The World's No. 1 Trade Fair for Plastics and Rubber

NEWS

SEP 2019

A World of Pioneers

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RUBBER WORLDWIDE

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Breaking new ground

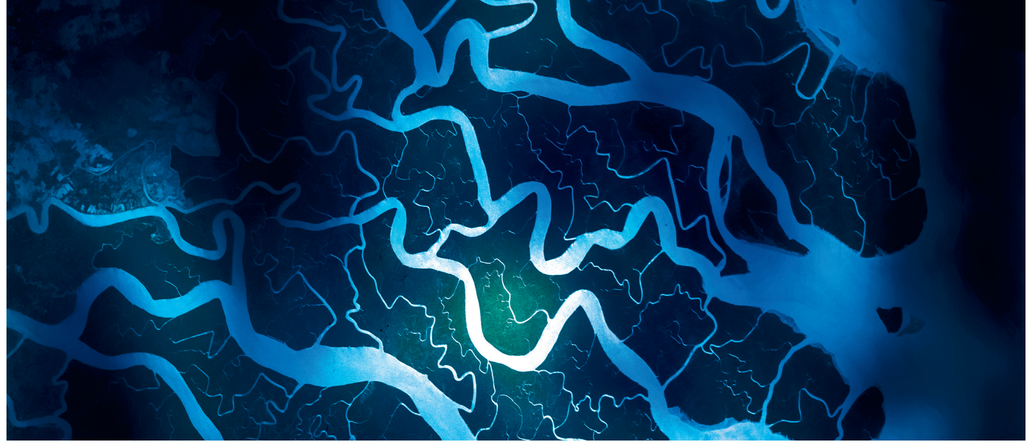
Further development is an innate human urge. It seems like part of our evolution to work towards acquiring, accumulating, improving and passing on knowledge and skills. Obstacles,however high or unpredictable, are perceived as challenges. People are lifelong pioneers. The more difficult the path, the greater the incentive to find a passage. Despite all progress, however, it is sensible and intelligent to pause for a moment and check whether the path once taken is still the right one, whether the goal set is still worth aiming for or if a course correction be called for. There will a lot of great successes and pioneering achievements to talk about when the international plastics and rubber industry gathers in Düsseldorf for K 2019 from 16 to 23 October.

Remembering successes

Over the past decades, the plastics and rubber industry has made a lasting difference to our world. The fact that the limits of what is humanly possible have been pushed further and further upwards is closely linked to the development and production of high-performance polymer materials. With its innumerable products and the many well-trained, differently qualified professionals in the industry worldwide, it plays a key role. It supplies all industrial sectors and research fields with materials that enable leaps of innovation, as we know them from the automotive and aviation industries. Safe food, patient-specific healthcare, mobility, electricity, communication, resource conservation – plastics and rubber make an essential contribution in all areas of our daily lives.

Driving innovation

The innovative strength of the plastics and rubber industry is more in demand today than ever. New challenges are arising that require deep knowledge of the development and production of polymers. It is not least a question of developing materials that deliver exemplary performance in their application yet do not become a problem in the long term, even if they enter the environment uncontrolled. The solution to this problem requires a comprehensive and in-depth understanding of the material and the technology that only the plastics and rubber industry has. It is part of the solution to upcoming tasks and challenges. At K 2019, the industry will be presenting its new products and forward-looking innovations. Young researchers from FabLab Lübeck e.V. will also be on hand at the special show at K in Hall 6 to demonstrate where additive manufacturing, robotics and modern materials such as plastics are heading. Their humanoid robot – a genuine high-tech pioneering achievement by northern German students of computer science, engineering and psychology. Living proof that history is always made by people.



The project "Renew Ganges" is supported by the non-profit organisation "Alliance to End Plastic Waste".

Strong alliance

More than 35 international groups and companies have come together under the umbrella of the non-profit organisation (NGO) "Alliance to End Plastic Waste" to work on new ways and efficient solutions for minimising plastic waste in the environment. The members of the alliance, whose base continues to grow, use their expertise, material and technological know-how as well as considerable financial resources in pursuit of this ambitious goal.

Successful together

The Alliance to End Plastic Waste has its European headquarters in London, where all threads come together and the decisions of the members are translated into strategies and procedures. The alliance pursues its goals in close cooperation with strategic partners such as the World Economic Council for Sustainable Development (WECSD) and the United Nations Environment Programme (UNEP). The focus on entrepreneurial and institutionalised interests makes the seriousness of the situation clear; long-term and lasting solutions require commitment, energy and a great deal of monetary support. The alliance has paid particular attention to combating the pollution of the world's oceans with plastic waste, much of which is washed into the oceans via tributaries. It aims to interrupt this flow of waste sustainably. For example, it supports projects such as "Renew Ganges", which is dedicated to freeing the 2,600 km long Ganges, a river that is highly polluted with waste water and other emissions, from pollutants. The Ganges flows through the vast plain south of the Himalayas, one of the most densely populated regions. In Indonesia, the world's largest island state and fourthmost populous country with 264 million inhabitants, the alliance is supporting the development of an infrastructure for waste collection and recycling.

Commitment in demand

The Alliance to End Plastic Waste focuses on projects that have a sustainable impact, on damage limitation and on a paradigm shift. Plastics are produced to fulfil tasks and functions. However, used plastics do not belong in the environment, but back in the recycling loop. Solving the dilemma requires a commitment on the part of society as a whole. Everyone is called upon to make his or her contribution to the preservation of an intact and liveable environment. The Alliance to End Plastic Waste (www.endplasticwaste.org) supports projects that have set themselves this goal. At the special show in Hall 6, the alliance will present its own projects, activities and initiatives, while also seeking dialogue, over two days. You are warmly invited!

Pioneers of plastics

Change is rare when things are going well. The beginning of the history of modern plastics involved a well-known ecological problem: the demand for ivory, which was used to make billiard balls, had almost caused the Ceylon elephant to die out in the second half of the 19th century. The dilemma was addressed by the synthesis of the plastic celluloid by the American chemist and inventor John Wesley Hyatt in 1867. In his development, which contributed to the continued existence of the elephants, the American chemist had relied on the 1855 patent of the British Alexander Parkes, who, however, had not succeeded in exploiting his invention in a meaningful way.

Unstoppable progress

Celluloid was not only suitable for the inexpensive imitation of animal luxury products such as ivory, mother-of-pearl or horn. The plastic caused a sensation above all as the material on which Hollywood built its future – as a flexible photographic film invented by the American Hannibal Goodwin, who had received US Patent 610'861 for it on 13 September 1898. At the same time, the advent of technical use of electric current led to the search for a suitable insulator. The Belgian chemist Leo Hendrik Baekeland, who emigrated to the USA, experimented with the condensation reaction of phenol and formaldehyde and invented Bakelite, the first completely synthetic plastic. Bakelite was used to manufacture switches, lamp sockets, radios, telephones and other components because of its heat resistance, electrical insulation properties, light weight and formability. Finally, there is Fritz Klatte, who also joins the list of early plastics pioneers. It was Klatte who created the conditions for the industrial production of polyvinyl chloride (PVC), one of the most important plastics of the 20th century. For a long time, the discoveries in the field of plastics, regardless of their great importance, were all more or less accidental discoveries that were attributable to the intuition and insight of the people involved. The shift towards a strategic orientation of polymer chemistry was only achieved with Hermann Staudinger and his theory of macromolecules in 1922, which he defended against fierce resistance from the professional world and for which he was awarded the Nobel Prize for Chemistry in 1953. Staudinger placed polymer chemistry in a scientific context, the foundation on which important plastics such as plexiglass, polystyrene, polyethylene and polyamides have been developed in our era. And the adventure of plastics continues, as a visit to K 2019 makes clear. At K, the modern pioneers of plastics history will present their achievements – and new progress will begin.

Circular Economy.
Read
part 3 of 3
on this trendsetting topic of the plastics & rubber industry.

Trendsetting ideas

Circular Economy – Part 3

Plastics are materials of value, too precious to simply be thrown away or even disposed of in the environment. They belong back into the material cycle, as recyclate that ideally does not differ from a new raw material. That sounds difficult, given the unbelievably large number of different types of plastics and plastic mixtures, don't you think? Times are changing: we present two approaches with trendsetting potential.

Everything in one pot

The spirit of the times brings new thinking: more and more companies are working to improve the reuse of plastics at the end of their lifecycle. However, all efforts always reach their limits when it comes to mixed plastic composites or multicomponent systems rather than pure materials. So far, these residual materials can only be thermally recycled, but not materially recycled. This could change in the foreseeable future in view of a process that BASF is currently testing. In contrast to conventional methods, the material used in the process known as "ChemCycling" is not mechanically treated and processed into a solid granulate, but liquefied to a pyrolysis oil under the influence of thermal energy. In simple terms, higher molecular-weight polymers are decomposed into low molecular-weight products that can be processed back into higher molecular-weight polymers after appropriate separation. Sounds like a good prerequisite for upcycling the plastic residues used. If established recycling processes and chemical recycling were combined, experts are convinced that the recycling rate for plastics could be more than tripled to 50 percent by 2030. ChemCycling would make a valuable contribution to the Circular Economy.

Thinking from the ground up

Scientists from the Lawrence Berkeley National Laboratory at the University of California, USA, are pursuing a different approach, but one that points in a similar direction. A major difference is that they already think about the end of use when manufacturing plastic products. The Berkeley researchers are working on a polymer that, at the molecular level, can basically be broken down into its smallest components and reassembled like a Lego play set into ever-changing and new shapes, textures and colours – without sacrificing performance or quality. Beginning at the end to think through, develop and produce plastics that can move through the recycling loop in their entirety and without loss – this idea is by no means new. Not even the many considerations regarding technological approaches to material recycling. Sometimes things just have to mature. The pioneering achievement lies in repeatedly trying to see failure not as defeat but as an incentive to successfully make the leap from theoretical consideration to practical application. K 2019 is the place where users experience inspiration for their practical applications. The plastics and rubber industry is always good for a surprise. Be there from 16 to 23 October 2019 at the Düsseldorf Exhibition Centre and experience it for yourself.

Pioneer of rubber

It is used as a band for bundling banknotes, letters and newspapers. As a seal, it provides loss-free retention of gases and liquids, and maintains heat, cold and pressure. In engines and machines, it makes an important contribution to the transmission of forces. It protects people from pollutants and pathogens and it is the substance that makes mobility, as we know and appreciate it, possible in the first place. To put it very clearly: without rubber there would be no progress.

History in motion

From his travels to the New World, Christopher Columbus (1451-1506), the renowned Italian navigator and first-class pioneer, brought rubber from Central America with him to Europe. Because the raw rubber was sticky and not very durable, however, no great importance was attached to testing its technical usefulness. This changed after Charles Nelson Goodyear produced natural rubber in 1839 by adding sulphur and under the influence of heat. The result was vulcanized, durable, elastic rubber, which attracted interest for many applications due to its useful properties. The burgeoning automotive industry, for example, developed an almost insatiable hunger for rubber. Shortly before the beginning of the First World War, Germany was cut off from the supply of natural rubber. Without rubber, mobilization was unthinkable. The solution came from a laboratory at Farbenwerke in Wuppertal-Elberfeld, the parent plant of the later Bayer Group. In 1909, after years of research, the chemist Friedrich Hofmann succeeded in synthesizing methyl rubber there. Although the process proved to be unprofitable, it ensured the supply of the required elastic material. In 1926 Walter Bock and Eduard Tschukur, two students of Friedrich Hofmann, finally succeeded in the industrial production of styrene-butadiene rubber (SBR). In 2012, 5.4 million tons of SBR were processed worldwide.

Concentrated know-how

New compounds and additives are being developed in laboratories around the world to further improve the performance and environmental compatibility of rubber. Research is being conducted into new natural resources for the production of natural rubber that will ensure a sustainable supply even under nutrient-poor conditions. Without rubber, progress is unthinkable. What the industry has to offer and what it can achieve will be reflected at K 2019 – concentrated along the "Rubber Road" in Hall 6. There you will meet the rubber pioneers of modern times.

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