TREFFERT®

Colour follows function

BIO-PLASTICS AND BIO-PIGMENTS

Properly dyeing and conditioning

Products made of bio-plastics are becoming increasingly significant in our living environment. Whether as shopping bags or in the food industry, plastics based on renewable raw materials are being used more and more frequently in our everyday lives. The term bio-plastic stands both for plastics that are made from renewable materials as well as for plastics that are made from mineral substances but are bio-degradable. The options for using the different bio-plastics with functions are correspondingly complex and dependent on the use case.

ALTERNATIVES WHICH ARE THE RIGHT CHOICE FOR THE ENVIRONMENT

The meaning of bio plastic materials for the future of the plastic market

The importance of bio-plastics is certain to rise in the future. Social trends and expected increases of oil prices promise strong growth in this area. Bio-plastics, and in particular technical bio-plastics, already represent an environmentally sustainable alternative to plastics made from fossil raw materials. Continuing technological development and growing production volumes mean that bio-plastics will soon provide economical alternatives that do not entail any compromises in the quality of the product.

Product sample of a flower pot made of plastics based on renewable raw materials (bio-based plastics).

WORTH KNOWING ABOUT BIO-PLASTICS

What are bio-plastics exactly?

The terms “bio-plastics” and “biopolymers” are not yet protected and as a result they are not used consistently. In general, however, they are used to refer to plastics made predominantly from renewable raw materials. Bio-plastics may be biodegradable, but do not have to be. If they are not, they may be attractive to industry as plastics with a longer service life.

For more information please visit:
www.treffert.eu

HOW LONG HAVE BIO-PLASTICS EXISTED?

Bio-plastics have been around for a very long time. The first industrially produced plastics were based on cellulose, which is extracted from plants such as cotton. As early as 1869, the Hyatt brothers produced the bioplastic celluloid in the USA. A few years later the cellulose film, better known by its trade name cellophane, began to be mass-produced. However, the discovery at the beginning of the 20th century that plastics could be manufactured from crude oil led to the rapid supplanting of bio-plastics for many decades, since producing plastic from crude oil was significantly cheaper. It was not until the 1980s that rising oil prices, coupled with gradually emerging ecological awareness, led to interesting new developments in the field of bio-plastics.

Blending in with the enviroment: the frame of a forest information board made of weather-resistant bio-plastic.

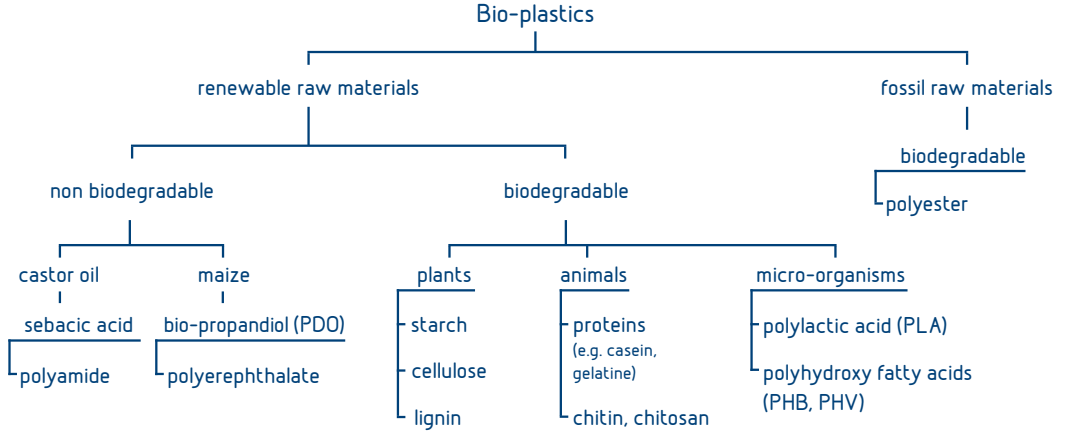
WHAT IS THE SIGNIFICANCE OF BIO PLASTIC MATERIALS FOR THE FUTURE OF THE PLASTIC MARKET?

Worldwide demand for plastics is currently around 350 million tons per year – and continues to grow. At around one fifth, Europe accounts for a major portion of this demand. The fact that plastics can have so many different properties makes them the material of choice for many everyday products. So far, bio-plastics are manufactured in very small quantities. However, their importance is growing rapidly and consistently, because in many applications bio-plastics can replace plastics hitherto produced from crude oil. A lot of packaging, cutlery, products for medical use and other products with a short service life are already made from bio-plastics. Their potential biodegradability gives them a key advantage over plastics with little or no biodegradability. These levels of biodegradability are defined by various standards. The European standard, for instance, permits a maximum of five per cent non-biodegradable materials and a maximum concentration of one per cent of any filler used. Further restrictions concerning the proportions of other substances, metals in particular, also have to be borne in mind.

BIO-PLASTICS FOR LONG-LIFE PRODUCTS

As material properties such as durability and degradability can be controlled during manufacture, bio-plastics are also attractive for the production of long-life items. For this, bio-plastics are already used to produce such things as keyboards, shoe heels and plastic cases for electrical appliances. Unlike fossil raw materials, bio-plastics are classified as largely carbon-neutral since the plants from which they are produced only release the CO_2 that they absorbed while they were growing. Bio-plastics are especially sustainable if they can be put to what is known as a thermal use at the end of their lifetimes. Alongside these environmental benefits, their greatest value lies in the fact that they reduce our dependency on crude oil, which is increasingly scarce and associated with ever more hazardous extraction processes.

OVERVIEW BIO-PLASTICS



RELIABLE QUALITY IS OUR STANDARD

Colouring bio-plastics

The term “colourants” denotes a series of coloured substances that affect a material’s appearance. Two kinds of colourants are used to colour plastics: pigments and dyes. Pigments may be either organic or inorganic in structure and are insoluble both during processing of the plastics and in the final product. Organic pigments normally possess greater colour strength but lower opacity than inorganic pigments. Other factors influencing colour strength are particle size and dispersion in the plastic matrix. Dyes, on the other hand, are organic molecules that dissolve into the substrate to which they are applied. As a result there are no visible particles and the material’s transparency remains unaltered. Over the years, many colourants have been developed for both standard and engineering plastics. The suitability of these colourants for colouring bio-plastics has to be researched separately for each polymer type.

NATURAL PIGMENTS FOR DYING

Due to our knowledge in the bio-plastics processing area, we are also able to dye plastic with natural pigments of plant origin. These masterbatches developed in our lab in provide a high level of processing stability in plastics like polyester and other bio-polymers in addition to even colouration. Of course, all of our natural pigments meet all of the specifications of the REACH ordinance and stress our willingness to maintain the permanent natural-product based orientation of our company.

USING ENGINEERING BIO-PLASTICS

Today technical plastics for applications with demanding mechanical requirements can be replaced by a new group of “technical bio-plastics”. These materials are not biodegradable, but their monomers are based on renewable raw materials such as castor oil, maize or wood. When colouring engineering bio-plastics such as polyamide 6.10 (which is made up of 58 % renewable raw materials), polyamide 10.10 (98 % renewable raw materials), polyterephthalate, lignin-based polyester and many others, virtually the same rules apply as for colouring ‘normal’ engineering plastics. Like conventional plastics, engineering bio-plastics can be joined and/or marked by laser. To be suitable for laser welding, the materials used must be laser-transparent or laser-absorbing, while laser-marking technology uses special materials that are optimized for either light or dark inscription. All this can be accomplished via the colour and function formulae used by Treffert polymer technology. However, a few limitations have to be borne in mind regarding biodegradable plastics such as PLA and cellulose, which are often used in packaging materials.

PERSONAL CONSULTATION DIRECTLY ON SITE

Colour masterbatches and bio-plastics

Given the need for good dispersion in order to achieve high colour quality, the way in which the dye is delivered to the processor is hugely important. In masterbatches or concentrates, pigments and dyes and/or special additives are optimally distributed in a carrier in high concentrations. The plastics used here should match the material to be dyed. What is true for polymers made from fossil fuels, also applies to Bio-plastics. They can also be used as carrier materials for colour concentrates. The processor can fully exploit all the benefits when using masterbatches. As almost all plastics have their own colour, the plastic itself is always part of the formula. This is why Treffert not only develops its own formulae for all colours but also adapts the colourants to each specific bioplastic.

Masterbatches for colour and function are always manufactured specifically to customer requirements. In a first step, particularly the comprehensive advice from our application engineers directly at your site is important for us.

Bio-plastic terrace flooring: stable, long-lasting, atractive and easy to clean.

Photo: TECNARO GmbH

For more information
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PERSONAL CONSULTATION DIRECTLY ON SITE

For individual performance demands

Our company's motto is "Colour follows function". So you won't be sold standardized solutions, but offered high-quality products which have been developed strictly as you specify at every stage of the process. Our orders place high performance demands on the development and consultation aspects. The most complicated specifications are part of our daily routine. What is particularly important and clear to us is comprehensive consultation by our additive experts or applications technicians directly on site at your location. We consult with you on all issues on the use of our products and of course provide sample materials to you in the short term. As a result, we can ensure that you use and apply our product in an optimum manner.
Contact an application technician near you. You can find the locations of our application technicians online at www.treffert.eu. We are looking forward to your task.

COLOUR FOLLOWS FUNCTION

Treffert corporate group

At our two locations in France and Germany, we advise and guide our customers from the idea, through product development to technical production. We develop and supply charges for small to medium-sized supply requirements as well as for unusual uses – from the smallest sample quantities to capacities of several tons. The motor driving our performance is our passion for material and function – and for results that are made with the highest precisions.

The results are high-grade products with an optimum of process security that meet all the criteria for tested quality management.
Every step of development and manufacturing is subject to constant internal quality control. We thus provide for a constant improvement of our work processes and production quality.

Documented production processes and formulas as well as secure storage of reserve samples assure that we can still supply our customers with more than 50,000 dye formulas even years after they were made, and that with absolute fidelity to the original, and always just in time.

Certified Quality, Environmental and Energy Efficiency Management

Management System
ISO 9001:2008
ISO 14001:2004
ISO 50001:2011

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CERTIFIED

TREFFERT®

Colour follows function

GERMANY

Treffert GmbH & Co. KG
In der Weide 17
D-55411 Bingen

Phone: + 49 (0) 67 21 403-0
Fax: + 49 (0) 67 21 403-27
E-mail: info@treffert.eu

FRANCE

Treffert S.A.S.
Z.I. Rue de la Jontière
F-57255 Ste-Marie-aux-Chênes

Phone: + 33 (0) 3 87 31 84 84
Fax: + 33 (0) 3 87 31 84 85
E-mail: info@treffert.fr

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