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Editorial



Dear Members,

Good day!

'WISH YOU ALL A HAPPY DEEPAWALI'.

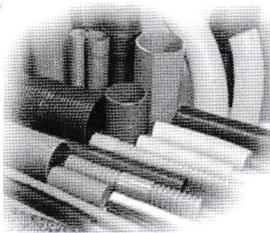
It gives me great pleasure in wishing you all 'A Happy Deepawali', though a belated one, third time at a stretch. I am indebted to all our members, particularly to the Office Bearers who reposed their faith and trust in me to be the Editor of our official organ - 'Plastics India'. Hope I have lived up to your expectation and rendered my services for the betterment of our Federation and members.

Throughout the last three years, my greatest concern has been to maintain the high standards and quality of our publication. While this has been a rewarding experience, it has not been without its challenges. I take this opportunity to extend my sincere thanks to all who have willingly contributed and helped me in bringing out Plastics India in time without any fail.

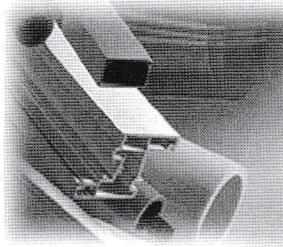
Durga Puja and Lakshmi Puja are over and Deepawali the festival of lights would be over before you get this issue. Deepawali celebrates the victory of Goodness over Evil and Light over darkness. On this auspicious occasion let us pray to Lakshmi, Goddess of wealth, light, prosperity and wisdom and also to Ganesha the 'Remover of Obstacles' and the 'Lord of Beginnings' for a rewarding 2013.

Yours truly,

Pradip Nayyar
Editor



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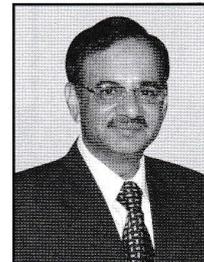
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PRESIDENTIAL ADDRESS



Dear Members,

Shubho Bijoya and Happy Diwali Greetings to all of you.

I thank all members of the Federation for their kind hard work and full support for the success of Indplas'12.

We will be holding our 53rd Annual General Meeting on 19th December 2012 in the auditorium of Indian Chamber of Commerce, Kolkata. I request all members to kindly join in the proceedings.

Our mission now is to build up IPF Knowledge Centre at Sankrail, Howrah. Please march and come forward for building IPF KC and to help our Chairman of IPF KC Shri Amar Seth to fulfill his dream. It is also under consideration to develop a new Poly Park through a private promoter during the present term. Hope to get your full hearted support as you have given in my last term.

With warm regards

A handwritten signature in black ink, appearing to read 'Rajesh Mohta'.

Rajesh Mohta

President

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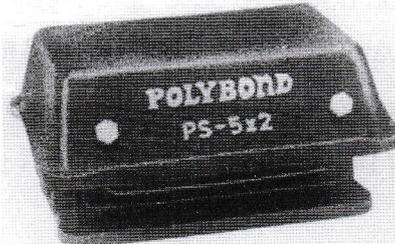
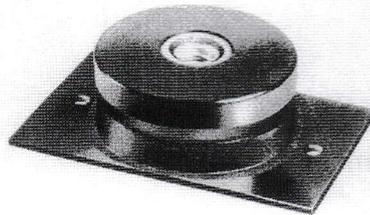
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SECRETARIAL REPORT



Dear Members,

By the time this issue of 'Plastics India' is in your hand the festival season will be over. DURGA PUJA, the principal festival in West Bengal and DEEPAWALI – the festival of lights - the festival celebrated all over India to welcome Sri Rama's return after completion of 14 years in exile will be over. Life that had been interrupted by frequent holidays due to festivals will be over and normal life will return once again in every office. On this solemn occasion of Durga Puja and Deepawali, I wish all members SHUBO BIJOYA and HAPPY DUSSERA. May the days ahead be one of peace and prosperity to every member.

After the successful completion of Indplas'12 – 6th International Exhibition on Plastics – the Federation has decided to hold its 53rd Annual General Meeting on 19th December 2012 in the auditorium of Indian Chamber of Commerce, Kolkata. Necessary formalities in this connection has already started. I request all members to kindly attend the AGM and participate in the proceedings.

To recognise the efforts of those who were the driving force for the success of Indplas'12, a felicitation programme accompanied by light music was held at The Park Hotel, Kolkata on 19th November 2012. Many members participated in the programme that was followed by a get together with dinner.

Wishing members once again **A SHUBO BIJOYA, HAPPY DUSSERA and A HAPPY DEEPAWALI.**

With best wishes,

A handwritten signature in black ink, appearing to be 'Pradip Nayyar'.

Pradip Nayyar
Hony. Secretary

India Vinyl Industry - Opportunities and Challenges

-by S S Naik

Sr. Vice President, PVC Business - Polymer Sector, Reliance Industries Ltd.

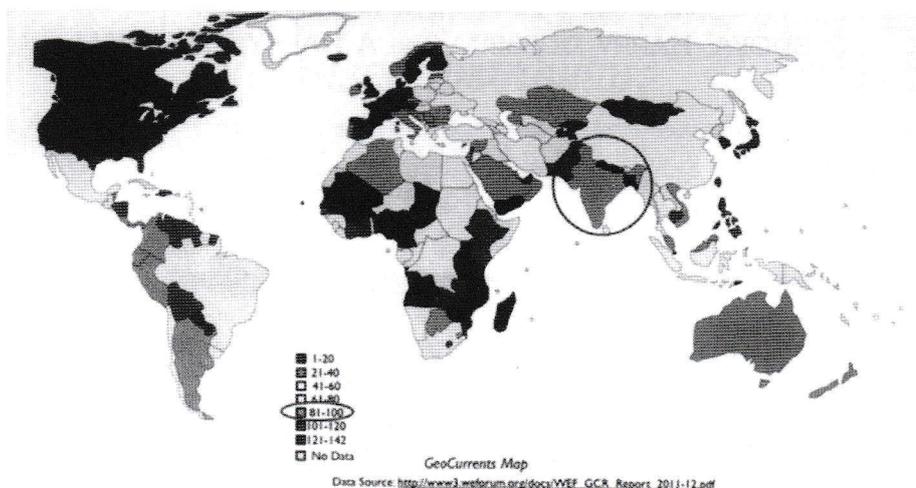
Introduction

Infrastructure is an integral element of Human Civilizations from times immemorial. Development activities in this sector have contributed a lot to India's Growth story. Construction sector has ~ 12% share in India's GDP and is growing at a handsome rate of ~ 9%. According to Goldman Sachs - an investment banking firm, India's Infrastructure Sector will require US \$ 1.7 trillion investment in the next 10 years. The key sectors identified include water management (agriculture and water supply & sanitation), housing and energy; besides transportation, information & communication, healthcare.

India Infrastructure - Current Status

Despite the robust economic growth, India continues to face challenges in upgrading and modernizing its Infrastructure at the desired rate. The World Economic Forum's Global Infrastructure ranking data indicates the number of 81-100 which shows that India has a long way to go in terms of Infrastructure facilities. Whereas a major reason could be inadequacy of Investments, many times our archaic processes, practices, and use of traditional materials as against new age materials could be held responsible for this sorry state of affairs.

World Economic Forum's
Global Infrastructure Rankings



Infrastructure Development - Major Sectors

Water Management - Domestic water consumption is projected to be increased to ~ 110 bcm by 2050. The 12th plan envisages investment of Rs 230,000 Crs for water management and Rs 500,000 Crs for irrigation sector.

Housing - Housing is one of the basic requirements for human survival. Govt of India is making ambitious plans to make India slum free by 2020 by providing affordable housing for low income group. Govt is also planning to build 90 million additional houses by 2020.

Energy - With the country's rising needs, the energy demand is also increasing. Plans have been worked out for setting up additional power generation capacity of 1,00,000 MW under 12th five year plan.

Green Buildings

To reduce burden on scarce natural resources, the concept of 'Green Building' is being spread across the country. In a short span of little above 10 years, India's Green building footprint has grown from 20,000 square feet in 2001 to projects covering ~ 900 million square feet till date. According to the Indian Green Building Council (IGBC), the market for LEED rated green buildings in India is projected to increase to \$ 5 billion by the end of this year.

Role of Plastics in Infrastructure

With natural resources becoming more and more scarce, traditional products are becoming more expensive. At the same time the requirement of construction materials is increasing many folds. Plastics have a number of important characteristics which when used alone or together make a

significant and ever increasing contribution to Infrastructural needs.

Advantages of Plastics in Building & Construction include -

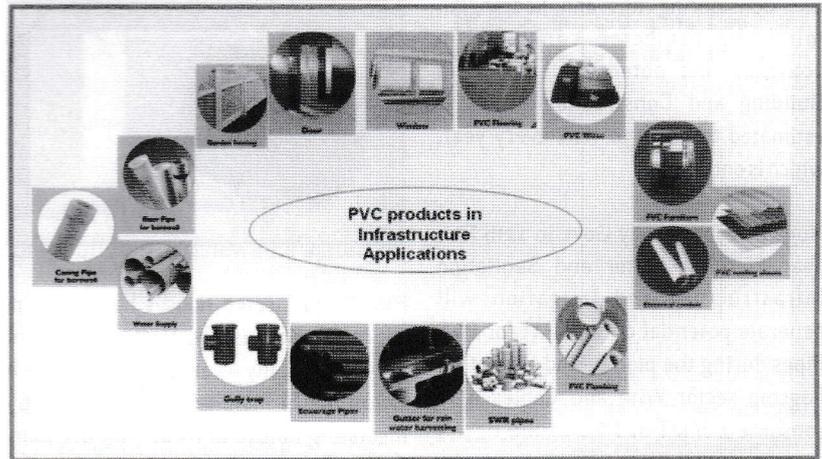
- Properties can be altered to suit needs.
- Good strength to weight ratio.
- Tough & durable.
- Easy processability.
- Chemical/moisture resistant.
- Do not rust/corrode.
- Resistant to termites, microbes, fungi.
- Good weatherability.
- Practically maintenance free
- Reusable/Recyclable.
- Attractive colors.

Plastics have become an indispensable part of the construction industry. Latter is the second largest consumer of plastics after packaging. In construction of all types of buildings, plastic products such as pipes, plumbing fixtures, sidings, floorings, windows and doors, gratings, railings etc are used for both structural and decorative uses.

India Infrastructure - Advantages PVC

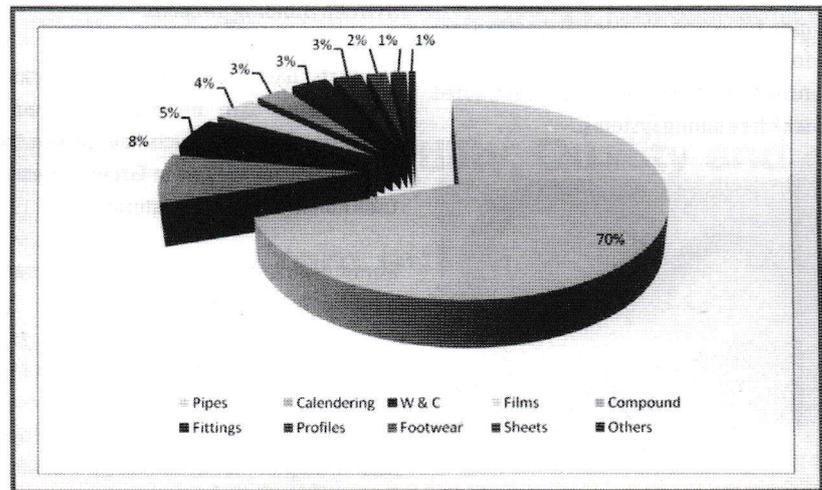
Various plastic materials like Polyvinyl chloride (PVC), Polyethylene, Polypropylene, Polystyrene, and Polyurethanes etc are used in Infrastructure applications. Out of total plastics used in the world 23% plastics is used in Infrastructure sector. PVC having a major share of ~60% is termed as 'Infrastructure Plastic'. PVC finds applications in Pipes, conduits, ducts, windows & doors and roofing etc...

PVC has been put to effective use by all the Developed and Advanced nations post second world-war, but its potential has not been fully utilized in Indian Construction sector.



Indian PVC Scenario

India PVC manufacturing is over 5 decades old. The domestic PVC industry has come a long way from its modest beginning with a capacity of 6 KTA to 1.3 MMTA. In the year 2011-12, PVC consumption in the country was close to 2 MMT resulting in a deficit of ~700 KT which was met by imports. PVC demand in the country is increasing @ ~10% which is more than twice compared to the world average of ~4%



The major application sectors for PVC in India include:

- a) Pipes and Fittings
- b) Profiles
- c) Calendering
- d) Wire and Cables

In India, Pipes continue to be the major sector with a share of ~70%.

Potential for PVC in Infrastructure

It is estimated that every year 2 million housing units are built in urban area while 4.5 million units are built in rural area. One typical urban unit consumes about 200 Kg of PVC in major applications like pipes, door and windows, conduits, wire & cable etc. while one rural unit consumes approximately 75 Kg of PVC for pipes, doors, roofing

etc. Considering this and keeping in mind the projected construction activities, the potential for PVC in Building and Construction sector is estimated to be ~730 KTA every year, which is enormous.

Huge investments by Govt. in 12th Five Year Plan for Water and Sanitation Infrastructure and Irrigation will generate potential of 8.5 MMT for PVC Pipes during the plan period. The other flagship sector Wire and Cables is to consume 1 MMT of PVC in the next 5 years.

Time to Adopt New Developments

Advanced technologies in various end use sectors including pipe manufacturing are being introduced in India. New products like Weldable PVC pipes have good potential particularly for trenchless installations. The Pipe provides monolithic, fully restrained, leak free piping systems.

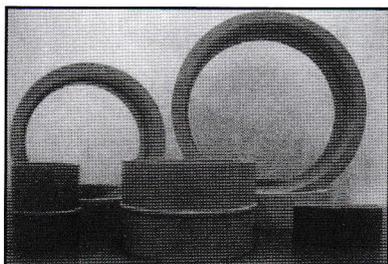


Photo Courtesy: Underground Solutions Inc. USA

Spiral Wound Pipe Renewal (SPR) technology on the other hand utilizes steel reinforced interlocking PVC Profile strips in place of high compressive grout. This system can be used for large diameter pipes while for smaller diameters fold and form PVC pipes can be used. These pipes are inserted in an old pipe to make the damaged system functional at much lower cost than total replacement of the system. These technologies are particularly useful in busy metros with heavy traffic density for rehabilitation of aged sewer pipelines.

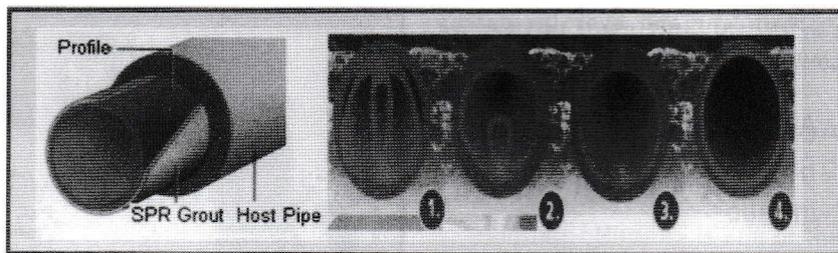
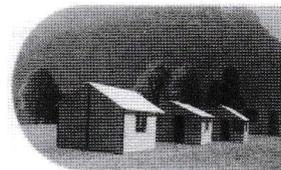
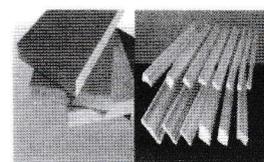


Photo Courtesy: Sekisui Chemical Company, Japan

PVC Prefabricated houses have huge potential in the country as Govt. is focusing on low-cost housing concept for economically weaker section. These houses not only save time of installation but conserve energy due to insulating nature of PVC. They are found to be safe in earthquake prone areas due to lightweight structures.



In situations of scarcity of wood and threats of deforestation, products like Wood PVC Composites and PVC trim boards are suitable materials for decorative applications, railings, decking, construction boards etc. Due to their light weight, resistance to termite and water, and ease for tailor made structures; these products are popular in many countries across the world and certainly have huge potential in India in Green Building projects.



Products like PVC Roofing membranes and PVC Geo membranes can be manufactured on calendaring machines. These products have proven themselves superior - technically as well as in Green aspects - compared to the traditionally available materials.

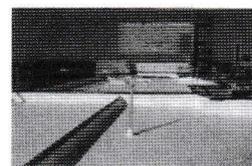


Photo Courtesy: Sika India Ltd.

Some innovative products like shading system are manufactured using recycled PVC. Due to insulating nature of PVC and artificial forest like grating system, this product provides shade with substantial temperature difference. The grating works like leaves of trees to provide protection from direct sun at the same time let light and air pass through. This saves energy of artificial lighting while simultaneously helps in removing heat by circulating air around the fractal shaped pieces.

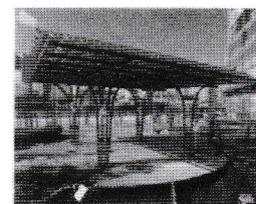


Photo Courtesy: Vinyl Environmental Council, Japan

Conclusion

The overall scenario in PVC sector is encouraging and provides excellent opportunities to the existing and new entrepreneurs to diversify businesses and invest in new developments. Yet a lot of applications of PVC remain untapped in the country, which when explored will open the floodgates for PVC business in India. A matured polymer with voluntary commitments, PVC has always met all the challenges successfully. World over the Vinyl associations are working for removing the myths and misunderstandings, and bringing the versatility of this wonder material to the forefront. All the stake holders in India's total Vinyl value chain should come on a common platform for sustainable growth. Launching of Indian Plastic Pipes Academy (IPPA) during the recently concluded Vinyl India 2012 is a welcome step in the direction.

Compounding of Renewable Materials

- by Dipl. Ing. Sabine Schonfeld, Dipl. Ing. Daniel Schwendemann,
Dipl. Ing. Edgar Strobel, Dipl. Ing. Uta Kuhmen

Abstract:

The use of renewable materials has a very long tradition. Today the use could be basically arranged in two areas:

- Use as a reinforcement or filler, e.g. sisal, hemp or wood fibers
- Use as raw material source for the polymer, e.g. starch or lactic acid based polymers

Compounding of renewable materials is mostly done on well known food and plastic extrusion processes.

For this purpose the machine predominantly used is a co-rotating twin screw extruder.

The following subjects will be part of the presentation:

- Design characteristics, series and function of co-rotating fully intermeshing twin screw extruders
- Starch based applications:
 - Thermoplastic starches (TPS)
 - Starch blends
- PLA-Based applications:
 - Pelletizing of the polymerized PLA
 - Direct extrusion of indried PLA film
- Blends, filling, reinforcing with polyolefins
 - Wood plastic composites
 - Natural fiber reinforcing
- In-line processes
 - Extrusion
 - Compression
 - Injection

Compounding of renewable Materials

Introduction

1. Processing machines

The processing systems available on the market, as shown in Figure 1, can be classified by number and rotational sense of shafts, and by whether the screws are tangential or intermeshing [1].

For compounding tasks in the food processing as well as in the plastics processing, the corotating inter meshing twin-screw compounder has been used. Since the

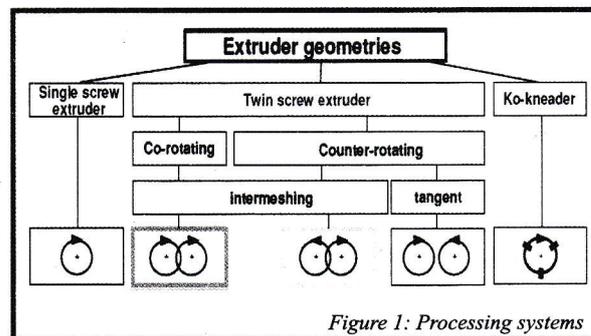


Figure 1: Processing systems

1950s some 30,000 self-wiping compounders have been built world-wide, of which around 90% are on the twinscrew principle. About 2,000 machines have gone into the food processing industry, and a few hundreds into the area of degradable plastics.

2. ZSK design criteria

In addition to the considerations of heat transfer, degassing, reaction time and die hole loading that are important for many processes, there are 3 criteria that are indispensable for design and use of a range of extruders, and for correct scale-up. These are shown in Figure 2. They are the criteria of screw diameter ratio, volume-specific shaft torque and screw speed. Taken together these three determine

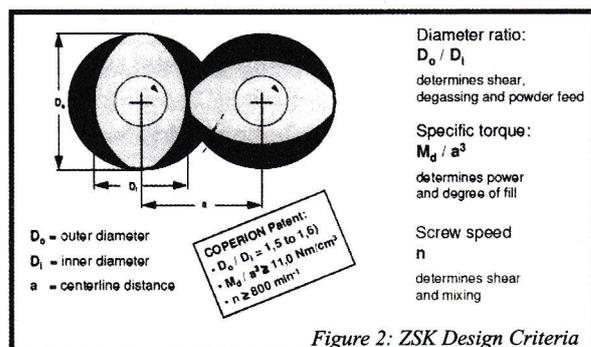


Figure 2: ZSK Design Criteria

the usable product volume, the shear loading and the power density, such as degree of fill and mixing effect. Figure 2 shows also the combination range of these 3 criteria that is protected by the MEGAcopounder patent [2] for Coperion.

3. Optimization of volume, torque and speed Figure 3 shows schematically the development of large free cross-section areas and torques. Both are roughly doubled by use of slim shaft / screw connections, 2-start screw profiles, new materials and manufacturing processes, connected with suitable drive trains and discharge parts. The small shear rate achieved by deeper cut sections, in connection with shorter residence times, permits an increase in speed by a factor of around ten, to 1,200-1,800 rpm.

All these developments promote improvements in cost-effectiveness, which since 1980 has risen at an average of 6% per year. Productivity has however also been improved by gentler processing and more frequent re-lamination.

Many extruder manufacturers offer a series that exhibits high torque and another one with large free volume. What is important is the choice of the best system for a particular product palette.

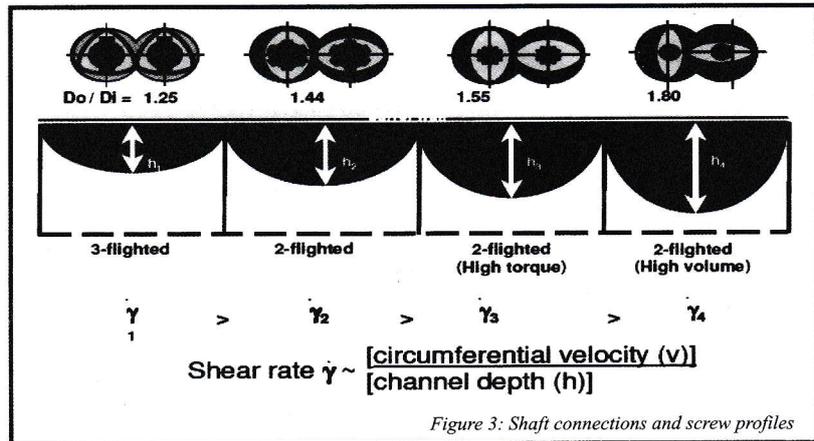


Figure 3: Shaft connections and screw profiles

Compounding of Renewable Materials

Figure 4 shows the throughput limits for the current ZSK range by diameter ratio. The material intake limit is defined by the raw material density; in most cases of low densities this is due to fluidization effects. The torque limit is set by design factors deriving from resistance torque, material, geometry and the specific mechanical energy input required for the process.

The 20% increase in torque to 13.6 Nm/cm³ achieved by the ZSK Mc PLUS range is optimum for processes where the raw material densities are between 0.3 and 0.5 g/cm³ and the specific mechanical energy input required is between 0.15 and 0.25 kWh/kg. This range covers the majority of engineering plastics and also thermoplastic starch (TPS) blends and polylactide (PLA).

The large volume ZSK MEGA volume has a diameter ratio of 1.8 and a specific torque of 8.7 Nm/cm³ (=SC torque), which is ideal for processes with a specific energy input requirement of less than 0.15 kWh/kg and for a wide range of raw material densities.

When handling products which fluidize, better venting often results in a disproportionate increase in throughput.

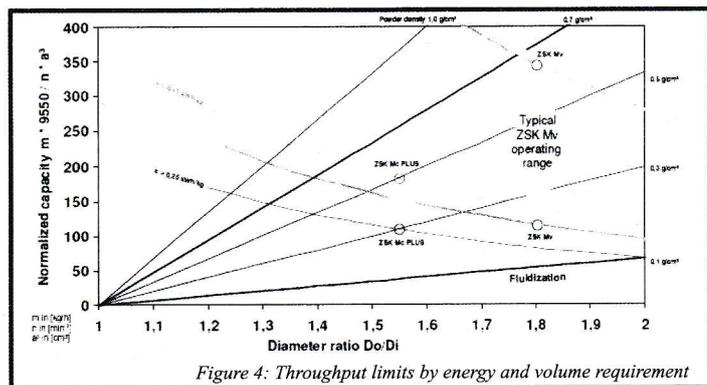


Figure 4: Throughput limits by energy and volume requirement

Figure 5 shows application examples for volume-limited products such as directly expanded and modified starch (incl. loose fill material), breakfast cereals and pet foods.

Figure 5: Volume-limited products - These all lie within the throughput / energy diagram under the torque curve of the ZSK MEGA volume.

The throughput limits can be imposed by volume, also by temperature, residence time or product quality.

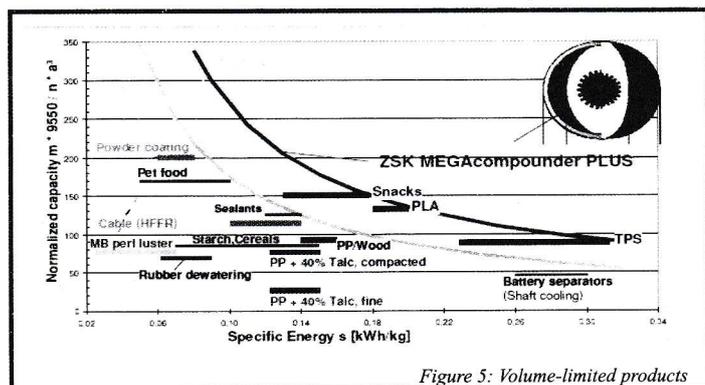


Figure 5: Volume-limited products

Figure 6 shows the application areas for torque-limited products that lie under the 20% increased torque limit curve of the MEGAcoupler PLUS. This includes savory snacks, and also PLA and TPS.

4. Pelletizing systems

Table 1 shows a system of conventional pelletizers, whereby melt that is extruded through the die holes is converted into pellet form [3]. There is a choice between air and water as the medium in which the product is cut, cooled and transported. Cooked starches are soluble in water and are sticky, so air is the preferred medium for their cutting and cooling. PLA and TPS blends are strand pelletized at low throughputs, but at large throughputs they are cut in an underwater pelletizer, in which the pellet cooling is also achieved under water. For wood fiber-reinforced products water ring pelletizer is particularly well suited; the product is cut in air with little backpressure and the taste of scorched wood is avoided by rapid cooling in water.

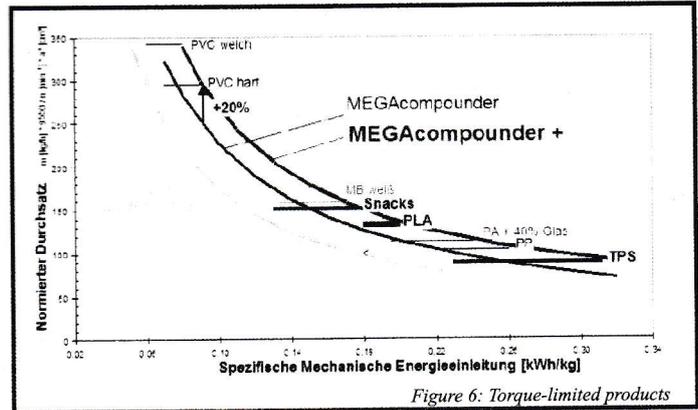


Figure 6: Torque-limited products

5. Biologically degradable materials (BDM)

Figure 7 shows the application range of twin-screw compounders in plastics recycling [4]. This can be performed as material, by degradation or biologically. The basic idea for biologically degradable materials is that of closing the CO₂ cycle by photosynthesis and composting or combustion. Products that are vegetable-based such as TPS and PLA also allow the materials cycle to be closed, which today is the best way of fulfilling the important principle of sustainability by conserving resources and protecting against climate change.

The history of BDM is summarized in table 2. The first plastic discovered was cellulose in 1869, and this is a BDM; but since 1930 the development of plastics has branched off into fully synthetic plastics. Only from 1980 was this area once again addressed by the general idea of closed cycles. BDM patents and production have grown exponentially since that time, but so far up to a very low level (figure 8).

Table 2: History of BDM

1869	Celluloid from cellulose / camphor, first plastic, easily combustible
1923	Cellophane, from cellulose, water-sensitive, coated
Since 1930	Development of synthetic technical plastics and polyolefins
Since 1980	Exponential growth of patents for bio plastics
1988	Thermoplastic starch and blends
1998	Wood fibers with protein or lignin
2002	Poly lactic acid PLA from maize, first large-scale plant at Cargill Dow/USA

As well as from renewable vegetable sources, BAW are also available from animal proteins such as casein and from a petrochemical base such as poly vinyl alcohol or certain polyesters (Ecoflex).

Hot pelletizer systems			Cold pelletizer systems	
Cutting the polymer directly at the face of the die plate. The polymer freezes in spherical or lenticular form			Cutting the cold strand. Pellets are cylindrical or cuboid in form	
Cutting in air		Cutting under water	Cutting in air or under water	
Conveying and cooling by air	Pellet conveying and cooling by water		Pellet conveying and cooling by air or water	
Concentric pelletizing	Knife rotor pelletizing	Water ring pelletizing WRG	Underwater pelletizing	Strand or belt pelletizing
For products that are soluble in water, such as starch, TPS Throughput up to 10,000 kg/h	Filled or reinforced, non-sticky products such as wood fiber reinforced polymers Throughput 50 to 800 kg/h	Sticky or low viscosity products: PLA Throughput 50 to 14,000 kg/h	Throughput 50 to 75,000 kg/h	All materials except those that are too brittle. Throughput limited by ability to handle the strands (< 3000 kg/h), but automatic systems up to 25,000 kg/h (PET), TPS blends, PLA

Table 1: Pelletizer systems

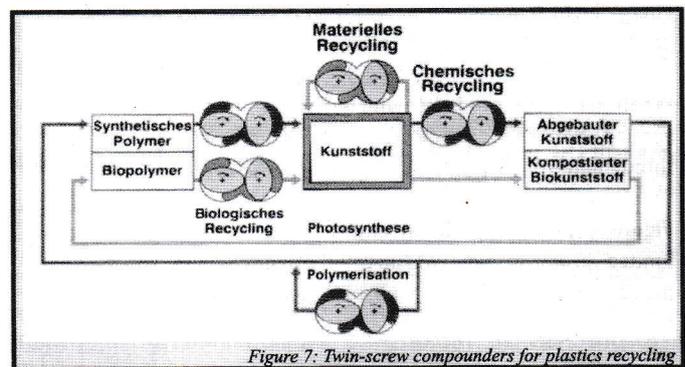


Figure 7: Twin-screw compounders for plastics recycling

Overall the percentage proportion of the total plastics market has grown from virtually 0% in 1980 to about 1% today and is projected to rise to 10% by 2020 [5].

The applications are predominantly in the areas of packaging, mostly for food, also for mulch films and other agricultural and garden products, biodegradable rubbish bags and hygiene products.

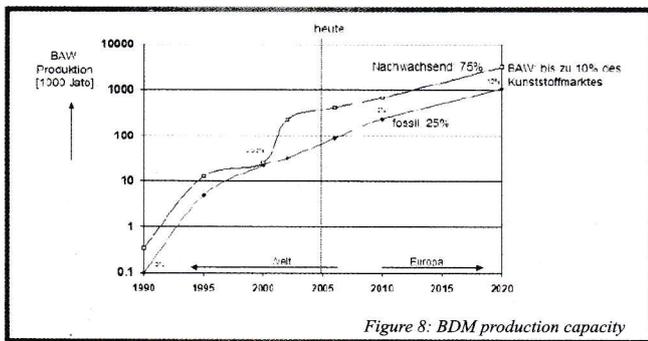


Figure 8: BDM production capacity

The reason for the development being slower than had been forecast has been largely due to the high price; and this in turn has been due to the small size of the initial production units.

Whilst standard plastics retail for less than 1€/kg, bioplastics cost 2-5€/kg. An attainable target is less than 2€/kg, and a further credit of 1€/kg could be allowed for the ease of disposal, were legislative conditions to authorise it. That would allow many bioplastics at least to approach the order of magnitude of standard plastics, and the real advantage of the closed loop cycle must of course also be acknowledged.

Sims takes recycling 'solutions' to new heights

Avon-based Sims Recycling Solutions expects to recycle record amounts of complex plastic waste, with their new technology. What the company described only 70,000 tonnes of plastic waste a year, and had been designed to cope with even larger volumes in future. Biagio Adragna, country manager for Sims Recycling Solutions, UK, said the volume of plastics entering its

as a "new, cutting-edge technological solution" to plastics recycling has been under development for the past five years. It has been trialled at the company's electronics recycling facility process had reached a point "that has allowed us to invest in chasing and refining different polymers in suitable volumes for sustainable markets. The new process can create a number of different polymers which are usable for

in Newport, Gwent, and is being rolled out on a large scale at Sims' new plastics recycling centre in Billingham, near Middlesbrough. Sims said the Billingham plant will process around compounding. "Our process is able to cope with a very complex set of plastics. Valuable plastics can be recovered from electronics or other material streams, either post-consumer, post-industrial or post-car shredder residues."

Dynomax making a push into medical molding

Wheeling-based company Dynomax Inc. plans during 2012's first quarter to boost its capacity to process thermoset and fluorosilicone resins with three new Arburg injection molding machines: two 110-ton electrics and one 28-ton

hydraulic. The company is making a "strong push into medical" molding and tool making, said Mark Zic, director of business development. Currently, "we are doing some small runs" in the medical market, he said. Currently, Dynomax operates 13 hydraulic

and seven electric presses with a total clamping-force range of 38-110 tons, shot sizes of 0.6-7.6 ounces and various vertical and horizontal configurations.

Pet Packaging - A Long Way to Go

-by P.S.Bhatnagar

Technical Director, Himalaya Polytech P. Ltd., Delhi

PET packaging is a green alternative to glass or aluminum cans. A 750ml glass bottle weighs around 400g. The same size in PET weighs 25g. A single-serve PET bottle (0.5 liter) is strong enough to hold nearly 40 times its weight in water. However, much of the progress with light-weighting in PET bottles has been channeled through the mold designers by reducing resin volume in the preform neck and base. The continued light weighting of bottles and other PET packaging, for both economics and an improved environmental footprint, coupled with increased use of recycled material, have been the main culprits behind the poor demand growth in 2010. PET packaging resin will see a prolonged period where capacity growth exceeds demand growth and operating rates decline. Unlike PTA this has been the norm for PET packaging resin.

Polyethylene terephthalate (PET) is one of the most commonly used food grade packaging plastics due to its chemical inertness and appealing physical properties. Bottled water is the fastest growing beverage industry in the world. Pharmaceutical, cosmetic, edible oil, domestic containers and herbal industry have also adapted PET bottles and wide mouth jars. You name any industry and will find end product packed in PET bottle, jar or film. PET film is replacing epoxy coating.

PET is a part of our daily life and Polymer technology advancement is opening new venues every day. Developed countries are spending big amounts in R&D especially for Green movement. Japanese blow molding equipment

maker Nissei ASB Machine Co. Ltd. is investing more than \$22 million to double the size of its factory near Mumbai in Maharashtra.

ENSO of Mesa, Arizona USA in an effort to help reduce the tons of discarded plastic bottles accumulating in our world's landfills brings biodegradable technology to the plastic packaging industry. These bottles are not Oxo biodegradable or PLA plastic (corn based) bottles. These are plastic containers that biodegrade in anaerobic (landfill) environments, breaking down through microbial action into biogases and inert humus leaving behind no harmful materials. These bottles are recyclable and can be mixed into the recycling stream with other plastic bottles.

The research sponsored by Husky Injection Moulding Systems found PET production resulted in less Green House Gas emissions and used less energy than glass or aluminum cans. Two new Polyethylene terephthalate Glycol (PETG) packaging materials have been launched by Spartech Corporation (Missouri USA) in 2009 claimed to be more environmentally friendly than PVC. Printpack, Atlanta- Georgia USA has developed a PETG film with a matte finish and light protection barrier to help fruit juice and dairy product makers replace expensive containers. Light exposure can damage the quality of yogurts, milk and fruit juices, reducing color, vitamin content and flavor. The Eastman Chemical Co. USA has developed a resin for thick wall applications that outperforms standard

PET resin. Heavy wall cosmetic bottles are also produced from 100% PCR PET resin, which is manufactured by DAAI Technology Co., Ltd., Taiwan.

India is one of the fast growing economies among BRIC countries. All types of plastic containers are being largely used to pack end products. Most of the heavy Glass containers are being replaced by PET. In certain areas, even tin is partially replaced by PET, HDPE or PP containers. More than two decades ago we were advised to control the increasing population, no doubt it would have been a right step but today this population has become our strength. Whatever we manufacture, we can sell completely in our country. Purchasing power of our people has increased in the last ten years. Big brands in almost all the sectors have established their manufacturing units in western and southern parts of the country like SIDEL blowing machines and injection molding machines Ferromatic Milacron and LT Demag. Other technological giants like Husky of Canada, Krauss Muffel of Germany and Netstal of Switzerland have their sales and service office in Maharashtra. This has helped our manufacturing sector to buy western advanced technology equipment at a lower price as the same imported from the West would cost more.

Growth rate of PET industry is believed to be 15 to 17% in the next few years and presently 10% of the population using PET bottles is a significant market. The pace of change in India is accelerating, all commodity Retail Sale - 205 Billion

USD (55%); Organized Retail-6.2 Billion USD (3%)(Source IMF and World Bank). In India most of the PET bottles blowing units are in the unorganized sector and are unable to meet the quality standards. There are two big consumers of PET bottles-one is country liquor manufactured by distilleries and the other drinking water packers. The forward focus for fillers is resource-efficient supply, driving the market toward on-site manufacturing options, be it HTW (hole-through-the-wall), self manufacture, or blow molding of performs.

Consumption of bottled drinking water in rural area is growing at a high rate because of scarcity of drinking water. PET bottles and the sun are helping millions of people in developing countries obtain potable water. Using a system called SODIS (solar water disinfection); inhabitants set water-filled PET bottles in the sun for several hours or days - depending on how much sunlight is available - as a simple but effective means of destroying disease-causing bacteria and gaining safe drinking water.

The development of heat-stable PET barrier containers is opening new markets such as juices, preserves, pickles, cooking sauces, soups, and baby food, which are traditionally packed in

glass containers. Further opportunities lie in cold-fill applications such as honey. There is a large scope for packing household chemicals, detergents, cleaners and personal care in PET bottles.

Alternative packaging for Wine, Beer, Milk and Honey in PET bottles is not new but the contents must be protected from ingress of oxygen for increased shelf life. There are companies selling additives for oxygen barrier and claim to raise shelf life by 6 to 8 months. PolyShield, a new PET resin from INVISTA PET Kansas USA, that is currently available in selected markets, provides outstanding oxygen scavenging and excellent passive gas barrier to monolayer containers.

The bottles produced with NOVAPET GLASSTAR from Spain, have a perfect distribution of material in the container wall, which in turn, gives it an extraordinary appearance, with the brilliance and transparency of glass bottles.

As with PET bottles, these bottles, as well as having an excellent appearance, have the added advantage of being light, unbreakable, and cheaper to produce. China is also not lagging behind in the R&D race and they have developed antibacterial additive of zirconium phosphate carrying silver ions, a new

dimension to international standards. These antibacterial agents are developed for PET containers. Himachal Pradesh and Kashmir are well known states of Apple plantation. It is said that large quantities of Apple are wasted every year because of non availability and high cost of transport. If apple juice filling plants are established near apple orchards on cooperative system, millions of PET bottles can be used and tons of Apples can be saved. Lichi crop in Bihar can work on the same system.

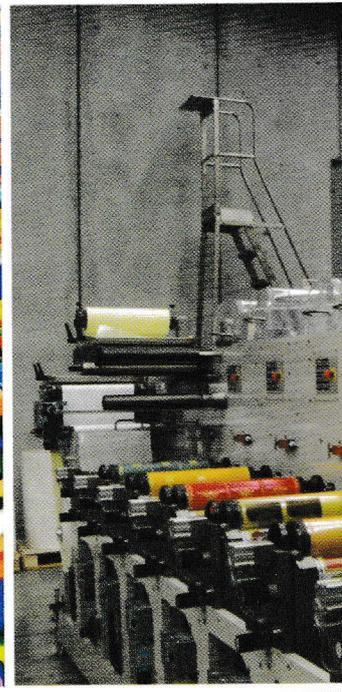
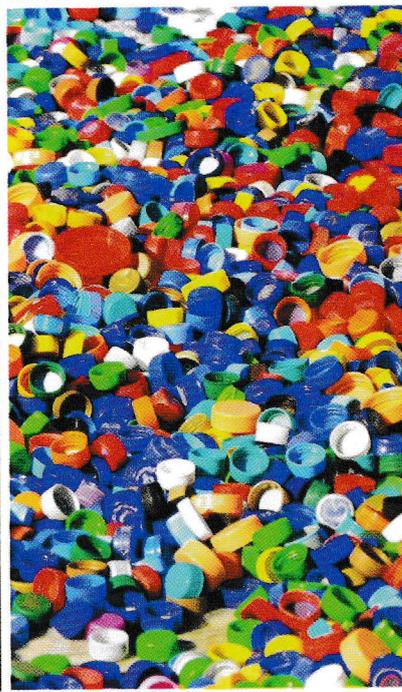
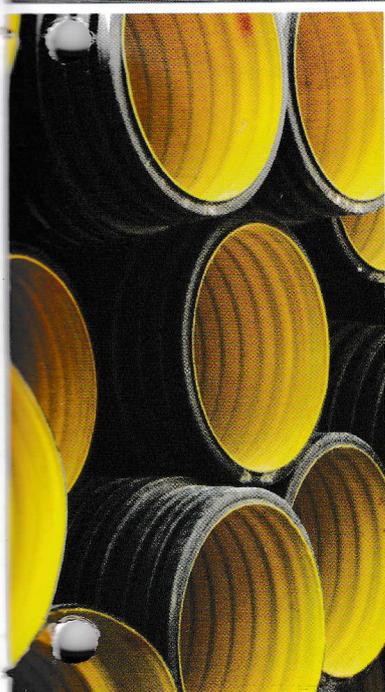
End-user segments are dispersed all over India so the development of small regional processors of PET bottle blowing is on increase as a result of rising cost of transportation. Local juice filling plants (semi and fully automatic) will raise employment opportunities for people living in villages or small towns who can earn better by learning new hygienic methods of packaging. Training can be imparted in plastic bottle blowing and quality control procedures through Industrial Training Institutes (ITI). Such ITIs can be opened in important towns of every state to meet the growing demand for operators and machine maintenance technicians on automatic PET bottle blowing machines. There are 22,000 plastic processing units of which three-fourth are in the small scale sector.

Contd. to Page 21

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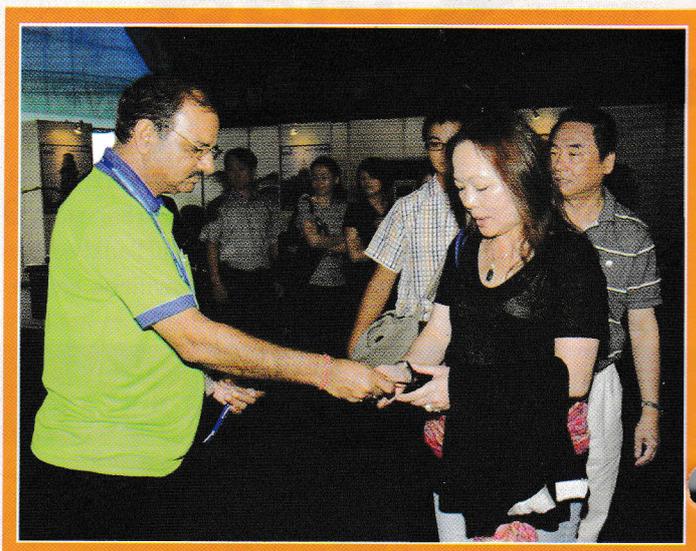
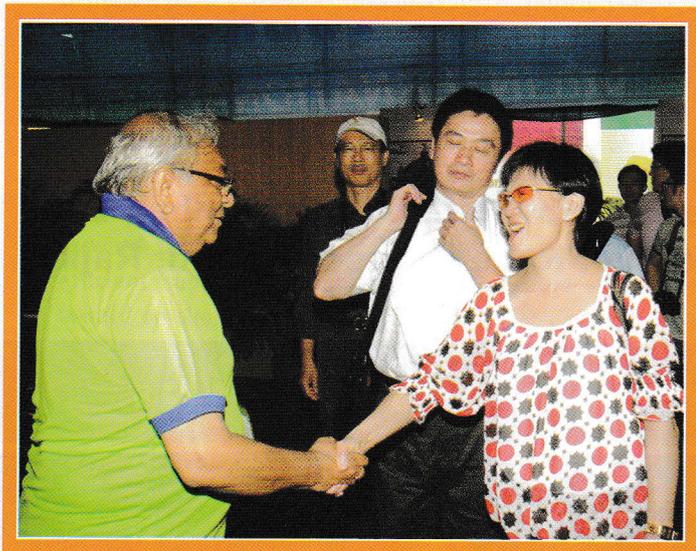


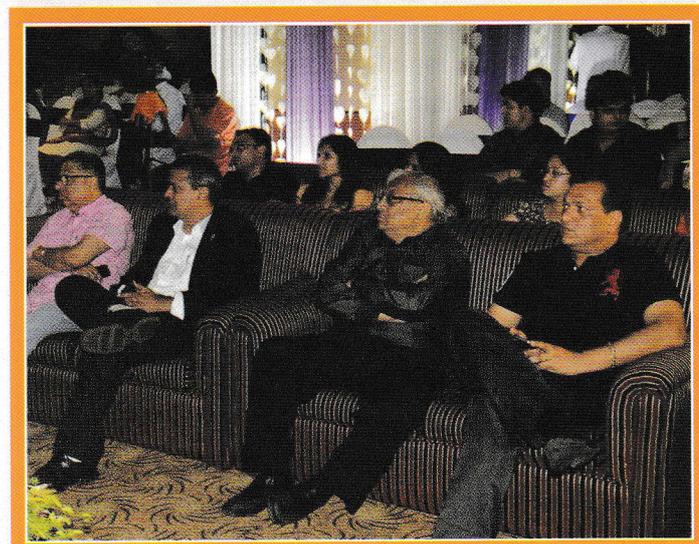
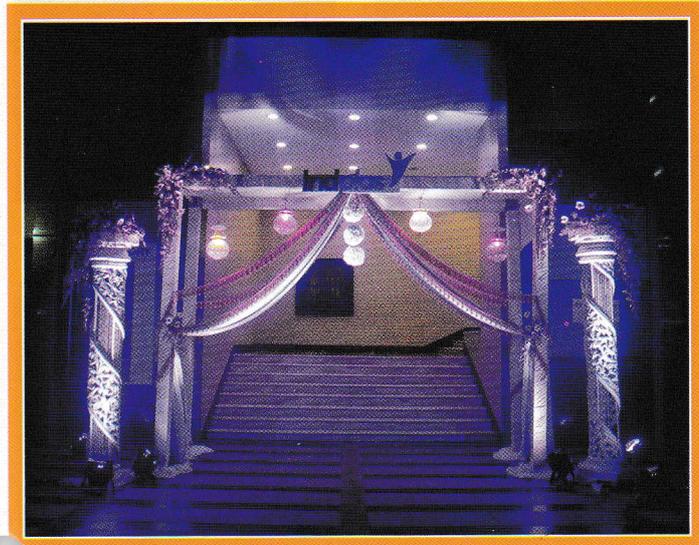
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GLIMPSES OF INDPLAS '12 EXHIBITION AT KOLKATA







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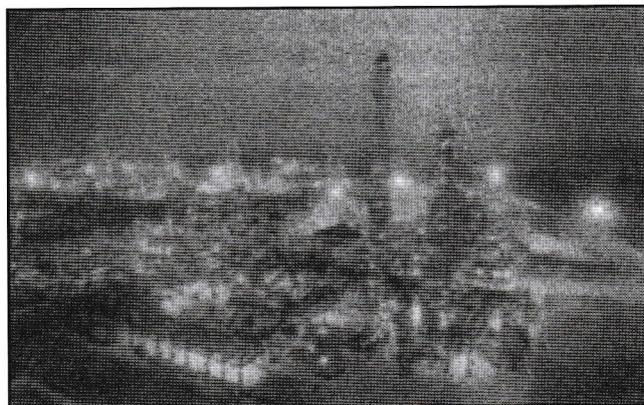
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EXPANSIONS / JVs / Tie-UPS

Chevron Phillips to Expand Facilities in Texas

Chevron Phillips Chemical Co LP is moving ahead with a massive project to add two Polyethylene (PE) plants with total annual capacity of 2.2 billion pound. The plants will be located either at the firm's Cedar Bayou complex in Baytown, Texas, or at its Sweeny facility in Old Ocean, Texas.

Chevron Phillips is ranked as North America's largest maker of high-density PE with a market share of 20 per cent of the annual capacity. The firm ranks fourth in low-density PE with 8 per cent share and sixth in Linear Low-Density Polyethylene (LDPE) with a 4 per cent share.



Final site selection is set for the first quarter of 2012. The total cost of the project is estimated at \$ 5 billion. The PE plants are part of a larger project for installing a new ethylene feedstock cracker in Baytown. This cracker will use natural gas-based ethane, and the annual capacity will be 3.3 billion pound. The project is expected to be completed in 2017.

LyondellBasell to Spend \$1.5 Billion on New Plants and Expansions

LyondellBasell Industries NV will spend \$ 1.5 billion on new plants and expansions to add about \$ 1 billion a year to pretax earnings by 2016. The company will start with ethylene capacity expansion

by increasing production at its facility in La Porte, Texas. Subsequently, it will undertake China PO/TBA Plant Study, which is an agreement to conduct a joint feasibility study to construct a world-scale PO/TBA plant in Ningbo, China.

Further, to take advantage of low-cost natural gas supplies, LyondellBasell plans to restart a 780,000 Tons Per Annum (TPA) methanol plant at Channelview, Texas. The Channelview plant is expected to increase its capability to process low-cost ethane feedstocks by an additional 500 million pound per year. The company is also advancing on a project to build a new metathesis unit at Channelview, which is planned to increase propylene production. Butadiene expansion will be done at Weaseling by 40 per cent, through a debottlenecking project.

PolyOne Expands Globalization with New Middle East Joint Venture

PolyOne Corporation, a global provider of specialised polymer materials, services and solutions, has announced an agreement with E.A. Juffali & Brothers Company Limited to form a joint venture that will enable PolyOne to expand its Global Color, Additives and Inks business into the Middle East. The new joint venture will be 51% owned by PolyOne and will be based in Jeddah, Saudi Arabia.

The joint venture will be investing in a new manufacturing facility focused on the production of specialty color concentrates with the potential for expansion into other product lines in future phases. The initial investment is expected to be approximately \$14 million and will take place over the next nine to twelve months with local production forecast to come on-line in late 2012.

E.A. Juffali & Brothers

Tel: +966 667 2222

Email: juffali@eajb.com.sa

Web: www.eajb.com

Eco-Friendly Engineering Polymers Preferred by Automotive Industry

Engineering polymers, with their ability to improve performance, safety and offer eco-friendly solutions, are finding rapid uptake in the Mexican automotive industry. The polymers' light weight enhances motor performance, which in turn reduces gas consumption and environmental degradation, while increasing the vehicle's resistance. Their cost efficiency, versatility and breadth of applications are helping them gradually edge out the competition from traditional materials such as metal and glass.

New analysis from Frost & Sullivan on the Mexican Market for Engineering Polymers in the Automotive Industry, finds that the market earned revenues of over \$757.5 million in 2011 and estimates this to reach \$1.31 billion in 2017 with a compound annual growth rate (CAGR) of 9.6 percent. The following markets are examined within this research: acrylonitrile butadiene styrene (ABS), polyamides (PA), polycarbonate (PC), polyoxymethylate (POM), and polybutylene terephthalate (PBT).

"While PC and PA are the most common engineering polymer replacements for metal and glass, POM is an effective alternative for metals that have a lot of wear, just as PBT is for electrical components," said Frost & Sullivan Research Analyst Agustina Zarich. "ABS frequently replaces commodity plastics because of its lower price and greater performance properties." Due to its proximity to the American market, the free trade agreement between both countries, and low labor costs, Mexico has become a favored investment destination within the automotive industry.

Despite the market's potential, the lack of technical preparation by the Mexican transformation sector limits the development of new engineering polymers applications. This in turn can lead to incorrect handling of these polymers. The market will also be affected by the rise in energy and raw material costs. The oil market's supplies are expected to suffer in 2012, and the tightness in the supply will increase oil prices. Furthermore, the market is feeling the pressure from low-cost Asian competitors, as they have larger

scale production units, making their costs much lower than those in Mexico. Asian products pose the biggest threat within the ABS market, as China and South Korea are the biggest importers.

The Mexican transformation sector needs international-quality personnel to be able to compete at the highest level and this can only be achieved with substantial investments in training. With a more prepared and better trained workforce, the market will have a greater opportunity to succeed.

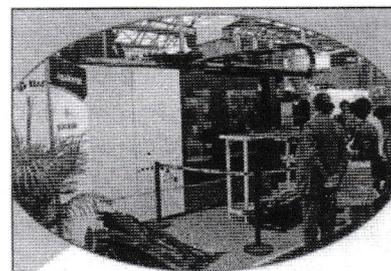
Meanwhile, new resources for polymer production will prevent the market from being buffeted by the volatility of oil prices and allow it to break free from the trends in the oil and gas industry. In order to counter competition from Asian companies, market participants will have to stand out through product differentiation.

In Mexico, the focus is on processability, fire retardancy, strength and heat resistance. Many blends are being developed to address these goals, including the PC/ABS blend that balances high-impact strength, surface finish, and a high flow for better processing. These advances are expected to boost the value of engineering polymers and make them the material of choice among automotive manufacturers.

Source: Frost & Sullivan

610g Automotive PP Part Moulded in 50 Sec

Haitian produced an automotive interior part (PP, shot weight: 610g, cycle time : 50 sec) on its second generation two-platen injection moulding machine JU1300 II / 1500 (clamping force : 1,300 t, 120 mm screw diameter). According to the company this range has been designed in-house by Haitian with intellectual property and eleven patented items.



www.haitian.com

PVC Slush for Dashboards, TPE for Sealings

CTS Automotive Compounds (Changshu) Co., Ltd. is a WOE (Wholly Foreign Owned Enterprise) by Tessenderlo Group (Belgium) and engaged in R&D and production of high-end compounds for automotive applications.

The company also supplies PVC Slush which is mainly used in the cortex material of automobile dashboard and door panels. At the exhibition the company presented its Marvyflo material, a range of free-flowing powder compounds for the slush moulding of instrument panel skins and other interior automotive surfaces. The material offers high freedom of design, a stress-free configuration, and a good cost-performance ratio combined with a soft leather-like touch.

www.tessenderlo.com

Multilayer Tubes for Fuel Lines

Ube Industries Ltd. exhibited its high performance fuel tube Sunbesta that has been jointly developed in cooperation with Asahi Glass Co. This two layer tubing system, made of an inner layer of ETEE (Ethylene Tetrafluoroethylene, brand: Fluon) and an outer layer PA12 (Polyamide, brand: Ubesta), features very good barrier performance and chemical resistance and is mainly used for fuel tubes. Another 5-layer tube on display was the Ecobesta multi-functional tube adhesive. This kind of tube is not only used in fuel lines but also as air brake tube. Customers for this multilayer fuel tubes include companies such as Zhejiang Iron Auto Parts and Chongqing Sulian Plastics.

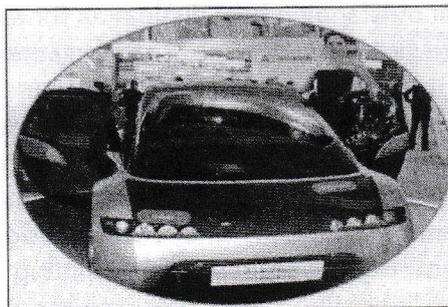
Also on display was an air intake manifold made of Nylon 1015GNKF (tensile strength: 190 MPa, Flexural modulus: 9.8 GPa) which has better performance over conventional polyamide grades in mechanical properties, heat stability and welding strength.

www.ube.co.jp

Concept Car "Artsis" Has it all

Mitsubishi Chemical Holdings Group is predestined to present "Artsis", a sophisticated concept car.

Due to the replacement of glass and metal by thermoplastic materials, mainly Polypropylene and



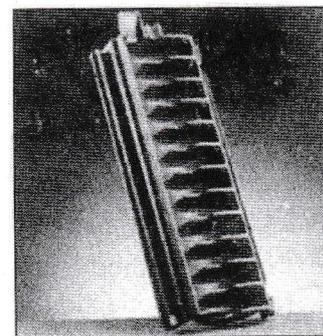
Polycarbonate, the weight could be kept low at only 490 kg, leading to an EV driving range of 210 km. The main materials and applications are as follows:-

- Roofing: PC (Polycarbonate)
- Chasis & Bonnet: CFR (Carbon Fibre Reinforced Plastic)
- Underbody Sheets: PP- foamed GMT (Polypropylene foamed Glass Mat Thermoplastic)
- Front End Module: LF-PP (Long Fibre Polypropylene)
- Solar Cells: OPV (Organic PhotoVoltaic)
- Body: Low CLTE PP (Low Coefficient of Linear Thermal Expansion Polypropylene)
- Floor Mat: PLA+PP Fibre (Poly Lactic Acid + Polypropylene)
- Light: Organic EL (Organic Electroluminescent Lighting)

Besides the massive employment of thermoplastic materials, the car also features LED front lights and a Lithium battery, all from the company's own production. With this concept car Mitsubishi is demonstrating not only how the car of the future may look, but also showing that the company itself is well prepared for the future.

PolyOne Specialty Solutions to Address Key Challenges for Automotive Engineers

PolyOne Corporation has launched three new grades of *Therma-Tech™* specialty engineering materials for automotive lighting systems and new *OnColor™ SmartBatch™* concentrates for automotive interior parts.



With their outstanding heat dissipation functionality, the three new *Therma-Tech™* formulations offer automotive Original Equipment Manufacturer (OEM) lighting engineers more design options. In addition to expanded design freedom, light-weighting potential and efficient manufacturability, these formulations help manage hot spots and enable designers to implement High-Brightness Light-Emitting Diodes (HB-LEDs) in lighting systems for new cars & trucks. The new materials offer customers varying degrees of heat stability, enabling them to select the most appropriate solution for their application.

The new offering of *OnColor™ SmartBatch™* concentrates for automotive interior parts not only fulfils carmakers' requirements for colour, but also prevents dust from collecting on finished parts in the automobile. *OnColor™ SmartBatch™* concentrates are available as drop-in solutions for injection moulding and also for use in compounding lines.

Hard Centres with a Soft Shell

Featured as part of Engel's presentation in Mannheim was its Dolphin-Technology which went into volume application for the first time at the end of last year in the Mercedes Actros. Using this



process means that the moulded parts with soft-touch surfaces in the passenger compartment can be manufactured in a single stage.

The production line, which is operated by Sole S.p.A., Oderzo/Italy at the Daimler works premises in Wörth/Germany, is composed of an Engel duo injection moulding machine with a horizontal intermediate rotary table system, a multiple -axis industry robot and equipment for physical foaming.

First of all the mineral-filled PC-ABS carrier is injected and then foamed in place with thermoplastic elastomer in one total machine cycle. That is why the Dolphin-method represents an economic alternative for the production of hard/soft components in

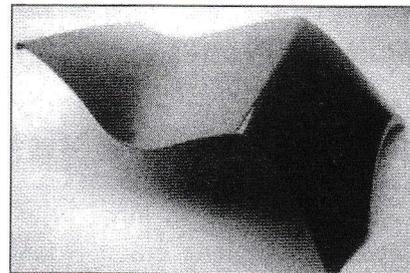
comparison to other conventional multi-component and foaming methods.

The highly integrated manufacturing method has been developed by Engel Austria in cooperation with mould manufacturer Georg Kaufmann, Busslingen/Switzerland as well as with plastic manufacturer BASF, Ludwigshafen/Germany and P-Group, Filderstadt/Germany. "The production start proceeded as planned", says a satisfied Michael Fischer, Sales Manager for Technologies at Engel. "The Dolphin-method's potential is enormous due to the high level of process integration as well as of the high quality concerning the components' surfaces. Negotiations with clients to start further volume applications are currently in progress."

www.engelglobal.com

Rapidly Moulded Sandwich Components

Even for large-area parts such as exterior paneling, interior trim, and concealed bases/supports, the use of sandwich design allows



weight savings of up to 60%. In this type of structure, face sheets of fibre-reinforced resins or thermoplastics are applied on a light but high-strength core.

Rohacell foam from Evonik is distinguished in this application by its strength coupled with low weight and high heat resistance. In cycle times of about 2min, the foam core is thermally formed into the geometry required for the component, and is then quickly processed with, for example, high-performance resins at temperatures well above 130°C and high pressure.

In combination with fibre reinforced thermoplastic face sheets, the foam is also said to offer another cost-effective method for production of panels, with the finished part available in less than 4min. The foam core is heated along with the thermoplastic face sheets and formed, and in the same operation the two are bonded together, cooled, and removed from the mould.

www.evonik.com

New techniques to increase 3-D visualization of flame retardants

A collaboration between researchers from Albemarle Corporation, Louisiana State University (LSU), and the Center for Advanced Microstructures and Devices (CAMD) has led to innovative new methods that will increase 3-D visualization of flame retardant and synergist components using element specific X-ray tomography. This research shows that it is possible to visualize key polymer additives in 3-D without damage to the polymer or test sample. Brominated flame retardants and synergists are important polymer additives for fire safety. The ever increasing demand for fire safety, lower cost products and greener chemistry in consumer products drives extensive research aimed at creating more efficient and green flame retardants.

Dispersion of the additives in the polymer matrices is critical to their efficiency and use. The spectroscopic tools and mathematical methods developed in this collaboration allow researchers to study both the dispersion of brominated materials and synergists to develop more efficient and greener blends. "Our collaboration with LSU has been very successful and has led to new insights benefiting polymer additives, especially brominated flame retardants and synergists," says Joop de Rooij, Albemarle's R&D director. "New tools developed in this collaboration allow us to more accurately study dispersion and address performance issues in real commercial flame retardant application. This effort enables Albemarle to maintain our technology

leadership in this highly competitive field by adapting and developing new and advanced products faster than the competition." According to Professor Les Butler of LSU and CAMD, "Working with Albemarle has clearly been a good situation. We have learned a lot about practical polymer and imaging technology and with this knowledge we have been able to develop the novel and powerful visualization tools."

The work is funded through a Grant Opportunity for Academic Liaison with Industry (GOALI) from the National Science Foundation. Principal investigators with Professor Butler are Professor Randall Hall of LSU, and Dr. Larry Simeral, Distinguished Advisor at Albemarle.

Bayer recognized for wind-blade technology

Bayer MaterialScience LLC has developed a new polyurethane-based composite technology for wind-turbine blades, which has been recognized by the U.S. Department of Energy. According to the release the DOE invited Bayer to display a prototype wind-turbine blade root ring – the ring that wraps around the base of the blade where it is fastened to the wind turbine blade shaft – at the recent American Wind Energy Association (AWEA) Off-Shore Windpower conference and exhibition in Baltimore.

A development team led by Bayer found polyurethane chemistry to dramatically improve fatigue and fracture toughness properties over epoxy-based systems used commercially today. The development was funded by Bayer, the DOE and Molded Fiber Glass Cos. Inc. in a public/private sector partnership. "It's gratifying for our development to be highlighted, particularly in light of the many wind technology projects funded by the DOE's energy efficiency and renewable energy program in the past year," said Mike Gallagher, director, Public Sector Business, Bayer. Bayer

said DOE saw value in the company's proposal to develop materials that allow blades to be lighter, stronger and longer. A key property for wind turbine blades is the inter-laminar fracture toughness. The incorporation of carbon nanotube reinforcement technology into the polyurethane composites improved the fracture toughness by as much as 48 percent, Bayer claimed, adding that this is double the fracture toughness of epoxy. Bayer said it is working to expand this work to manufacture, test and certify full-scale prototype blades in collaboration with wind industry experts.

Mixing carbon nanotubes with polymer can boost bactericidal action in thin films

Carbon nanotubes can kill bacteria and prevent the formation of virulent and corrosive biofilms, probably by puncturing the microbes' cell walls. As a result, scientists think the nanomaterials could produce antimicrobial coatings for surgical equipment and industrial piping, as per PRW. However, nanotubes are difficult to turn into effective coatings, toxic to people at high concentrations, and expensive. Now researchers led by Debora F Rodrigues at the University of Houston report that mixing nanotubes with a specific polymer can produce thin films that are still effective at killing bacteria, but use very low concentrations of

nanotubes. When mixed into a solvent or applied to a surface alone, carbon nanotubes tend to clump together. These nanotube clumps produce uneven coatings and have relatively small surface areas exposed to the environment, decreasing their ability to kill microbes. Previous research showed that mixing nanotubes with polymers could help break up these clumps. The team wanted to know what proportion of nanotubes they needed to add to such a mixture to retain the nanotubes' antimicrobial properties. They chose the polymer called polyvinyl-N-carbazole, because they could easily use it to form thin films on metal surfaces through

electrodeposition. They tested a mixture of 3% nanotubes with 97% polymer by weight. In a liquid suspension containing the nanotube-polymer composite along with *Escherichia coli* and *Bacillus subtilis* cells, the nanotubes damaged or killed 94% of the *E. coli* and 90% of the *B. subtilis*. When they used the mixture to produce a thin film, the scientists found that it completely inhibited the formation of biofilms on the metal surface. The nanotube-polymer mix also killed up to 90% of both species of bacteria added to the surface, about the same effect as that produced by a coating of carbon nanotubes alone.

Waldorf introduces Check 'n 'Pack technologies for barrier packaging

Automation group Waldorf Technik, based in Engen, Germany, has introduced Check'n Pack, a system for inspecting and verifying the quality of the EVOH layer in PP-EVOH-PP barrier packaging. Injection moulding of this barrier technology has existed for a few years, but Waldorf says there was previously no way of checking that the EVOH barrier layer was fully and equally injected throughout the body of the container. The Check'n Pack module allows 360° inspection of the rim, side wall, bottom and injection point.

Kortec, which supplies the co-injection mould technology for the system, says levels of both oxygen and water vapour barriers are very high and allow a shelf life of up to two years. Waldorf claims that for high volume products that are currently retorted or aseptically filled, such as fish, meat, fruit and pet food, switching to barrier packaging would yield savings of 30-40% compared with tin plate packaging. Waldorf has also highlighted other barrier packaging technologies it has developed. The firm is already well known for its expertise with in-mould labelling processes,

and these include IML using a barrier label. Another technique it has been working on is 3D in-line coating for thin-wall packaging. It has worked with various coating substrates from German company Cavonic, which Waldorf says are low in cost and provide a barrier and similar hermetic properties to glass.

The company says laboratory tests have shown the process to achieve a barrier against oxygen permeability of 99.15% after sterilisation.

UFP Technologies launches new branding

Georgetown based UFP Technologies Inc., a producer of custom-engineered foam components, products and specialty packaging, has unveiled its new unified brand. All of the

company's various brands and product lines, including United Foam, Molded Fiber, Simco Automotive, United Case, and others, will now be marketed under the UFP Technologies brand

name. "Over the past eight years, we have doubled our sales, entered new markets, and added many important capabilities," said Mitch Rock, vice president of sales and marketing.

London's Former government minister backs plastics recycling

Labour MP for Barking and former government minister Margaret Hodge got 'up close and personal' with a recycling facility in her constituency this week. Hodge toured Closed Loop Recycling's plant in Dagenham, East London, to see how plastic waste is recycled and hear about the 'green jobs' that can be created when such businesses set up. She was also told by Chris Dow, Closed Loop's managing director, how much waste is exported, rather than

processed in the UK. "If this material stayed in the UK it would reduce our imports of virgin raw materials and would create sorting and reprocessing jobs in the country," Dow said. "We're not asking the government to stop waste exports altogether, simply to create a level playing field for the UK recycling industry by reviewing the existing system which currently favours export of materials rather than domestic recycling," he added. Dow said at least 50,000 new UK

recycling jobs could be created if 70 per cent of waste collected by local councils was dealt with in the UK, rather than exported. Hodge, who was accompanied on her visit by John Williams, chief executive of business support service Gateway to London, said: "I was really impressed with the plant and the work Chris and the company do. It is not only benefitting the environment but helping to create new jobs at a time when they are much needed," she added.

German packaging association slams bag tax

The German Green Party has called for a tax on plastic carrier bags in the country, which has drawn a fierce response from the German Association for Plastics Packaging and Film (IK Industrievereinigung Kunststoffverpackungen EV). The party is proposing a 22 cent tax for plastic carrier bags in order to promote alternative packaging materials. IK said in a statement the German Green Party is justifying its call on the basis of plastics pollution in oceans. IK said: "Has the Green Party actually missed the fact that for over 20 years great success

has been made in the area of disposal and recycling of plastic carrier bags within the framework of the packaging directive? By now, the recycling quota of plastics packaging has reached 97 percent. As a consequence, there are no littering problems with plastic carrier bags in Germany, nor do they end up in the sea in large quantities. This statement by the Green Party is simply wrong." The group claimed more than 90 percent of German consumers collect packaging for recycling. It also criticized a suggestion that carrier bags should be made from plastics

derived from renewable resources that decompose in the environment. Bad Homburg-based IK said: "A plastic material that decomposes by itself within a short period of time is currently not available. Rather, these so called biodegradable carrier bags are sorted out in German composting plants, as their decomposition is taking too long. In addition, they are not suitable for the recycling process." In this context, the Green Party would be well advised to listen to factual arguments and not to build up an ideological enemy stereotype."

BASF Conducts Pilot Project to Promote Composting of Organic Waste in Pune

- **Supported by Pune Municipal Corporation, project launched in conjunction with World Environment Day**
- **Initiative to showcase benefits of diverting organic waste from landfill**
- **Certified compostable and fully biodegradable bags made of BASF's Ecovio® used to collect and process organic waste**

On the occasion of World Environment Day, BASF, with the support of the Pune Municipal Corporation, announced the launch of its pilot composting project. The project aims at promoting composting of source-separated organic waste in certified compostable and fully biodegradable bags.

"Through this project we wish to promote composting as the most effective and efficient method for organic waste management. Further, the launch of this joint project in conjunction with World Environment Day aptly exemplifies the theme 'Green Economy: Does it include you?' as it serves to demonstrate how a community can contribute to and benefit from a sustainable future," said Dr. Tobias Haber, Head, Specialty Plastics Asia Pacific, BASF.

As part of the project launch, composting awareness booths were stationed in two residential complexes in Pune. Certified compostable and fully biodegradable bags made of BASF's Ecovio were distributed to residents, to source-separate organic waste. The compostable bags made of Ecovio with source separated organic waste were collected and transported to an industrial composting site the next day.

Speaking about this initiative, Mr. Prasad Chandran, Chairman, BASF Companies in India & Head South Asia said, "BASF is committed to creating chemistry for a sustainable future. Through this pilot project, we aim to showcase our efforts and contribution in the biodegradable plastics segment to protect the environment and reduce greenhouse emissions. It is a privilege to partner Pune Municipal Corporation

towards promoting a green initiative on the special occasion of World Environment Day."

Together with BASF, we are excited to explore the potential for composting of source-separated organic waste as a sustainable alternative to landfilling. Composting of organic waste will significantly reduce greenhouse gas emissions. Additionally, the compost produced is a marketable commodity that can be returned to the soil to improve soil quality, reduce fertilizer use and serve as a cost-effective alternative for landscaping", remarked Mr. Suresh Jagtap, Joint Commissioner, Pune Municipal Corporation.

Landfilling of organic matter is environmentally detrimental as it generates methane, a greenhouse gas that is 23 times more potent than carbon dioxide. As organic waste has a high water content, incineration is also not a suitable alternative as it requires significant amounts of energy and results in higher emissions of carbon dioxide.

As the global market leader in the area of biodegradable polymers, BASF's solutions include compostable and fully biodegradable shopping and waste bags made of Ecoflex® and Ecovio (a compound of Ecoflex and polylactic acid). Such bags ensure that source-separated organic waste can be sent directly to industrial composting sites to be processed and converted into high-quality compost without having to separate the bags from waste. As such, industrial composting with compostable and fully biodegradable bags is the most efficient and effective waste management option for organic waste.

The high water content in organic waste also makes it difficult to collect and transport it in paper bags. Waste bags made of biodegradable, compostable plastic on the other hand make collection of organic waste more hygienic as they are tear-resistant and provide a barrier to odors.

BASF has been actively involved in similar projects worldwide to demonstrate the potential of composting as a feasible and effective waste management option for organic waste. Most recently in Australia, BASF partnered with Woolworth (supermarket chain), Zero Waste Australia and the Murrumbidgee Shire Council

in the Cooperation for Organics Out of Landfill (COOL) project, providing proof that composting of organic waste on farm as well as by local councils, can be done safely, hygienically and at a low cost. A video which documents the project over a 12 week period is also available at http://youtube/J-x1xsz_6Jw

Bid to Ban Plastic Bags Met with Ambivalence in Halifax



A bid to ban plastic bags in Halifax Regional Municipality is garnering ambivalent reaction from the city's business community.

After Toronto's city council approved a motion to ban plastic shopping bags last week, a Halifax city councillor says Halifax should follow suit.

Coun. Dawn Sloane is expected to give her city hall colleagues a heads-up Tuesday of her plan to bring forward a motion next week to study a plastic bag ban.

"The amount of waste just from plastic bags is unbelievable," she said in an interview on Monday. "Most plastic bags end up in landfills and take thousands of years to break down."

The bold move to ban plastic bags in Toronto began as a debate to quash an unpopular five-cent fee tacked onto plastic bags there.

However, the city was criticized for not studying the proposal first and faces an impending legal challenge over the ban, according to reports citing Mayor Rob Ford.

In Halifax, Mayor Peter Kelly warned against bringing in a knee-jerk policy on plastic shopping bags and suggested a longer-term strategy is needed.

Yet Sloane said most plastic bags don't end up recycled and have a harmful impact on the environment.

She added that reusable cloth bags have become a mainstay of many shopping trips and that a full transition away from plastic bags is an attainable goal.

The proposal to study a plastic bag ban has drawn both praise and criticism from businesses.

"Personally and philosophically, I think it's great," said Mike Hamm, manager at Bookmark Inc., an independent bookstore in downtown Halifax. "For the longest time we've encouraged people not to take bags."

While plastic bag use has dropped significantly in the 13 years Hamm has worked at Bookmark, he said they still come in handy when it's raining.

"We always ask first if a customer needs a plastic bag and for the most part they decline. The exception is when the weather is damp. It's just the nature of our product that when it's raining a plastic bag does come in handy."

Some stores in Halifax have already started charging customers a nickel for plastic bags.

Pete's Frootique was one of the first in Halifax to charge for plastic bags in 2007. The five-cent fee goes toward the grocer's green committee, which aims to make the store and its food packaging more environmentally friendly.

The charge doesn't seem to deter shoppers from the upscale food market, however, as many bring their own reusable bags.

But Atlantic Superstore backed away from its policy of charging customers five cents for every plastic grocery bag two years ago after its plan backfired.

Meanwhile, Coles, Indigo and Chapter's bookstores charge five cents for plastic bags across the country, which goes toward the company's reading foundation.

Hamm said charging for plastics bags would be a nuisance for Bookmark customers.

"We want to make people happy when in our store, not aggravate them."

For the same reason, Hamm said a transition period would be necessary if a plastic bag ban was approved by city council.

"We'd need some time to make the switch. It might encourage us to get some cloth bags made."

Leanne Hachey, Atlantic vice-president of the Canadian Federation of Independent Business, said a plastic bag ban would have a major impact on businesses and consumers.

"This is something that would have to be examined closely in consultation with businesses," she said.

While she said larger retailers would likely adjust fairly smoothly, a plastic bag ban would have a disproportionate impact on smaller businesses.

As for backing away from a ban and going with the less heavy-handed plastic bag tax, Hachey said Nova Scotians already have enough taxes.

Source: <http://thechronicleherald.ca/business/106030-bid-to-ban-plastic-bags-met-with-ambivalence-in-halifax>

NPE 2012 Recycling Program Surpassed NPE 2009 Achievement

Other than food, none of the waste generated by exhibitors or visitors in the giant exposition ended up in landfills, according to SPI and the Convention Center.

For five days in April, the NPE2012 international plastics exposition transformed the Orange County Convention Center (OCCC) in Orlando, Florida into a virtual manufacturing city, generating many tons of industrial scrap in addition to packaging and other post-consumer waste. None of it, however, ended up in landfills, according to the OCCC and SPI: The Plastics Industry Trade Association, which produces the triennial NPE.

Final figures provided to SPI by Maine Plastics, Inc., the official recycler for NPE2012, indicate that the production scrap generated by machinery operated on the show floor by 56 exhibitors participating in the "NPE Recycles" program amounted to 260,208 lb. (118 metric tons). This was more than double the 125,040-lb. (57-ton) total for NPE2009, where 45 exhibitors participated.

A rule set by SPI required that scrap generated during NPE2012 by exhibitors not participating in the NPE Recycles program could not be disposed of as waste.

These exhibitors were responsible for having their process scrap delivered to the OCCC loading dock for sorting off-site.

NPE week also generated large quantities of post-consumer solid waste—908,620 lb. (413 metric tons), according to the OCCC. All of this was recycled except for 157,700 lb. (72 tons) of food waste, which went to landfills.

In addition to having more participants and recycling more scrap than in 2009, the 2012 NPE Recycles program collected 67% more scrap on a per-exhibitor basis, noted A.J. Janosko, SPI's director of trade show operations. "Individual exhibitors generated more scrap during NPE2012 than in 2009 chiefly because they had more machines operating on the show floor," Janosko said. "The economic and logistical advantages of exhibiting in our new venue in Orlando, along with the improved business climate, encouraged equipment companies to invest more in their booths, resulting in what SPI called 'The Return of the Machines'."

NPE is a triennial international plastics exposition solely owned and produced by SPI: The Plastics Industry Trade Association. NPE2015 will take place March 22-26, 2015, at the Orange County Convention Center in Orlando, Florida.

Petrochem Wire: All Grades of Recycled Polyethylene Fell in May

By Editorial Staff, Resource Recycling

Recycled polyethylene prices fell across the board in May, tracking the prime PE market down and reflecting increased availabilities for both domestic and export markets.

Pellet prices were down at least 5 cents per pound, with dairy natural pellets in the low 60s cents per pound and black reprocessed HDPE around 58 to 60 cents per pound. LDPE film grade natural pellets sold in May in the mid-50 cent range. June deliveries were being discussed at still lower levels at the end of May.

In the regrind market, fractional melt material was mostly in the mid to upper 40s cents per pound, depending on color. HMW regrind hovered closer to 50 cents per pound, down 3-4 cents. Generic prime PE prices dropped 6-7 cents per pound in May.

Recycling of Plastic Packaging Across Canada up by 15% in a Single Year

The Canadian Plastics Industry Association (CPIA) released a new report on June 11 on the increased recycling efforts in Canada based on the amount of post-consumer plastic packaging being recycled across the country. The report noted that there was a 15% increase in plastic packaging recycled in 2010 compared to 2009 as reported by Moore Recycling Associates Inc. This increase is the result of more material collected for recycling as well as more companies providing recycling information. In total, over 217 million kilograms of post-consumer plastic packaging were collected for recycling in Canada.

The results are derived from a survey of over 500 companies who are handling recycled plastics in North America. These companies are made up of reclaimers, exporters, brokers, MRFs (Material Recovery Facilities) and other handlers of used plastics.

"We are elated that around 70% of the plastic packaging collected, was recycled in Canada. This amounts to more than 149 million kilograms. We are building a recycling industry in Canada, re-using valuable plastic materials and creating jobs to grow the economy" says Carol Hochu, President and CEO of the CPIA.

Plastic packaging collected for recycling includes plastic bottles, non-bottle rigid plastics such as deli and dairy containers, bakery, vegetable, fruit containers, and plastic film, bags and outer wrap. These valuable resources are reused to make, for example, fleece jackets, new plastic bottles, pipe, pallets, crates and buckets, decking and other lawn and garden products.

The plastic recycled quantities reported for 2010 by Moore and Associates Inc. compared to 2009 represent an increase of 13% for bottles (for a total of 150 million kilograms), an increase of 6% for non-bottle rigids (for a total of almost 30 million kilograms) and an increase of 36% for plastic bags and outer wrap (for a total of almost 37 million kilograms). Of particular note, there was over a 50% increase in plastic film and bags collected for recycling from commercial businesses. In addition, of the total film and bags recovered, a third came from consumer curbside recycling programs across Canada. CPIA continues to work with partners

and stakeholders across Canada to increase recycling opportunities and it appears to be paying off.

And even better, Canadian recyclers of plastics want more supply; they have underutilized capacity creating ample opportunity for consumers and businesses to supply our recyclers with more plastics.

For instance, it is estimated that the film and bag recycling capacity in Canada to be at 38% utilization of the capacity and non-bottle rigid recycling capacity is at a 47% utilization of the capacity. There is plenty of room to increase plastics recycling. "Given the large access to plastic recycling collection programs across Canada, we are calling upon consumers and businesses to participate in them. Used plastics are valuable resources to be re-manufactured into new products," says Cathy Cirko, VP of CPIA.

The Canadian Plastics Industry Association (CPIA) is the voice of the Canadian Plastics Industry. With over 3,198 companies employing 91,530 workers, Canada's \$26.3-billion plastics industry is a sophisticated, multi-faceted sector encompassing plastic products manufacturing, machinery, moulds, and resins.

Reverdia 'Bio' Joint Venture Announced

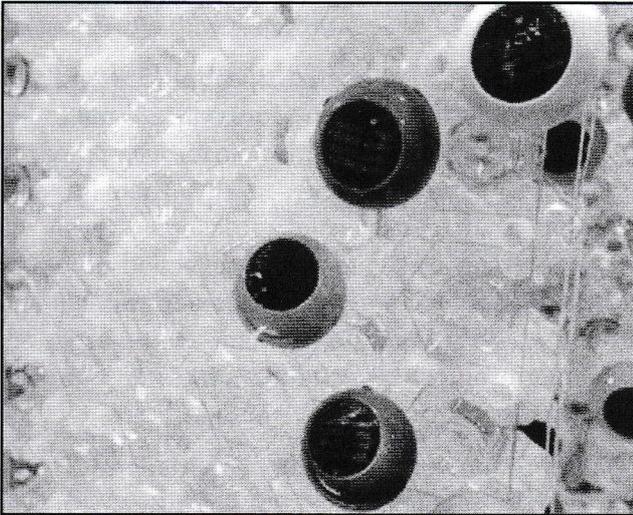
Royal DSM and Roquette Freres announced the formal regulatory approval and launch of Reverdia, a joint venture established to develop technologies and production of bio-based Succinic Acid, under the Biosuccinium brand. It is derived from non-fossil feedstock that can be used in the manufacture of polymers and resins for packaging and paints. The product has been under development since 2008 and a large-scale facility for commercial production, at the Roquette site in Casso Spinola, Italy, is scheduled to be operational by the end of Q3 2012.

www.reverdia.com

College Grads in Caps, Gowns Put a New Spin on Recycled Bottles

At their recent commencement, more than 5,000 graduates at George Washington University joined hundreds of thousands of other students across the country in forgoing traditional polyester gowns for versions made entirely from bits of melted plastic.

When George Washington University's Class of 2012 marched across the Mall in D.C. to accept its degrees recently, the nation's backyard was transformed into an eco-fashion runway.



Sure, the men wore dress shirts and slacks while the women donned colorful spring dresses and shoes that wouldn't sink in soft soil. But on top of these outfits, each GWU student sported the newest trend: gowns made from plastic bottles.

More than 5,000 graduates at GWU joined hundreds of thousands of other students across the country in forgoing traditional polyester gowns for versions made entirely from bits of melted plastic.

"The 'green' gowns look and feel the same, and the students were really excited," said Robert Blake, the manager of the GWU bookstore and a member of the university's regalia committee. "For us, this was really a no-brainer."

The eco-friendly fashion statement is part of a larger effort by colleges and universities to reduce the carbon footprint of commencement ceremonies. With paper graduation announcements and diplomas, and plastic cutlery and tableware for nonsustainably grown meals and snacks, graduation day has been an eco-warrior's nightmare.

That began to change several years ago. Unity College in Maine, for instance, sends online invitations, while Pace University in New York prints programs on recycled paper with soy ink. Boston University uses compostable tableware. New York's New School

decorates with local, seasonal flowers. Southwestern University in Texas serves organic refreshments. College of the Atlantic in Maine, which has never used caps or gowns, has had zero-waste graduations since 2005.

And then there are George Washington University's plasti-gowns, each spun from 29 post-consumer bottles. In all, about 145,000 bottles that might otherwise have ended up in landfills hung from the shoulders of the graduates.

In addition to GWU, several other schools, including Catholic University, Johns Hopkins University and the University of Maryland, used graduation gowns made of plastic bottles (with such brand names as "Repreve" and "GreenWeaver"). Georgetown University used the "Elements" line of gowns, made of tree fibers and certified by the Department of Agriculture as a "bio-based" product.

Herff Jones, the company that sells GWU's gowns, reported that 140 U.S. schools placed orders for its gowns this year. Virginia-based Oak Hall Cap & Gown reported orders from more than 100 schools.

It is important to note that these gowns are nothing like the plastic ponchos donned by weathermen reporting from the eye of a hurricane. (You know that's what you're picturing.)

The "green" gowns look and feel just like the ones worn by previous generations because — fun fact — the gowns of yore were made from the same material that is used to make plastic soda and water bottles.

But instead of using virgin polyester, the gowns are made from recycled bottles that have been crushed or melted down into pellets and then spun into polyester yarn. The yarn is knit into fabric, dyed and sewn into any type of clothing, from graduation garb to ball gowns.

In most instances, according to manufacturers, the recycled gowns cost slightly more to produce, but they sell for nearly the same price — \$1 to \$2 more — as the standard ones. GWU undergrads paid \$42.95 for the gown, or \$51.50 for cap and gown.

"There are a few more costs associated with it, but not enough to make us want to raise our prices," said Tom Carew, a vice president at Herff Jones who oversees the cap and gown division. "We're just glad to be able

to maintain our commitment to doing good in the world."

Over the next 18 months, Carew said, Herff Jones expects to develop a recycled-materials fabric that can withstand dry cleaning and multiple wears as part of its rental program. Until then, the company will collect recycled gowns after graduation, break them down and re-recycle them into new gowns.

Recycling bottles into fabric began in 1993, when the outdoor-clothing manufacturer Patagonia introduced fleece products made of post-consumer bottles. Now, such companies as Hanes and Under Armour make athletic garments out of plastic bottles. For the 2010 World Cup, some teams — including the U.S. soccer squad — wore Nike uniforms made from recycled bottles.

Stores ranging from the hip Brooklyn Industries in New York to the high-end Fred Segal in Los Angeles have sold plastic-based T-shirts coveted as much for their softness as their eco-cachet.

Even couture designers have sipped on the "green" Kool-Aid: At this year's Oscars, Livia Firth, actor Colin Firth's wife, wore a Valentino gown made of polyester produced from plastic bottles. But for universities, the recycled gowns go beyond making a fashion statement.

"Using recycled gowns really fits into the ethos here," which includes student groups dedicated to sustainability, a campus garden maintained by students and a new minor in sustainability, said Sophie Waskow of GWU's Office of Sustainability.

"This is a really great time to be greening our campus, and we hope our students will carry on this commitment after they leave GW."

Source By: http://seattletimes.nwsources.com/html/nationworld/2018289998_green_gowns27.html

Battenfeld-Cincinnati Extrusion Line Tailored to Meet PVC Recycler's Needs

Tönsmeier Kunststoffe GmbH & Co. KG of Germany has recently purchased a pelletizing line from leading extrusion specialist battenfeld-cincinnati. The high output of the line, which features a twin-screw extruder was extremely important for the

manufacturer of high-quality PVC regrinds. "The overall package of reliability, user-friendliness and service was the decisive factor" according to Dr. Marc Schmidt, Managing Director of Tönsmeier Kunststoffe.

The recycling specialist is an important player in regrind production, and also produces high-quality secondary window profiles and technical profiles from the regrind. In both fields, Tönsmeier relies on extrusion equipment from battenfeld-cincinnati.

Most recently, Tönsmeier purchased a pelletizing line with a BEX 2-135-28V twin-screw extruder and decentralised hot-cut pelletizer GWH 130 to produce h-PVC granulate. The infeed product for this line is a homogeneous h-PVC regrind produced by Tönsmeier itself with a grain size of 6 to 13 mm and a high purity level of 99.7 per cent. Tönsmeier uses a continuous screen changer to filter out any residual contamination and metal particles, reportedly with 100 per cent reliability. battenfeld-cincinnati has integrated this screen changer, which was already present at Tönsmeier, into its complete extrusion system. The complete system operates with a BMC touch control system. "This control system is well organised and user-friendly, which is of great help to us in daily production", said Schmidt.

The integration of the screen changer is not the only feature which has been customised specifically for the customer. With its optimally adapted screw geometries, the extruder is ideally suited for the tough task of processing h-PVC. The screws are armored with a special anti-wear coating. A three-component metering device with variable mixing ratios and integrated metal separators enables the creation of individual compounds.

Tönsmeier is a recognised waste disposal and recycling specialist and holds DIN ISO 9001 and REACH certificates. It is a well-established partner of the German Plastic Pipe Association KRV, cooperating in collecting, processing and recycling pipe materials, and is also a partner of the recycling initiative Rewindo, an association of the leading German plastic profile manufacturers for compliance with the voluntary

European product stewardship commitment in the PVC industry.

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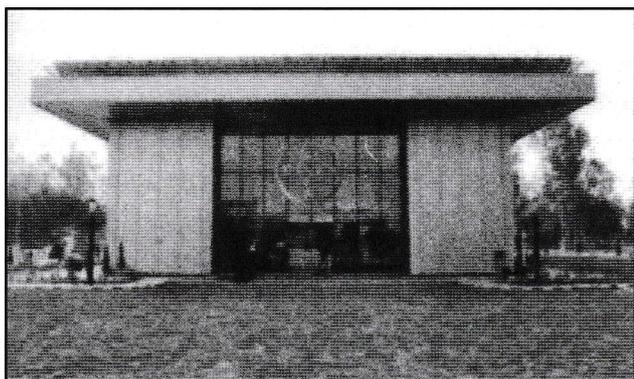
Email: austria@battenfeld-cincinnati.com

Web: www.battenfeld-cincinnati.com

Category: Processing Equipment & Ancillaries > Pipe and Profile Extrusion

Processing Equipment & Ancillaries > Pelletizing & Compounding Equipment

Highest LEED Platinum Rating for Bayer's ECB in Greater Noida



Bayer's EcoCommercial Building (ECB) in Greater Noida, India, has received a highest score in the category of 'New Construction' (NC) of the International rating system Leadership in Energy and Environmental Design (LEED). The building was awarded 64 points out of a total possible score of 69 points. Bayer's ECB achieved the maximum number points in three out of six categories, namely, 'Water Efficiency', 'Indoor Environmental Quality, and 'Innovation & Design'.

The Bayer ECB at Greater Noida now has the highest score in the LEED NC rating worldwide. "We are pleased to have received the Platinum ranking with highest points in the prestigious LEED rating system. This is a clear signal that the concept of ecologically sustainable buildings can be achieved with the right materials. This is independent of whether the building is located in the developed world or an emerging market," said Thomas Roemer, Vice President-Industry Platform Construction and Building, Bayer MaterialScience AG.

Bayer had opened its first emissions-neutral office building in Asia as part of its Group-wide sustainability programme in Leverkusen, Germany. The new building in Greater Noida draws 10 per cent of its electricity from a Photovoltaic (PV) plant, needs about 50 per cent less power than comparable buildings in the area. Bayer's ECB has added a wide range of individual energy conservation measures such as Envelope (thermal insulation for roofs), Windows (type of windows), Lighting and Central plant to the budget case in order to optimise the performance of the proposed building. Also, the energy used by the ECB on an annual basis will be obtained from PV cells installed on the roof-top, which can significantly reduce the environmental impact by preventing greenhouse gas emission and air pollution.

TerraCycle's Recycling Programme

TerraCycle has developed a **recycling program for cigarette foil, packaging and plastic waste**. The company has developed 38 collection sites across Canada as part of the program.

Agilyx Corporation has received Patent No. 8,193,403 which describes a **method of producing crude oil from scrap plastic**, as well as Patent No. 8,192,586 and Patent No. 8,192,587 that describe a system of using **sealable cartridges to transfer plastic feedstock**.

Boca Raton, Florida-based NextLife has received a letter of non-objection from the U.S. Food and Drug Administration and clearance from Health Canada to **produce food containers made from recycled polypropylene and recycled polystyrene**.

Several big **corporations are teaming up to develop and promote the use of plant-based PET**. Coca-Cola Co., Ford, H.J. Heinz, Nike and Procter & Gamble have announced the formation of the Plant PET Technology Collaborative, which will work to develop common practices, standards and applications for plant-based PET.

The Washington State Recycling Association will be hosting "In the Loop: The NW Carpet Recycling Value Chain" on June 21 at the Kent, Washington ShoWare Center.

The networking event is designed to **build new relationships between those collecting and recycling used carpet**.

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