



Biodegradable Polymers

Product Information

Version 1.0

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# ecovio<sup>®</sup> F2332

**Biodegradable polyester for compostable film  
with 18% of renewable resources**

® = ecovio and ecoflex are registered trademarks of BASF SE.

## Product description

ecovio<sup>®</sup> F2332 is our new biodegradable film product containing 18% renewable resources. It is basically a compound of our biodegradable copolyester ecoflex<sup>®</sup> F Blend and polylactic acid (PLA). Due to its outstanding mechanical strength ecovio<sup>®</sup> F2332 offers a great down gauging potential needed for thin film applications like garbage bags, organic waste bags, T-shirt bags, agricultural film etc. ecovio<sup>®</sup> F2332 already contains antiblocking and slip agents required for easy processing on film extrusion and film conversion equipment. ecoflex<sup>®</sup> F Blend is the continuous phase in the structure of ecovio<sup>®</sup> F2332 transferring the beneficial film properties of ecoflex<sup>®</sup> F Blend into the new product.

 **BASF**  
The Chemical Company

Our new ecovio® F2332 exhibits the following properties compared to PE-LD:

- Translucent, semi-crystalline structure with DSC melting points for ecoflex® and PLA
- High strength, low-medium stiffness and high failure energy (dart drop)
- High, but controllable water vapour transmission rate (WVTR)
- High melt strength: MVR (190 °C, 5 kg): 7.0 - 11.0 ml/10 min
- Good thermo stability up to 230 °C
- Good processability on conventional blown film lines, e. g. for PE-HD, PE-MD
- Down gauging to 8 µm possible, typical thicknesses: 10 - 120 µm
- Broad sealing window required for sealing layers of multi-layer film structures
- Weldable and printable in 8 colours by flexo printing

ecovio® F2332 exhibits an excellent compatibility to other biodegradable polymers e. g. in dry blends with ecoflex® F Blend, PLA or aliphatic biodegradable polyesters (e. g. Polycaprolactone PCL, Polybutylenesuccinate PBS or Polyhydroxyalkanoates PHA), if their MVR is close to the MVR of ecovio® F2332. Because of the moisture sensitivity of PLA at melt temperatures in the order of 170 - 180 °C we have to assure a maximum moisture content of below 1000 ppm prior to film blowing.

The processing of ecovio® F2332 on extrusion lines depends on the formulation, the extrusion technology and processing conditions. Trials are always recommended to assess the quality of the final product. ecoflex® masterbatches are available to tailor properties of the final product as well as the barrier to water vapour. Detailed information concerning our ecoflex® masterbatches will be sent upon request.

ecovio® F2332 fulfils the requirements of the European standard DIN EN 13432 for compostable and biodegradable polymers, because it can be degraded by micro-organisms. The biodegradation process in soil depends on the specific environment (climate, soil quality, population of micro-organisms). The advantages for the customer concerning the certification of his products according to EN 13432 are:

- Biodegradable according to EN 13432
- Biobased according to ASTM D 6866
- Quick certification procedure without additional controlled composting test

### **Form supplied and storage**

ecovio® F2332 is supplied as lens-shaped pellets in 1t Octabins. Temperatures during transportation and storage may not exceed 70 °C at any time. Storage time in an unopened bag may not surpass 12 month at room temperature (23 °C).

### **Quality Control**

ecovio® F2332 is produced as a standard material in a continuous production process according to DIN EN ISO 9001:2000. The melt volume rate, MVR, at 190 °C, 5 kg, according to ISO 1133 has been defined as specified parameter for quality control. A certificate of the MVR value can be provided with each lot number (5 t) upon request. Other data given in our literature are typical values, which are not part of our product specification for ecovio® F2332.

## Applications

ecovio® F 2332 has been developed for the conversion to flexible films using a blown film process. Typical applications are garbage bags, organic waste bags, T-shirt bags and agricultural film. In view of numerous factors influencing functionality and shelf life of ecovio® films and finished articles made thereof the production parameters have to be tested by the converters before utilisation. Additionally sufficient field tests are required to ensure the right functionality of the articles made from ecovio® F2332.

We supply technical service information concerning the blown film process with ecovio® F2332 on demand.

### Typical basic material properties of ecovio® F2332

| Property                           | Unit              | Test Method   | ecovio® F2332 |
|------------------------------------|-------------------|---------------|---------------|
| Mass density                       | g/cm <sup>3</sup> | ISO 1183      | 1.24 - 1.26   |
| Bulk density                       | g/cm <sup>3</sup> | DIN EN ISO 60 | 0,78          |
| Melt volume rate<br>MVR 190°C, 5kg | ml/10 min         | ISO 1133      | 7.0 - 11.0    |
| Melting points                     | °C                | DSC           | 110-120       |
|                                    | °C                | DSC           | 140-155       |

### Typical properties of ecovio® F2332 blown film, 30 µm

| Property                         | Unit                  | Test Method                | ecovio® F2332 |
|----------------------------------|-----------------------|----------------------------|---------------|
| Tensile modulus                  | MPa                   | ISO 527                    | 300 / 180     |
| Tensile strength                 | MPa                   | ISO 527                    | 15 / -        |
| Ultimate strength                | MPa                   | ISO 527                    | 30 / 30       |
| Ultimate Elongation              | %                     | ISO 527                    | 420 / 480     |
| Dart Drop                        | g                     | ASTM D 1709-04<br>Method A | 650           |
| <b>Permeation rates:</b>         |                       |                            |               |
| Water vapour<br>(38°C, 90% r.h.) | g/(m <sup>2</sup> ·d) | ASTM F-1249                | 600           |
| Water vapour<br>(23°C, 50% r.h.) | g/(m <sup>2</sup> ·d) | ASTM F-1249                | 120           |

## Note

The information submitted in this document is based on our current knowledge and experience. In view of the many factors that may affect processing and application, these data do not relieve processors of the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance for a special purpose. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.