المعهد العالي للصناعات البلاستيكية
Higher Institute For Plastics Fabrication

# PLASTICS LINK

Your Link to the Plastics World

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VOLUME 09
ISSUE 01
April 2017

## HIPF awarded the winners and participants of the technical fair.


**HIPF is rewarding the winners and participants of the 10th technical fair for their zealous efforts in displaying their technical proficiency acquired during the institute's training program.**

## Polymeric materials could be a solution to the oil spillage.

Oil spillage clean up is one of the burning issue of the modern world as it is causing a disaster to the marine life. The basic principle involved in the removal of the oil from water is that the material should have affinity towards oil (lipophilic) and repel the water molecules(hydrophobic). In this regard several materials called 'sorbents' were tested and used, which were found to be quite expensive, single time use and non recyclable. The urge was to create a material having super absorbance, cost effectiveness, recyclability and eco-friendliness.

Scientists across the world have developed super-sorbent material by silanization of micro fibrillated cellulose, which has a great affinity towards oil by providing binding site to the lipid molecules. The efficiency of the polymer to absorb the oil is around 85 to 90g of oil for each gram of super sorbent material. This has been made possible due to the micro-fibrillated cellulose which provides a very large surface area of absorption and high porosity. The oil can be recovered easily and this material can be reused many times without structural failure due to high mechanical strength and flexibility.

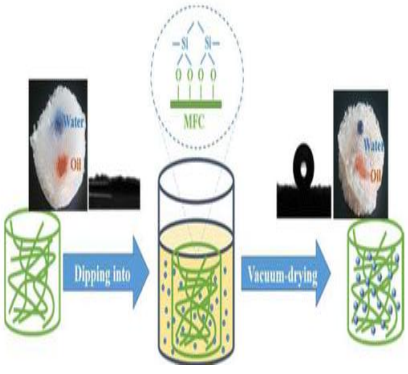
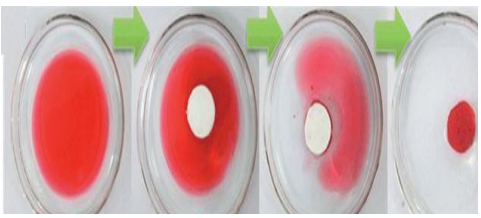



Image courtesy of ACS publications



QUARTERLY ISSUED BY THE HIGHER INSTITUTE FOR PLASTICS FABRICATION

### SPECIAL POINTS OF INTEREST:

- Process Tips and Recent Path Breaking Innovations in Plastics.
- Selected International Plastics centered events and exhibitions.
- HIPF awarded the winners and the participant of the technical fair.

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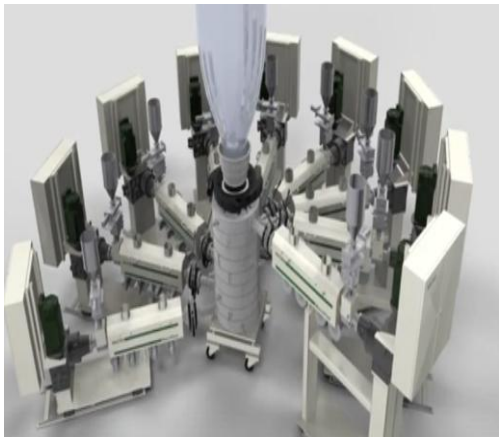
# Barrier films offer higher resistance to moisture, oxygen and microbes.

Barrier films are films having barrier resistance against oxygen, moisture and microbes which are used in many consumers, industrial and food packaging applications. These films are multilayer having 5 to 9 layers made from combination of PP,PE, nylon, EVOH, PET etc. According to various application . It is made by co-extrusion which is a single step process and no need for any lamination or coating. It has advantage of reduced weight, enhanced barrier functions with more mechanical strength and good processibility and bulkiness. It replaces aluminum substrate and is easily recyclable. 5-9 layers are used for the many applications like Anti-Fog Films , Industrial application Films & Pouches, bags for chemical, Resin and Bulk food applications, Vacuum & Gas Flush Films/Pouches, Films specifically designed for high-speed machines, Vertical Form/Fill/Seal Films for Edible oil, Adhesive, shredded cheese, and other, Horizontal Form/Fill/Seal Films Liquid Packaging Films for applications such as soups, sauces and condiments. Thermoforming Films for high-barrier shallow to deep-draw applications, Tray Top Lidding Films, Easy peel able Films, LDPE/LLDPE shrink wrap Film Stretch film.



Multilayer blown film extrusion process

Courtesy: Macro advanced extrusion systems

# Polymeric materials in the development of fiber optics

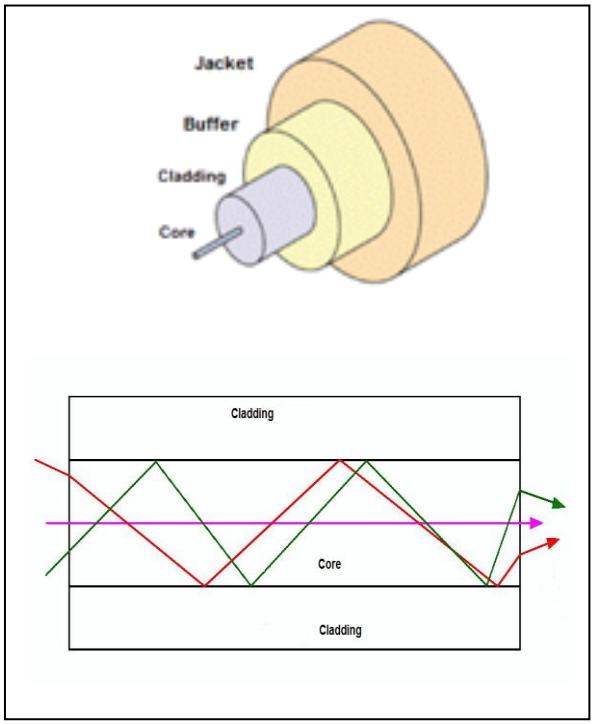
Use of Fiber Optic in data transfer is now increasing day by day. It provides very high speed of data transfer to quite a long distances. Optical Fiber cable uses Total Internal Reflection property of light to transfer the data.

Optical fiber is made of plastic material which is called POF, Plastic Optical Fiber or Polymer Optical Fiber. To transmit light signals, POF uses Polymer as a core.

Its biggest advantage over glass fiber lies in its bending and stretching abilities. In early stage of POF, PMMA (poly(Methyl Methacrylate)) is used to create core and fluorinated polymers are used in cladding. But now amorphous fluoropolymer (poly perfluoro-butenylvinyl ether) is used to develop fiber with higher performance graded index. Some of products has very high transparency and provides visible light transmission ratio of more than 95%.

For its buffer material also Optical fiber uses highly non-reactive thermoplastic materials like Polyvinylidene fluoride (Kynar) and Polytetrafluoroethylene (Teflon)

Optical fiber uses various material for Jacket like Polyvinyl chloride (PVC), Polyethylene (PE), Polybutylene terephthalate (PBT), Polyamide (PA) and Polyurethane (PUR) etc. Choice of jacket material is application specific.



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## Flexible and tough concrete for long lasting performance.

The invention of tough yet flexible concrete could halve the duration of road and paving works.Conventional concrete vs bendable concrete developed at Nanyang Technological University (NTU), Singapore.Scientists in Singapore have developed

a form of bendable concrete they say is stronger, lighter and more resistant to cracking than regular concrete made of sand and cement.

Researchers at NTU successfully tested tablet-sized slabs of ConFlexPave, which is made from a combination of hard materials and polymer microfibres that allow the concrete to flex under tension.The material's improved strength will enable the formation of slimmer, precast pavement slabs, say researchers, potentially halving the time needed to complete road works and lay new pavements. They claim it lasts longer, requires less maintenance than conventional concrete widely used today, and enhances skid resistance.


Concrete tablet testing Image courtesy NTU

## Light weight and cost effective automobiles parts by Compression hybrid molding (CHyM)

Car interior part made with compression hybrid molding

Image courtesy of Yanfeng automotive interior systems

Polypropylene and natural fibers hybrid mat is used in Compression Hybrid Molding (CHyM), It is the process to reduce around 40% of weight for automotive interior. The journey of developing light weight automotive interior is being extended by using bio-composite with a decorative light weight film eliminating traditional molded parts.

A customized honeycomb structure can be made using polypropylene injected to natural fiber placed inside the tool. Glass fiber is also an alternative for required application.

A patterned thermoplastic polyolefin film can be used above natural fiber gives 3D effect. The polyolefin film can protect from ultraviolet rays and also could hide scratches, scuffs on lower door panels.

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## INTERNATIONAL PLASTICS EVENTS

### CURRENT & UPCOMING TRADE SHOWS AND TRADE EVENTS FOR PLASTICS & PLASTIC PRODUCTS

| | | |
|---|---|---|
| **Plastics News Marketing summit 2017**<br>**A hands-on conference certain to generate ideas that can be put to any practice in plastics industries.** | **Chicago, IL.** | **May 01-02, 2017.** |
| **Polymer foam 2017**<br>**An International conference on foam technology and applications in thermoplastics and elastomeric products** | **Pittsburgh, United States.** | **May 02-03, 2017.** |
| **Frontiers in polymers**<br>**The fifth international symposium** | **Seville, Spain.** | **May 17-19, 2017.** |
| **AMI's Medical tubing 2017**<br>**Conference on latest advances on polymer, additives and compounds.** | **Cologne, germany.** | **June 06-07, 2017.** |
| **AMFPMC**<br>**Additive Manufacturing and Functional polymeric material conference.** | **Albufeira, Portugal.** | **June 23-26, 2017.** |
| **PPS 2017**<br>**Polymer processing society Europe Africa conference 2017.** | **Dresden, Germany.** | **June 26-29, 2017.** |
| **3rd Functional Polymeric Materials Conference**<br>**An international conference on recent most cutting edge technologies.** | **Rome, Italy** | **July 07-10, 2017.** |
| **GCNPC 2017.**<br>**An international conference on Green chemistry and Nanotechnologies in polymer chemistry.** | **Prague, Czech Republic.** | **Sep, 06-08, 2017.** |
| **81PMM 2017**<br>**The conference on polymers and organic materials for electronics and photonics.** | **Prague, Czech Republic.** | **Sep 10-14, 207.** |
| **The plastics caps and closures**<br>**The conference targeting on top innovations, process and product technologies.** | **North America** | **Sep 12-14, 2017.** |
| **Physical aspects of polymer science.**<br>**The conference on the condensed matter of physics and materials** | **Swansea university, United Kingdom.** | **Sep 13-15, 2017.** |
| **Annual meeting on Bio-polymers and Polymer chemistry.** | **Osaka, Japan.** | **Oct 12-13, 2017.** |

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The establishment of HIPF aims to prepare Saudi youth to participate as skilled technicians in the booming plastics industry of the Kingdom and to develop the technical knowledge and skills of Saudi workforce towards localization of plastics fabrication technology.