Global Marketing Biopolymers

Product Information

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G-PM/PB

ecovio® PS1606

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Product Description

ecovio® PS1606 is our industrial compostable product for paper coating based on renewable resources. It is one of our high performance grade in the biopolymer extrusion coating portfolio. ecovio® PS1606 contains biobased carbon content of 75 % of renewable resources according to ASTM D 6866.

The unique feature of ecovio® PS1606 is its beneficial properties – excellent welding and very good adhesion to paper and board. ecovio® PS1606 can be used for mono-, co- and multilayer extrusion coating on paper and board.

Applications

Typical applications of ecovio® PS1606 are paper wraps e. g. for fresh food (cheese, meat, fish) or snack food, portion sachets for sugar and salt; lawn and leaf bags as well as coated card board e. g. for coffee cups, plates; tubs for fats and spreads and freezer boxes.

Because of its unique combination of sealing and barrier properties against mineral oil, fat and hydrocarbons ecovio® PS1606 can also be used in co-extrusion or multilayer extrusion coating with other biodegradable polymers to enhance the barrier properties of a multilayer with paper and board.

In view of numerous factors influencing functionality and shelf life of ecovio® films and coatings and finished articles made thereof the production parameters have to be tested by converters before utilization. Additionally sufficient field tests are required to ensure the right functionality of the articles made from ecovio® PS1606.

General Properties of Coatings using ecovio® PS1606

- Good scratch resistance
- Barrier for fat, liquids, aromas and mineral oils
- Relatively high water vapor transmission rate
- Weld strength comparable to LDPE at temperatures 20 to 30 °C (36 to 54 °F) below LDPE level
- Good printability using alcohol and/or water based colors

Special Barrier Properties

Using an accelerated migration test of mineral oil at 60 °C (140 °F) for paper samples extrusion coated with ecovio® PS1606 the following result has been obtained by Kantonales Labor, CH-Zürich (Table 1):

- Mineral oil migration lag time measured in days at 60 °C using Gravex 913 (75 % MOSH*, 25 % MOAH**)
- Lag time at 60 °C recalculated in time unit at 22 °C

Substrate	ecovio® PS1606	Break Through @ 22 °C
Fresh Fiber Board, 210 g/m²	16 g/m² (12.8 µm)	**> 9 years**
Glassine Paper, 92 g/m²	16 g/m² (12.8 µm)	**> 9 years**
Recycled Board, 290 g/m²	29 g/m² (23.2 µm)	**> 6.8 years**
LDPE-Film, 100 µm (92 g/m²)	–	**> 10 h**

Source: BASF SE, Ludwigshafen based on results of Grob, K. Kantonales Labor Zürich, April 2011

ecovio® PS1606 provides a special combination of sealing, mechanical and barrier properties. ecovio® PS1606 has an excellent barrier against migration of mineral oil and hydrocarbons e. g. ethylene and various other chemicals from packaging cartons made of recycled paper and board. Detailed information is available upon request.

* MOSH = Mineral Oil Saturated Hydrocarbons
** MOAH = Mineral Oil Aromatic Hydrocarbons

Food Regulatory Status

The composition of ecovio® PS1606 complies with the requirements of the Comission Regulation (EU) No 10/2011 of 14 January 2011 on plastic materials and articles intended to come into contact with food as well as with the requirements of the Federal Food, Drug and Cosmetic Act, 21 CFR for the use in single use polyester films, coatings, and molded articles. Specific limitations and further details concerning the food contact compliance status of this product can be obtained upon request via a local BASF representative or by contacting plastics.safety@basf.com. The suitability of the article for the application concerned must be ensured in each case by the person who places any finished food contact article on the market.

Certification of Compostability and Biodegradability

ecovio® PS1606 can be degraded by micro-organisms under industrial composting conditions. The biodegradation process depends on the specific environment (e. g. climate, substrate, population of microorganisms). The registration according to the American standard ASTM D 6400 and the European standard DIN EN 13432 for compostable and biodegradable polymers has been performed up to a maximum thickness of **624 µm**. Documents are available upon request. Thus paper articles coated with ecovio® PS1606 can be certified for composting.

Experiments using paper coated with ecovio® PS1606 in thermophilic biogas plants with compost post treatment facility have demonstrated the compatibility to this treatment of municipal biowaste.

Recycling of Paper and Board Coated with ecovio® PS1606

Coatings from ecovio® PS1606 are as repulpable as LDPE coatings in a paper recycling process (pilot plant result, PTS, Germany).

Drying Conditions

For ecovio® PS1606, a moisture content below 600 ppm is recommended prior production. In most cases, the high extruder output rate will allow the use of material directly from the big bag without drying. If necessary – e. g. after storage of an opened big bag – drying of ecovio® PS1606 at maximum 60 °C (140 °F) for a minimum of 4 hours or overnight drying at 50 °C (122 °F) is possible.

Purging out of LDPE and Start-up of Production

Extrusion coating with ecovio® PS1606 starts with purging of LDPE in the extruder. The purging procedure is very important for the melt stability of ecovio® PS1606 during production. Detailed information on processing is available upon request.

Extrusion Coating Process

In general we can summarize our results of extrusion coating trials as follows:

- Excellent processing on conventional extrusion coating lines
- Processing feasible on extrusion coating lines for LDPE depending on machine design
- Constant extruder output rate determines achievable line speed. Thus best results using a melt pump

- A typical coating thickness of LDPE can be achieved in most cases.
- Minimum coating weights depending on application requirements and equipment. In general coating weights of 12 to 30 g/m² (~10 to 24 µm) can be obtained.

- No sticking to the chill roll – matt and glossy chill rolls can be used
- Good cutting performance on regular cutting devices
- Good adhesion to paper – depending on card board or paper grade, maximum melt temperature and coating technology

- Good thermo-stability up to 260 °C (500 °F)
- Appropriate viscosity for extrusion coating: MVR (190 °C (374 °F), 2.16 kg): 13,5 to 19,5 ml/10 min

Cup Making

ecovio® PS1606 has a good processing performance on cup making machines for LDPE coated board if high air temperatures of 500 °C (932 °F) can be reached. The full speed of 330 cups/minute could be achieved on a Hörauf BMP 400 using 20 - 25 g/m² of ecovio® PS1606.

LDPE cup making speeds can also be achieved on slow running lines with e. g. 50 - 70 cups/minute.

Form supplied and storage

ecovio® PS1606 is supplied as pearl- or cylinder-shaped pellets in 1 t big bags with barrier inliner. Temperatures during transportation and storage may not exceed 60 °C (140 °F) at any time. Storage time in an unopened bag may not surpass 12 months at room temperature (23 °C / 73 °F).

Quality Control

ecovio® PS1606 is produced as a standard material in a continuous production process according to DIN EN ISO 9001. The melt volume rate, MVR, at 190 °C (374 °F), 2.16 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 upon request. Other data given in our literature are typical values, which are not part of our product specification for ecovio® PS1606.

Typical basic material properties of ecovio® PS1606, 20 gsm

Property	Unit	Test Method	ecovio® PS1606	LDPE
Mass density	g/cm³	ISO 1183	**1.24 – 1.26**	0.92
Melt volume rate MVR 190 °C, 2.16 kg	ml/10 min.	ISO 1133	**13,5 - 19,5**	MFR 8 - 25 g/10‘
Water Vapor Transmission Rate (23 °C, 85 % r. H.)	g/(m²·d)	ASTM F 1249	**220**	13
Oxygen Transmission Rate (23 °C, 0 % r. H.)	cm³/ (m²·d·bar)	ASTM D 3985	**1400**	11000

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. (June 2024)

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