Transport ban, combusible material, pyrophoric substance
m) Waste Disposal and Public Cleaning Law (Japanese)	Befor disposal, consult an approved waste disposal operative to ensure regulatory compliance.

16. Other information

A. Information source and references

This MSDS is compiled by the provisions of Korea`s Occupational Safety & healt Agency.

B. Issuing date

Dec-08-2021

C. Revision number and date

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|---------------------------|-------------|
| a) Revision number | 1 |
| b) Revision data of Final | Apr-19-2022 |

D. others

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|------------------------|--|
| a) Writing | KOS GLOBAL,LTD. Quality Assurance Team |
| b) Review of Technical | |