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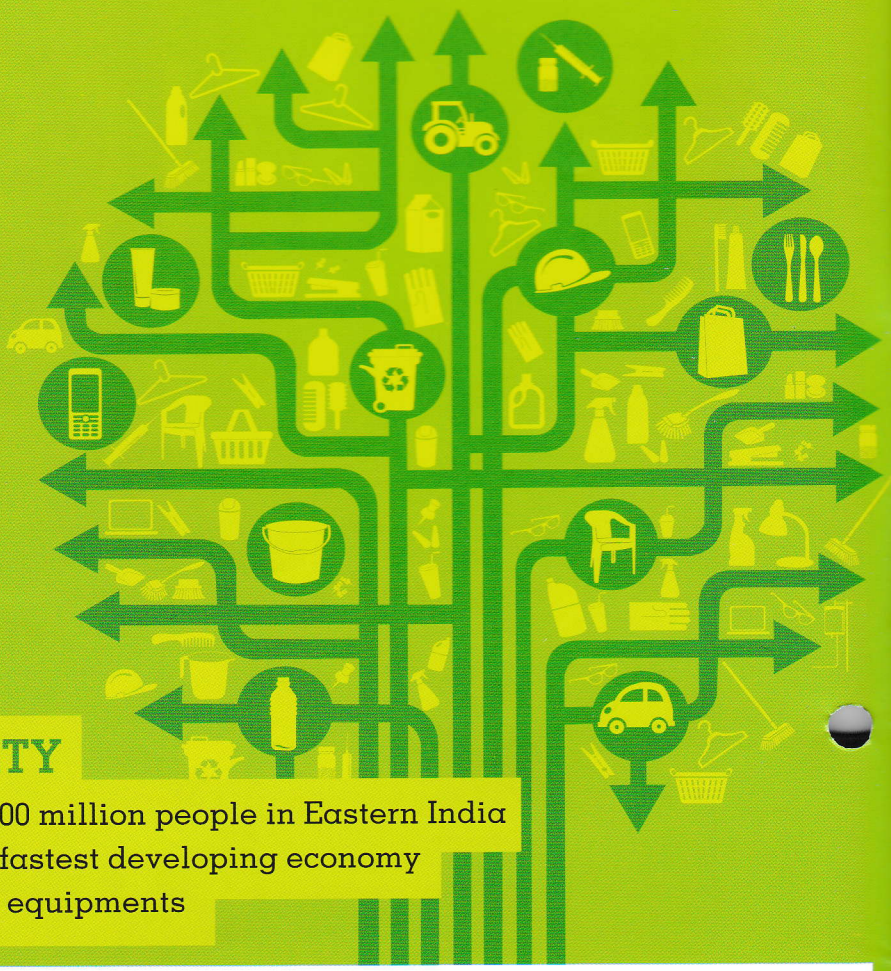
**India, October 5 - 8, 2012**



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**PLASTICS INDIA**

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



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**Editor : Sri Pradip Nayyar**



# Editorial

Dear Members,

Good day!

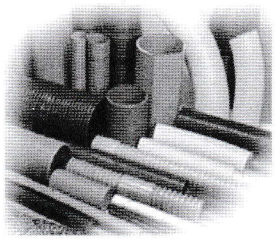
Petrol price has gone up drastically within the last 12 months. There may be an increase in diesel, kerosene and cooking gas in the near future. One of the most important factor that decides the future of our economy is the price of petroleum products. A small increase in the price of this has got widespread impact on the Economy. High cost of power and fuel will usually result in rise in the price manufacturers charge for their products, so that they are not selling products at below cost. Further, fuel cost increases the transportation cost of various products thereby making the companies to hike the price of their products. Rise in the price of manufactured goods will often translate into fewer sales, and can often cut into the profits of manufacturing companies. This causes inflation in the market and the performance of the economy is affected.

It is evident to every one how volatile the prices of petroleum in the global market is. Considering the fact that it is a non renewable source of energy and also the fact that India has one of the highest energy needs the world, it is not a cause of surprise to anyone how volatile Indian Economy becomes.

In addition to economic effects, hikes in power and fuel prices can dramatically affect a country's politics. Rise in power & fuel prices can translate into dissatisfaction amongst public with the government, occasionally leading stoppage of production in manufacturing units.

Yours truly,

**Pradip Nayyar**
Editor



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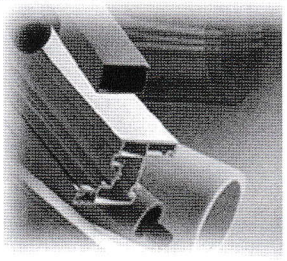
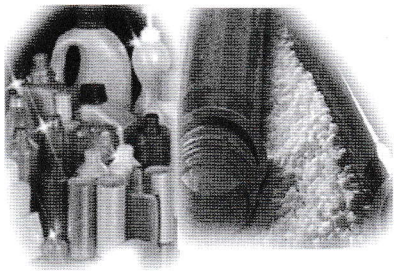
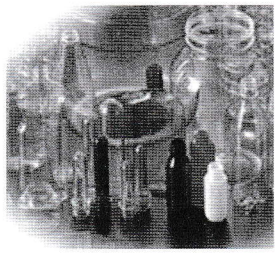






# PRESIDENTIAL ADDRESS

Dear Members,

Greetings,

I am glad that preparations for Indplas'12 is going on in full swing with full zeal and dedication by the Indplas'12 team. There is a good response from the exhibitors from western part of the country. I am sorry to note that the members and units from the eastern part of the country have not yet given their bookings for the space as exhibitors.

My request to all members is to please book the space at the earliest. As the total space has also been reduced due to installation of transformers and other electrical appliances we will have shortage of space and might be we have to deny late bookings due to over booking. Therefore, I would request all members to come forward at the earliest and book the space as per their requirement.

There was a grand programme at Plastindia to celebrate 25 years of existence at Mumbai. Myself along with Mr. Pradip Nayyar, Hony. Secretary, IPF attended the function.

With warn regards

**Rajesh Mohta**

*President*

# SECRETARIAL REPORT

Dear Members

With the advent of the month of June every body is looking forward to the coming of monsoon. Till the time of my message going to the press there is still no sign of rain and the humid and sultry heat continues. In spite of all these shortcomings Indplas team is working tirelessly for the success of the exhibition.

Members will be pleased to know that India Trade Promotion Organisation (ITPO) have granted approval to IPF to hold our exhibition Indplas'12 at Science City, Kolkata from October 5 – 8, 2012. With regarding to the participation of Pakistan and Taiwan they have requested us to get a No Objection Certificate (NOC) from the Ministry of Home Affairs and Ministry of External Affairs. IPF has written to both the Ministries to grant NOC for participation from Pakistan and Taiwan.

The Federation is organising a Press Conference and Industry Meet at Bhubaneswar on 20th June 2012 at The New Marrion, Bhubaneswar. The Federation has requested the Commissioner-cum-Secretary, Industries Department,Govt. of Odisha and Special Secretary, MSME Industry, Govt. of Odisha to grace the Industry Meet as Chief Guest and Guest of Honour respectively,

Members will be pleased to know that the Industries Department, Government of Gujarat has consented to participate in Indplas'12 by booking 75 sq.m. space. IPF has written to the Principal Secretaries and Director, MSME Development Institute of all the major states in India requesting them to participate in Indplas'12 on similar lines as Government of Gujarat.

IPF welcomes M/s Mukand Poly Products, Guwahati as a Life Manufacturer Member of the Federation.

As decided in a previous meeting of our Executive Committee, IPF has opened a Savings Bank Account with Indian Overseas Bank, Free School Street Branch, Kolkata.

With best wishes,

**Pradip Nayyar**
*Hony. Secretary*

# Cutting cost of plastic products using systematic approach for material selection, design and production.

**Mr. Pradeep Kamat**
pkamat@polysmart.com

With today's competitive, global environment, launching of new products and innovation within timeframe are critical to a company's growth and sustainability. The top priority for companies is to be first to introduce new product and ensuring cost reduction. It happens many times that the actual cost exceeds targeted cost. This is either due to increased costs on account of bad product design, bad tooling or delays or compelling conditions for changing materials to overcome manufacturing problems.

Product development must be done within a long-term strategic context that identifies customer or market needs, environmental, regulatory and compliance rulings and trends, customer value and financial considerations. This up-front effort will ensure speed to market, early revenues, and low costs at launch. Most companies spend little time in validating and improving their designs up front, and end up spending large sums on money in rectifying the ills of their efforts thus realizing lower profits. Many companies perceive the costs of design validation as a fruitless exercise as they believe they have the best of design or assume that mold maker or a processor would take care of their design flaws. In addition, the product development process is not well understood by most firms. Finding, developing, and exploiting new product growth can help corporations deliver sustained customer value with innovative products in existing, growing or emerging markets. It also allows corporations to be flexible, and target desired customers and markets, while enhancing customer satisfaction and maintaining a competitive advantage.

Developing a new product calls for a systematic approach where emphasis is more given in the design stage itself. It calls for virtually simulating the manufacturing process and the part performance. With technology this is possible and being used by leading companies. When product fails to meet the expectations it could be due to design, material, mold design, processing and product testing. Once the design is frozen, the component volume is fixed. The product cost is then determined by the processing cost which mainly is based on the tooling design. If sufficient cooling is not provided, the cycle time will be high, if filling is imbalanced, the clamp tonnage would be more. If gate location is not correct, cavity pressure will be high and would distort the part. Almost all the times, to overcome warpage problems which could be more due to tooling issue, a higher cycle time is maintained to overcome the issue. The mould with the machine and higher operating cost acts like a jig.

All of the above are like known overheads, but what about the unknown? If we are required to increase injection pressure to 1100 kg/cm2 instead of 780 kg/cm2 then how does it translate to increase cost? If your nozzle fitted on the machine is too long or if the runner system has higher pressure drop then what is the increase in power cost?

Do we calculate this? Certainly ot; because we do not know what should be the ideal settings. Scientific injection molding addresses the same. There are many ways of cutting the costs in your existing products as well as designing your new products which are energy efficient. We will discuss the same below.

The first step is to consider material for the application. In almost all cases there would be atleast 2-3 generic families that can be considered for a particular application.Various compounding grades are available or tailor made to suit your requirements. Based on the application,

determine the properties required by the product. Plastic materials are tested at a particular condition and the test methods that match well with the application has to be considered. For example, if you have a product on automotive exterior and if the vehicle will hit at 60 km/hr speed, there is no point in considering polymer tensile values tested at jaw separating speed of 5mm/min. The properties vary greatly with speed at which polymers are tested. For structural analysis Stress-Strain curves are more important. Selecting material on mouldability and property requirement can influence the product design and the cost. While selecting raw material, you should use the funnel method where, first you have all the material families and as per property requirements, you eliminate one by one and finally only few remain which can be compared for costs.

Next is product design which plays a vital role in product cost. Our general thinking is that we provide ribs to increase the rigidity of the product. The fact is, if the ribs are not of proper design or if they are wrongly placed, they can do more harm than benefit. Designers, would follow the rib design guidelines but can not guarantee that the designed ribs would give the necessary rigidity. Many times, designers do not refer to design guidelines provided by resin manufacturer and design ribs that are very thick and can cause sink marks on the product. I have come across a case where an automotive exterior grill was designed with tall ribs. Yes, as you increase the height of rib, the stiffness increases. The rib height was 65 mm with bottom thickness of 1.4 mm; imagine what would be the top edge thickness when a taper is provided for ejection? The designer did not think of the injection pressure requirement to fill the thin rib section. Thus, just going by design standards is not enough, but one has to validate the design for manufacturing. Sometimes the designer provides reverse draft or provides radius on matching surfaces. These issues are clearly brought forward in DFM studies. It is important to perform DFM study by neutral agency as the designer can not identify his own mistakes.

Another aspect is performing Finite Element Analysis (FEA). The success of FEA depends on the material data that is available. Stress-Strain curve, Young's modulus, % elongation at yield and break, properties at different material temperatures are important for accuracy of the results. Most of the resin manufacturers provide the data. If the input is corrected, you can be rest assured of the results. FEA can help in optimization of design. It is possible to save material by optimizing the product with FEA. The person performing FEA should be knowledgeable on polymer behavior. Using FEA, drop test, compression test, fatigue test, thermal behavior can be predicted. Thicknesses can be modified only in selected areas which have higher stress. Figure shows a Stress Strain curve.

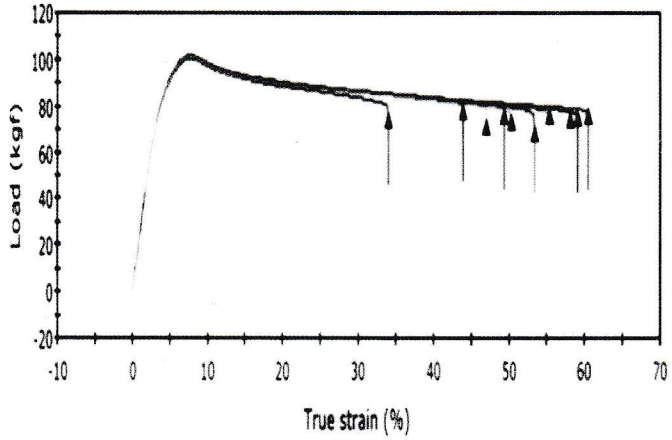
Moldflow simulation is a very important aspect of product design. Majority of Moldflow simulations are performed for validating the mold design. If this tool is to be rightly used, it should start from validating and updating the product design. Using Moldflow one can study the mouldability of resin, compare different grades, compare the effects of adding ribs (from warpage point of view), check

*Fig 3: Back Cover*

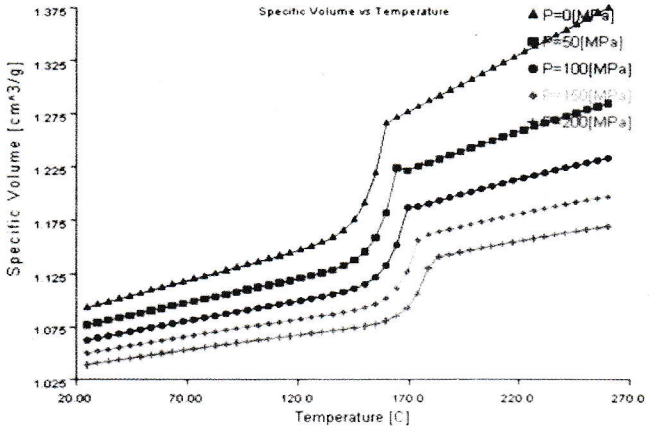
machine requirements etc. If one can save on product weight, runner system weight, energy cost, it will amount to tremendous savings with the product life. Different grades with additives behave in a different way while cooling. If you have a thick section where a sink mark is likely, the amount of sink will change based on the PVT (Pressure,Volume,Temperature) relationship of the material. The clamp tonnage is another aspect where the

| Thickness | Height | Mol |
|---|---|---|
| 3.9 | 25 | 54737 |
| 2.5 | 55 | 117441 |
| 2 | 55 | 81603 |

*Fig. 4: Effect of rib dimension*




True strain (%)



machine pump remains on for a longer time and consumes high energy. If the filling in the cavity is not balanced, the pressure starts building in the cavity the moment material touches the edges and can not flow further. Thus unbalanced filling would increase the cavity pressure and would need higher clamp tonnage to keep the mold closed. This would be the recurring expense for the added energy cost.

To drive the point what we discussed above, we will consider a back cover used for an appliance. Figure 3 shows a design of a back cover. We have studied how the product cost changes with the design. There are three cases; one with actual design with rib thickness almost same as base thickness, the second design is ribs removed and the third design is with rib thickness reduced but rib height increased.

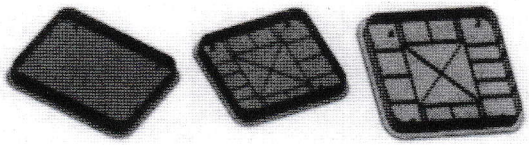
Figure 4 shows the effect of rib dimensions on Moment of Inertia.

As can be seen, reducing thickness by 50% and increasing rib height by 100% the Moment of Inertia has doubled which means the product is more stable.

Table 1 compares the three scenarios and the product cost. One has to further fine tune the design so as to reduce the cost of the product.

Thus when you have problems it should be understood that you should be aware of little expenses; small leakages can sink big ship.

When we design the mould, do we really calculate the vent lines needed?



| | Concept 1 | Concept 2 | Concept 3 |
|---|---|---|---|
| Raw Material / Machine Size | ABS / 380 T | ABS / 380 T | ABS / 380 T |
| Volume of Part | 1518 cc | 1345 cc | 1407 cc |
| Hold Pressure time | 60 s | 48 s | 48 s |
| Typical cycle time | 78 s | 62 | 64 |
| Sink mark depth | 0.19 mm | 0.04 mm | 0.06 mm |
| Warpage in Z axis | 0.98 mm | 1.03 mm | 0.96 mm |
| Product Cost | 282.98 | 242.63 | 253.98 |

*Table 1 : Comparing 3 scenarios with costs*

Does a mold maker design the vent lines by considering the fill time? We observe that one sets a particular fill time but actual fill time is high. Why this happens? The air inside the cavity has to also expel at the higher speed as the melt enters the cavity. If the air does not escape, it resists the material flowing inside the cavity. This leads to higher pressures to fill the cavity and increase in energy cost. The runner dimensions has to be based on the resin manufacturers specification for the part volume to be filled. There should not be more than 25% pressure drop in the runner system as it calls for higher energy requirements. Scientific injection molding techniques have to be utilized to find the optimum time and packing pressure required for gate sealing. There is a tremendous potential in saving energy costs in production.

Now a very important aspect of product cost. One has to really think of product delays that add to the cost. For example, an automotive B pillar trim mold costing about 15 Lakhs is delayed by two months on account of sink marks and warpage would add a cost of Rs 45,000/- on account of interest and adding to it, the person cost, trials cost and most important the opportunity cost, the impact would be tremendous. The profits that would have otherwise been generated in two months are wiped out and over and above costs have increased.

Summarizing the above discussions, I would say it is very essential to virtually simulate the product to verify the cost of product before you cut the steel.

ENVIRONMENT

# Use of Waste Plastic in Construction of Flexible Pavement

*Dr. Aslam, Professor & Head, Er. Shahan-ur- Rahman, Lecturer,*
*Department of Civil Engineering, Integral University, Lucknow*

**A modified technique was developed for construction of flexible pavements. In flexible pavement construction plastic coated aggregate showed better binding property. It has less wetting property and voids.**

## Introduction

Polymer modified bitumen is emerging as one of the important construction materials for flexible pavements. Use of plastic waste in the construction of flexible pavement is gaining importance because of the several reasons. The polymer modified bitumen show better properties for road construction & plastics waste, otherwise considered to be a pollution menace, can find its use in this process and this can help solving the problem of pollution because most of the plastic waste is polymers.

Various studies (1-5) are being carried out to improve the quality of bitumen used in bituminous road construction. One of the results of such studies is to use polymer-modified bitumen. Use of disposed plastic waste (specially plastic bags) is the need of the hour. The studies on the thermal behavior and binding property of the molten plastics promoted a study on the preparation of plastic waste-bitumen blend and its properties to find the suitability of the blend for road construction.

## Polymer Modified Bitumen

In the construction of flexible pavements, bitumen plays the role of binding the aggregate together by coating over the aggregate. It also helps to improve the strength of the road. But its resistance towards water is poor. Anti-stripping agents are being used. A common method to improve the quality of bitumen is by modifying the rheological properties of bitumen by blending with organic synthetic polymers like rubber and plastics. Studies on this subject are going on both at national and international level.

## Plastic Waste Scenario

The use of plastic materials such as carry bags, cups, etc. is constantly increasing. The consumption of plastics have increased from 4000 tons/annum (1990) to 4 million tons/annum (2001) and it is expected to rise 8 million tons/annum during the year 2009. Nearly 50 to 60% of the total plastics are consumed for packing. Once used plastic materials are thrown out. They do not undergo bio-decomposition. Hence, they are either land filled or incinerated. Both are not eco-friendly processes as they pollute the land and the air. Any method that can use this plastic waste for the purpose of construction is always welcomed.

## Characteristics of Plastic Waste

### Thermal study

A study of the thermal behavior of the polymers namely polyethylene, polypropylene, polystyrene shows that these polymers get softened easily without any evolution of gas around 130-1400C, this has been scientifically verified.At around 3500C, they get decomposed releasing gases like methane, ethane etc. and above 7000C, they undergo combustion producing gases like CO and CO2.

### Binding property

The molten plastic waste inhibits good binding property. Following experiments were carried out to study the binding property.

The aggregate was heated to around 1700C and the shredded plastic waste (size between 2.36mm and 4.75 mm) was added. Plastics got softened and coated over the aggregate. The mix of aggregate and plastic was compacted and cooled. The block was very hard and showed compressive strength not less than 130 MPa and binding strength of 500 kg/cm2. This shows that the binding strength of the polymer is good.

The polymer coated aggregate was soaked in water for 72 hours. There was no stripping at all. This shows that the coated plastic material sticks well with the surface of the aggregate.

### Preliminary Studies

The studies on the thermal behavior and binding property promoted a study on the preparation of plastic waste-bitumen blend and its properties to find the suitability of the blend for road construction.

## Plastic Waste Blending Materials

### Preparation of blend

Polyethylene carry bags were cut into pieces using a shredding machine. It was sieved and the plastics pieces passing through 4.75mm sieve and retaining at 2.36mm sieve were collected. These plastic pieces were added slowly to the hot bitumen of temperature around 170-1800C. The mixture was stirred well using mechanical stirrer for about 20-30 minutes. Polymer-bitumen mixtures of different compositions were prepared and used for carrying out various tests.

## Characterization of Blend

### Separation test (IRC-SP: 53-1999)

Samples of different composition were prepared and subjected to the separation test. The following observations were made on the basis of their softening point values. Homogeneity was obtained approximately up to 1.5% blend. Beyond this composition, the variation of softening point was much higher for the top and bottom layer of the test samples showing that there is a separation of polymer from bitumen on standing.

### Determination of softening point (IS: 1205-1978)

The blend of different composition with different percentage of plastic waste has been prepared and their softening points were determined. It is observed that the softening point increases by the addition of plastic waste to the bitumen. Higher the percentage of plastic waste added, higher is the softening point. The influence over the softening point may be due to the chemical nature of polymers added.

### Penetration Test: (IS: 1203-1978)

Samples having different percentage of plastic waste in bitumen were prepared and their penetration values determined The penetration values of blends are decreasing depending upon the percentage of polymers and the type of polymer added the increase in the percentage of polymer decreases the penetration value. This shows that the addition of polymer increases the hardness of the bitumen.

### Ductility

The ductility is decreasing by the addition of plastic waste to Bitumen. The decrease in the ductility value may be due to interlocking of polymer molecules with bitumen.

### Flash and fire point (IS: 1209-1978)

The studies of flash and fire points of the plastic waste-bitumen blend helps to understand the inflammability nature of the blend. Flash & fire point of plain Bitumen is 175-2100C. From the experimental results it is observed that the inflammability of the blend is decreasing as the percentage of polymer increases. The blend has developed better resistance to burning. The polymer bitumen blend road surfaces will be less affected by fire hazards.

## Characterization of Plastic Waste-Bitumen Blend For Flexible Pavement

The utility of the plastic waste blended bitumen-aggregate mix for flexible pavement construction was characterized by studying stripping value and Marshall Stability value of the mix for the blends having a maximum of 1.5% plastic waste.

### Stripping Test (IS :6241-971)

Plastic waste was dissolved in bitumen and the blend was coated over aggregate. It was tested by immersing

in water. Even after 72 hrs, there was no stripping. This shows that the blend has better resistance towards water. This may be due to better binding property of the plastic waste-bitumen blend.

### Marshall Stability Test

The specimen was prepared as per the IRC specification using plastic waste-blended bitumen. This shows that plastic waste-bitumen blend has higher strength compared to pure bitumen, whose value is approx. 1200Kg

Moreover, the Marshall Quotient is also within the range of tolerance, thus showing that the plastic waste (polyethylene) blended bitumen mix is better and more suitable for flexible pavement construction.

## Results of Preliminary Studies

The studies of properties of the plastic waste-blended bitumen show that the addition of plastic waste to bitumen increases softening point, decreases penetration value and ductility, increases flash point and fire point, increase Marshall stability value and improve anti-stripping properties. Yet the above process has its own limitations.

The preparation of such modified bitumen needs high power stirrer with thermostatic facilities to maintain the temperature between160-1800C. Any increase in the temperature could affect the properties of bitumen.

The proper storage of such polymer-blended bitumen is very important. It should be stored in a freezer and it is also referred that it is stable for 6 hrs at a temperature of 1800C It was also observed from the separation test that when the plastic was mixed beyond the soluble range (from 2% and above) the excess plastic material got separated on cooling. These limitations necessitated developing an alternate method for using higher percentage of plastic waste for flexible pavement.

### Modified Process (Dry Process)

An alternate method was innovated to find an effective way of using higher percentage of plastic waste in the flexible pavement. The aggregate coated with plastic was used as the raw material. The plastic used were the disposed carry bags, films, cups was etc. with a maximum thickness of 60 microns. The bitumen was not blended with plastic waste.

### Preparation of Plastic-Waste Coated Aggregate

The aggregate was heated to around 1700C; the plastic waste was shredded to the size varying between 2.36mm and 4.75mm. This shredded plastic-waste was added over hot aggregate with constant mixing to gave a uniform distribution. The plastic got softened and coated over the aggregate. The hot plastic waste coated aggregate was mixed with the hot bitumen 60/70 or 80/100 grade (1600C).

## Characterization of PCA Bitumen Mix

### Stripping Test (IS: 6241-1971)

The plastic waste coated aggregate bitumen mix prepared by the above process was immersed in water. Even after 96 hours there was no stripping. This shows that the plastic waste coated aggregate-bitumen mix has good resistance towards water.

### Marshall Stability Test

It is observed that the Marshall stability values obtained were generally much higher than the Marshall stability value obtained for pure bitumen min.

### Field study

Using this dry process technique, road length of more than 1200 km were laid at different places in Tamil Nadu both by the department of Rural Development Agency and by Highways at Cochin, Mumbai, and Pondicherry the corporation laid test roads using this technology. The roads are exposed to heavy traffic, monsoonal change, heavy rain, hot summer etc. The roads are functioning well without potholes, raveling and rutting. Expert's opinions are also in agreement.

### Water absorption test

A known quantity of aggregate was taken dried at 1100C and cooled. The weight of aggregate was determined. It was then immersed in water for 24 hrs. Then the aggregate was dried using dry clothes and the weight was determined. The water absorbed by the aggregate was determined from weight difference. 500gms of the aggregate was taken and heated to around 1700C. It was then coated with plastic at that temperature. The plastic coated aggregate was cooled to room

temperature. It was immersed in water for 24 hrs. Then it was removed dried and the weight of the aggregate was determined. It is observed that the absorption of water had decreased with the increase in the percentage coating of plastic over the aggregate. This shows that the coating of plastic reduces the voids. Hence, coating of plastic over aggregate helps to improve the quality of the aggregate.

## Results and Discussion

Preliminary studies on the use of plastic-waste as a blending material with bitumen, suggest that the blends behave similar to PMB, thus having improved properties compared to plain bitumen. It is also observed that this process of blending has limitation. At high percentage of blending there is separation of plastic. Hence, process modification was needed and a new product namely plastic waste coated aggregate was developed. This product is not only easy to prepare but also helps to use higher percentage of plastic-waste for coating without much of difficulty.

The coating of molten-plastic over the aggregate will reduce water absorption. This shows that the voids at the surface were reduced. Lesser the voids better the quality of the aggregate. Otherwise, the air entrapped in the voids would cause oxidation of bitumen resulting in stripping, pothole formation etc. Moreover, the presence of water in the voids is detrimental to adhesion between aggregate and the binder namely bitumen. Hence the aggregate with lesser voids is considered to be good for better road construction. These observations help to conclude that plastic-waste coated aggregate can be considered as more suitable material for flexible pavement construction.

## Conclusion

Polymer Modified Bitumen is used due to its better performance. But in the case of higher percentage of polymer bitumen blend, the blend is a more polymer dispersion in bitumen, which get separated on cooling. This may affect the properties and quality of the blend and also the road laid using such blend. In the modified process (dry process) plastics-waste is coated over aggregate. This helps to have better binding of bitumen with the plastic-waste coated aggregate due to increased bonding and increased area of contact between polymer and bitumen. The polymer coating also reduces the voids. This prevents the moisture absorption and oxidation of bitumen by entrapped air. This has resulted in reduced rutting, raveling, and there is not pothole formation. The road can withstand heavy traffic and show better durability.

The dry process thus helps to:

- Use higher percentage of plastic waste
- Reduce the need of bitumen by around 10%
- Increase the strength and performance of the road
- Avoid the use of anti-stripping agents.
- Reduce the cost to around Rs. 5000/Km. of single lane road
- Carry the process in situ
- Avoid disposal of plastic waste by incineration and land filling
- Add value to plastic waste
- Generate jobs for rag pickers
- Develop a technology, which is eco-friendly

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## INTERNATIONAL NEWS

# Dallas plastics firm expands to Longview, buys facility

A Dallas-based plastics firm is planning to expand its operations to Longview with a $5.8 million investment and 65 new jobs during the next six years according to a report. Dallas Plastics Corp was approved for an incentive package from Longview Economic Development Corp. that could be worth up to $500,000 in coming years, according to Susan Mazarakes-Gill, executive director of LEDCO. Dallas Plastics plans to purchase an existing 55,000-square-foot building on about 4 acres at 900 Jordan Valley Road. The property has been the home of Exopack, which is closing its Longview facility and consolidating operations in South Carolina. "Even before they had a chance to market the building for sale, we have a buyer," Mazarakes-Gill said. Mark Thoreson, president of Dallas Plastics, said the company will install blown film extrusion equipment and manufacture polyethylene film products that serve the food, medical, industrial and other markets in the region. Production could begin in the first quarter of 2012.

Steve Metcalf, president of the LEDCO board of directors, said the announcement is positive news for the company and the Longview economy. "We consider this a win-win for Longview and Dallas Plastics," Metcalf said after the board action Wednesday. "They get a quick path to expansion, and we were able to put a new manufacturer in an existing building." The company's headquarters are in Mesquite, and Dallas Plastics has a second operation near St. Louis. "We were impressed with what we saw at Dallas Plastics' other operation in Mesquite and have high hopes that they will quickly grow their operation in Longview," Metcalf said. "Our incentive package provides $200,000 upon occupancy, with the remaining $300,000 to be paid out over several years," he said. The initial payment will be made once the company proves it has invested $1.8 million and receives a city certificate of occupancy. "The up-front money helps them offset some of their move-in and initial capital investment," Metcalf said. "The jobs based portion of the incentives is in line with what we traditionally provide for other companies." Mazarakes-Gill said the company plans to hire five people the first year, eight the second year; 12 the third year; and 20 in each the fourth and fifth years of the agreement. "The capital investment is projected to be $1.8 million the first year and an additional $1 million each year for four years," she said. The job creation part of the incentive package averages out to about $4,615 per new employee. Mazarakes-Gill said the estimated payroll and benefits to Dallas Plastics workers locally during a 10-year period is about $26 million. LEDCO is also recommending a six-year tax abatement that should save the company about $70,000 over the life of the abatement in city and county property taxes.

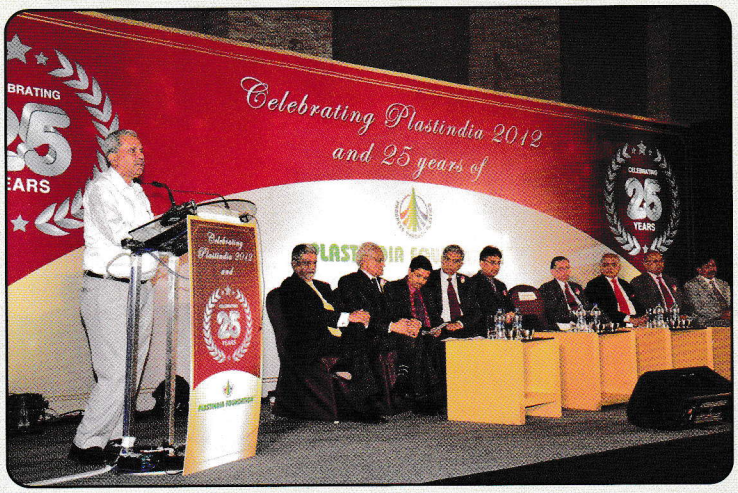
# North American PET bottle resin prices up 4 cents per pound

Tightness in raw material supplies has sent North American prices for PET bottle resin up by an average of 4 cent per pound since Sept. 1 According to reports Paraxylene feedstock, in particular, has been in tight supply Higher prices for paraxylene, in turn, have driven up prices for purified terephthalic acid (PTA) feedstock, which has its U.S. prices tied to paraxylene on a formula basis. The increase is the fourth to hit the North American PET market along with a pair of smaller price decreases this year. Regional PET prices in North America now are up a net of more than 19 percent since Jan. 1.

*Contd. to Page 23*

## The Silver Jubilee celebration of Plastindia Foundation

The Silver Jubilee celebration of the creation of Plastindia Foundation, Mumbai was held on 21st May 2012 at The Grand Hyatt, Kalina, Off. Western Express Highway, Santacruz East, Mumbai. Shri Ashok Goel and Members of the Managing Committee invited all founder members, past NAB/NEC members and other distinguished members of the plastics fraternity to join in the celebration. IPF was represented by the President, Shri Rajesh Mohta, Hony Secretary, Shri Pradip Nayyar and Shri Amar Seth, past Vice President of Plastindia Foundation and other senior members of IPF. Shri K. Jose Cyriac, Secretary, Department of Chemicals and Petrochemicals, Govt of India was the Chief Guest. A felicitation ceremony of Plastindia team was also organised. The programme ended with cocktail and dinner.


# GLIMPSES

## Technical Lecture on "New Product Development: A novel Approach using Rapid Prototyping Techniques" jointly organized by Indian Plastics Federation and Indian Plastics Institute (Kolkata Chapter) at IPF Conference Room on Friday, the 25th May 2012


Audio Visual Presented by Mr. Aditya Kumar,Technical Director, Marco Polo Products P Ltd (Having 12 years of experience in the prototyping industry related to Automotive, Home Appliances, Electronics and Medical Industries & winner of PLASTICON AWARD for Best Entrepreneurship at PLASTINDIA 2012) at IPF conference room on Friday 25th May'12.

Mr. T. K. Banerjee, Chairman, IPI (Kolkata Chapter) presented a flower bouquet to Mr. Aditya Kumar.

Mr. Aditya Kumar started his lecture introducing the Prototyping Process & explaining how starting from the conceptual stage of a product to the designing and three dimensional projection of the product & up to making the actual product, so that the fitment, actual size, utility and changes/modifications, if any, can be incorporated in the product.

Mr. Aditya Kumar then emphasized the benefits of the Rapid Prototyping. By virtue of this method, the plastic processor and the end user save not only the time but also cost. Even the Dimensional accuracy is also much higher. He showed slides of various process of prototyping and the medium used for prototyping of moulds. He showed several samples including a very interesting product - a telephone instrument developed by rapid prototyping process. He also showed moulds made of Silicon Rubber by casting process and how changes, if any required, can be easily incorporated in the mould. Mr. Kumar also showed various plastic products developed by rapid prototyping.

The technical lecture was concluded with a very interesting & lively question answer session. The Lecture on this new subject was well attended.

# Saurashtra Plast 2012

**Date : 28 November - 2 December, 2012**
**Venue: Race Course Ground, Rajkot**

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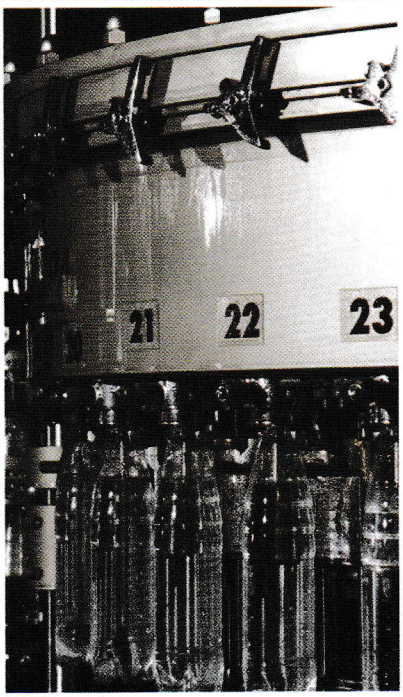

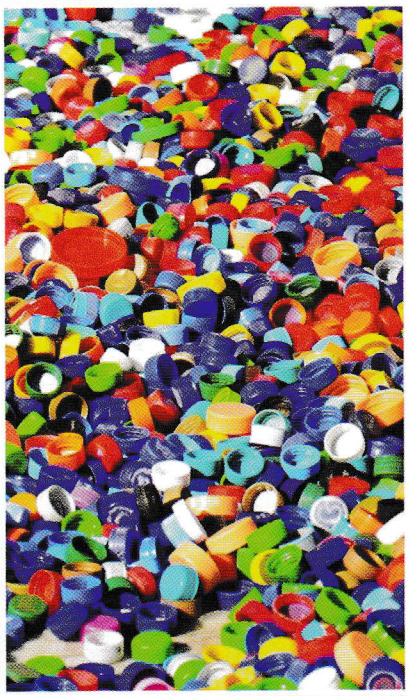
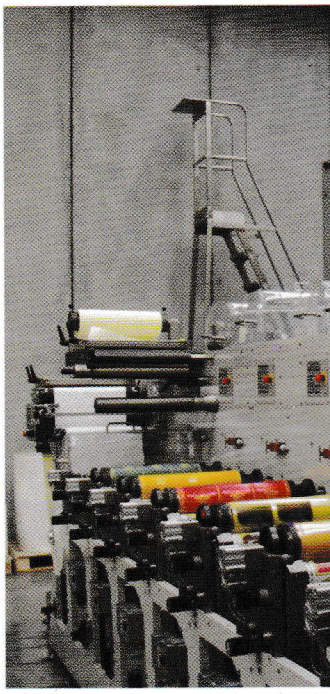

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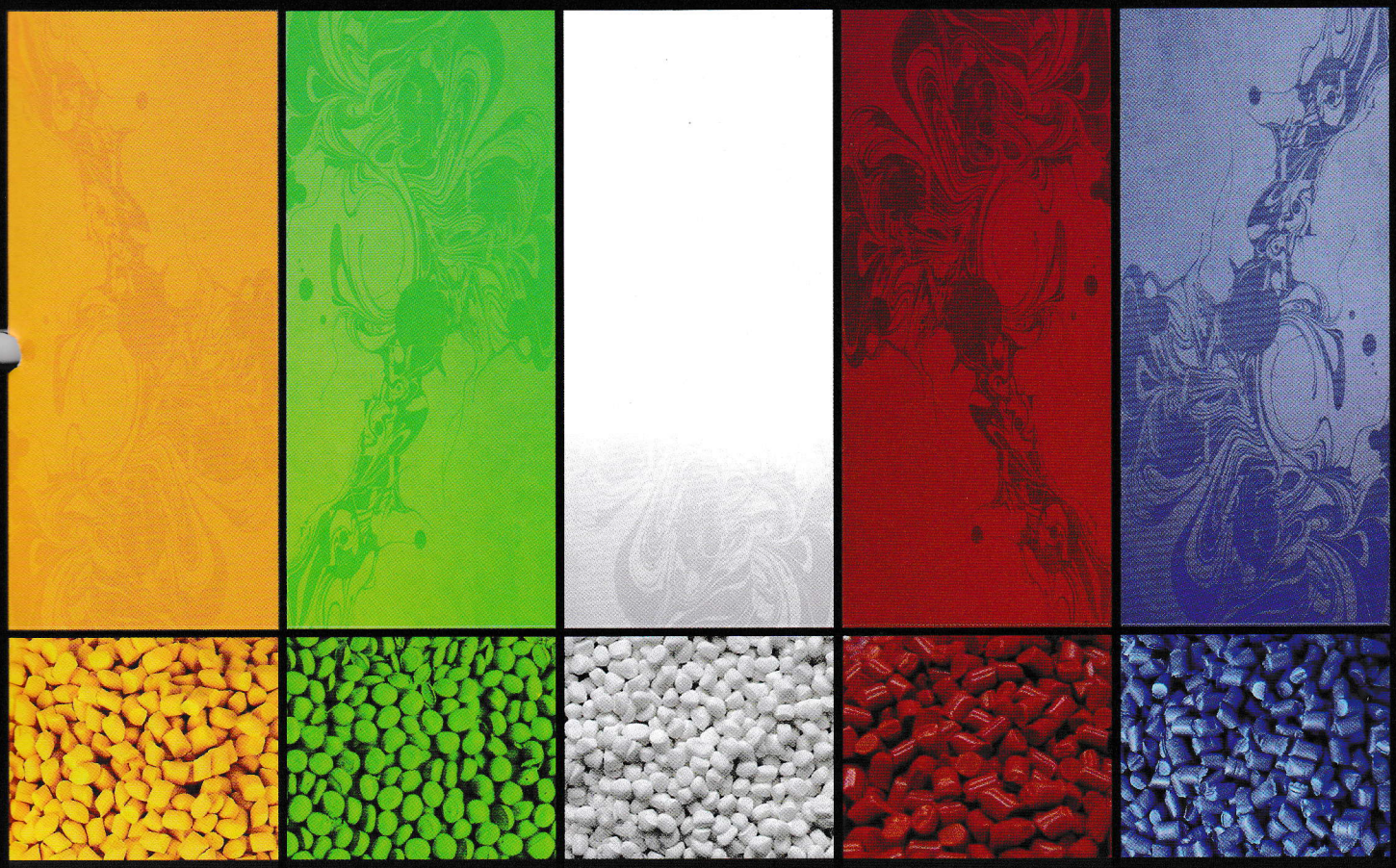

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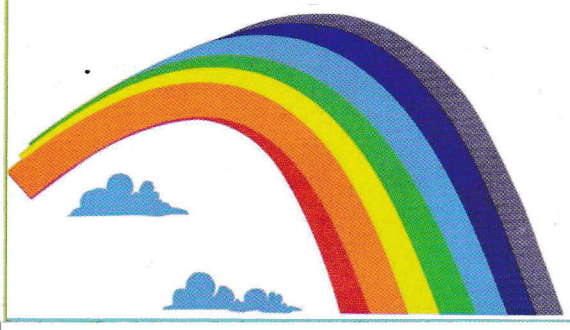

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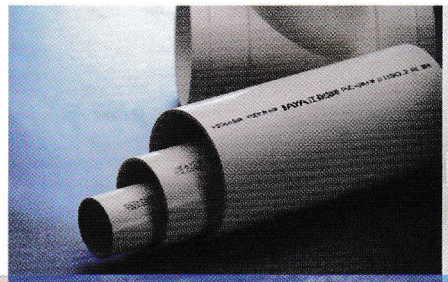

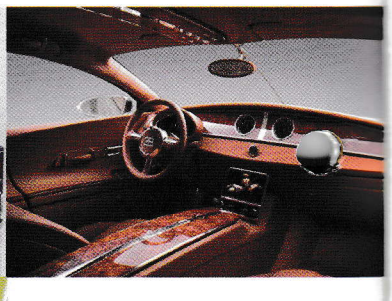
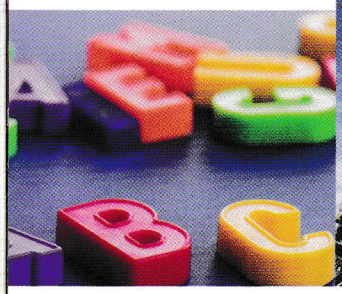

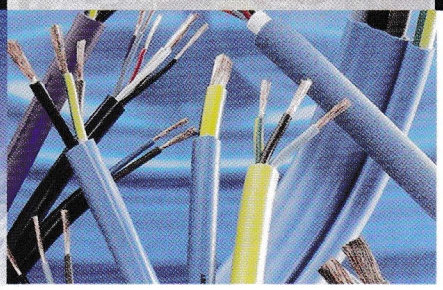

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# BUSINESS NEWS

## GAIL in talks to buy US LNG plant stakes

The Economic Times has reported that GAIL India, the nation's biggest natural gas distributor, is in talks to buy stakes in as many as three US liquefied natural gas export terminals and contract fuel supplies, According to the report holding stakes in ventures would help New Delhi-based GAIL obtain long-term LNG supply agreements. The company is also in talks to acquire a share in gas projects in Brunei. GAIL and Petronet LNG, India's biggest LNG importer, want access to overseas assets after a surge in US shale gas output led to increased availability of the fuel for export by companies including Cheniere Energy Inc. Asia's second-fastest growing economy faces a shortfall of the cleaner-burning fuel after output dropped at the nation's biggest gas field. GAIL chairman B C Tripathi had earlier said that the company may spend as much as $2 billion on acquisitions, including shale gas assets in the US and Australia. US companies including Cheniere, Southern Union Co and Freeport LNG have applied to federal regulators to build LNG export terminals on the Gulf of Mexico. Cheniere plans to start sellings LNG outside the US in 2015, chairman Charif Souki said.

## Bharat Plastics opens plant at Umbergaon

Indian molder Bharat Plastics, part of Bharat LLC.,has moved from Mumbai into a new facility in Umbergoan as part of a two-phase project that will see the firm expand and diversify into plastic packaging and organized retailing. According to the release the new facility begins a chapter of growth for the company. The site will employ 500 and make more than 70 different plastic products for the consumer-goods market, "We are further expanding and doubling the production facility in Phase 2, which includes the development of another 200,000 square feet of production space," said Sanjay Parekh. "Construction [of that phase began] in Q2 2011, and is expected to be completed by April 2012." "We are diversifying in cosmetic packaging, PET bottles and home-care products," Parekh said. Currently, the firm manufactures household and housewares products like lunch boxes, water jugs, flasks, casserole containers, insulated bottles and buckets. The new plant manufactures 330,690 pounds of plastic products per month, while packaging production is just 55,115 pounds monthly.

## Tooling Technology buys FPM Tooling

Ohio based Tooling Technology LLC, which makes tooling for thermoforming, compression molding and rotational molding, has expanded into industrial blow mold tooling by acquiring FPM Tooling & Automation in Fremont, Ohio. However Tooling Technology did not disclose terms of the deal. FPM makes blow molds and complete automation production cells for automotive, housewares, recreational, industrial packaging and toy markets. The company was formerly known as Fremont Plastic Molds. FPM's automation offerings include equipment for trimming, assembly, welding, vision inspection, ultrasonic welding and robotic press loading and unloading, and packaging systems. "This acquisition presents an opportunity for the Tooling Tech Group to expand our already strong position in the automotive, transportation and consumer products tooling markets through additional product offerings," CEO Tony Seger said. Founded in 1982, Tooling Technology is a major provider of tooling for making automotive headliners, carpet and floor assemblies, acoustic products and truck bed liners. Other large-part thermoforming includes molds for hot tubs and spas, boat hulls, kayaks, automotive roof boxes, appliances, transportation interiors, and industrial trays and packaging.

# First plants of BASF-YPC expansion in Nanjing China come on stream

The first production facilities in the $1.4 billion expansion of BASF-YPC , a 50-50 joint venture between BASF and Sinopec , have now begun operations. Along with the successful completion of the steam cracker expansion, the newly constructed butadiene extraction plant and the non-ionic surfactants plant are now operational. These plants are part of a $1.4 billion investment project which broke ground in September 2009. The project includes the expansion of the existing steam cracker, from 600,000 tons/year to 740,000 tons/year of ethylene, the expansion of three existing plants, and the construction of ten new plants. The products of this second phase will serve multiple industries such as agriculture, construction, electronics, pharmaceutical, automotive and chemical manufacturing. The bulk of the remaining plants are expected to come on-stream around the end of 2011. Also, a superabsorbent polymers (SAP) plant will be constructed as part of the ongoing expansion project.

"With this expansion, we are now beginning to realize the true potential of BASF-YPC as a 'Verbund' site – a German term referring to a highly-integrated, highly energy-efficient production complex. At the same time, the chemicals produced here contribute directly to supporting China's energy efficiency goals as outlined in the 12th Five Year Plan," said Dr. Bernd Blumenberg, President, BASF-YPC Company Limited.

BASF and SINOPEC also signed a Memorandum of Understanding in December 2010 to jointly explore the further expansion of BASF-YPC. The new projects under consideration will extend the C3 and C4 value chains, including the construction of a new acrylic acid facility with a capacity of 160,000 tons per year, a new butyl acrylate plant, as well as capacity increases at the 2-propyl-heptanol, styrene monomer, and non-ionic surfactants plants. A new world-scale hydrogen peroxide / propylene oxide (HPPO) facility is also included in the new investments under consideration. The new investments under consideration collectively total approximately USD 1 billion.

# BHEL to develop a 1320-MW thermal power plant in Madhya Pradesh

Engineering and manufacturing enterprise Bharat Heavy Electricals Limited (BHEL), has secured a contract worth Rs 3,800 crore from Dainik Bhaskar Power Ltd (DBPL) to develop a 1,320-MW thermal power plant in Madhya Pradesh. According to the release

The company bagged the order for Dainik Bhaskar Power's forthcoming coal-based supercritical thermal power project located at Singrauli District in Madhya Pradesh. The scope of work under the 1,320-MW thermal power plant from DBPL includes the design, engineering, manufacture, supply, erection, testing and commissioning of supercritical boilers, steam turbines and turbo-generators along with controls and instrumentation (C&I) and other associated auxiliaries like transformers and a switchyard. BHEL, is already carrying out another contract for DBPL which involves the supply and commissioning of a 2x600 MW (boiler, turbine and generator) BTG package, along with associated auxiliaries for a 1,200-MW coal-based thermal power project in Chhattisgarh.

## Advance Polybag's Accredo Packaging unit invests in sustainable flexibility

Texas based Advance Polybag Inc. Accredo Packaging Inc., is extending its plant in Sugar Land. The release said,officials broke ground late last year on a 175,000-square-foot expansion and it should be completed next year. Accredo makes blown film and does printing, laminating and conversion with an emphasis on sustainable products and manufacturing.

# Coca-Cola-Eco Plastics JV to recycle plastic bottles in Great Britain

Coca-Cola Enterprises Ltd (CCE) and ECO Plastics have formed a pioneering joint venture - a first for the UK recycling and beverage industries, the new business will be known as Continuum Recycling Limited. The name reflects the fact that the joint venture company will establish a continuous process for re-processing plastic bottles in Great Britain. Used plastic bottles will be recycled in Lincolnshire and the high quality materials produced will be re-used in new Coca-Cola bottles.

Jonathan Short, Managing Director of ECO Plastics said, "ECO Plastics' plant is already the largest and most sophisticated in Europe and having put the finishing touches to a £24 mln financing packaging in the last month, we will now be able to increase capacity from 100,000 tpa to 140,000 tpa of mixed plastic bottles, just under 50% of the total collected last year. The new facility will increase the amount of high-quality bottle-grade rPET currently produced in the UK to more than 75,000 tonnes a year, more than doubling the current total. Having been transformed into food-grade rPET pellet by Continuum Recycling, these will then be used in Coca-Cola bottles, enabling Coca-Cola Enterprises to meet its target of including 25% recycled PET in all its plastics packaging by 2012.

# Wavin invests £3m in recycled plastic pipes

Wavin has invested £3m in equipment to produce piping using 50% recycled plastics that it says are as good as its virgin grade and are the same price. The company manufactures the pipes in a three layer extrusion process allowing it to produce the pipe with three PVC layers the inner core is made from the recycled material.

Virgin grades are used on the outer and inner layers. The inside of the pipe needs to be smooth to avoid blockages and so using virgin grade on the interior ensures this.

Also, underground pipes have to be colour coded and colouring recycled material is very difficult, which is why virgin polymer is used on the outside. However, Wavin is looking to eventually increase the amount of recycled polymers used further.

Wavin says the Recycore Technology pipe looks and performs exactly the same as its piping made from virgin polymers apart from the dark middle layer of recycled material - and costs the same. Wavin md Calum Forsyth said, The offer is that simple. It allows customers to enhance their sustainability credentials at no extra cost. It will also future-proof them against further changes in regulations as concern for the environment rises up the political, business and consumer agenda.

# AEP acquiring film maker Webster

Film manufacturer AEP Industries Inc. that makes an extensive range of polyethylene, polypropylene and PVC packaging films for the consumer, industrial and agricultural markets has agreed to acquire the assets and some liabilities of Webster Industries, a privately-held blown film extruder and converter of retail and institutional private-label food and trash bags.According to South Hackensack, N.J.-based AEP, the cash transaction is valued at $28.4 million, subject to a post-closing working capital adjustment. Brendan Barba, chairman, president and CEO of AEP, said in the release that the deal allows the company to enter a new market with significant cross-selling potential. AEP. The company has 12 plants in the United States and Canada and employs about 2,000. For the third quarter of 2011, AEP reported after-tax profit of $2.5 million on sales of $246 million, compared to profit of $3.7 million on sales of $204.9 million for the year-ago period.

# APT seeks to Partner with PVC Impact Modifier Suppliers in Middle East

Advanced Polymer Trading (APT), an international trading company specializing in the world wide trade of rubber, plastics and petrochemicals, has announced its intention to expand its product range in the Middle East. According to the release APT is seeking to partner with PVC impact modifier suppliers. APT currently partners with many international rubbers, plastic and chemical suppliers and enables manufacturers to enter the Middle Eastern markets helped by APT's years of experience, local representation and highly capable technical support staff. To expand its product range APT are seeking partners to fulfill the market demands for PVC impact modifiers. Impact modifiers are elastomers that are added to PVC to absorb mechanical energy. Once added they give impact strength to the inherently brittle PVC, with minimal negative influence on its other mechanical properties. "There is a large market demand for PVC impact modifiers in the Middle East." said Hamid Amiri, Managing Director, APT. "We want to form a partnership with a supplier to meet these demands in this increasingly lucrative market." APT has successfully introduced hundreds of different products into the Middle East including chemicals, plastics, paints and additives. Its clients come for a broad range of different sectors including automotive, packaging, construction and agricultural.

# Mitsubishi Polyster's US$20 mln upgradation at South Carolina

Officials at Mitsubishi Polyester Film, Inc. have initiated another major capital upgrade at its location in Greer, South Carolina. The US$20 mln project will increase capacity as well as provide enhanced capability to produce innovative new products.

Dennis Trice, President and CEO at Mitsubishi Polyester Film, Inc. said This project comes on top of the multi-million dollar project announced in 2010 to roll out the Reprocess™ Sustainable Liner Program; the industry's first closed loop recycling process for silicone coated polyester liners. The projects at the Greer facility will be completed in late 2012. Mitsubishi has already invested over US$200 million at its Greer facility over the past 10 years. Mitsubishi Polyester Film, Inc. is an American affiliate of Mitsubishi Plastics, Inc. and offers a wide array of polyester films for existing markets such as industrial labels and liners, flexible packaging, and also for many of today's new emerging markets in energy and electronics. Mitsubishi Plastics, Inc. has additional polyester film assets in Germany, Japan and Indonesia as well as a new plant under construction in China.

# Essar Energy Targets Global Oil & Gas Assets

The Economic Times has reported that London-listed Essar Energy is in talks to acquire oil and gas assets of global oil majors like Exxon, Chevron, Shell and Conoco Philips in Africa,Latin America and Australia and hopes to clinch a few deals. According to the report the company seeks to expand its global footprint and looks to earn good bargains to increase its oil and gas portfolio. It already has assets in Africa and Europe. It is expected that the company would invest billions of dollars in such assets. Essar had bid for royal Dutch Shell's stake in four Nigerian oil fields but had fallen out of the race when shell did not find Essar's offer for any of the blocks attractive. Shell is divesting stake in the onshore fields as part of its plan to sell $5 billion of assets this year.

FEATURES

# Bio-based plastics to emerge as growth potential

## Recent technology breakthroughs have substantially improved the properties of novel bio-based plastics, such as heat-resistance of PLA, enabling a much wider range of applications

The market for bio based plastics is still growing and is yet to grow far more. In fact in the past two decade bio-based plastics have faced renaissance. One should expect more growth in coming years for the simple reason global demand for bio based plastics is now more than 38%, with Europe registering the annual growth rate of 48 %. The article is based on the study done commissioned by European Polysaccharide Network of Excellence (EPNOE) and European Bioplastics.

Today, public concern about the environment, climate change and limited fossil fuel resources are important drivers for governments, companies and scientists to find alternatives to crude oil. Bio-based plastics may offer important contributions by reducing the dependence on fossil fuels and the related environmental impacts. In the past few decades, many new polymers from renewable feedstocks were developed.

For example, starch, i.e. a naturally occurring polymer, was rediscovered as plastic material. Other examples are PLA that can be produced via lactic acid from fermentable sugar and PHAs which can be produced from vegetable oil next to other bio-based feedstocks.

Recent developments in emerging bio-based plastics are spectacular from a technological point of view. Many old processes have been revisited, such as the chemical dehydration of ethanol which leads to ethylene, an important intermediate chemical which can be subsequently converted into polyethylene (PE), polyvinyl chloride (PVC) and other plastics.

Moreover, recent technology breakthroughs have substantially improved the properties of novel bio-based plastics, such as heat-resistance of PLA, enabling a much wider range of applications. For numerous types of plastics, first-of-its kind industrial plants were recently set up and the optimization of these plants is ongoing. Some of the plant capacities are still rather small when compared to petrochemical plants (capacity of Tianan's PHA plant is only 2 kt), but others are very sizeable (Dow-Crystalsev's biobased PE plant is to have capacity of 350,000 tons).

With growing demand for bio-based plastics, it is probably just a matter of time until turnkey plants with large capacities will be commercially available for more bio-based plastics, thereby allowing substantially accelerated growth.

This study estimates the global capacity of emerging bio-based plastics at 0.36 mln tons by the end of 2007. This is approximately 0.3% of the worldwide production of all plastics (dominated by petrochemical plastics). The current production capacity of bio-based plastics is even smaller compared to "conventional bioproducts": they represent only 2% of the global production of established bio-polymers (20 tons; comprising cellulose polymers, alkyd resins and non-food starch without starch for fuel ethanol) and only 0.1% of the world paper and board production. However, the market of emerging bio-based plastics has been experiencing rapid growth.

From 2003 to end of 2007, the global average annual growth rate was 38%. In Europe, the annual growth rate was as high as 48% in the same period.

The total maximum technical substitution potential of bio-based polymers replacing their petrochemical counterparts is estimated at 270 tons, or 90% of the total polymers (including fibres) that were consumed in 2007 worldwide. It will not be possible to exploit this technical substitution potential in the short to medium term.

The main reasons are economic barriers (especially production costs and capital availability), technical challenges in scale-up, the short-term availability of bio-based feedstocks and the need for the plastics conversion sector to adapt to the new plastics. Nevertheless, this exercise shows that, from a technical point of view,

there are very large opportunities for the replacement of petrochemical by bio-based plastics.

The worldwide capacity of bio-based plastics, according to company announcements, will increase from 0.36 tons in 2007 to 2.33 tons in 2013 and to 3.45 tons in 2020. This is equivalent to average annual growth rates of 37% between 2007 and 2013 and 6% between 2013 and 2020. In 2007, the most important products in terms of production volumes were starch plastics (0.15 tons) and PLA (0.15 tons). Based on the company announcements it is projected that the most important representatives by 2020 will be starch plastics (1.3 tons), PLA (0.8 tons), bio-based PE (0.6 tons) and PHA (0.4 tons).

Today, the combined volume of these non-food and non plastics applications of starch and man-made cellulose fibres is 55 times larger than the total of all new bio-based polymers (approx. 20 tons versus approx. 0.35 tons in 2007). The new bio-based polymers may reach this level in 20-30 years from now. The use of starch for paper production only amounts to 2.6 tons and is hence still six times larger than today's worldwide production of bio-based plastics. This demonstrates that the production of bio-based products at very large scale is not unprecedented.

First-in-kind production of bio-based plastics in large industrial plants should be seen as a large-scale experimental phase in which the strengths and weaknesses of the various biobased plastics and their production routes become apparent. The experience gained must then be taken into account when the production reaches the steep phase of the S-curve. It will hence take more than two decades from now until meaningful benefits such as CO2 emission reduction will be achieved at the macro level. On the other hand, the advantages of slow substitution of petrochemical plastics are that technological lock-in can be more easily avoided and that an optimized portfolio of processes can be implemented, ensuring maximum environmental benefits at lowest possible costs and minimum social backlash.

Several factors clearly speak for bio-based plastics. These are: the limited and therefore uncertain supply with fossil fuels (especially oil and gas), the related economic aspects, environmental considerations (especially savings of non-renewable energy and greenhouse gas abatement), innovation offering new opportunities (technical, employment etc.) and rejuvenation in all steps from chemical research to the final product and waste management. Challenges that need to be successfully addressed in the next years and decades are the lower material performance of some bio-based polymers, their relatively high cost for production and processing and the need to minimize agricultural land use and forests, thereby also avoiding competition with food production and adverse effects on biodiversity and other environmental impacts.

# Bioplastics with new alternatives have wider applications

## Bio plastics allow for the realization of diverse applications within the electronic and household appliances sector

Until recently many bioplastics found application in highly undemanding applications because of their poor mechanical properties. However, recently introduced materials and additives are leading to development of a new generation of bioplastics that can find application in much more demanding end-use environments.

Also, uptil now, companies developing products from biopolymers could use all-natural masterbatches with its limited, expensive and not very process- or light-stable range of colors and additives. Or far more they could use conventional pigments and functional ingredients and compromise on the environmental friendliness of their product. While the matrix resin might have been compostable or biodegradable, the colorants and additives were not. But new alternatives are now available

with many of the producers getting innovative and trying to work on developing new compounds.

Bioplastics producer FKuR Kunststoff GmbH has introduced a wide range of biodegradable, biobased and natural fibre reinforced compounds that offer a wide range of possibilities. Further developments have been made in the cellulose acetate based Biograde® products. The highlight of this development is Biograde® V 2091 which is a completely transparent injection mouldable grade that has been developed for thin wall parts with long flow paths. Along with its high transparency, it stands out due to its smooth and shiny surface. Moreover, especially for thin walled parts, it out performs standard polystyrene (PS) for flexibility and heat distortion temperature. These properties allow for the realisation of diverse applications within the electronic and household appliances sector.

Clariant Masterbatches has developed color and performance innovations for plastics packaging. RENOL®-compostable colors and CESA®-compostable additive masterbatches incorporate conventional (non-natural) additives and pigments in a biopolymer carrier resin. Testing of the ingredients, completed in the independent laboratories of OWS nv (Gent, Belgium) determined that the materials can comply with EN 13432:2000 – the widely recognized standard for heavy-metal content and plant-toxicity. The RENOL-compostable product line includes masterbatches based on over 80 different pigments, so color choices are almost unlimited. CESA-compostable additive masterbatches include UV-stabilizer and antioxidant packages, with more additives currently pending review. It has been granted OK Compost certification by AIB Vinçotte. Any product featuring the OK Compost logo can be assumed to comply with the requirements of the EU Packaging Directive (94/62/EEC), which seeks to limit packaging waste. The certificate indicates conformity with approved production procedures and guarantees that only colorants and additives that pass strict testing for ecotoxicity are added to the biopolymer carrier resin. These additives give the performance and cost benefits and does not change the compostability of products made of the bio-based resins.

Dow Plastics Additives produces Paraloid BPM-520 at its facility in Jurong, Singapore. The additive is said to help improve the impact resistance of opaque, injection molded polylactic acid (PLA) products with minimal effect on heat distortion temperature and stiffness. PLA is derived from cornstarch; its brittle nature means that for many applications, modifiers are required to improve its impact resistance. It is designed for use with injection molded PLA applications to improve their impact strength at room and sub-zero temperatures, improves impact strength of PLA/PC alloys, has minimal effect on stiffness and heat distortion temperature and is food contact compliant.

PolyOne incorporates the impact modifier into its OnCap BIO Impact L masterbatches. OnCap BIO L flows well for mold filling, maintains part stiffness and can be easily colored. The master batch and additive can be used in compliance with the Commission Regulation (EU) No 10/2011 on plastics materials and articles intended to come into contact with food and with U.S. Food and Drug Administration (FDA) requirements. This is the first supplier to be granted OK Compost certification by AIB Vinçotte for its full range of colorants and additives. Because the PolyOne solutions meet this standard, they are authorized to use the OK Compost label, which identifies the item as biodegradable in an industrial composting plant. PolyOne has unveiled reSound biopolymer compounds for durable applications. These innovative materials, which incorporate a minimum of 30% bio-derived content by weight, enable manufacturers in the durable consumer products sector to reduce environmental impact of their products while delivering exceptional performance equal to or better than conventional engineering resins. reSound compounds solve this dilemma by providing both a high percentage of renewable content and excellent mechanical properties. With reSound biopolymer compounds, tomorrow's cars, mobile phones and other durable applications can stand out from the competition with a combination of sustainability and performance. reSound compounds combine high performance engineering thermoplastic resins with bio-derived polymers such as polylactic acid (PLA) for a unique balance of temperature, impact and cost performance, making them ideal candidates for durable applications across a variety of industries. reSound compounds are an excellent choice for applications including consumer durable goods,

interior automotive components, medical devices and equipment, electronics housings and equipment.

## Primary benefits include:

- Impact resistance and toughness, extending product life and maintaining functional and aesthetic integrity
- Temperature resistance, offering improved performance for bio-derived polymers in high-heat and low-temperature applications
- Bio-derived, reducing the carbon footprint at the beginning of the product life cycle

Technology developed by Teknor Apex Company has eliminated a property tradeoff that until now has limited use of polylactic acid (PLA) in injection molded semi-durable and durable applications requiring impact strength and heat stability, as well as in high-end disposable food service items such as cutlery, coffee lids, and containers for microwavable products.

Compounding innovations by Teknor Apex have overcome an inverse relationship between heat distortion temperature (HDT) and Izod impact strength in PLA, creating a new series of compounds, Terraloy™ BP-34001, that provide up to two times the HDT and up to six times the impact strength of standard PLA resins. FDA-Compliant Terraloy™ BP-34001 substantially out-performs standard PLA and Yields 28-30% shorter molding cycles than previous 'enhanced-performance' PLA resins. They incorporate 10-30% more renewable resource-based content. In property tests, a typical grade in the new series, Terraloy BP-34001D, exhibits a heat distortion temperature of 112°C and Izod impact strength of 135 J/m. By comparison, approximate values for standard PLA are 65°C and 33 J/m. The new compound complies with FDA 21 CFR requirements and has a renewable content of 78%.

# Despite problems SE Asia plastics sectors continues to grow

## Even with the shortage of labour and the problem of increased wages plastic manufacturers in Malaysia, Bangkok, Thailand are anticipating growth this quarter

We have been discussing about the acute shortage of the skilled / unskilled labour across the industry world over. However with the higher economic growth in China and India, Southeast Asia's plastics industries, it seems to have emerged from recession and is moving towards a healthier curve.

Most of the manufacturers say they've emerged out and are in generally good shape, with solid growth. But there are major challenges looming, including inflation, a slowing world economy and rapidly rising wages that threaten to price some of the former Asian tigers out of the ranks of low-wage countries.

According to a report from the leading trade publication some plastics firms in Thailand are facing up to 45-50 percent wage increases, both from government plans to boost minimum salaries and from market factors like rising incomes in rural areas. Addressing the media President of the Thai Plastics Industries Association, Krianglit Sukcharoensin said " Not everyone will see wage spikes like that.

In Bangkok, where salaries are higher than elsewhere in the country, wage pressure is less but still present. Though executives say rising wages are accompanied by labor shortages many of the companies maintained that they were facing the crisis of the increase of labor rates. Needless to say the labour shortage has become the problem for most of the players in the industry. One of the manufacturers said that his 600-employee company needs another 200 workers to meet demand for its toothbrushes and other household items, including from Japan, its major export market. "We have a very serious labor shortage."

It is also lerant that many of the industry groups in Malaysia and Thailand, which has Southeast Asia's largest plastics sector, are investing in education and upgrading efforts. While the government approved a five-year, 720 million baht ($24 million) last year plan to create the Plastics Institute of Thailand, dedicated to workforce and industrial upgrading and technology development, the Malaysia Plastics Manufacturers Association received a 3 million ringgit ($1 million)

government grant in January to set up its own training program.

Experts maintain that "In the past, Thailand could consider that we were a labor-intensive country, but not anymore," Energy costs are also becoming more important, which prompted Krauss-Maffei to show its AX series of all-electric presses at the show, Yodprechavigit said.Officials from Italian auxiliary equipment maker Moretto SpA said plastics processing executives visiting them were concerned about losing competitiveness from rising wages, and are talking technology upgrades.

"They are worried and they are going in the direction of automation," said Jan Wauschkun, the Bangkok-based agent for Moretto and managing director of Terramar Engineering & Machinery (Thailand) Co. Ltd. "For us, it is only good."

# Propylene demand is expected to recover soon

## According to a report published by Nexant's on ChemSystems the demand for propylene and its related compounds would increase once again or would recover so to say for various reasons.

Most propylene derivatives suffered a downturn as a result of the global economic recession during 2008-2009. Asian markets recovered first in 2009, followed by the rest of the world in 2010. All of the derivatives performed strongly in 2010, due to a variety of influences ranging from economic growth to changes in manufacturing trends and agricultural factors as per Nexant's recently published report on ChemSystems. Demand growth in 2011 has benefitted from the ongoing gradual economic recovery in Western economies, but has been undermined to some extent by fluctuating demand in Asia. Propylene availability has been squeezed from both sides. Rapid consumption growth has coincided with a significant decrease in production capability in North America, resulting from the switch to lighter steam cracker feedstocks.

The resulting tightness in the propylene market has increased U.S.'s propylene values relative to ethylene, and relative to propylene prices in other regions. High prices and physical shortages of propylene have limited the participation of U.S. producers in derivative exports markets, although exports have recovered significantly since the downturn in 2008. High global operating rates and prices for most propylene derivatives allowed significant inter-regional trade in 2010. The increase in U.S. propylene values will become increasingly important over the next business cycle when these export markets themselves become temporarily oversupplied as a result of the major capacity development now underway.

Polypropylene demand improved in 2009, led by a strong recovery in Asia while markets such as North America and Western Europe declined. The year 2010 was stronger globally however, as all regions increased, despite a slight slowdown in Asia. The global dynamics of the industry are in flux, with a major surge of new capacity in the Middle East now on-stream, but heavy capacity addition in Asia still underway. While producers in North America traditionally had a competitive advantage conferred by their relatively low propylene price, this situation has now reversed. The acrylonitrile market grew strongly in 2010. Fibre demand was strong due to record cotton prices, and the robust carbon fibre market resulting from growing usage in mass-produced applications.

Demand into HMDA/nylon also benefitted from the cotton effect. Demand for ABS generated very strong demand growth for acrylonitrile in this sector, mainly due to a strong recovery in the automotive and electrical/electronic markets. Other end applications such as polyacrylamide also continue to perform well.

Market growth is increasingly focussed in Asia while the western markets suffer from lower consumption growth and increasing propylene costs. Global capacity has been largely stable since 2004 as shutdowns in the United States have been offset by small additions in Asia. Propylene oxide faced a massive impact from the

economic crisis as due to its exposure to sectors such as consumer goods, construction and automotive uses. Propylene oxide was among the first of the products to recover in 2009, and producers struggled to keep pace with growing demand in 2010, partly due to limited availability of propylene feedstock. Recent introduction of HPPO technology by BASF, Dow and Evonik Industries has prompted these producers to invest in the production of propylene oxide in emerging markets.

As we know like propylene oxide, the phenol market collapsed during 2008-2009, being heavily exposed to the construction, automotive and electronics industries in its principal derivatives. Demand for phenol rebounded again during the economic recovery in 2010. Cumene availability was extremely short, partly due to propylene shortages in the United States, and phenol production globally was restricted as a result. Several BPA and polycarbonate developments in China and other developing markets in Asia have driven phenol demand growth, and accelerated development of phenol capacities in a number of countries. Most capacity development is concentrated in Asia Pacific, where both demand growth and feedstock availability are strongest. The cumene market usually behaves in tandem with phenol, as cumene production is almost entirely used for phenol production. Most new cumene/phenol production is integrated, and only one of the current slate of phenol projects globally is to be based on purchased cumene. T

There is a substantial merchant market for cumene in North America, Western Europe and East Asia that is mostly operated through long term supply agreements. Acrylic acid is one of the propylene derivatives that suffered least during the global economic slowdown as it has a diverse range of applications, which collectively have comparatively little exposure to economic cycles. Acrylic demand into acrylate esters is the most volatile due to its exposure to the construction market while demand into SAP shows steady growth, supported by improvement in standard of living and increasing SAP usage in new applications.

Usage in the water treatment sector etc. does not tend to fluctuate. The strong growth profile for acrylic acid production has promoted a rapid development in both developed and developing markets. Capacity is also expected to develop in new markets such as Brazil and India.

Demand for isopropanol fell sharply during 2008-2009 with a small recovery in 2010. Its recovery was subdued by exposure to the construction industry which remains weak in Western markets, and the ongoing replacement of isopropanol and its derivatives with water-based systems which produce less VOC emissions.

# California Legislature fails to pass the bill banning EPS takeout containers

## A measure that would have banned expanded polystyrene takeout packaging in California has been put on hold for lack of vote in the state Assembly.

According to report the Senate Bill 568, which would have gone into effect statewide Jan. 1, 2016, would have applied to PS cups, bowls, trays, containers and clamshells. It would have been the first statewide ban on PS packaging in the U.S.The bill was placed in the inactive file Sept. 8, meaning it could surface again in 2012. It had passed the Senate in May. Bill's sponsor, Sen. Alan Lowenthal, D-Long Beach said "I am disappointed we were not able to get SB 568 off the Assembly floor this year.The money and effort spent to kill this bill was too great to overcome. We simply ran out of time."

Both Pactiv Corp. and Dart Container Corp., which have PS plants in the state, had argued that the ban would have resulted in a loss of jobs in California. Likewise, the California Chamber of Commerce had placed the bill on its list of job-killing legislation.

"We're very pleased that the Assembly realized that SB 568 was bad policy and that it wouldn't have reduced

litter and that it would hurt businesses and that it would jeopardize the good recycling strides we've made," said Michael Westerfield, corporate director of recycling programs for Dart.

Dart, which is the largest global producer of PS foam cups in the U.S., does not make school food-service trays, but began recycling them two years at the urging of a distributor that sells PS lunch trays to roughly 80 percent of the schools in Southern California and collects them for recycling at a rate of roughly 1 million a month.

This past May, it opened a wash-and-dry line at its plant in Corona, California, to better recycle dirty PS at that site. The line has the capacity to clean slightly more than 3 million pounds of PS foam a year. Dart also has PS foam drop-off centers at all 13 of its plants in the U.S., and at its plant in Mexico City, and helped expand the number of California cities that recycle PS foam to 43.

Dart compacts the foam into 45-lound bricks and ships them to Timbron International Inc. in Stockton, Calif., to make interior moldings, and to Nepco Industrial Co. Ltd. to make high-end picture frames at its plant in Chino, Calif.

The American Chemistry Council also was involved in the debate.

"When legislators learned more about ... the bill's impact on jobs and the state budget, support for the ban faded," said Keith Christman, managing director of plastics markets for Washington–based ACC. "An economic analysis for similar legislation in 2009 [done by Keybridge LLC for ACC and Pactiv] concluded that California would lose nearly $1.4 billion in output, $335 million in earnings and close to 8,000 jobs.

"And that doesn't even include the impact on the Department of General Services budget, state enforcement costs and the untold millions of dollars it would have cost schools that use plastic foam lunch trays," Christman added. "The state focus should be improving opportunities to recycle, not banning valuable products."

"The battle over this bill is not done," said Miriam Gordon, the San-Francisco-based California director of Clean Water Action. "It is poised to be heard on the Assembly floor next year.

"This is a match-up of David vs. Goliath," she said. "Despite massive spending and efforts of well-funded chemical and plastic groups [and] despite the paltry budgets over organizations like mine, we moved this bill way further than any of the three previous polystyrene ban bills in the California Legislature."

"With increases on the cost of oil driving up the price of polystyrene, and demand for sustainable food packaging increasing 17 percent each year already, companies like Dart and Pactiv are already responding by offering lines of sustainable food packaging," Gordon said. "Are we going to let the manufacturing of the alternatives continue to move to China, or are we going to attract more manufacturers of alternatives to California by making this state the nexus of demand for sustainable packaging? It largely depends on the outcome of SB 568 [and that] won't be determined until the 2012 legislative year."

Environmentalists also argue that a ban is needed because PS packaging is a major source of litter along coastlines, and in rivers and oceans.

"Our investigation of the debris flowing from urban Los Angeles streets to the [Los Angeles and San Gabriel] rivers found that, in terms of the number of pieces of debris, 71 percent were foam," research scientist Charles Moore said in a study released Aug. 31 by the Algalita Marine Research Foundation. Moore founded the Long Beach-based, nonprofit foundation in 1994.

Forty-three cities and three counties in California have bans on PS takeout packaging. More than three-quarters of those communities are in the area between the Monterey Peninsula and San Francisco, and most of them are coastal communities.

The bans represent a combined area that accounts for less than 10 percent of the state's population.

Further up the coast, there are bans in Seattle; Portland, Ore.; and Issaquah, Wash.

The proposed bill had included an exemption from the ban for communities that could demonstrate a 60 percent recycling rate for PS food containers.

In addition, school districts would have had an additional 18 months to comply, and also could have been exempt from the ban if they established a PS recycling program with a 60 percent recycling rate.

# MONTHLY CIRCULAR OF THE FEDERATION

## CIRCULAR NO. 60/2012 :

**Sub: Membership of the Federation**

The Federation has received the following application for membership of the Federation :

| | | | |
|---|---|---|---|
| 1. | a) Name & Address of the Applicant Firm | : | **M/S ENTEK PACKAGING**<br>1/1A, Baghbazar Street<br>Baghbazar Market<br>Kolkata – 700 003. |
| | b) Class of membership | : | **Manufacturer member** |
| | c) Proposed by | : | M/s Barai & Turakhia |
| | d) Seconded by | : | M/s Rajda Sales (Cal) Pvt. Ltd. |
| | e) Name of Representatives | : | 1. Mr. Deepak Jaiswal<br>2. Mr. Pankaj Jaiswal |
| | f) Items of manufacture | : | Manufacturer of BOPP Self-adhesive Tape |
| 2. | a) Name & Address of the Applicant Firm | : | **M/S. ELECTRONICA PLASTIC MACHINES LTD.**<br>GAT No. 399, HISSA No. 1 & 2 Bhare<br>Tal : Mulshi<br>Pune – 412 111. |
| | b) Class of membership | : | **Manufacturer member** |
| | c) Proposed by | : | M/s Rajda Sales (Cal) Pvt. Ltd. |
| | d) Seconded by | : | M/s Mahabir Plastic Industries |
| | e) Name of Representatives | : | 1. Mr. K. P. Ghosh<br>2. Mr. Harmindar Singh |
| | f) Items of manufacture | : | Manufacturer of Plastic Injection Moulding Machines & Auxiliaries |
| 3. | a) Name & Address of the Applicant Firm | : | **M/S. SWASTIK RUBBER INDUSTRIES PVT. LTD.**<br>173, Mahatma Gandhi Road<br>Kolkata – 700 007. |
| | b) Class of membership | : | **Life Manufacturer member** |
| | c) Proposed by | : | M/s Stretch Plast |
| | d) Seconded by | : | M/s Plastic Engineers |
| | e) Name of Representative | : | Mr. Lokesh Chowdhury |
| | f) Items of manufacture | : | Manufacturer of PP Spunbond Non-Woven Fabrics and Allied products. |
| 4. | a) Name & Address of the Applicant Firm | : | **M/S. GULMARG DISPOSAL AND SUPPLY AGENCY**<br>Chawkdeghi Rd., Harijan Pally, Ward – 4<br>P.O. – Memari, Opp. 1 No. Pani Tank<br>Dist – Barddhaman – 713 146. |
| | b) Class of membership | : | **Dealer member** |
| | c) Proposed by | : | M/s Plastic Engineers |
| | d) Seconded by | : | M/s Ever Bright Plastic Works |
| | e) Name of Representative | : | Mr. Soumen Kr. Hazra |
| | f) Items dealt in | : | Dealer in Waste Paper & Board and Plastics etc. |
| 5. | a) Name & Address of the Applicant Firm | : | **M/S. PHARMACHEM TRADERS PVT. LTD.**<br>103G, Block – F<br>New Alipore<br>Kolkata – 700 053. |
| | b) Class of membership | : | **Dealer member** |
| | c) Proposed by | : | M/s Plastic Engineers |
| | d) Seconded by | : | M/s Ever Bright Plastic Works |
| | e) Name of Representatives | : | 1. Mr. Sachin Pal<br>2. Mrs. Sucharita Pal<br>3. Mr. Soumendra Saha |
| | f) Items dealt in | : | LLDPE and other Polymer Products. |

(Circulated in terms of Article 15 of the Articles of Association of the Federation)


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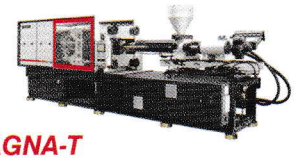

**MAGNA-T**
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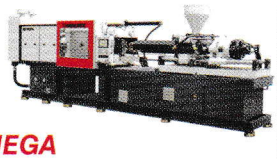
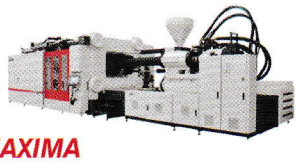


**OMEGA**
Hydraulic Injection Moulding Machine 80 to 910 Ton



**MAXIMA**
Two Platen Injection Moulding Machine 500 to 3000 Ton

**ELEKTRON**
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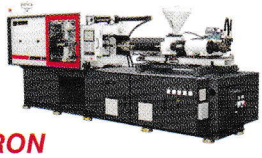

**HYDRON**
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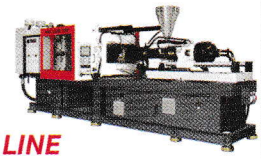
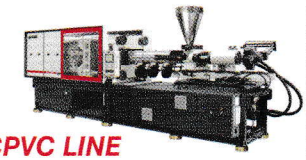
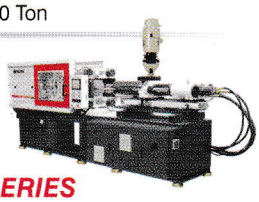


**PVC LINE**
Hydraulic Injection Moulding Machine 100 to 910 Ton



**CPVC LINE**
Toggle Injection Moulding Machine 110 to 500 Ton



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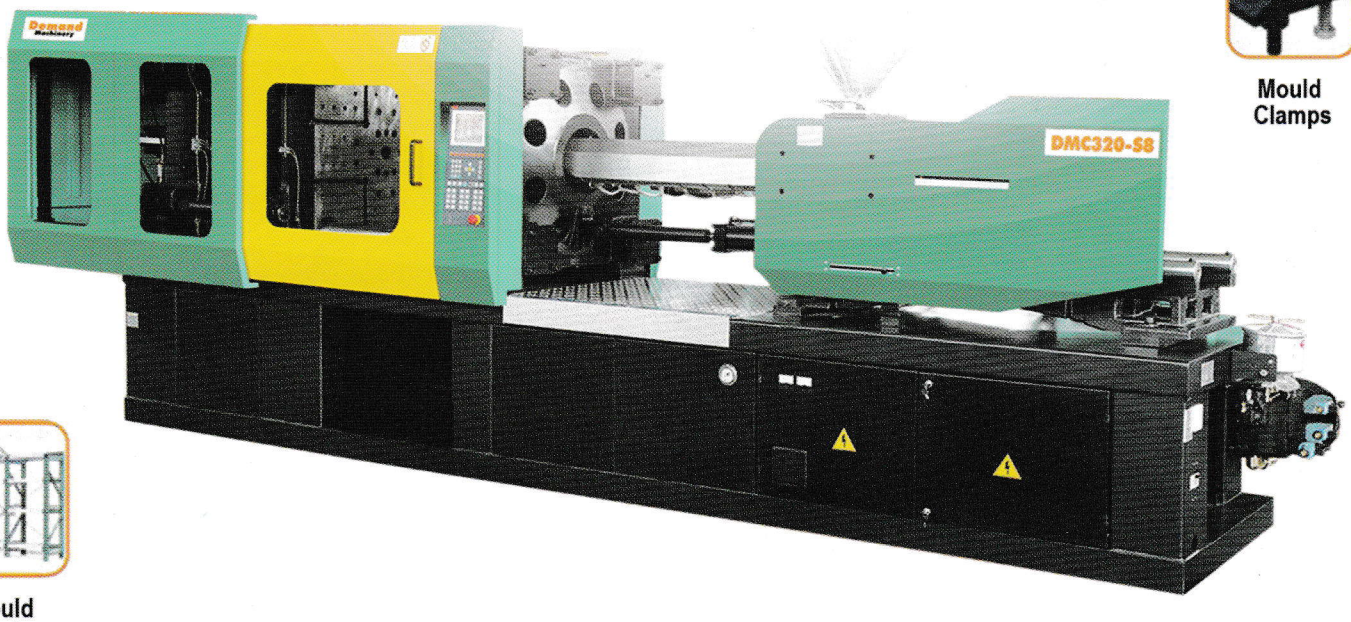
Flow Controller

Mould Clamps




Mould Racks

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