



**Product name:**  
Ingeo™ biopolymer

**Product code:** 3D850      **Revision Number:** 6      **Revision date:** 03/20/2019      **Print date:** 03/20/2019

**SAFETY DATA SHEET**

In accordance with 29 CFR 1910.1200:2012, ANSI Z400.1-2010, and ISO 11014-1: 2009.  
In accordance with WHMIS 2015.

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

**Product name:** Ingeo™ biopolymer  
**Product code:** 3D850  
**Product Use:** A biopolymer to be used in 3D printing applications.

**Supplier:**  
NatureWorks LLC  
15305 Minnetonka Blvd  
Minnetonka, MN 55345

sdsinquiry@natureworksllc.com  
952-562-3450

**Emergency telephone numbers (24 hours a day):** (Medical Information) +1-(651)-632-9273  
(Transportation Information) CHEMTREC: +1-(800)-424-9300 (in the United States)  
(Transportation Information) CHEMTREC: +1-(703)-527-3887 (outside the United States)

**2. HAZARDS IDENTIFICATION**

**Classification:** This product is NOT classified according to 29 CFR 1910.1200 Hazard Communication Standard 2012, or WHMIS 2015

**Signal word:** None

**Hazard Statements:** None

**Precautionary Statements:** None

**Potential health effects:** See Section 11 for more information

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**Environmental precautions:** See Section 12 for more information

**Other Hazards:** If small particles are generated during further processing, handling, or by other means, combustible dust concentrations in air may form. See Section 7 and 8 for additional information.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name and CAS	Weight %	OSHA Exposure Limits:	ACGIH Exposure Limits:
Polylactide resin 9051-89-2	>98	None	None

All ingredients in quantities > 1.0% (0.1% for carcinogens) that are potentially hazardous per OSHA definitions.

**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/m<sup>3</sup> for total dust and 5 mg/m<sup>3</sup> for the respirable fraction. The American Conference of Governmental Industrial Hygienists (ACGIH) TLV/TWA for PNOC is 10 mg/m<sup>3</sup> for inhalable particulates and 3 mg/m<sup>3</sup> for respirable particulates.

### 4. FIRST AID MEASURES

**Emergency telephone numbers (24 hours a day):**

- **(Medical Information) +1-(651)-632-9273**
- **(Transportation Information) CHEMTREC: +1-(800)-424-9300 (in the United States)**
- **(Transportation Information) CHEMTREC: +1-(703)-527-3887 (outside the United States)**

**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.

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**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.

## 5. FIRE-FIGHTING MEASURES

**Flammability:**

**Autoignition temperature:** 388 °C

**Flammability Limits in Air:**

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

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

**Suitable extinguishing media:** Foam, Water, Carbon dioxide (CO<sub>2</sub>), 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

**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.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Use personal protective equipment. Avoid contact with skin and eyes. Avoid dust formation. Remove all sources of ignition. Sweep up to prevent slipping hazard.

**Environmental precautions:** Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system.

**Methods for cleaning up:** Clean up promptly by scoop or vacuum. Sweep up and shovel into suitable containers for disposal.

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## 7. HANDLING AND STORAGE

**Safe handling advice:** 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.

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

**Precautions:** No special precautions required.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure Control:

**Engineering measures:** 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.

**Exposure limits:** 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/m<sup>3</sup> for total dust and 5 mg/m<sup>3</sup> for the respirable fraction. The American Conference of Governmental Industrial Hygienists (ACGIH) TLV/TWA for PNOC is 10 mg/m<sup>3</sup> for inhalable particulates and 3 mg/m<sup>3</sup> for respirable particulates.

### Personal protective equipment:

**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

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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.

## 9. 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  
**Partition Coefficient (n-octanol/water):** 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:** 388 °C  
**Freezing point °C:** Not determined  
**Flash point:** Not determined  
**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

## 10. STABILITY AND REACTIVITY

**Reactivity:** None expected under conditions of normal use.

**Chemical stability:** Stable under recommended storage conditions.

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**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.

**Materials to avoid:** Oxidizing agents, Strong bases

**Hazardous decomposition products:** Burning produces obnoxious and toxic fumes, Aldehydes, Carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>)

**Possibility of hazardous reactions:** None expected under conditions of normal use.

**Polymerization:** Not applicable

## 11. TOXICOLOGICAL INFORMATION

**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.

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**Skin:** LD50/dermal/rabbit > 2000 mg/kg

**Ingestion:** LD50/ oral/ rat > 5000 mg/kg

**Further information:** No information available

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity effects:** EC50/72h/algae > 1100 mg/L

**Persistence and degradability:** No data available.

**Bioaccumulation:** Not expected to bioconcentrate or bioaccumulate.

**Mobility:** No data available

## 13. DISPOSAL CONSIDERATIONS

**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.

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## 14. TRANSPORT INFORMATION

**U.S. Department of Transportation (DOT):**

**Proper shipping name:** None

**Hazard class:** Not regulated

**UN-No:** None

**Packing group:** None

**Hazardous substances (RQ):** None

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**IMDG:**

**Proper shipping name:** None  
**Hazard class:** Not regulated  
**UN/Id No.:** None  
**Packing group:** None

**ICAO/IATA:**

**Proper shipping name:** None  
**Hazard Class:** Not regulated  
**UN-No.:** None  
**Packing group:** None

## 15. 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

**TSCA Inventory List:** Listed

Sara 313 title III: Not Listed

### 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.

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**China inventory of existing chemical substances list :** Listed  
**Taiwan Chemical Substance inventory (TCSI):** Listed

## 16. OTHER INFORMATION INCLUDING INFORMATION ON PREPARATION AND REVISION OF THE SDS

**Label information:** Ingeo™ biopolymer  
**Product code:** 3D850

**Reason for revision:** Not applicable

**Revision Number:** 6  
**Revision date:** 03/20/2019  
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**Recommended restrictions:** None  
**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.

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