News Release

BASF at Compamed 2014: Plastics, adhesive raw materials and plasticizers for medical applications

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Evelyn Naudorf
Phone: +49 621 60-42223
Evelyn.Naudorf@basf.com

- **Extremely thin-walled films for drainage tubes made of Elastollan®**
- **Plasticizer with a low migration rate: Hexamoll® DINCH®**
- **First application of Ultraform® PRO: Skin Stretcher**
- **acResin®: adhesive raw material for medical tapes**

At Compamed 2014 in **Hall 8B, Stand J32**, BASF will be exhibiting innovative products for medical applications made of plastics (polyoxymethylene and thermoplastic polyurethanes), its widely applicable non-phthalate plasticizer Hexamoll® DINCH® and acResin®, a variable adhesive raw material for medical adhesive tapes.

Highly durable films with wall thicknesses in the micrometer range

With the thermoplastic polyurethane (TPU) from BASF, molding to form extremely thin-walled films in complex shapes is now possible. This is due to the consistent quality of the raw material. These thin-walled films also create new and versatile areas of use in medical applications. For instance, the company Creative Balloons Maschinenbau GmbH & CoKG in Heidelberg has now used Elastollan®, the TPU from BASF, to manufacture a balloon which interacts with the body with almost neutral pressure, flexibly foldable tube elements, elastically deformable foam suppositories (in the head section) and a discharging drainage tube for an

BASF SE
67056 Ludwigshafen
Telefon: +49 621 60-0
http://www.basf.com
Communications Performance Materials
Telefon: +49 621 60-42223
Telefax: +49 621 60-49497
www.plasticsportal.eu

improved stool drainage system with a new type of innovative functionality. The tissue-friendly hygthec® system from Creative Balloons thus promises relief for bedridden patients with liquid stools.

The balloon element in the head section of the system can be positioned with a low filling pressure and utilizes the pressure prevailing in the body in a novel way to reliably seal and anchor the drainage tube in the anus. The consistent and high quality of Elastollan® 1195A makes it possible to manufacture the functionally segmented body of the balloon with a wall thickness of just a few micrometers. In addition, Elastollan® 1190A is used in the tube element on the inside: this element is elastically deformable and self-righting, axially and radially kinkable and foldable and therefore does not cause too much discomfort to the patient. In addition, it considerably reduces the likelihood of perforation-related injuries to the intestinal wall. The elastically deformable suppository (green, in the head section) is made of thermoplastically molded polyurethane foam (Elastollan® 1160A) and the yellow ring at the bottom end of the head section is also a TPU foam.

In addition to the complex shaped head section, the discharging drainage tube is also made of TPU (Elastollan® 1185A). Here too the properties of the thermoplastic polyurethane play a crucial role. Elastollan® is a highly transparent, chemically resistant, extremely tear-resistant, elastically folding and resetting material. This means that in the low-pressure range it represents a genuine alternative to materials such as PVC, latex, and silicone. In addition, the combination of PU films and thermoplastically molded PU foam in one application facilitates production and delivery processes at the customer.

Wide field of application of Hexamoll® DINCH®

Also at Compamed, BASF will be presenting a broad range of applications of the non-phthalate plasticizer Hexamoll® DINCH®. Thanks to its low migration rate and excellent toxicological profile,

Hexamoll® DINCH® is perfectly suited as a safe alternative to traditional phthalates that are used in medical applications.

Hexamoll® DINCH® is used, for example, in products for enteral and parenteral feeding, as well as in catheters and breathing masks. Studies have also shown that Hexamoll® DINCH® is suitable for use in blood bags. Red blood cells can survive 42 days of storage without any problems; blood platelets can be stored for six days without any restrictions. In recognition of this outstanding result, in 2013 a joint project in which BASF was involved received the SolVin Award Special Prize. Good blood compatibility is also confirmed during use in dialysis sets. Moreover, with soft PVC articles that contain Hexamoll® DINCH®, the technical properties are maintained even after sterilization. In addition to the Medical Device Directive 93/42/EEC, Hexamoll® DINCH® also satisfies other regulatory requirements for medical applications around the world. It is also licensed for products that come into contact with food in many countries.

Leading brand owners in the medical industry, toy industry and food industry rely on Hexamoll® DINCH® thanks to its wide variety of uses, reliability of supply and traceability. In May 2014, the second plant producing 100,000 metric tons a year began operating. The total capacity is 200,000 metric tons a year and the intention is that this should cover the increasing demand.

First application of Ultraform® PRO

Ultraform® S2320 003 PRO (polyoxymethylene) from BASF is used in the Skin Stretcher from the company BioWim GmbH in Freiburg im Breisgau. The material is particularly suitable for this intended use as it reduces the friction between touching functional parts and thus enables easy handling during application. In addition, the material has very good flowability. The plastic parts for the Skin Stretcher are produced in an injection-molding process at the company Josef Frech KG. Following a development phase lasting around four years, the project is now on the verge of going into mass production. Ultraform PRO offered a persuasive choice primarily

thanks to its mechanical properties, i.e. the combination of high rigidity and strength with excellent resilience and spring characteristics, which is hugely important for the spring component of the part. In addition, the material offers demonstrated compliance with the relevant international standards and tests for the use of plastics in medical technology.

The Skin Stretcher is an implement which can be used to close the skin when treating large wounds following operations or accidents. The total of six hook modules are introduced into the edges of the wound on both sides and then pulled together. The wound is then closed up with a simple skin suture so that complicated skin grafts are no longer required. The intuitive handling of the Stretcher makes it easier for the surgeon to operate – the wound can be sewn up in just one action. Together with its plastics from the "PRO" family (PRO: Profile covered raw materials only), BASF offers a comprehensive service package that is adapted specifically to cater for the requirements of medical technology. As well as support with applications, it includes the documented intention not to make any changes to the plastic formulation stored in the drug master file (DMF) at the FDA.

acResin® - the adjustable adhesive raw material for medical tapes

Medical tapes must fulfill strict requirements, since they should not cause any cytotoxic and allergenic reaction or skin irritation. Particularly for such sensitive applications the adhesive raw material acResin® A 260 UV is ideally suited, proven by the ISO certificate 10993 "Biological evaluation of medical devices". In addition to its compatibility the UV-curable, solvent- and latex-free pressure sensitive adhesive is characterized by excellent technical properties, such as high durability, adjustable adhesive performance, transparency and low VOC-emissions.

hygthec® is a protected trademark belonging to the company Creative Balloons Maschinenbau GmbH & CoKG

About BASF

At BASF, we create chemistry – and have been doing so for 150 years. Our portfolio ranges from chemicals, plastics, performance products and crop protection products to oil and gas. As the world's leading chemical company, we combine economic success with environmental protection and social responsibility. Through science and innovation, we enable our customers in nearly every industry to meet the current and future needs of society. Our products and solutions contribute to conserving resources, ensuring nutrition and improving quality of life. We have summed up this contribution in our corporate purpose: We create chemistry for a sustainable future. BASF had sales of about €74 billion in 2013 and over 112,000 employees as of the end of the year. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (AN). Further information on BASF is available on the Internet at www.basf.com.