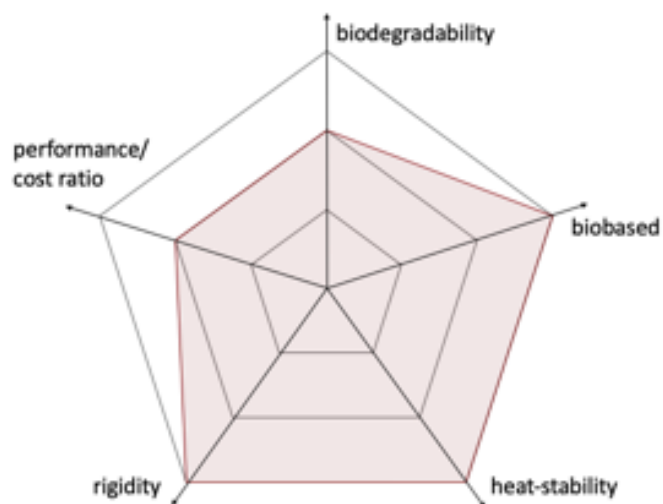




SUMMARY

Spectabio L grades are developed for rigid injection molded applications with a moderate to thick wall-thickness. Spectabio LB₃₀MB is reinforced with up to 30 w.-% bamboo or other natural fibers. Parts molded with Spectabio L grades have a sturdy look & feel. The compound is biodegradable in controlled conditions.

KEY CHARACTERISTICS



- injection molding grade
- biopolymer compound
- can be blended with bamboo powder (B), rice husk (R), coffee husk (C), wheat straw (W) and wood powder (H)
- high rigidity
- can be crystallized/annealed to be heat-stable up to 80°C
- biodegradable in controlled conditions (e.g. industrial compost) according to DIN EN 13432 / ASTM D6400
- food contact safe
- look and feel close to clay
- global availability

Spectabio LB₃₀MB is a modified PLA-blend. The grade is significantly enhanced with a blend of natural fibers. Spectabio LB₃₀MB is suitable for a post-process annealing.

Spectabio LB₃₀MB is compostable/biodegradable (microbial and enzymatic degradation) in the targeted disposal environment; the grade is designed to be biodegradable in controlled (e.g. industrial compost facilities). Spectabio LB grades offer a significant reduction in carbon footprint compared to traditional fossil-based plastics.

The grades exhibit good strength and stiffness properties as well as a medium flow combined with improved elongation values. An increased rate of crystallization allows an annealing to a heat-stable temperature of up to 80 °C (HDT-B).

Part wall-thickness shall be greater than 2.5 mm.



TECHNICAL DATA SHEETS (TDS)

TYPICAL CHARACTERISTICS not annealed			
Property	Test Method	Unit	Typical Value*
Density		g/cm ³	1.25
Melt Flow Rate (190°C/2.16 kg)	ASTM D1238	g/10 min	> 70.0
HDT-B (@ 0.46 MPa)	ASTM D648	°C	54.2
Tensile Strength (50 mm/min)	ASTM D638	Mpa	39.1
Flexural Strength	ASTM D790A	Mpa	54.5
Flexural Modulus (1% secant)	ASTM D790A	Gpa	4.1
Elongation (50 mm/min) @ Yield	ASTM D638	%	6.8
Elongation (50 mm/min) @ Break	ASTM D638	%	6.8
IZOD Notched Impact Strength (@ 23°C)	ASTM D256	J/m	57.3
Mold Shrinkage		%	0.45

* Typical values; properties are minimum values and might be slightly higher than indicated (for density and mold shrinkage, maximum values, slightly lower). All mechanical properties as per ASTM D638 Type I specimen injection moulded in accordance with ASTM D4101.

TYPICAL APPLICATIONS

Typical applications where Spectabio LB grades are used for are:

- consumer goods
- kitchen ware
- toys
- personal care (e.g. tooth brush handle, soap box)
- beauty (cream containers)
- urns
- etc.





PROCESS GUIDELINES

Spectabio LB30MB can be processed on conventional injection moulding equipment. The material is sensitive to moisture and high temperatures (above 190°C); high shear rates shall be avoided. The material needs to be dried before processing. Do not keep the material in the heated barrel longer than 6 – 8 minutes; the material is prone to degrade.

1. PREPERATION	
Storage	Keep the material tightly closed in a dry and cool place. Keep away from heat and sources of ignition and avoid exposure to moisture, dampness. Do not stor outdoors. Use material within 6 month after delivery.
Drying	Dry the material for a minimum of 4 - 6 hours at 60° C. A moisture content of less than 0.07% (700 ppm) is required / less than 0.10% (1000 ppm) is recommended. Avoid exposing the material to atmospheric conditions after drying; process immediately.
Injection Moulding Start-Up	<ol style="list-style-type: none"> 1. Vacuum-out/clean hopper and air-suction system to avoid contamination. 2. Clean/purge the barrel. 3. Once the barrel has been cleaned, reduce barrel temperatures to the right set points (see next section). 4. Introduce the compounds into the barrel only after all barrel temperatures are at target set points. The material cannot enter into the barrel when temperatures are above 190°C in any section! 5. Make sure that the mold is heated up to a temperature of around 55°C. Spectabio LB grades cannot be processed on cold molds. 6. Start with a moderate holding pressure and keep it applied for long initially. Spectabio LB grades have a slow solidification. Sink marks throughout the part are a result of a too low holding pressures that are applied for a too short time. Carefully increase holding pressure and prolong holding time until sink marks disappear. 7. Start with long cooling times before opening the mold: $t_{cooling} \text{ (in sec)} > \text{biggest wall-thickness (in mm)} \times 10$ 8. After start-up, the injection moulding process shall be optimized step-by-step to industry relevant process paramaters
SDS	Read and understand the Material Safety Data Sheet (SDS) provided with the material.
Remark	Do not keep the material longer than 6 - 8 minutes in the heated barrel; if so, the material needs to be purged and removed to avoid degradation.



2. INJECTION MOULDING PROCESS PARAMETERS

Hopper Temperature	room temperature
Feed Zone Temperature	180°C
Compression Zone Temperature	180°C
Metering Zone Temperature	185°C
Nozzle Temperature	180°C
Mould Temperature	50°C – 60°C
Screw Speed	low – medium
Injection Pressure	low
Holding Pressure	long
Injection Speed	slow
Cooling Time	long

3. ANNEALING

Moulded parts can be annealed during or after injection moulding. Annealing initiates a further crystallization of the material. The moulded part will, depending on the intensity of the annealing process, become effectively **heat stable to temperatures above 80°C** (HDT-B). Mechanical properties will change as well; please refer to the respective TDS.

Post-moulding annealing

Post-moulding annealing is the exposure of the part to temperatures around 120 – 140°C for 10 – 15 minutes (depending on the wall-thickness). Please make sure that there is no load on the part (during the annealing process, the material is softening) and that parts are not touching each other. Heat ovens or channels with circulating hot air are most suitable for mass production.

After the direct annealing process, the material will further crystallize slowly. Final results shall be obtained after 24 – 48 hours.

Get in touch with our experts for more information.

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The material has to be stored, handled and processed according to nature2need Safety Data Sheets (SDS) & Process Guidelines. In some cases, mold deposits may develop. These deposits shall be removed periodically; we recommend a mold cleaning cycle of every 50.000 shots. This information and data presented herein is true and best as per our knowledge. We make no warranty, expressed or implied, regarding the performance or otherwise. The user of the information is advised to obtain the latest details from the authorised representatives of the company, as the information is subject to change based on the research and development work undertaken by the company.