

Processing advice

Product name: **Bio-Flex® A 4100 CL**

Date of issue: 18.05.2009

(prev. Bio-Flex® CL)

Version: 2.0

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1. Designation of product, preparation and manufacturer

- 1.1 Trade name: Bio-Flex® A 4100 CL (prev. Bio-Flex® CL)
- 1.2 Use of product: Biodegradable compound for film extrusion made primarily from renewable resources.
- 1.3 Manufacturer: FKUR Kunststoff GmbH
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2. Processing conditions for blown film extrusion

2.1 Machine equipment: Standard screw for low-density polyethylene

2.2 Machine settings:	Zone 1	160	[°C]
	Zone 2	160	[°C]
	Zone 3	165	[°C]
	Zone 4	170	[°C]
	Adapter	170	[°C]
	Lower die	175	[°C]
	Upper die	175	[°C]
	Water jacket (feed)	35	[°C]
	Mass temperature	max. 180	[°C]
	Density	1.26	[g/cm³]
	Bulk density	821	[kg/m³]
	MFR (190 °C/2.16 kg)	6 - 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 180 °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: approx. 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. The film will be soft and flexible during production. It will recrystallize and stiffen after 48 hours.
- 3.3 After production: Purge the extruder with LDPE, MFR 0.4 - 2.0 [g/10 min]. Do not allow material to remain hot inside the extruder for extended periods as the material will degrade.

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4. Drying conditions and storage

- 4.1 General: Bio-Flex® A 4100 CL is a biodegradable plastic based on PLA and other biopolymers. Moisture content can start hydrolysis! Residual moisture content of more than 0.3 % can result in fish eyes and/or pin holes during processing of blown film.
- 4.2 Drying: Drying is recommended 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 resealed 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 seal goods in black PE films 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 on 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® A 4100 CL is certified as compostable material according to European standard EN 13432 and according to ASTM D6400 (max. thickness:140 microns). It is registered at DIN Certco (7W0076) and OK Compost.
- 5.2 Food contact approval: Bio-Flex® A 4100 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“, „BIO-FLEX“, „BIOFLEX“, „BIOGRADE“ and „FIBROLON“ are registered trademarks of FKUR Kunststoff GmbH, according to the international 'Nice-Classifications' (NCL9), no. 01, 02 and 17.