

according to Regulation (EC) No 1907/2006 and 1272/2008, Hazard Communication Standard 29 CFR 1910 (USA), WHS Regulations Australia, JIS Z 7253 (2012) Japan

LaserForm[®] Ni718 Type A

Revision Date: November 22nd, 2016

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

1.1 Identification of the mixture: Nickel Alloy

1.2 Type:

Nickel based superalloy Contains the following substances with hazardous properties: Nickel

1.3 Use of the preparation: For use with ProX[®] DMP 320 printers

1.4 Uses advised against:

Use of nickel in articles intended for direct and prolonged contact with the skin where the release of nickel exceeds the limit set out in Directives 94/27/EC and 2004/6/EC and REACH regulation 1907/2009 (Annex XVII).

Use of nickel in nickel-containing food contact materials for which migration into foodstuff would exceed more than 0.1 mg/kg of nickel in accordance with the Council of Europe Guidelines on metals and alloys used as food contact materials

Use of nickel in immersion-type kettles which would release more than 0.05 mg/l of nickel into the water in accordance with the Council of Europe Guidelines on metals and alloys used as food contact materials.

Use of nickel in commercially available "do-it-yourself" home electroplating kits.

1.5 Company/undertaking identification:

3D Systems, Inc. 333 Three D Systems Circle Rock Hill, South Carolina U.S.A. Phone: 803.326.3900 or Toll-free Phone: 800.793.3669 e-mail: moreinfo@3dsystems.com Chemical Emergency: 800.424.9300 – Chemtrec

3D Systems Europe Ltd. Mark House, Mark Road Hemel Hempstead Herts HP2 7 United Kingdom Phone: +44 144-2282600 e-mail: moreinfo@3dsystems.com Chemical Emergency: 703.527.3887 - Chemtrec 3D Systems / Australia 5 Lynch Street Hawthorn, VIC 3122 +1 03 9819-4422 e-mail: moreinfo@3dsystems.com Chemical Emergency: +(61) 29037.2994 – Aus Chemtrec

2. HAZARDS IDENTIFICATION

2.1 Classification

GHS Classification

Regulation (EC) No. 1272/2008, HazCom 29 CFD 1910:

Carcinogenicity	Category 2	H351
Skin Sensitization	Category 1	H317
Aquatic environment - long term hazard	Category 3	H412
Specific target organ toxicity-repeated exposure	Category 1	H372

Regulation (EC) 67/548/EEC and 1999/45/EC:

T; R48/23 Xn; R40 Xi; R43 R52/53

2.2 Label Elements

Hazard pictograms and signal word (Regulation (EC) No. 1272/2008):





LaserForm[®] Ni718 Type A Revision Date: November 22nd, 2016

Hazard determining components of labelling:

Hazard statements:

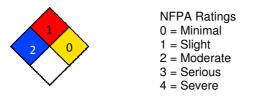
H317:	May cause an allergic skin reaction
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- H351: Suspected of causing cancer
- Causes damage to organs through prolonged or repeated exposure H372:
- H412: Harmful to aquatic life with long lasting effects

Precautionary statements:

P201: P202:	Obtain special instructions before use
	Do not handle until all safety precautions have been read and understood.
P260:	Do not breathe dust.
P270:	Do not eat, drink or smoke when using this product.
P271:	Use only 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:	Wear respiratory protection.
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.
P314:	Get medical advice/attention if you feel unwell.
P333 + P313:	If skin irritation occurs: Get medical advice/attention.
P362 + P364:	Take off contaminated clothing and wash before reuse.

NFPA rating



Hazardous Materials Identification System (HMIS):

(Degree of hazard: 0 = low, 4 = extreme);

Health	2	
Flammability	2	
Physical Hazards	0	

Personal Protection: Skin, eye protection

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Chemical characterization:

Description: Metallic alloy powder



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LaserForm[®] Ni718 Type A

Revision Date: November 22nd, 2016

3.2 Dangerous components:

				C	lassification
Chemical name	CAS-No	EC-No	%	Regulation 67/548/EEG or 1999/45/EG	Regulation (EC) No. 1272/2008
Nickel	7440-02-0	231-111-4	50-55	R40 R43 R48/23 R52/53 T	Carc.2, H351 Skin Sens. 1, H 317 STOT RE 1, H372 Aqu.Chron. 3, H412
Chromium	7440-47-3	231-157-5	17-21	Not Applicable	Not Applicable
Iron	7439-89-6	231-096-4	13-24	R11	Flam. Sol. 1, H228
Molybdenum	7439-98-7	231-107-2	2.5-3.5	Not Applicable	Not Applicable
Niobium	7440-03-1	231-113-5	4.5-5.5	R17 F	Pyr. Sol. 1, H250
Cobalt	7440-48-4	231-158-0	≤1	R42/43 R53	Resp. Sens 1, H334 Skin Sens. 1, H 317 Aqu. Chron. 4, H413
Manganese	7439-96-5	231-105-1	≤0.35	R11 R15 F	Water react. 1, H260

4. FIRST AID MEASURES

4.1 General Information: Ensure that eyewash stations and safety showers are close to the workstation location.

4.2 Description of First Aid Measures

Skin contact: Wash off thoroughly with soap and water. If rash develops, seek medical attention.

Eye contact: Irrigate thoroughly with water, including under the eyelids, for at least 10-20 minutes. Obtain medical attention if irritation persists.

Inhalation: Move affected person to fresh air, rest and keep warm. In severe cases, if exposure has been great, or if respiratory irritation occurs, obtain medical attention.

Ingestion: Wash out mouth thoroughly with water. Obtain medical attention if further symptoms develop.

4.2 Most important symptoms and effects, both acute and delayed

Skin Contact: Rash may develop.

Eye Contact: Mechanical irritation.

Inhalation: Possible asthma like symptoms.

Ingestion: No information

4.3 Indications of any immediate medical attention and special treatment needed

Skin Contact: Treat symptomatically Eye Contact: Treat symptomatically Inhalation: Treat symptomatically

4.6 Self-protection of the first aider: Put on appropriate protective equipment (see section 8). Move exposed person to fresh air.

5. FIRE-FIGHTING MEASURES

5.1. Suitable extinguishing media: The product itself is not flammable. Adapt extinguishing measures to surroundings. Use extinguishing type D powder or sand if available.



LaserForm[®] Ni718 Type A

Revision Date: November 22nd, 2016

5.2 Extinguishing media which must not be used for safety reasons: High volume water jet.

5.3 Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases: increased fire hazard during dust formation.

5.4 Special protective equipment for fire-fighters: breathing protection in the presence of dust.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions: Keep unnecessary personnel away. Wear appropriate protective equipment and clothing.

6.2 Environmental precautions: Take precautions to ensure product does not contaminate ground or enter the sewer or drainage system.

6.3 Methods for cleaning up:

Wear appropriate protective equipment and clothing.

For containment:	not applicable
For cleaning up small spillage:	vacuum with equipment fitted with HEPA or immersion filtration.
For cleaning up large spillage:	solids should be carefully transferred to salvage containers. Any residues should be treated as small spillages.
Other information:	no information.

7. HANDLING AND STORAGE

7.1 Pre	ecautions for safe handling Protective measures:	Work u	sing a suitable extraction/ventilation system.	
	Measures to prevent fire:	Not app	licable.	
	Measures to protect the environment: Use appr		propriate containment to avoid environmental hazard.	
Wash hand and face thorough		contact with skin and eyes. Do not breathe dust. hand and face thoroughly after working with material. hinated clothing should be removed and washed re-use.		
7.2 Co	nditions for safe storage Technical measures and storage conditions	6:	Store in sealed container in dry conditions and keep the container closed when not in use.	
	Packaging materials:		Keep in the container supplied, or suitable metal, plastic or polythene container.	
	Requirements for storage rooms and vesse	els:	Containers should be stored under cover in a clean and dry environment	
	Storage class:		Not applicable.	
	Further information on storage conditions:		Local regulations should be followed regarding the storage of this material.	



LaserForm[®] Ni718 Type A

Revision Date: November 22nd, 2016

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Exposure limit values:

Exposure limits	OSHA/PEL	ACGIH/TLV
Nickel	1mg/m ³	1.5mg/m ³
Chromium	1 mg/m ³	0.5 mg/m ³
Iron	No exposure	limit established
Molybdenum	15 mg/m ³ *	10 mg/m ³ **
Niobium	No exposure	limit established
Cobalt	0.1 mg/m ³	0.02 mg/m ³
Manganese	5 mg/m ³	0.2 mg/m ³

* insoluble compounds, total dust

** insoluble compounds, inhalable

8.2 Exposure controls

Technical measures to prevent exposure:

Ensure adequate ventilation to maintain exposures below occupational limits. Whenever possible the use of local exhaust explosion proof ventilation or other engineering controls is the preferred method of controlling exposure to airborne dust and fume to meet established occupational exposure limits. Use good housekeeping and sanitation practices. 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.

Instructual measures to prevent exposure:

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.

Personal protection equipment:

Respiratory protection: If ventilation cannot effectively keep dust concentrations below established limits, appropriate certified respiratory protection must be provided. Use a dust mask or filter apparatus of minimal level FFP3.

Hand protection: Use impervious nitrile gloves.

Eye protection: Wear safety glasses or chemical goggles.

Body protection: Use long sleeved antistatic garments and closed, antistatic safety shoes.





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LaserForm[®] Ni718 Type A

Revision Date: November 22nd, 2016

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Appearance:

Physical state: Powder Colour: Gray Odour: Odourless

9.2 Important health, safety and environmental information

pH (20 °C): Melting point/range (°C):	NA 1354 - 1413
Boiling point/range (°C):	No Data
Flash point (°C):	No Data
Ignition temperature (°C):	No Data
Vapour pressure (°C):	No Data
Density (g/cm3):	8.19
Bulk density (kg/m3):	No Data
Water solubility (20°C in g/l):	No Data
Viscosity:	NA
Auto-ignition temperature:	No Data
Decomposition temperature:	No Data
Dust explosion hazard:	No Data
Explosive properties	No Data
Oxidising properties	No Data
Particle size	100% <1mm

10. STABILITY AND REACTIVITY

10.1 Chemical Stability: Stable under normal conditions and under recommended storage conditions

10.2 Reactivity: No data.

- 10.3 Possibility of hazardous reactions: No Data
- 10.4 Conditions to avoid: Prevent formation of dust clouds and accumulation of fines.
- 10.5 Incompatible materials: oxidizing agents. strong acids and strong bases.
- 10.6 Hazardous decomposition products: No data.

11. TOXICOLOGICAL INFORMATION

11.1 Likely Routes of Exposure:

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

11.2 Symptoms of Exposure:

Fines/dusts may irritate skin and eyes.



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LaserForm[®] Ni718 Type A

Revision Date: November 22nd, 2016

11.2 Acute and chronic effects:

Nickel: The most common harmful health effect of metallic nickel in humans is an allergic skin reaction in those who are sensitive to nickel. Although nickel compounds are known human carcinogens, the evidence suggests that the relatively insoluble metallic nickel is less likely to present a carcinogenic hazard than are the nickel compounds that tend to release proportionately more nickel ion.

Chromium: Although much is known about the health effects of chromium compounds, the health effects of chromium metal, Cr(0), is not well studied. Due to insolubility most elements in their metallic state are not considered to be serious health hazards.

Iron: Irritating to the respiratory tract, iron compounds may cause pulmonary fibrosis if dusts are inhaled. Inhalation of large amounts may cause iron pneumoconiosis. Chronic inhalation of finely divided powder may cause chronic iron poisoning and pathological deposition of iron in the body tissue. Ingestion may cause vomiting, diarrhea, pink urine, black stool, and liver damage. Iron compounds may also cause damage to the kidneys.

Molybdenum: No data

Tungsten: No data

Niobium: No data

Cobalt: Acute exposure to cobalt metal dusts or fumes is characterized by irritation to the eyes, and to a lesser extent, irritation to the skin. Chronic exposure to cobalt metal dust or fumes may cause respiratory and dermatologic signs and symptoms. Chronic exposure to cobalt by inhalation in humans results in effects on the respiratory system, such as respiratory irritation, wheezing, asthma, decreased lung function, pneumonia, and fibrosis.

Manganese: Chronic inhalation exposure of humans to high levels of manganese may result in a syndrome called manganism which typically begins with feelings of weakness and lethargy and progresses to other symptoms such as gait disturbances, clumsiness, tremors, speech disturbances, a mask-like facial expression and psychological disturbances. Manganese is an essential micronutrient in humans.

Acute Toxicity: No data

Carcinogenicity:

Nickel: NTP: R - reasonably anticipated to be a human carcinogen; IARC: 2B - possibly carcinogenic to humans

Cobalt: **NTP**: R - reasonably anticipated to be a human carcinogen; **IARC**: 2B - possibly carcinogenic to humans

To the best of our knowledge the chemical, physical and toxicological characteristics of the substance are not fully known.



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LaserForm[®] Ni718 Type A

Revision Date: November 22nd, 2016

- 12. Ecological information
- 12.1. Toxicity

Long-term Ecotoxicity May cause long-term adverse effects in the aquatic environment 12.2. Persistence and degradability No data available **Abiotic Degradation** Physical-and photo-chemical elimination No data available Biodegradation Not readily biodegradable. 12.3. Bioccumulative potential **Bioconcentration factor (BCF)** No data available 12.4. Mobility in soil Known or predicted distribution to environmental compartments No data Adsorption/Desorption No data available 12.7 Additional information

Do not allow product to enter drains. Do not flush into surface water. Do not let product contaminate subsoil.

13. DISPOSAL CONSIDERATIONS

13.1 Appropriate disposal / **Product:** Do not contaminate sewers, drains, soil or surface waters with this material. Reduce waste by attempting to utilize product completely. Dispose of this container and its contents in accordance with all local, state, and federal regulations.

13.2 Packaging disposal: Consult local and national guidelines for the disposal of discarded packaging.

13.3 Additional information: Prior to disposal 3D Systems recommends consulting your local waste disposal authority or an approved waste disposal firm to ensure regulatory compliance.

14. TRANSPORT INFORMATION

UN Number	None
UN proper shipping name	Not classified hazardous for transport
Transport hazard class(es)	Not applicable
Packing group	Not applicable
Label(s)	Not applicable
Environmental hazards	None
Special precautions for user	Always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.



LaserForm[®] Ni718 Type A

Revision Date: November 22nd, 2016

15. REGULATORY INFORMATION

15.1 EU regulations

EINEC/ELINCS/NLP: All materials are listed REACH Annex XVII: None listed

15.2. US FEDERAL

TSCA 8(a) CDR Exempt/Partial exemption: Not determined United States inventory (TSCA 8b): All components are listed or exempted SARA 302/304: No products were found. SARA 311/312: Hazards identification: Immediate (acute) health hazard, Delayed (chronic) health hazard Clean Water Act (CWA) 307: chromium; Nickel

15.3 Canada

WHMIS:	Class D-2A: Material causing other toxic effects (Very toxic).
	Class D-2B: Material causing other toxic effects (Toxic).
NPRI:	The following components are listed: Cobalt (and its compounds); Chromium (and its
	compounds)

15.4 Australian regulations

SUSDP, Industrial Chemicals Act 1989: Australian Inventory of Chemical Substances, AICS: Listed

15.5 Japanese regulations

Chemical Substance:	Pneumoconiosis Act Dust Disability Prevention Rules
Components:	
Cobalt:	ISHL: Cobalt and its compounds, Deliver of Documents, etc. Articles 57-2.18-2 (MSDS), Table 9-172, ≥0.1% Cobalt and its inorganic compounds, Labeling, etc. Articles 57.18.Table 9-04, ≥0.1%
	Cobalt and its inorganic compounds, Eabeling, etc. Anticles 37.18. Table 9-04, 20.1% Cobalt and its inorganic compounds, Specific Chemical Substances Disability Prevention Rules, 13-2
	PRTR: Cobalt and its compounds, Designated Class I Substance, I-132 (previously 1- 100), ≥1%
	Ship Safety Act: Combustible material, Pyrophoric substance Combustible material, Flammable substance
	Aviation Law: Transport ban; combustible material, pyrophoric substance (194-1) Clean Air Act: Cobalt and its compound, Hazardous Air Pollutants/ No. 60 of Environmental Council 9th report
	Labor Standards Act: Cobalt and its compounds, Rule No. 75-2
Chromium:	Water Pollution Control Law: Designated Substance PRTR: Chromium and Chromium(III) compounds, Designated Class I Substance, I-87, ≥1% ISHL: Chromium and Chromium(III) compounds, Articles 57-2 and 18-2, Table 9-142,
	≥0.1% Air Pollution Control Law: Hazardous Air Pollutants/Priority Initiative No. 49 Waste Disposal and Public Cleaning Law: Article 29
Nickel:	Water Pollution Control Law: Designated Substance PRTR: Nickel, Designated Class I Substance, I-308 ISHL: Nickel and its compounds, Articles 57-2 and 18-2, Table 9-418, ≥0.1% Specific Chemical Substances Disability Prevention Rules: Nickel compounds, 2-23 Clean Air Act: Hazardous Air Pollutants, No. 148 Labor Standards Act: carcinogenic substance (cancer of the upper respiratory tract or lung from working in the smelting or refining of nickel)



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LaserForm[®] Ni718 Type A

Revision Date: November 22nd, 2016

Manganese:	PRTR: Manganese and its compounds, Designated Class I Substance, I-412, ≥1% ISHL: Manganese and its compounds, Articles 57-2 and 18-2, Table 9-550, ≥1% Water Pollution Control Law: Designated Substance Specific Chemical Substances Disability Prevention Rules: Designated Substance, 2- 33 Clean Air Act: Hazardous Air Pollutants, No. 225
Molybdenum:	Water Pollution Control Law: Designated Substance Clean Air Act: Hazardous Air Pollutants, No. 243

OTHER INFORMATION

16.1 Relevant Hazard and Precautionary Statements (number and full text) referred to in sections 2 and 3 (according to (EC) No. 1272/2008):

Skin sens. 1, H 317- Skin sensitization, category 1, H317: May cause an allergic skin reaction

Carc.2, H351- Carcinogenicity, category 2, H351: Suspected of causing cancer

STOT RE 1, H372- Specific target organ toxicity-repeated exposure, category 1, H372: Causes damage to organs through prolonged or repeated exposure

Aqu.Chron. 3, H412- Aquatic environment - long-term hazard, category 3, H412: Harmful to aquatic life with long lasting effects

Flam. Sol. 1, H228- Flammable solids, category, H228: Flammable solid

Pyr. Sol. 1, H250- Pyrophoric solids (liquids), category 1, H250: Catches fire spontaneously if exposed to air Resp. Sens 1, H334- Sensitisation, respiratory, category 1, H334: May cause allergy or asthma symptoms ot breathing difficulties if inhaled

Water react. 1, H260- Emission of flammable gases in contact with water, category 1, H260: In contact with water releases flammable gases which may ignite spontaneously

Aqu. Chron. 4, H413- Aquatic environment - long-term hazard, category 4, H413: May cause long lasting harmful effects in the aquatic life

Relevant Precautionary statements (number and full text) referred to in sections 2 and 3 (according to (EC) No. 1272/2008):

(EC) No. 1272/2008):	
Obtain special instructions before use	
Do not handle until all safety precautions have been read and understood.	
Do not breathe dust.	
Do not eat, drink or smoke when using this product.	
Use only in a well-ventilated area.	
Contaminated work clothing should not be allowed out of the workplace.	
Avoid release to the environment	
Wear protective gloves/protective clothing/eye protection/face protection.	
Wear respiratory protection.	
IF ON SKIN: Wash with plenty of soap and water.	
IF INHALED: Remove person to fresh air and keep comfortable for breathing.	
Get medical advice/attention if you feel unwell.	
If skin irritation occurs: Get medical advice/attention.	
Take off contaminated clothing and wash before reuse.	

Relevant R-Phrases (number and full text) referred to in sections 2 and 3 (according to (EC) 67/548/EEC and 1999/45/EC):

T: Toxic

Xn: Harmfull

Xi : Irritant

R40 : Limited evidence of a carcinogenic effect

R48/23 : Danger of serious damage to health by prolonged exposure, Toxic by inhalation

R43 : May cause sensitisation by skin contact

R52/53 : Harmful to aquatic organisms, May cause long-term adverse effects in the aquatic environment

R11: Highly flammable

R17: Spontaneously flammable in air

R42/43: May cause sensitization by inhalation and skin contact

R15: Contact with water liberates extremely flammable gases



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LaserForm[®] Ni718 Type A

Revision Date: November 22nd, 2016

16.2 Further information:

SDS Creation Date:......November 5th, 2015 SDS Revision #:00-C SDS Revision Date:......November 22nd, 2016 Reason for Revision: Added additional P-phrases in accordance to GHS rev 6; Updated 3DSystems logo

www.3dsystems.com

800.793.3669 (Toll-free in the US GMT-07:00; N. America, Mon – Fri, 6:00 a.m. to 6 p.m.) 803.326.3900 (Outside the U.S. GMT-07:00; N. America, Mon – Fri, 6:00 a.m. to 6 p.m.) +44 144-2282600 (Europe GMT+01:00; Mon – Fri, 08:00 a.m. - 17:00 p.m. MEZ)

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