Dryflex® Green

Biobased TPE compounds from renewable resources

HEXPOL TPE

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INTRODUCTION

Dryflex Green is a family of biobased thermoplastic elastomer (TPE) compounds containing raw materials from renewable resources. We have developed several compounds with amounts of renewable content to over 90% (ASTM D 6866-12) and hardness from 20 Shore A to 50 Shore D.

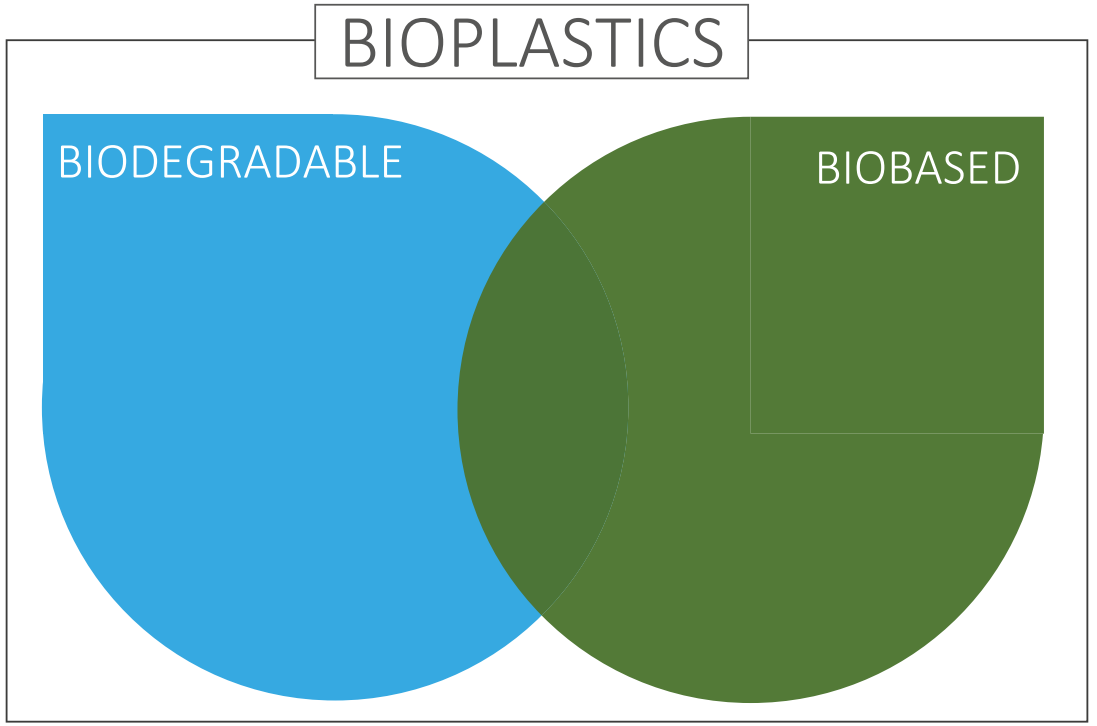
In this guide we show some typical properties for the Dryflex Green range, these are not exhaustive and by no means list all available properties and materials. Our aim is to supply a material that precisely matches application requirements and where an existing grade cannot satisfy the specific demands of your application, we have the proven expertise to customise a material that will.

Please use this guide as an introduction to our Dryflex Green range and contact us to discuss your specific requirements.

WHAT ARE BIOPLASTICS?

The term bioplastics describes an evolving and increasingly sophisticated family of materials. Bioplastics can be biobased, biodegradable or both.

Bioplastic that is biobased is made partially or wholly from raw materials derived from renewable biological sources, these include products and by-products from agriculture that are rich in carbohydrates, especially saccharides such as grain, sugar beet, sugar cane, etc. The biobased content could derive from different raw materials such as polymers, fillers, plasticizers or additives.



BIOBASED VS BIODEGRADABLE

There can sometimes be confusion between the terms ***biobased*** and ***biodegradable***, biodegradability and biobased content are in fact, two distinct features of bioplastics.

A common misconception is that biobased bioplastics are all biodegradable, they are not. A bioplastic that is biobased may not necessarily be biodegradable, and a biodegradable bioplastic may not be biobased.

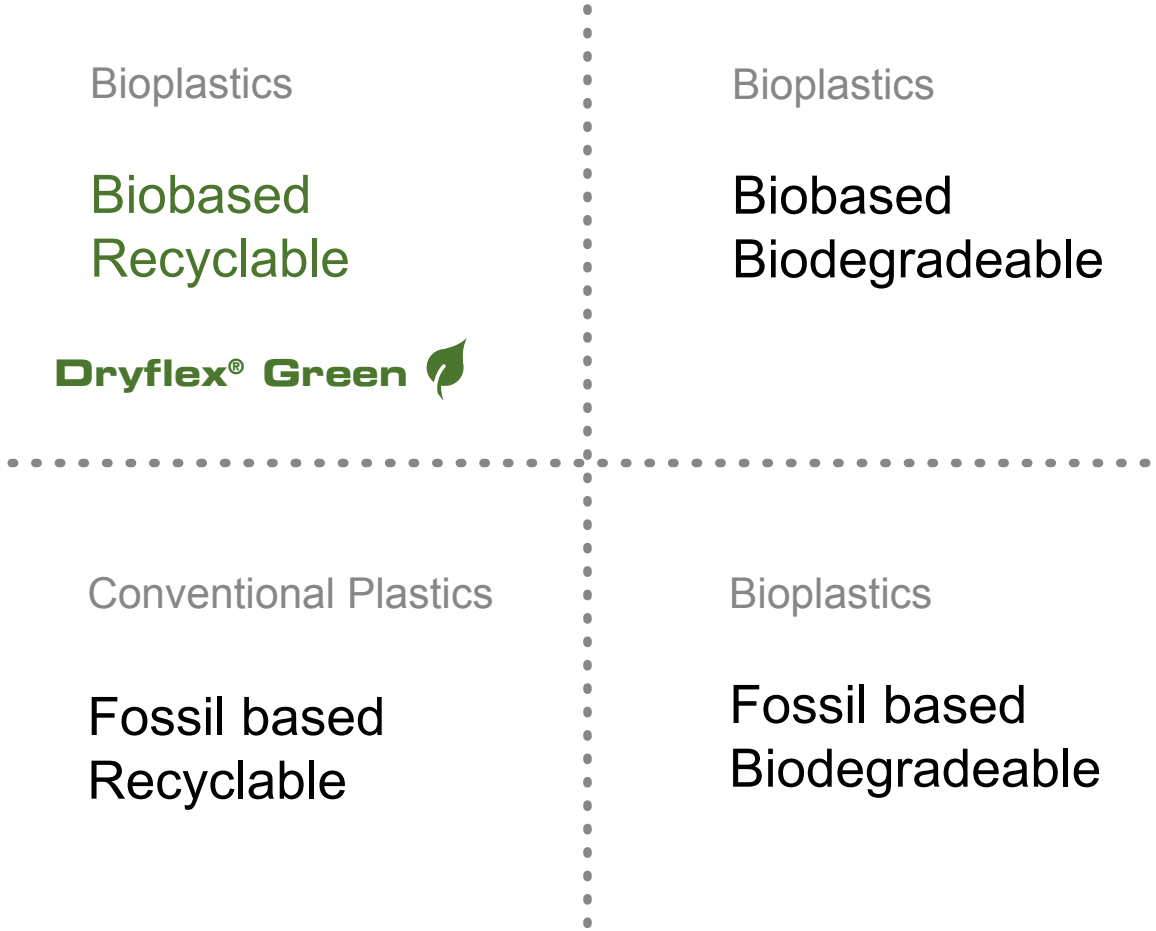
We can therefore categorise bioplastics in three groups, each with their own set of properties and characteristics.

Biobased plastics: a plastic where at least a part of the content comes from renewable biological or agricultural materials

Biodegradable & biobased plastic : a plastic that is designed to degrade under compost conditions. Containing renewable content

Biodegradable plastics : a plastic that is designed to degrade under compost conditions. Based on fossil resources

Dryflex Green TPE compounds are biobased



WHY USE BIOBASED?

SUSTAINABILITY : Biobased plastics help to reduce the usage and dependency on limited fossil resources, which are also expected to become more expensive in the coming decades.

IMPROVED CARBON FOOTPRINT : Plants absorb carbon dioxide from the atmosphere as they grow. By using these crops to create biobased plastic products, greenhouse gases (CO2) are removed from the atmosphere.

LIFE CYCLE ASSESSMENT : Bioplastics have the potential to contribute to an improved LCA.

ETHICAL LAND MANAGEMENT : Crops for industrial use can be grown in poor soil which is unsuited to food crops, thereby avoiding food crop displacement and improving biodiversity.

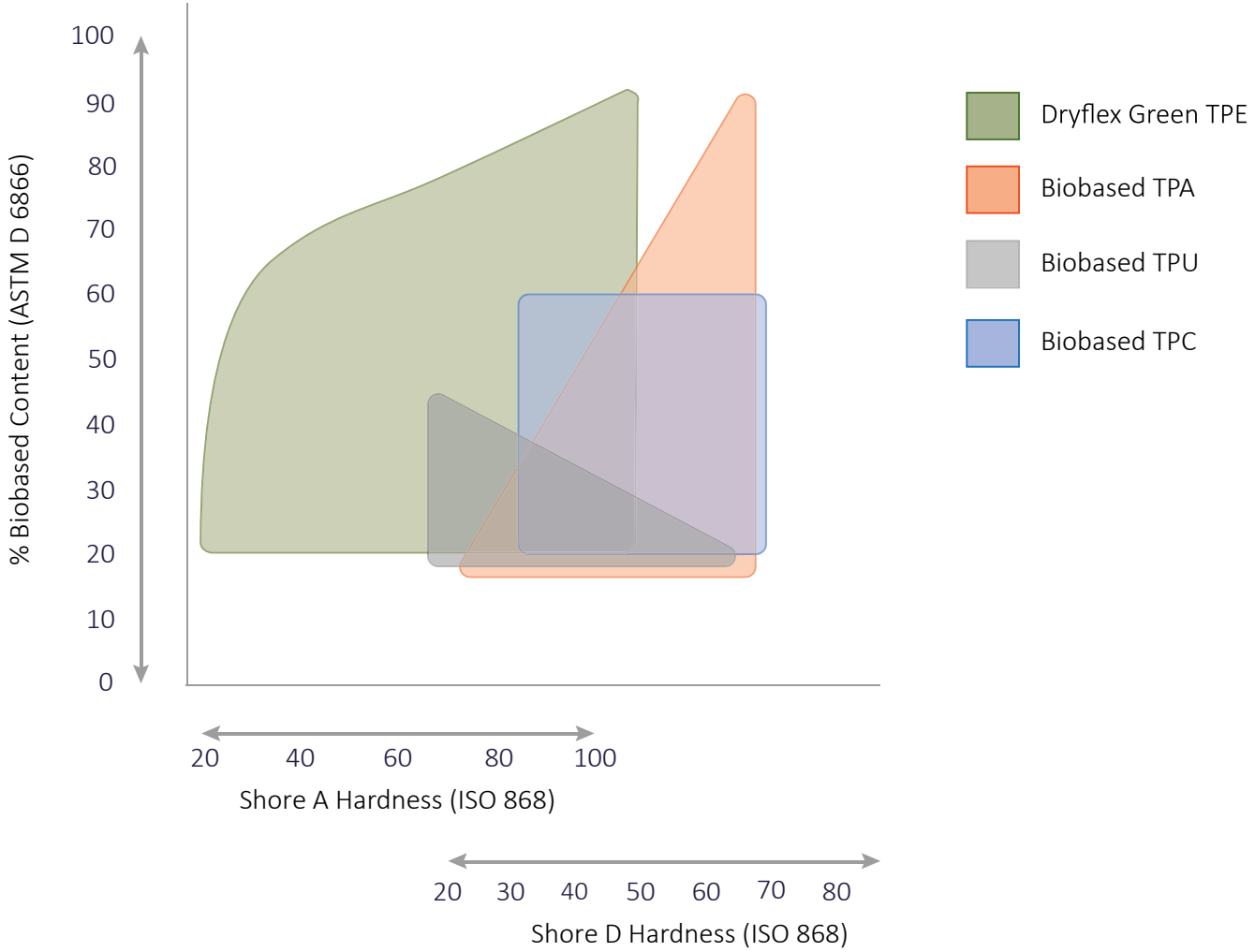
CONSUMER DEMAND : Purchasing power favours products from sustainable resources.

CREATING SOFT MATERIALS WITH HIGH LEVELS OF RENEWABLE CONTENT

Since most biobased raw materials in the market are quite hard on their own, a major challenge has been to develop compounds with high renewable content, low hardness while at the same time maintaining mechanical properties at acceptable levels.

As can be seen in **Figure 1** on the next page, the Dryflex Green TPE compounds divert from the other soft thermoplastic materials on the market today by including also soft materials with high levels of renewable content and thereby covering a greater segment and opening up more design possibilities.

Figure 1 : Percentage of Bio-content vs Hardness



A LOOK EVEN CLOSER TO NATURE

The biobased content in the Dryflex Green compounds can derive from various raw materials such as polymers, fillers, plasticizers or additives. For applications wanting a look even closer to nature, we have also developed compounds using organic fillers and natural fibres from plants, crops or trees, including cork. These give an additional ‘organic’ appearance

Cork is a natural product which comes from the bark of the cork oak tree. The removal of the bark does not harm the trees and the bark is only harvested after the first 20 years of growth. The removal stimulates a steady regeneration of the bark.

HOW DO THEY COMPARE TO CONVENTIONAL TPEs?

Dryflex Green TPE compounds display mechanical and physical properties close to and comparable to TPE compounds from fossil based raw materials.

In general the Dryflex Green compounds show very good bonding behaviour to PE and PP.

We have also developed special grades with good bonding to ABS, PET and PLA.

Like conventional TPE compounds, Dryflex Green TPEs can easily be coloured to give vibrant and appealing visual impact.

TYPICAL PROPERTIES OF REPRESENTATIVE DRYFLEX GREEN GRADES

Hardness [1]	Biobased Carbon Content % on TOC	Density g/cm3	Tensile Strength [2] MPa	Elongation at Break [2] %
ISO 868	ASTM D6866-12	ISO 2781	ISO 37 Type 1	ISO 37 Type 1
55 Shore A	> 20	0.89	5	650
60 Shore A	> 75	0.91	5	360
70 Shore A	> 50	0.93	8	700
80 Shore A	> 60	0.89	5	380
55 Shore D	> 70	0.94	20	900

[1] After 15 seconds

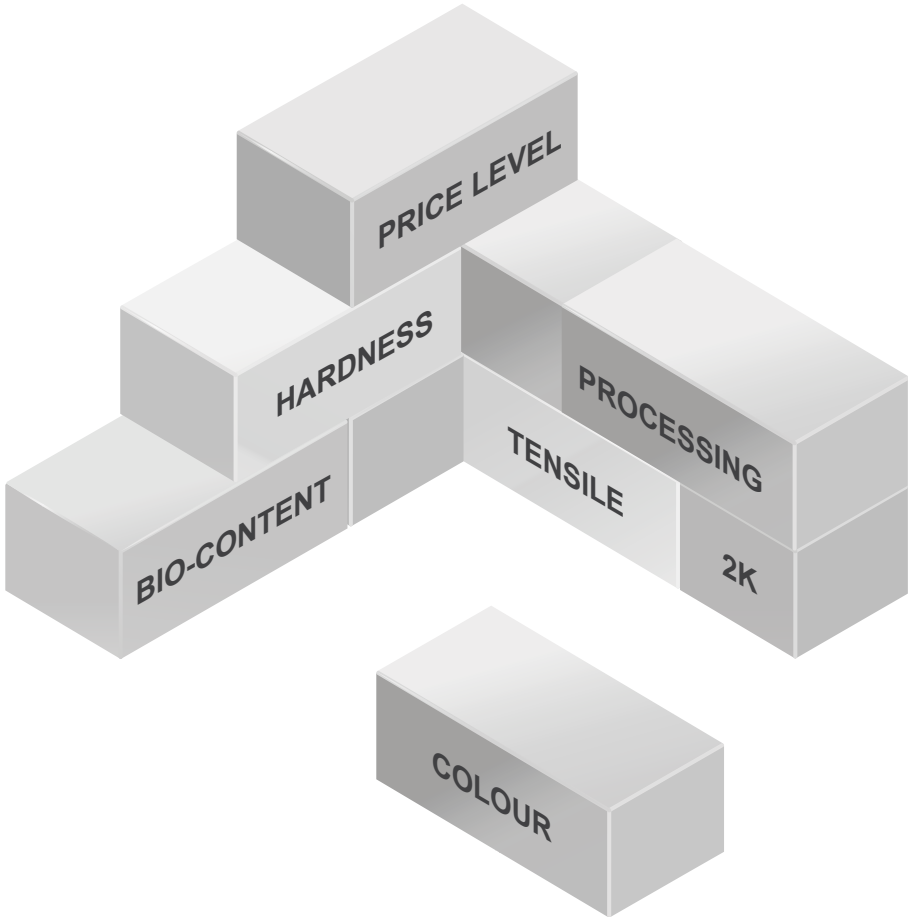
[2] Across the flow direction

CUSTOMISED BUILDING BLOCKS

As requirements can vary greatly for each application, we see a need for highly customised formulations.

Rather than a standard grade range, we have therefore qualified a number of raw materials which will allow us to work with a modular system to build a compound that is tailored to customer specifications.

Depending on requirements regarding bio content and hardness, food contact grades are available.

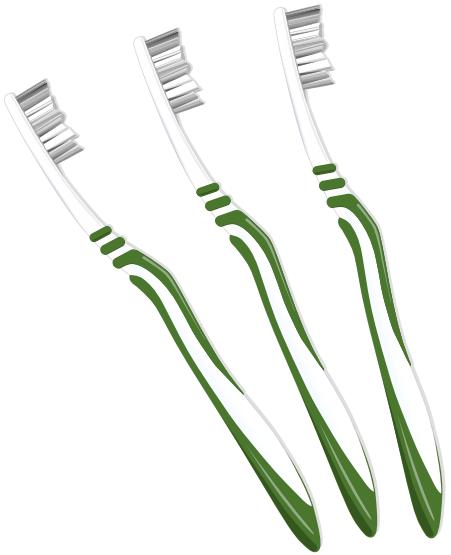


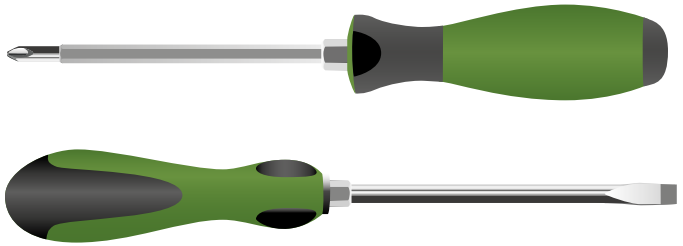
CUSTOMISATION OPTIONS

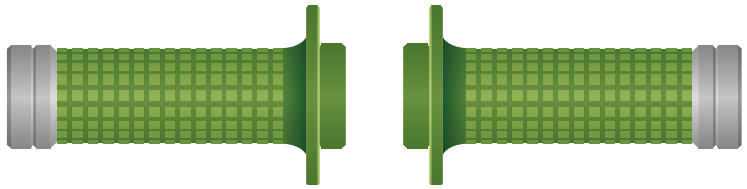
- Percentage and type of renewable content (to over 90% ASTM D 6866)
- Hardness (20 Shore A to 50 Shore D)
- Adhesion to polymers, such as PE, PP, ABS, SAN, PET & PLA
- Colour
- Filled or unfilled compounds
- Compounds with organic fillers and natural fibres to give an additional ‘organic’ appearance
- Mechanical behaviour such as flexibility and tensile properties
- Price level
- Surface finish & haptics
- UV and heat stability

APPLICATIONS

Dryflex Green TPE compounds can be used in many applications that currently use conventional TPE compounds, such as soft-touch grips and handles, sealing and closures for packaging, sports equipment, toys and infant care, soft-touch areas for packaging.







WANT TO LEARN MORE?

Contact the Green team at
green@hexpolTPE.com

or visit
www.hexpolTPE.com/en/dryflex-green

A few of our other product ranges →

Lifocork cork compounds

Dryflex SE : TPEs for injection moulding

Dryflex TPE based on post consumer recyclate

ABOUT HEXPOL TPE




HEXPOL TPE is a global compounding group specialising in Thermoplastic Elastomers (TPE) for key industries such as consumer, medical, packaging, automotive and construction. We have a core belief in being the easiest company to do business with. That's why we invest in our operations, teams and technologies to offer our customers the most reliable, relevant and cost-effective TPE compounds, backed by highly responsive support, technical know-how and application expertise. Our teams work together, across boundaries, applying the knowledge, experience and talents we have all around the world to meet the needs of our customers.

LEGACY NAMES: From 2017, the ELASTO and Müller Kunststoffe businesses were renamed to HEXPOL TPE.

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