NEW
EUROPEAN
EDITION

Distrupol

A Univar company

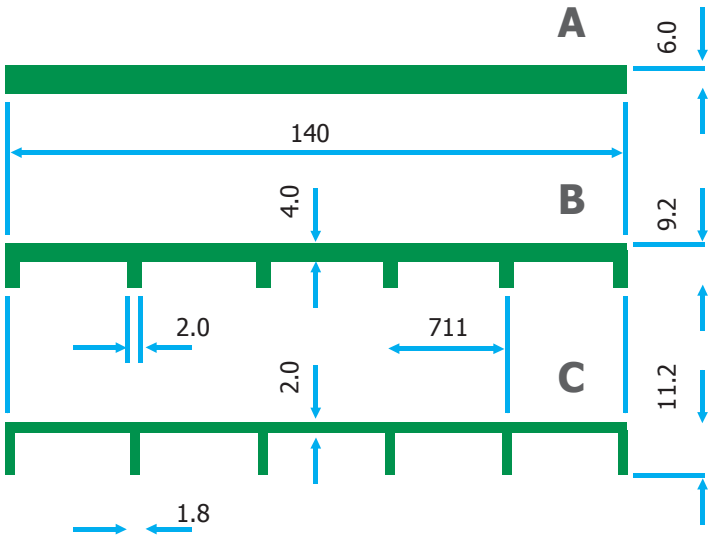
Eco-Polymers

Reducing the Environmental Impact

The environmental impact of producing eco-friendly plastic components can be reduced not only by material selection but, just as importantly through effective part design and reducing the energy required to manufacture each part with optimisation of the production processes.

Part Design and Processing

Reductions in wall thickness and using ribs give reduction in weight, cycle times and provide extra reinforcement, as can be shown:

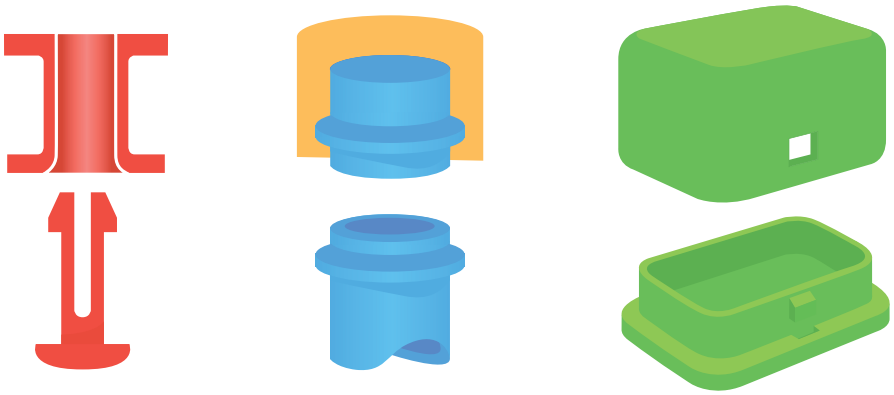


Moment of Inertia for A, B and C 2520 mm^2

Compares to A material savings up to 22.9%

Compares to A material savings up to 57.4%

Utilisation of snap fits or plastic welding eliminates the need for screws, rivets and glues. The process is simple and reliable, no extra part is required, and it enables greater design freedom, and also shows thought of manufacture for disassembly as well.



It is vital that design is considered at the start of a project and Distrupol have the development engineers that can assist with this and optimising cycle times.

With one of the most comprehensive ranges of Eco-Polymers, Distrupol makes material selection easier by comparing some key properties. For more in depth information, consult individual polymer keycards or data sheets.

The Solution

There are no magic answers on the topic of Eco-Polymers but bringing together recycled, biodegradable, organic and sustainable materials, and non polluting technologies will help to save the environment in many ways. Fewer raw materials will be mined, and less waste or discarded material will go to land fill. The changes made may seem small but cumulatively the changes implemented will make a huge difference. Distrupol will assist with design, process optimisation and materials selection to ensure the customer has all the information necessary to make an informed decision

Smarter Selection – Standard Materials

It is also possible to reduce the environmental impact through smarter selection of standard materials without using specialist "Eco" grades. Ultimately saving time and money too.

Super structural engineering thermoplastics for metal replacement could give:

- Retention of strength
- Reduced part weight
- Reduced manufacturing costs
- Reduced Eco footprint using advanced fillers
- Reduced dependency on petroleum derived feedstocks
- Reduced water consumption by as much as 200%
- Reduced CO_2 emissions by up to 20%.

A better choice of unfilled commodity materials could give:

The density of a material has a dramatic effect on the amount of polymer required to produce a part. For example use of a suitable alternative to PC can:

- Reduced density, thus the amount of polymer required by up to 20%
- Reduced environmental impact of transportation
- Lower processing temperatures thus lower energy consumption
- Avoidance of drying thus lower energy consumption

This brochure has been printed on 100% recycled paper.

Smarter Selection – Eco-Polymers

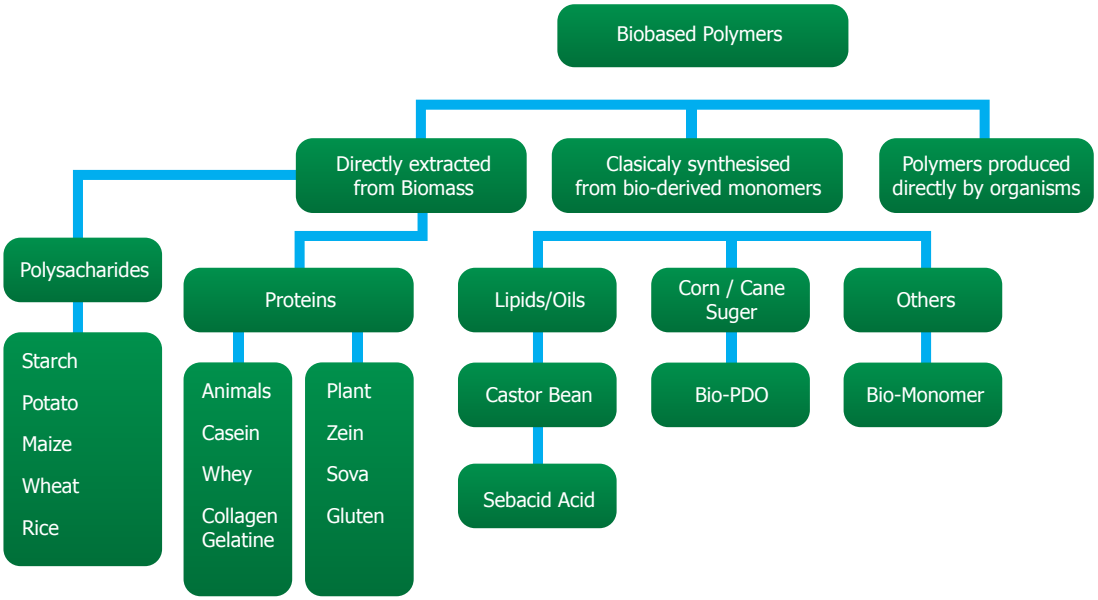
Eco-Polymers can be divided into 3 main categories:

1) Regenerated

Recovered after use in a previous application, re-ground into pellets and then re-used on new products, these materials usually come from a single source (i.e. CD cases, car batteries or drinks bottles) and are therefore of good quality and consistency. Certain grades also have food and water approvals.

2) Renewably Sourced

Bio-plastic materials have ingredients from non-depletable resources and can be derived from a selection of sources. Use of these materials is subject to debate, with certain sources potentially depleting the food chain! There are however a range of non-depleting sources available and these options are all an essential part of the selection process.



3) Biodegradable

Standard petrochemical derived polymers can last thousands of years. Biodegradable materials are designed to last for the expected life span of a product and then breakdown after use. Additives also exist that will enable a standard materials to biodegrade though it is not fully understood the long term effects of any bi-products are created as a result of the chemicals used.

Flexural Modulus

Giving an indication of the polymers' general flexibility.

Zytel® RS	**PA**
Hytrel® RS	**TPC-ET**
Sorona® EP	**PTT**
Biomax®	**PTT & TPS**
Transmare™ Bio	**PLA**
Plastarch®	**TPS**
Biobatch®	**Additive**
M Black	**Regen PP**
Econyl	**Regen PA**
Econyl 70	**PA**
Transmere™	**Regen PP**
Transmere™ Bio	**Bamboo**

Flex Mod (MPa) Range
ISO 178

- Renewably Sourced
- Biodegradable
- Regenerated/Bio Blend

Relative Cost

The final cost of a product depends on many factors, e.g. density, cycle times, processing temps, drying requirements etc.

Zytel® RS	**PA**
Hytrel® RS	**TPC-ET**
Sorona® EP	**PTT**
Biomax®	**PTT & TPS**
Transmare™ Bio	**PLA**
Plastarch®	**TPS**
Biobatch®	**Additive**
M Black	**Regen PP**
Econyl	**Regen PA**
Econyl 70	**PA**
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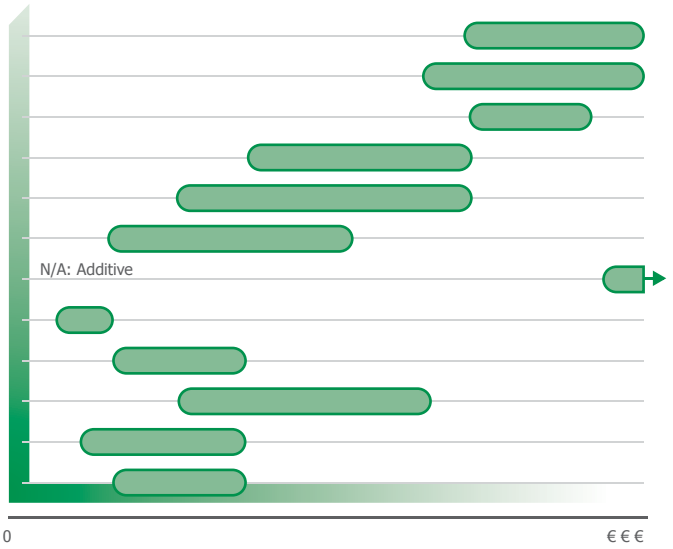

Relative to Polystyrene

- Regenerated/Bio Blend
- Biodegradable
- Renewably Sourced

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Think Eco-Polymers... *Think Distrupol*

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Comparing basic properties within the flexible materials range selected

	Zytel® RS PA	Hytrel® RS TPC-ET	Sorona® EP PTT	Biomax® PTT & TPS	Transmare™ Bio PLA	Plastarch® TPS	Biobatch® Additive	M Black Regan PP	Econyl Regan PA	Econyl 70 PA	Transmere™ Regan PP	Transmere™ Bio Bamboo
2K moulding	●	●						●	●	●	●	●
Chemical resistance	●	●	●					●	●	●	●	●
Clear												
Co-Ex (co-extrusion)	●	●						●			●	●
Colour	●	●	●	●	●	●			●	●	●	●
Conductive / antistatic												
Dimensionally stable	●								●	●		
Electrical performance	●	●										
Extrusion	●	●						●			●	●
Flame retardant												
Flex crack resistance		●										
Flexible		●										
Food approvals												
High flow		●									●	
High temperature	●								●	●		
Hydrolysis resistant								●			●	
Low wear	●								●	●		
Medical												
Metal replacement	●								●	●		
Tough & strong	●	●							●	●		
Weather resistant	●	●							●	●		
Water approvals												

Renewably Sourced

Biodegradable

Regenerated/Bio Blend

Most materials mentioned are registered trade marks. Properties for the above resins were extracted from Campus and polymer suppliers' brochures. The values reported are subject to revision as additional information becomes available. Due to the many factors affecting the use of our products which are outside our knowledge and control, no warranty is given or implied with respect to the information given. March 2009