

## What is Ingeo?

Ingeo biopolymer is the world's first performance material whose manufacture shows a significant reduction in greenhouse gas emissions. Made from plants, not oil, Ingeo is derived from abundant 100% annually renewable plant resources.

### How is Ingeo made?

Carbon is captured in these plant resources, sequestered from the atmosphere during plant photosynthesis and stored as plant starches. NatureWorks LLC uses dextrose derived from these starches as the starting point for Ingeo. Through a process of fermentation, separation and polymerization, the carbon and other elements in these natural sugars are transformed into the family of Ingeo grades captured in this resin guide.

### Where is Ingeo used?

Ingeo is used uniquely to create a full and diverse range of finished consumer goods marketed under the Ingeo brand. Bridging both plastics and fiber categories, Ingeo is fueling innovation and spearheading a whole raft of creativity across a wide range of products from packaging, foodservice, automotive, electronic, and durable goods, to personal care products, clothing, and homewares.

## Ingeo Benefits

### Environmental Benefits

- Fewer greenhouse gas emissions
- Less fossil fuel used
- Made from plants - not oil
- Peer reviewed and 3rd party validated eco-profile
- Multiple end of life options after use
- Cradle-to-cradle options

### Performance Benefits

#### Ingeo plastics

- Excellent gloss, transparency, and clarity
- Excellent form and stiffness
- UV A and B Stable
- Non-allergenic
- Exceptional flavor and aroma barrier properties
- Easy to blend, mold, shape, emboss, and print
- Ability to lightweight

#### Ingeo fibers

- Outstanding moisture management properties
- Outperforms polyester for breathability, comfort and insulation
- Low odor retention
- High UV light resistance
- Hypoallergenic, easy care, and quick drying

## Ingeo Regulation Information and Scope/Specifications

### Food Packaging Materials Compliance\*\*

Ingeo products have food contact compliance in many regions of the world including the US (FDA) and EU. For conditions or limitations and information on other regions of the world please refer to the Regulatory Affairs Compliance Information (RACI) document\* or contact us directly.

### Chemical Control Law Compliance

Ingeo products are compliant with chemical control laws in many regions of the world including the US, EU (REACH), Japan, China, etc. For more details or other regions of the world please refer to our RACI document\* or contact us directly.

### Biobased Content

NatureWorks carries the "OK biobased" certification from Vinçotte and the USDA BioPreferred label. Certification is based on the biobased content of Ingeo which can be determined through radiocarbon dating according to ASTM D6866-5. Both certifications require that the raw materials and the final articles carry certification in order to claim compliance.

### Industrial Composting according to ASTM D6400 and EN13432

Composting is a method of waste disposal that allows organic materials to be recycled into a product that can be used as a valuable soil amendment. Ingeo is a compostable material in municipal and industrial composting facilities where available. Ingeo carries certification through various organizations including BPI (US) and DIN CERTCO (EU). For further information refer to RACI document or contact us directly.

### Certification Notes:

BPI and DIN CERTCO certification programs require both plastic articles and polymer products be certified. Therefore, NatureWorks' certifications cannot be automatically leveraged by downstream customers.

BPI - ASTM D6400:

- 3001D, 4032D, 4043D, 4060D, 7001D, in parts up to 2.0 mm thickness
- 2003D, 3052D, 3251D, in parts up to 3.2 mm thickness

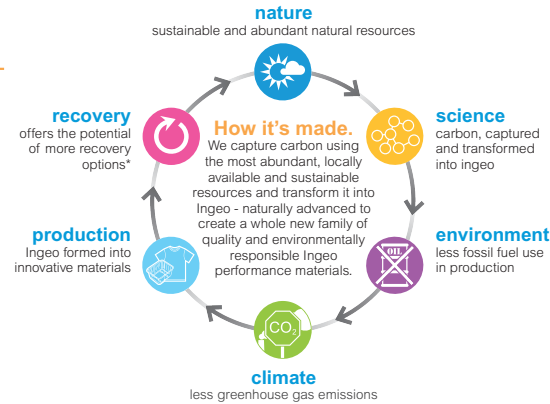
DIN CERTCO EN 13432:

- 2003D, 3001D, 3052D, 4032D, 4043D, 4060D, 7001D in parts up to 2.0 mm thickness

\* US and EU are shown as an example, if you need data for other geographic regions please contact NatureWorks LLC.

\*\* It is the responsibility of both the manufacturers of finished food contact articles as well as the industrial food packers to make sure that these articles in their actual use are in compliance with the imposed specific and overall migration requirements.

\* RACI document is located at: www.natureworksilc.com/RACI



\*Check out the complete Ingeo eco-profile and read about our improved carbon footprint potentials in The Ingeo Journey at [www.natureworksilc.com](http://www.natureworksilc.com)

Where can you learn more about Ingeo resin?  
visit [www.natureworksilc.com](http://www.natureworksilc.com)

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# Ingeo resin product guide

## Naturally Advanced Materials

This Ingeo Resin Product Guide is intended to provide a collection of the physical, mechanical and thermal properties for the Ingeo grade family. In addition, regulatory approvals / specifications, grade characteristics, and typical applications are provided on each product line and its uses.

Please refer to individual technical data sheets on each grade for the most up-to-date data and information at [www.natureworksilc.com](http://www.natureworksilc.com)

