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24-25 MAY 2022 > Munich, Germany

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Accelerating Biobased Innovations

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7th PLA World Congress

24-25 MAY 2022 MUNICH › GERMANY

Dear Attendee,

On behalf of Polymedia Publisher, I'd like to welcome you to Munich. We are convinced that the 7th PLA World Congress will provide you with the most up-to-date information you need to evaluate the possibilities and challenges of PLA as a versatile material made of renewable resources.

In order to help us improve future events of this kind, we kindly ask you to complete our evaluation form. You can find it online.

Conference books are often thick, heavy, and difficult to transport. For this reason and for improved sustainability we did not print all presentations in the book, but rather just abstracts on individual pages where you can add your personal notes. And we did not prepare CDs or USB devices.

However, all presentations will be recorded and will be available for "on-demand" streaming. They will be available for a full month after the event. The presentations (PDF) and further information will also be made available for download to the delegates and speakers. Approximately two weeks after the conference we will send you an email with a link to download the latest versions of all presentations as they were presented during the conference.

On Tuesday May 24 bioplastics MAGAZINE is proud to invite you to a "Bavarian Night" in a unique Bavarian beerhouse, the world-renowned HOFBRÄUHAUS. Details on how to get there will be given during the conference as well as in this handbook.

If you would like to know more about Polymedia Publisher and bioplastics MAGAZINE don't hesitate to contact us personally. Feel free to take one or more sample copies of the magazine from our displays.

We are happy to meet you and are looking forward to a hopefully fruitful conference for all of us.

Yours sincerely

Michael Thielen
Publisher

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General Information

Here we answer some of the frequently asked questions and provide useful information for the meeting

Name Badges

On-site attendees, please be so kind to always wear your badge to make it easier for everyone to start networking. The badge shows your name and company name.

Venue

The Meeting room is called Forum 12+14.

Evaluation Forms

In order to help us improve future events of this kind, we kindly ask you to complete our evaluation form. It is an online form

Delegate Lists

A list of all delegates, speakers, journalists, and staff is part of your material. Please note that this list is for your personal use only. Should you want to get in touch with one of the attendees after the conference, we suggest using the **Whova** app and platform.

Refreshments, Coffee/Tea

Each refreshment break will be held inside or just outside the meeting room.

Programme

The programme, with full conference timings, is available in this conference book. The chairperson will advise on any changes to the published timings. The latest updates can also be found in the Whova app and platform.

Questions

We encourage delegates to ask questions throughout the conference and recommend you prepare possible questions to ask each speaker. The question will be answered in joint Q&A sessions at the end of each presentation session.

We use the **Slido** platform for questions, so on-site and online attendees can ask questions the same easy way.

Of course on-site attendees can also raise their h each Question and Answer session and ask questions them- selves. Please wait until a microphone is handed to you and state your name and company before you ask your question.

Smoking

The conference hotel is designated a non-smoking area, we do ask delegates to respect this. If you would like to smoke, you must leave the building.

Messages

Any messages taken throughout the conference will be forwarded to you at the earliest opportunity.
Please have a look at the flipchart once in a while and look in the announcements function on the Whova app/platform.

Recording

We will record the presentations and offer these in form of a "video-on-demand" for a full week after the event, in order to accommodate for different time zones of the online attendees. Other attendees are only allowed to make recordings with the permission of the Organizers. Should you want to object to any publication of a photograph or video clip where you are visible, please tell our staff. If you do not object, we assume your consent for publication.

Mobile Phones/Smartphones

Please make sure that all mobile phones are turned off or set to "flight mode" during the conference sessions. This is a minimum of politeness and respect to all speakers and other delegates.

Valuables/Security

Polymedia Publisher cannot take responsibility for any valuables, personal luggage or notes left in the meeting room or registration area. Please do not leave any possessions/baggage unattended at any time, we recommend contacing the hotel staff (concierge).

Free Wifi

Free Wifi is available. Please look for signage in the hotel. As the total bandwidth is limited, please use max. one device per person.

Dinner

bioplastics MAGAZINE is happy to invite you to a traditional "Bavarian Night" in the famous HOFBRÄUHAUS. Details see in this handbook. Dinner will be in the restaurant area and will be "kind of" *a-la-carte*.
In order not to lose too much time for ordering, we preselected a few different meals for you to pre-order during the first day of the conference. Please make sure to make your choice, so that we can order for all as we enter the restaurant.

Anti-Trust

Polymedia Publisher will not enter into any discussion, activity or conduct that may infringe, on its part or on the part of its participants any applicable competition law.
By way of example, participants shall not discuss, communicate or exchange any commercially sensitive information, including non-public information relating to prices, marketing and advertising strategy, costs and revenues, trading terms and conditions with third parties, including purchasing strategy, terms of supply, trade programmes or distribution strategy. This applies not only to discussions in formal meetings but also to informal discussions before, during and after meetings.

Presentation-Download and CD

All presentations of the 7th PLA World Congress will be available

for download about two weeks after the event.

All approved presentations of the 7th PLA World Congress will be available for download about two weeks after the event.

We will send you a download link and password by e-mail.

A CD with the presentations will also be available by then.

Delegates of the conference can order this CD for a discounted price of EUR 99.00 (regular EUR 149.00).

This will also be announced in the above-mentioned e-mail.

Conference Team

Your conference team will try to help you in everything you need.

Michael Thielen
Head of Conference Team
Publisher and Editor of
bioplastics MAGAZINE

Alex Thielen
Conference Team
Editor of
bioplastics MAGAZINE

Philipp Thielen
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Head of Design of
bioplastics MAGAZINE

Sam Brangenberg
Conference Team
Reporter of
bioplastics MAGAZINE

Hans van der Pol
Co-Moderator
Sirius Consultancy bv

Programme

Tuesday, May 24, 2022

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subject to changes

Bavarian Night

Tuesday, May 24, 2022

„Bavarian Night“

Hofbräuhaus
Platzl 9
80331 München

bioplastics MAGAZINE cordially invites all PLA World Congress delegates to a "Bavarian Night“ in the famous *HOFBRÄUHAUS*.

Tuesday May 24 at 19:00 hrs we'll enjoy Bavarian specialities and good beer in a rustic environment.

It is about 15-20 walking minutes from the Holiday Inn and when the weather is fine, a walk would do all of us good, wouldn't it?

We meet in the hotel lobby at 18:30 (6:30 pm). Or you try to be there at 19:00. Tell the Taxi driver "Hofbräuhaus“ or punch in your GPS "Platzl 9". Note that parking space is limited in the area.

The event will be in the regular restaurant. We have a reserved area. You may want to ask for "POLYMEDIA" or "THIELEN"

The dinner will be "kind of" *a-la-carte*.
In order not to lose too much time for ordering, we preselected a few different meals for you to pre-order during the first day of the conference. Please make sure to make your choice, so that we can order for all as we enter the restaurant.

The staff of bioplastics MAGAZINE is looking forward to a wonderful evening.

Visit https://hofbraeuhaus.de
to whet your appetite.

(photo: oktoberfest-eitung.de)

Speaker Biographies

Abstracts for your personal notes

Tuesday, May 24, 2022 | 08:30-08:45

Welcome Remarks

Michael Thielen, Polymedia Publisher

Biography

Dr.-Ing. Michael Thielen, studied mechanical engineering specialized in plastics processing at the Technical University of Aachen (RWTH / IKV), Germany. After his diploma exam (BSc), he joined the Research and Development Centre of KRUPP in Essen, Germany. Here he did developmental and research work mainly in the field of extrusion blow moulding. He passed his PhD-exam with a thesis on "Blow Moulding Long Glass Fibre Reinforced Thermoplastics". After 5 years with Krupp Kautex being a project engineer and sales manager for the North American market was Head of Public Relations at SIG Plastics International, Essen. Then he founded his own PR consultancy firm Polymediaconsult and in 2006 started his own publishing company with the first product being the "bioplastics MAGAZINE". Today he still acts as a PR consultant and publisher of bioplastics MAGAZINE as well as organizer of technical conferences such as the PLA World Congress, PHA World Congress, bio!TOY, bio!PAC, or the Bioplastics Business Breakfasts.

Co-Moderator

Hans van der Pol. Sirius Consulting

Biography

Dr Hans van der Pol is the Founder and President of Sirius Consultancy International bv, enabling clients to accelerate biobased innovations from technology to market.

Hans created his own company with more than 20 years of strategic leadership such as market development, business development, venture development and innovation management in biobased materials. While at Corbion, he was involved in the development and commercialization of the company's PLA polymer from early-stage up to commercialization through the formation of the JV with Total Bioenergies and the formation of a JV with BASF for Succinic Acid

He earned a bachelor of science degree in Physical Organic Chemistry from the University at Utrecht in 1986, was awarded a PhD in Physical Organic Chemistry in 1990 and later has obtained a business degree at Nyenrode Business University. Hans has a keen interest in combining Strategy, Business and Innovation aspects into developing new business opportunities in the Biobased Products field.

Hans has been engaged in bioplastics and biobased chemicals market development since the early 2000s and served on the Board of European Bioplastics for several years. Besides Corbion Hans van der Pol has served companies such as Akzo Nobel, Teijin Aramid, Eastman Chemical, and most recently Biorizon.

He has a great passion for sustainability and biobased materials in diverse markets.

Sirius Consultancy
Accelerating Biobased Innovations

Tuesday, May 24, 2022 | 08:45 - 09:15

Keynote Speech: The fossil addiction and bioplastics

Remy Jongboom, Biotec

Biography

University of Technology and graduated in polymer technology. After his education in 1991, he started at ATO-DLO (Wageningen, NL, currently FBR-WUR) as polymer scientist. His R&D activities included contract research projects for industrial companies on starch plastics, controlled-release technology and starch nanoparticles.

In 2000 he joined the Rodenburg Group and was assigned as the first managing director of Rodenburg Biopolymers. Under his responsibility, a pilot plant and an industrial plant were built and the brand Solanyl was introduced to the market. During this period he was also chairman and co-founder of the Dutch bioplastic association BCPN (>40 members).

From 2005 on he founded his own company for consultancy and development of bioplastics. Furthermore, he has been responsible for the project management of several innovation projects for bioplastics (>15M€), facilitating the market introduction of new applications.

In 2015 Remy Jongboom joined BIOTEC as Director Business Development and is furthermore a board member of Holland Bioplastic (successor of BCPN).

Abstract

The use of compostable materials in packaging applications has been under development for more than 30 years and has achieved currently a quality level that in principle enables the replacement of many packaging applications with compostable alternatives.

Consumers are having in general a very positive perception of biodegradable and compostable materials in packaging applications, so actually, a massive market acceptance would seem a logical result of this. It is not, however, and the question is valid why not. Is it the somewhat higher price, or is there more to the story?

For some waste processing companies, like composting companies, the use of compostable packaging remarkably enough leads to discussions. Surprisingly these discussions are having different outcomes for different geographical regions, and also have been gradually shifting over the last 2 decades. Why is that? Opinions and facts are mixed up on a regular basis, and relevant aspects of the discussions are deliberately left out of the public debate.

In this presentation, a vision will be presented of how the bioplastic industry, together with the waste processing industry, and legislators could come to meaningful concepts and approaches that are beneficial for consumers and the environment.

Tuesday, May 24, 2022 | 09:15 - 09:40

The Political Environment of Bioplastics in the EU
A Policy Update

Oliver Buchholz, European Bioplastics

Biography

Oliver Buchholz heads the Communications Department of European Bioplastics (EUBP). At EUBP he is responsible for press and public relations as well as for the association's internal communication. He holds a diploma in political sciences from the Free University of Berlin. Mr Buchholz worked for several years as a consultant in an international public/ government affairs agency where he specialized in the areas of health, chemicals, and energy. Previous to his position at EUBP, he worked for several years as an advocacy officer for a German foundation.

Abstract

The request for a more sustainable lifestyle has become a common desire in our society. This desire is also expressed by the continuously growing demand for bio-based, biodegradable, and compostable plastic. Production capacities for these materials are predicted to grow significantly as well in the next five years. For this innovative and young sector to unfold its full potential, however, a clear, supportive, and reliable policy framework is needed. In its Green Deal, the European Commission has made the ambitious commitment to make Europe climate neutral by 2050 and to transform its economy from a linear to a circular model that is less dependent on fossil-based resources. Bioplastics are without a doubt one of the solutions to achieve these ambitious goals. The upcoming policy framework on bioplastics will therefore be a crucial testimony to how committed the EU really is.

Tuesday, May 24, 2022 | 09:40 - 10:05

Lactic Acid and Lactide Technology by Uhde Inventa-Fischer

Udo Mühlbauer, Uhde Inventa-Fischer

Biography

After his studies of Physics and Chemical Engineering in Regensburg, Berlin and Paris, Udo Mühlbauer began his career at Uhde Inventa-Fischer as an R&D engineer in 1998 – at that time still Karl Fischer Industrieanlagenbau. From the first day, he was involved in the development of UIF's PLAneo® process. Udo conducted the first experiments in the lab, designed and ran UIF's PLA miniplant and PLA pilot plant.

As product manager of PLA, he was responsible for the successful start-up and operation of Uhde Inventa-Fischer's first industrial-scale PLA plant.

He is a joint inventor of several patents on UIF's PLA technology.

Besides being PLA product manager he is the Head of R&D of Uhde Inventa-Fischer GmbH.

Abstract

Uhde Inventa-Fischer (UIF) has successfully developed and extensively validated its lactide technology as a crucial link between its lactic acid technology and its PLA polymerization technology. The lactic acid technology based on ammonium sulfate as byprodcut has been extended to include also the gypsum technology, as gypsum will be becoming a product of higher economical value in the future.

The key differentiator between UIF's lactic acid and lactide technology and most common technologies is that UIF's technology is basically available to any investor worldwide.

The presentation focuses on the lactic acid and lactide process and its special features:

- Fermentation and purification to obtain polymer grade lactic acid
- Lactide Purification technologies
- Handling of meso-lactide
- Process design options to produce different grades of PLA
- Technological readiness of lactide process
- Process economics
- Properties and qualities of the UIF PLA

Tuesday, May 24, 2022 | 10:05 - 10:30

Recent advances in recycling and composting as viable end-of-life options for PLA

François de Bie, TotalEnergies Corbion

Biography

François de Bie is Senior Marketing and Supply Chain Director at TotalEnergies Corbion. In his job, he supports partners and brand owners that want to capitalize on the benefits of bioplastics.

François holds a Master of Science degree in biomedical mechanical engineering from Eindhoven University of Technology, the Netherlands.

Before joining TotalEnergies Corbion, François worked at Corbion, EconCore, Sabic and GE Plastics where he held various leadership positions in marketing, product management, pricing and sales. Building partnerships and new business development are his key areas of expertise.

In 2013, François was elected Chairman of the Board of European Bioplastics, a position he still holds. With over 70 members from across the value chain, it is the largest European association representing the bioplastics industry. Furthermore, François is a founding member of Holland Bioplastics association and Chairman of the European CN/TC411 committee that created the EU standard for measuring biobased content.

Abstract

TotalEnergies Corbion has launched the world's first commercially available chemically recycled bioplastics product. The Luminy® recycled PLA grades boast the same properties, characteristics and regulatory approvals as virgin Luminy PLA, and are partially made from post-industrial and post-consumer PLA waste. rPLA has now also been officially certified by 3rd parties, allowing full transparency and allowing our customers to make credible claims about using recycled plastic products.

In the field of composting of Luminy PLA, we have found more evidence to show PLA fragments and biodegrades rapidly in industrial composting facilities and biodegradable PLA helps to reduce plastic leakage into the environment.

Tuesday, May 24, 2022 | 11:10 - 11:35

Floreon: Redefining PLA

Andrew Gill, Floreon

Biography

Dr Andrew Gill is Technical Director at Floreon, having joined the company in 2011 as a researcher.

With a first degree in chemistry, Andrew completed his PhD in Materials Science at the University of Sheffield (UK) focused on medical applications for PLA via additive manufacturing.

Today Andrew leads the continuing development of Floreon's innovative technology and is responsible for numerous patent applications and newly developed compounds. He works closely with Floreon's licensed compounding partners as well as end-users of the technology in to help them transition to renewable and low carbon materials.

Abstract

Floreon is pioneering the use of PLA in durable applications. Our highly disruptive technology offers the performance of engineering plastics such as ABS and can be further modified with a halogen-free flame retardant to achieve fire resistance. This innovation is fully patented and is available through Floreon's global network of licensed compounders. Brands can also take a license for Floreon materials allowing them to source our materials through their existing supply chain. Target applications include electronics, toys, 3D printing and horticulture. The talk will showcase Floreon's technology and our most recent developments in these areas.

Tuesday, May 24, 2022 | 11:35 - 12:00

Biocomposites of PLA/natural rubber/fiber

Nopadol Suanprasert, Global Biopolymers

Biography

Nopadol is a born Thai national and a Canadian citizen. He studied Industrial Engineering at the University of New South Wales, Sydney, Australia. After graduating with a bachelor's degree, he emigrated to Canada where he worked for Canadian Telecommunication in Toronto and Montreal. He also attended an MBA at McGill University, Montreal. After Canada, he returned to Thailand to work for two state enterprises, first Airport of Thailand, and second Rubber Authority of Thailand. At these places, he came into the bioplastic industry. He foresees that the bioplastic industry is a sustainable and rising industry. So he set up Global Biopolymers to be one of the bioplastic pioneers.

Abstract

Poly Lactic Acid (PLA) is a biobased polymer obtained from renewable raw materials such as starch and sugar. PLA has both bio-content and compostability. PLA has many applications that can replace petroleum-based polymers. However, the properties of PLA have constraints such as brittleness, low impact resistance, and low heat stability. Therefore it is necessary to improve these property constraints by compounding it with other materials. Natural rubber is latex obtained from the tapping of rubber trees. Natural rubber is elastic and has high mechanical impact resistance. Fibers, such as coir fiber, is an agricultural by-product. Fibers improve biodegradability and good product appearance. Both natural rubber and fibers are bio-based materials. When compounded with PLA, the composite material has high bio-content, is compostable, and has higher heat stability. There are many applications of BIOCOMPOSITS OF PLA/NATURAL RUBBER/FIBER . Among them are injection molding, blow molding, and thermoforming. Examples of final products are toothbrush handles, tool handles, furniture parts and tiles.

Tuesday, May 24, 2022 | 12:00 - 12:25

Sustainable Fibers in PLA compounds

Steven Schuitema, FKuR

Biography

Steven graduated (MSc) in Chemical Engineering and is active for more than 25 years in the plastic industry. Experienced in Marketing, Technical Sales (15 years), Process- and Product development. He has in-depth knowledge of (Bio-)plastic raw materials and (international) markets and is very familiar with plastic and rubber processing technologies.

His challenge is to combine sales, marketing and new business development in a technical BZB environment.

Abstract

The presentation will cover FKuR Fibrolon materials. "Sustainable Fibers in PLA compounds". It will comprise experience, new development and examples.

Tuesday, May 24, 2022 | 13:45 - 14:10

The benefits of using amorphous PHA in PLA compounds

Hugo Vuurens, CJ Bio

Biography

Hugo Vuurens started his career at DSM on polyester and epoxy coating resins. After working for various companies, he has been active as a business developer in the biopolymer industry for over 12 years. Hugo initially worked for Corbion (later Total-Corbion PLA), as an independent consultant and since this year for CJ Bio where he is active as Vice President of business development for the recently commercial PHA business that CJ has started from the Metabolix heritage. Hugo holds a master's in chemical technology from Delft University of Technology, an MBA from IMD Lausanne, and is on the advisory board of various biopolymer startups. Hugo likes taking walks in the forest and collecting waste while he walks.

Abstract

CJ BIO, a division of South Korea-based CJ CheilJedang, has introduced PHACT® Marine Biodegradable Polymers based on its proprietary PHA technology.

PHB (polyhydroxybutanoic acid) copolymers and their products are known to biodegrade in soil, home compost, industrial compost sites, and marine environments. Currently, PHB copolymers are the only marine biodegradable polymers that are available at a reasonable scale to displace many of the single-use and disposable plastic products that tend to pollute our oceans. Because of their biobased content and their broad biodegradability, PHB copolymers are receiving considerable attention for employment in various thermoplastics applications such as injection molding, extruded sheet, film (blown and cast), and extrusion coating. PHAs incorporated at the appropriate levels can enable or replace other polymers and act as a modifier to improve biodegradability, flexibility, and toughness, or provide an enhanced bio-balanced system. In this presentation, we will discuss a family of PHB copolymers (ranging in composition from highly crystalline to fully amorphous) that are commercially available today and the value proposition of these compositions not only in marine biodegradable formulations but to deliver performance enhancement across multiple applications.

Tuesday, May 24, 2022 | 14:10 - 14:35

PLAIR - a new material made from plants and air

Philippe Wolff, Ricoh Europe

Biography

Philippe Wolff has a MSc degree in Economics from Metz (F) and Saarbrücken universities and studied Marketing Management at ESCP-Europe Business School.

He has been in various Sales and Marketing positions for Ricoh in Europe with a focus on labels and other consumables. In 2015 he joined Ricoh's global headquarter in Tokyo and the new industrial solution team with a focus on flexible packaging.

Since September 2021 he is in charge of the Marketing and BDM in EMEA for Ricoh Group's range of sustainable technologies helping industries to reduces their environmental impact and thus contributing to the planet and society. His current position is Business Development Director for Ricoh Industrial Sustainable Solutions.

Abstract

Ricoh promotes the realization of a zero-carbon society through energy conservation activities, renewable energy, and active participation in international initiatives.

Ricoh is committed to the development of society and will do this by resolving social issues through business and by creating new markets and value.

Engaged in the reduction of fossil-based plastic in packaging Ricoh has developed PLAiR – A New Material made from Plants and Air:

- A plant-derived foamed PLA sheet that is both flexible and strong
- Which can be used as packaging material, cushioning material, and various containers by changing the foam expansion rate
- Carbon neutral and compostable (when burnt, PLA does not increase the net amount of CO_2 in the atmosphere and degrades into water and CO_2 under controlled environments such as soil or compost).

Tuesday, May 24, 2022 | 14:35 - 15:00

Recent developments and applications with PLA packaging solutions

Allegra Muscatello, Taghleef

Biography

Allegra Muscatello holds a bachelor's degree in Industrial Engineering at Università degli Studi di Trieste and a master's degree in Materials Engineering and Nanotechnology at Politecnico di Milano.

She is currently working in Taghleef Industries as a Product Manager within the Business Unit of Flexible Packaging, responsible for the brand of biobased and biodegradable packaging solutions NATIVIA®.

Abstract

PLA is one of the most promising bioplastics in the flexible packaging scenario, offering a mix of properties (among them transparency, stiffness, breathability, mineral oil and aroma barrier, twist and dead fold retention) that well suits many applications. NATIVIA, Taghleef Industries' brand of PLA films, is used as a mono-web or in lamination with paper or other biobased and biodegradable films, for various applications that are currently on the market: fresh produce, bakery products, confectionery, dry food, and tape, to name a few. Several reDESIGN examples of replacing traditional fossil-based structures with NATIVIA are available and the recent developments in NATIVIA's portfolio allow to enlarge this range of suitable applications even more.

Tuesday, May 24, 2022 | 15:00 - 15:25

PLA in current Research Projects: Material Development Packaging Applications – Recycling

Kerstin Müller, Fraunhofer IVV

Biography

Kerstin Müller has been working at the Fraunhofer Institute for Process Engineering and Packaging IVV in Freising since 2017. As a research associate, she works on research and industry projects in the field of bio-based polymers and packaging recycling. She studied biotechnology and food technology in Fulda and Munich. Her research focuses on the material use of polymers from natural resources, biopolymers for technical applications, and polymer recycling. Currently, she is also a doctoral candidate at the Technical University of Munich in the field of thermoplastic processing of natural polymers.

Abstract

In terms of resource conservation and a more sustainable circular economy, the use of renewable raw materials is a long-term goal. To achieve this, bio-based polymers must meet many criteria: A sustainable raw material base, a suitable property profile for technical applications and an end-of-life option without environmentally harmful effects. First material combinations of PLA and cellulose show promising results: The miscible blends are transparent, exhibit higher biodegradability than cellulose itself, and can be thermomechanically formed.

The high availability of PLA facilitates the establishment of a PLA circular economy. Possible disadvantages in the packaging area with regard to water vapor or oxygen permeability with PLA can be eliminated by additional coatings with non-polar materials such as vegetable waxes, or proteins. The reuse of PLA recyclates in food packaging is the goal of developing suitable recycling processes. Especially solvent-based recycling shows great potential due to its selectivity and high cleaning performance.

Tuesday, May 24, 2022 | 16:00 - 16:25

Evolutions in Performance and Environmental Degradability of PLA-based Biopolymer Films

Ed Tweed, Sidaplax/Plastic Suppliers

Biography

Ed Tweed is the Director of R&D for Earthfirst® Films by Sidaplax global operations. Resident in Columbus, Ohio's global headquarters, Ed also has responsibility for the Ghent, Belgium operating site. Throughout his 40+ years at Earthfirst Films, Ed has served in advancing Operations, Manufacturing and Research & Development roles. Ed has authored and been granted twelve patents in manufactured films covering North America and Europe. Outside of film pursuits, Ed gains his inspiration from scenic motorcycle rides and the tranquility of lake fishing.

Abstract

PLA films have evolved significantly over the past 18 months and now have greater performance attributes. Evolutions continue as increased market demand and greater packaging performance needs drive engineered films that enhance feel and function, increase barrier properties for package integrity and create impressive source reduction opportunities for environmental benefits.

Topics include recent advancements in softer, stronger and more extensible PLA-based films, high heat resistance and differential temperature films, expanded End of Life (EOL) films for home compostability, effective barrier laminations and material source reduction. Future developments will also be covered as we continue the technical advancement of environmentally responsible biopolymer films.

Tuesday, May 24, 2022 | 16:25 - 16:50

Reviewing the science around biodegradability and (home) compostability of PLA

Ramani Narayan, Michigan State University

Biography

Ramani Narayan, is University Distinguished Professor at Michigan State University in the Department of Chemical Engineering & Materials Science.

He has 140 refereed publications, 26 issued patents, and edited three books – all in the area of bio-based and biodegradable polymeric materials.

He served and serves in many different functions, such as the Scientific Chair of the Biodegradable Products Institute (BPI), Director to Society of Plastic Engineers (SPE) Bioplastics special interest group (BioSIG) or on the Board of Directors of ASTM International, to name just a few.

He has won several awards and is a successful entrepreneur having been responsible for commercializing several technologies.

Abstract

Industrial composting of PLA products used in packaging of food, collection bags, disposables, hybrid paper products and similar articles helps divert food and organic wastes from landfills, and open dumps to industrial composting resulting in GHG emissions reduction.

Industrial composting transforms unstable biodegradable organic wastes (which represents 50%+ of a country's municipal solid waste stream) to a stable, volume reduced (70% volume reduction) soil amendment product using natural consortium of mesophiles and thermophiles. PLA is certified and validated to be industrial compostable as per ISO/ASTM/CEN norms. However, PLA products are reported to not biodegrade, or incompletely biodegrade in a home/residential composting environment, although the operating biology should be the same. In this lecture, we discuss the science around these seemingly disconnected observations. We present discussions around polymer structure and biodegradability in natural environments like the oceans.

See the @EnvSciTech article https://pubs.acs.org/doi/10.1021/acs.est.9b04513. The article "Reducing environmental plastic pollution by designing polymer materials for managed end-of-life" was published in Nature Reviews (Materials) publication. It can be read online (subscription needed): https://www.nature.com/articles/s41578-021-00382-0 .

Wednesday, May 25, 2022 | 09:00 - 09:25

Application and Recycling of PLA

Kevin Yang, Shenzhen Esun Industrial Co

Biography

Kevin (Yihu) Yang, Chairman of Shenzhen Esun Industrial Co.,Ltd. He is currently the Vice chairman of the Degradable Materials Special Committee of China Plastics Industry Association. 2013 Forbes China Science and Technology Pioneer, TOP 10 business leaders in the new materials industry in 2018. He has applied for more than 60 international and domestic invention patents, and more than 40 have been authorized.

Abstract

- Applications of PLA
- Chemical recycling technology of PLA
- PLA recycling demonstration project - PLA quilt
- Company profile

Wednesday, May 25, 2022 | 09:25 - 09:50

Current market reaction on PLA

Patrick Gerritsen, Bio4pack

Biography

After his apprenticeship to become an industrial manager and three more years of education Patrick started his career in the bioplastics industry in 2000 as an employee and shareholder at natura.

In 2009 he left natura and founded his own company bio4pack. This company develops, produces, and sells packaging products that are either renewable (biobased), compostable - or both. But in all cases with all necessary certifications.

Abstract

Why is it not possible to put PLA packaging on the market on a large scale? The raw material has proven itself as a full-fledged, environmentally friendly basis for packaging. Why do producers and packers still opt for packaging based on fossil raw materials? Patrick Gerritsen of Bio4Pack discusses this situation in his presentation and tries to understand what it takes to give PLA the position it deserves. One thing is clear: it's not the material. We must ensure that existing (economic) systems are broken. It won't be easy, but together we can achieve this. Patrick Gerritsen will discuss this in more detail in his presentation and will provide some ideas for this in his own way.

Wednesday, May 25, 2022 | 09:50 - 10:15

Influence of PLA in PET recycling

Karin Molenveld, Wageningen UR

Biography

Karin Molenveld is educated as a Chemical Engineer (MSc) at the Technical University of Twente. Karin has been working at Wageningen Food & Biobased Research in the field of sustainable plastics for over 25 years. At present Karin is expertise leader in the field of "Sustainable Plastic Technology" coordinating the work of a group of about 20 people focused on topics related to the development and application of biobased and biodegradable plastics and the end-of-life of plastic products including organic, chemical and mechanical recycling.

Extending the application opportunities of biobased and biodegradable plastics as well as improving recycling practices of plastic products are the main topics within this expertise. Well-known examples of developed products include PLA based particle foam (Biofoam™), full PLA coffee cups as well as various starch-based compounds and products. More recent topics include biodegradable netting for agricultural applications, the fate of compostable products in full-scale organic waste treatment facilities and improving the properties of PLA with respect to its foaming behaviour, flow properties and biodegradation in the open environment. More generic topics are the effect of regulations on the recyclability of packaging, the ban on single-use plastics and balancing the use of packaging with food waste prevention.

Abstract

Decoupling from fossil feedstock is necessary to progress towards a more sustainable plastic system. Biobased plastics, therefore, have to be integrated into plastic waste management systems. This should, however, not reduce the performance of current recycling systems. Several studies have previously suggested that the uptake of polylactic acid (PLA) in this system would endanger polyethylene terephthalate (PET) recycling. This suggestion has been carefully studied by analysing how much PLA could potentially end up in recycled PET and by studying the impact of these amounts on the optical and thermal properties of rPET.

The study presented here contravenes previous studies on the impact of PLA on the quality of recycled PET. The difference between this study and the previous studies is that within this study, recycled PET has been processed in agreement with industrial methods to produce food-grade recycled PET. Therefore, in case the sorting and recycling facilities maintain their current careful operation, no negative impact of PLA on PET recycling can be foreseen, and further integration of biobased plastics in the plastic waste management system can be pursued.

This presentation is related to the paper which was recently published (DOI: 10.1002/pts.2633).

Wednesday, May 25, 2022 | 10:15 - 10:40

Exploring advanced biocomposites based on biodegradable bioplastics and degradable glass fibre reinforcements

Ari Rosling, Arctic Biomaterials

Biography

Ari Rosling received his PhD at Åbo Akademi University in 1998 (Organic Chemistry) after which he was appointed assistant professor at the Department of Polymer Technology, leading the biomaterial research. At present he is R&D Director at Arctic Biomaterials, being in charge of the technical and medical material development. He has published more than 50 papers and several patents.

Abstract

We supply bio-based polymeric material solutions, including but not limited to World's strongest biodegradable composites – enabled by the award-winning ABMcomposite degradable glass fiber technology.

The composite materials are produced as SGF (short glass fiber) composites or as long-fiber-reinforced thermoplastics on our (LFT) line. This proprietary degradable glass fiber technology enables the increase of ABM composite materials' temperature resistance and mechanical properties to new levels and opens a variety of possible application areas in the field where technical plastics are being used. The degradable glass fiber also opens new end-of-life options for the GF-reinforced composites by promoting biodegradation and compostability.

Wednesday, May 25, 2022 | 11:20 - 11:45

PLA melt spinning, coating and printing for fully biobased clothing

Lien Van der Schueren & Willem Uyttendaele , Centexbel

Biography

Dr **Lien Van der Schueren** holds a Master in Materials Engineering and obtained her PhD in Materials Engineering on the subject of chromic textile materials at Ghent University. She is working for 9 years as a research engineer at Centexbel (Belgian Textile Research Centre) where she is responsible for several European and private research projects in the field of extrusion of thermoplastic polymers. Within this, she is mainly focusing on the use of sustainable, bio-based materials for textile applications.

Willem Uyttendaele obtained his Master of Science in Chemistry in 2018 with a thesis on polymer reinforced peptide hydrogels for drug delivery. Since 2018, he is a research scientist in the coating and finishing division at Centexbel, the Belgian textile and plastics competence center. His research is focused on bio-based coating materials and environmentally friendly coating techniques.

Abstract

The HEREWEAR project aims at the creation of an EU economy for locally-produced circular textiles and clothing made from bio-based resources. Instead of fossil-based polyester, which is one of the most often used materials for clothing, we investigate the use of PLA. If needed for the comfort properties, PLA is mixed with other bio-polyesters such as PBS. For further clothing design, the bio-based textile coating and printing applications are limited. To tackle this, a waterborne PLA formulation was developed that is completely solvent-free and uses biobased and biodegradable additives. These can be applied using standard direct coating or screen-printing techniques. The coatings show excellent abrasion resistance, good flexibility, and are compatible with a range of fillers, (biobased) flame retardants and colourants. First prototypes developed within the project showed the technical feasibility of fully bio-based garments out of PLA.

To further support the transition to a more sustainable textile industry, a HEREWEAR Community is being built, bringing together a broad range of engaged people, businesses, associations and institutions over the complete textile value chain.

HEREWEAR is a Horizon 2020 project, co-funded by the European Union (grant agreement No. 101000632), it will last 48 months and started on October 1st, 2020.

Wednesday, May 25, 2022 | 11:45 - 12:10

PLA integrated supply chain & life cycle management

Geoffroy Delvinquier, Futerro

Biography

Geoffroy Delvinquier, studied Biotechnology and Entrepreneurship at the University of Bordeaux, France. In his job, he both supports customers and partners to switch from an old and polluting way of production to a sustainable and innovative one by using Bio-RENEW-able solutions and acts in the strategic development of the company. Before joining Futerro as "New Business Development and Marketing Manager", Geoffroy worked in the pharmaceutical industry for 3 years after having launched a project called EcoP.E.T, which was aiming to develop a bio-recycling process of PET using enzymes. Setting-up new and innovative projects as new applications and businesses are his main experiences and competencies.

Abstract

As we all know, plastic end-of-life is one of the biggest industrial challenges of the 21st century. While being more sustainable, bio-based polymers suffer from the same challenges as petro-based polymers (life-cycle, end-of-life, pollution, reuse, etc.). Today, to open up the PLA market and applications to their real potential, we must put in place a positive policy and an innovative way of sorting and recycling PLA. Monomaterials can go directly to mechanical recycling while the other must be treated in composting or chemical recycling, which appears to be a good opportunity for PLA. This presentation will introduce Futerro PLA chemical recycling solution (LOOPLA) as well as the next challenges to tackle collectively regarding PLA end-of-life options and associated policies.

Wednesday, May 25, 2022 | 12:10 - 12:35

Development of High Temperature Resistant Stereocomplex PLA for Injection Moulding

Sebastian Körber, Fraunhofer ICT

Biography

Sebastian Körber studied general mechanical engineering at the Karlsruhe Institute of Technology from 2013 to 2019. During his bachelor's and master's studies, he focused on materials science, starting with metals and ceramics until he finally arrived at polymers. During his master's thesis at the Fraunhofer Institute for Chemical Technology, Sebastian first came into contact with PLA. He was so enthusiastic about this topic that he remained at the Fraunhofer Institute after his studies and still works there in the field of material development of biopolymers.

Abstract

A promising approach to equip PLA with superior temperature resistance is the production of stereocomplex PLA (sc-PLA). Sc-PLA is produced by the two PLA stereoisomers, PLLA and PDLA, and offers the decisive advantage of a melting point that is approx. 50 °C higher (Tm = 230 °C). Although stereocomplex formation has high potential as a biodegradable high-performance polymer, the formation is difficult to control as both the PLLA and PDLA chains must be alternately aligned in the crystal lattice of the complex. If this is not the case, homocrystallisation of PLLA and PDLA occurs, which must be suppressed due to the lower melting point.

The aim of this study was to improve the (thermo-)mechanical properties by generating pure stereocomplex PLA. For technically relevant chain lengths homocrystallisation is more dominant than stereocomplex crystallisation. To achieve the objective of pure sc-PLA, numerous nucleating agents described in the literature as "advanced nucleating agents" were compounded into PLA and their effects investigated. Combination of two nucleating agents proved to be the most effective. Based on parameters determined in these laboratory tests, the process was transferred to pilot scale and universal test specimens were injection moulded.

Wednesday, May 25, 2022 | 12:35 - 13:00

Development of Stereocomplex PLA filament yarns and monomaterial composites based thereon

André Lehmann, Fraunhofer IAP

Biography

André Lehmann studied Chemistry and got his Diploma at the University of Potsdam, followed by a PhD at the Technical University of Dresden (and Fraunhofer IAP) in the field of polysaccharide chemistry

Since 2011 he is head of the department "Fiber Technology" at Fraunhofer IAP, dealing with shaping of polymers from solution (focus on man-made cellulosics) and melt (focus on bio-based thermoplastics) into filaments, films and nonwovens actual main topics: viscose, carbon fiber precursors, man-made cellulose fibers for technical applications

Abstract

Improving the thermal and mechanical properties of monomaterial composites based on PLA can significantly help to expand its potential areas of application. In particular, high-temperature-resistant Stereocomplex PLA (scPLA) crystal structures could play a key role here.

The presentation will reflect on the ongoing developments at Fraunhofer IAP, which focus on the manufacture of scPLA filament yarns and films as well as their application as fiber-reinforced plastics consisting of exclusive PLA monomaterial. The major goal of the research projects is the realization of scPLA fiber-based short fiber reinforced composites (SFRC), UD tapes and organo sheets for applications in the technical segment. A prerequisite of this goal is the achievement of an exclusive high-melting scPLA fiber structure with a sufficiently high textile-physical property profile for addressing the reinforcement effect.

Wednesday, May 25, 2022 | 14:15 - 14:40

Composite 3D printing filaments

Zsolt Bodnar, Filaticum

Biography

Dr Zsolt Bodnar graduated as chemical engineer from Technical University in Budapest. He holds PhD in industrial chemical technology, later he got MBA as well. He worked as a scientific assistant at Technical University in Budapest and ETH in Zürich. His professional path includes various senior managing positions at several international companies: Wacker Chemie, Vinnolit GmbH.

Dr Bodnar established his engineering bureau in 2015, working with Baerlocher GmbH, Zeppelin. He has more than 15 years of experience in bioplastics, especially in PLA. One of his main projects in this field was the visibility study of a Hungarian Biorefinery. Filamania Ltd. Was established in 2015 for the research and production of industrial 3D printing filaments.

Abstract

Today, 3D printing is much more than a technique used only in prototyping, in the past years, several factors have encouraged the adoption of 3D printing for large scale production. This process goes hand in hand with enhanced material design, and PLA is an inevitable solution in this field. Filaticum develops and produces unique, PLA-based filaments for industry, among others Filaticum Engineering (high heat and impact resistance) Filaticum Foam (foam-structured, lightweight), and Filaticum ESD (with surface resistance at megaohm order of magnitude).

Zsolt Bodnar in his lecture presents, how composite PLA filaments can provide a competitive solution in 3D printing.

Wednesday, May 25, 2022 | 14:40 - 15:05

Utilizing novel technologies and partnerships to scale the production and adoption of PLA

Mariagiovanne Vetere, NatureWorks

Biography

As NatureWorks Global Public Affairs Director, Mariagiovanna represents the company on public and legislative affairs. Her responsibilities include Government relations, product Circular Economy options, feedstock and biomass sustainability aspects, bioeconomy and interface with relevant industry associations and external stakeholders. Mariagiovanna manages an extensive network and relationships with the Plastics industry associations, Brand Owners associations and NGOs; she has practical experience in how the legislative process is implemented both in the EU and USA.

Mariagiovanna brings a strong background well suited to this space, having spent 10 years at Corepla, the Italian consortium for Plastics Packaging Collection, Recycling and Recovery, where she gained competence in EPR – Extended Producer Responsibility.

Her previous experience is with consulting company KPMG where she was focused on Business Process Reengineering.

Mariagiovanna holds a degree in Philosophy and a master's degree in Economics.

Abstract

Scaling up for success. How NatureWorks' journey moved from its first Ingeo-based materials in 2002 to a fully integrated and innovative facility in Thailand. A journey that is moving through applications and partnerships to provide advanced materials for a demanding market in challenging times.

Wednesday, May 25, 2022 | 15.05 - 15:30

PLA packaging: returnable, recyclable, re...

Johann Zimmermann, NaKu

Biography

After his university degree in polymer science at the University of Leoben (Austria) in 1999, Johann Zimmermann started his career at Biesterfeld Interowa, a European distributor of polymers. Initially, he was working as a technical service engineer, taking over the lead of the technical service group in 2005. Having finished his second degree in economic science Johann Zimmermann founded "ZimTec" the consulting office for polymer engineering in 2006 and the company Naku in May 2007. Naku is a specialist in biopolymer products (films, bottles, injection moulded parts, etc.) and in biopolymer compounds. Their main product is a specially designed bag that increases the shelf life of vegetables, fruits, and bread fresh. For this invention Naku has earned many national innovation awards like the Genius Innovation Award in 2007, the Weisssee Innovation Lounge 2010, the nomination for the Austrian Climate Protection Price in 2012, or the economy award ÖGUT 2015. Most recently, Naku won the Energy Globe Award Austria in 2021 in the category "earth" and was nominated for the Energy Globe World Award in the same category, which was presented during the 26th UN Climate Change Conference (COP26) in Glasgow last year.

Abstract

NaKu has specialized in the production of bioplastic articles for 15 years. The company mainly produces bottles and carrier bags and realizes customer projects.

While marketing and storytelling have played a very important role in the past for products made of bioplastics, the end of life is currently becoming an increasingly critical focus.

Dealing with the various end-of-life scenarios for bioplastics, especially for packaging, is becoming a forward-looking challenge not only for individual companies but for the entire bioplastics industry.

In principle, bioplastics can be recycled in exactly the same way as conventional plastics. And with composting, there is even an additional option.

Dealing with products and their end of life from the perspective of a medium-sized processor.

Wednesday, May 25, 2022 | 15:30 - 15:55

Effect of regrind addition on shelf-life of injection molded PLA-based products

Shilpa Manjure, NaturTec

Biography

Shilpa received her PhD in Chemical Engineering from Clemson University, SC and has almost 20 years of experience in working with polymeric materials and processing. She started working in the area of bioplastics 14 years ago when she joined Northern Technologies Intl. Corp. (NTIC) where she currently holds the title of Director, R&D. Shilpa is an active member of the Society of Plastics Engineers (SPE) and serves on the board and Bioplastics division. She has been involved in working groups organized by BPI and ASTM for establishing universal standards for compostability.

Abstract

PLA is known to undergo hydrolysis over time depending upon environmental conditions of heat and humidity. The shelf-life of a PLA-based product is therefore affected not only by storage conditions but also largely dependent on how well properties are retained in a freshly molded part. The Addition of regrind further reduces the initial performance. An injection molding process can generate anywhere from 1 to 15 % scrap based on the type of mold, mainly the runner system, and it is important to add this scrap as regrind to reduce cost. How much regrind can be added to a PLA-based part while retaining performance over the life of the product? This presentation will review results obtained for molded PLA-based spoons made with different amounts of regrind and its effect on overall shelf-life.

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Recyclable and compostable biobased plastics like PLA are poised to respond to numerous ecological challenges. From their low carbon footprint to the flexibility of their end-of-life, these plant-based materials represent a sustainable alternative to current petroleum-based, non-biodegradable plastics in a wide range of applications.

TotalEnergies Corbion (formerly known as Total Corbion PLA) is a global technology leader in Poly Lactic Acid (PLA) and lactide monomers. PLA is a biobased, recyclable, and biodegradable polymer made from annually renewable resources, offering a reduced carbon footprint versus many traditional plastics. The Luminy® PLA portfolio, which includes both high heat and standard PLA grades, is an innovative material that is used in a wide range of markets from packaging to consumer goods, fibers and automotive.

TotalEnergies Corbion, headquartered in the Netherlands, operates a 75,000 tonnes per year PLA production facility in Rayong, Thailand and has recently announced the intention to build a second plant in Grandpuits, France. The company is a 50/50 joint venture between TotalEnergies and Corbion.

Throughout our communications, unless otherwise specified, the terms 'biobased' and 'compostable' or 'biodegradable' refer to EN16785-1 and EN13432 standards respectively. It is the responsibility of the article producer to ensure that claims on final products are substantiated by testing against the relevant standards. Check your locally available end-of-life infrastructure to ensure that legitimate end-of-life claims are made on the final product. www.totalenergies-corbion.com

Back to earth

Facts about biobased compostable plastic

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CJ BIO is a division of CJ CheilJedang, a core subsidiary in charge of the food and bioengineering business unit of South Korea-based CJ Group. CJ Group has developed its business portfolio into four core sectors: Food & Food Service, Bio & Pharma, Entertainment & Media and Retail & Logistics.

CJ BIO is the world's leading supplier of fermentation-based bio-products for animal nutrition, human nutrition, and biomaterials at its thirteen manufacturing facilities worldwide. As a socially responsible company, CJ BIO strives toward practicing carbon-neutral manufacturing operations by utilizing renewable raw materials and developing value-added co-products to minimize environmental waste.

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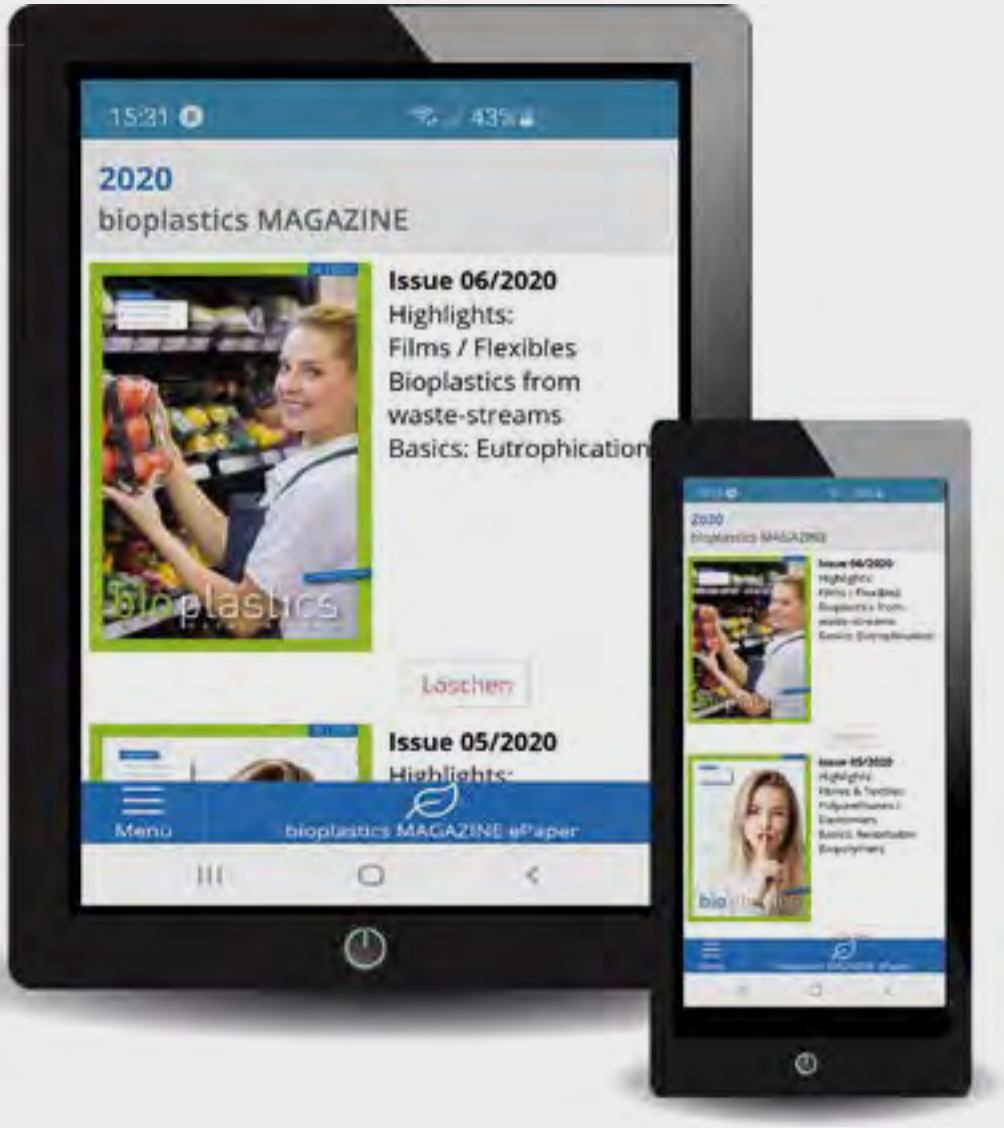

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daily updated eventcalendar at www.bioplasticsmagazine.com

2nd Annual Bioplastics Innovation Forum
09.06. - 10.06.2022 - Praque, Czech Republic
www.interfoam.cn/en

The European Biopolymer Summit
14.06. - 15.06.2022 - London, UK
https://www.wplgroup.com/aci/event/european-biopolymer-summit/

Packaging Design 4 Sustainability Conference ✱
14.06.2022 - Chemelot Campus, Geleen,The Netherlands
https://design4sustainabilityconference.com

Interfoam 2022 ✱
15.06. - 17.06.2022 - Shanghai, China
www.interfoam.cn/en

Plastics for Cleaner Planet - Conference
26.06. - 28.06.2022 - New York City Area, USA
https://innoplastsolutions.com/conference

Bioplastix India
29.07. - 30.07.2022 - Bangalore, India
https://bioplastex.com/

Bioplastics Business Breakfast K'2022 ✱
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