ESTABIO F04 TR

Transparent, biodegradable and compostable thermoplastic compound as a blend of biodegradable polyesters, partially from renewable resources. The product is suitable for the production of blow films.
The film is suitable for low temperature usage (-15°C).

Mechanical and Physical properties: average values *				
	Unit	Standard	Value	Note
Thermal properties				
Melting point	°C	ASTM D3418	125-150	Pellets
Rheological properties				
Melt Flow Rate MFR	g/10 min	ASTM D1238	< 4	Pellets @ 190°C; 2,16 Kg
Mechanical Properties				
Tensile strenght at break	MPa	ASTM D882	33	Film thickness: 20 microns , measured in MD**
"	MPa	ASTM D882	35	Film thickness: 20 microns , measured in TD***
Tensile elongation at break	%	ASTM D882	510	Film thickness: 20 microns , measured in MD**
"	%	ASTM D882	530	Film thickness: 20 microns , measured in TD***
Other properties				
Density	g/cm³	ASTM D792	1,26-1,28	Plate
Bulk density	g/cm³	Internal Meth.	0,82 +/- 0,05	Pellets

* Data shown are to be considered indicative, therefore they cannot be considered product specifications
** Measurement in MD (machine direction) are carried out on specimens taken from the film
*** Measurement in TD (transverse machine direction) are carried out on specimens taken from the film
Specimens used for the mechanical properties tests are 10 mm wide and the traction speed was 500mm / min.

Extruder: ideally on single-screw extruder with L/D 27-30 with cylinder for an optimized feed of the screw.

Extrusion condition (recommended)	
Extrusion profile temperature	From 145 to 170°C
Necklace and head	From 165 to 185°C.
Residual humidity on pellets before the extrusion	< 200 ppm

In the end of extrusion (or during a stop of the process higher than 60 minutes) it is recommended to clean the machine with LDPE (MFR 2-4 g/10 min) to avoid the degradation of ESTABIO F04 TR on the screw.

Screw: screws for extrusion of LDPE are generally suitable also for ESTABIO F04 TR. On some plants, screws for LLDPE and for HDPE are usable too.

Head: it is recommended to use a gap of 1-1,3 mm.

Blowing ratio: it is recommended to use a blowing ratio > 3.

Draw ratio: Known that different filming plants produce films with very different mechanical properties, it is recommended to check the tensile properties in MD e TD to select the appropriate draw ratio. A not-appropriate draw ratio affect mechanical properties (elongation at break) in extrusion machine direction (MD).

Filter: The mesh size of the filter used depends on the requied degree of filtration.

It is recommended to check the pressure during the filter process to avoid the degradation of the material**.**

Welding: The welding process temperature is between 350 and 450 °C, for the welding of bottom/handle between 27 and 33%.

Printing: Tests are positive performed with solventless inks; however it is recommended to perform a mild corona treatment.

Manipulation: ESTABIO F04 TR is ready to use. As other biodegradable, material it is sensitive to moist that affect mechanical properties of the final product. It is recommended to open the original packaging only at the time of use; in case of leftovers reseal the packaging to avoid moisture contamination.

Storage: It is recommended to store the product in its original packaging in a cool and dry place. In any case it is recommended to use the material within 6 months from the arrival.

Processing waste: processing waste can be recycled and added with new material in less than 10%; higher amount or adding other biodegradable material affect the mechanical characteristics of the final film.

Gorla Maggiore, 15/10/2025

Fi-Plast S.r.l. SOC.UNIPERSONALE Sede legale, Amministrativa e Stabilimento: 21050 Gorla Maggiore (VA) Via del Vignolo 55 Tel 0331644363
E-mail Commerciale@fiplast.it P.IVA e C.F. 02886470125 R.E.A. n. 298833

ESTABIO® F08

Biodegradable and compostable thermoplastic compound as a blend of biodegradable polyesters. The product is suitable for the production of blow films.

Mechanical and Physical properties: average values*				
	Unit	Standard	Value	Note
Thermal properties				
Melting point	°C	ASTM D3418	110 - 130	Pellets
Rheological properties				
Melt Flow Rate MFR	g/10 min	ASTM D1238	3	Pellets, @ 190°C 2,16 Kg
Mechanical properties				
Tensile strenght at break	MPa	ASTM D882	32	Film thickness: 20 microns measured in MD **
"	MPa	ASTM D882	30	Film thickness: 20 microns measured in TD ***
Tensile elongation at break	%	ASTM D882	500	Film thickness: 20 microns measured in MD **
"	%	ASTM D882	500	Film thickness: 20 microns measured in TD ***
Others properties				
Density	g/cm³	ASTM D792	1,43	Plate

* Data shown are to be considered indicative, therefore they cannot be considered product specifications
** Measurement in MD (machine direction) are carried out on specimens taken from the film
*** Measurement in TD (transverse machine direction) are carried out on specimens taken from the film
Specimens used for the mechanical properties tests are 10 mm wide and the traction speed was 500mm / min

Extruder: ideally on single-screw extruder with L/D 27-30 with cylinder for an optimized feed of the screw.

Extrusion condition (recommended)	
Extrusion profile temperature	From 145 to 170°C
Necklace and head	From 165 to 185°C.
Residual humidity on pellets before the extrusion	< 200 ppm

In the end of extrusion (or during a stop of the process higher than 60 minutes) it is recommended to clean the machine with LDPE (MFR 2-4 g/10 min) to avoid the degradation of material on the screw.

Screw: screws for extrusion of LDPE are generally suitable also for ESTABIO® F08. On some plants, screws for LLDPE and for HDPE are usable too.

Head: it is recommended to use a gap of 1-1,3 mm.

Blowing ratio: it is recommended to use a blowing ratio > 3.

Draw ratio: Known that different filming plants produce films with very different mechanical properties, it is recommended to check the tensile properties in MD e TD to select the appropriate draw ratio. A not-appropriate draw ratio affect mechanical properties (elongation at break) in extrusion machine direction (MD).

Filter: The mesh size of the filter used depends on the requied degree of filtration.

It is recommended to check the pressure during the filter process to avoid the degradation of the material**.**

Welding: The welding process temperature is between 350 and 450 °C, for the welding of bottom/handle between 30% and 36%.

Printing: Tests are positive performed with solventless inks; however it is recommended to perform a mild corona treatment.

Manipulation: ESTABIO® F08 is ready to use. As other biodegradable, material it is sensitive to moist that affect mechanical properties of the final product. It is recommended to open the original packaging only at the time of use; in case of leftovers reseal the packaging to avoid moisture contamination.

Storage: It is recommended to store the product in its original packaging in a cool and dry place. In any case it is recommended to use the material within 6 months from the arrival.

Processing waste: processing waste can be recycled and added with new material in less than 10%; higher amount or adding other biodegradable material affect the mechanical characteristics of the final film.

Gorla Maggiore, 22/04/2025

Fi-Plast S.r.l. Soc.Unipersonale Sede legale, Amministrativa e Stabilimento: 21050 Gorla Maggiore (VA) Via del Vignolo 55 Tel 0331644363
E-mail Commerciale@fiplast.it P.IVA e C.F. 02886470125 R.E.A. n. 298833

ESTABIO F08 D

Transparent, biodegradable and compostable thermoplastic compound as a blend of biodegradable polyesters, partially from renewable resources. The product is suitable for the production of blow films.

Mechanical and Physical properties: average values *				
	Unit	Standard	Value	Note
Thermal properties				
Melting point	°C	ASTM D3418	110-130	Pellets
Rheological properties				
Melt Flow Rate MFR	g/10 min	ASTM D1238	3	Pellets @ 190°C; 2,16 Kg
Mechanical Properties				
Tensile strenght at break	MPa	ASTM D882	30	Film thickness: 20 microns , measured in MD**
"	MPa	ASTM D882	25	Film thickness: 20 microns , measured in TD***
Tensile elongation at break	%	ASTM D882	400	Film thickness: 20 microns , measured in MD**
"	%	ASTM D882	400	Film thickness: 20 microns , measured in TD***
Other properties				
Density	g/cm³	ASTM D792	1,52	Plate

* Data shown are to be considered indicative, therefore they cannot be considered product specifications
** Measurement in MD (machine direction) are carried out on specimens taken from the film
*** Measurement in TD (transverse machine direction) are carried out on specimens taken from the film
Specimens used for the mechanical properties tests are 10 mm wide and the traction speed was 500mm / min.

Extruder: ideally on single-screw extruder with L/D 27-30 with cylinder for an optimized feed of the screw.

Extrusion condition (recommended)	
Extrusion profile temperature	From 145 to 170°C
Necklace and head	From 165 to 185°C.
Residual humidity on pellets before the extrusion	< 200 ppm

In the end of extrusion (or during a stop of the process higher than 60 minutes) it is recommended to clean the machine with LDPE (MFR 2-4 g/10 min) to avoid the degradation of ESTABIO F08 D on the screw.

Screw: screws for extrusion of LDPE are generally suitable also for ESTABIO F08 D. On some plants, screws for LLDPE and for HDPE are usable too.

Head: it is recommended to use a gap of 1-1,3 mm.

Blowing ratio: it is recommended to use a blowing ratio > 3.

Draw ratio: Known that different filming plants produce films with very different mechanical properties, it is recommended to check the tensile properties in MD e TD to select the appropriate draw ratio. A not-appropriate draw ratio affect mechanical properties (elongation at break) in extrusion machine direction (MD).

Filter: The mesh size of the filter used depends on the requied degree of filtration.

It is recommended to check the pressure during the filter process to avoid the degradation of the material**.**

Welding: The welding process temperature is between 350 and 450 °C, for the welding of bottom/handle between 27 and 33%.

Printing: Tests are positive performed with solventless inks; however it is recommended to perform a mild corona treatment.

Manipulation: ESTABIO F08 D is ready to use. As other biodegradable, material it is sensitive to moist that affect mechanical properties of the final product. It is recommended to open the original packaging only at the time of use; in case of leftovers reseal the packaging to avoid moisture contamination.

Storage: It is recommended to store the product in its original packaging in a cool and dry place. In any case it is recommended to use the material within 6 months from the arrival.

Processing waste: processing waste can be recycled and added with new material in less than 10%; higher amount or adding other biodegradable material affect the mechanical characteristics of the final film.

Gorla Maggiore, 15/10/2025

Fi-Plast S.r.l. SOC.UNIPERSONALE Sede legale, Amministrativa e Stabilimento: 21050 Gorla Maggiore (VA) Via del Vignolo 55 Tel 0331644363
E-mail Commerciale@fiplast.it P.IVA e C.F. 02886470125 R.E.A. n. 298833

ESTABIO M01

Biodegradable and compostable thermoplastic compound as a blend of biodegradable polyesters, partially from renewable resources. The product is suitable for the production of blow films.

Mechanical and Physical properties: average values*				
	Unit	Standard	Value	Note
Thermal properties				
Melting point	°C	ASTM D3418	125-150	Pellets
Rheological properties				
Melt Flow Rate MFR	g/10 min	ASTM D1238	3	Pellets @ 190°C; 2,16 Kg
Mechanical properties				
Tensile strenght at break	MPa	ASTM D882	30	Film thickness: 20 microns , measured in MD**
"	MPa	ASTM D882	33	Film thickness: 20 microns , measured in TD***
Tensile elongation at break	%	ASTM D882	470	Film thickness: 20 microns , measured in MD**
"	%	ASTM D882	500	Film thickness: 20 microns , measured in TD***
Other properties				
Density	g/cm³	ASTM D792	1,4	Plate
Bulk density	g/cm³	Internal Meth.	0,83 +/- 0,05	Pellets

* Data shown are to be considered indicative, therefore they cannot be considered product specifications
** Measurement in MD (machine direction) are carried out on specimens taken from the film
*** Measurement in TD (transverse machine direction) are carried out on specimens taken from the film
Specimens used for the mechanical properties tests are 10 mm wide and the traction speed was 500mm / min.

Extruder: ideally on single-screw extruder with L/D 27-30 with cylinder for an optimized feed of the screw.

Extrusion condition (recommended)	
Extrusion profile temperature	From 145 to 170°C
Necklace and head	From 165 to 185°C.
Residual humidity on pellets before the extrusion	< 200 ppm

In the end of extrusion (or during a stop of the process higher than 60 minutes) it is recommended to clean the machine with LDPE (MFR 2-4 g/10 min) to avoid the degradation of ESTABIO M01 on the screw.

Screw: screws for extrusion of LDPE are generally suitable also for ESTABIO M01. On some plants, screws for LLDPE and for HDPE are usable too.

Head: it is recommended to use a gap of 1-1,3 mm.

Blowing ratio: it is recommended to use a blowing ratio > 3.

Draw ratio: Known that different filming plants produce films with very different mechanical properties, it is recommended to check the tensile properties in MD e TD to select the appropriate draw ratio. A not-appropriate draw ratio affect mechanical properties (elongation at break) in extrusion machine direction (MD).

Filter: The mesh size of the filter used depends on the requied degree of filtration.

It is recommended to check the pressure during the filter process to avoid the degradation of the material**.**

Welding: The welding process temperature is between 350 and 450 °C, for the welding of bottom/handle between 27 and 33%.

Printing: Tests are positive performed with solventless inks; however it is recommended to perform a mild corona treatment.

Manipulation: ESTABIO M01 is ready to use. As other biodegradable, material it is sensitive to moist that affect mechanical properties of the final product. It is recommended to open the original packaging only at the time of use; in case of leftovers reseal the packaging to avoid moisture contamination.

Storage: It is recommended to store the product in its original packaging in a cool and dry place. In any case it is recommended to use the material within 6 months from the arrival.

Processing waste: processing waste can be recycled and added with new material in less than 10%; higher amount or adding other biodegradable material affect the mechanical characteristics of the final film.

Gorla Maggiore, 15/10/2025

Fi-Plast S.r.l. SOC.UNIPERSONALE Sede legale, Amministrativa e Stabilimento: 21050 Gorla Maggiore (VA) Via del Vignolo 55 Tel 0331644363
E-mail Commerciale@fiplast.it P.IVA e C.F. 02886470125 R.E.A. n. 298833

ESTABIO PL 0480 T05 BIANCO ET

Biodegradable and compostable thermoplastic compound as a blend of biodegradable polyesters. The product which has **high HDT (high thermal resistance)** is suitable for producing dishes, plastic cups, cutlery.

Average physical and mechanical properties*				
	Unit	Standard	Value	Note
Thermal properties				
H.D.T. (0,45 MPa 120°C/h)	°C	ASTM D648	96	
H.D.T. (1,80 MPa 120°C/h)	°C	ASTM D648	62	
Mechanical properties				
Izod notched	J/m	ASTMD256	40	
Tensile strenght at yield	MPa	ASTM D638	45	
Elongation at break	%	ASTM D638	3	
Flexural modulus	MPa	ASTM D638	5800	
Other properties				
Density	g/cm^3	ASTM D792	1,63	Plate

*Data shown are to be considered indicative, therefore they cannot be considered product specifications

THE PRODUCT IS AVAILABLE IN TWO VERSIONS (WITH DIFFERENT MFR) ACCORDING TO THE TRANSFORMATION TECHNOLOGY

INJECTION MOULDING

MFR g/10 min (190°C 2,16Kg) = 10

Moulding guidelines:
Cylinder temperature: 190-220°C
Mold temperature: 30-50°C
Injection Pressure: medium
Injection speed: medium

Product must be dried before use (60°C for 3 hours).

Unless otherwise deal the product is supplied in octabins equipped with aluminum film of 500 Kg each. In case of partial use, it is recommended to close the packaging carefully. The material must be used within six months of arrival. Store the product in its original packaging in a cool and dry place.

The material can produce undesired chemical substances when reused (check food contact statement); therefore it is NOT possible to reuse the material for food contact application.

In the end of the process (or during a stop of the process higher than 60 minutes) it is recommended to clean the machine with LDPE (MFR 2 g/10 min).

EXTRUSION / THERMOFORMING

MFR g/10 min (190°C 2,16Kg) = 3

Extrusion guidelines:
Cylinder temperature: 190-220°C
Chill roll temperature: 30-50°C

The product is particularly suitable for thermoforming

Product must be dried before use (60°C for 3 hours).

Unless otherwise deal the product is supplied in octabins equipped with aluminum film of 500 Kg each. In case of partial use, it is recommended to close the packaging carefully. The material must be used within six months of arrival. Store the product in its original packaging in a cool and dry place.

The material can produce undesired chemical substances when reused (check food contact statement); therefore it is NOT possible to reuse the material for food contact application.

In the end of the process (or during a stop of the process higher than 60 minutes) it is recommended to clean the machine with LDPE (MFR 2 g/10 min).

Gorla Maggiore 22/01/2025

Fi-Plast S.r.l. Sede legale, Amministrativa e Stabilimento: 21050 Gorla Maggiore (VA) Via del Vignolo 55 Tel 0331644363
E-mail Commerciale@fiplast.it P.IVA e C.F. 02886470125 R.E.A. n. 298833

ESTABIO PL 0480 T05 NATURALE ET

Biodegradable and compostable thermoplastic compound as a blend of biodegradable polyesters. The product which has **high HDT (high thermal resistance)** is suitable for producing dishes, plastic cups, cutlery.

Average physical and mechanical properties*				
	Unit	Standard	Value	Note
Thermal properties				
H.D.T. (0,45 MPa 120°C/h)	°C	ASTM D648	95	
H.D.T. (1,80 MPa 120°C/h)	°C	ASTM D648	60	
Mechanical properties				
Izod notched	J/m	ASTMD256	40	
Tensile strenght at yield	MPa	ASTM D638	45	
Elongation at break	%	ASTM D638	3	
Flexural modulus	MPa	ASTM D638	4300	
Other properties				
Density	g/cm^3	ASTM D792	1,55	Plate

*Data shown are to be considered indicative, therefore they cannot be considered product specifications

THE PRODUCT IS AVAILABLE IN TWO VERSIONS (WITH DIFFERENT MFR) ACCORDING TO THE TRANSFORMATION TECHNOLOGY

INJECTION MOULDING

MFR g/10 min (190°C 2,16Kg) = 10

Moulding guidelines:
Cylinder temperature: 190-220°C
Mold temperature: 30-50°C
Injection Pressure: medium
Injection speed: medium

Product must be dried before use (60°C for 3 hours).

Unless otherwise deal the product is supplied in octabins equipped with aluminum film of 500 Kg each. In case of partial use, it is recommended to close the packaging carefully. The material must be used within six months of arrival. Store the product in its original packaging in a cool and dry place.

The material can produce undesired chemical substances when reused (check food contact statement); therefore it is NOT possible to reuse the material for food contact application.

In the end of the process (or during a stop of the process higher than 60 minutes) it is recommended to clean the machine with LDPE (MFR 2 g/10 min).

EXTRUSION / THERMOFORMING

MFR g/10 min (190°C 2,16Kg) = 3

Extrusion guidelines:
Cylinder temperature: 190-220°C
Chill roll temperature: 30-50°C

The product is particularly suitable for thermoforming

Product must be dried before use (60°C for 3 hours).

Unless otherwise deal the product is supplied in octabins equipped with aluminum film of 500 Kg each. In case of partial use, it is recommended to close the packaging carefully. The material must be used within six months of arrival. Store the product in its original packaging in a cool and dry place.

The material can produce undesired chemical substances when reused (check food contact statement); therefore it is NOT possible to reuse the material for food contact application.

In the end of the process (or during a stop of the process higher than 60 minutes) it is recommended to clean the machine with LDPE (MFR 2 g/10 min).

OK Compost
N. certicate
TA8011601583
2018, 28th November

OK compost

TÜV AUSTRIA
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Gorla Maggiore 23th April 2020

Fi-Plast S.r.l. Sede legale, Amministrativa e Stabilimento: 21050 Gorla Maggiore (VA) Via del Vignolo 55 Tel 0331644363
E-mail Commerciale@fiplast.it P.IVA e C.F. 02886470125 R.E.A. n. 298833

ESTABIO PL 0640 T05 NATURALE ET

Biodegradable and compostable thermoplastic compound as a blend of biodegradable polyesters. The product which has **high HDT (high thermal resistance)** is suitable for producing coffee caps.

Average physical and mechanical properties*				
	Unit	Standard	Value	Note
Thermal properties				
H.D.T. (0,45 MPa 120°C/h)	°C	ASTM D648	88	
H.D.T. (1,80 MPa 120°C/h)	°C	ASTM D648	52	
Mechanical properties				
Izod notched	J/m	ASTMD256	50	
Tensile strenght at yield	MPa	ASTM D638	38	
Elongation at break	%	ASTM D638	>10	
Flexural modulus	MPa	ASTM D638	2300	
Other properties				
Density	g/cm^3	ASTM D792	1,4	Plate

- Data shown are to be considered indicative, therefore they cannot be considered product specifications

THE PRODUCT IS AVAILABLE IN TWO VERSIONS (WITH DIFFERENT MFR) ACCORDING TO THE TRANSFORMATION TECHNOLOGY

INJECTION MOULDING

MFR g/10 min (190°C 2,16Kg) = 20

Moulding guidelines:

Cylinder temperature: 190-220°C
Mold temperature: 30-50°C
Injection Pressure: medium
Injection speed: medium

Product must be dried before use (60°C for 3 hours).

Unless otherwise deal the product is supplied in octabins equipped with aluminum film of 500 Kg each. In case of partial use, it is recommended to close the packaging carefully. The material must be used within six months of arrival. Store the product in its original packaging in a cool and dry place.

The material can produce undesired chemical substances when reused (check food contact statement); therefore it is NOT possible to reuse the material for food contact application.

In the end of the process (or during a stop of the process higher than 60 minutes) it is recommended to clean the machine with LDPE (MFR 2 g/10 min).

EXTRUSION / THERMOFORMING

MFR g/10 min (190°C 2,16Kg) = 3

Extrusion guidelines:

Cylinder temperature: 190-220°C
Chill roll temperature: 30-50°C

Product must be dried before use (60°C for 3 hours).

Unless otherwise deal the product is supplied in octabins equipped with aluminum film of 500 Kg each. In case of partial use, it is recommended to close the packaging carefully. The material must be used within six months of arrival. Store the product in its original packaging in a cool and dry place.

The material can produce undesired chemical substances when reused (check food contact statement); therefore it is NOT possible to reuse the material for food contact application.

In the end of the process (or during a stop of the process higher than 60 minutes) it is recommended to clean the machine with LDPE (MFR 2 g/10 min).

OK Compost certificate n. **TA8011700923** Of 30 July 2019

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Gorla Maggiore 23 April 2020

Fi-Plast S.r.l. Sede legale, Amministrativa e Stabilimento: 21050 Gorla Maggiore (VA) Via del Vignolo 55 Tel 0331644363
E-mail Commerciale@fiplast.it P.IVA e C.F. 02886470125 R.E.A. n. 298833