BAMBACORE

Organic Plastic Composites Made to Degrade!

Bio-polymers & bio-compounds

Bio-polymers and bio-compounds are classified as biopolymer because they are biobased, biodegradable, or feature both properties. Spectabio and Bioblend bio-polymers and bio-compounds are all at least biodegradable in their target environment and are labelled with **"Made to Degrade".**

Biobased: The term biobased means that the material, compound or product is derived from biomass (plants, agricultural by-products, agricultural waste, etc.). It can additionally be filled or be reinforced with natural fibres, mineral fillers or other biomass.

Biomass rice husk – an agricultural by-product

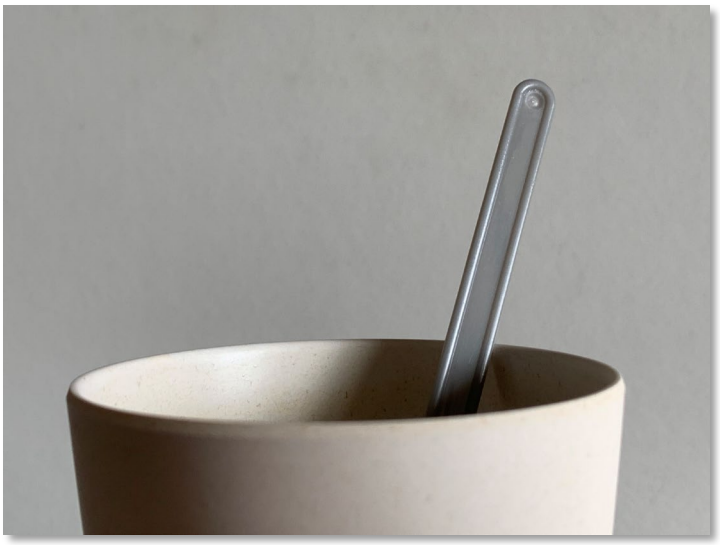
Biodegradable: Biodegradation is a chemical process during which microorganisms that are available in the environment convert materials into natural substances such as water, carbon dioxide (CO2), and compost (no artificial additives needed). The process (e.g. time) of biodegradation depends on the surrounding environmental conditions (e.g. location or temperature), on the material and on the application itself.

Biodegradable in soil/sea-water: Biodegradation in soil refers to degradation to CO_2 corresponding or exceeding 90 w.-% within 2 years in soil. Spectabio B / T grades and Bioblend B / T grades can be considered as biodegradable in soil/sea-water.

Compostable (according to EN 13432): Compostable addresses the following characteristics: biodegradability (namely the capability of the compostable material to be converted into CO_2 under the action of microorganisms; the standard contains a mandatory threshold of at least 90 % biodegradation that must be reached in less than 6 months), disintegration during biological treatment (namely fragmentation and loss of visibility in the final compost), effect on the biological treatment process (namely no negative effects on the composting process) and effect on the quality of the resulting compost (amount of heavy metals has to be below given maximum values, and the final compost must not be affected negatively). All materials labelled with "Made to Degrade" are compostable according to EN 13432 (Spectabio and Bioblend line).

Reduction of CO_2: Bio-polymers and bio-compounds contribute to the reduction of Greenhouse Gas emissions or can be carbon neutral. Plants, bamboo and rice husk absorb atmospheric carbon dioxide (CO2) as they grow. Using this biomass (through biobased polymers, through natural fibre reinforcements or both) to create products constitutes a more permanent removal of CO_2 from the atmosphere.

Contribution to the Circular Economy: With reference to global waste hierarchies, biodegradable polymers and compounds can provide added value through organic recycling (i.e. industrial composting and anaerobic digestion) as an additional waste treatment option. Industrially compostable polymers certified according to the harmonised European standard EN 13432 contribute to efficient waste management and circular preservation of resources.



Coffee stirrer

Bioblend LT25B – compostable/biodegradable according EN 13432 & ASTM D6400

EXTRUSION GRADES

Spectabio and Bioblend grades are bio-polymers and bio-compounds being compostable according to EN 13432, hence rated as biodegradable. Spectabio B and Spectabio T grades are also biodegradable in soil and sea-water. Spectabio grades are reinforced with bamboo fibres, rice husk and wheat straw/husk. Bioblend grades are blends of different biopolymers filled with mineral fillers. All compounds have improved thermal and mechanical properties with reduced cost levels.

Spectabio compounds

All extrusion grade materials are delivered as **compounds** suitable for extrusion moulding on standard equipment. To suite different product needs, we have grades with varying mechanical, thermal and processing properties. All grades are ready-to-use feedstock moulding grades.

Based on specific needs, we can tailor and customise all material grades to customers' requirements.

Availability

Globally

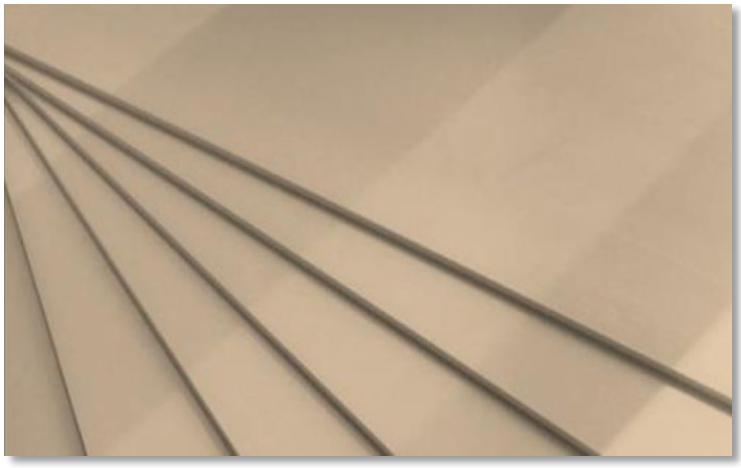
Certificates & Data Sheets

Material Safety Data Sheets (SDS), detailed Technical Data Sheets (TDS), REACH compliance certificates and other certificates are available on request.

All materials are food contact safe according to relevant EN and ASTM regulations. All Spectabio and Bioblend grades comply with EN 13432 (industrial composting).

Material transport, storage and handling shall be according to Material Safety Data Sheets (SDS); processing shall be according to relevant Process Guidelines.

Bioblend compounds



Spectabio sheets

Bioblend LT25B EX

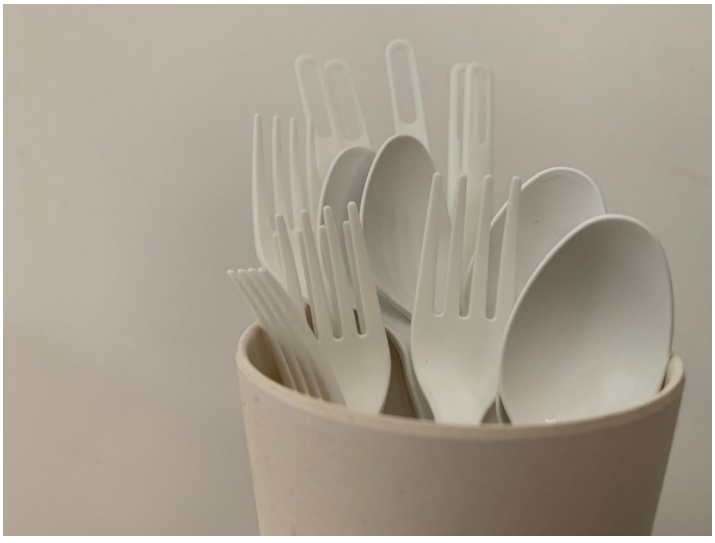
Bioblend LT25B EX is a modified PLA-blend. The grade is enhanded with a blend of natural, inorganic fillers. Bioblend LT grades are easy to process and prepared for a fast and efficient post-processing crystallization/annealing process. The grade is labelled with “Made to Degrade”.

Bioblend LT25B is designed to be completely compostable/biodegradable (microbial and enzymatic degradation) in the targeted disposal environment; it will compost in municipal/industrial facilities according to global standards like EN 13432 (for Europe) and ASTM D6400 (for the USA). The grade offers a significant reduction in carbon footprint compared to fossil-based plastics.

Bioblend LT EX grades are used for general purpose extrusion moulding applications. They exhibit excellent strength and stiffness properties combined with improved elongation values. An increased rate of crystallization allows an annealing to a heat stable temperature of 125 °C and above.

Key characteristics

- Compostable/biodegradable according to EN 13432 and ASTM D6400
- High-heat stable up to 125 °C after annealing
- Dishwasher - ok



Single-use cutlery made with **LT25B EX**

Bioblend LT25B EX

Typical Characteristics Bioblend LT25B EX (not annealed)			
Property	**Test Method**	**Unit**	**Typical Value***
Density		g/cm^3	1.3
Melt Flow Rate (190°C/2.16 kg)	ASTM D1238	g/10 min	6 – 8
HDT-B (@ 0.46 MPa)	ASTM D648	°C	54.2
Tensile Strength (50 mm/min)	ASTM D638	Mpa	51.7
Flexural Strength	ASTM D790A	Mpa	65.2
Flexural Modulus (1% secant)	ASTM D790A	Gpa	5.3
Elongation (50 mm/min) @ Yield	ASTM D638	%	7.5
Elongation (50 mm/min) @ Break	ASTM D638	%	31.0
IZOD Notched Impact Strength (@ 23°C)	ASTM D256	J/m	31.5
Mold Shrinkage		%	0.45

Typical Characteristics Bioblend LT25B EX Post-process crystallization/annealing, 5 minutes @ 130 °C			
Property	**Test Method**	**Unit**	**Typical Value***
Density		g/cm^3	1.3
HDT-B (@ 0.46 MPa)	ASTM D648	°C	> 125.0
Tensile Strength (50 mm/min)	ASTM D638	Mpa	37.3
Flexural Strength	ASTM D790A	Mpa	56.9
Flexural Modulus (1% secant)	ASTM D790A	Gpa	5.1
Elongation (50 mm/min) @ Yield	ASTM D638	%	7.5
Elongation (50 mm/min) @ Break	ASTM D638	%	9.5
IZOD Notched Impact Strength (@ 23°C)	ASTM D256	J/m	29.8

Spectabio TR15SB EX

Spectabio TR15SB EX is a 15 w.-% rice husk reinforced bio-polymer blended with mineral fillers. It is designed to be biodegradable in soil as well as compostable (microbial and enzymatic degradation) in municipal/industrial facilities according to global standards like EN 13432 (for Europe) and ASTM D6400 (for the USA). The grade is labelled with "Made to Degrade".

Spectabio TR extrusion grades are used for general purpose extrusion moulding applications. They exhibit good flow, as well as excellent impact and high elongation properties. Spectabio TR15SB EX is suitable for food contact.

The material can be delivered as compound or sheet.

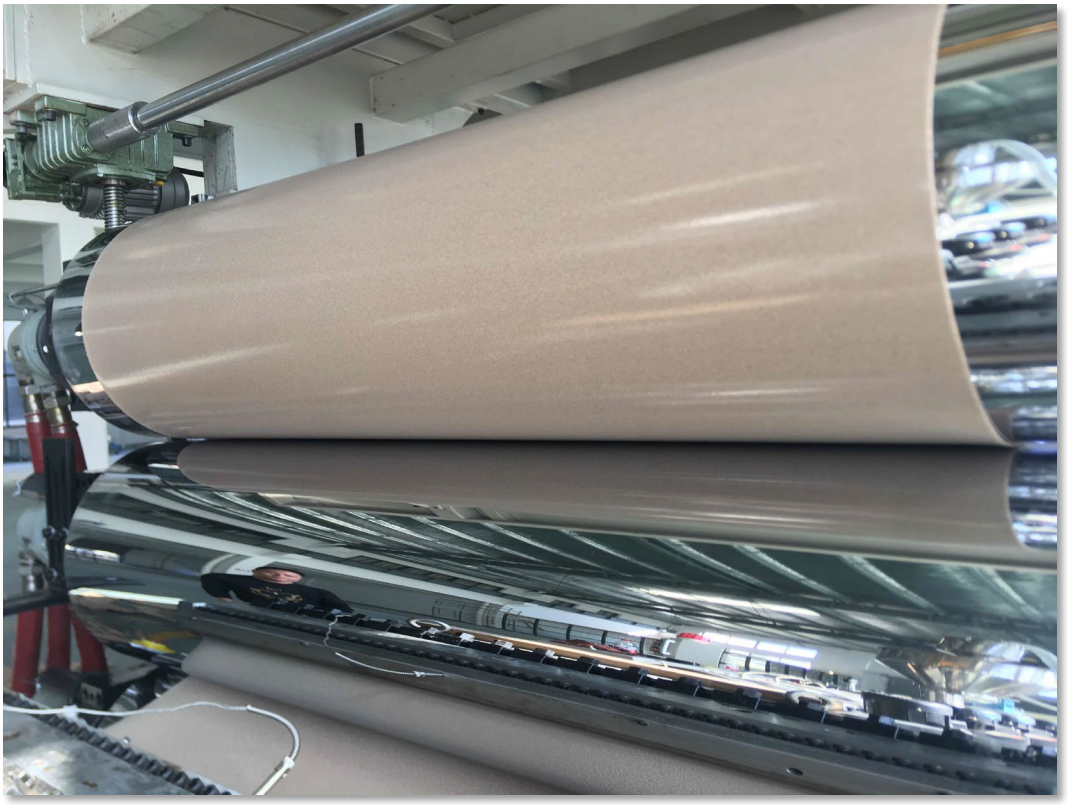
Key characteristics

- 15 w.-% rice husk reinforced
- Biodegradable in soil & sea-water
- Compostable/biodegradable according to EN 13432 and ASTM D6400
- Very good elongation values
- Low in cost

Typical Characteristics TR15SB EX			
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	8 – 10
HDT-B (@ 0.46 MPa)	ASTM D648	°C	61.5
Tensile Strength (50 mm/min)	ASTM D638	Mpa	10.6
Flexural Strength	ASTM D790A	Mpa	13.6
Flexural Modulus (1% secant)	ASTM D790A	Gpa	0.5
Elongation (50 mm/min)	ASTM D638	%	16.1
IZOD Notched Impact Strength (@ 23°C)	ASTM D256	J/m	64.6
Mold Shrinkage		%	0.4

Spectabio and Bioblend sheets

Extrusion grade Spectabio and Bioblend grades can be delivered as sheets suitable for compression moulding & thermoforming. All sheets have a glossy finish; they are available in sizes up to 2.00 m (in extrusion direction) to 1.30 m (perpendicular), thickness of 0.6 mm to 2.5 mm.



Sheet extrusion line

INJECTION GRADES

Spectabio LB25MS

Spectabio LB25MS is a biobased material. The grade is reinforced with 25 w.-% mechanically extracted bamboo fibres. It is designed to be completely compostable/biodegradable (microbial and enzymatic degradation) in the targeted disposal environment; it will compost in municipal/industrial facilities according to global standards like EN 13432 (for Europe) and ASTM D6400 (for the USA). Spectabio LB25MS exhibits the fastest degradation time of all Spectabio LB/LR grades. The grade is labelled with "Made to Degrade".

Spectabio LB25MS grades are used for general purpose injection moulding applications. They exhibit good flow, as well as high strength and stiffness properties. Spectabio LB25MS is slightly brittle in nature.

Spectabio LB25MS is food contact safe. The grade is not suitable for a post-process annealing.

Key characteristics

- 25 w.-% bamboo fibre reinforced
- 100% biobased material
- Compostable/biodegradable according to EN 13432 and ASTM D6400
- Minimum part wall-thickness 2.00 mm

Typical applications

Consumer goods, kitchenware, houseware, bathroom utensils

Usage temperature is limited to 50 – 55 °C

Typical Characteristics Spectabio LB25MS			
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	> 25.0
HDT-B (@ 0.46 MPa)	ASTM D648	°C	59.9
Tensile Strength (50mm/min)	ASTM D638	Mpa	38.5
Tensile Modulus	ASTM D638	Gpa	3.2
Flexural Strength	ASTM D790A	Mpa	67.2
Flexural Modulus (1% secant)	ASTM D790A	Gpa	5.7
Elongation (50 mm/min)	ASTM D638	%	1.5
IZOD Notched Impact Strength (@ 23°C)	ASTM D256	J/m	34.4
Mold Shrinkage		%	0.5

Spectabio LB30MB

Spectabio LB30MB is is reinforced with 30 w.-% mechanically extracted bamboo fibre. It is designed to be completely compostable/biodegradable (microbial and enzymatic degradation) in the targeted disposal environment; it will compost in municipal/industrial facilities according to global standards like EN 13432 (for Europe) and ASTM D6400 (for the USA). Spectabio LB30MB is labelled with "Made to Degrade".

Spectabio LB30MB grades are used for general purpose injection moulding applications. They exhibit excellent strength and stiffness properties and a very good flow combined with improved elongation values.

Spectabio LB30MB is food contact safe. Spectabio LB30MB is suitable for a post-process annealing.

Key characteristics

- 30 w.-% bamboo fibre reinforced
- Compostable/biodegradable according to EN 13432 and ASTM D6400
- High-heat stable up to 125 °C after annealing
- Minimum part wall-thickness 1.50 mm

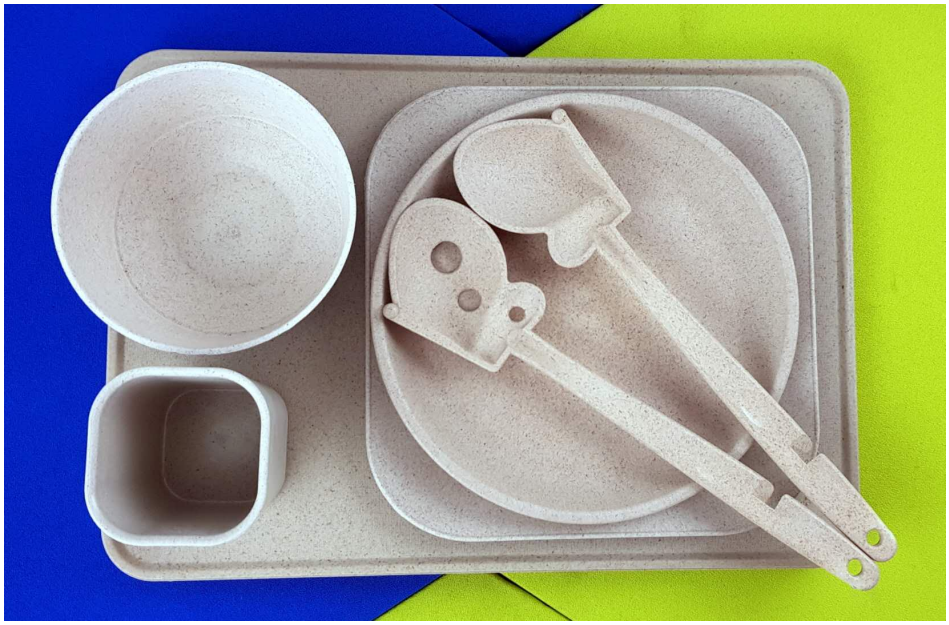
Typical applications

Consumer goods, kitchenware (e.g. cups), houseware, bathroom utensils

Typical Characteristics LB30MB			
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

Spectabio LB25MS

Spectabio LB30MB



Multi-use cutlery made with **Spectabio LB25MS**

Eco-garden candle made with **Spectabio LB30MB** (annealed)

Spectabio BB35MB

Spectabio BB35MB is reinforced with 35 w.-% mechanically extracted bamboo fibre. Spectabio B grades completely biodegrade in soil and sea-water, they also compost in municipal/industrial facilities according to global standards like EN 13432 (for Europe) and ASTM D6400 (for the USA). Spectabio BB35MB is labelled with "Made to Degrade".

Spectabio BB35MB grades are used for general purpose injection moulding applications. They exhibit medium strength combined with good impact and elongation properties.

Spectabio BB35MB is food contact safe. The grade is not suitable for a post-process annealing.

Key characteristics

- 35 w.-% bamboo fibre reinforced
- Biodegradable in soil and sea-water
- Compostable/biodegradable according to EN 13432 and ASTM D6400
- Heat stable up to 70 °C
- Minimum part wall-thickness 1.50 mm

Typical applications

- Spectabio BB35MB has a look and feel like traditional PP/PE-based applications.
- Spectabio BB grades can be a 1:1 replacement for applications made currently of traditional PP/PE without high-heat requirements.

Typical Characteristics Spectabio BB35MB			
Property	**Test Method**	**Unit**	**Typical Value***
Density		g/cm^3	1.23
Melt Flow Rate (190°C/5 kg)	ASTM D1238	g/10 min	20.6
HDT-B (@ 0.46 MPa)	ASTM D648	°C	70.5
Tensile Strength (50 mm/min)	ASTM D638	Mpa	18.0
Tensile Modulus	ASTM D638	GPa	0.26
Flexural Strength	ASTM D790A	Mpa	31.0
Flexural Modulus (1% secant)	ASTM D790A	Gpa	2.4
Elongation (50 mm/min)	ASTM D638	%	9.5
IZOD Notched Impact Strength (@ 23°C)	ASTM D256	J/m	42.2
Mold Shrinkage		%	0.4

Spectabio BR40MB

Spectabio BR40MB is reinforced with 40 w.-% rice husk (agricultural by-product). Spectabio B grades completely biodegrade in soil and sea-water; they also compost in municipal/industrial facilities according to global standards like EN 13432 (for Europe) and ASTM D6400 (for the USA). Spectabio BR40MB grades are labelled with "Made to Degrade".

Spectabio BR40MB grades are used for general purpose injection moulding applications. They exhibit medium strength combined with good impact and elongation properties.

Spectabio BR40MB is food contact safe. The grade is not suitable for a post-process annealing.

Key characteristics

- 40 w.-% rice husk reinforced
- Biodegradable in soil and sea-water
- Compostable/biodegradable according to EN 13432 and ASTM D6400
- Heat stable up to 70 °C
- Minimum part wall-thickness 1.25 mm

Typical applications

- Sepctabio BR40MB has a look and feel like traditional PP-based applications.
- Spectabio BR grades can be a 1:1 replacement for applications made currently of traditional PP/PE without high-heat requirements.

Typical Characteristics Spectabio BR40MB			
Property	**Test Method**	**Unit**	**Typical Value***
Density		g/cm^3	1.15
Melt Flow Rate (190°C/2.16 kg)	ASTM D1238	g/10 min	27.6
HDT-B (@ 0.46 MPa)	ASTM D648	°C	71.0
Tensile Strength (50 mm/min)	ASTM D638	Mpa	13.6
Flexural Strength	ASTM D790A	Mpa	31.0
Flexural Modulus (1% secant)	ASTM D790A	Gpa	2.4
Elongation @ Yield (50 mm/min)	ASTM D638	%	11.6
Elongation @ Break (50 mm/min)	ASTM D638	%	13.8
IZOD Notched Impact Strength (@ 23°C)	ASTM D256	J/m	75.90
Mold Shrinkage		%	0.4

Spectabio TR45MB

Spectabio TR45MB is reinforced with 45 w.-% rice husk (agricultural by-product). Spectabio T grades completely biodegrade in soil and sea-water; they also compost in municipal/industrial facilities according to global standards like EN 13432 (for Europe) and ASTM D6400 (for the USA). Spectabio TR45MB is labelled with "Made to Degrade".

Spectabio TR grades are used for general purpose injection moulding applications. They exhibit good flow, as well as excellent impact and high elongation properties.

Spectabio TR45MB is food contact safe. The grade is not suitable for a post-process annealing.

Key characteristics

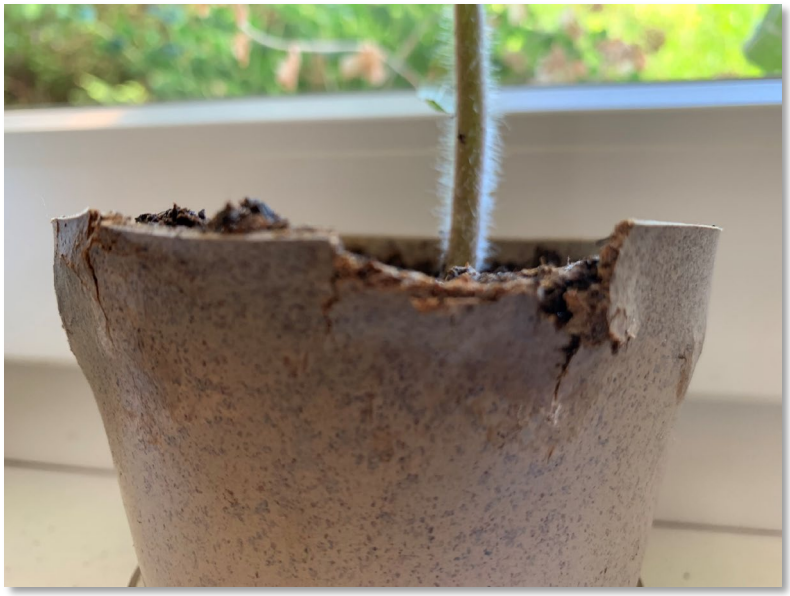
- 45 w.-% rice husk reinforced
- Biodegradable in soil and sea-water
- Compostable/biodegradable according to EN 13432 and ASTM D6400
- Degradation time can be customised
- Heat stable up to 70 °C
- Low in cost

Typical applications

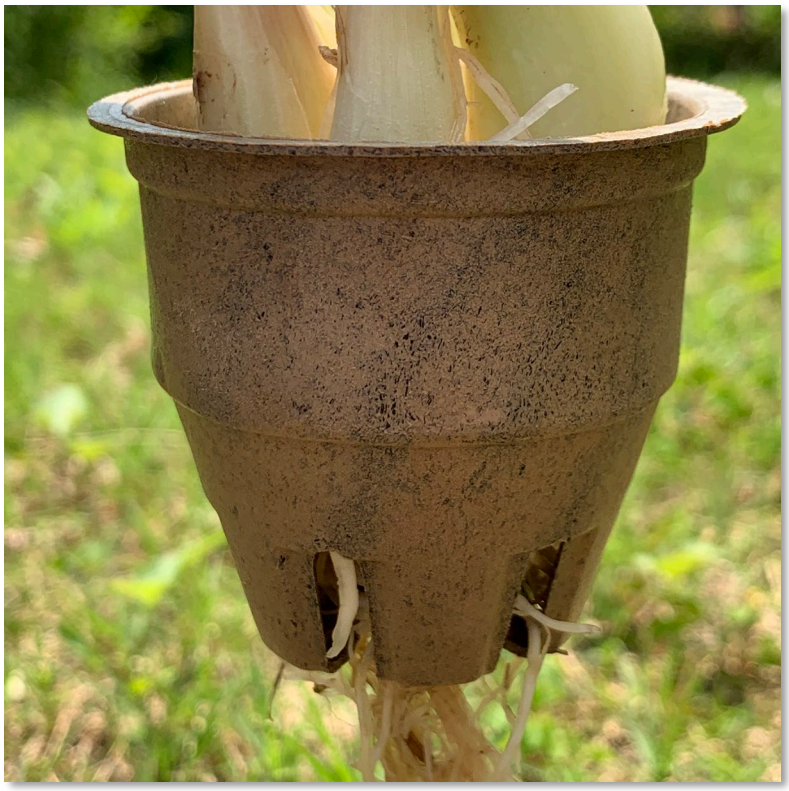
- Spectabio TR45MB is elastic and can replace traditional elastomer applications
- Spectabio TR45MB is widely used in typical agricultural, gardening and hydroponics applications, like flower pots, plant pots, hydroponic pots, etc.

Typical characteristics Spectabio TR45MB			
Property	**Test Method**	**Unit**	**Typical Value***
Density		g/cm^3	1.23
Melt Flow Rate (190°C/2.16 kg)	ASTM D1238	g/10 min	9.4
Melt Flow Rate (190°C/5 kg)	ASTM D1238	g/10 min	19.1
HDT-B (@ 0.46 MPa)	ASTM D648	°C	61.5
Tensile Strength (50 mm/min)	ASTM D638	Mpa	10.6
Flexural Strength	ASTM D790A	Mpa	13.6
Flexural Modulus (1% secant)	ASTM D790A	Gpa	0.5
Elongation (50 mm/min)	ASTM D638	%	16.1
IZOD Notched Impact Strength (@ 23°C)	ASTM D256	J/m	64.6
Mold Shrinkage		%	0.4

Spectabio TR45MB



Plant pot made with **Spectabio TR45MB** after several months in soil



Hydroponic pot made with **Spectabio TR45MB** – biodegradable in soil

Bioblend LT25B

Bioblend LT25B is a modified PLA-blend. The grade is enhanced with a blend of natural mineral fillers. Bioblend LT grades are easy to process and prepared for a fast and efficient post-processing crystallization/annealing process.

Bioblend LT25B is designed to be completely compostable/biodegradable (microbial and enzymatic degradation) in the targeted disposal environment; it will compost in municipal/industrial facilities according to global standards like EN 13432 (for Europe) and ASTM D6400 (for the USA). The grade offers a significant reduction in carbon footprint compared to fossil-based plastics.

Bioblend LT grades are used for general purpose injection moulding applications. They exhibit excellent flow, high strength and stiffness properties combined with improved elongation values. An increased rate of crystallization allows an easy annealing to a heat stable temperature of 125 °C and above.

Key characteristics

- compostable/biodegradable according to EN 13432 and ASTM D6400
- high-heat stable up to 125 °C after annealing
- dishwasher-ok (when annealed)
- minimum part wall-thickness 0.6 mm

Typical applications

Single/few times-use cutlery, single/few-times use food containers and cups, etc.

Typical Characteristics Bioblend LT25B (not annealed)			
Property	**Test Method**	**Unit**	**Typical Value***
Density		g/cm^3	1.3
Melt Flow Rate (190°C/2.16 kg)	ASTM D1238	g/10 min	> 70
HDT-B (@ 0.46 MPa)	ASTM D648	°C	54.2
Tensile Strength (50 mm/min)	ASTM D638	Mpa	51.7
Flexural Strength	ASTM D790A	Mpa	65.2
Flexural Modulus (1% secant)	ASTM D790A	Gpa	5.3
Elongation (50 mm/min) @ Yield	ASTM D638	%	7.5
Elongation (50 mm/min) @ Break	ASTM D638	%	31.0
IZOD Notched Impact Strength (@ 23°C)	ASTM D256	J/m	31.5
Mold Shrinkage		%	0.45

Bioblend LT25B

Typical Characteristics Bioblend LT25B * Post-process crystallization/annealing, 5 minutes @ 130 °C			
Property	**Test Method**	**Unit**	**Typical Value***
Density		g/cm^3	1.3
HDT-B (@ 0.46 MPa)	ASTM D648	°C	> 125.0
Tensile Strength (50 mm/min)	ASTM D638	Mpa	37.3
Flexural Strength	ASTM D790A	Mpa	56.9
Flexural Modulus (1% secant)	ASTM D790A	Gpa	5.1
Elongation (50 mm/min) @ Yield	ASTM D638	%	7.5
Elongation (50 mm/min) @ Break	ASTM D638	%	9.5
IZOD Notched Impact Strength (@ 23°C)	ASTM D256	J/m	29.8

Single-use cutlery made with **Bioblend LT25B** (annealed) after 25 cycles dishwasher

We have many more grades, we can customise to meet your requirements.
Get in touch with our experts for more information!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* All values given are typical values; properties are minimum values and might be slightly higher than indicated (for density, lower). All mechanical properties as per ASTM norms. Detailed Technical Data Sheets (TDS) are available on request. Colors can be customised; references are given for natural colors. White or bright colors are not available.

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Product Catalogue
Bio Grades and Bio-Compounds