

# Designers & bioplastics

**D**esigners and bioplastics — what an exciting combination... In so many cases designers are the ones to make a decision for a certain material, be it for consumer goods, architectural applications or art. bioplastics MAGAZINE spoke to a number of designers to collect impressions, opinions and thoughts in order to gather more insight into how designers deal with materials in general and bioplastics in particular.

by Michael Thielen

InteriorPark, an agency for architecture, communications and design, from Stuttgart, Germany, has been contracted by the BIOPRO society in the German state of Baden-Württemberg to help with the market acceptance of bioplastics through designs that will appeal to consumers and manufacturers. They offer workshops that are intended to raise the users' awareness of biobased plastics. InteriorPark puts designers, material developers and architects into contact with each other as innovative materials set the trend. With its online shop for best Eco Design InteriorPark offers extraordinary designs made of sustainable materials.

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## The Material Shapes The Product

**T**he high level of innovation available through new, sustainable materials is brought face to face with the high level of pressure for innovation in companies whose activity within an ever more competitive global market calls for ever more efforts. Technologically it seems that, in terms of functional quality, almost anything can be achieved. The challenge lies in the successful transfer of the concept into a marketable product.

The designers and architects will have a key role to play in the development of applications for biobased materials. They have to develop the things that will appeal to us tomorrow, that have a maximum consumer benefit, and that also have something to offer in economic terms. Alongside functionality, aesthetics and economics, the designer today has to look at topics such as sustainable production processes, the eco-balance and life-cycle costs.

These problems are generally considered and applied globally. Products have to appeal to consumers world-wide – and function properly! The potential of a good prototype concept includes anticipated energy usage, an absence of noxious contaminants through good material selection, and avoidance of scrap by using a recycling system. The potential savings offered by the designer via his creativity can be huge – in energy savings alone up to 90% can be achieved. Thus the designer's job has become more complex, and the future success of his design depends in a similar degree on all of these factors. He is a key link between consumers and manufacturers.

Things have today become interchangeable. We are surrounded by mass produced articles and an apparently

endless over-supply – this is different from goods in short supply. And what about good design? The doyen of German designers, Dieter Rahms, has put together a list of aspects covering good design:

1. Innovation
2. Make a product useable
3. Aesthetics
4. Make a product understandable
5. Frankness and honesty
6. Unobtrusive
7. Long-lived
8. Consistent down to the last detail
9. Environmentally-friendly
10. As little design as possible.

Sustainable design has no set formula of its own, and so a passion for the work is necessary for those promoting such design.

The approach taken to promote such developments is shown in designers' prototypes and drafts that interact with the intellectual and creative topics in areas such as sustainability, and ultimately with the material to be processed and used.

Design has gained a lot today in relevance and we are already addicted to it – whether it is product design, fashion design, or architecture. Design is a reflection of society and the spirit of the times. The deciding factor in differentiation for successful companies and their brands is Design. Thus innovative industrialists and marketing professionals use *design* as a tool, and offer their clients a real advance in user benefits.

Intro by Tina Kammer, Architect and Managing Director of InteriorPark, Stuttgart, Germany



(Photo: 4e solutions / InteriorPark.com)

## Product design

**Raphael Stäbler**, Managing Director of 4e solutions (Stuttgart, Germany) said that it was clear from the first moment when he founded his company to create products only from renewable resources. The designer of the award winning stackable storage box system *ajaa!* emphasized that, for him, it is quite important to create a biobased product that does not look as if it is based on an *eco* concept ... . He wanted to offer products with high design attributes. “ajaa! stands for products which help to make life easier. Practical use is combined with innovative design”, he said.

For **Johann Beil** (of the company Linhardt in Viechtach, Germany) it is important, that bioplastics, being a different sort of plastic, can be processed on existing equipment without significant modification. The manufacturer of collapsible tubes will process bioplastics if a customer asks for it and the materials are processable. In addition the materials must fulfil the *usual* performance requirements of the packaging product, e.g. the resilience properties, the impermeability, or the potential for decoration.

The headphones developed by British-born and Hong Kong based designer **Michael Young**, were part of bioplastics MAGAZINE's Application News in issue 01/2012. When asked about his thoughts in terms of bioplastics for this article, Michael Young stated that in his opinion bioplastics are a field about which many designers and architects do not have very much knowledge. The whole eco-thing is often connected to recycling, he said. But when it gets down to bioplastics on an industrial level, it is not so easy to find companies capable of delivering good bioplastics. For him bioplastics are still too much in their infancy. In their industrial design studio, they often struggle, because for technical applications such as headphones it is difficult to find the right materials and suppliers.

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Being asked about the visibility of the natural source of a material, Young said that in his opinion it is beautiful to have materials that have some sort of life. "Real objects resonate with people," he said, "they last a long time and they have value in a home". And when a component is reinforced or filled with natural fibres, people would accept the *organic* look. It becomes a holistic object then. "For me it is important that you can feel the inherent quality. If it is dyed pink it can be any material in the world."

## Architecture

bioplastics MAGAZINE recently reported about spekDESIGN (also from Stuttgart). **Eberhard Kappler** is one of the owners of the company that stands for product - and architectural design - the use of innovative materials and technologies, for aesthetic, functional and economical solutions. He said that for designers, from his point of view, the most important factors are: innovative (better, different, more sustainable) materials, the optimization of production processes, user-friendly products, or to make things possible that were not possible before. But not only in order to increase the consumption of such products, as he emphasized, but also to improve the quality and the environmental balance, for which a designers have to take their share of responsibility. When it comes to materials, he says that among the goals that need to be achieved today are energy savings and material savings, for example by choosing the right materials or the right combination of materials. And this is true for all parts of a product life cycle, including sales and transportation.

When it comes to architecture, mainly for large public or corporate buildings, Kappler sees a few trends coming up. So could it become true that a building owner does not purchase the materials (for example a façade) any more, but rather rents them for a timeframe of, for example, 30 years. After or maybe even during that period the façade will be replaced by a new one with more up-to-date materials. And such materials could well be biobased plastics. The old material will be recycled for other purposes. Or a building-owner does not buy lamps, but rather *light* or *luminance*, for example 50,000 lumens per month.

It is then up to the supplier of lamps to realize this luminance with up-to-date technology and to replace the technology from time to time (**Thomas Rau**, oneplanet architecture, Amsterdam).

Large buildings and their architectural products will become kind of *raw-material banks* with a lot of steel, aluminium, glass and plastics.

In cases where bioplastics and conventional plastics are used in one project, Kappler pointed out, that it is essential that all materials can be separated and do not influence the recyclability of each other.

Eberhard Kappler is particularly impressed by certain properties of certain bioplastics for certain applications. One example which he mentioned are corner protectors for solar panels. When setting up such solar panels the protectors can simply fall down into the excavation pit and left to biodegrade instead of picking them up for disposal. Musical instruments such as clarinets or recorders are the second example that Kappler mentioned. When producing such flutes from conventional plastic the sound is rather poor. Flutes made from lignin based *liquid wood* (Tecnar) exhibit the sound quality of a wooden instrument.

*Michael Young and Eops have developed the EOps Noisezero i+ Eco edition. It uses cornstarch bio-plastics for the ear-buds and the microphone housing (Photo: Michael Young Design)*

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Another architect, bioplastics MAGAZINE spoke to is **Martin Böttcher** from Frankfurt/Main, Germany. From the very beginning of his career, he concentrated on ecologically-sound construction. For him this meant to build houses using ecologically sustainable materials such as wood, clay and straw, but also bioplastics. Böttcher recognized a trend that ecologically sound construction is moving from a *treehugger* niche to a broader public. And thus, the design requirements are also increasing. In other words, even wood/clay buildings must look modern and stylish. And when it comes to the use of bioplastics, he is convinced that the fact that these applications are made from renewably sourced plastics must not be visible. He calls it kind of understatement: The parts must look cool and when the consumers are told that these parts are made from biobased or biodegradable plastics, they should appear even cooler.

Another aspect which is even more important for Martin Böttcher is building biology. It is good, that materials are made from renewable resources and maybe they can be composted after their lifetime. But during use, during the lifetime of a building, under no circumstances may harmful substances evaporate from the building materials. So Böttcher will have a close look at this aspect when choosing a material.

**Carmen Köhler**, PhD student and scientific staff member at the Institute of Building Structures and Structural Design (ITKE) - University of Stuttgart, contributed an article on bioplastics to be used in façades in the last issue of bioplastics MAGAZINE. She is always looking for unique features in terms of tactile and visual appearance, or technical features. A designer should not constantly try to bring new materials to the market but rather analyse what advantages a certain bioplastic might offer compared to other plastics. For her this was a decisive factor in all her projects so far. Bioplastics combine the advantages of plastics (e.g. easy to bring into shape, transparent, or with different tactile and visual aesthetic aspects) with the merits of natural materials such as wood. Wood cannot be shaped as easily as plastic and the possibilities to vary the visual nature of wood are limited. Wood comes as it was grown, the properties cannot be changed any more. Bioplastics are based on renewable resources as well, but you can tailor them to your needs.

Concerning the visibility of the renewable source Carmen Köhler said that one of the fascinating facts about bioplastics is that these materials can be both unobtrusively sustainable, minimalistically plain or come in a brown eco-design. It is always dependant on the architectural task. In discussions with architects she found that many of them are excited about the fact that bioplastics can be transparent or white and can be perfectly shaped and coloured. They can compete with sustainable materials but do not need to restrict themselves with a view to the final appearance.

The French designer **Philippe Starck** from Paris prefers synthetic materials because mankind has created them, and not actually found them. "We have found the stone, like it is, wood like it is, leather like it is ... but from a black mud we have created a crystal of intelligence", he said. "The history of plastic is the history of human genius. We are at the end of the fossil era, no more oil means no more gas for cars — who cares? But no more plastic is a drama that we cannot even conceive. The only solution today seems to be bioplastics but we cannot start a new era without rules and ethics." One of his biggest concerns

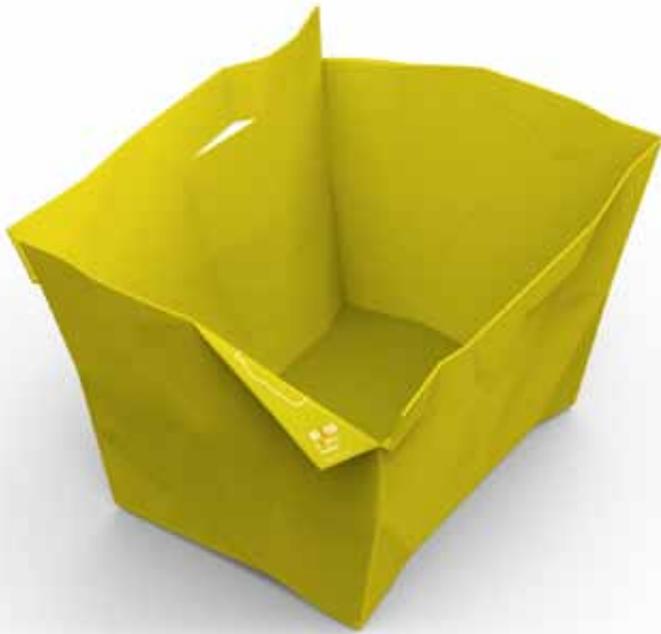


Paneling, thermoformed bioplastic-example by research group: itke, iswa, Tecnaró, Bauer, spek Design (Foto: spek Design)

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Façade element made from a thermoformed lignin-based bioplastics (Tecnaró) filled with moss (Photo: M.R. Hammer / ITKE)





ELISEbyS+ARCK® Waste basket made from GAIALENE® (Roquette) (cf. bM 06/2012)

is to make sure that bioplastics will never compete with food. "Scientists forecast the return of world famine for 2022 – and that means tomorrow morning."

Philipp Starck does not prefer bioplastic or conventional plastic. For him it is just a shift in civilization. He does not see a need to choose whether to show the biobased nature of a product or not. "When we need bright colours, or a different finish, we can paint it and when we need a natural effect, which is very interesting, a new range of textures and natural colours, we keep it natural and it brings actually a new range of textures and colours (see Zartan and the Magis broom from Emeco)". And finally he said: "The end of the fossil era shall be a drama for some members of society. Exploring and searching, with ethics, the new territories of organic materials is a fantastic opportunity for creativity for new designers".

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