

Product name:
Ingeo™ biopolymer
Product code:
3D850

Revision Number: 3

Revision date:
10/14/2016

Print date:
10/14/2016

SAFETY DATA SHEET

Regulation (EC) No. 1907/2006 COMMISSION REGULATION (EU) No. 830/2015 of 20 May 2015

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name: Ingeo™ biopolymer
Product code: 3D850

1.2. Relevant identified uses of the substance or mixture and uses advised against

Product Use:
A biopolymer to be used in 3D printing applications.

1.3. Details of the supplier of the safety data sheet

Supplier:
NatureWorks LLC
15305 Minnetonka Blvd
Minnetonka, MN 55345

sdsinquiry@natureworksllc.com
952-562-3450

1.4. Emergency telephone number

Emergency telephone numbers (24 hours a day):
(Medical Information) (651) 632-9273
(Transportation Information) CHEMTREC: 800-424-9300 (in the United States)
(Transportation Information) CHEMTREC: (703) 527-3887 (outside the United States)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification: Not classified

2.2. Label elements

Symbols/Pictograms: None
Signal word: None
Hazard Statements: None

The information in this Safety Data Sheet (SDS) is provided in good faith and believed to be accurate. This SDS contains a general summary of hazards known to NatureWorks, but does not purport to describe every hazard that exists. NatureWorks and its subsidiaries ("NatureWorks") expect each customer or user of its products (each, a "User") to study this SDS carefully and consult appropriate expertise to become aware of any hazards associated with NatureWorks products. NATUREWORKS MAKES NO WARRANTY, EXPRESS OR IMPLIED, REGARDING THE INFORMATION CONTAINED HEREIN OR ITS PRODUCTS, INCLUDING BUT NOT LIMITED TO ANY WARRANTY AS TO ACCURACY OR COMPLETENESS OF INFORMATION, OR ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

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Precautionary Statements None

2.3. Other hazards

No information available

SECTION 3: Composition/information on ingredients

Chemical name and CAS	Weight %
Poly lactide resin 9051-89-2	>98

Other standards: This material can generate Particulates Not Otherwise Classifiable (PNOC). The Occupational Safety and Health Administration (OSHA) PEL/TWA for PNOC is 15 mg/m³ for total dust and 5 mg/m³ for the respirable fraction. The American Conference of Governmental Industrial Hygienists (ACGIH) TLV/TWA for PNOC is 10 mg/m³ for inhalable particulates and 3 mg/m³ for respirable particulates.

Additional Information: No information available

SECTION 4: First aid measures

Emergency telephone numbers (24 hours a day):

- (Medical Information) (651) 632-9273
- (Transportation Information) CHEMTREC: 800-424-9300 (in the United States)
- (Transportation Information) CHEMTREC: (703) 527-3887 (outside the United States)

4.1. Description of first aid measures

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes Call a physician immediately

Skin contact: Adverse effects are not expected from accidental skin contact following occupational exposure. After contact with skin, wash immediately with plenty of water. If skin irritation persists, call a physician. Cool skin rapidly with cold water after contact with hot polymer. DO NOT attempt to remove hot polymer from skin or contaminated clothing as skin may be easily damaged. Call a physician immediately

Inhalation: Move to fresh air. Call a physician immediately

Ingestion: Drink water as a precaution. Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice. Call a physician immediately

Notes to physician: Treat symptomatically

4.2. Most important symptoms and effects, both acute and delayed

No information available

4.3. Indication of any immediate medical attention and special treatment needed

No information available

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SECTION 5: Firefighting measures

Flammability:

Autoignition temperature: 388C

Flammability Limits in Air:

Flammable limits in air - lower (%): Not applicable

Flammable limits in air - upper (%): Not applicable

5.1. Extinguishing media

Suitable extinguishing media: Foam. Water. Carbon dioxide (CO₂). Dry chemical. Alcohol resistant foams are preferred if available. General-purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively.

Unsuitable extinguishing media - None known

5.2. Special hazards arising from the substance or mixture

Burning produces obnoxious and toxic fumes Aldehydes, Carbon monoxide (CO), carbon dioxide (CO₂)

5.3. Advice for firefighters

Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

Under fire conditions: Cool containers / tanks with water spray Water mist may be used to cool closed containers Fine dust dispersed in air may ignite. Risks of ignition followed by flame propagation or secondary explosions shall be prevented by avoiding accumulation of dust, e.g. on floors and ledges.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Use personal protective equipment as required
- Avoid contact with skin and eyes
- Avoid dust formation
- Remove all sources of ignition
- Sweep up to prevent slipping hazard

6.1.2. For emergency responders

- Use with proper personal protective equipment (see Section 8).

6.2. Environmental precautions

- Do not flush into surface water or sanitary sewer system
- Do not allow material to contaminate ground water system.

6.3. Methods and material for containment and cleaning up

- Clean up promptly by scoop or vacuum.
- Sweep up and shovel into suitable containers for disposal

6.4. Reference to other sections

- No information available

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Use personal protective equipment as required
- Avoid contact with skin and eyes
- Low hazard for usual industrial or commercial handling
- Workers should be protected from the possibility of contact with molten material during fabrication
- Avoid dust formation
- If small particles are generated during further processing, handling, or by other means, combustible dust concentrations in air may form

7.2. Conditions for safe storage, including any incompatibilities

- Store at temperatures not exceeding 50 °C/ 122 °F. Keep cool
- No special restrictions on storage with other products.

7.3. Specific end use(s)

- No data available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

- None established.
- This material can generate Particulates Not Otherwise Classifiable (PNOC). The Occupational Safety and Health Administration (OSHA) PEL/TWA for PNOC is 15 mg/m³ for total dust and 5 mg/m³ for the respirable fraction. The American Conference of Governmental Industrial Hygienists (ACGIH) TLV/TWA for PNOC is 10 mg/m³ for inhalable particulates and 3 mg/m³ for respirable particulates.
- Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction.
- Provide appropriate exhaust ventilation at places where dust is formed.

8.2. Exposure controls

Eye protection: Safety glasses with side-shields. Goggles

Skin and body protection: Impervious clothing

Respiratory protection: Respirator must be worn if exposed to dust. Wear respirator with dust filter. Respiratory protection is needed if any of the exposure limits in Section 3 are exceeded. Consult an industrial hygiene professional prior to respirator selection and use. Use a positive-pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection: Preventive skin protection.

Hygiene measures: Avoid contact with skin, eyes and clothing.

Special hazard: Workers should be protected from the possibility of contact with molten material during fabrication.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: Solid
Appearance: Clear, translucent, opaque, pellets.
Color: Clear Translucent Opaque
Odor: Sweet
pH: Not applicable
Vapor pressure: Not determined
Vapor density: Not determined
Evaporation rate: Not determined
Density: 1.25
Decomposition temperature: 482F (250C)
Boiling point / boiling range: Not applicable
Melting point / melting range: 150-180C (302- 356F), Tg (Glass Transition Temperature): 55-60C (131-140F)
Autoignition temperature: 388C
Flammability: Fine dust dispersed in air may ignite
Flammability Limits in Air: No information available
Water solubility: Insoluble
Solubility in other solvents: Not determined
Solubility: Not determined

9.2. Other information

No information available

SECTION 10: Stability and reactivity

10.1. Reactivity

None expected under conditions of normal use.

10.2. Chemical stability

Stable under recommended storage conditions

10.3. Possibility of hazardous reactions

None expected under conditions of normal use

10.4. Conditions to avoid

Temperatures above 446F (230 °C).

Avoid keeping resin molten for excessive periods of time at elevated temperatures.
Prolonged exposure will cause polymer degradation

10.5. Incompatible materials

Oxidizing agents
Strong bases

10.6. Hazardous decomposition products

Burning produces obnoxious and toxic fumes
Aldehydes, Carbon monoxide (CO), carbon dioxide (CO₂)

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SECTION 11: Toxicological information

11.1. Information on toxicological effects

Principle routes of exposure:	Eye contact Skin contact Inhalation Ingestion
Acute toxicity:	There were no target organ effects noted following ingestion or dermal exposure in animal studies.
Local effects:	Product dust may be irritating to eyes, skin and respiratory system Resin particles, like other inert materials, are mechanically irritating to eyes. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea
Specific effects:	May cause skin irritation and/or dermatitis Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough Burning produces irritant fumes.
Long term toxicity	Did not cause skin allergic reactions in skin sensitization studies using guinea pigs.
Mutagenic effects:	Not mutagenic in AMES Test
Reproductive toxicity:	No data is available on the product itself.
Carcinogenic effects:	This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP
Target organ effects:	There were no target organ effects noted following ingestion or dermal exposure in animal studies.
Skin:	LD50/dermal/rabbit > 2000 mg/kg
Ingestion:	LD50/ oral/ rat > 5000 mg/kg
Further information:	No information available

SECTION 12: Ecological information

12.1. Toxicity

EC50/72h/algae > 1100 mg/L

12.2. Persistence and degradability

No data available

12.3. Bioaccumulative potential

Not expected to bioconcentrate or bioaccumulate.

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

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Not applicable

12.6. Other adverse effects

No information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

In compliance with the requirements of Directive 2008/98/EC

Waste from residues / unused products: In accordance with local and national regulations Should not be released into the environment Do not contaminate ponds, waterways or ditches with chemical or used container. Contact manufacturer.

Contaminated packaging: Empty remaining contents Do not re-use empty containers. Empty containers should be transported/delivered using a registered waste carrier to local recyclers for disposal.

THE COMPANY HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION

SECTION 14: Transport information

Applicable to: ADR/RID: IMDG: ICAO/IATA: ADN

- 14.1. UN number None
- 14.2. UN proper shipping name None
- 14.3. Transport hazard class(es) None
- 14.4. Packaging group None
- 14.5. Environmental hazards None
- 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code None

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance of mixture

- No information available

15.2. Chemical safety assessment

- Not applicable

Regulatory Information:

(not meant to be all inclusive - selective regulations represented)

Regulatory requirements are subject to change and may differ between locations. It is the User's responsibility to ensure that all activities comply with all federal, state or provincial and local laws and regulations. The following specific information is made for the purpose of complying with numerous national, federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

U.S. REGULATIONS

Sara 313 title III: Not Listed

TSCA Inventory List: Listed



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STATE REGULATIONS

California Proposition 65: Not Listed

INTERNATIONAL INVENTORIES

Canada DSL Inventory List : Listed

REACH/EU EINECS List : Components are in compliance with and/or are listed.

Japanese inventory (ENCS): Listed

Australia (AICS): Listed

Korean chemical inventory: Listed

Phillipines (PICCS) inventory: Contact NatureWorks for additional information.

Taiwan Chemical Substance inventory (TCSI): Listed

China inventory of existing chemical substances list : Listed

SECTION 16: Other information

Label information: Ingeo™ biopolymer
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Reason for revision: Updated to be compliant with 2015/830/EC

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Prepared by: NatureWorks LLC Health and Safety

NOTICE REGARDING APPLICATION RESTRICTIONS: The company does not recommend any of its products, including samples, for use: (A) in any application which is intended for any internal contact with human body fluids or body tissues (B) as a critical component in any medical device that supports or sustains human life; and (C) specifically pregnant women or in any applications designed specifically to promote or interfere with human reproduction. Components of products intended for human or animal consumption.