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Editorial



I had ended my last address to you mentioning two important events eagerly awaited by everybody – viz the quarterly monetary policy by RBI on 29th January '10 and subsequently the Annual Central Budget on 26th February '10. By now the first event is out of the way. Briefly stated as a measure to control inflation the Governor raised the CRR by 75 bps to suck out Rs. 36000/- crores from the system in two trenches. He did not tinker with any policy rates –repo rate or reverse repo rate etc. He raised his earlier estimate of 6% GDP growth to 7.5 % in the fiscal 2009-10. At the same time he also raised his earlier estimate of WPI inflation of 6.5% to 8.5% by March '10. Further he expressed his serious concern over the ballooning fiscal deficit and advised the government to come back to FRBM Act (Fiscal Responsibility and Budget Management) as early as possible.

Now coming to the second event – Annual Centre Budget on 26th February '10. Hectic preparations are going on behind the scene in this regard. As usual Finance Minister is having meetings with various Chambers of Industries and Trade labor unions etc to, obtain their suggestions and demands. Always there are conflicting demands. As an example – the domestic manufacturers of medical devices are demanding a hike in custom duty to make imports costlier whereas the administrative dept is calling for a reduction to bring down the cost of imported devices. So a compromise and balance has to be found out. However these are routine matters happening every year.

At this juncture, the Government is in a particular and serious dilemma. In view of better GDP growth nos, higher Industrial Production and other encouraging parameters the Government is under pressure to withdraw stimulus measures to improve the fiscal health of the country, whereas others are vehemently opposing this for various reasons. Firstly the latter argue that this will risk growth. Also these datas are based on estimates and guess and are not conclusive. Besides, at this time around last year, the whole world including India was in a great turmoil and recession. Till then even our government had also taken no steps to improve matters. As such the current datas are based on very low base effect, and do not show the real picture. Global situation is also not very clear and not showing any definite and positive improvement. Our exports are improving but at a very very slow speed. High level deliberations amongst the finance dept , planning commission, RBI and other financial institutions are currently going on to build a consensus. But it is being generally and commonly believed that the Government should wait at least up to May'10. By that time a more clear picture on all the points as stated above will be available to start the process of stimulus withdrawal in stages.

Kirit Parikh Commission has also submitted its report on Petroleum subsidies. Briefly and Broadly stated the report has suggested decontrol of Petrol and diesel and linking the rates with International prices. Further, it has suggested increase of Rs 150/- per cylinder of LPG and Rs 6/- per liter of kerosene. The commission has also pointed out that such high subsidies are no longer sustainable. So the Government is confronted with this delicate and highly politically sensitive problem.

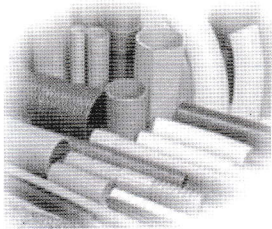
Thus our Government has a very long list of problems. Limited space does not allow me to enumerate them. I will do that at some later stage.

I shall end my address with an observation on our own Plastic Industry. Realizing the potential of export of Plastic goods the Government has recently included besides other labour intensive products such as Textile, Leather, Gems and Jewellery etc. Plastic products also under FPS (Focus Product Scheme). This scheme gives many extra advantages and facilities for exports.

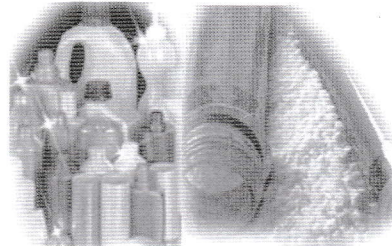
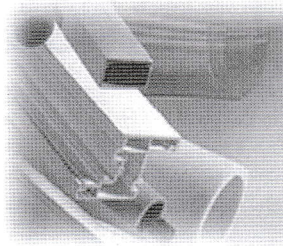
Hoping that the Finance Minister presents a budget which is friendly towards the development of Trade and Industry and a clear road map.



Pradip Nayyar
Editor



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PRESIDENTIAL ADDRESS



Dear Members,

This is my second message to you after taking over as President of this august body.

After a disastrous 2008, the year 2009 did not appear to be any better economically for the Western countries. With support from stimulus packages given by the US government, USA with 23% share of the world economy, clocked a GDP growth of 2.89% in Q2-09 and Q3-09. GDP of European countries declined slightly in 2009. Japan showed a steep decline in 2009. There was also a decline in GDP for Latin American and Caribbean region countries. However for China and India the picture was quite different. Both India and China have shown positive growth. India's finance ministry has recently projected a GDP growth of 7% upwards for 2009-10, hopeful of clocking a better performance in industry and service sectors in the second half of this fiscal. China has also clocked over 9% growth. This indicates that the financial stimulus packages of the Chinese and Indian Governments have indeed worked in enhancing economic growth in 2009.

While USA, Japan and EU countries are expected to produce low to negative GDP figures for 2009, Asia's bold GDP run is expected to slow to 5.3% - 5.5% as per predictions by research organisations.

Most economists and experts believe that the worst is over and there is a discerning recovery all around. Supported by fiscal and monetary policy, as well as government legislative intervention, the global economy shows signs of recovery. However, recoveries are not yet truly self-sustaining as job markets generally remain very low leading to restrained growth in consumer spending. It is projected that major economies will remain in expansion but the pace of recovery will remain slow.

Oil prices that had peaked to US \$147/ barrel in July 2008 slid to less than US \$40 in December 2008. The price of Naptha, the main input for production of polymers, also declined. Polymer price fluctuations in 2009 were not as volatile as in 2008, but fluctuated about 40 - 65% from the maximum levels. It is quite possible that 2010 may also see price fluctuations but they could be lower than levels of 2008 with massive petrochemicals capacities due on stream in 2010 in the Middle East, China and India that is likely to lead to a glut, leading to erosion of margins for polyolefins players in the Middle East and India compared to 2009. Over supply may be key cause for concern for many producers. However, in the last week of December '09, naptha prices in Asia hit a four-week high as strong fundamentals continue to boost sentiments.

The plastics industry now looks forward to the Union Budget that will be presented in Parliament on 26th February 2010. Hopefully, with no additional taxation on polymers, the most important raw material for processors, the plastic processing industry can look forward to a favourable year.

Wishing All the Members and their family HAPPY HOLI...!!!

With Warm Regards,

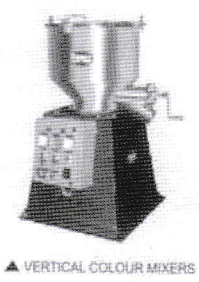
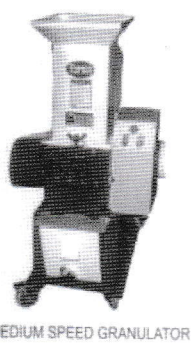
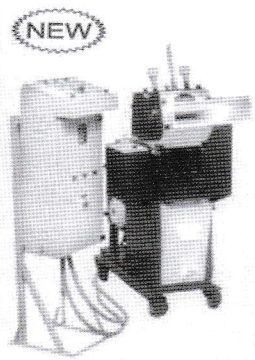
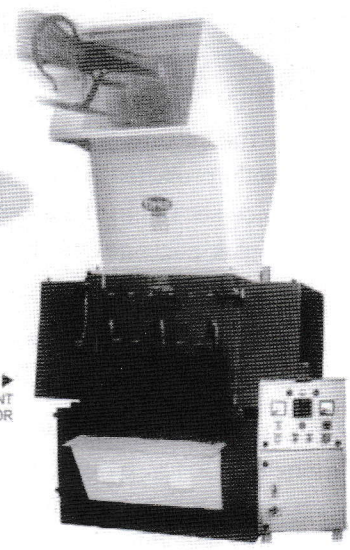
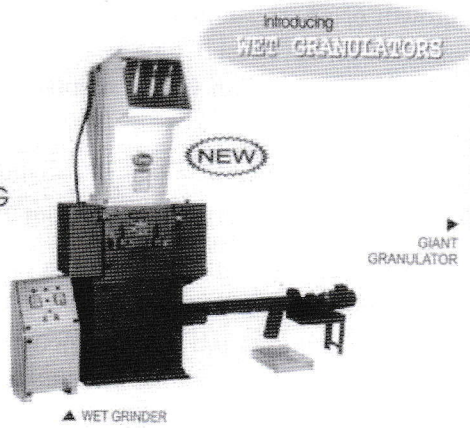
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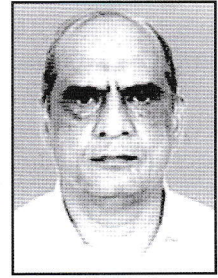
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From the Desk of

The Hony. Secretary



Dear Members,

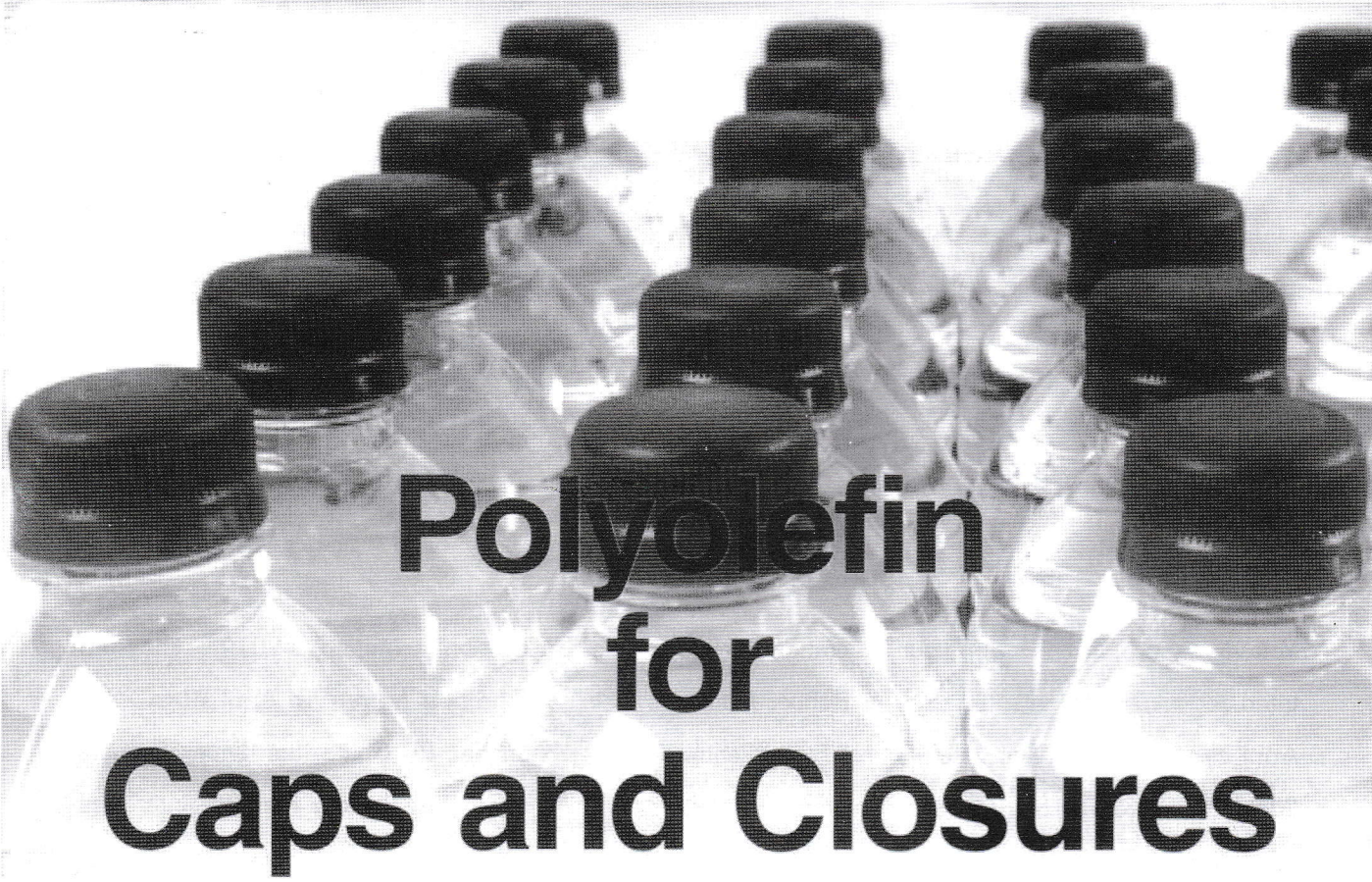
You will be glad to know that your Federation intends to take a delegation to Chinaplas 2010 – The 24th International Exhibition on Plastics & Rubber Industries which will be held from 19th April'10 to 22nd April'10 at Shanghai New International Expo Centre, Pudong, Shanghai, PR China. Shri Dipak Gathani (Mob : 98300 39614) has kindly consented to take this responsibility to organize the tour. Members interested in joining this delegation may kindly contact Shri Dipak Gathani and be a part of our delegation.

The financial year is coming to a close and most of you may be working on your budgets. Every body is eagerly waiting for our Union Finance Minister to present his budget for 2010 – 11 this month. We hope for the growth of the plastics industry, our Hon'ble Finance Minister will present a plastic friendly budget this year.

With best wishes

A handwritten signature in black ink, appearing to read 'Poddar' with a stylized flourish.

Ramawatar Poddar
Hony. Secretary



Polyolefin for Caps and Closures

Ashish Srivastava
Borouge India Pvt. Ltd

Introduction

Polyolefin Caps and Closures market is one of the major markets which are poised to show impressive growth in Indian Subcontinent in future and is of strategic importance. There are certain reasons for this impressive growth. Firstly there has been a clear shift from glass bottles to plastic bottles. Secondly there are a whole lot of metal caps which are being replaced by Polyolefin caps due to environmental advantages, cost benefits, improved processing, quality and safety and obviously design freedom. Last but not least, consumerism and modern life style is fuelling this growth as more and more people prefer to buy packed product, available in numerous brands and types.

The Caps and Closures market segmentation:

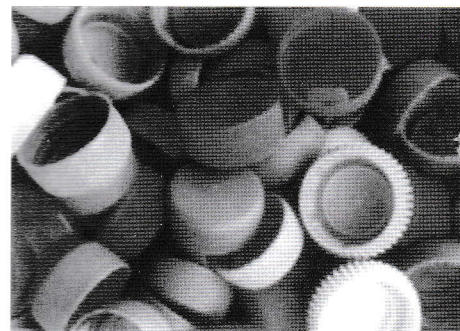
There are numerous types of caps and closures available for various applications. The market can be split in differ-

ent ways. Broadly, this market may be segmented into two categories:

1. Standardized caps and closures
2. Customized caps and closures

Standardized Caps

Standardized caps are designed to be fitted on standard bottle of PET or glass and are designed for a standard filling machine. Standard caps are used for Beverages e.g still and carbonated water, carbonated soft drinks. We call them standardized because the glass and PET bottles used have standardized neck finish. The growth in standardized caps and closures has been triggered by the replacement of metal caps used on glass bottles which are now replaced largely by PET bottles and a change in the consumption pattern as more refreshments are consumed from small bottles off the shelf. There are some very important requirements of these caps such as:



- Tightness
- Safety
- Ease of opening
- Good performance on the filling lines
- Gas retention
- Security of content
- User friendliness

PP and HDPE closures can be made using injection molding or compression molding and both offer their own spe-

cific advantages. The whole value chain for standard caps and closures is clearly looking for an increase in security and quality with favorable economics. PP Caps are normally two piece with liner. They are preferred for CSD in hot climate (better creep and ESCR), on glass bottles and on returnable PET bottles (as sealing is better). HDPE closures are normally one piece and can be used for still water, non carbonated juice and CSD in moderate temperature conditions.

Customized Caps

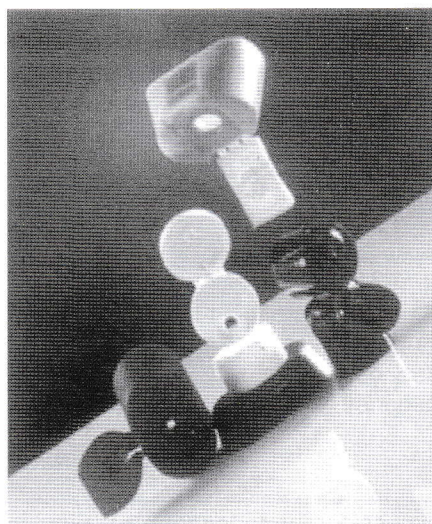
As the name says, customized caps and closures are designed for particular applications or products in various sub segments of the market such as pharmaceuticals, cosmetics, HIC, industrial and food. Food is again split into sub segments, according to the product. Customized caps and closures are diversified not only in their applications but also in the choice of material, shape, functionality and dimensions. Customized caps are dominated by PP.

Different types of closures are now being used like screw caps, flip top caps with integral hinge, wide mouth lids etc. Additional features such as tamper evidence, pouring systems, child safety and sealing solutions are being integrated into these basic designs.

Polyolefin for Caps and Closures

Both PP and PE are used for making Caps and closures. Depending upon the end product and the processing requirements one has to choose between the two and the right grade for the designated application.

Polypropylene is widely used for both standardized and customized caps. PP homopolymer is used where the stiffness is required along with easy processing. Typical examples are lamitubes and carbonated soft drinks. When the package needs exposure to sub zero temperature and higher impact strength PP block copolymer is used, the only drawback being increased stress whitening at the hinge area. Random Copolymer gives the highest transparency together with the lowest tendency to stress whitening, which is particularly important in cosmetics where the visual aspects carry a high value.



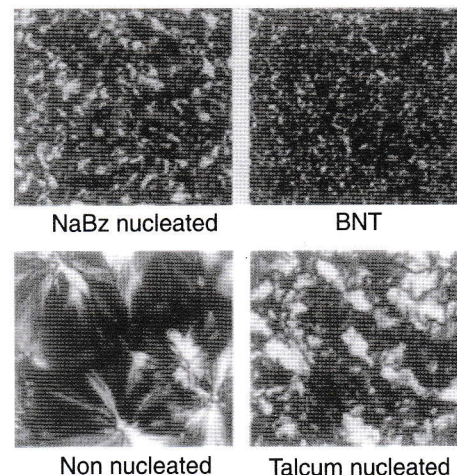
The increased demand for closures, dispensing systems and pumps with more features explains a clear trend in the use of more advanced materials. Controlled rheology (CR) materials, nucleation, slip agents and antistatic agents together with increased MFR and state of the art polymerizations bring new opportunities as they are employed to support increase design features and progress in closure design.

Polyethylene closure is the preferred choice when closures are used for organoleptic sensitive applications. Still mineral water caps are by far the most common application where one component HDPE closure is used. There are several other markets where HDPE/LDPE caps are used viz; milk bottles, pharmaceuticals, edible oil, libe oil, detergents etc.

Like in Polypropylene materials, PE has also been subjected to increased performance demands from end use application and processing requirements. As a result we find new generations of HDPE grades which are designed to bridge the gap between ESCR, impact strength and stiffness, at the same time making the material easy processing through broadening the molecular weight distribution utilizing the reactor process design. These days there are so-called multimodal HDPE grades which are of low MFR (1.5-2.0) having outstanding ESCR and flow behavior, outperforming the classical higher MFR unimodal grades.

New generation PP Grades for C&C market

Polypropylene grades with external nucleating agents and lubricating agents are known for C&C market for quite some time. Borealis and Borouge have made huge success in the C&C market with their new generation Polypropylene grades which have in-situ nucleation (BNT process). The grades offered are unique as they are produced with their state-of-the-art Borealis Nucleation Technology (BNT) which enables the material to have very strong nucleation effect, enhancing the performance for Caps and Closures. There are some of the unique features of BNT technology which are highlighted:



A consistent and better dispersion of the nucleation effect resulting into repeatability and reliable behavior in processing and properties

- Inert, no reaction with the other additives
- No taste or odor, especially in comparison with other nucleated Polypropylene
- Full compliance with food contact regulations

The strength of the nucleating effect is directly related to the spherulite sizes. The smaller the spherulite, more efficient is the nucleation. A comparison between non nucleated and BNT is shown in the picture.

Why use BNT – PP for closures?

High crystallization (solidification) temperature (T_c) and high crystalliza-

tion rates are two key elements that enable the material to solidify faster in the mould and hence reduce cycle time.

Compared with traditional commercial nucleating agents, BNT has a high crystallization temperature and offers the possibility for very high stiffness and potential for cycle time reduction up to 20%.

Dimension consistency with colors

It is well known that pigments act as a nucleating agent. In most cases the nucleating effect as such has a positive influence on mechanical properties. The problem generally encountered in C&C market because of the following reasons:

- Different pigments cause different degrees of shrinkage and thus different dimensions of the caps
- Caps with different colors behave differently e.g. have different opening force
- Different colors require different processing parameters

Typically, certain red and blue pigments act as nucleating agents in Polypropylene, resulting in various levels of shrinkage. It can be very difficult to obtain the correct product dimensions with one mould when using several colors. Often it is necessary to apply different processing parameters for example in the cooling time.

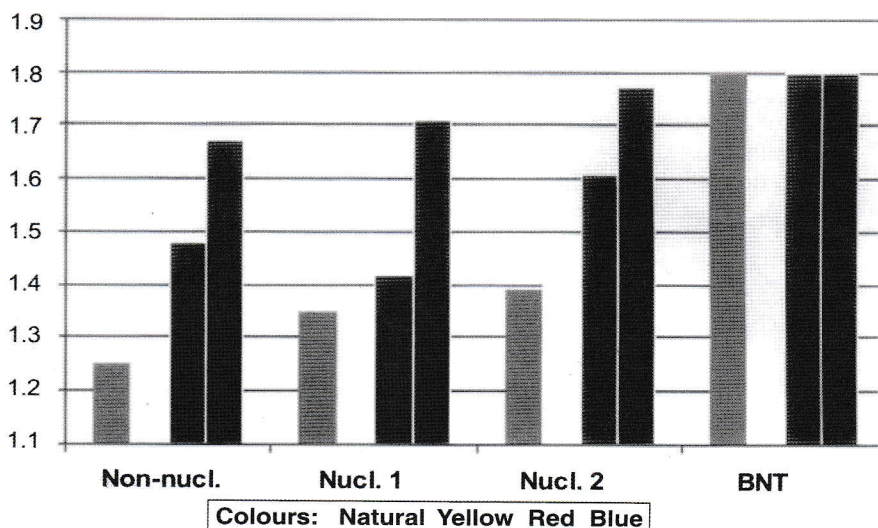
BNT solves these problems because its nucleating effect is much stronger than the nucleating effect of pigments. Therefore, it provides repeatable, constant shrinkage and constant dimensions, independent of the color chosen.

Polypropylene products standardized caps BD950MO

BD950MO is a heterophasic copolymer with MFR 7 with BNT technology. It is intended for both compression and injection molding process. It is optimally designed to give good balance of impact/stiffness. The grade can be used for CSD as well as drinking water.

Key features and benefits of BD950MO

- Constant shrinkage and cap



dimensions independent of pigment used

- Improved productivity through reduced cycle time
- Balanced mechanical properties
- Low stress whitening
- Good organoleptics
- Excellent dimensional stability
- Good antistatic properties
- Low friction of coefficient leading to low opening torque

Polypropylene products customized caps HG385MO

HG385MO is a homopolymer with MFR=25, made with BNT technology. It is specially designed for injection molded caps and closures. This grade has narrow MWD, and has antistatic agent and the slip additive for enhanced performance.

Key features and benefits of HG385MO

- Good flow properties
- Excellent stiffness
- Low warpage
- Very good gloss
- Excellent anti static performance
- Cycle time reduction up to 10%
- Very good demoulding properties

RG460MO

RG460MO is a Random copolymer

with MFR=30. It is specially designed for good impact-stiffness balance

Key features and benefits of RG460MO

- Very good flow properties
- Low warpage
- Good gloss
- Excellent anti static performance
- Good impact

Polyethylene products standardized and customized caps Borpure™ MB6561

Borpure™MB6561 is a bimodal High density Polyethylene grade intended for injection and compression molding. The MFR and density of this grade is 1.5g/10min and 955kg/m³. This grade is suitable for still and sparkling water & Carbonated soft drinks.

Key features and benefits of Borpure™MB6561

- Superior flow
- Excellent organoleptics
- Excellent ESCR
- Good impact strength even at sub zero temperature

Borpure™ MB6562

Borpure™MB6562 is a bimodal High density Polyethylene grade intended for injection and compression molding. The MFR and density of this grade is 1.5g/10min and 955kg/m³. This grade is suitable for Beverage food and industrial packaging. This grade contains

lubricant for optimum opening torque of the caps

Key features and benefits of Borpure™ MB6562

- Superior flow
- Excellent organoleptics
- Excellent ESCR
- Good impact strength even at sub zero temp
- Optimum opening torque of the cap

Summary

Caps and Closure market is all set to go for a step change. The advent of heat

stable PET, clarified PP and multilayer containers is opening new markets to plastic closures, such as juices, preserves, pickles, cooking sauces, soups, and baby food, which are traditionally packed in glass containers and sealed with steel vacuum closures. Further opportunities lie in cold fill applications such as honey.

Clearly, one has to choose between PP and PE material to make suitable caps and closures meeting the processing requirements and the end product needs. Polypropylene, in a broader perspective is preferred where transpar-

ency, hinge properties, high temperature resistance, resistance to internal gas pressure is required. Polypropylene offers the advantage of stiffness for lightweighting and parts per unit weight of the resin (lower density of PP against HDPE). PE (mainly HDPE) is preferred for organoleptic sensitive applications, but the boundary between PP and PE is moving close as the new generations of high performance PE's emerge. There are some applications where HDPE will continue to be used due to pharmaceutical specifications or recycling issues on account of compatibility with the bottle or base container

Source : IPI Journal



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ADVANCED COMPOSITE MATERIALS FOR DAMAGE MITIGATION – PART I: FIRE RETARDANT COMPOSITES

Dr. Dipayan Sanyal & Dr. Nripati Ranjan Bose

Abstract

Polymer based composites for damage mitigation is finding a great deal of application as critical components in engineering and strategic sectors. In this article, we highlight the phenolic resin based composites which exhibit excellent resistance to fire and heat related damages. These composites are prepared by using sheet moulding compound (SMC) and find applications in transformers, switchgears, circuit breakers, railway panels, aerospace structures and so on for their good physical properties and low flammability and low smoke production.

Introduction

Fibre reinforced polymer based composites are being increasingly used in automotive, aerospace, marine, biomedical, infrastructure, sports and other strategic and critical engineering sectors. The main advantages of using polymer composites over other materials, such as, metals and alloys etc. lie in their superior strength-weight ratios and modulus-weight ratios which are substantially higher than these traditional metallic materials. Composites can be broadly classified into two categories – engineering composites and advanced composites. They differ mainly in the type and length of fibre reinforcements and the type of resin used. Engineering composites are characterized by short fibres with low mechanical properties whereas the advanced composites are characterized by long fibres with superior mechanical properties. In case of the latter, the matrix is a high performance resin with superior thermal and mechanical properties. Components made of engineering composites are used in various applications which demand better strength and toughness than that of conventional plastic resins, such as, boat hulls, tubs, fuel storage tanks and so on. Advanced composites are used in niche applications requiring exceptional damage resistant properties such as automotive components, rocket motor cases, aeroplane parts and so on. Advanced composites are primarily sought for resisting two types of damages, namely, impact related damages and heat/fire related damages. In this first part of a two part article, we shall deal with advanced composites for fire-resistant applications. Impact damage resistant advanced composites will be dealt with in the second part.

Fire resistant advanced composites have attracted a great deal of attention in recent years not only due to harsh environmental conditions that composite parts are subjected to in strategic aerospace applications (such as, rocket motor casing), but also due to the safety and security requirements in transportation and infrastructure sectors (car bodies, railway coaches, bridges etc.) which demand better protection against fire caused either purely accidentally or by human actions, such as, vandalism, mob violence or terrorist strikes. An early account of the role of synthetic resin matrix in resisting fire/heat related damages upto 300 °C was provided by Delmonte [1]. The chemistry and thermo-oxidative properties of heat resistant polymers, especially, thermosets, were discussed in details by Lewin et al. [2]. Phenolic resins have been used widely in the automotive, electrical, appliance and construction industries since 1910. These applications took advantage of the material's excellent thermal and dimensional stability and adhesive qualities. Cured phenolic resins, such as, low molecular weight oligomeric compounds e.g., resorcinol bis (diphenyl phosphate) [3], polycyclic phosphonates [4] etc. derive their excellent fire retardance property from their extensive cross-linking and high aromatic content. Often these resins are mixed with special additives, such as, boric acid [5], mixture of metal hydroxides and halogenated organic phosphates [6] for improving fire retardance. Depending on the structure of the polymeric material which govern the fire retardance property various strategies have been evolved to enhance fire retardance property of polymers and composites [7]. These are briefly discussed as follows.

Design of Fire Retardant Polymers and Composites

Fire retardant polymers are designed to achieve one or more of the following properties:

- (a) high resistance to ignition and flame propagation
- (b) low rate of heat release on combustion
- (c) low smoke generation and
- (d) little or no emission of toxic vapours on combustion

The rate of combustion and the mechanism of combustion are both altered favourably by mechanical blending or chemical combination of a suitable fire retardant compound with the polymeric substrate. The additive or reactive fire retardant compound facilitate damage mitigation either by

- (a) vapour phase inhibition whereby gas phase radicals generated out of combustion are converted to less reactive species, or by
- (b) Condensed phase inhibition where the fire retardant compound reduces supply of flammable volatiles into the zone of fire by breakdown and withdrawal of polymer from that zone or deposition of a layer of carbon by cyclising and cross-linking of unsaturated polymer generated by means of a dehydrating action of the fire retardant compound.

As a consequence, the combustion cycle gets disrupted which leads to damage mitigation. The choice of a suitable fire retardant depends on a variety of factors, such as, degradation characteristic of the polymeric substrate and the compatibility in chemical and physical properties between the substrate and the retardant. The commonly used and widely known fire retardant additives are poly-halogenated hydrocarbons, hydrated metal salts and phosphorus based inorganic and organic additives. The halogen atoms liberated from halogenated hydrocarbons improve fire retardance by inhibiting the gas-phase chain oxidation reactions. The hydrated metal salts enhance fire retardance by decomposing endothermically and releasing water which reduces the overall heat of reaction and dilutes the flammable gases. Phosphorus based additives promote formation of incombustible char which protects the polymeric substrate from burning and imparts fire retardant property. In most practical applications, various combinations of additives, such as, a mixture of antimony oxide and halogenated polymers, are used to produce synergistic effects reported by various researchers [8, 9]

Based on comparative studies of various candidate thermoplastics and thermosets for manufacturing fire retardant composites, it was found that composites with a phenolic resole resin matrix exhibit low flammability, low smoke generation and excellent strength retention up to 200 °C for 1000 hours [10]. Further enhancement and long term retention in fire retardant property of composites could be achieved by blending phenol-aralkyl resins with phenolic resin without any compatibility problem and without necessitating any changes in processing [11].

Phenolic resins are synthesized by catalytic conversion of phenol and formaldehyde as follows :



Depending on the molar ratio of phenol and formaldehyde, two types of phenolic resin can be produced, namely, Novolacs and Resols.

1. Novolacs resins are made with more phenol than formaldehyde (on a molar basis), that is, for $x > y$ and acid catalyst
2. Resols resins are made with more formaldehyde than phenol (on a molar basis), That is, for $x < y$ and basic catalyst

In this article we describe how resols have been used as matrix materials. Resols are used at room temperature in liquid form to wet the fibers and fillers. Subsequently, the fibre and filler laden resol matrix is subjected to acid curing (at 25°C to 37°C) or basic curing (at 140°C to 180°C) with the application of heat and pressure to produce high strength, fire resistant composites [12-14].



Detailed studies on the thermal and thermal-oxidative degradation of phenolic resin have been reported by various researchers over a wide range of temperature upto 1000 °C [2, 15, 16]. These studies have revealed the roles played by both the methylol species and the dibenzyl ether linkage in phenolic resin chemistry. The methylol group is a primary reaction product formed during base catalysed resin formation and the ether group has been shown to be formed either by heating methylol group containing resins to over 120°C or by treatment under acid-catalysed condensation conditions. Methylol groups have been shown to react in the temperature range between those used for curing and 450°C, where they can no longer be detected as discrete chemical moieties in the resin system. The three possible reactions of methylol groups have been observed :

- (a) the reversal of condensation process forms formaldehyde
- (b) the heating of the methylol groups results in the formation of additional methylene linkages (curing) and
- (c) under oxidative conditions the methyl group is oxidized to acid groups.

The ether linkage appears to play only a minor role, if any at all, in the oxidative degradation of phenolic resins.

Manufacturing Process

Fabrication of a fire resistant composite can be done semi-automatically or automatically. In this article, we present a semi-automatic process for manufacturing. The raw materials comprised E-glass fibre chopped strand mat, stitched combination mat made of chopped strand mat and woven roving and phenolic resolite resin (Grade Phenoset 5001 from Hindusthan Adhesive & Chemicals Ltd.). For improved adhesion with Phenolic resin, the glass fibre mat was pretreated with organosilane coupling agent (amino silane coupling agent of Union Carbide Ltd., India.)

For the enhancement of fire resistance property the SMC slurry was prepared using boric acid, alumina trihydrate and chlorinated paraffin wax. The SMC based on water soluble phenolic resin was prepared by using resin slurry paste. Phenolic sheet moulding compound is made in much the same way as unsaturated polyester sheet moulding compound, except that the resin-catalyst system is different. Unsaturated polyester SMC equipment can be used to make phenolic SMC. The sketch of SMC machine is given in Figure 1. The resin slurry paste is fed to the doctor boxes, where a measured thin layer of resin slurry paste was deposited on each film of polyethylene via a doctor blade. Fibreglass chopped strand mat or fibreglass woven roving or a stitched form of fibreglass combination mat passed over series of rollers underneath and a layer of paste was distributed evenly over the fibreglass mat. The thickness of the paste films and density of fibreglass mat determine the thickness and density of final SMC. The green SMC goes through the kneader rolls, which led the glass into the paste (i.e., wet the glass with resin). After this treatment, the SMC was put on a roll. The phenolic SMC was unrolled and dried over a tray drier for 2 hours at 60°C. Tackiness and pliability indicating the quality of phenolic SMC ready for hot hydraulic moulding. The laminates were made by assembling alternate layers of requisite size CSM-based SMC and WR-610 based SMC or combination mat based SMC according to desired thickness inside of female mould attached at the bottom of the hot hydraulic press. The laminates were then pressed at a pressure of 7.6 MPa and at a temperature of 140°C for 10 minutes.

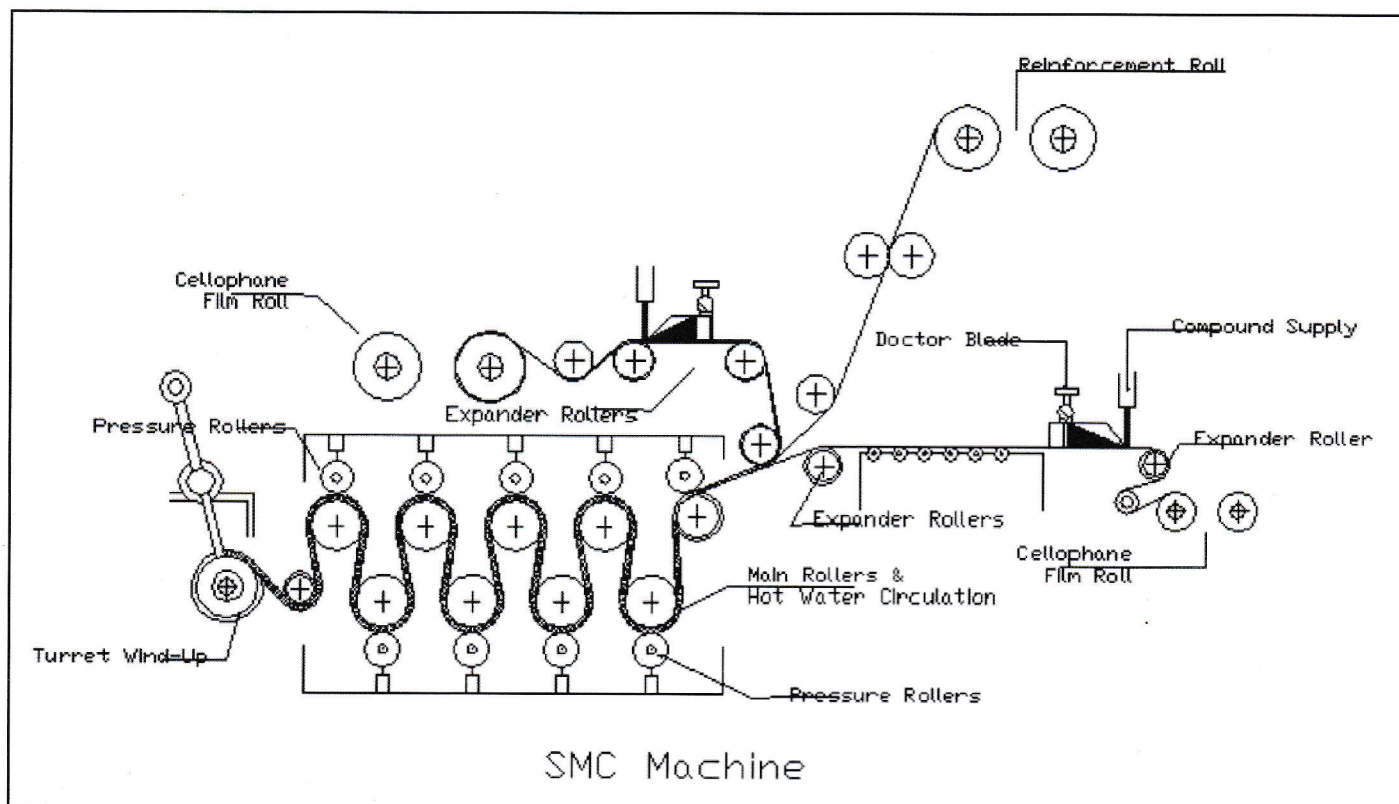


Figure 1 Schematic Diagram of SMC Machine for Composite Manufacture

Test Results

Various tests were conducted relating to composition of the composites made and their mechanical properties, hydrothermal degradation, thermal degradation, heat deflection temperature, thermo gravimetric analysis and phase morphology [18]. The mechanical properties were determined by using Universal Testing Machine, model Instron 1185, U.K. as per BS 2782

and ASTM specifications and the impact properties were determined by using Izod Impact testing machine supplied by M/s . S.C.Dey & Co., India. TGA curves of the composites was obtained from TGA – 50 equipment supplied by Shimadzu Co., Japan. TGA analysis of each specimen was performed at a heating rate of $10^{\circ}\text{C min}^{-1}$ in an atmosphere of air. Scanning Electron Micrograph (SEM) of the fracture surface of the composite specimen was taken by using SEM equipment model LEO-430S, U.K. Resistance to spread of flame of the composite sample was carried out as per "Schedule of Technical Requirements" (STR) for SMC products (C-9403) of R.D.S.O., Ministry of Railways, Lucknow, India. Details of the test results have been reported by Bose and co-workers [17, 18] and are not reproduced here for paucity of space.

The results of tests conducted to evaluate the flexural properties of the composites under (1) hydrothermal degradation in boiling water for 24 h and (2) thermal degradation at different furnace temperatures clearly indicate that the rate of flexural strength loss of the composite on hydrothermal degradation in boiling distilled water is only 0.43 % per hour. In case of thermal degradation of the composite at different furnace temperatures, the rate of flexural strength loss of the composite is only 2.14% per hour at 150°C and 5.13% per hour at 200°C . Results of the mechanical properties of phenolic-glass SMC composites indicate that phenolic glass SMC composites are somewhat inferior to polyester-glass composites in strength (tensile and flexural) and impact toughness. However, with higher weight fraction of glass in the composites, higher strength characteristics could be achieved. Heat deflection temperature (HDT) of three selected matrix resins and those of the corresponding E-glass fiber reinforced composites clearly revealed that for each matrix resin system, glass fiber reinforcement causes much improvement in the heat deflection temperature. Among these three composites, the phenolic resin based composite showed superior heat resistant properties.

Conclusion

In this paper, we have shown how to manufacture large components in glass reinforced phenolic composites with high fire resistance and low fume emission characteristics which are much superior to those attainable with polyester and epoxy matrices. Our studies on the fire resistant properties of phenolic-glass composites show that these composites exhibit high strength and high resistance to fire, temperature, smoke and toxicity performance at low cost and can be used safely as components where fire retardant behaviour is of paramount importance, such as, transformers and switch gears, circuit breaker, transport vehicles, door panels, corrugated roofing sheets, interior aircraft panels, food galleys, railway components etc.

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NEWS AROUND THE WORLD

Global Petro Chemical Industry is witnessing a paradigm shift from West to East.

The petrochemical industry of today is an indispensable part of the manufacturing and consuming sectors, churning out products which include paint, plastic, rubber, detergents, dyes, fertilizers, textiles, and even solvents, as per a report by Research and Markets. The 21st century is seeing a paradigm shift from West to East in the Petrochemicals business, with the Middle East emerging as global production hub with natural advantages of low cost feedstock. Major consumption centers are shifting to Asia given the rapid growth in demand in China on account of chemical intensive and export driven industry and India emerging as global consumption centers. This trend is likely to also shake up the global petrochemical industry with emergence of National Chemicals and Oil Companies as global players and established western companies having to exit or shrink unless they realign by moving eastwards through partnerships or strategic alliances to be near the consumption centers to catch up with Asia Petrochemical boom. However, as regional petrochemicals development continues, the industry will face significant challenges relating to energy and feedstock availability and to climate change, particularly carbon dioxide emissions. Focus in 2009 remains at construction of olefin projects in Middle East, economic development and demand in Asia Pacific and supply and pricing of petroleum and natural gas.

Industry expectations that can boost the consumption of petrochemicals in India.

The growth potential of India's polymer and petrochemical industry has not completely materialized largely due to the high excise duty rate on petrochemicals. To boost petrochem consumption to partially/fully offset the loss in revenue from excise duty, the industry has a few expectations that include: Import duty on two basic feedstock's naphtha and propane be reduced from 5% to nil. Import duty on polymers, chemicals and fibre intermediates be rationalized and increased to 10% from current 5%. Excise duty on naphtha to be brought down to 8% from current 16% and maintain excise duty on polymer at 8%. Customs duty on capital goods imported by Petrochemicals sector be made 'nil' and the customs duty on catalysts imported for use in manufacture of petrochemicals (like EDC, VCM and Styrene) be made 'nil'.

Greenstar WES has claimed it has become the world's first commercial producer of food-grade recycled plastic.

The plastic is already being used to make millions of plastic milk-bottles and food containers for British supermarkets. Marks and Spencer has approved Greenstar WES for the continuous supply of recycled plastic for its new organic-milk bottles. These milk bottles are made with 10 per cent recycled food-grade plastic, known as r-HDPE.

Packaging manufacturer Nampak converts the r-HDPE flakes into new plastic bottles and Dairy Crest fills them with Marks and Spencer's organic-milk range. Nampak estimates it has made more than 21 million milk bottles so far, using flake from Greenstar and other suppliers.

Over the past few months, Greenstar WES has supplied nearly 500 tonnes of food-grade recycled plastic to packaging manufacturers such as Nampak, Sharp Interpack and Linpac Packaging and estimates it will supply 8,000 tonnes during 2009. Greenstar WES's recycled plastic is also being used for other food-packaging applications, such as the thermoforming of supermarket food trays.

Greenstar WES receives up to 2,000 tonnes of baled plastic each month, much of it sourced from domestic recyclables processed at Greenstar UK's materials-recycling facilities, such as its site at Aldridge near Birmingham.

Nampak will ultimately take 6,000 tonnes of r-HDPE annually from Greenstar WES, using it to make plastic milk bottles with up to 30 per cent recycled content. The company has been instrumental in helping drive the initiative to use food-grade recycled plastic for new packaging. Greenstar WES's r-HDPE is now a standard manufacturing ingredient at Sharp's Bristol production site.

Reusable Plastic

Researchers in the Netherlands have reported the development of a plastic that can be reused many times. Antonius Broekhuis and his colleagues at the University of Groningen noted that thermoset plastics are widely used in consumer electronics because of their hardness and heat resistance. These plastics, however, contain additives and reinforcement materials that make them almost impossible to recycle.

As a result, thermoset plastics often end up in landfills or incinerators, where they contribute to pollution. Scientists have long sought a simple, inexpensive process to make these plastics recyclable, but, until now, they have been largely unsuccessful. Broekhuis and his colleagues claim that they have developed a type of thermosetting plastic that can be melted and remoulded without losing its original heat resistance and strength.

The scientists showed in laboratory tests that they could melt granules of what they term a self-healing polymer and reform them into uniform, rigid plastic bars. They also showed that the plastic could be remoulded multiple times, setting the stage for a new generation of recyclable plastics.

Tough plastic

A Michigan State University researcher and his students have developed nanoparticles that could be used to make plastic stiffer, lighter and stronger. Lawrence Drzal, a professor of chemical engineering and materials science at the university, led the research group that developed the graphene nanoparticles, which are now being exclusively manufactured by XG Sciences, a university spin-off. The nanoparticles themselves consist of small stacks of graphene layers that can replace carbon nanotubes, nano-clays, or other carbon compounds in many composite applications.

When added in trace amounts to plastics or resins, the nanoparticles make these materials electrically or thermally conductive, and less permeable, while simultaneously improving mechanical properties such as strength, stiffness or surface toughness. For example, when the graphene nanoparticles are added to nylon, the resulting nanocomposite is significantly less permeable to petrol or other fuels while also dissipating static electricity.

To make the nanoparticles, the researchers developed a new process to separate layers of graphite (graphene) into stacks less than 10nm in thickness but with lateral dimensions anywhere from 500nm to tens of microns.

'Now that we know how to make this material and how to modify it so that it can be used in plastics, our attention is being directed to high-end applications where we can really make some substantial changes in the way electronics, fuel cells, batteries and solar cells perform as a result of using this material,' said Prof Drzal.

Biodegradable Plastics

Biodegradable Plastic is plastic which will degrade from the action of naturally occurring microorganism, such as bacteria, fungi etc. over a period of time. Note, that

Continued to Page - 19

GLIMPSES
SEMINAR ON
MAKE YOUR COMPETITION & PRICE WAR
IRRELEVANT WITH CORRECT MARKETING
BY MR. HELMUT G. FLASCH, CEO,
FLASCH BUSINESS EXPANSION, USA

A Report on Seminar

Indian Plastics Federation jointly with Indian Plastics Institute(Kolkata Chapter) organised a one-day Seminar on "Make your Competition & Price War Irrelevant with Correct Marketing" on 27th November 2009. The Seminar was held at the Staurday Club, Phoenix Room, 7, Wood Street, Kolkata - 700 016. The speaker in the Seminar was the renowned international marketing Guru Mr. Helmut G. Flasch.

This was a unique seminar for Business Owners who would like to grow their business in the current environment of competitive and price was scenario. This business will help expand business with an innovative marketing approach and would inculcate the art of marketing one's product/service.



From L to R : Mr. Helmut G. Flasch, Mr. Sourabh Khemani, President, IPF, Mr. Subhash Kadakia, Chairman, IPI, Mumbai & Dr. N. R. Bose, Chairman, IPI (Kolkata Chapter) are present on the dais.

The Course objectives for the Seminar were :

- Successful strategies to grow one's business in the current slow down scenario.
- Expansion strategies for Small Business Owners and Entrepreneurs.
- How to make one's product/service stand out from one's competition.
- Expand one's business with innovative marketing approach.

Over 125 persons joined the seminar consisting of CEOs, business owners, top management, sales/marketing executives, entrepreneurs, bank officials etc.

The presentation was followed by an interactive session where Mr. Helmut G. Flasch answered various questions of participants.

The Seminar was a great success.



A View of the teaching technique by Mr. Helmut G. Flasch.

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VISIT OF IPF DELEGATION TO GUJARAT

A Visit Report by
Mr. Jayanta Goenka, Executive Committee Members, IPF



A View of the IPF Delegation at PP Plant of RIL, Jamnagar, Gujarat

RIL also showed us their Jamnagar Refinery & PP Plant- I and another Plant-II which is a SEZ unit. These Plants are again a feast to the eyes. On the shop floor hardly any Men can be seen, The plant is fully automatic & computer controlled and is run by mere 20 persons per shift. It is located in a few thousand acres. The entire Plant was commissioned within a short span of 3 years only and at any given time about 1 Lac people were involved round the clock to commission the Plant.

RIL also showed us their Jetty which is about 6 K.M. inside the Sea from the shore. At a time, 4 large Ships can be loaded from the RIL Jetty. Further 11 K.M. from the Jetty very large Ships were parked and from there Crude was being pumped through underground pipes from ships and was being brought to the RIL Refinery. RIL has further drawn pipe line up to Bhatinda in Punjab. RIL can process worst quality of crude available in the world.

On 8th Jan'10, the delegation proceeded to Dwarka Dham & stayed at the Muth. This leg of the tour was organized by Mr. Rajesh Mohta. Dwarka Darshan of lord Krishna (The Ranchod) was performed by the members and it was a life time experience. Members also visited "Nageshwar Jyotirling" which is again a sacred place for Hindus.

On 9th January'10 the members visited Plastics & Packing Exhibition Plexpo India 2010.

In the evening the Exhibition was inaugurated by the Chief Minister of Gujarat Hon'ble Sri Narendra bhai Modi. The inauguration speech of Sri Narendra bhai Modi was for the common man, very simple but at the same time very much to the point and he accepted the fact that Plastics is now a part of our lives and we cannot live without the same but effective use & disposal is required. His industry friendly speech was an inspiration to the entrepreneurs to set up and run Plastics industry in Gujarat.

The Plexpo India 2010 was an international standard Exhibition, well organized and well attended. The GSPMA extended warm welcome & hospitality to the members of IPF delegation. IPF also had a stall at the Exhibition which furthered the awareness about our activities in the Western part of India.

In short the entire trip was a memorable one.

On an invitation by GSPMA, an IPF Delegation consisting of about 20 members visited Gujarat from 06/01/2010 to 10/01/2010. Besides attending Plexpo India 2010 - Plastics & Packaging Exhibition at Ahmedabad on 9th & 10th Jan '10 the delegation also visited RIL Jamnagar and Dwarkaji.

IPF extends its heartiest thanks to Reliance Industries Ltd., Kolkata for inviting and hosting its esteemed customers and DCA's to visit the plant of RIL at Jamnagar on 7th Jan '10. This leg of the visit was hosted by RIL and it was an occasion to cherish. Their Vice President Mr. S.C. Malhotra welcomed the delegation and extended memorable hospitality and personally accompanied the delegation.

Environmental consciousness of RIL is demonstrated in maintaining a Green field in which RIL is discharging all their waste after affluent treatment and thereby maintaining harmony of the soil by growing about 8000 Tones of Mangoes and other fruits per annum by the drip irrigation method. Drip irrigation and mulch film usage gives higher fruit output.



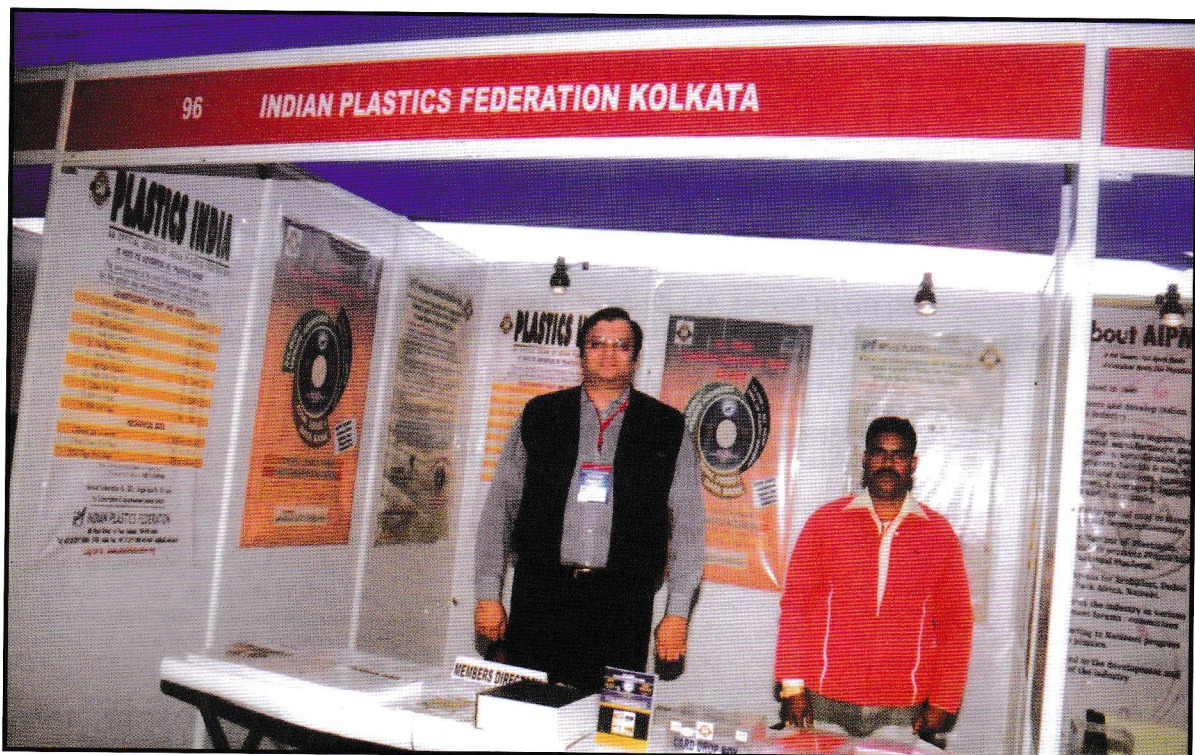
A View of the Plant of Reliance Industries Ltd., Jamnagar, Gujarat

GLIMPSES

PLASTICS & PACKAGING EXHIBITION PLEXPO INDIA 2010 AT AHMEDABAD



From L TO R : An IPF team consisting of Mr. Bharat Shah, Mr. Jayant Goenka, Mr. R. A. Lohia, Mr. Sourabh Khemani, President, IPF, Mr. Amar Seth & Mr. Pankaj Bansal were present at the Plexpo India 2010 exhibition ground.



A view of IPF Stall at PLEXPO India 2010 Exhibition, Ahmedabad.

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there is no requirement for leaving "no toxic residue", and as well as no requirement for the time it needs to take to biodegrade.

Biodegradable plastics are plastics that will decompose in the natural environment. Biodegradation of plastics can be achieved by enabling microorganisms in the environment to metabolize the molecular structure of plastic films to produce an inert humus-like material that is less harmful to the environment. They may be composed of either bioplastics, which are plastics whose components are derived from renewable raw materials, or petroleum-based plastics.

The use of bio-active compounds compounded with swelling agents ensures that, when combined with heat and moisture, they expand the plastic's molecular structure and allow the bio-active compounds to metabolise and neutralize the plastic.

Advantages and disadvantages

Under proper conditions biodegradable plastics can degrade to the point where microorganisms can metabolize them. This reduces problems with litter and reduces harmful effects on wildlife. However degradation of biodegradable plastic occurs very slowly, if at all, in a sealed landfill. Proper composting methods are required to efficiently degrade the plastic, which may actually contribute to carbon dioxide emissions.

Degradation of oil-based biodegradable plastics may contribute to global warming through the release of previously stored carbon as carbon dioxide. Starch-based bioplastics produced from sustainable farming methods can be almost carbon neutral. Biodegradable plastics cannot be mixed with other plastics when sent for recycling; this damages the recycled plastic and reduces its value.

Mechanisms

Materials such as polyhydroxyalkanoate (PHA) biopolymer are completely biodegradable. Fully biodegradable plastics are more expensive, partly because they are not widely enough produced to achieve large economies of scale.

Other types are semi-biodegradable, but avoid increased costs by using existing manufacturing processes and are based mainly on conventional non-biodegradable resins. These plastics can be manufactured to be clear or opaque, and in any color. A disadvantage of this approach is that the products of degradation of the conventional material will remain in the environment for years.

Environmental concerns

Over 200 million tonnes of plastic are manufactured annually around the world,

according to the SPE[citation needed]. Of those 200 million tons, 26 million are manufactured in the United States. The EPA reported in 2003 that only 5.8% of those 26 million tons of plastic waste are recycled, although this is increasing rapidly.

Energy Costs For Production

Various researchers have undertaken extensive life cycle assessments of biodegradable polymers to determine whether these materials are more energy efficient than polymers made by conventional fossil fuel-based means. Research done by Gerngross, et al estimates that the fossil fuel energy required to produce a kilogram of polyhydroxyalkanoate (PHA) is 50.4 MJ/kg, which coincides with another estimate by Akiyama, et al, who estimate a value between 50-59 MJ/kg. This information does not take into account the feedstock energy, which can be obtained from non-fossil fuel based methods. Polylactide (PLA) was estimated to have a fossil fuel energy cost of 54-56.7 from two sources, but recent developments in the commercial production of PLA by NatureWorks has eliminated some dependence fossil fuel based energy by supplanting it with wind power and biomass-driven strategies. They report making a kilogram of PLA with only 27.2 MJ of fossil fuel-based energy and anticipate that this number will drop to 16.6 MJ/kg in their next generation plants. In contrast, polypropylene and high density polyethylene require 85.9 and 73.7 MJ/kg respectively, but these values include the embedded energy of the feedstock because it is based on fossil fuel.

Gerngross reports a 2.65 total fossil fuel energy equivalent (FFE) required to produce a single kilogram of PHA, while polypropylene only requires 2.2 kg FFE. While this assessment is valid, it is important to realize the feedstock for PP continues to be fossil fuel-based, and in the light of limited fossil based resources, production of polymers with a slight increase in total energy could be advantageous by lowering dependence on fossil fuels. Gerngross assesses that the decision to proceed forward with any biodegradable polymer alternative will need to take into account the priorities of society with regard to energy, environment, and economic cost.

Furthermore, it is important to realize the youth of alternative technologies. Technology to produce PHA, for instance, is still in development, and energy consumption can be further reduced by eliminating the fermentation step, or by utilizing food waste as feedstock. The use of alternative crops other than corn, such as sugar cane from Brazil, are expected to lower energy requirements- manufacturing of PHAs by fermentation in Brazil enjoys a favorable energy consumption scheme

where bagasse is used as source of renewable energy.

Many biodegradable polymers that come from renewable resources (i.e., starch-based, PHA, PLA) also compete with food production, as the primary feedstock is currently corn. For the US to meet its current output of plastics production with BPs, it would require 1.62 square meters per kilogram produced. While this space requirement could be feasible, it is always important to consider how much impact this large scale production could have on food prices and the opportunity cost of using land in this fashion versus alternatives.

Three generations of starch-based plastics are recognized. The first generation consists of a synthetic polymer. Starch is only used as a filling material it's polymeric properties are not made use of. An example are "biodegradable" plastic bags. These bags are not fully biodegradable, though, since they consist of mainly non-biodegradable synthetic polymers like polyethylene or polypropylene and only 5-20 percent starch. Under special conditions the starch degrades and the plastic falls apart into small particles, that will prevail for many years although they are not visible.

In the second generation the starch is used for its polymeric properties. It is blended with hydrophilic synthetic polymers and contributes to the strength of the material. 50-80% starch can be used in these plastics, but still a large part is not biodegradable.

BIODEGRADABLE UTENSILS

Biodegradable utensils are a great alternative to plastic ware. Biodegradable utensils can be used for hot or cold foods. There are also best uses for warm to cold foods. The friendly utensils are on the rise in popularity. Contrary to belief, they will not fall apart on you if you use them in hot items like soups, and they will not break if you use them in cold foods or desserts like ice cream. Biodegradable utensils work just like their normal plastic parts.

Biodegradable Utensils Make for Great Composting

Summer's just around the corner and you know what that means - barbecues, family gatherings, picnics, beach parties, and even more barbecues! This is the time of year that all your good dishware and silverware stay in their cupboards and drawers and you utilize nothing but disposable plates and cutlery. But did you ever consider how much waste that adds up at all the landfills? So many plastic utensils end up piling up landfills and aren't being recycled, because who would even think to recycle that? A better alternative that does the job and is good for the environment that's now catching on in the market is biodegradable cutlery.

Made from corn starch and other biodegradable "plastic" fillers, eco-friendly utensils are on the rise in popularity. Contrary to belief, they will not fall apart on you if you use them in hot items like soups, and they will not break if you use them in cold foods or desserts like ice cream. Biodegradable utensils work like their normal plastic counterparts; the only difference is that they won't pile up in landfills and can even be used in your compost bins.

Bio Plastic – An Alternative To Petroleum Based Plastic

In order to stop Earth's degradation the ecologists, and for several years the majority of the population has demanded for reduced production of these products and even their replacement with more environment friendly materials, such as paper or Bioplastic.

Bioplastic is a material made of renewable, raw materials, which was invented in the mid-1980. Corn, wheat, beets, sugar, potatoes and other plants, as well as vegetable oils are the main materials from which the Bioplastic is produced.

For producing a Bioplastic product only 65% of the energy consumed by producing a petroleum-based product is needed, which means that by producing only Bioplastic products we will save 35% of the energy we now waste on making traditional plastics. If we take into consideration that the annual plastic products used in only in Europe weighs no less than 50 million tones we will understand why Bioplastic products are so badly needed.

Also, the fact that the Bioplastic generates only 68% of the greenhouse gases caused by petroleum-based products makes them environment friendly and should be the first choice of people who care about our planet.

In addition to that, the fact that Bioplastic are made only from natural materials guarantees that they are not toxic to the environment and while decomposing will not leach any chemicals in the soil or in the water. This shows once again that Bioplastic is conceived so as not to harm, but protect the nature.

Other good news about Bioplastic is the fact that it can be recycled, so that nothing should be lost. This means less pollution and more fresh air for the entire population. Yet, the ecological features are not the only the only reasons in favor of Bioplastic.

In what regards the production there is another advantage of Bioplastic, that of being independent of the countries that export petroleum and not being affected by the fluctuations of petroleum price from the national and international market. This makes the business of producing Bioplastic a safer one.

However, not all the things are favorable to Bioplastic. The degradation of the Bioplastic is conditioned by a series of factors, which are impossible to achieve in nature. This means that in practice the Bioplastic will decompose as hard as the traditional plastic.

BIO PLASTICS WASTE MANAGEMENT

Waste management and bioplastics treatment

Waste management will be a key success factor of bioplastics in two different ways. On the one hand, for compostable plastic products it is crucial to have composting infrastructures in place. That's the reason why European Bioplastics advocates for a separate collection of organic and residual waste and for installing composting sites across Europe. The association welcomes all political initiatives that support this goal as the latest announcement of German Environmental Ministry did. The ministry intends to draw up a national organic waste recycling strategy. This includes the question of whether organic waste should be dried, burnt, fermented or composted or whether it should be processed to create biofuels. The Federal Government has also started to introduce its organic waste strategy at the European level. In the EU, organic waste accounts for around 38 per cent of municipal waste. This amounts to around 120 million tonnes of organic waste per year, with the potential to obtain over 50 million tonnes of compost annually (in EU 25). One problem, however, is the European Landfill Directive. Though the directive includes several requirements to reduce the organic component of waste, it permits explicitly the burning, the treatment in a mechanical biological facility and the mixed composting of organic waste components, with the result that the waste can no longer be used for soil improvement. Like the EU parliament and the "biowaste coalition" (Austria, Belgium, Cyprus, Czech Republic, Estonia, Hungary, Italy, Portugal, Slovakia, Spain, Rumania and Germany) European Bioplastics supports the idea of a dedicated Organic Waste Directive that is unfortunately not yet on the agenda of the EU Commission.

On the other hand European Bioplastics is strongly supporting an adequate treatment of bioplastics given the quantities of the material. Organizing the most optimized waste management system is dependent on local infrastructures for collection and recycling, local and regional regulations, the total volume on the market available and the composition of waste streams. This is also a primary reason why conventional packaging is not always treated in the same way across the EU. Most countries have set up systems to recover and recycle post consumer plastic bottles. For most other packaging, the results are more fragmented

and not always very well developed. In many cases, mixed fractions are being incinerated and by doing so, (fossil) energy is being recovered. Biopackaging that would end up in the mixed waste fraction for incineration with energy recovery will generate renewable energy instead. With both bioplastics and biopackaging in their infancy, the development of the market should not be delayed even though the most optimal recovery systems have often not been recognised by local authorities. The risks associated with existing recovery schemes should be monitored. These will be limited at this time given the relatively small volumes that currently enter the market. Once volumes reach a critical mass, waste management systems which make most sense from an environmental and economic point of view can be set up. Over time, recycling may be the best option for certain bioplastics, especially if a homogenous stream can be organised such as in place for plastic bottles. German government acknowledged this considerations in the amendment process of the Packaging Ordinance by releasing bioplastic bottles from deposit obligation. The ordinance states that bottles with more than 75 percent RRM content will not be charged with a deposit fee. The privilege postpones the obligation of installing recovery systems to a point of time after market introduction.

BIOTECH TO BIO-PLASTICS

Biotechnology is often used to refer to genetic engineering technology of the 21st century. A wider range and history of procedures for modifying biological organisms according to the needs of humanity, going back to the initial modifications of native plants into improved food crops through artificial selection and hybridization. Bioengineering is the science upon which all biotechnological applications are based. With the development of new approaches and modern techniques, traditional biotechnology industries are also acquiring new horizons enabling them to improve the quality of their products and increase the productivity of their systems.

The bioplastics have been developed and will be tested as a raw material for hi-tech hog feeders that use RFID technologies. The advent of modern chemistry and the growth of the petrochemical industry resulted in the development of new materials, plastics and polymers, that frequently surpassed older, renewable materials in both cost and performance.

German Production of process technology equipment exceeds 7 billion Euro

In 2008 German production of machinery and equipment for the chemical and allied industries exceeded the amount of 7 billion

Euro. This is a rise of 25 percent compared to the previous year. Due to the high level of orders on hand, the VDMA Process Plant and Equipment Association expects stable figures this year.

But, don't be misled by the dynamic development of the production volume: The incoming orders in the process technology industry decreased dramatically in the first quarter of 2009.

The manufacturers regard themselves as being in good shape nevertheless: in the past five years, one record result has followed hot on the heels of the other. The order books were still well filled at the end of 2008. The capacity utilisation of the companies is assured until the middle of the year and even beyond.

In addition, the manufacturers of process technology machinery and apparatus have a broad profile – in terms of both the sectors supplied and the countries supplied.

Exports of process technology machinery and apparatus reached almost EUR 4.6 billion in the past year. They thus increased year-on-year by 10%. Exports recorded a substantial year-on-year increase in the last quarter especially, with an increase approaching 20%. Compared with the previous year, the ranking of the most important export markets altered slightly only in the lower ranks. The largest purchaser of German process technology is the USA with exports accounting for a value of EUR 383 million, followed by China (EUR 350 million) and France (EUR 287 million).

WHAT ABOUT THOSE ECO-FRIENDLY PLASTIC NEWS BAGS? FOR NOW—VISIT MINNEAPOLIS

The leading manufacturer of polyethylene bags for the newspaper industry announced today that the Star Tribune in Minneapolis will be the first major metropolitan newspaper to provide degradable plastic bags to its subscribers and advertisers, beginning June 30.

In February of this year, the manufacturer announced that all of its newspaper customers would be given the option of delivering oxo-biodegradable, environmentally friendly plastic bags.

Officials of Dallas based GP Plastics Corporation said that over the next few months, many of its newspaper customers will be converting to eco-friendly PolyGreen plastic bags, and that the Star Tribune will be the first major domestic newspaper to distribute its daily and Sunday newspapers in this , leading edge alternative to conventional plastic bags.

By some estimates, conventional plastic bags may remain in our environment for

500-1000 years. Depending on the actual conditions within a landfill, PolyGreen plastic bags should degrade in 2-3 years and bags "floating" as litter in the environment will normally degrade completely in a few months.

Additionally, PolyGreen bags feature water soluble inks and non-lead based color concentrates. Also, because they are conventional plastics with an additive, they are compatible with the existing recycle stream. Mike Skinner, CFO of GP Plastics, says "In order to insure delivery integrity (dry papers) to their subscribers, the domestic newspaper industry uses 6-7 billion bags per year. GP manufactures more than one-half of those bags."

Skinner said that "the folks at the Star Tribune embraced the concept of oxo-biodegradation from the start. Over the next several months, many of our customers nationwide will convert to PolyGreen bags; however, this day belongs to the Star Tribune, as it's not often that you have the chance to lead the way".

Al Olson, Star Tribune Circulation Fleet Logistics Manager who spearheaded the research in to these bags with GP Plastics added, "In our effort to be a company that is continuously improving our processes and products, it is also critical that in our innovation we are also environmentally responsible. We are very excited about the prospect of eliminating anything relative to our newspaper that could have a negative affect on our environment."

Used in over 30 countries worldwide, oxo-biodegradation of conventional plastics occurs as a result of a fairly simple two stage process. First, triggered by oxygen, heat, sunlight, or mechanical stress, a proprietary additive causes the plastic to oxidize. The oxidative degradation breaks the polyethylene molecules into smaller sizes. Second, when the molecules are small enough, microorganisms (fungi, bacteria, etc.) digest the molecules, leaving only water, carbon-dioxide, and biomass, which are natural elements of nature. Results of tests at Willow Ridge Plastics, in Erlanger, Kentucky, confirm that bags manufactured by GP Plastics, containing a proprietary additive, will meet the specification of an oxo-biodegradable plastic.

Bob Bumgarner, President of GP Plastics, said "I congratulate the management of the Star Tribune. This is a significant endeavor and there are additional costs involved. I know that their readers and advertisers are aware of the environmental issues, and I believe that both will respond favorably."

Bumgarner added "Our main focus is to transition 100% of our manufacturing to environmentally friendly products. At this point, I just do not see conventional plastics as a necessity."

Plastic Bag Industry criticises UN call for plastic bag ban - comment update

The United Nations Environment Programme has come under criticism from the plastic bag industry after calling for a world-wide ban on thin film plastic bags.

Responding to the results of a UN report assessing marine litter, UN under secretary and UNEP executive director Achim Steiner said: "Some of the litter, like thin film single use plastic bags which choke marine life, should be banned or phased-out rapidly everywhere. There is simply zero justification for manufacturing them anymore, anywhere."

At a conference of degradable plastics distributors held by degradable plastics manufacturer Symphony Environmental, the industry believed the ban demonstrated a lack of understanding of modern plastics technology.

Chairman of the British Standards Institute Panel on Biodegradability of Plastics said: "If the plastic waste in the Pacific Garbage Patch had been d2w plastic, most of it would have degraded before it arrived leaving no harmful residues."

The UNEP report, Marine litter: a global challenge is the 'first attempt' to take stock of the extent of marine litter. It concludes that 46.8 per cent of wildlife debris entanglements in 2007 were due to disregarded fishing lines. However, plastic and paper bags were the second most frequent marine debris items found globally between 1989 and 2007 with 9.4 per cent. Cigarette butts were the number one marine debris constituting 24.6 per cent.

Carrier Bag Consortium head of communications Peter Woodall said: "The report states that plastic bags are not the biggest problem for marine debris by a long way. Plastic bags are very useful containers and can be recycled. Government statistics show that 80 per cent of all households reuse plastic bags to ensure their waste is hygienically tied up and plastics reprocessing is a very good use of resources as it is endlessly recyclable."

Woodall cited the research carried out in Scotland, which found that if carrier bags were taxed retailers would supply paper bags. These bags were much less likely to be reused due to the bags soaking up water, unlike the plastic variety. He added: "Biodegradable bags break the first rule of sustainability, as it is a product that is made to go to waste. It allows people to think they can leave their bags lying in the hedgerow because it will degrade eventually."

Halogen-free, flame-resistant TPE replaces PVC in cable sheathing.

For cable manufacturers and suppliers in the IT and entertainment electronics sector, KRAIBURG TPE (Germany) has developed number of special halogen-free and flame-resistant TPE compounds that meet the most stringent flame-resistance requirements of the relevant European and US standards. According to the Company, TPE sheathing does not cause toxic or carcinogenic fumes in the event of fire as opposed to PVC sheathing. This property makes the TPE material an interesting option for all companies that take health concerns and the protection of the environment seriously. The new compounds comply with the European RoHS directive and contain no hazardous ingredients, says the company. They are thus free of heavy metals and organic halogen compounds such as polybrominated biphenyls (PBBs) or polybrominated diphenyl ethers (PBDEs). The sheathing material made from the new TPE successfully passed the VW-1 vertical flame test, which is the most demanding flame test for single cables. In addition to outstanding flame resistance, the new compound is said to have number of other properties very high tensile strength as well as excellent flexibility and surface quality. "To achieve high flame resistance on the one hand and good strength and surface properties on the other was a balancing act. We mastered this challenge by using a halogen-free intumescence flame retardation system that is compatible with the polymer matrix. This compound is added in quantities that are much lower than those normally used with conventional halogen-free flame retardants," explains Dr. Markus Beitzel, Director of Product Technology at KRAIBURG TPE.

SABIC-IP unveils new natural fiber reinforced compounds.

In a bid to drive the use of eco-friendly plastics and composites, SABIC Innovative Plastics recently unveiled two products in a new line of LNP* Thermocomp* specialty compounds that use curauá fiber and wood flour natural reinforcements. One of SABIC Innovative Plastics' new materials is LNP Thermocomp PX07444 specialty compound, a polyamide (PA)-6 nylon that is reinforced with up to 20% curauá fiber. The curauá plant is a member of the bromeliad family and is cultivated in South America. The fibers extracted from its leaves have high mechanical strength. This new LNP Thermocomp grade - while not identical in properties to glass-reinforced PA-6 - can potentially be substituted for the glass-filled nylon in specific applications such as automotive interior components. It provides a strength-to-

weight advantage with good surface aesthetics. Also, natural fibers such as curauá are not as abrasive as glass or mineral reinforcement, thus reducing wear and tear on molding equipment.

Another new grade, LNP Thermocomp MX07442 specialty compound, is polypropylene (PP) reinforced with 30% wood flour. It is aimed at replacing wood because, in addition to having a similar appearance, it is more resistant to fungi and has better dimensional stability than natural wood. Compared to unfilled PP or 30% mineral-reinforced PP, this lower specific gravity compound has higher flexural strength with retained impact strength, thus providing a strength-to-weight advantage. It can be extruded and injection molded, and provides a colorable surface with the natural grain of wood. The company says compared to traditional reinforcements such as glass fiber, natural fibers offer several environmental benefits. They are renewable, biodegradable and require less energy to produce. Further, they are lighter in weight than glass and other traditional fibers, helping to reduce energy consumption in shipping. Further, the customers also get greater options to create next-generation sustainable solutions to differentiate their products, grow current markets, expand into new sustainable market and application areas, and increase overall productivity and profitability.

CENTRAL MINISTRY considers Ramanathapuram for setting up a PCPIR

The Union ministry of chemicals is considering setting up a Petroleum Chemicals and Petrochemicals Investment Region (PCPIR) in Ramanathapuram district. This decision is based on a proposal from the state government after inspecting suitable sites at Naripaiyur, Thondi and Valinokkam in Ramanathapuram district.

INCOE® introduces patented* laminate manifold technology.

US-based hot runner systems manufacturer INCOE® has developed a patented* manifold technology featuring a laminate construction. The manifolds are an addition to INCOE®'s current range of Standard, Custom and Opti-Flo® manifold designs. Manifold halves are machined to mirror each other and then metallurgically fused to create a complete laminate manifold. This eliminates the need for welded plugs associated with gun drilled designs. INCOE®'s patent improves the manufacturing process resulting in a superior "bond" when fused. Inherent in the laminate manifold design is the ability to manufacture flow channels that are difficult or impossible to produce using

conventional gun drill methods. The new laminate design will provide improved processing of challenging resins, says the company.

New PEEK film lamination without use of adhesives.

To further enhance its position as the leading manufacturer of PEEK-based films, Victrex has installed a new high temperature vacuum laminating press system at its manufacturing facility in the Lancashire, United Kingdom. With this addition, Victrex now has the capability of bonding its APTIV™ film, produced from VICTREX® PEEK™ polymer, to a wide range of other substrates without the use of adhesives. The press system operates at temperatures up to 400°C (752°F), which allows the APTIV film to be joined to other substrates in the melt phase.

The system features sophisticated controls including programmable cycles of temperature, press force and vacuum by time or other parameters, as well as highly accurate platen pressure control. The new laminating capability will allow customers to develop applications combining the inherent properties of APTIV film with other materials such as metal foils or non-woven fabrics and meshes to produce laminate materials with exceptional combinations of properties.

Stabilizing ballast stones using PU foam system in rail transportation.

An innovative track superstructure system that can be used for reducing noise emissions and maintenance costs was recently highlighted as part of the German "365 Landmarks in the Land of Ideas" initiative. FRENZEL-BAU GmbH & Co. KG in Freden, Lower Saxony, a medium-sized company, specializing in rail construction solutions, has worked in close collaboration with Bayer MaterialScience to develop this system called Durflex®. It is based on stabilizing the ballast stones under the track using the elastic polyurethane foam system Bayflex® from BaySystems, the global polyurethane system partner of Bayer MaterialScience. Over 2,000 companies, research institutes and other establishments submitted applications for this year's "365 Landmarks in the Land of Ideas" contest. The cavities between the ballast stones in the track bed are completely filled with the polyurethane foam system. This almost completely prevents the stones from shifting as a result of the forces generated when a train passes over them. This in turn increases the durability of the ballast superstructure considerably and also absorbs the structure-borne noise at the point where it is usually generated. The system can be used for building new sections

of track and upgrading existing stretches. Durlflex® was successfully tested on the two stretches of track and, encouraged by the positive test results and public feedback, FRENZEL-BAU and Bayer MaterialScience are also looking to work on developing Durlflex® further in various projects in the future. Plans include construction of a longer demonstration track in Germany.

New BFS grade for high temperature sterilisation and production efficiency.

Borealis, a leading provider of innovative, value creating plastics solutions, has re-launched Bormed™ LE6609-PH, its unique, transparent Blow, Fill and Seal (BFS) grade for medical bottles and ampoules. This is in line with its commitment to meet market demands for greater security for sterilised products, reductions in material use and more efficient manufacturing. Bormed LE6609-PH is a low density polyethylene (LDPE) with high density level, and therefore high melting point. Bormed LE6609-PH allows steam sterilisation, the most commonly used method for these applications, at temperatures above 110°C. This meets the market trend towards higher sterilisation temperatures in order to improve manufacturing efficiency. The grade can also be sterilised with ethylene oxide (EtO) and radiation. The high steam sterilisation temperatures allow converters to speed up their production cycle by reducing autoclave residence time. The material offers straightforward conversion on BFS and standard blow moulding machines, with low energy requirements for extrusion, further aiding these benefits.

Bormed LE6609-PH's high density and optimised molecular weight distribution (MWD) open up the potential to reduce material usage and individual product weight. The combination creates a material with low swell, making it easy to reduce wall thickness while maintaining the same bottle top-load. For end-users, Bormed LE6609-PH assures greater security for sterilised products and increased confidence through its compliance with European Pharmacopoeia and US Pharmacopoeia regulations. The grade is Drug Master File registered.

Another fall expected in European polymer demand.

GDP for the EU27 is forecast to contract by 4% in 2009, and AMI sees no quick return to growth for polymer demand. European polymer demand could fall another 3-4% in 2009, resulting from the massive destocking that hit commodity and engineering plastics last year, according to AMI. Weak polymer production and demand was seen through H1-09 with little

evidence of re-stocking through the supply chain. Some hints of recovery in markets mid-year, primarily driven by the packaging sector. But processors are still buying polymer strictly to order, rather than rebuilding stocks to former levels. In 2008, demand for thermoplastics in Europe fell by 8% compared with 2007, and such difficult market conditions have not been experienced in the plastics industry in Europe since the early 1980s. Many companies were ill-prepared for the precipitous slide in demand that occurred from August 2008 in the midst of economic uncertainty caused by the banking sector's problems. In the last quarter demand declined on average by 20-25% for most resins. The destocking by converters in the fourth quarter affected all polymers, applications and markets, although to a greater or lesser extent. Some packaging, medical and hygiene markets held up better than others, but polymer demand in building, automotive or discretionary consumer products saw "unprecedented drops in demand". PET demand declined by 3% last year, one of the smallest percentage declines among polymers, but still a setback for a material more used to growing at 6% per year. Polyolefin demand was down between 8% and 10% for 2008. As well as the problems in key construction and automotive markets, AMI noted volume demand was also impacted by trends in down gauging and re-engineering to strip out costs. The grimdest performance was in PVC where the market contracted by more than 11%. This followed two years of relatively strong growth for this material with the market reaching a new peak of 6.4 mln tons in 2007. AMI estimates the market for general purpose, high impact polystyrene was also down sharply by 9% following a better than expected performance for 2007. Even engineering resins, which AMI said had been enjoying growth rates at twice the rate of commodity polymers in the five year period to 2007, experienced a 7% drop in demand in 2008. Weakness in engineering polymers demand is expected to continue through 2009 because of their greater dependence on manufacturing trends in automotive production and electrical goods. The severest demand falls in 2008 were in Western Europe, particularly in the UK and Spain which both saw double-digit percentage drops in polymer demand caused by the collapse of property markets and subsequent consumer demand weakness, said AMI. In contrast, German demand was least affected by the downturn due to exposure to markets in eastern Europe and lower levels of consumer debt in the domestic economy. AMI said the slowdown in Central and Eastern Europe hit converter buying much later in the year, but demand was very weak in these countries during the first quarter of 2009.

Indian plastics processing industry appeals against 'unjust' ADD recommendations.

Indian plastics processing industry represented by several trade associations and bodies associated with plastics industry recently appealed to the Hon. Prime Minister, Dr. Manmohan Singh and Hon. Finance Minister, Shri. Pranab Mukherjee, not to implement the recently recommended anti-dumping duty on polypropylene (PP) imported from Saudi Arabia, Singapore and Oman into India. In a recently published appeal in The Economic Times dated June 30, 2008, the plastics processing industry asked the competent authority 'not to implement unjust and arbitrary recommendations of DGAD (Directorate General of Anti-Dumping), unduly favouring only the domestic polypropylene manufacturers.' The appeal was sent in response to the notification no. 14/5/2009-DGAD dated 15/6/2009 issued by the Union ministry of commerce recommending a provisional anti-dumping duty on PP imported from Saudi Arabia, Oman and Singapore ranging from nil to US\$ 1033.65/MT. The Union ministry of commerce issued the aforesaid notification following an appeal filed by Polypropylene (PP) producers in India—Reliance Industries, supported by Haldia Petrochemicals Ltd (HPL). The trade associations and bodies representing the Indian plastics processing industry included All India Plastics Manufacturers Association (Mumbai), Organisation of Plastics Processors of India (Mumbai), Gujarat State Plastics Manufacturers Association (Ahmedabad), Indian Plastics Federation (Kolkata), All India Flat Tapes Manufacturers Association (New Delhi), The Tamil Nadu Plastics Manufacturers Association (Chennai), Andhra Pradesh Plastics Manufacturers Association (Hyderabad), Kerala Plastics Manufacturers Association (Ernakulum) and Karnataka State Plastics Association (Bangalore).

Sales volumes of ethylene and derivatives to remain low.

Absence of clear signs of a rebound in cyclical end-user markets such as construction and housing, automotives, and those markets depending on discretionary consumer spending, Fitch Ratings expects low sales volumes of ethylene and its derivatives for the remainder of 2009, as detailed in a report. A potential 2010 recovery will only be slow and gradual rather than v-shaped. The recovery will be particularly lengthy in polyvinyl chloride (PVC) segment given PVC's high dependency on the housing and construction sector. Renewed discussions to implement bans for the use of polystyrene (PS) in fast-food containers also cast doubts on recovery prospects for

PS. Prospects are moderately better for high-density polyethylene (HDPE) and low-linear density polyethylene (LLDPE). While sales volumes for both materials were adversely affected by the economic downturn, HDPE and LLDPE may benefit from less cyclical end-user markets, particularly in the food and packaging sector. Even in the event of a rebound, the economics of the ethylene value chain may remain under pressure as new global capacity additions, particularly in the Middle East, come onstream which benefit from low-cost access to feedstock. As a result, production capacity, especially smaller and older steam crackers, will be idled or permanently shut down along the U.S. Gulf Coast. North American producers will also continue to seek alliances and joint ventures with players from the Middle East.

New electro active polymer for pioneering organic electronics applications.

Solvay Solexis SpA has announced the launch of solvene™, the innovative range of electro active polymers for the printed electronics requirements the present and the future. According to the company, solvene™ is ready to face the Organic Electronics industry's challenges allowing the electronics to spread in new areas, providing an innovative material with outstanding performances for pioneering organic electronics' applications. solvene™ electro active polymers combine superior properties with easy processing: it exhibits a unique set of intrinsic piezo, pyro and ferro behavior:

- Piezo electricity: solvene™ can convert mechanical energy received through a mechanical stress into electrical energy, and reversely can deform under an electrical field; electro strictive properties
- Pyro electricity: solvene™ can convert calorific energy into electrical energy, as temperature variation will change the dipole orientation and create a temporary electrical potential
- Ferro electricity: solvene™ is an organic ferroelectric material exhibiting several advantageous properties including a large remanent polarization stability, a low leakage for high resistivity and very short switching times. Furthermore, it is intrinsically bistable, meaning it does not require a voltage to keep its polarization state. solvene™ shows also an intrinsic high K constant, which offers a high charge with a low applied electric field and makes it suitable for transistors and capacitors. Thanks to its intrinsic properties, solvene™ doesn't need any specific or expensive past treatment process to be electro active. solvene™ can therefore be processed by various techniques, from classic spin coating and printing on various substrates, including flexible plastic films. Furthermore, solvene™ benefits from

good mechanical properties conferring toughness and flexibility, and a high thermal stability allowing a large window of manufacturing processes.

SABIC-IP unveil new Ultem composites, foam and fiber for extreme performance.

SABIC Innovative Plastics unveiled the new leading-edge Ultem composite, fiber and foam technologies at NPE 2009 which it says will fulfill new levels of extreme performance. The new materials build on the company's hugely successful Ultem polyetherimide (PEI) resin, an industry-renowned workhorse thermoplastic for the most demanding and high-heat resistant applications. The target applications for these materials include flame retardant fabrics, ultra-lightweight aircraft interiors, state-of-the art radomes and communications equipment, among many others. SABIC

According to the company, the Ultem composites will help to reduce weight and cost by replacing metals without sacrificing performance while offering temperature and impact performance, particularly in aerospace, electronics and ballistics applications. By attaching fabric made with Ultem fiber and other materials to an Ultem foam or honeycomb core, unique composites can be created for the design flexibility, low-cost manufacturing, and long-term performance needed to address specific application requirements, the company notes. These composite-based materials are also said to provide exceptional flame-smoke-toxicity (FST) performance, low-moisture uptake, thermoformability, and strength retention enabling the composite systems to deliver light-weight performance to eliminate the use of aluminum and thermosets that require long cure cycles.

Further, Ultem fiber meets the safety and performance requirements for home furnishings, including mattresses, specialty high-temperature filtration media, and protective clothing for military, emergency response and sports applications, in addition to transportation applications. The fiber delivers inherent FST performance without the use of halogens or other flame retardant additives, as well as resistance to extremely high temperatures, chemicals and ultraviolet (UV) light, the company adds. The company asserts that the use of Ultem foam can deliver impressive weight savings, coupled with high-class FST and high-temperature performance of Ultem resin for aircraft interior and exterior components. Ultem foam is said to be up to 20-times lighter than Ultem resin. In addition, this thermoformable, rigid foam with a uniform cell structure is said to be ideal as the structural core in multi-layer systems.

Practical tests wear resistance developed for coated polycarbonate in automotive glazing.

Bayer MaterialScience's technical service center has developed a practical wear resistance tests for coated polycarbonate automotive glazing. The newly developed windshield wiper test checks the scratch and abrasion resistance of the polycarbonate glazing to see whether it can withstand a car wash and windshield wiper usage. Dr. Frank Buckel, expert in the surface modification of polycarbonate automotive glazing at Bayer

MaterialScience, says, "This test enables us to simulate the actual stress exerted on the wiped glazing in the everyday life of a vehicle far more realistically, accurately and with a higher reproducible quality than is possible with the Taber abrasion test stipulated in the regulations." In the new test system, a wiper arm fitted with commercial wiper blades moves backwards and forwards across a fixed test sheet to which the requisite coating has been applied. A force of 20 g/cm² is applied and the wipers move at a speed of 14 cm/s. As drivers tend to have very different "wiper habits", the test can be adjusted accordingly. For example, the tests can be performed dry and/or wet with or without standard dirt (ISO 6255). "Initial tests have shown that, when dirty panes with a polysiloxane coating are wiped under primarily wet conditions, they exhibit virtually no clouding that is visible to the naked eye - even after 30,000 double-wiper cycles," says Buckel. In order to check the precise correlation between laboratory wiper test and conditions during practical usage, a wiper test bench for large polycarbonate rear windows has also been set up. Bayer MaterialScience has been able to show that the Taber test does not provide reliable data on the actual abrasion resistance of unwiped polycarbonate glazing on the road. Unwiped glazing includes fixed side windows and panorama roofs. For this purpose, test sheets with commercial coatings were attached to the roof of a car. Once a week over a period of more than three years, the vehicle was put through a car wash - no "protective" substances such as car waxes were used. The tests showed that the AS 4000 polysiloxane system from Momentive Performance Materials GmbH is significantly more resistant than wetcoats with a plasma topcoat. Even after over 150 wash cycles, the Makrolon® glazing coated with AS 4000 displayed no visible clouding. The team was also able to verify the good abrasion resistance of pure polysiloxane coatings on used, series-produced polycarbonate glazing after more than six years of active use and mileages of up to 125,000 kilometers.

Source : TAPMA Polymer Business

NATIONAL AND INTERNATIONAL PLASTICS NEWS

Essel Propack Back In The Black, Nets Rs.9 Cr

Essel Propack, has posted a net profit of Rs.9.4 crore in Q2, compared to a loss of Rs.21.4 crore due to an improved demand for laminated tubes.

The company's revenue in the July ~ September quarter grew 4.4% to Rs.351 crore. For the fiscal half year ended September 30, Essel Propack said its net profit was Rs.9.5 crore compared to a loss of Rs.26.6 crore last year. In the same period, sales were up 8.2% to Rs.1,008 crore.

Source ET : 29.10.2009

RBI To Introduce 100 cr Rs 10 Plastic Notes

Soiled notes may soon be a thing of past with the Reserve Bank planning to introduce Rs 10 polymer banknotes whose life span would be 4 times the normal currency notes and would be difficult to imitate.

The apex bank has initially decided to introduce 100 crore pieces of Rs 10 polymer notes, for which it has floated a global tender, a senior central bank official said.

Explaining the rationale for introduction of polymer notes, the official said, these notes would have an average life span of 5 years compared to one year for the currency notes.

Besides, the official said, these notes are cleaner than paper notes and it would be difficult to counterfeit the currency.

The polymer notes were first introduced in Australia to safeguard against counterfeiting of currency.

Besides Australia, other countries which have introduced plastic notes include New Zealand, Papua New Guinea, Romania, Bermuda, Brunei and Vietnam.

Haldia's Supermax Project Viable Despite Increased Cost

Haldia Petrochem's Supermax project comprises of augmentation of naphtha cracking capacity from 520,000 tons to 675,000 tpa. HPL will see 45 day shutdown starting in October to facilitate synchronizing of the project with the existing operations. The cost of Haldia's expansion project increased from the initial outlay of Rs. 675 cr, to over Rs. 1,000 cr. Mott MacDonald was appointed by HPL at the behest of the lending consortium led by IDBI to look into Supermax's viability since the company had sought additional debt funding to finance the project.

Vizag Petrochem Project On Hold: Viability To Be Re-evaluated After 6 Months

Hindustan Petroleum Corp Ltd (HPCL)'s planned refinery and petrochemical complex in Vishakhapatnam is on hold due to weak market conditions amid the global economic downturn; and will be re-evaluated only after six months.

HPCL, France's Total, Mittal Investments, GAIL (India) Ltd and Oil India Ltd signed a deal in 2007 to explore building the Vizag project which was initially valued at US\$8.3 – 9.4 bln and included an export-oriented refinery with an annual capacity of 280,000 – 300,000 bpd and a petrochemical plant with a capacity of at least 1 million tpa.

Texmo Pipes To Enter Market

Madhya Pradesh –based Texmo Pipes and Products Ltd, a manufacturer of PVC and HDPE pipes, plans to enter the capital market with a public issue of 50 lakh equity shares of Rs. 10 each at a price to be determined by the book-building process.

The Company has filed the draft red herring prospectus with SEBI, according to a company release.

The proceeds of the proposed issue, the release suggests, will be used for expansion of the product range and for setting up manufacturing facilities for injection mouldings / fittings and woven sacks.

Texmo Pipes & Products Ltd became a public limited company in July 2008. Earlier, it was partnership firm which was launched in 1999 in the name of Mohit Industries.

The company now has manufacturing facilities at Burhanpur (M.P.).

PVC Plant At Cuddalore

Tamilnadu Deputy Chief Minister M.K. Stalin inaugurated the RS. 600-crore 1.70-lakh-tonne capacity polyvinyl chloride (PVC) plant set up by Chemplast Sanmar Ltd at the SIPCOT Industrial Estate at Cuddalore recently.

He said the Cuddalore SIPCOT Industrial Estate was growing from strength to strength since its inception. In Phase I, 36 of the 59 approved industries were on stream. In Phase II, two of the seven approved industries had started production.

The Rs. 5,000-crore oil refinery to be set up by Nagarjuna Oil Company in Cuddalore would bring in

substantial foreign exchange. In Phase III, the Southern India Mills Association would facilitate setting up of textile units and all these would create thousands of jobs.

Deputy Chairman of Sanmar Group S. Vijay Shankar said that the PVC plant would encourage many downstream industries to come up. Through its 24 production facilities across the State, The Sanmar Group had created 10,000 direct and indirect jobs.

Thanks to the unstinting support extended by the Chief Minister, M. Karunanidhi, and the Deputy Chief Minister, the company could overcome the hurdles in setting up the PVC plant, Mr. Shankar said. Chairman of the Chemplast Sanmar Ltd. (the flagship company of the Sanmar Group) P.S. Jayaraman said the first unit of the company was inaugurated 42 years ago by the former Chief Minister, C.N. Annadurai, at Mettur. Now the turnover of the company had touched Rs. 4,000 crore.

Chemplast Sanmar has built its own jetty to offload the raw material VCM (Vinyl Chloride Monomer) from ships and pump it by the pipeline to the PVC (Poly Vinyl Chloride) plant 3 km inland. The pipeline is a two-walled structure buried a couple of meters under the seabed and continues to run underground onshore. It keeps the VCM cooled to about at low pressure, a unique feature, company officials explain.

Chemplast Sanmar's 1.7-lakh tonne PVC plant costing over Rs. 600 crore is set to more than double the company's business. The project, conceived in 2004, started trial production on September 9, nearly a year behind schedule and costlier by about Rs 80 crore due to socio-environment concerns and delayed clearances.

Explaining the other features, Mr. V. Ramesh, Director, Chemplast Sanmar, says that the plant uses about 1.003 tonne of VCM to make one tonne of PVC, against the industry average of about 1.013 tonne. This level of efficiency not only is a cost advantage, also means reduced concerns on pollution.

The factory has its own desalination plant converts seawater to freshwater for its use and an effluent treatment plant that ensures total water recycling and 'zero discharge'.

On-site equipment closely monitor for VCM in the environment to ensure there is no pollution. A mobile unit equipped with VCM monitors also ensures that there is no VCM contamination up to a distance of 3 km around the factory.

The company has collected base line health data of the residents in the surrounding villages and will monitor the surroundings continuously, he said.

But there are tough times ahead still as the company faces the additional expenditure due to the delay, and the Rs. 66-crore loss during 2008-09, the first time the company has been in the red. "The next two years could be testing," says Mr. P.S. Jayaraman, Chairman, Chemplast Sanmar Ltd, "the toughest time in the history of Chemplast."

But he is confident that the company will weather the test.

The new plant gives Chemplast Sanmar economies of scale; it is now among the top producers of PVC, a product for which demand is growing by the day. Including the 65,000 tonnes of PVC it produces now at other plant in Mettur, Tamil Nadu the company can produce about one-fifth of India's annual production of about 10 lakh tones. It will mean an additional Rs. 1,000 crore a year to the Rs. 800 crore business now, which "should give us a decent return," he says.

Giving it added strength will be the group's investment in Egypt, where an \$800-million plant will produce two lakh tonne of VCM and an equal quantity of PVC later this year.

The entire quantity of VCM will be available for the Cuddalore plant giving it an assured supply of raw material, crucial advantage to a PVC producer, says M.T. Jayaraman.

Indian Ciba Operations To Be Merged Into BASF India Ltd.

- Board of Directors of respective Companies approve the Scheme of Amalgamation.
- Share-swap ratio determined at 90 equity shares of BIL for every 100 equity shares of CIL and 18 equity shares of BIL for every 100 equity shares of Ciba Research (India) Private Limited.

Following the acquisition of Ciba Holding AG by BASF SE in April 2009, BASF India Limited (BIL) announced its plans to merge the three Indian Ciba Companies viz. Ciba India Ltd., Diamond Dye-Chem Ltd. and Ciba Research (India) Pvt. Ltd. with BASF India Ltd.

The merger proposal was approved by the Boards of all the respective companies on September 12, 2009. It is expected to take effect as of February 1, 2010, subject to the following steps:

- Approval of merger scheme by the Shareholders.

- Approval by the Ministry of Corporate Affairs
- Approval of the scheme by the Bombay High Court

BASF, Sinopec To Embark Upon Petrochemical Expansion At Nanjing

BASF AG and Singapore (China Petroleum & Chemical Corp.) plan to embark upon plans to expand its petrochemical venture in Nanjing, East China. At an investment outlay of US\$1.4 bln, steam cracker capacity will be expanded to 740,000 tpa from 600,000. The plan comprises expansion of three other existing facilities and 10 new chemical plant starts ups. Yangzi-BASF Styrenics Co., a Sinopec and BASF JV, is being merged into BASF-YPC Co.

This capacity increase will satiate growing demand in China that is on the rise. China's industrial production rose in the last month since August 2008, boosting demand for fuel and chemicals.

BASF Aims To Grow Above Market: Asia Pacific Sales To Double By 2020

- Asia Pacific Strategy 2020 targets growth of two percentage points above market.
- Earn premium on cost of capital
- 70 percent of sales to be manufactured locally in Asia Pacific
- Headcount to increase by at least 5,000
- Investments of EUR 2 billion planned between 2009 and 2013
- Efficiency improvements to save at least EUR 100 million annually by 2012

BASF, today outlined its Strategy 2020 for Asia Pacific. Through 2020, BASF aims to grow on average two percentage points faster than the Asia Pacific chemical market each year. With expected market growth of 4 to 5 percent per year, this would double regional sales by 2020 while earning a premium on cost of capital.

BASF will initially target five key growth industries in the region, will increase headcount by at least 5,000 from a current figure of approximately 15,000, and plans to generate 70 percent of regional sales from local production. At the same time, the company plans to invest EUR 2 billion between 2009 and 2013, and aims to create efficiency improvements that are expected to save at least EUR 100 million annually by 2012.

Borealis And ADNOC Co-operate With Machino Polymers

Borealis and ADNOC (Abu Dhabi National Oil Company) joint venture company Borouge is

cooperating with Machino Polymers to supply its advanced PP material to the market. The cooperation encompasses the use of Borealis's proprietary Borstar technology to manufacture PP compounds in accordance with Machino Polymers's compounding technology. PP compounds are used in the production of exterior and interior automotive components, including bumpers, instrument panels and door trim panels.

Established in 1994, Machino Polymers has a capacity of 40,000 tonnes /year at its five acre plant in Gurgaon, Haryana in North India. The company plans to set up facilities in Pune and Chennai within the next year.

German Set-Up In India

Machinery maker Krauss Maffei has expanded its relationship with India by having set up a local company in Pune recently.

Having previously sold its reaction process machinery in a sales and service partnership with Goodie Enterprise in New Delhi, the German company now intends to offer injection moulding and extrusion machinery directly to customers in India.

While it is focusing its attention on the growing automotive sector, Krauss Maffei has also supplied compounding systems, pipe, profile, film and sheet extrusion lines for construction industry products and injection moulding systems for packaging and medical technology products.

Graham Packaging Acquires 22% stake in PPI Blowpack

Graham Packaging, a Blackstone Group Company has acquired 22% stake for an undisclosed amount in PPI Blowpack, a manufacturer of plastic containers.

PPI Blowpack manufactures recyclable rigid plastic containers for the food, pharmaceutical, chemical and FMCG markets and has sophisticated manufacturing facilities in Daman, Haridwar and Umbergaon. Its clients include many blue chip companies like Heinz, Castrol, BASF, Monsanto, Cadbury, Dupont, Glenmark and Shalimar.

Automated Recycling Systems Can sort Natural Plastic Bottles from Other Plastic Bottles.

Following an extensive analysis of current technology, NatureWorks LLC concludes that automated systems being used today in the recycling industry are capable of sorting natural plastic bottles from other plastic bottles with an accuracy approaching 100 percent. This

finding is significant because it demonstrates that there is no technological barrier to recycling bottles made from plants instead of oil.

"To become more sustainable, the packaging industry must lower the overall waste, energy consumed, and greenhouse gas emitted from the use of plastics, metals, and fibers," said Steve Davies, NatureWorks director of communications and public affairs. "Demonstrating that natural plastic bottles can be brought seamlessly into the recycling stream through the use of automated sorting equipment available today is a major finding and another step towards greater sustainability."

During the past two years, NatureWorks has surveyed equipment manufacturers that have systems with the potential to sort biopolymers from such other plastics as PET, HDPE, PVC and PS. These sorting systems are usually based on one or more of the following technologies: infrared, ultraviolet, x-ray, color identification and laser. NatureWorks has identified a dozen companies offering systems that can potentially sort bioresins and has worked closely with three to ascertain actual sorting accuracies. Titech demonstrated the ability of its near-infrared sorting systems to eject concentrated amounts of NatureWorks Ingeo™ natural plastic in a PET sorting operation. Sorting efficiency in a single pass was found to be a minimum of 97.5 percent accurate.

Thailand's IRPC Estimates Revenues of 180 Bln baht On Strong Petrochemical Demand

Thailand's IRPC Plc expects to outdo its previous target for the year with sales revenues of 180 billion baht on strong petrochemical demand from China. Thailand's leading petrochemical producer and oil refiner predicts revenue to fall by 26% this year from last year's levels. Performance has picked up this quarter on robust demand and rising polymer prices. The petrochemical spread has improved slightly in the current quarter from the previous quarter, while the refining margin has weakened marginally. The company's gross integrated margin is in double digits. Performance is obviously good in the current quarter and better than the second quarter. Hence business outlook seems to be brighter than before.

IRPC, which is 37% owned by PTT Plc, now projects revenue of 180 billion baht this year based on oil at about \$70 per barrel. In the quarter to June, the company posted a net profit of 2.42 billion baht, down from 5.12 billion in the same period last year, in line with a decline in revenue of 45% to 40.3 billion baht.

The petrochemical business will account for about 54 billion baht of this year's estimated revenue. The figure is expected to be maintained in 2010.

SABIC Prepares To Commence LDPE Production at Wilton

SABIC UK Petrochemicals is preparing to commence production at its new Low Density polyethylene (LDPE) plant at Wilton in the face of the most severe economic down-turns. Commissioning work on the new multi-million pound facility has progressed as planned.

SABIC'S Second Quarter Net Income Declines

Sabac has reported a net income of SR 1.8 billion in the second quarter, compared with SR 7.5 billion in the same period last year, a decline of 76%. The company says the decline is due to lower prices of petrochemicals, plastics and metals owing to the global financial and economic crises. However, its total production volume during the first half of 2009 reached 28.5 million tones, reflecting an increase of 1% while total quantity sold reached 22.9 million tones, an increase of 2% over the same period last year. The company is also banking on its investment with Sinopec to further enhance its footprint in the fast growing Chinese market.

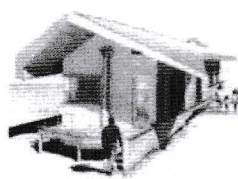
Mitsubishi Plastics Purchases Swiss Resin Producer Quadrant

MITSUBISHI Plastics Inc. recently announced its acquisition of major Swiss engineering plastics manufacturer Quadrant Ag.

The Mitsubishi Chemical Holdings Corp. unit increased its indirect stake in Quadrant from 33 per cent to 95.33 per cent as of August 26. A total of about 13.3 billion yen (US\$144.3 billion) was spent on the move.

Mitsubishi Plastics aims to buy all of the remaining shares by the end of the first half of 2010 on the market and through direct transaction. Through the acquisition, the company hopes to bolster overseas sales of high-performance resin used in automobiles and machine parts.

Floating House Rides The Floods



A house capable of floating in flood waters made its debut recently in New Orleans, US. It has been designed by American Morphosis Architects, under the direction of architect and UCLA Professor Thom Mayne. Known as the Float House, it is the first floating house

permitted in the US for actor Brad Pitt's Make It Right Foundation (MIRF). But what is interesting for the plastics industry is that the house floats on a base made from polystyrene (PS) foam.

Though its architecture is along the lines of traditional New Orleans shotgun homes (complete with the porch), the house has contemporary features like the solar panels and a roof designed to capture and recycle water.

It sits on a raised 1.2 m base and, in the event of flooding, the base of the house acts as a raft, allowing the house to rise vertically on guide posts up to 3.6 m as the water levels rise. The prefabricated PS foam base is coated in glass fibre-reinforced concrete, which hosts essential equipment to supply power, water and fresh air.

While not designed for occupants to remain inside during a hurricane, the structure aims to minimise catastrophic damage. This approach also allows for the early return of occupants in the aftermath of a hurricane or a flood.

The technology was developed and is in use in the Netherlands where architects and developers are working to address an increased demand for housing in the face of rising sea levels associated with climate change.

Since the house was designed in line with the MIRF's aims to provide affordable and sustainable housing, especially in flood prone areas like New Orleans (that was badly affected by Hurricane Katrina in 2005), imagine how useful this house could be in Asia's low lying areas.

Film Resins For The Asian Market

Dow Chemical has introduced new materials for film converters, especially for use in food and speciality packaging, industrial and consumer packaging and health and hygiene applications.

The new products include developmental Dowlex NG (Next Generation) Linear Low Density Polyethylene (LLDPE) resins that take LLDPE performance to a new level and new Attane NG (Next Generation) Ultra Low Density Polyethylene (ULDPE) resins that allow the use of ULDPE in more demanding applications.

The new Dowlex resins are said to offer better optics and improved downgauging potential with good processability. These breakthroughs are enabled by Ziegler-Natta catalyst technology combined with the company's proprietary solution process, which together have delivered 'super octene' LLDPE products.

The ULDPE resins are designed with a molecular structure optimised to offer a combination of improved toughness (especially for cold temperature film applications) and better optics and flex crack resistance, low seal initiation temperature and enhanced processability.

In first half of next year, a second LLDPE plant, jointly developed with the Siam Cement Group, will be commissioned in Thailand. This new plant will produce the resins.

Resin Promotes Downgauging

Double-digit savings from downgauging is one of the features of a new grade of medium-density PE targeted at agricultural, industrial and food packaging films.

LyondellBasell Industries's Lupolen GX 4081 has a melt flow rate of 1.4 g/10 minute and a density of 0.935 g/cm³. The company says that tests on 50 micron films extruded with Lupolen GX 4081 achieved dart drop impact results of 330 g. Mechanical tests also revealed that films offer combined mechanical properties in machine and cross direction with haze values reduced by about half compared to conventional MDPE film resins.

With its low coefficient of friction, film made from the resin does not require slipping and antiblocking agents. Plus, it has good bubble stability and a low gel level.

The material, which can be blended with standard LDPE, will be made on a commercial scale in LyondellBasell's European plant.

Composites Market To Double In Asia

Asian countries are increasing their market share of global composite production at a faster rate than Europe or the US, according to the recently concluded JEC show in Singapore.

It is predicted that by 2015, the growth of the Asian market for composites will have doubled to reach 50% of total market volume, that is an estimated 5.15 tonnes. Unlike America or Europe, Asia's main growth drivers are markets like the building and construction (equipment stage), automotive (increasing local demand), wind energy (driven by the combination of favourable public regulations and the possibility to exploit economically viable wind farms) and aeronautics (continuing penetration of composites due to weight reduction issues).

It is against this background that the second session of JEC Asia (created in 2008) closed recently with 46 out of the 345 exhibitors exhibiting for the first time.

PlastiPure and Hydrapak Take First Safer Plastic Water Bottle To Market

In the past few years, consumers have had growing concerns about the health risks associated with plastic products, specifically those with Bisphenol A (BPA) and phthalates. But, BPA and phthalates are only two of hundreds of chemicals that can leach from plastics and cause estrogenic activity (EA), which is a common and serious form of endocrine disruption.

The polymer scientists and biologists at Austin-based PlastiPure have partnered with the California-based hydration specialists at Hydrapak to create the new Purebot (TM) water bottle, which gives consumers all the advantages of modern plastics without the associated health risks of EA. PlastiPure has taken plastic to the safest level by creating and certifying materials and products free of EA, not just EA caused by BPA and phthalates.

EA occurs when chemicals are ingested that mimic or block the actions of naturally occurring estrogens, and is associated with early onset of puberty in females, reduced sperm counts in males, altered functions of reproductive organs, obesity, altered behaviors, and increased rates of some breast, ovarian testicular and prostate cancers.

"Our Purebot (TM) water bottle has been certified as a PlastiPure-Safe EA-Free product, and our partnership with PlastiPure allows Hydrapak to bring this important technology to our customers," said Hydrapak president Matt Lyon. "We believe our health-conscious customers are seeking safer solutions than BPA – phthalate-free, and that they want a product that retains the significant advantages plastic has over glass, steel, aluminum and other materials. We are excited to be working with PlastiPure to meet those needs with this breakthrough product."

Over the last nine years, PlastiPure has spent millions of dollars to develop exclusive patents, methods and data covering material formulation, manufacture, processing, testing and certification, resulting in the creation of PlastiPure-Certified products. PlastiPure-Certified EA-Free products go far beyond BPA- and phthalate-free, and are specially formulated to contain no chemicals that cause EA providing the most comprehensive solution to address the serious health concerns about endocrine disruptors.

"The PlastiPure certification seal ensures customers are receiving not a mere marketing tag, such as BPA-free or phthalate-free, but a comprehensive health

solution," said Mike Usey, CEO of PlastiPure. "PlastiPure's partnership with Hydrapak provides us the opportunity to leverage the strength of both companies and is a model we will continue to follow as we work with plastic suppliers and product manufacturers to deliver the safe and ecologically-friendly products consumers demand."

Nissei To Start Production In China

Nissei Plastic Industrial has jumped on the bandwagon of Chinese production with its first set up in the Taicang Economic Development Zone, Jiangsu.

With a total floor space of 4,463 sq m, the facility is expected to start soon. The machine components will be supplied from Japan and the moulding machines will be assembled at the plant. Starting next year, the machines will be assembled using locally supplied components. Though the machines are targeted at the domestic market, the company has not ruled out exporting these machines to other countries.

The types of machines that will be manufactured consist of four main models of the electric NEX series with clamping force of 50-180 tonnes and four hybrid PNX and FNX models with clamping force of 40-180 tonnes. The annual production goal is 30 units for the first year, 300 units for 2010 and 600 units after 2011.

In 2010 The Markets Will Change Radically,

Are You Prepared?

ChemOrbis covers the key regions; China, South East Asia, Turkey, Italy, Egypt

CHINA

Shanghai (ChemOrbis)—"Massive stimulus packages led to a **relentless upward trend in polymer prices** this year despite the depressing start to the year. This also led to widespread suspicions that players have made **speculative purchases** which may come back to haunt the market at year's end. As for 2010, a lot of changes are on the horizon due to free trade agreements. For now import duties of 5-6.5% are in place protecting local production, which is expanding significantly, but **starting January 1, many of these duties will be reduced to zero** as free trade agreements between China and its Asian neighbours take effect. No doubt these agreements will disrupt and forever change traditional trading relationships."

Source : OPPI-Plastiscope

WHAT IS SHRINK PLASTIC?

Shrink plastic is plastic stock that is heated and stretched in two directions until a thin sheet is formed. When heated again, the plastic returns to its original dimension and overall thickness.

For creative uses, the plastic sheet is usually sanded and design is applied using a wide variety of art supplies. Scissors are used to trim and shape. Holes can be punched using an ordinary paper punch.

When finished designs are baked, the plastic shrinks to approximately 45% its original size and returns to its original 1/16 inch thickness. During the shrinking process most art materials are permanently bonded to the surface.



Why is it good for creative projects?

The shrinking process has a wonderful effect on the design and color that's applied before baking. Simple designs become crisper, elaborate designs look amazingly detailed, and colors look rich and vibrant. No special tools are needed. Before baking, the plastic is thin and can be cut with scissors. Complex cut outs that couldn't be made using scissors at the baked thickness are easy to make before shrinking. How is PolyShrink™ different ?

Poly Shrink is made to our specifications, and is tested for even, reliable shrinkage. PolyShrink also gives you the creative versatility of 4 different types. Each type has its own special visual quality, so you can choose just the look you want for any project.

• Clear

Great for see-through techniques where color is applied to the back to be viewed through the front of the finished piece. Color seen through the plastic is extremely vibrant and gives a feeling of depth. Also use Clear PolyShrink when you want a glass-like effect or look.

• Translucent

There's an appealing soft look to Translucent that suits certain images and themes. It's also the type that many people prefer for simple designs with large areas left as is, without any background color.

• Canvas White

For designs where you want crisp color and high contrast, choose Canvas White PolyShrink. Even extremely detailed drawings or stamped images read well and keep their visual impact.

• Black

Black PolyShrink provides a dramatic backdrop for many of your favorite art and stamping supplies. Use colored pencils, stamping inks, metallic markers and rub-ons for beautiful, rich effects.

What baking method is best?

You'll get good results using a conventional or toaster oven. The even heat that an oven provides is a plus, especially when baking complicated shapes or pieces with interior cut outs, such as frames.

You can also heat PolyShrink with an embossing heat tool. The maximum temperature of different models varies up to 300° F. If you're having the feeling that the shrinking process is out of control and happening too fast, move the gun 4 or 5 inches back to slow things down. Keep the heat tool moving to heat the PolyShrink as evenly as you can. Being directly involved in the shrinking process is fun, and it's easy to see how the shrinking process is going. You can even flip your piece over to help it heat evenly.

Heating PolyShrink with an embossing tool is the method of choice for the Intaglio technique. Please see the PolyShrink General Instructions for details.

Expect PolyShrink to curl and move during baking. Occasionally a piece may stick to itself as it shrinks. To separate, allow the piece to cool and pull gently. You'll hear a tiny "snap" as the joint comes apart. You can now reheat the piece and finish shrinking.

Baked PolyShrink is very pliable while it is hot. It can be smoothed flat using cardboard or shaped over a variety of objects

What is the best way to cut out complicated shapes?

Small scissors with narrow blades are easier to maneuver than larger scissors. To make cutting sharp inside corners easier, cut to the corner coming from one direction, then turn the PolyShrink around and finish the cut from the opposite direction.

For pieces with interior cuts, like picture frame style designs, make an opening for your scissors by punching several overlapping holes with a paper punch, or cut an X using a single edge razor blade or exacto knife.

You'll find lots of great tips in the PolyShrink General Instructions. There's information on baking, art materials, stamping ink techniques, the Intaglio technique and lots more.

This is a vast subject and I have tried to add as much information as I can – with the pieces I have found from the site itself – but this write up is only my view as a guidance – but all the fan pieces I have done to ensure the different mediums work – with some interesting results too

1. So after reading Craig (Sakura) on the forum talk about Shrink Plastic & it was said about making a Shrink ruler as different colour shrinks and makes all shrink differently - so here's how to make one

Take a strip of Shrink and add your measurements to the rectangle piece – I have used cm's as you need the writing big enough to be able to read it once shrunk and I have done it to 20cm's

2. Then shrink it down and you'll have a handy reference to what size the shrink will be when finished – If you want why not add a large hole (as that will shrink too) and then have a key fob for all the different shrinks , whether clear , black etc

3. This shrink is the frosted one listed above – I have used the Lyra Aquacolours with a koi waterbrush to add the colour – as remember the colour always darkens when it shrinks – so the Lyra's were excellent for this technique – the frosted shrink had a rough surface bit like a fine layer on tissue paper and was an ideal surface for the colour to be added

4. The finished piece with more intense colour to it

5. I then tried Sakura Stardust pens and again watered down some to give a wash – this has been done on the polyshrink white

So in trying this I coloured all the flower buds with the stardust then water coloured the big area and then the flower buds were washed away – didn't think and i'm only saying so you don't do the same – it's best to do a fine colourwash all over first and then add the detail with the neat pen and the edges too

6. And here is the result – lovely and sparkly and with the Lyra's my favourite one

7. Now this one was fun to try – i added colour using the stardust pens to the flowers again and then took a brilliance pad - pearlescent Jade and wiped it over the whole design a quick technique with great results

8. The first one I messed up but shows the flower buds coloured in and is the fan behind the one that is just brilliance ink and with a gold rim of permapaque pen - with is another fantastic way to add colour to shrink

9. Below is the charm made on frosted shrink with again permapaque pen to colour it in.

Source : TAPMA, Polymer Business

WELCOME TO NEW MEMBERS OF THE FEDERATION

The following New Membership has been accepted by the Federation at its Executive Committee Meeting on 22nd January 2010 :

- | | | |
|--|---|--------------------------|
| 1. M/s. Precision Polyplast Pvt. Ltd., Kolkata | - | Life Manufacturer Member |
| 2. M/s. Element Products, Kolkata | - | Manufacturer Member |
| 3. M/s. Meghaa Mouldings, Guwahati | - | Manufacturer Member |
| 4. M/s. KPL International Ltd., New Delhi | - | Dealer Member |
| 5. M/s. Godawari Traders, Jalgaon | - | Dealer Member |

FORTHCOMING IMPORTANT NATIONAL AND INTERNATIONAL EXHIBITIONS AND CONFERENCES

PLASTASIA 2010 – February 26 – March 01, 2010 at Palace Ground, Bengaluru. For details contact : Triune Exhibitors Pvt. Ltd., Bengaluru, Karnataka. Tel: 080-22352770-71, 65608641, Mobile : 98450 89641, 98451 99545, Fax: 22352772, E-mail: plastasia@triuneexhibitors.com, info@triuneexhibitors.com

DIEMOULD 2010 – March 18 – 21, 2010 at NSE Exhibition Complex, Mumbai. For details contact : Tool & Gauge Manufacturers Association of India (TAGMA), Mumbai, Maharashtra. Tel: 022-28526876, Fax : 28503273, E-mail : mumbai@tagmaindia.org, Website : www.tagmaindia.org

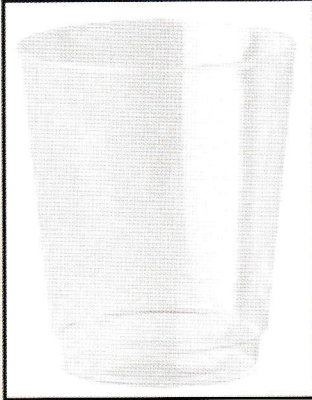
PLASTEX CENTRAL ASIA – March 02 – 05, 2010 at Atakent International Exhibition Centre, Almaty, Kazakhstan. For details contact : ITE Group PLC London, United Kingdom. Tel: (44)-(207) 5965000/5008; Fax: 75965111/5965018; E-mail : enquiry@ite-exhibitions.com; Website : www.ite-exhibitions.com

TAIPEI INTL. PLASTICS & RUBBER INDUSTRY SHOW – March 05 – 09 at Taipei World Trade Centre, Taipei, Taiwan. For contact details : Taiwan External Trade Development Council (TAITRA) Taipei, Taiwan. Tel: (886)-(2) 27255200; Fax: 27576245; E-mail: taitra@taitra.org.tw; Website : www.taitra.org.tw

10TH WENZHOU INTERNATIONAL PLASTICS INDUSTRY & MATERIALS EXHIBITIONS – March 12 – 14, 2010 at Wenzhou International Convention and Exhibition Centre, China. For details contact : Donnor Exhibition Company Ltd., Wenzhou, China. Tel: (86)-(577) 88959805; Fax: 88901788; E-mail: info@donnor.com

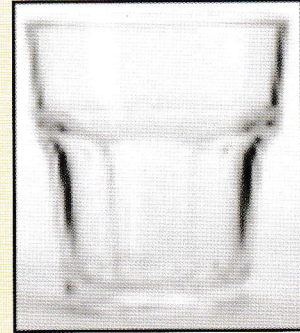
PLASTEC MIDWEST – September 28 – 30, 2010 at Donald E Stephens Convention Centre. For details contact : Canon Communications, Los Angeles, USA. Tel: 310-996-9454, 310-4-454200; Fax: 310-4-454299; E-mail: plminfo@cancom.com

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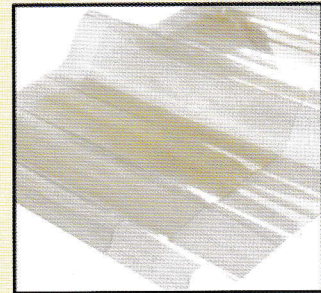
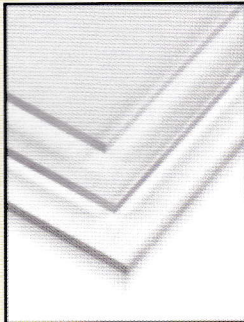


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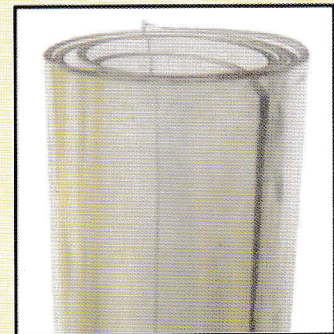
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