PolimerUs

" Somos Polímeros "

Masterbatch de ECM

La solución única certificada para lograr la biodegradabilidad de los plásticos

ECM

Biodegradabile

ECM MasterBatch (MB)

Una solución para la Biodegrabilidad de los plásticos

El másterbatch de ECM en granza tiene como base PE

Reutilización. La tecnología del MB de ECM no altera las características de los plásticos, además es posible tener un producto perdurable en el tiempo

Reciclado. Los productos que Contienen este MB de ECM pueden ser reciclados junto con otros materiales plásticos

Biodegradable. Los plásticos que utilizan el MB de ECM se Bio-degradan en compost

Reutilización

Reciclado

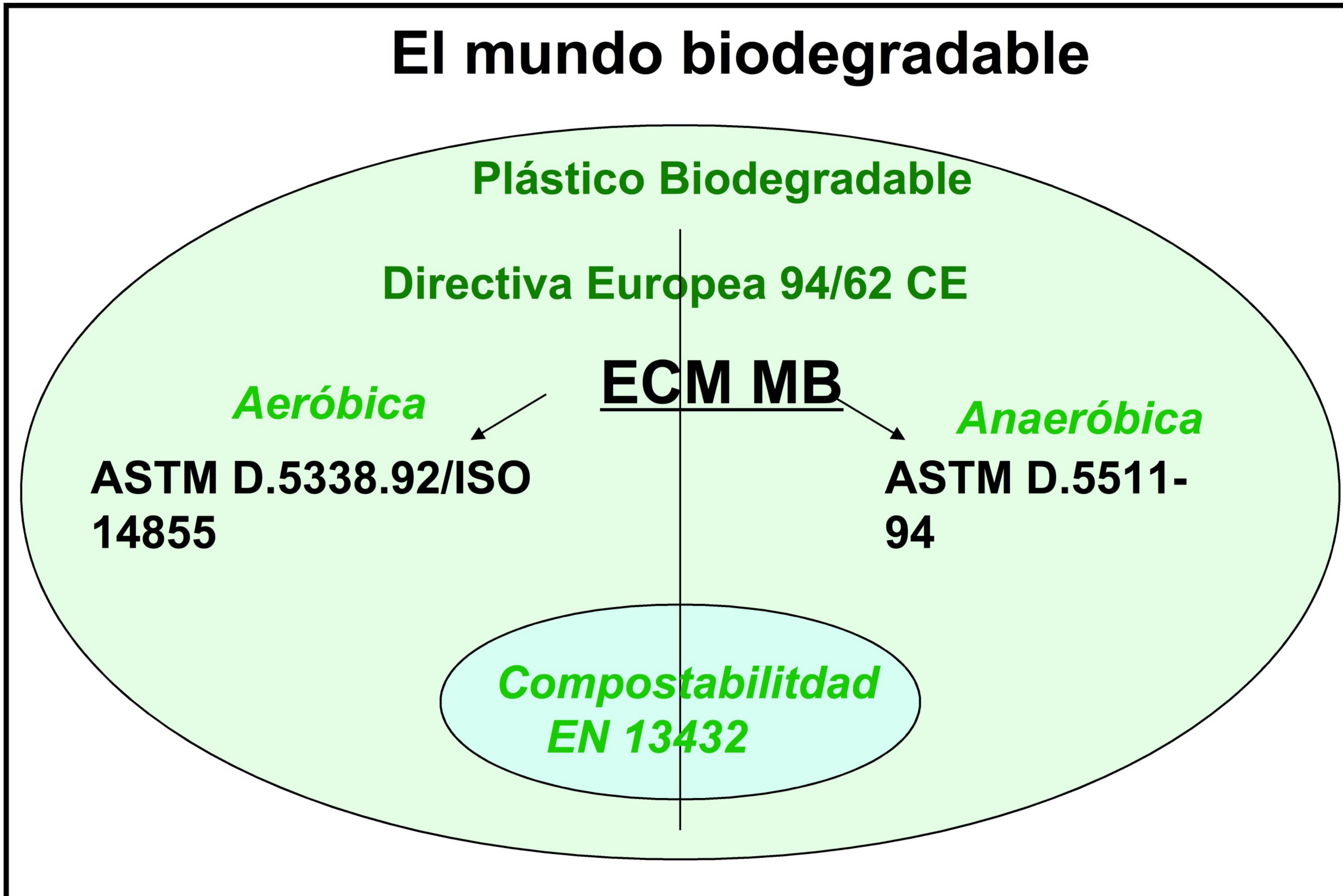
Biodegradable

Explicación de la bio-degradación. ¿Cómo funciona?

Los productos plásticos que se fabrican con la tecnología bio de ECM, ayudan a que los microbios del suelo reaccionen produciendo enzimas y ácidos que atacan las largas cadenas poliméricas de carbono. Estas cadenas son fragmentadas, después actúan los ácidos naturales de los microbios y enzimas hasta que puedan metabolizar y/o biodegradar en CO_2 + Agua o Metano

Los productos plásticos que se fabrican con la tecnología BIO de ECM se degradan en aprox. 9 meses hasta 5 años en vertederos o en el lugar donde se pueda encontrar

Normativa biodegradable vigente:



Certificaciones / Homologaciones

El material aditivado con el MB de ECM ha sido testado como biodegradable
Es seguro para el medio ambiente porque cumple las siguientes normativas:

- **ASTM D5338 / ISO 14855 "Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials under Controlling Composting Conditions."**
- **ASTM D5511 "Standard Test Method for Determining Anaerobic Biodegradation of Plastic Materials under High Solids Anaerobic Digestion Conditions."**
- **ASTM D5209 "Standard Test Method for Determining the Aerobic Biodegradation of Plastic Materials in the Presence of Municipal Sewage Sludge."**

Certificaciones y homologaciones adicionales

El plástico producido con el MB de ECM ha sido aprobado por las próximas regulaciones/directivas internacionales:

REACH / Regulación (EC) No 1907/2006

FOOD Approvals.

- **EU Commission Directive 2002/72/EC and all its amendments.**
- **Germany / BfR recommendations**
- **Italy Decreto Ministeriale 21/03/1973**
- **UK Plastic Materials in Contact with Food Regulations – 2009**

ABSENCE DECLARATION (SVHC)

Polycyclic Aromatic Hydrocarbons-Free and Phtalate Declaration

Comparison of Products Produced with ECM MasterBatch Pellets™ to Alternative Products			
	ECM MasterBatch ™	**Oxo-Degrader***	**Bioplastics+**
For Biodegradation			
100% Biodegradable (on land, in land, in water)	**True**	False	False
100% Biodegradable in landfill, as litter or backyard compost	**True**	False	False
For Recycling			
100% Recyclable at any time	**True**	False	False
Compatible with the recycle stream	**True**	False	False
For Properties			
No special storage conditions required	**True**	False	False
Shelf life is indefinite	**True**	False	False
Not degraded by exposure to heat, light or external stresses during storage,shipping, handling or use.	**True**	False	False
Does not fragment during degradation	**True**	False	False
Degradation begins at the time of disposal - not before	**True**	False	False
For Performance			
When compared to the original material in the application, physical properties are unchanged and no redesign of end	**True**	False	False
UV or anti-oxidant additives are needed, inhibiting product performance	**False**	True	False
Performance not negatively affected by over loading	**True**	False	n/a
For Processing			
Can be processed with conventional equipment	**True**	True	False
No changes to the process settings required	**True**	False	False
Biodegradable with 1% loading in PE, PP, PVC, PS and PET	**True**	False	n/a
For the Environment			
No heavy metals, ecologically safe	**True**	False	True
Degraded product returns to the environment not as small	**True**	False	True°
For the Bottom Line	**True**	False	False
Cost effective			
* EPI Environmental Products Inc.,Willow Ridge Plastics, Inc., Symphony Environmental, Inc., etc.			
+ PLA, Mater-Bi®, PHB and combinations (NatureWorks LLC., Novamont S.p.A., et al.)			
° Only in industrial/municipal composting facilities			

Fabricación & Dosificación

-**El MB de ECM** puede ser dosificado con los principales polímeros, EVA, PE, PP, PS, PET, PVC, PA , PU y cualquier combinación entre ellos dosificados al menos al 1%.

-El MB está envasado con materiales barrera para evitar la humedad. Es altamente recomendable volver a cerrar el envase para preservarlo en óptimas condiciones.

-El procedimiento de secado estándar es el siguiente:

4 horas a 80ºC.

-Es apto para cuquier proceso de transformación de plásticos:

-Inyección, extrusión, soplado, calandrado, termoformado y rotomoldeo.

Certificaciones clientes finales.

Requerimos por parte de nuestro cliente que conozca bien nuestro producto, así como su óptima utilización para prevenir un mal uso del mismo y garantizar por parte de ECM la certificación de biodegradabilidad de acuerdo a la Directiva 94/62/CE

CERTIFICADO CLIENTE FINAL DE BIODEGRADIBILIDAD

CERTIFICATE

of the Biodegradability* of Plastic Products Sold by

PolimerUs

which Incorporate the ECM MasterBatch Pellet Technology

This is to certify that numerous plastic samples, submitted by ECM BioFilms, Inc., have been tested by independent laboratories in accordance with standard test methods approved by ASTM, ISO and other such standardization bodies to determine the rate and extent of biodegradation of plastic materials.

A Degradable Plastic is defined (ASTM D883-12) as a plastic that is designed to undergo a significant change in its chemical structure under specific environmental conditions resulting in a loss of some properties that may vary as measured by standard test methods appropriate to the plastic and the application in a period of time that determines its classification. A Biodegradable Plastic is defined as a degradable plastic in which the degradation results from the action of naturally occurring microorganisms such as bacteria, fungi and algae.

The biodegradation of the submitted plastic samples were tested using ASTM D5209-91, "Standard Test Method for Determining the Aerobic Biodegradation of Plastic Materials in the Presence of Municipal Sewage Sludge", ASTM D5338-98, "Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials under Controlled Composting Conditions", which is equivalent to CEN prEN WI 261085, and the ISO 14855 method, "Evaluation of the Ultimate Aerobic Biodegradability and Disintegration of Plastics under Controlled Composting Conditions", ASTM D5511, "Standard Test Method for Determining Anaerobic Biodegradation of Plastic Materials Under High-Solids Anaerobic Digestion Conditions." The results of these tests and the related biodegradation and ecological impact experiments in various environments are contained in the Ecological Assessment of ECM Plastic report dated February 16, 1999, which certifies that plastic products manufactured with ECM additives can be marketed as biodegradable and safe for the environment.*

This Certificate and the Ecological Assessment of ECM Plastic report, along with Scanning Electron Microscope and other studies that have been conducted since the publication of the Ecological Assessment, all of which use a one percent loading rate for the ECM MasterBatch Pellets rather than the higher additive levels used earlier, have been presented to ***PolimerUs*** *and may be used by it to validate its claims to the biodegradability* and environmental safety of plastic products that it sells that are made consistent with the manufacturing guidelines for uses of ECM MasterBatch Pellets presented to it by ECM BioFilms, Inc.*

Dated: May 10, 2017

Certified by: ______________________

Robert Sinclair, President
ECM BioFilms, Inc.

*** 49.28% biodegradation in 900 days under non-typical conditions. No evidence of further biodegradation.**

ECM BIOFILMS

DECLARATION OF CONFORMITY
OF ECM MasterBatch Pellets

The company ECM BioFilms, Inc. based in Painesville, Ohio, U.S.A.,

DECLARES

Under its own responsibility, that:
the ECM MasterBatch Pellet Technology is a wholly different technology than the group of additive technologies classified as the OXO-Degradable technologies.

Painesville, June 13, 2018

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Website: www.ecmbiofilms.com • E-mail: biodeg@ecmbiofilms.com

EJEMPLO CERTIFICADO CLIENTE USO 1% DE NUESTRO MB PARA SER BIODEGRADABLE

Thursday, January 29, 2015

ECM BioFilms, Inc.
Victoria Place, Suite 225
100 South Park Place
Painesville, OH 44077, U.S.A.

VIA EMAIL TO BIODEG@ECMBIOFILMS.COM
OR FACSIMILE TO +1 440-350-1444

Re: **Certificate of Assurance of Minimum Loading Rate When Using ECM MasterBatch Pellets**

Dear Sirs:

The purpose of this letter is to certify to ECM BioFilms, Inc. (hereinafter "ECM") that our company will always use a minimum loading rate of one percent by weight (accounting for any margins of error for our loading procedures) of any of the ECM MasterBatch Pellets biodegradation additives to the remainder of our plastic product formulations whenever using ECM MasterBatch Pellets.

We are fully aware that ECM disclaims any assurance that plastic products manufactured with its additives will biodegrade if it can be shown that they were manufactured with less than a one percent load of any version of their ECM MasterBatch Pellets. We are also fully aware that the reputation of ECM is vitally at stake in this certifying requirement and that ECM's reputation can be materially and, perhaps, irreparably damaged when products claiming to use ECM MasterBatch Pellets fail to biodegrade when placed in environments where other material is actively biodegrading. Finally, we are fully aware that ECM believes the risk that a particular plastic product will not fully biodegrade if it contains less than a one percent load of its ECM MasterBatch Pellets is large enough that ECM will not knowingly sell its products to a manufacturer that will not certify its intent in the manner we have done by signing this letter.

It is with these facts in mind and with a desire that ECM will sell its ECM MasterBatch Pellets biodegradation additives to us that this letter has been signed below for our company by an authorized person.

____
(Print Company Name)

By: ________________________________ (Signature)

Printed Name: ________________________________

Its: ________________________________ (Title of Authorized Representative)

CUMPLIMIENTO NORMA CONTACTO ALIMENTARIO FDA

ECM BIOFILMS

Tuesday, June 05, 2018

Mr. Raúl Presa
PolimerUs
C/ Nubes, 12 - Pol. Ind. San José
de Valderas ii, Leganés
Madrid, 28918 Spain

VIA EMAIL *.PDF

Re: FDA Compliance for Plastic Products Manufactured with ECM MasterBatch Pellets as an Additive

Dear Mr. Presa:

Per your request, I am sending you this letter for the purpose of assuring both you and your customers that all United States FDA requirements for direct food contact will be satisfied for products with our additives.

As you are probably aware, the FDA does not actively approve items that are manufactured within the parameters of their guidelines and regulations. This is the case with our additives to plastic products. Therefore plastic products manufactured with our additives at their recommended loading percentages comply with FDA regulations for direct food contact at or below cooking temperatures as long as the same product without our additives would comply.

If you or your customers have any questions concerning this matter, please have them contact me directly at the numbers listed.

Very truly yours,

Robert Sinclair
President & CEO

RS/ml

CUMPLIMIENTO NORMA REACH

ECM BIOFILMS

Tuesday, June 05, 2018

Mr. Raúl Presa
PolimerUs
C/ Nubes, 12 - Pol. Ind. San José
de Valderas ii, Leganés
Madrid, 28918 Spain

VIA EMAIL *.PDF

Re: REACH Compliance for Plastic Packaging and other Products Manufactured with ECM MasterBatch Pellets as an Additive

Dear Mr. Presa:

Per your request, I am sending you this letter for the purpose of assuring both you and your customers that all provisions of the REACH regulations which are published as Regulation (EC) No 1907/2006 and came into force on June 1, 2007 will be satisfied for products with our additives as long as the same product without our additives would comply.

As you are probably aware, the Registration, Evaluation, Authorization and Restriction of Chemicals otherwise known as REACH, aims at protecting human health and the environment from the risks that can be posed by chemicals. According to the European Chemical Agency's Guidance on Registration only monomers must be registered, the ECM Masterbatch however is not a monomer. The ECM Masterbatch is a preparation comprised of substances that are however registered. The ECM Masterbatch is formulated from multiple substances and suppliers and then manufactured through a third party. For competitive reasons, I will only confirm the third party manufacture as having all substances present in the mixture as well as all building blocks of the polymers (monomers) for finished products as being (pre) registered.

If you or your customers have any questions concerning this matter, please have them contact me directly at the numbers listed.

Very truly yours,

Robert Sinclair
President & CEO

RS/ml

PREGUNTAS FRECUENTES I

¿Qué polímeros son compatibles con el MB de ECM?

Compatibilidad

La tecnología del MB de ECM es 100% compatible con todos los polímeros habituales como PE, PP, PS, PET, PVC, EVA , PA, PU

¿Son reciclables los productos plásticos fabricados con el MB de ECM?

Por supuesto, es reciclable al 100% si se utiliza el MB de ECM al 1%. Nuestra garantía de reciclabilidad permite usar sin ninguna restricción o modificación

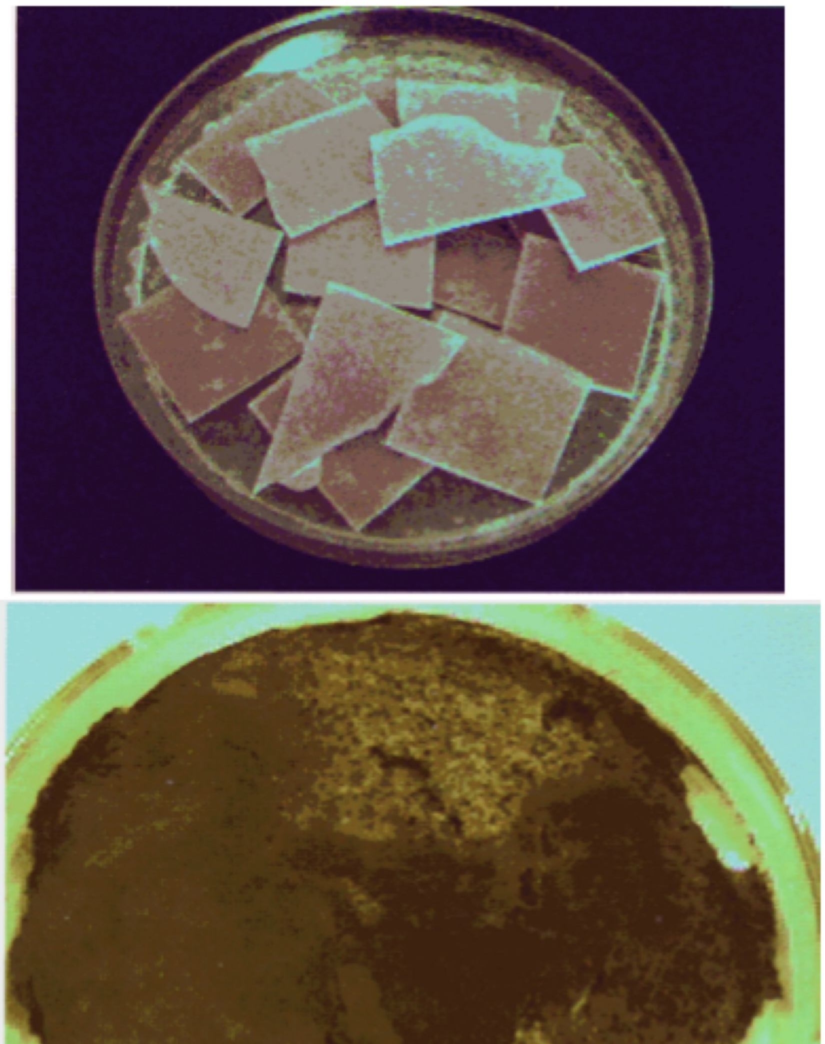
Reciclabilidad

Almacenaje

¿Los productos que se fabrican con el MB de ECM necesitan unas condiciones especiales de almacenaje?

No. Pueden ser almacenados como cualquier otro producto

Figure 2. 5% ECM Film, Day 1 and Day 672
(Laboratory Video, Microtech Research)



LLDPE cast film strips totally degraded

Tests conducted from 1/6/97 through 11/9/98 –
672 days exposure time

Figure 1. Aerobic Biodegradation of 50% ECM Film and Cellulose

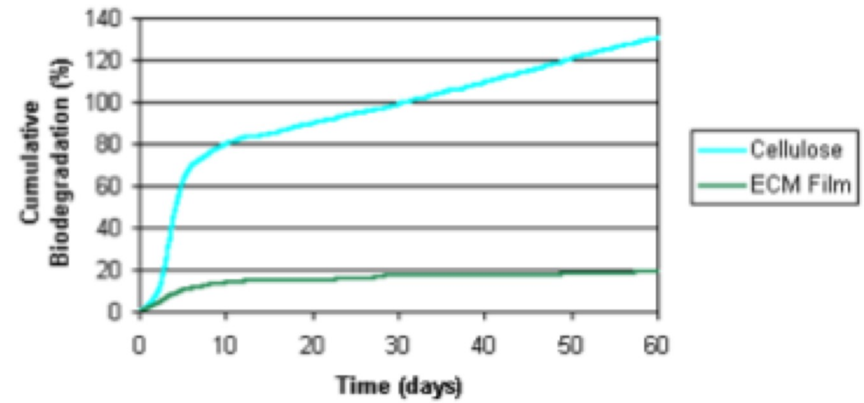
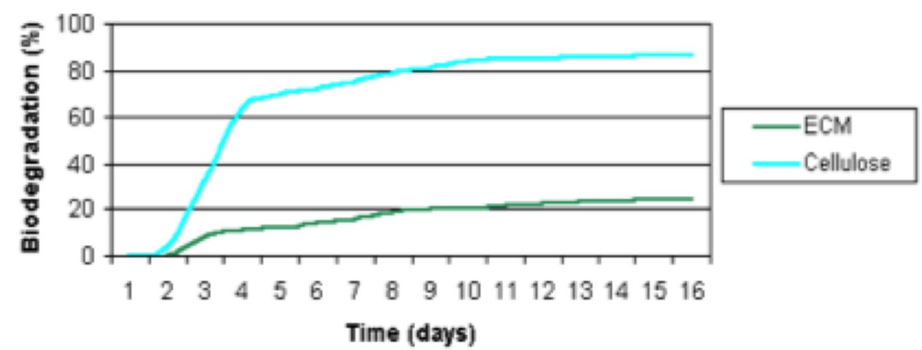


Figure 3. Anaerobic Degradation of ECM Pellets and Cellulose



PREGUNTAS FRECUENTES II

Reprocesabilidad

¿Es posible reutilizar o reprocesar los productos fabricados con el MB de ECM?

Las propiedades del MB de ECM permanecen invariables al 100%, si se reprocesan de nuevo

¿En qué lugares y/o condiciones se biodegradan y dónde no?

Lugares o condiciones biodegradabilidad

La biodegradabilidad se produce en compost en Hogares, vertederos, enterrado o bien en contacto con la tierra o suelo
No se biodegradan en almacenes, estanterías, oficinas o en casa

Otras preguntas

¿Son los polímeros y/o aditivos utilizados en el MB de ECM Oxo-Biodegradables?

No. Ninguno de nuestros productos tienen tecnología Oxo-biodegradable responsables de los microplásticos que son tan dañinos para el medio ambiente

PolimerUs

" Somos Polímeros "

POLIMERUS ELASTOMEROS Y POLIMEROS, S.L. - PolimerUs -

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