

Processing advice

Product name: Bio-Flex® F 2201 CL

Date of issue: 21.04.2011

Version: 1.1

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1. Designation of product, preparation and manufacturer

- 1.1 Trade name: Bio-Flex® F 2201 CL
- 1.2 Use of product: Biodegradable compound for film extrusion
- 1.3 Manufacturer: FKUR Kunststoff GmbH
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2. Processing conditions for blown film extrusion

- 2.1 Machine equipment: Standard low-density polyethylene screw
- 2.2 Machine settings:
- | | | |
|----------------------|-----------|------------|
| Zone 1 | 160 | [°C] |
| Zone 2 | 170 | [°C] |
| Zone 3 | 175 | [°C] |
| Zone 4 | 180 | [°C] |
| Adapter | 180 | [°C] |
| Lower die | 180 | [°C] |
| Upper die | 170 | [°C] |
| Water jacket (feed) | 35 | [°C] |
| Mass temperature | max. 190 | [°C] |
| Density | 1.25 | [g/cm³] |
| Bulk density | n/a | [kg/m³] |
| MFR (190 °C/2.16 kg) | 8 - 10 | [g/10 min] |
| Die gap | 0.8 - 1.4 | [mm] |
| Die diameter | up to 400 | [mm] |
| Blow film ratio | 2.5 - 4 | [-] |
- 2.3 General advice: Start at temperatures given above. If gel particles or die lines appear, increase temperature in 5 °C steps up to a maximum of 190 °C melt temperature.

3. Purging advice

- 3.1 Before production: Ensure that all temperature zones work correctly!
Purge the extruder with low melting LDPE, MFR approx. 4 - 6 [g/10 min] using the above temperature settings.
Purging time: approximately 10 - 20 minutes.
We recommend to change the screen before production.
- 3.2 During production: Monitor melt temperature continually!
Use sufficient cooling for extruder and bubble, a dual lip air ring and/or inner bubble cooling system is preferred with chilled air, as the melt is soft when emerging from the die.
- 3.3 After production: Purge out the extruder with an LDPE, MFR 0.4 - 2.0 [g/10 min]. Do not allow material to remain hot inside the extended periods as the material will degrade.

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4. Drying conditions and storage

- 4.1 General: Bio-Flex[®] F 2201 CL is a biodegradable plastic based on PLA and other biopolymers. Moisture content can start hydrolysis! Residual moisture content of more than 0.2 % can result in fish eyes and/or pin holes during processing of blown film.
- 4.2 Drying: We recommend drying Bio-Flex[®] F 2201 CL at 60 °C for a period of 2 - 4 hours.
- 4.3 Storage conditions: It is essential to store the material in a dry and cool place. Opened octabins should be used immediately or adequately sealed back up after use to avoid moisture uptake. It is recommended to use Bio-Flex[®] granules within a time period of max. 6 months.
- 4.4 Storage conditions for films and finished products: Films on rolls and finished products made from Bio-Flex[®] must be stored dry and cold. It is recommended to wrap goods in black PE inliners to protect them against moisture and UV radiation. In any case we recommend to use films on rolls and products as soon as possible and not to store them for a time period of more than 6 months. Storage time depends on processing parameters and of climate conditions in the respective area. Because of these essential and complex interacting parameters, FKUR Kunststoff GmbH cannot give any shelf life guarantees for finished goods. Please notice that the conditions mentioned above depend on experiences of our customers. Each customer should execute individual storage tests according to product specifications and storage requirements.

5. Legal notice

- 5.1 Compostability: Bio-Flex[®] F 2201 CL is not jet certified as compostable material
- 5.2 Food contact approval: Bio-Flex[®] F 2201 CL is approved for food contact according to European directives.
- 5.3 General: Neither FKUR Kunststoff GmbH nor its marketing affiliates shall be responsible for the use of this information or of any product, method or equipment mentioned. Customers must undertake their own determination of this product's suitability and completeness for their own use, for the protection of the environment, for the health and safety of their employees and purchasers of their products. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the seller's conditions of sale.
- 5.4 Brands: The brands „FKuR – Plastics made by Nature“ and „BIO-FLEX“, are registered trademarks of FKUR Kunststoff GmbH, according to the international `Nice-Classifications´ (NCL9), no. 01, 02 and 17.