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A journal for the growth and development of plastics trade & industry

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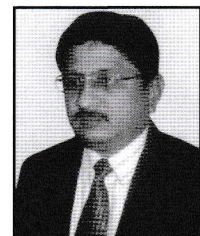
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Editorial



Dear Members,

Asian PE markets have posted considerable increases over the past two weeks on the strength of stronger upstream costs and improved buying interest. Crude oil prices have gained over US\$5/barrel over the past week to cross the US\$82 threshold, while spot ethylene prices have posted week on week gains of US\$45-60/ton. Spot naphtha prices have also spiked by US\$39/ton over the past week.

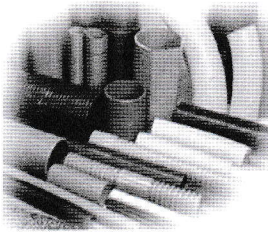
In the derivative segment, some of the fastest increases have been observed in the LLDPE market, where supply concerns coupled with impending high season for agricultural film have encouraged strong buying interest from converters. LLDPE film prices in China gained US\$40-70/ton this week while HDPE and LDPE film prices recorded relatively smaller increases of US\$20-50/ton.

In Southeast Asia, import LLDPE film prices shot up by US\$25-120/ton this week while import HDPE film prices rose at a slower rate of US\$20-70/ton. However, higher end offers may see more interest next week, as the low end of the import offer range is expected to dwindle as most cargoes that have been purchased have been at the lower end of the range. Converters have responded to rising PE prices in Asian markets by stepping up purchases, although most buyers continue to avoid making purchases in large amounts given their expectations that the current cost-driven PE price increases will not prove sustainable over the medium term due to the lack of sufficient support from the downstream sector. Demand for LLDPE, however, is entering its high season in Asia as re-exporters begin preparations for their Christmas orders while converters in the agricultural film sector are also beginning to replenish stocks ahead of the upcoming high season for their end products, which generally begins in mid-August in China. LLDPE buyers received a further incentive to secure some cargoes this week upon hearing news of shutdown of plant in Singapore & China.

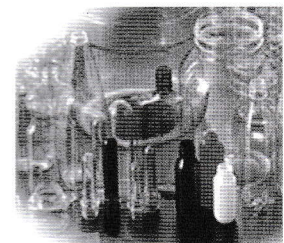
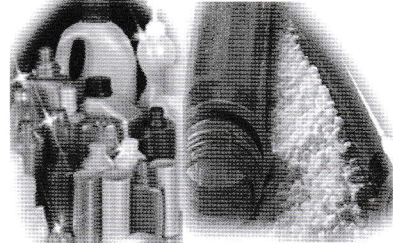
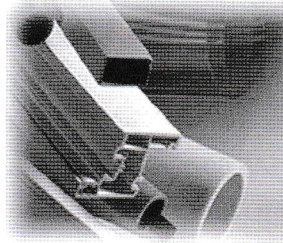
Yours truly

Pradip Nayyar

Editor



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PRESIDENTIAL ADDRESS



Dear Members,

This is my penultimate message to you as President in my present term in office.

In this Issue I wish to share my thoughts on a very important sector - MASTERBATCH.

As you may be well aware Asia is the fastest growing and most dynamic market for thermoplastic masterbatch products in the world. Despite the impact of the global recession, demand for masterbatch products has continued to power ahead in the region and is forecast to continue growing by over 7% p.a. The masterbatch market in China is one of the fastest growing and most dynamic in the world. Its rate of advance has enjoyed strong double-digit growth over recent years and despite the impact of the global recession the market continues to advance at around 8% p.a. in volume terms. The most significant driver of this demand is the continuing expansion and rapid development of the market in China, where masterbatch production has grown rapidly.

Though it is the world's fastest-growing and largest usage market, the Chinese consumers are very price sensitive. The processors still use dry pigmentation instead of masterbatches where aesthetics and colour consistency are still not essential. Several factors drive the growth of masterbatches in China- Demographic change, where over 40% of the total population now lives in urban area has a significant impact on the market dynamics of plastics and masterbatches. Introduction of Western lifestyle has pioneered and established the concepts of super markets and retail chains that have driven the growth of masterbatches because of the growing need for more sophisticated packaging products which need masterbatches for consistency and superior aesthetics. As a result, a thriving business has developed to serve China's plastics processing industry involving a wide variety of companies from those that remain under state control to major international groups. Unlike plastics processing, production of masterbatch in China is more concentrated in the hands of the leading players. The leading 50 companies in China account for approximately 50% of production in 2008.

In India also with the increasing growth of polymer production capacity in India, master batch manufacturers have a greater scope for expansion of their units. New entrepreneurs can also make manufacturing of master batches an investment destination. Hopefully the next few years will see an increasing growth of master batch manufacturers and India may not be far behind China in this area of investment.

With Warm Regards

A handwritten signature in black ink, appearing to read 'Sourabh Khemani', with a stylized flourish at the end.

Sourabh Khemani
President

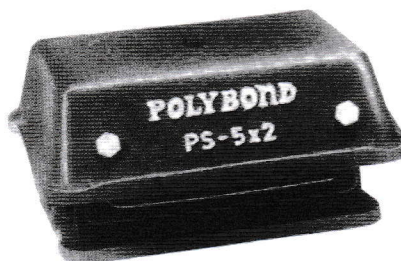
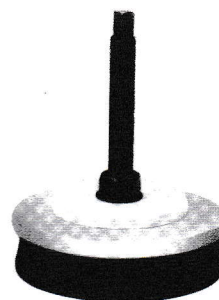
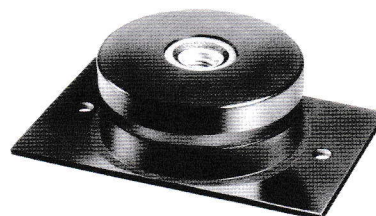
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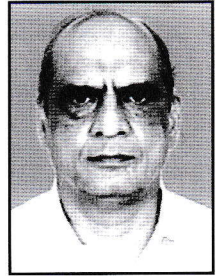
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From the Desk of

The Hony. Secretary



Dear Members,

The Executive Committee at its last meeting held on 23rd July 2010 has decided to hold the 51st Annual General Meeting of the Federation on 22nd September 2010 at the auditorium of Indian Chamber of Commerce, 4 India Exchange Place, Kolkata - 700 001. The Federation also proposes to hold a Seminar on that day when papers from eminent personalities in the plastics industry will be presented.

On the occasion of this AGM the Federation has decided to bring out an AGM Special issue. This issue will contain the name, address, company representatives, tele-communication particulars and activities of all the members of the Federation. This issue serves a Members Directory and a book of reference; In this issue we are trying to incorporate the photographs of company representatives and have, therefore, requested members to send us their photographs. We have also requested members to contribute advertisement for this Special Issue. The response to this appeal has been satisfactory with all Special position being booked. Only full page colour (4-colour) advertisement is available, the cost of which has been fixed at Rs.6,000/-. Members are requested to release an advertisement in this Special Issue. The Print Area of each advertisement is 23.5 cm X 18 cm.

The Federation has also sent a circular to all its members requesting them to give their suggestions/ comments for amending the present 'Memorandum and Articles of Association' of the Federation that was prepared many years back. Members are requested to kindly send their suggestions to the Federation in this regard.

With best wishes,

A handwritten signature in black ink, appearing to read 'R. Poddar'.

Ramawatar Poddar
Hony. Secretary



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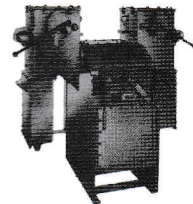
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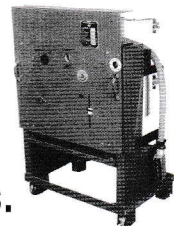


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Flammability & Polymers

Mr. Manish Garg

Sr. Manager – Technical
Product & Applications Tech. Group - Polymers
Reliance Industries Limited

Plastics (Polymers) are a large and growing fraction of the fire load in homes, commercial environment and transportation. Organic materials, in general are excellent fuels. Plastics are classified as ordinary combustibles. Plastics are similar to most ordinary combustibles, such as wood, leather, wool, silk, etc. in that they are capable of thermal degradation into volatile and gaseous products of combustion. Plastics that are most widely used are the least expensive and tend to be the most flammable. Flammability which generally refers to the propensity of a substrate to ignite easily and burn rapidly with a flame, is one indicator of fire hazard.

Fire is the oxidative destruction of a combustible material. This process is accompanied by the release of heat and light energy. There are certain mechanism of combustion that must be clearly understood.

Burning process :

Gases and volatile liquid are small molecules that are held together by weak (<1KJ/Kg) secondary chemical bond. These volatile compounds spontaneously form combustible mixtures with air that ignite easily and burn with a high rate. Polymers are very large molecules with the same intermolecular and intramolecular forces as low molecular weight compounds but their boiling

temperature is essentially infinite because of high molecular weight. Consequently, both intermolecular and intramolecular chemical bonds of polymers must be broken to generate volatile fuel species. This process requires a large (~ 2MJ/kg) and continuous supply of thermal energy for ignition and sustain burning.

Flaming combustion can be roughly divided into physical and chemical process taking place in each of three separate phases: gas, mesophase and condensed (liquid/solid) phase. The mesophase is the interface between the gas and condensed phase during burning.

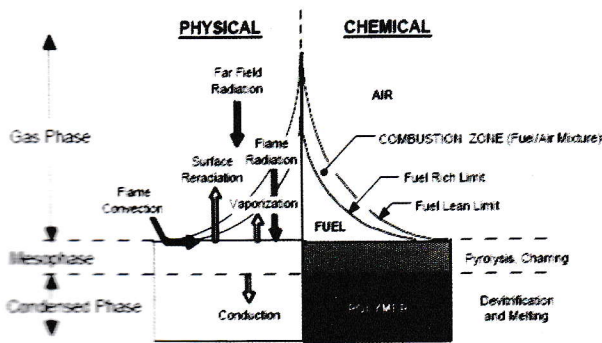


Fig. 1

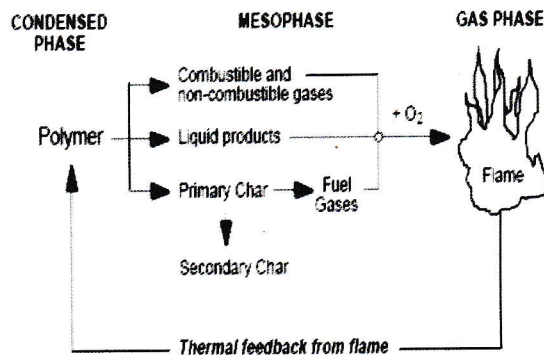


Fig. 2

Figure 1 shows a schematic diagram of a horizontal polymer slab that is burning with a diffusion flame. The physical processes are shown on the left-hand side of figure 1, which include (1) energy transport by radiation and convection between the gas phase (flame) and the mesophase and (2) energy loss from the mesophase by mass transfer (vaporization of the pyrolysis gases) and conduction into the solid. At typical burning rates, the polymer surface (mesophase) recedes at a velocity of about 10^{-6} m/s. Conservation of momentum at the gas-mesophase boundary shows that fuel gases evolve at a relatively low velocity ($\approx 10^{-3}$ m/s) compared to the burning velocity of these gases when mixed with air (≈ 1 m/s). Consequently, fuel generation is the rate limiting step in polymer flaming combustion, and it is governed primarily by the rate at which heat and mass are transported to and from the polymer, respectively.

The important chemical processes are shown on the right-hand side of figure 1, which include (1) thermal degradation of the polymer in a thin surface layer (the mesophase) as a consequent of the physical (energy transport) processes, (2) mixing of the volatile pyrolysis products with air by diffusion, and (3) combustion of the fuel-air mixture in a combustion zone that produces radiant energy over a spectrum of wavelengths including visible. The combustion zone is bounded by a fuel-rich region on the inside and a fuel-lean region on the outside. Increasing the concentration of oxygen in the environment is known to increase the flame heat flux, either due to a higher flame temperature, an increase in the volume of the combustion zone, or an increase in the soot concentration (luminosity) of the flame.

Figure 2 shows the phenomenology of polymer burning and illustrates the coupled nature of the flaming combustion of condensed phases. The sequence of events for self-sustained burning involves the application of heat sufficient to thermally degrade (pyrolyze) the solid polymer to a low molecular weight volatile fuel

species and possibly a nonvolatile/solid char, depending on the polymer chemical structure. Mixing of the volatile thermal degradation products with atmospheric oxygen and ignition of this fuel and air mixture results in flaming combustion. Flaming combustion produces thermal energy in proportion to the heat of combustion of the volatile thermal degradation products and at a rate that is controlled by the fuel generation rate. The majority of the combustion energy form the flame is lost to the environment, but a fraction is returned to the polymer surface by convection and radiation. If the feedback of thermal energy from the flame at the polymer surface is sufficient to generate fuel vapors, flaming combustion will continue after the ignition source is removed and burning will be self-sustained.

Mechanism of combustion and flame retardancy :

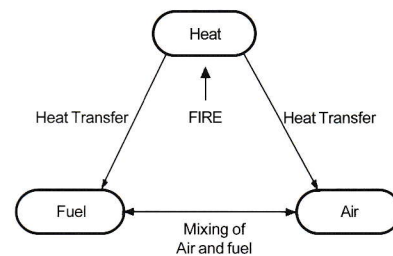
In order for a solid polymer to burn it must be volatile, or produce volatile products, because combustion usually occurs in the gas phase. In the case of polymers, the solid substrate has a high decomposition (e.g. depolymerisation) and volatilization. Decomposition begins in the solid phase and continues in the melt and gas phase. It produces decomposition products of low molecular mass. These volatiles decomposition products enter the gas phase where they burn to produce more heat, driving further polymer decomposition. This provides the feed-back loop that sustains the combustion process. The above process can be visualised in terms of the so called fire triangle as shown in Fig. (Gilman and Kashiwagi, 1997).

It shows the interaction between the three elements essential for a fire.

- Heat generated by the flames
- Fuel from the thermal decomposition of the polymer
- Oxygen from the air

The fire generates heat, part of which is absorbed by the substrate via radiation. The polymer substrate thermally decomposes into combustible gas fraction. These mix with the oxygen in the air to form a combustible mixture

that fuels the fire. Once started, this process can sustain itself via the feedback loop. In order to stop the fire, it is necessary to interrupt one or more of the pathways between the three major elements. This can be done in several ways, for example, by preventing the mixing of the polymer decomposition gas with the air. Alternatively one could prevent the transfer of heat to the polymer substrate.



(Gilman and Kashiwagi, 1997).

Role of flame retardants

Flame retardants are added to different materials to reduce the risk of fire. They save lives, prevent injuries and property losses, and protect the environment by helping to prevent fires from starting and to limit fire damage. It is possible to treat most potentially flammable materials in the modern world with special additives to make them more difficult to ignite and to significantly reduce the spread fire. Flame retardants can thus make a decisive contribution to the fire safety of buildings, furniture, electric and electronic apparatus, textiles, public transport and cars ...

The type of flame retardant used will depend on the material, but also on the degree of fire safety required. Following are the application areas where fire retardant play an important role in fire safety measures:

Electronics : Electrical and electronic equipment: TVs, computers, household appliances, industrial electrical installations, mains adapters and portable electronics ... Fire safing both of plastic casings, resin circuit boards, switches and components...

Upholstered furniture : In upholstered furniture, the covering textile, the polymer (PUF) or natural foam cushions, and the moulded or rigid structure can

all be fire safety treated, where required by regulations or to improve consumer safety.

Building : Fire safing of insulation and decorative foams and other building materials, in particular to ensure conformity to building safety regulations.

Wood : Both to prolong the resistance of timber structural building elements to fire, and to fire safe wooden panelling and other easily flammable wood applications, both for pure wood and for composite materials.

Textiles : Both for day-to-day clothing in contexts where fire is a risk (eg. children's nightwear, hospital linen...) and for technical fire-resistant textiles for professional uses.

Cables :Electrical and optical cables are particularly exposed to fire risks (in case of electrical faults), can represent a significant fire load and can carry fires from one place to another.

Transport (aeroplanes, ships, trains, cars) : Transport vehicles face specific fire safety issues, because of the risks of accidents, and the need to ensure occupants have sufficient time to escape, but seats, cables and plastic structures will burn violently and rapidly if not flame retarded..

Types of Flame Retardant

There are many different flame retardants and these work in a number of different ways. Some flame retardants are effective on their own other products are used mainly or only as "synergists", acting to increase the effect of other types of flame retardant.

The major basic chemical elements in most commercial flame retardants are chlorine, phosphorus, and bromine. Most flame retardants contain one or more of these elements, often in addition to such other elements as nitrogen and antimony. The presence of nitrogen and/or antimony enhances the effectiveness of the basic elements in certain combinations (formulations).

Intumescent coatings

Intumescent coatings are fire protection systems which are used to protect materials such as wood or plastic from fire (prevent burning), but

also to protect steel and other materials from the high temperatures of fires (thus preventing or reatarding structural damage during fires). The coatings are made of a combination of products, applied to the surface like a paint, which are designed to expand to form an insulating and fire-resitant covering when subject to heat.

Toxicity of Flame Retardants

Broadly speaking all flame retardants can be subdivided into "nonreactive" and "reactive" types. Nonreactive types are used as in prior to or during polymer processing and as a finish or surface coating. Reactive flame retardants are used as comonomers in the polymerization or grafting of the material. This leads to an important distinction as concerns the toxicity of a material when used as nonreactive flame retardants have to be inherently nontoxic, whereas reactive flame retardants which are converted into nontoxic polymeric materials may not necessarily have to be nontoxic (vinyl chloride is an example). Of course, effective removal of traces of unreacted toxic reactive flame retardants is a problem when dealing with such materials.

Inherently Flame-Retarded Polymers

In general, most synthetic high polymers are chemically inert and exhibit only slight or no physiological and toxicological effects. However, there are distinct differences in their action depending upon the mode of their introduction into the body.

Some of the polymers with inherent flame retardant properties which have

been investigated for their toxicological properties are : poly (vinyle chloride), vinyl chloride / vinylidene chloride copolymer, polytetrafluoroethylene, and chlorinated rubber.

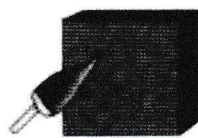
Flammability Analysis & Measurements :

Flammability testing is used to evaluate the fire hazards that are presented by a material or product. However, most small-scale flammability tests are not intended to directly simulate actual fire conditions. This is because there are simply too many variables and possible scenarios in real life - variables such as temperature, humidity, the mass, orientation and shape of the material, air flow, available oxygen, the source and intensity of the ignition source, heat from radiance and/or conduction, and so on. Instead of closely simulating actual conditions, a flammability test provides information on the nature of the material itself (e.g. its flashpoint or auto-ignition temperature) or information on the behavior of a material when subjected to a standardized, controlled ignition source (e.g. how fast the material burns when tested according to a specific standard).

Most fire and flammability test standards are developed by consensus-based committees. The rules and procedures by which these committees operate ensure that the development cannot be dominated by a single interest group.

ASTM International and the National Fire protection Assosiation (NFPA) are the primary consenses-based organization in US that develop and maintain fire and flammability test standards.

SURFACE BURN



Doesn't Ignite Under Hotter Flame
 UL 94 5VA
 UL 94 5VB

VERTICAL BURN



Self Extinguishing
 UL 94 V-0 (Best)
 UL 94 V-1 (Good)
 UL 94 V-2 (Drips)

HORIZONTAL BURN



Slow Burn Rating
 Takes more than 3 min. to burn 4 inches

UL Chart

5VA Surface Burn	Burning stops within 60 seconds after five applications of five seconds each of a flame (larger than that used in Vertical Burn testing) to a test bar. Test specimens MAY NOT have a burn-through (no hole). This is the highest (most flame retardant) UL94 rating.
5VB Surface Burn	Burning stops within 60 seconds after five applications of five seconds each of a flame (larger than that used in Vertical Burn testing) to a test bar. Test specimens MAY HAVE a burn-through (a hole).
V-0 Vertical Burn	Burning stops within 10 seconds after two applications of ten seconds each of a flame to a test bar. NO flaming drips are allowed.
V-1 Vertical Burn	Burning stops within 60 seconds after two applications of ten seconds each of a flame to a test bar. NO flaming drips are allowed.
V-2 Vertical Burn	Burning stops within 60 seconds after two applications of ten seconds each of a flame to a test bar. Flaming drips ARE allowed.
H-B Horizontal Burn	Slow horizontal burning on a 3mm thick specimen with a burning rate is less than 3"/min or stops burning before the 5" mark. H-B rated materials are considered "self-extinguishing". This is the lowest (least flame retardant) UL94 rating.

Criteria Conditions

	94V-0	94V-1	94V-2
Total flaming combustion for each specimen	≤10 sec	≤ 30 sec	≤ 30 sec
Total flaming combustion for all 5 specimens of any set	≤ 50 sec	≤ 250 sec	≤ 250 sec
Flaming and glowing combustion for each specimen after second burner flame application	≤ 30 sec	≤ 60 sec	≤ 60 sec
Cotton ignited by flaming drips from any specimen	NO	NO	YES
Glowing or flaming combustion of any specimen to holding clamp	NO	NO	NO

Committee E05 on Fire Tests is the primary committee in ASTM that develops fire and flammability tests standards. Several material or product-oriented committee have sub-committees that develop fire and flammability test standards as well. For example D20 on Plastics has a subcommittee on thermal properties (D20.30) that develops and maintains some fire and Flammability test standards for plastics. A number of test laboratories in the US such as UL and FM Global have established consensus process that meets the requirements of the American National Standards Institute so that they now can publish American National Standards.

International fire and flammability test standards are developed by the International Organisation for Standardization (ISO) and the International Electrotechnical Committee (IEC). The latter is concerned with electrical products only. Each country that actively participates in the work can be voting member on an ISO or IEC committee. Committees are composed in a similar manner in CEN and CENELEC which are the European counterparts of ISO and IEC respec-

tively.

Testing for Regulatory compliance

A few important tests have been selected and discussed where as some standards are given which may be help to end user as per requirements.

UL (Underwriters Laboratories).

UL intends this standard to serve as a preliminary indication of a plastics acceptability for use as part of a device or appliance with respect to flammability under controlled laboratory conditions. The standard includes several test methods that are employed depending upon the intended end use of the material and its orientation in the device. It is not intended to reflect the hazards of a material under actual fire condition. UL94 is the first step towards obtaining a plastic recognition and subsequent listing in the " Plastics Recognized Component Directory". UL 94 contains following tests: 94HB, 94V, 94VTM, 95-5V, 94HBF, 94HF and radiant panel.

94HB Horizontal Burning Test :

This is generally considered the easiest test to pass and materials that pass any of the V or VTM tests will usually be accepted by UL for application that

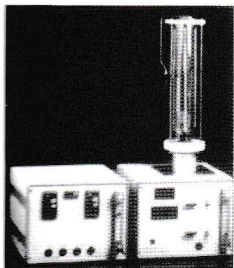
require 94HB. The 94HB rating would typically be acceptable for portable, attended intermittent-duty, household appliance enclosures or for decorative parts.

94V Vertical Burning Test : This test includes three classification - 94V0, 94V1, 94V2 and would typically be acceptable for portable, unattended, intermittent-duty, household-use appliance.

94V Thin Material Vertical Burning Test : This test includes three classifications - 94V0, 94V1, 94V2. Materials that are thin gauge-typically ≤10mil or very flexible may distort, shrink or flex during the 94V test. These materials can be tested using 94VTM-the thin material version of the vertical burning test. This differs in several ways from the 94V tests.

LOI (Limiting Oxygen Index) : The LOI refers to the minimum amount of oxygen that must be present that will result in sustained combustion for at least 3 minutes or excessive flame propagation down the specimen. The dimension of the specimen and the limit of excessive flame propagation depend on the type of material is being tested.

The LOI test is a typical example of a method that is used to control the production of materials, products, and assemblies and in research to develop new products. The test is standardized in North America as ASTM 2863, "Standard Test Method for Measuring the Minimum Oxygen Concentration to support the Candle like Combustion of plastics (Oxygen Index)" and internationally as ISO 4589-2, "Plastics-Determination of Burning Behaviour by Oxygen Index-Part-2: Ambient-Temperature Test." The test does not correlate well with other fire and flammability tests nor does it provide a reliable indication of material performance in real fires. However, the results appear to be very sensitive to the composition of the material and the tests is, therefore, ideally suited to serve as a quality tool of fire-retardant-treated materials.



The Cone Calorimeter :

The cone calorimeter is standardized in North America as ASTM E 1354. "Test Method for Heat and visible smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter." And

A higher LOI implies that a higher oxygen concentration in the gas stream is required to sustain the combustion of the strip.

internationally as ISO 5660-1, " Fire Tests - Reaction to Fire - Part 1: Rate of Heat Release From Building products (Cone Calorimeter Method)".

Automotive :

Many of the materials used in the passenger compartment of cars are required to meet the requirements of a federal government standard, FMVSS 302 or 49 CFR 571.302. This standard limits the horizontal burn rate of materials to 102 mm/minute (4 inches per minute), when tested under the conditions specified in the standard.

The National Highway Traffic Safety Administration has a legislative mandate under Title 49 of the United States Code, Chapter 301, Motor Vehicle Safety, to issue Federal Motor Vehicle Safety Standards (FMVSS) and Regulations to which manufacturers of motor vehicle and equipment items must conform and certify compliance. FMVSS 209 was the first standard to become effective on March 1, 1967. A number of FMVSS became effective for vehicles manufactured on and after January 1, 1968. Subsequently, other FMVSS have been issued. New standards and amendments to existing standards are published in the Federal Register.

These Federal safety standards are regulations written in terms of minimum safety performance requirements for motor vehicles or items of motor vehicle equipment. These requirements are specified in such a manner "that the

public is protected against unreasonable risk of crashes occurring as a result of the design, construction, or performance of motor vehicles and is also protected against unreasonable risk of death or injury in the event crashes do occur."

Flammability Test for Automobile Interior Material

Resistance to propagation of flame of materials used in the interiors of motor vehicles is determined by finding the horizontal burning rate of a test specimen taken from the material under test after application of a standard flame at one end for a specified duration. The test specimen is held horizontally in a U-shaped holder inside a combustion chamber and flame from a Bunsen burner applied at its end. The ratio of the burnt distance and time taken to burn through this distance gives a measure of the flammability.

Standard No. 302 - Flammability of Interior Materials - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses (Effective 9-1-72)

This standard specifies burn resistance requirements for materials used in the occupant compartments of motor vehicles. Its purpose is to reduce deaths and injuries to motor vehicle occupants caused by vehicle fires, especially those originating in the interior of the vehicle from sources such as matches or cigarettes.

A very important standard for the aircraft industry is Boeing BMS 1347J.

RELATED SPECIFICATIONS

- IS 15061 - 2002** : Automotive Vehicles - Flammability requirement
- ASTM D 5132 - 1993** : Standard Test Method for Horizontal Burning Rate of Flexible Cellular and Rubber Materials used in occupant compartments of Motor Vehicles
- SAE - J 369 - Jan 94** : Flammability of Polymeric Interior Materials - Horizontal Test Method
- NHTSA - 571 - 302** : Flammability of Interior Materials
- ISO 3795 - 1989 (E)** : Road Vehicles and Tractors and Machinery for Agriculture and Forestry - Determination of Burning Behaviour of Interior Materials
- JIS K 6400 - 1997** : Test Methods for Flexible Polyurethane Foam
- SASO 449 - 1988** : Motor Vehicles - Flammability of Interior Materials and their Testing Methods

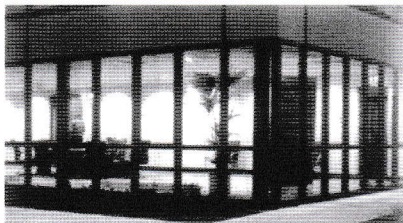
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Mr. Werner Preusker, MD, Arbeitsgemeinschaft PVC and Umwelt e.V Bonn, Germany 49 228 23-10-05 Werner.preusker@pvcplus.de

Economical from A to Z

One key competitive advantage of PVC products is its cost-effectiveness over its entire life-cycle. This can be seen very clearly using the example of energy-saving plastic windows. A study commissioned by PVCplus in Germany and the European PVC Window Profile and Related Building Products Association (EPPA) shows that the use of modern window systems with high heat insulation throughout Europe can save Euro 13 billion per year after just five years¹. The low purchase price, and minimal care and maintenance costs over a lifetime of at least 35 years also make a positive economic impact; additionally, plastic frames do not need a regular coat of paint. Furthermore, new profiles can be made from used PVC windows. This creates a materials cycle that protects resources.

The cost-benefit analysis for other PVC products is similarly positive. Easy-care PVC floor coverings with special surface treatment reduce the use of water, detergents and energy. Overall, the maintenance costs



can be reduced by up to 30% in comparison to other materials. In a survey commissioned by the Specialist Association of Flexible Floor Covering Manufacturers that questioned 142 architects, building project managers, wholesalers and fitters, elastic floor coverings received the best average marks in comparison to other solutions with respect to four important reasons of choice: easy cleaning and care, life-cycle costs, purchase price, availability². Lightweight PVC pipes generate low transport costs, make laying easier (without lifting equipment) and hardly need any maintenance over their expected life of use of over 100 years. This is a key advantage because it is precisely the follow-up costs that play a much greater role in the economic assessment of products in comparison to the purchase price. For example, the cost for

PVC - A sustainable Plastic Material with new perspectives.

fitting a hospital ward with 100 square meters of surface-treated PVC floor covering is around Euro2,300. By contrast, the total costs for purchase and cleaning over a period of 20 years is almost Euro37,000.

In turn, savings can be used for sensible ecological and social improvements, such as better thermal insulation of the building walls, using solar energy or improving working conditions. This is how climate-neutral products that help with sustainability come about. Just small sums can bring about great benefits. For example, approx. 135 kg CO₂ is emitted in the production of a PVC window. To compensate for these emissions, only approx. Euro2 per window needs to be invested in CO₂-saving activities. If the building project managers use the investment costs saved in comparison to an expensive wooden window (Euro150-250) for the thermal insulation of the house, a great deal of energy can be saved. Moreover, the CO₂ emission falls by several tonnes³.

Reducing Costs-Protecting Resources

In recent years, the PVC industry has realised tremendous cost reductions in production, use, recycling/waste and energy. Since the proportion of oil is comparatively low compared with other plastic products, precious non-renewable resources are spared. At the same time, the final products are very economical with great benefits, as is shown by the Technology Study conducted by the Fraunhofer Institute in Pfnztal, Germany.

“Especially taking into account a diverse requirement profile, one can often see that PVC is not only the right choice technically, but is also the safest and cheapest material. (...) PVC is a very good value for money. Thanks to the composition of PVC from rock salt and mineral oil, the price of this material is also less dependent on the mineral oil price than other plastic price.”

In many cases, the positive cost-benefit ratio and high quality standards have resulted in a re-assessment of PVC and an increased use of the plastic. For example, the car industry returned to using PVC after alternative materials for instrument panels and cables proved in many cases to be either expensive or technically inferior.

Ecological Development

10-Year European Programme

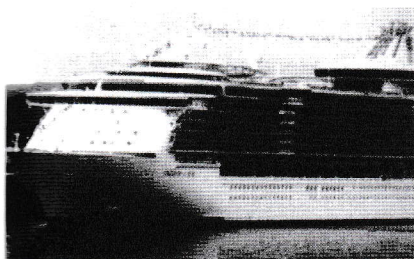
To achieve higher efficiency for their products, PVC manufacturers and processors for example, represented by the Arbeitsgemeinschaft PVC and Umwelt e.V. in Germany, and by the Vinyls Group of the British Plastics Federation in UK have cut their consumption of fossil fuels and energy, and reduced the overall impact on the environment. Furthermore, in 2000 the European TVC industry adopted its 10-year programme “VINYL 2010” with specific goals to improve product management over the whole life-cycle⁵.

This programme enabled great progress in industrial safety and in health and environmental protection while safeguarding social welfare. Adherence to the goals is checked by independent third parties and documented in annual progress reports⁶. “VINYL 2010” received recognition in October 2004 with its registration as an official member of the initiative “UN Partnership for Sustainable Development”. The former EU Environmental Commissioner, Margot Wallstrom, officially recognised the monitoring structure of “VINYL 2010”⁷.

Success in PVC Manufacturing

As part of its voluntary commitment, the PVC Industry has cut emissions in PVC manufacturing. To reduce emissions, the European PVC manufacturers signed two ECVM charters which specified precise limit values for the manufacture of PVC using the suspension (S-PVC) and emulsion (E-PVC) methods. This meant that for the

first time uniform European standards for the production of vinyl chloride and PVC have been created which the German Federal Environmental Agency has



described as "ambitious" in the positive sense of the word⁸. The certification company Det Norske Veritas reviewed compliance with both charters in 2002 and 2004. CO₂ emissions and energy consumption have been greatly reduced through improved technologies, such as the establishment of membrane electrolysis. Nowadays, PVC is mainly manufactured from oil and salt. In addition, coal or regenerative sources of raw materials, e.g. bioethylene, are alternatives.

Progress in the Use of Additives

Progress has also been made in the use of additives. For example, the PVC industry located in the original member states of the EU has not used cadmium stabilisers since 2001. By 2015, lead stabilisers are to be completely replaced in new production and, in an interim stage, reduced by 50% by 2010. Reduction already reached more than 20% in 2006. The use of lead stabilisers for drinking water pipes has already been stopped except in Greece, Portugal and Spain. The greater efficiency of additives in PVC manufacturing and processing, as well as the lower ecological and economic impact, encourages sustainable development.

Positive news comes from EU risk assessments. They have closely examined the effects of plasticisers on people and the environment in studies over many years. It has explicitly been confirmed that the two most commonly used plasticisers, DINP and DIDP, do not pose any risk to human health or the environment⁹. Concerning DINP, the report stated:

"The end products containing DINP (...) and the sources of exposure (...) are unlikely to pose a risk for consumers (adults, infants and newborns) following inhalation, skin contact and ingestion"¹⁰.

There is thus no further need for limitations on the use of the substances. The ban on DINP in toys which children could put in their mouths went into effect in July 2005 for precautionary reasons. In view of the scientific facts and available alternative materials, EU Commissioner Gunter Verheugen told the magazine OKO-TEST:

"There are also a number of harmless alternative materials with which plasticised PVC can be made. That is why a general ban on phthalates in PVC or on plasticised PVC cannot be justified according to present studies."¹¹

Even in the sensitive field of medicine, PVC products, such as blood bags, drip tubes or oxygen tents have had a permanent place in patient care for decades. In the opinion of the German Federal Institute for Drugs and Medical Devices, a general ban on medical products containing DEHP, which is sometimes imposed, does not make sense.

Finally these products are essential for recovery & health maintenance and even to sustain life, and cannot thus be dispensed with easily. Moreover, alternative medical applications are not allowed to threaten the quality of medical care.¹²

Furthermore, the industry has developed new additives with the aim of further simplifying the processing of the material, improving the desired product properties, and continuously improving the impact on people and the environment.

Establishing Waste Management

The study "PVC Production, Consumption and Recycling Data for Germany, 2003" by CONSULTIC GmbH (marketing research company) illustrated that almost half of PVC waste was recycled. The share in material recycling was approx.33%. In addition, 10% was treated by energy recovery and 2% by feedstock recycling¹². Since June 2005,

landfill sites have been closed down for organic waste in Germany. For that reason, different means of PVC recycling have become more competitive and the amount of PVC recycling will continuously increase.

Across Europe, over 37,000 tonnes of post-consumer PVC window profiles were recycled in 2006, a commitment that Professor Dr. Andreas Troge, President of the German Federal Environmental Agency, strongly emphasised:

"I therefore positively welcome the efforts of the PVC window profile manufacturers which have now been ongoing for several years, to set up treatment capacities for scrap PVC windows and the high-quality recycling of these scrap windows."¹⁴

On the European level, the PVC industry supports PVC recycling with its "VINYL 2010" voluntary commitment.

The energy recovery of PVC waste has been improved. Modern waste incineration plants recover chlorine in the form of hydrochloric acid, rock salt or brine. New technologies, such as the NEUTREC method from SOLVAY, have made important progress in reducing the chlorine input. Many studies prove that the proportion of PVC in domestic waste has no influence on the level of dioxin formation and thus on dioxin emissions¹⁵. Modern plants reliably adhere to the stringent statutory amount of gas emissions.

PVC is an Eco-Efficient Material

The economic advantages of PVC products have generally been recognised. At the same time, many eco-audits give PVC a good score in terms of sustainability. This is also proved by an evaluation of over 230 eco-audits commissioned by the EU Commission. Published in 2004, the evaluation provides information on the life-cycle of PVC in comparison to rival materials. Accordingly, PVC should be classified as ecologically equivalent to other materials.

The study thus comes to the following conclusion for windows :

"For windows, one of the most important PVC applications, the available studies conclude that there is no "winner" in terms of a preferable material since most of the studies conclude that none of the materials has an overall advantage for the standard impact categories."¹⁶

Now, PVC profiles in Switzerland were given the top classification "ecologically interesting" in "eco-devis NPK 371 Fenster" together with wooden frames¹⁷.

They are thus clearly ahead of wood metal systems, which were classified as "of limited ecological interest.

In the field of floor coverings, most eco-audits consider the environmental impact of PVC and linoleum to be comparable. In 2007, the independent British institute, "Building Research Establishment", certified the low environmental impact of the PVC floor coverings of a leading manufacturer and attested that PVC floors had a similar environmental profile as other floor coverings, including linoleum and rubber¹⁸. In the case of roofing membranes, the environmental impact of plastic materials is less than that of bitumen membranes, according to other findings of the EU study.

Lightweight plastic pipes are ideal for modernising and creating new sewage systems. They can be laid simply, cheaply and reliably, and last for at least 100 years. Stable against corrosion and cheap to maintain, PVC pipes do not become clogged due to their smooth inner walls. Anti-corrosion films for ships are another example. They delay the adhesion of algae and replace the previously used anti-fouling paints with tributyl tin compound (Orca Maritime, Norway). PVC-coated membranes for high-profile architectural projects, such as roofs of football stadiums or heparin-coated PVC tubes for better compatibility with the body tissue, also prove the innovative capabilities of the sustainable plastic. In general, flexible PVC products have a very low potential for allergies. They are therefore explicitly recommended for people with allergies because of their compatibility. This not only applies to many medical applications such as

blood bags, tubes or wound dressings, but also to important building products such as plastics windows.

Reassessment of a Classic

Many decisions show that PVC is recognised as an eco-efficient material. A great deal of factual information from the PVC industry together with independent testimonials has brought about a re-evaluation of the product. In Germany, for example, earlier restrictions in the procurement of PVC or in publicly-sponsored building projects have been eliminated or reduced in the states of Hesse, Mecklenburg-Western Pomerania, Thuringia, Lower Saxony, Berlin and Bremen. Some local authorities, such as in Leverkusen (2003) and Lubeck (2005), have revised former PVC bans. The most recent success is a decision by the Leipzig city council (July 2007). After a 13-year PVC ban, windows cables and pipes made of PVC can be used in municipal buildings such as for the renovation of schools. It is not only the great efficiency of PVC products that has convinced the decision-makers, but also the products' contribution to sustainable development with respect to ambitious environmental quality goals. Similar tendencies could be seen on the European level. For example, in 2004, Denmark abolished tax on various unplasticised PVC products. In the Netherlands, the manual on sustainable construction from the Ministry of Housing and the Environment makes an explicit recommendation to use PVC products which are recyclable or made of recycle¹⁹. Environmentalists appreciate the advantages of the material. Dr Patrick Moore, co-founder of Greenpeace stated:

"There is absolutely no evidence that vinyl damages human health or the environment: (...) Further, PVC is durable, low maintenance, recyclable and performs well on LVA tests."²⁰

Summary

Growing populations, difficult living conditions in developing countries, the threat of climate change, limited resources, the enormous pressure of costs: all over the world, national governments are facing

major challenges, and the world is demanding workable solutions for these urgent problems. Against this background, sustainability is very important. The PVC industry is facing this social, economic and ecological responsibility with great commitment. PVC products have proved their worth over many decades and have continuously been further developed. Because of its many material properties and its outstanding cost-benefit ratio, the plastic material has developed into a worldwide successful product with further growth potential.

- Thanks to the unique range of its properties, PVC opens up extensive possibilities for innovation. The material offers progress and advantages to society in a variety of applications: from the health system and building technology to the development of everyday goods. The favourable life-cycle costs save money that can be sensibly used for ecological and social improvements.
- Products from PVC have an impact on the environment during manufacturing, use and disposal just like those made of steel glass or paper. In an overall comparison (life-cycle assessment, sustainability comparison) PVC products perform well especially because of their durability and their comparatively low-energy requirements. Almost all of the overall evaluations published so far therefore reject phasing out PVC and recommend ecological improvements.
- In the last few decades, PVC has been the subject of numerous discussions and a wide range of studies with regard to many different aspects of its life-cycle. Independent studies indicate that PVC is an eco-efficient material that offers society permanent advantages over its entire life-cycle if controlled responsibly.
- The low weight of the material leads to energy savings in areas of application such as packaging and transport.
- Because of the long life of PVC, a useful life of over 100 years can be assumed for some applications.
- The PVC industry is continuously working for the sustainable development besides investing time and money in innovations overall.

Plastic Auxiliary Equipments from World Leaders

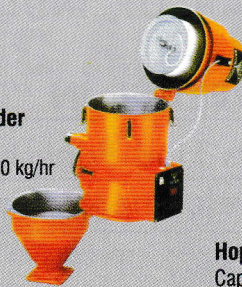


Joint Venture with Koch Technik - GERMANY



Dehumidified Air Dryer
Capacity from 25M³/hr to 3000M³/hr

Hopper Loader
Out put from 8 kg/hr to 1200 kg/hr



Hopper Dryer
Capacity from 15 Ltrs. to 3500 Ltrs.

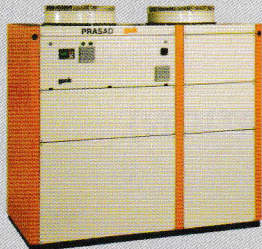


Multi Component Gravimetric Blender



Joint Venture with GWK - GERMANY

Compact Chiller
(Air/Water Cooled)
Energy efficient compact water chiller
Cooling capacity from 10 KW to 360 KW



Air Chiller
Direct cooling air chillers for blown film plants

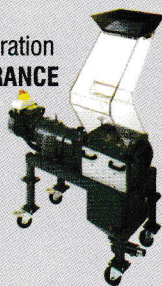


Mould Temperature Controller
Oil / Water based with microprocessor control



Technical Collaboration with Moditec - FRANCE

Granulator
Low speed, Low noise



Technical Collaboration with Ariostea - ITALY

Silo
Silo feeding system & Material handling system for PVC Resin



Technical Collaboration with Rapid - SWEDEN

Granulator
The efficient solution to all your wastage



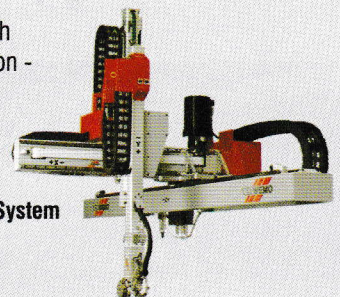
Technical Collaboration with Crizaf - ITALY

Polymer Conveyor Belt



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Economy Through Automation



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Seminar on "Volume Cost and Its Importance in Plastic Applications"

Indian Plastics Federation (IPF) and Indian Plastics Institute (IPI) - Kolkata Chapter jointly organised a Seminar on "Volume Cost and Its Importance in Plastic Applications" by Mr. Siddhartha Roy, Roy Plas Tec, Pune on 2nd July 2010 at IPF Conference Room. The Seminar was attended by over 40 persons, who are the members of both the institutions.

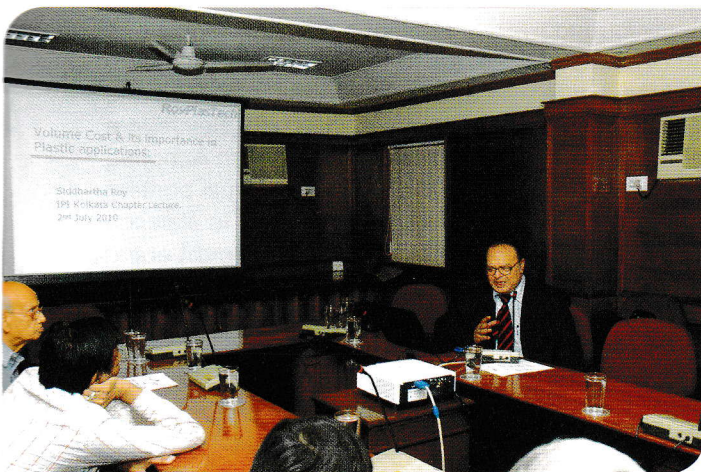


Mr. Pratap Ganatra, Chairman, IPI - Kolkata Chapter welcoming Mr. Siddhartha Roy



Mr. Sourabh Khemani, President, IPF, Kolkata welcoming the guests

The speaker, Mr. Siddhartha Roy, gave an interesting lecture on "Volume Cost" and explained the importance of volume cost while calculating the total cost of a Plastic product. He gave interesting examples and all the members, who attended the Seminar were benefited from the talk. The seminar was a grand success.



Mr. Siddhartha Roy giving his talk



A view of the audience

Do Not Litter. Keep Your Environment Clean.

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Plastics, Metals, Paper ...
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The Building Block of the Future provides Excellent Insulation with a Simple Filling of Elastopor® H

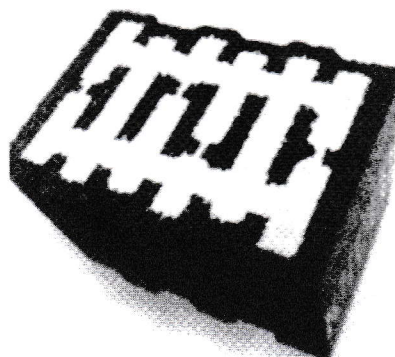
Instead of complex insulating layers, the building block of the future provides excellent insulation with a simple filling of Elastopor® H. In fact, it could almost be called the modern philosophers' stone. In the middle ages, alchemists searched in vain for the fabled philosophers' stone - a mythical substance which would transform base metals into gold or silver. The search is over for today's alchemists because Elastopor® H is the simple building block that has it all.

Energy conservation is becoming an increasingly important issue in the 21st century and there is now a strong drive to save on precious resources and cut costs wherever possible. Nowhere more so than in private house building. In recent years, we've taken great steps forward, and architects and developers are turning more and more to new energy-saving concepts. Everyone agrees that intelligent building design begins with highly efficient insulation.

In a solid construction, a typical insulated external wall consists of either a double wall structure with a core insulation, or a single wall with additional external insulation. Both of these alternatives are costly and have a relatively long construction period. A new construction method is now available which consists of monolithic brickwork made from hollow blocks with thermal insulation already built in. The advantage: no additional insulation is necessary and there are substantial savings on construction time and costs.

In addition, a considerable

amount of space is saved as there's no need for any external insulation. Moreover, where mineral wool and perlite



were used before to fill hollow blocks, now even better levels of insulation are provided by the polyurethane rigid foam Elastopor® H from BASF.

Because of rising energy costs, the building materials industry is focusing increasingly on heat conductivity - the lower this value, the better the insulation will be. So the whole industry is looking for a product that sets itself apart from the competition. PUR rigid foam Elastopor® H is that product, because it's the only one that offers all these advantages:

Extremely low heat conductivity / Very low water intake / No falling or trickling out of the insulation / Manageable investments in industrial and building systems / Rapid cycle times / Lower requirement for heat energy Altogether moderate costs

The company behind the philosophers' stone is Knobel in Albstadt, and the product is actually called Liapor SL-plus. It's manufactured from Lias clay, which is formed into a

ceramic clay interspersed with air, and its cavity is then filled with Elastopor® H. The end result satisfies both architects and builders alike, providing efficient heat and noise control which can be used in a wide range of applications. Eastman Chemical Company announced that Baby Dipper, LLC, a manufacturer of innovative, easy-to-use baby products, has introduced the Baby Dipper® bowl made with Eastman Tritan™ copolyester. Tritan is a new-generation copolyester that provides a balance of properties to help the infant care market respond to consumer demand for products that offer superior clarity, dishwasher durability and toughness, and are manufactured without bisphenol-A (BPA).

The Baby Dipper bowl is a 4-ounce triangular bowl with a non-slip base to prevent movement and spills. The bowl's contoured interior helps guide food to a lower corner for collection, enabling use with one hand. The bowl's unique design helps parents easily feed infants, as well as teach toddlers to feed themselves.

"Being a mother of two sets of young twins, I understand why parents want safe and smart infant care products," said Barbara Schantz, president and CEO of Baby Dipper, LLC. "By using Eastman Tritan™ copolyester for the development of the Baby Dipper bowl, we can offer parents a high-quality, user-friendly feeding product that fits into their everyday lives."

Baby Dipper chose Eastman Tritan™ copolyester because it provided a clear, tough and BPA-free material choice. Baby Dipper

tested NAS for the manufacture of the bowl when initially looking for a plastic alternative to polycarbonate (PC). However, Tritan offered higher impact and heat resistance, as well as dishwasher durability.

Tritan also offers odor, taste and stain resistance, which are important for infant care

feeding products that demand cleanliness and safety.

"The design flexibility and ease of processing of Eastman Tritan™ copolyester also has allowed us to create the thick-to-thin wall design, and meet our cost and production goals," Schantz said. The Baby Dipper bowl comes in a three-piece set with a matching spoon and fork

made of polypropylene, which also is BPA-free. The patented Baby Dipper bowl is available select online and retail stores. Eastman Tritan™ copolyester used for the development of a variety of infant care products, including reusable bottles, pacifiers, breast pumps, bottle sterilizer lids, plastic cutlery ar dishes, and more.

Bioplastic based Contactless IC card

IC cards are widespread as e-money or security card. They include a printed circuit board with

IC chip, antenna inside and plastic lamination sheets on both sides. The Japanese group Sony

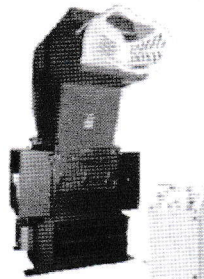
Corporation has developed a new contactless IC card technology that is available under the trade name FeliCa.

PIECO "QUALITY WITH Since 1983 INDIGENOUS TECHNOLOGY"

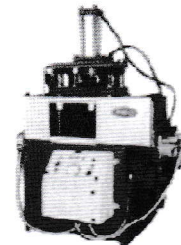
RANGE OF PRODUCTS

- PLASTICS SCRAP GRANULATOR
- DRY BLENDING CONICAL MIXERS
- DRY BLENDING VERTICAL MIXERS
- LUMP CUTTERS
- BLADE SHARPENERS
- AGGLOMERATORS
- MEDIUM SPEED GRANULATOR

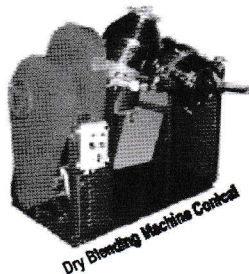
PLASTICS SCRAP GRANULATOR
GRINDING CAPACITY :
10 Kgs./Hr. to 1000 Kgs./Hr.



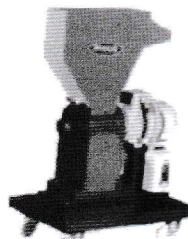
Scrap Granulator



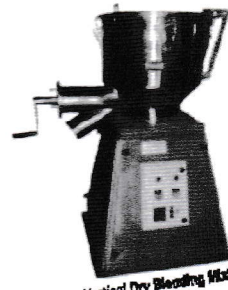
Lump Cutter



Dry Blending Machine Conical



Mini Granulator



Vertical Dry Blending Machine

Mfg. by
PIECO Pioneer Engineering Corporation

Regd. Office : E-14, Ansa Indl. Estate, Sakivihar Road, Sakinaka, Mumbai - 400072.

Tel. : 2847 3143 » Telefax : 022-28473787 » Mobile : 9820998657

E-mail : pieco@aol.in / dinesh@piecomachines.com » Website : www.piecomachines.com

Factory : Plot No. A2/2218, G.I.D.C., III Phase, Vapi - 396195 Dist. Bulsar (Gujarat) (INDIA) Tel.: 0260-2431282,2423895

PIECO THE NAME IN MARK OF QUALITY AND RELIABILITY.

These FeliCA smart cards that are highly secure and tamper resistant support speedy data transfer. They are notably made using a poly(lactid acid) (PLA) based lamination sheets

designed by Sony. This new bioplastic-based contactless IC card has already been adopted as a student and faculty ID card by the Shohoku College in Kanagawa, Japan.

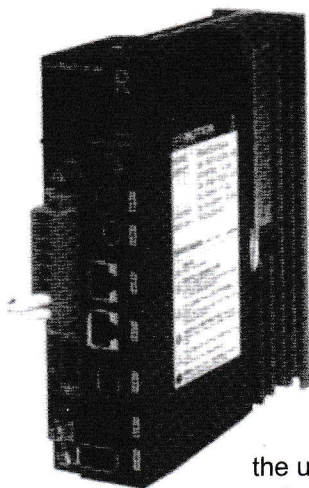
Biobased polyamide for ultra-slim TV

The Japanese group Sony Corporation is a pioneer for the use of bio-based plastics in electronics products. The company has been continuously increasing these materials since 2000. Recently it has introduced bio-based polyamide components in its latest Ultra-Slim OLED (Organic Light Emitting Diode)

television commercialized on the European market. A polyamide-11 (PA-11) material is used for the terminal cover on the back of the television and an ABS/PA-11 blend is used in the bottom casing and in the battery cover of the remote controller. According to Sony, it is the first use of high performance bioplastics in a television set.

AC servo amplifier with EtherCAT interface

Sanyo Denki America, Inc. has added a high-speed EtherCAT Interface Model to its SANMOTION R line of AC servo amplifiers. The SANMOTION R amplifier with EtherCAT allows for 100Mbps communication and increased motion control speeds, claims the company.



Newly developed software includes a motion simulation function designed to aid in application development. The simulation runs the same codes as the actual SANMOTION R, allowing the amplifier to go directly from simulation to live

usage without re-programming, says Sanyo Denki.

The SANMOTION R does not require an interface board or any additional hardware; it connects with Ethernet cables to the Ethernet port of a PC. Only software modifications are necessary with application changes.

According to the company, the unit offers a 50 per cent reduction in position settling time compared to conventional Sanyo Denki models.

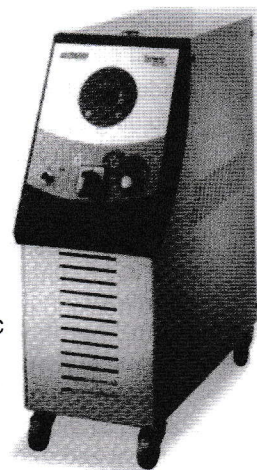
The unit includes two inputs and two outputs, output capacities of 15A, 30A and 50A and an input voltage of AC200V (three phase/single phase). The amplifier is compatible with AC servo motors of up to 1.5 kw. Protocol is CANOpen over EtherCAT (CoE).

New temperature controllers with serial interface

Wittmann has introduced the latest configuration option for its TEMPRO basic C90 and TEMPRO basic C140 temperature controllers: the serial machine interface. The interface enables direct communication between injection moulding machine and the tempering unit, says the company. The interface works with all common transmission protocols such as P2, EUROMAP 66, and CAN, says the company.

According to Wittmann, the temperature control base models TEMPRO basic C90 and C140 are suitable for applications requiring precise tempering in the range of 10–140°C. The technical design of the TEMPRO basic C90 tempering unit is based on an open system (i.e. unpressurized operation). It can be used for temperatures of up to 90°C max. The TEMPRO basic C140 is designed as a closed system, heating the carrier medium (water) to a value of up to 140°C.

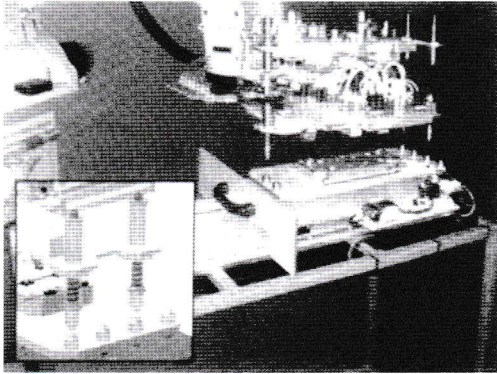
Both units are equipped with a self-optimizing microprocessor controller; automator filling with leakage monitoring and maximum temperature monitoring; sensor break monitoring and level control; and an evacuation function and leak stop function. The units also offer pressure measurement based flow control.



Spring-loaded docking pins for insert moulding applications

SAS Automation has introduced new spring-

for complex and low tolerance applications.



Features of the new product include: accuracy of +/- .001 in.; sized to fit the customer's end-of-arm tool, robot and mould; the ability to dock on existing mould locators; and availability of custom lengths, strokes and diameters.

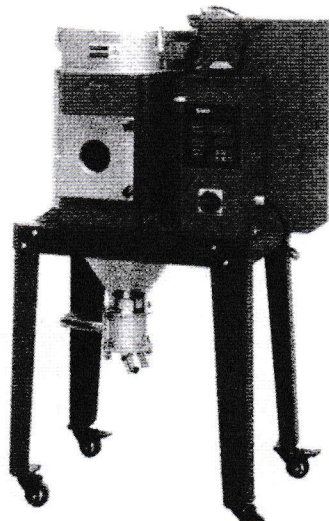
"These docking pins have enabled several customers to consistently

increase production of complex insert molded parts while reducing labor," said Robert Dalton, general manager for SAS Automation in a release. "Our insert mould tools and spring-loaded docking pins have automated many operations that used to be performed manually."

loaded docking pins for insert moulding applications (IML). In addition to requiring precise accuracy, insert moulding applications are often performing several processes at the same time. According to the company, these docking pins are suitable

Rapid, efficient drying is promised

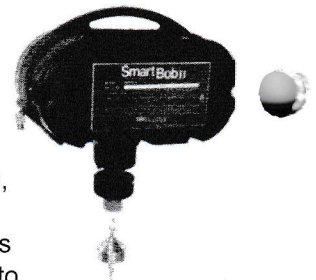
Based on the pressure transformation principle, the SHD-U-HD heatless dehumidifying compact dryer from Shini reaches a dewpoint of -40°C. Compared to traditional hot-air dryers, it uses no heat and is said to offer shorter drying time and higher efficiency, and is free from the influence of



environmental humidity. It is suitable for drying even hydrophilic plastics such as ABS, PBT, PC, PE, and PVC to a moisture content of less than 0.02%. The SHD-UHD can be directly mounted on a molding machine or on a floor stand.

Remote wireless inventory manger tool for bins, tanks and silos

BinMaster Level Controls, a division of Garner Industries, has introduced BinLink, a web-based monitoring system for bins, tanks and silos. The system is designed to enable remote wireless inventory management of stored material from any computer connected to the Internet. The core components of the solution are BinMaster's SmartBob2 and SmartBob-TS1 sensors mounted on the bins, a wireless or wired data communications network, a gateway to provide connectivity to a personal computer or IP network, and data collection software that can be viewed by any authorized individual via an Internet connection.



BinLink is designed to eliminate the need to manually check bin levels for all types of operations from farms, to processing and manufacturing operations, to the largest storage facilities. The system is scalable and can monitor one or a hundred bins and grow as operations expand, says the company. Site mapping capabilities include a built-in visual mapping feature that shows tank types, locations and levels to streamline operations and optimize delivery, filling and emptying schedules. BinLink features end-to-end encryption and authentication to ensure data is safe and confidential from the bin to the corporate office, says BinMaster.

Turning Waste into Energy

Polymer Energy, LLC is the creator of an innovative, environment-friendly system for processing Plastic Waste into Energy, specifically, Hydrocarbon or crude oils. The Polymer Energy Systems will process Polyolefins such as Polyethylene, PP, with up to 5% of other plastics and 30% of other wastes like paper and glass. The output of this technology is the mixture of 20% gasoline, 50% diesel, and 30% heavy fractions. The system is modular in construction and so is easily scalable. It is considered energy efficient besides getting the energy material Hydrocarbons. It is environmentally friendly too. The company has supplied 2 plants in Thailand and one in Chennai. For more information contact Harita-NTI Ltd, Ph: 044-26357087 / 42017019. Email hnti.pe@scl.co.in www.harita.nti.com

Sidel launches SBO Universal2 range-greener pet bottles

This new launch by Sidel increases the industrial blow molder output by 10%, touching 2,000 bottles per hour per mold while decreasing energy consumption by 10% in the ovens.

Wittmann's Gravimax GMX 14V blender series

Wittmann of Vienna, Austria, announces that its Gravimax GMX 14V is the first of the blender series to incorporate the company's enhanced metering system for repeatable batch-to-batch consistency. The GMX 14V can blend up to four components with a total batch size of 2.2 lbs (1kg) and a material throughput of up to 170 lbs (80kg) per hour. Gravimax blenders provide single and multicomponent gravimetric blending of up to 11,000 lbs an hour (5000 kg/h) for injection molding, blow molding and extrusion. The GMX 14V has been completely redesigned with construction based on a new modular concept that allows the hoppers and body to form one compact unit. The new corner windows of each hopper provide a full view for material inspection, and detach quickly for easier cleaning.

Also, Wittmann Battenfeld, Torrington, Connecticut, USA, has introduced a clear-tube feature on its Feedmax B material loaders. The Visual Material Monitoring feature is achieved by placing a glass cylinder between the stainless-steel center section and the stainless-steel material flow cone, providing a clear view of the material inventory in the loader. This also allows retrofitting of existing vacuum loaders while on the machine, blender, dryer, or other resin-consuming equipment. Wittmann says a complete retrofit takes a few minutes. www.wittmann-group.com

Coperion GmbH Successful results with improved WRG Watering Pelletizers

Coperion GmbH, Stuttgart/Germany, has not only improved its range of WRG Watering Pelletizers for the pelletizing of polystyrene (PS) and polyoxymethylene (POM), but also extended it by the addition of new sizes of machines. One of these pelletizers, a WRG 320 for the pelletizing of Ps with an output of 5,000 kg/hr rated for 9,000 kg/hr was recently delivered to the same customer. Several watering pelletizers of similar design for the pelletizing of POM at output rates of up to 6,000 kg/hr are being used by various companies in the Far East and are likewise giving very satisfactory service.

The advantage of these watering pelletizers is that the cooling and conveying medium, water, does not come into direct contact with the die plate. The rotating knives cut the extruded strands of melt into pellets. The still-hot pellets are catapulted by centrifugal action of the knives into the rotating water, which then cools them and conveys them out of the pelletizer hood. Thus it is that watering pelletizers feature an extremely compact design and are distinguished both by low investment and operating costs, and by a very simple start-up process. A decisive factor is the relatively negligible investment cost of the die plate, which is of simple design, as it is not exposed to any high temperature gradients between the polymer melt and the cooling water. Only a very short passage of melt is required in the melt nozzles, which in turn not only reduces the pressure acting on the die plate but also makes for a more gentle

treatment of the melt. Moreover, the geometry of the nozzles can be adapted within wide limits to the specific requirements dictated by the desired shape and size of pellet. The favourable operating costs result from the following:

- Low energy requirement for the die plate and the rotor drive
- Negligible wear on the knives and the die plate (the design of the system prevents cavitation erosion of the die plate)
- Simple start-up process, which requires a minimum of time and therefore saves costs, especially in cases where changeover from one product to another occurs frequently.

As the die plate does not come into contact with the cooling medium, its temperature remains constant during operation. The melt does not freeze in the flow channels, not even in cases where the output rate is very low. Consequently, these watering pelletizers give reliable operation within a wide output range. Under normal operating conditions, the pellets are extremely uniform, which means that they can be easily handled downstream, exactly metered either by weight or by volume and when processed by an extruder or an injection moulding machine, readily conveyed and plasticized in the barrel or cylinder. Coperion (www.coperion.com) is the international market and technology leader in compounding systems, bulk materials handling systems and services.

DSM opens New Factory for Waterborne Acrylic Resins in the Netherlands

Royal DSM NV, the global life sciences and materials sciences company headquartered in the Netherlands, announced that a new factor for waterborne acrylic resins has been opened in Waalwijk (Netherlands) at a total investment cost of EUR 30million. Waterborne acrylic resins manufactured by DSM NeoResins+ have far less environmental impact and are much more painter friendly than traditional solvent-based resins while offering high performance and durability standards. Waterborne acrylic resins use water as a carrier instead of oil-based solvents. Solvent-based paints contain a variety of VOC that are harmful to the environment and painters.

World's first thermoplastic bridges to support 70 tons

Axion International Holdings, Inc unveiled the world's first high-load thermoplastic bridge designed from 100% recycled plastic at Fort Bragg, NC. The bridge can support load in excess of 70 tons and is less expensive to build than its alternatives, has greater corrosion resistance and is practically maintenance free. Developed in conjunction with scientists at Rutgers Univ, Axion's patented process transforms recycled consumer and industrial plastics into structured products that are ideal replacements for materials such as wood, steel or concrete.

Evonik Industries to launch new single-component resin system

Evonik will be launching Calidur, a newly developed polyaryl ether amide resin system, specially suitable for structural components. The material has high temperature resistance, low moisture absorption, good resistance to chemicals and low exotherm & minimal shrinkage during curing.

SABIC Innovative Plastics develops Valox iQ 2205HV

Sabic Innovative Plastics of Pittsfield, Massachusetts, USA, has developed Valox iQ 2205HV resin for Interface America's Inc. New Convert carpet line. The environmentally progressive, high-performance resin is a critical additive that provides permanent stain resistance and strong, consistent color, while maximising post-consumer-recycled (PCR) content, Sabic says. The resin is highly effective in dispersing pigment throughout the polymer melt to produce consistent, vivid colors with lower loadings of expensive colorants. Compared to fiber dyed after being produced, solution-dyed fiber using ValoxiQ resin maintains excellent color and provides permanent stain resistance to prolong carpet life, while maintaining an attractive appearance and allowing easier cleaning, the company says.

Ashok Goel President of Plastindia Foundation

Ashok Goel has been elected President of

Plastindia Foundation for the term 2009 - 2012. Bipin M Shah and KK Seksarai were elected as Vice President and Honorary Treasurer respectively. Goel is the Vice Chairman and MD of Essel Propack, a global player in laminated tubes. The Other members in his committee are Pradeep Rathod, F Pinto, Amar Seth, Ajay U Desai, Raju Desai, C V Jain, Amrit Patel, Nimesh Sayani, Manoj Agarwal, S K Nayak and P Poomalai.

PVC plant Inaugurated in Cuddalore

MK Stalin, the deputy Chief Minister of Tamil Nadu, inaugurated the Rs.600crore, 1.7 lakh tonne capacity polyvinyl chloride plant set up by Chemplast Sanmar Ltd at SIPCOT Industrial Estate at Cuddalore which is expected to more than double the company's business. He said the SIPCOT Ind Estate was growing from strength to strength since its inception.

In Phase I, 36 of the 59 approved industries went on stream with 2 of the approved 7 in Phase II starting production. The Rs.5,000 crore oil refinery in Cuddalore to be set up by Nagarjuna Oil Company would bring in substantial foreign exchange. Vijay Shankar, Dy Chairman, Sanmar Group said that the PVC plant would aid many downstream industries to come up. Jayaraman, Chairman, Sanmar Group said the first unit of the company was inaugurated at Mettur by the former CM, CN Annadurai, 42 years ago and the turnover of the company had now touched Rs.4,000 crore. V Ramesh, Director said the plant uses about 1003 tonne of VCM to make one tonne of PVC as against the industry average of 1.013 tonne. The factory has its own desalination and effluent treatment plants.

Book on Polymer Analysis by Smithers Rapra

Smithers Rapra Publishing has released 'Introduction to Polymer Analysis', a book that gives an up-to-date and thorough exposition of the present state of the art of polymer analysis that will be of interest to all those involved in this field. Contact: Smithers Rapra, Shawbury, shrewsbury, shropshire, SY4 4NR, UK; publications@rapra.net

IIT Kanpur designs Artificial Knee Joint from polymers

IIT Kanpur's biological science and bio-engineering department has successfully designed an artificial knee joint from polymers. The newly discovered polymer used in this joint decomposes after two months of surgery and the cartilage functions properly thereafter unlike the metal alloys which need to be replaced after a stipulated time.

PolyOne

PolyOne sets up its first Colour & Additive Masterbatch Plant in Navi Mumbai. PA6/66 Compounds are now manufactured in India under the brand name Bergamid. www.polyone.com

Leap in demand for Wood-Plastic Composites & Plastic Lumber

Demand for wood-plastic composite and plastic lumber is projected to advance 9.2%/yr to \$5.3 billion in 2013, creating a market for 3.3 billion lbs of plastic, according to Wood-Plastic Composite & Plastic Lumber a new study from The Freedonia Group Inc., a research firm based in Cleveland, Ohio, USA. Gains will be driven by continued consumer acceptance of these products as replacements for more traditional materials such as natural wood. Wood-plastic composite lumber will post more rapid gains than plastic lumber, advancing 10.5%/yr to \$2.9 billion in 2013. www.freedoniagroup.com

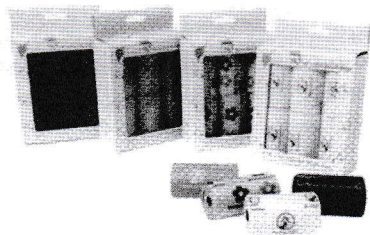
RIL-RPL Merger will create Mammoth Refining Entity

The RIL-RPL merger has created the biggest single location petro refinery in the world. Located in Gujarat, the refining complex will have a combined capacity of 1.24 million barrels per day. The merger will create an entity worth \$47 billion at present levels and will displace IOC as India's biggest refiner.

It will have an annual capacity to process 2 million tonnes of crude in a year and will be the 5th largest producer of propylene in the world.

NEWS AROUND THE WORLD

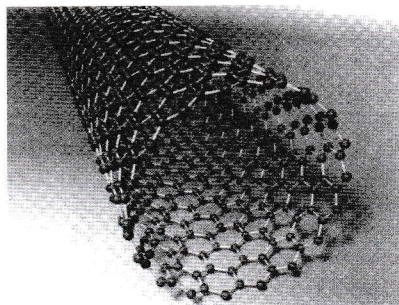
New Study of PER Bags



A life cycle analysis (LCA) study of plastics waste bags carried out by the IFEU Institute has shown that traditional PE resins are less damaging in environmental terms than the bio-based biodegradable bags. The study compared virgin and recycled PE resins, which had the best results, with biodegradable alternatives, which had the worst result, including starch and PLA-based formulations. As stated the environmental profiles of each waste bag are dominated by the raw material production process.

According to the IK, sanctions against conventional plastic bags are by no means justified. Despite the result of the analysis, the IK considers that biodegradable bags have a good future for the future. The German Association for Plastics Packaging and Films (IK, Industrievereinigung Kunststoffverpackungen e.V.) largest in Europe with approx. 400 members.

Carbon Nanotubes from Old Plastic Bags: A major development



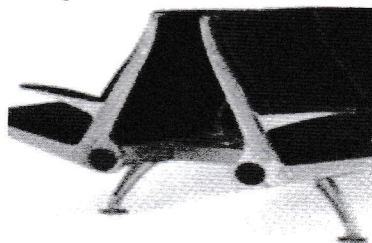
An "upcycling" method of converting waste plastic bags into nanotubes has been developed at the Argonne National Laboratory in Illinois. In this path breaking method, 1 gm pieces of high or low-density polyethylene (HDPE and LDPE) were cooked at high temperatures (700 degrees C) which

broke down the chemical bonds of plastic and cause carbon nanotubes to grow on pieces of the cobalt acetate catalyst. Though a lot of catalyst (about a fifth of the weight of the plastic being converted) is needed to get good results, this is still one of the cheapest and environmentally friendly ways yet found to grow nanotubes.

Individual pieces of the catalyst become trapped inside forests of newly grown nanotubes. But the research has shown the nanotubes can be used as is without further processing to cut them free.

The cobalt impurities also make the nanotubes suitable for use in lithium-air batteries, because the cobalt is converted to cobalt oxides that perform as catalysts to help the reactions of ions in the battery that let current flow. Nanotubes could also become self-repair tools for electronic circuits in our smart phones and laptops.

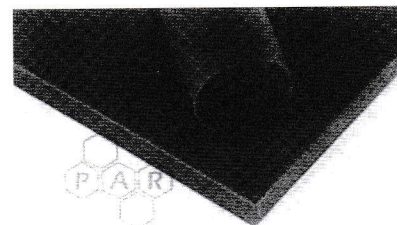
First environmental friendly airport-seating solution



Arconas has become the first airport-seating manufacturer to incorporate soy-based BiOH® polyols from Cargill. BiOH polyols give airport passengers the opportunity to rest comfortably on a more environmentally responsible choice. Soy-based BiOH materials replace a portion of the petroleum ingredients typically used in foam production. Arconas is a global leader in airport seating, servicing some of the world's largest airports such as Boston Logan, Dallas/Fort Worth, JFK, Hong Kong, La Guardia, Lisbon, Orlando, and Ottawa, among others. Arconas has already introduced Cargill's BiOH polyols for current orders and will increase the percentage of soy-based components during 2010. All Arconas' airport-seating lines adhere to a strict environmental policy and have passed the ANSI/BIFMA

emissions test. "We are pleased to partner with Arconas to bring more environmentally friendly seating products to airports around the world," said Yusuf Wazirzada, business unit leader of Cargill Bio-based Polyurethanes. "Foam cushioning made with soy-based BiOH polyols is widely used in residential furniture, but expanding the use of BiOH polyols to meet the seating needs of airport customers is an exciting next step."

Metal detectable plastics for food industry



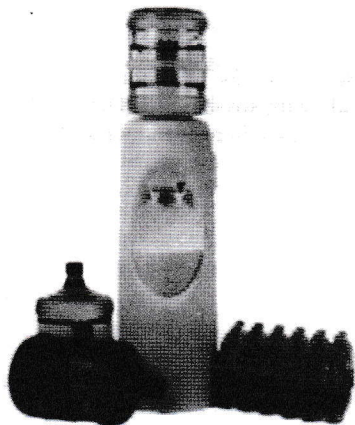
Vectra® E550i MD and GUR® 4150 MD grades from Ticona are all 'metal detectable' (MD) plastics which can be specifically modified for recognition by conventional contamination inspection systems.

In the food industry, to avoid delivering food that contains foreign particles, detectors are installed in operations that transport or prepare foodstuffs. These systems detect particles that may originate from the production environment, for example from mixers, stirrers, cutters, kneaders or conveyor systems. Upon detection, the relevant articles are rejected.

Food handling operations also need to detect and reject potential plastic residues using existing metal detector security systems. Ticona says that Hostaform POM, Vectra LCP and GUR UHMW-PE are specially tailored for this application area.

The range of Ticona plastics covers food applications from flash freezing through to use at temperatures of up to 300°C. They are approved for use in contact with foodstuffs according to the regulations of American and European authorities including the US Food and Drug Administration (FDA) and the German Federal Institute for Risk Assessment (BfR). All products exhibit good chemical resistance.

100% recycled polyethylene terephthalate for bottling spring water



Mirabel's Les Eaux Naya Inc. has become the first bottled spring water company in the world to use 100% recycled PET (polyethylene terephthalate) plastic in its bottles. These 100% recycled PET bottles are engineered to use plastic waste that would otherwise be left to landfills.

The recycled material has met the same safety standards as virgin plastic and also carries Health Canada's approval. The new bottles will be available starting in January 2010. Naya was sold by Europe's Danone food giant to a U.S. equity fund last year.

Global trends in stretch and shrink film

The stretch and shrink film industry is among the fastest growing and most dynamic flexible packaging segments in Europe, and has been studied by Andrew Reynolds, Research Director at Applied Market Information. Consumption of stretch and shrink film is now in excess of 2.1 mln tpa in Europe.

Reynolds will be giving the opening address at the 7th international conference, Stretch & Shrink Film 2010, to be held from 26-28 April 2010 in Madrid. Typically the attendees account for over 1.6 mln tons of polymer purchase.

AEP Industries will outline issues for the North American stretch film market, and EuropackNE Ind e Com de Prod Termoplasticos will review the industry in South America.



There will be a separate study on the structure of the Polish market by PHP ICC NESKOR Sp. z o.o. Strategic challenges will be discussed by John Campin of AMI, and a personal global view will be given by Mr. Poon Khim Ang of the Malaysian company Thong Guan Plastic & Paper Industries.

There are new materials in the market including metallocene PE from ExxonMobil and next generation plastics for collation shrink from Dow Europe.

Italian suppliers include ENI Polimeri Europa. Film performance can be enhanced with the right additives, such as the new stabilisers from Chemtura, and with styrene-butadiene copolymers from Chevron Phillips Chemicals. Manufacturing technology is advancing.

Macchi has studied blown film coextrusion trends. Cast stretch machinery has been improved by SML, winding by Gloucester Engineering and cores have been optimised by Sonoco Alcore.

Testing is important to maintain quality control: Davis Standard has been working on blown film thickness measurement.

Highlight Industries is developing test methods for both field and laboratory use. The conference will cover the main stretch applications for pallet wrap and silage wrap as well as addressing issues in the collation shrink, pallet shrink and the stretch hood arena. Beumer Maschinenfabrik has expertise in stretch hooding.

World's first silicon-on-plastic integration technology for solar cells and LCD TFT

Teijin Limited (Teijin) has developed the world's first technology to integrate

silicon onto general-purpose plastic substrates, working in cooperation with NanoGram Corp. (NanoGram), a world-leading company in the development of nano materials. The technology has promising applications in next-generation energy and electronics, including solar cells and thin film transistors for liquid crystal displays (LCD TFT).

It is expected to help reduce the weight of these products, as well as enhance their flexibility and environmental sustainability.



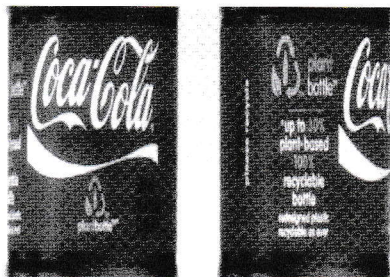
Conventional silicon devices generally are manufactured onto a glass or a silicon substrate, but many electronics manufacturers are seeking ways to replace such substrates with thinner, lighter and flexible plastic substrates.

Due to their low heat stability, however, general-purpose plastic substrates cannot withstand the conventional silicon sintering process, which has a high temperature of 500-600°C. The challenge has been to develop a low-temperature silicon sintering process of below 200°C.

Teijin and NanoGram entered into phase 1 of a technology development agreement in February 2009 to develop silicon-on-plastic integration technology. Thereafter, the technology for the sintering of silicon nanoparticles onto polycarbonate substrate at low temperature was developed, and then a silicon-on-plastic prototype was exhibited.

Teijin and NanoGram are the first to achieve these results. Further improvements of the prototype are expected to contribute to low-weight solar cells and LCDs that are at least 50% lighter than current models. Such weight reductions also will help to lower CO₂ emissions during the transportation of these products.

Coca-Cola products in North America to be packaged in plant-based containers



Very shortly, Coca-Cola products in North America will be packaged in plant-based containers. Made from mono-ethylene glycol (MEG) derived from sugarcane and molasses, the new PlantBottle will be ready for a North American debut at the 2010 Winter Olympics in Vancouver. With this, the Coca-Cola Company becomes the first-to-market with a recyclable PET plastic bottle made partially from plants.

Coca-Cola says the new packaging helps reduce the company's dependence on petroleum and reduce its carbon footprint, citing preliminary research that indicates a lifecycle carbon advantage for the plant-based bottling product over **traditional petroleum-based bottles**.

PlantBottle packaging is currently made through a process that turns sugar cane and molasses, a by-product of sugar production, into a key component for PET plastic.

Coke says the sugar cane waste being used for its bottle production comes from predominantly rain-fed crops that were processed into ethanol, not refined sugar and that they are working with the World Wildlife Fund to promote sustainable sugarcane production in Brazil and elsewhere.

The PlantBottle packaging in the North American market will consist of up to 30% plant materials from sugarcane production in Brazil.

The remainder of the material will be traditional PET plastic, some proportion of which will likely be post-consumer content. But regional variations in PET consistency cause the percentage of plant material in the bottles to vary from one country to the next.

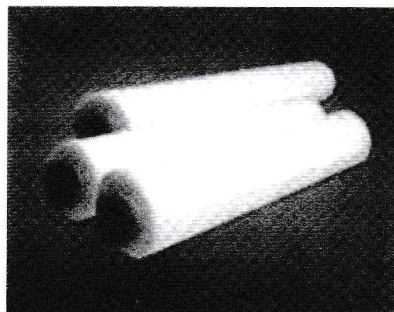
ACC promotes plastics via events, social media

The sponsorship of a number of special events, many of them not typically associated with the plastics industry, illustrates one of the core approaches the plastics department of the American Chemistry Council is using to remind people of the benefits of plastics.

In the last two months, the Plastics Make It Possible campaign of the ACC took a prominent role at the Solar Decathlon in Washington, partnered with Gen Art at the Fresh Faces in Fashion show in Los Angeles, and with *Green Car Journal* to sponsor the Green Car Ride & Drive event held in conjunction with the Los Angeles Auto Show this month.

The Web site, which currently focuses on eight end-markets and areas of innovation for plastic, includes stories and video commentary from third-parties, independent experts and industry.

100% recyclable LLDPE stretch film

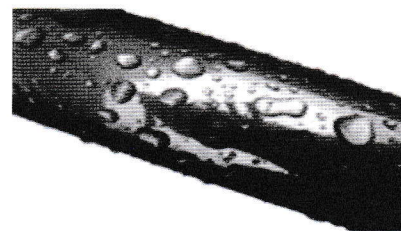


Italian manufacturer Manuli has said to have launched one of the most environmentally friendly LLDPE stretch film. This film is free of PVC and plasticizers and is 100% recyclable.

The film named Manfood is designed to seal food packaging and can be applied manually or automatically.

The film is non-toxic and anti-condensation and also very thin. This results in manufacturer using a smaller amount of raw materials during the manufacturing process, while users eventually disposing off a lower volume of material.

New PO material for steel pipe coating: Dow's breakthrough



DOW Chemical Company has achieved a breakthrough by introducing a new top coat and adhesive polyolefin material for 3 layer steel pipe coating systems. The new Dow materials meet stringent performance requirements for coating large diameter steel pipes when used in 3 layer coating system with a fusion bonded epoxy. This material is used in combination.

DOW HDPE 12110G is a black high density polyethylene top coat material and AMPLIFY GR 320 Functional Polymer is a grafted adhesive resin.

Scientists successfully bio-engineer 'green' plastic

Scientists have successfully bio-engineered polymers, completely bypassing fossil fuel based chemicals. This breakthrough opens the way for the commercial production of 'green' plastics. Polymers are molecules found in the form of plastics and rubbers.



The team, from KAIST University, South Korea and LG Chem, led by Sang Yup Lee, professor, focused on polylactic acid (PLA), a bio-based polymer, the key to producing plastics through renewable resources.

Until now PLA has been produced in a two-step fermentation and polymerisation, which is both complex and expensive. Now, through the use of a metabolically engineered strain of *E. coli*, the team has produced polylactic acid and its co-polymers through direct fermentation.

Forecasts of global development supported by market studies

FUTURE OF BIOPLASTICS

A jointly commissioned study on bio-based plastics has been published by European Bioplastics and EPNOE (European Polysaccharide Network of Excellence). Forecasts concerning capacity developments and technical substitution potentials are the focus of the investigations carried out at Utrecht University. New bio-based polymers have been available in the market for approximately one decade. Recently, standard polymers like polyethylene, polypropylene, PVC or PET, but also high-performance polymers like polyamide or polyester have been totally or partially substituted by their renewable raw materials equivalents. The starting raw materials are usually sugars or starches, partially also recycled materials from food or wood processing. The study demonstrates that up to 90% of the current global consumption of polymers can technically be converted from oil and gas to renewable raw materials. Bio-based plastics will not substitute oil-based polymers in the near future for several reasons including low oil price, high production cost and restricted production capacity of biomass-based polymers that limit the technically possible growth of these plastics in the coming years. Important major projects were delayed in the years 2008 and 2009 due to the financial and economic crisis. The role that lightweight conventional plastics played in the past, substituting durable materials like iron and steel in vast products, could soon be taken over by bio-based plastics. The study discusses for all major groups of bio-based plastics, the production process, the material properties and the extent to which they could substitute petrochemical polymers from a technical point

of view. Further aspects covered are the prices of these novel materials and their main producers. Three scenarios are distinguished to establish potential future growth trajectories, i.e. a baseline scenario, an optimistic and a conservative scenario. The results for these scenarios are also compared to the findings of a previous study made in 2005. The new study confirms that substantial technological progress has been made in bio-based plastics in the past five years. Innovations in material and product development, environmental benefits as well as the gradual depletion of crude oil increasingly call for polymers made from renewable raw materials.

www.european-bioplastics.org

Global demand for bioplastics will rise from 200,000 tons in 2008 to 900,000 in 2013, valued at 2.6 billion dollar. Growth will be driven by a number of factors, including consumer demand for more environmentally-sustainable products, the development of bio-based feedstocks for commodity plastic resins, and increasing restrictions on the use of non-degradable plastic products, particularly bags. Most important, however, will be the expected continuation of high crude oil and natural gas prices, which will allow bioplastics to become more cost-competitive with petroleum-based resins. These

and other trends are presented in a new study from Freedonia Group.

Biodegradable plastics, such as starch-based resins, polylactic acid (PLA) and degradable polyesters, accounted for the vast majority (nearly 90%) of bioplastics demand in 2008. Double-digit gains are expected to continue going forward, fuelled in part by the emergence on the commercial market of PHAs. PLA will also see strong advances in demand as new production capacity comes online.

Western Europe was the largest regional market for bioplastics in 2008, accounting for about 40% of world demand.

Bioplastics sales in the region benefit from strong consumer demand, a regulatory environment that favours bioplastics over petroleum resins, and an extensive infrastructure for composting. Going forward, however, demand will grow more rapidly in the Asia-Pacific region, which will surpass the West European market by 2013. Gains will be stimulated by strong demand in Japan, which has focused intently on the replacement of petroleum-based plastics. Other regions, such as Latin America and Eastern Europe, will see stellar gains in bioplastics demand from a very small 2008 base.

www.freedoniagroup.com

The bioplastics market in South-East Asia is in its nascent stage and in the preliminary



development phase. Producers are encouraged to explore opportunities here by the huge market potential of the region, which primarily stems from the market's novelty and current low penetration in target applications. The market is expected to grow at a compounded annual growth rate of 129.8% in the next 5-7 years until 2015 as indicated in a report by Frost & Sullivan. Lack of local production as well as the low levels of consumption and public awareness are the major barriers to the greater usage of bioplastics in SE Asia. This is likely to change as more companies set up manufacturing plants. The market in this region is likely to find the going good with favourable local government support and initiatives. The efforts of governments, especially those in Thailand, to derive 5% of their plastics from bio-based sources in 2012 have given a huge boost to the market. With the country's abundant agricultural sector and large lactic acid (LA) manufacturing base, the government is taking steps towards making Thailand a regional bioplastic hub. Although Thailand is currently the Asia Pacific's third largest bioplastics producer, ranked behind Japan and China, a combination of the country's natural resources, infrastructure and government support are expected to push the local industry forward to become a regional hub for bioplastics manufacturing and export. Thailand has a large manufacturing base for lactic acid, derived from cassava and sugarcane starch which is broken down with enzymes into glucose and fermented to make lactic acid, and later converted into PLA resin.

www.frost.com

WORLD BIOPLASTICS DEMAND (ktons)	2003	2008	2013
NORTH AMERICA	28	58	193
WESTERN EUROPE	41	77	295
ASIA-PACIFIC	25	58	302
OTHER REGIONS	4	7	110
TOTAL	98	200	900

Continental recovery

The plastics industry and MEP Sajjad Karim have asked European decision-makers to support the plastics recycling markets following the negative impact of the financial crisis. The annual report published by PlasticsEurope (in cooperation with EuPR, EuPC and EPRO) shows that recycling is under threat as plastics demand decreases and prices of virgin material keep dropping. As a direct consequence, 12.2 million tons of plastics waste in Europe still ends up in landfill. The industry warns that the situation could get worse as they continue to struggle with the impact of the economic downturn. Among the concrete requests which the industry is making to legislators are: recasting green public procurement legislation and guidelines; providing incentives for energy efficiency-related measures; boosting innovation by providing a more favourable environment.

This was further supported by Sajjad Karim, who sent a clear message to European decision makers: the plastics industry needs their support in these times of crisis - not only for the benefit of its 1.6 million employees, but also for the environment.

The annual report shows that plastics recycling across Europe still increased (from 20.4% in 2007 to 21.3% in 2008) as well as energy recovery (from 29.2 to 30%) - but both figures represent a slowdown compared to the considerable increases recorded in recent years. Recycling of plastic packaging increased from 28.1 to 29%. A recent study by the Swiss consultancy Prognos shows that 7% of the EU Kyoto target for greenhouse gas (GHG) emissions could be saved if all waste currently going to landfill was moved to a combination of recycling and energy recovery. The best results were achieved

without specific targets but with full flexibility to explore recycling and energy recovery for each waste stream. In addition to saving GHG emissions, diversion from landfill helps increase resource efficiency and energy security, while reducing litter.

The countries with high recovery rates score highly on both recycling and energy recovery. This means that a strategy which includes energy recovery is not contradictory to achieving good recycling results. A complete resource management strategy, therefore, needs to address both areas. Whilst recycling performance is similar across most European countries, there are big differences in the utilisation of energy recovery.

www.plasticseurope.org

The European post-sorting PET



Waste to Far East

Since last August the Chinese authorities accepted the import of additional plastics waste into their country. They now allow the import of ethylene, styrene, PVC, PET bottles and CD-ROM scrap. This new policy - according to EuPR (European Plastics Recyclers) - will deteriorate the fragile state in

collection reached 1.26 million tons in 2008, an increase of more than 11% on 2007 - according to the latest report from Petcore. The overall collection rate rose by nearly 5%, from over 41 to 46%, of all PET bottles on the market. The overall share of fibres as an end use for recycled PET decreased from 47 to 45%, although the tonnage processed continued to grow. The sheet market tonnage fell slightly to 22%. Blow moulding continued to grow with more than 20% going to this outlet in 2008. The tonnage used in strapping increased strongly again to use more than 11% of the total flakes. Exports to the Far East rose to nearly 17% of collected PET and the tonnage exported increased by 20%. A relatively small amount of baled PET bottles (<2%) was imported from outside the area.

Of the collected bales that were reprocessed in Europe, only 75% was usable PET. The remainder consists of caps and labels, residues and other contamination such as foreign materials and other polymers. The continuing programme of lightweighting means that the caps and labels form a greater proportion by weight of the whole PET package. According to Petcore, it should be recognised that PET will be the most important packaging polymer in contributing towards achieving the plastics targets in the Waste Framework Directive (2008/89 EU). This mandates that there should be 50% recycling or reuse of plastics from household streams by 2020. It was estimated that there is a total mechanical reclamation input capacity in the European region of 1.4 million tons in 2009.

www.petcore.org

viewpoint, the export of the European plastics waste to be treated in the Far East is far from being a sound policy. The greenhouse gas (GHG) emissions increase significantly if the plastics waste is recycled in the Far East compared to Europe. As a matter of fact, additional GHG emissions are due to additional transport involved (going as a waste and returning as a product) and to the inefficient energy mix of these countries.

According to a recent study, recycling nearly 300,000 tons of PET bottles into fibre in Europe, rather than in China, cuts global emissions by a further 175,000 tons a year.

Second, there is a tax flow from Europe to the Far East. The European tax payers are financially penalised for every product they buy (Green Dot fee passed to the customer) and throw (garbage bag tax). This huge amount of money should be used to increase the collection systems' efficiency, permitting better recycling rates at a lower cost and with a lower environmental impact. However, at present, part of this money indirectly supports the Far East recyclers who have lower costs than the European ones.

Third, the social conditions in the Far East are far from being comparable to European standards. From an ethical

which European recyclers are found.

From 2000 to 2008, the European exports of plastics waste have risen by 250%, reaching 2.27 million tons - approximately 5 million tons are annually recycled in Europe and 87% of these exports are going to China (including Hong Kong). The financial downturn seems to have worsened the situation, as the first quarter of 2009 has seen a 33% increase in export compared to the previous year. Some of the European collection systems directly or indirectly support plastics waste exports to the Far East. From a sustainability point of view, this policy can be questioned.

First, from an environmental

point of view, Europeans cannot tolerate that their waste is treated by companies that do not apply with European social standards, working security and, in the worst cases, child labour.

Environmental, social and economic variables constitute the three sustainability pillars. The waste export policy does

not fulfil any of these essential variables. Thus, European waste export should be limited, and local treatment should be favoured.

EuPR calls for the European collection systems to act in a sustainable way by reducing the export of plastics waste to the Far East and by supporting their local treatment.

www.plasticsrecyclers.eu



BOREALIS

Water for L'Aquila

Seven months ago, in the night of April 6, a heavy earthquake destroyed 15,000 buildings at L'Aquila, Italy causing 300 hundreds deaths and making 28,000 people homeless. At present a large number of them are still living in provisional camps, waiting to move into real houses before the start of winter.

Borealis has announced the donation of water pipes urgently needed for the establishment of temporary houses in cooperation with System Group-Centraltubi, a leading Italian pipe producer.

The partners agreed with the national civil protection agency to support the re-construction of Coppito 3, a new village consisting of 13 housing blocks allocating 1,200 people.

Borealis is supplying BorSafe LS-H polyethylene material and System Group-Centraltubi is producing the pipes and fittings. A water pipeline of 1.3-km length (diameter 90 and 180 mm) is being installed.

Water pipes made of polyethylene provide excellent resistance to earth movements and are therefore especially suited to the installation of new houses for homeless people after the earthquake.

"Acqua per L'Aquila" is one of various initiatives under the "Water for the World" umbrella. This programme was initiated by Borealis and its partner Borouge in 2007, with the aim to contribute to the global water challenge.

The programme supports social, environmental and business initiatives, to bring effective water solutions to those that need them most - like the re-establishment of water supply in troubled areas.

In China, for example, where a major earthquake struck the Sichuan province in May 2008, Borouge, together with local pipe producer Chinaust, provided a 2-km polyethylene water pipeline to connect the mobile water treatment system with the nearby river.

As proven by studies into the Kobe (Japan) earthquake, polyethylene compared to any other material provides highest resistance to earth movements and is therefore especially suited for the installation in earthquake regions.

www.borealisgroup.com

Youth Parliament

Introduced by PlasticsEurope in 2007-2008, the Youth Parliament initiative brings together young people to debate sustainability and plastics. This year eight countries (Belgium, Czech Republic, France, Germany, Italy, Poland, Spain, and Turkey) had their national debates and sent their ten winners to the European final that was held on November 13 in the Parlamentino in Rome. The latter was selected due to its place in EU history: the treaties which established the European Community were signed in Rome in 1957.

The final and all debates in the eight countries were done in the same style and following identical rules. The debate in Rome was opened by Wilfried Haensel, executive director of PlasticsEurope. Italian astronaut Umberto Guidoni took the role of the con speaker while the opening address for the pro faction group was given by the German Thomas Schmidt, Olympic gold medalist in canoeing and plastics engineer at MT Aerospace.

After that, four students presented initial pro arguments of the role of plastics in sustainability and another four stand up for the con side. Very many participants seized the chance to ask questions of their own and thereby introduced new good arguments.

At the end of this grand final parliament session, the top ten debaters were elected by an international jury consisting of politicians, industry experts, and journalists. Value of presentation, interesting reasoning, independence of opinion and presentation skills were the decisive points.

At last, the 18-year old Nora Sundahl from Belgium convinced the jury with her good arguments and her very own impressive style of presenting them.

www.plasticseurope.org

PLA bottles

The 2nd PLA Bottle Conference - hosted by Bioplastics magazine - was held in Munich on September 14-15, attracting almost 80 experts from 18 different countries.

In his keynote speech "Land Use for Bioplastics", Michael Carus (Nova Institut) gave a comprehensive overview of the situation regarding the need to use available arable land to feed humans and animals, and its use for the production of biofuels and bioplastics.

The conference itself followed a central theme from renewable feedstock to end-of-life. Starting with the basics on how starch or sugar is converted into lactic acid and then into PLA, the speakers addressed topics such as preform making and bottle blowing.

Special focuses were on certain challenges such as barrier improvement or enhanced thermal stability. Here special processing techniques were discussed. Colorants and additives were introduced in order to achieve effects such as anti-yellowing or anti-slip.

Once a bottle has been produced and filled, the subsequent steps are capping and labelling. Shrink sleeves made of PLA represent a viable solution that neither compromises automated sorting nor compostability.

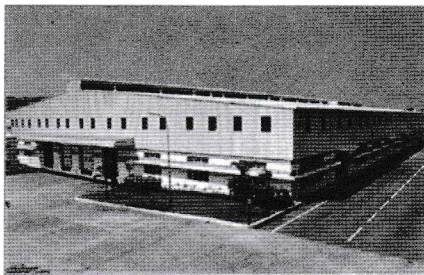
The conference ended with a session on end-of-life or better end-of-use options for PLA. The delegates learned that NIR (near infrared) is a technology that works well for automated sorting but that, on the other hand, still has some limitations.

Almost all of the attendees agreed that composting is not necessarily the best option. However, in closed loop systems collection and composting may be a viable solution, provided that composting facilities are available.

www.bioplasticsmagazine.de

EXPANSION

Grundfos India inaugurates Phase II of its Chennai facility



Grundfos Pumps India Pvt Ltd recently inaugurated phase II of its facility at Thoraipakkam, Chennai. The 7000 sq m facility, constructed with an investment of Rs 17.6 crore, has sophisticated material handling equipment needed

to handle pumps and components in the manufacturing, assembly & storage operations. It has a test bed capacity of 300 kW and the entire load is well supported by power back-up. This will help in the testing of large pumps used for massive infrastructure projects. In addition to this expansion within the existing facility, Grundfos has acquired 16 acre of land near Sriperumbudur for the construction of an additional production facility and the work is expected to commence by 2011.

Carlo Proia, senior vice president, Grundfos Group, said, "India is one of the most important overseas markets for the company in the Asia-Pacific region. The expansion of the Chennai-based facility

further strengthens our capabilities to adapt to the local market and signifies our commitment to long-term business operations in India."

Speaking about the expansion, Ranganath N K, managing director, Grundfos India, revealed, "We plan to increase our footprint in India and expand our operations by setting up another facility near Sriperumbudur. Our vision is to be the best pump company in all the segments that we operate in. We continue to be eco-friendly with our products and our factories." Grundfos is also working with IGBC to get a green factory building certification to take forward its agenda of energy efficiency, water conservation and being eco-friendly.

DISCOVERY

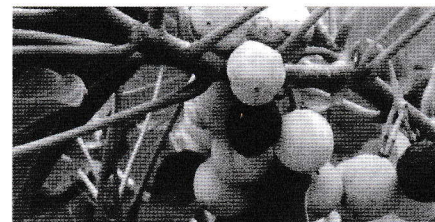
Microbe to make bio-degradable plastics

Central Salt and Marine Chemical Research Institute (CSMCRI), Bhavnagar, has discovered a microbe from Indian waters to manufacture bio-degradable plastics using a by product of the Jatropha plant. According to a press release, the bio-degradable plastics can be

manufactured from a side stream product of Jatropha called glycerol which is formed during the process of bio-diesel extraction from its fruit.

The institute had undertaken research to find cheaper renewable sources to produce bio-degradable polymers, and now is looking forward to produce it on a commercial scale.

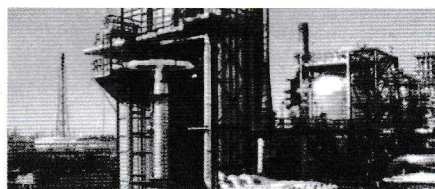
In 1991, Imperial Chemical Industry had tried to manufacture bio-



degradable plastics, but the source of this kind of plastics was expensive. Hence, it had failed to evoke any response from the industry.

INVESTMENT

British Petroleum to set up 1mt petrochemical plant in Gujarat



British Petroleum (BP), one of the world's largest energy and petrochemical companies, plans to set up a 1 million tonne (mt) petrochemical plant in India. The plant - to be built at an investment of Rs 3,500 crore - could come up in Gujarat.

The company is currently negotiating with oil refiners in India

for the purchase of paraxylene as feedstock to make purified terephthalic acid (TPA).

BP had tried to enter the refining business three years ago through a tie-up with the state-owned Hindustan Petroleum Company, proposing an upcoming 9 mt plant at Bhatinda.

The venture had, however, not materialised back then.

ACQUISITION

BASF completes the legal process of acquiring Ciba companies in India

BASF India Ltd (BIL) recently completed the legal process of acquiring Ciba India Ltd, Diamond Dye-Chem Ltd and Ciba Research (India) Pvt Ltd. The merger took place after the shareholders approved the scheme of amalgamation held at the court convened meetings of

the companies on December 16 and 17, 2009.

Speaking about the acquisition, Prasad Chandran, chairman, BASF Companies in India and head, South Asia, said, "We are convinced that the acquisition of Ciba is already helping our customers to be more successful, based on an innovative and comprehensive product portfolio."

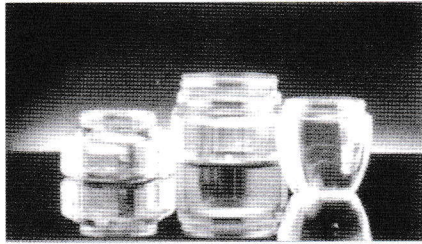


Nearly 350 employees of Ciba in India will be integrated into BASF by end of May 2010.

EXPANSION

Parle Agro to expand its PET capacity

As part of expanding its plastic packaging business, food and beverage



player Parle Agro, is planning to expand its polyethylene terephthalate (PET) business by increasing its production capacity by another 21 per cent in the next fiscal. The company recently installed two new machines - a KM 96 cavity machine and a Husky - HyPET 72 cavity machine at its Silvassa plant, at Dadra and Nagar Haveli. It has commissioned its second preform manufacturing plant in Orissa and plans to set up its third plant in South India by early 2011.

Outlining growth segments for the PET business, Schauna Chauhan, CEO, Parle Agro, said, "We plan to increase our presence within the oil, confectionery and pharmaceutical segments while also reaching out to new customers in the liquor segment. We have already started R&D to expand our range of preforms and technology. We recently started manufacturing wide mouth jars in addition to preforms, in order to cater to the confectionery packaging segment."

VENTURE

Kuwait offered stakes in ONGC and IOC's petrochemical plants

India has offered Kuwait a stake in Oil and Natural Gas Corp's (ONGC) Rs 12,440 crore petrochemical plant at Dahej in Gujarat on the West coast and Indian Oil Corp's (IOC) proposed chemical plant at Paradip on the east coast.

Kuwait Petroleum Corp (KPC) has repeatedly rejected offers for stake in Indian refinery projects in the past since India could not fulfil its demand for auto fuel distribution rights.

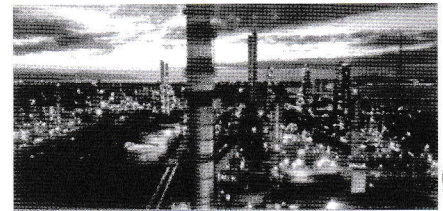
ONGC's Dahej petrochemical complex is to comprise capacity to

produce 1.1 million tpa ethylene, 340,000 tpa propylene, 135,000 tpa benzene and 95,000 tpa butadiene. The unit will use C2-C3 (ethane and propane) compounds extracted from imported liquefied natural gas (LNG) as feedstock.

The scope for a foreign partner in ONGC's Dahej unit will be for 20-25 per cent stake holding.

ONGC is keen to get an overseas major who can either bring technology or marketing support for its Dahej plant to be built by February 2012.

KPC has also been offered a stake in the 1 million tonne (mt) petrochemical plant that was split from the Rs 29,777 crore refinery at Paradip for building



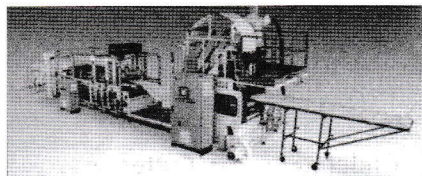
in future. The plant is planned to be built after the 15 million tpa refinery is commissioned in 2012.

Kuwait supplies 10 per cent of India's current crude needs. India is counting on Kuwait and other oil-rich nations in the Gulf to meet crude oil requirements of new refineries that are set to increase India's refining capacity by 70 mt to 250 mt by 2012.

RECOGNITION

Rajoo Engineers felicitated

Rajoo Engineers was recently conferred the IPMMI - Machinery Design



Innovation Recognition (IMDIR) award 2009 by the Institute of Packaging Machinery Manufacturer's of India (IPMMI) for its vacuum forming machine.

The award which is given for uniqueness of the design and development of packaging machinery and systems was conferred on Rajoo-Commodore's Vacuum Forming Machine (*Dispocon FPS - RECR - 7086 XPS*) in the

category of 'machinery for packaging operations'.

The foamed PS sheet line and vacuum formers are capable of producing fine quality PS foam sheet which is then converted into an array of vacuum formed articles like trays, dishes, lunch boxes, plates, bowls and so on. Typical produce consumes only 5 per cent plastics while the rest is air.

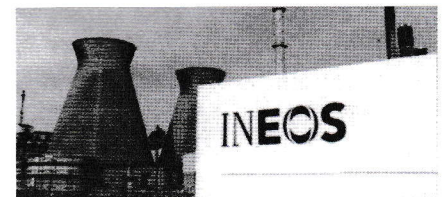
SURVEY

INEOS explores Dahej SEZ for setting up catalyst facility

The UK-based INEOS is exploring the prospect of setting up a catalyst unit at the special economic zone (SEZ) in Dahej. Senior officials from the US and UK offices of INEOS visited the site recently. The estimated initial cost for

setting up the project would be about Rs 10 billion. The catalyst plant would cater to the company's clients in the East. The petrochemical plant in the SEZ will be able to source directly from the catalyst plant, especially for HDPE/LDPE swing product.

Oil and Natural Gas Corporation (ONGC) is the anchor tenant for the SEZ, and is setting up a Rs 124.40 billion



petrochemical complex called ONGC Petro-additions Ltd, that has sourced its technology under licence from INEOS for its cracker and other units.

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