

UNDER POWER

Plastics and Electricity – From Bakelite Switch to Blackberry

Our modern communication society would not be imaginable without the use of increasingly more efficient plastics.

The exhibition of the Deutsches-Kunststoff-Museums (German Plastics Museum) traces the history and present of plastics and electricity in five stations: From the early beginnings of power generation and transport – and in the world of information and communication.

The history is illustrated with historical products from the extensive collection of the Kunststoff-Museums-Verein. There is information on the latest inventions in regard to modern applications and interactive elements, with which the visitors can increase the depth of their knowledge on the subject even more.



Leo Hendrik Baekeland (1863-1944)

01 Plastics and Electricity: The Beginnings–First Success

One hundred years ago, Henri Leo Baekeland invented an artificial resin of phenol formaldehyde, named “Bakelite” after him, which was mouldable under heat and pressure. This was not only the start of the age of fully synthetic plastics, however, Bakelite was also a material which seemed to have been made especially for the requirements of the electrical industry and telecommunications, which were also still in the absolute starting phase: Easily mouldable, stable and above all non-conductive. No matter whether for casings, switches or plug-and-socket connections: Bakelite soon became indispensable as an insulating material.



Button for Electric Bell, Germany about 1940, Phenolic resin, Metal, Ceramics



Ampèremeter, USA 1960, Phenolic resin



02 Plastics in the Field of Power Generation

At the beginning, plastics were especially used because of their insulating properties: Casings or separating layers in motors, accumulators and generators have first made safe handling of electricity possible.

Today, plastics help with the economic utilization of renewable energies and technologies: For example, rotor blades for wind power stations; films and laminates for photovoltaics in solar technology; proton conducting polymer membranes which make fuel cells work.



Hair Dryer „AEG Foen“, Germany about 1930, Phenolic resin, Wood

03 Electricity and Data Transmission Electricity Consumption

Initially, the insulating properties of the material were also sought-after for transmission: No matter whether for long-distance transmission (insulators) in high voltage areas, for the distribution to individual households or for the safe wire into the end device.

Lamps, heat generation and kitchen appliances in the homes: High safety standards, ease of use and aesthetics are a matter of course nowadays, but would be inconceivable without the different types of plastics: Flexible cables, safe switches, light-weight and well-designed casings for various purposes. Better insulation materials made of plastic increase the energy efficiency of refrigerators and freezers, for example.

Electric Bedwarmer, Great Britain about 1935, Phenolic resin



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A travelling exhibition of the
Kunststoff-Museums-Verein e.V.
(Plastics Museum Association), Düsseldorf

Plastics: Information and Communication

Almost a Jack-of-all-trades: Mobile computers unite many different functions in one small device, which easily fits into your trouser pocket. In the past, a complete arsenal of devices and equipment was necessary: Calculator, typewriter, personal organiser, address book, notepad, camera and jukebox. By the way: You can also use it to make a call...

It was a long way from the beginnings of telecommunication to this practical piece of high-tech. It was necessary for data transmission by means of electrical impulses, as with the use of energy, to have plastics as insulation for conducting metal wires. Plastics also played a decisive role in the development of increasingly compacter devices.



Raw Material of the Future

Increasingly smaller and more efficient applications are being made possible thanks to modern, high performance polymers. The media landscape will undergo a change: Instead of the printed newspaper, there will be plastic films equipped with OLEDs on which the current news can be downloaded and shown. Ultra-flat computers will one day replace classic books.

Clothing and utensils are being equipped with photovoltaics on plastic films, in order to charge the batteries of your technical devises (mobile, notebook) while you are underway.

Extremely small radio frequency identification tags (RFIDs) are revolutionising merchandise management: From manufacturer to retailer, each product can be traced and controlled along its way - in real time.



Mobile Computer „Siemens“, Germany 2004,
Polycarbonate and Acrylonitrile-butadiene-styrene Blend

The museum owns a unique collection, which by now contains approximately 14,000 historical plastic objects, machines for the processing of plastic, sample collections and other documents on the history of plastics.

Since 2003, the Deutsche Kunststoff-Museum has been mobile and would like to reach their visitors there, where they already are anyway. Travelling exhibitions are shown in public places all over Germany: Places such as shopping arcades, savings banks or also theatre lobbies. They are implemented in cooperation with local partners and due to their modular concept; they can be built up quickly and at a comparatively low cost. In the meantime, there are three exhibitions on the topic of plastics: „Die Kunststoff-Macher“ (The Plastics Makers), this exhibition introduces the pioneers of the age of plastics. „Wir packen es!“ (We Package It) concerns itself with the topic of packaging with plastics in the past and in the present. The third show is called „Unter Strom“(Under Power).

Since the collection can only be viewed in small segments, the photographic and museological documentation of the exhibits in form of an EDP supported databank is of even more importance. All interested parties can look at extracts on the homepage of the museum and in more detail on a CD-Rom. Furthermore, the Internet presence of the museum also gives information about the various aspects of plastics as materials, their role in design and in everyday culture. There is also current information about exhibitions, literature as well as events.

www.deutsches-kunststoff-museum.de

Deutsches Kunststoff Museum (German Plastics Museum)

Kunststoff-Museums-Verein e.V. (Plastics Museum Association)

The Kunststoff-Museums-Verein (KMOV), founded in 1986, is the supporting organisation of the Deutsche Kunststoff-Museum. Its purpose is to document, to research and to present the scientific, technical, economical and cultural significance of plastics in the past and in the present to a broad public. Besides companies, associations and representatives from the plastics industry, members also include scientists, scientific institutions as well as collectors of historical plastic objects and interested private people.

Becoma a member:
kmv@deutsches-kunststoff-museum.de



TV „Siemens Alpha 31“, German Federal Republic 1960,
Acrylonitrile-butadien-styrene copolymer (ABS)

Kunststoff-Museums-Verein (Plastics Museum Association)

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Apple Computer, German Federal Republic 1985,
Acrylonitrile-butadiene-styrene copolymer (ABS)