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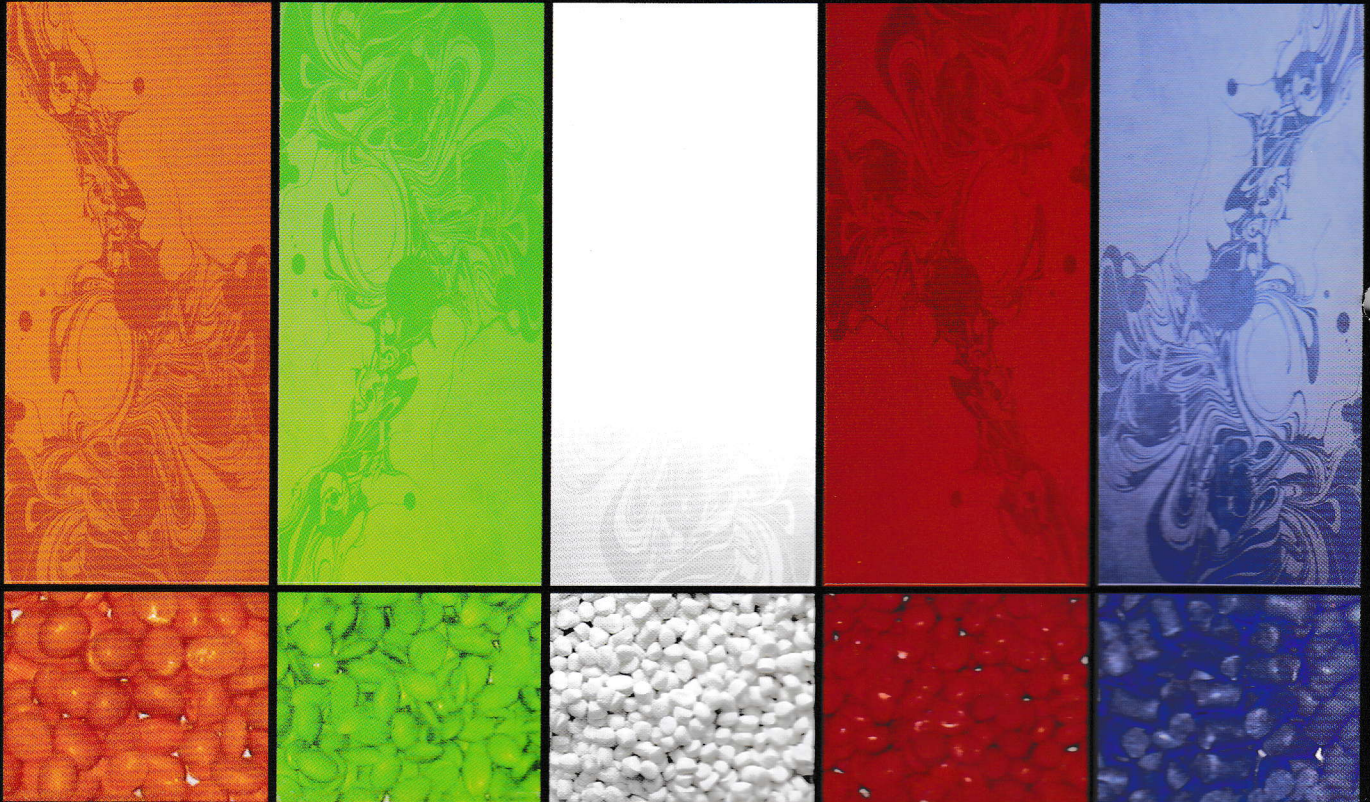
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PLASTICS INDIA

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 8B, Royd Street, 1st Floor
 Kolkata - 700 016 (INDIA),
 Phone: 2217 5699 / 5700 / 6004
 Telefax : 91-33-2217 6005
 Email : ipf@cal2.vsnl.net.in,
 Web : www.plasticfederation.org

Editor : Sri Pradip Nayyar

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Editorial



There's a popular saying which goes 'If it's not broken then don't fix it'. The Indian Finance Minister Mr. Pranab Mukherjee is considered to be the ruling Congress Party's prime troubleshooter because he is someone who adheres to this prudent thought quite religiously. It has yielded political results but in matters of Finance it's a conservative approach and it is this conservative line of thought that has spilled onto the Union Budget 2011. The India Street Presents the Fiscal Budget Review 2011 :-



It has become quite passe for the government and the bureaucrats involved in writing the budget to describe it as one which has 'Something for Everyone'. It's a line sold to the public by Government Officials year after year via media channels quite eager to capitalize on the Budget hoopla.

But peel back the apparent shiny layer and you'd realize that the Union Budget 2011 will be known more for what it has not been able to do rather than that which it says it wants to do.

On one hand we are delighted that the Budget has delivered in the critical area of Social Sector Spending. There have been many mini-reforms announced. **The government has also increased its spending target towards social sector schemes.** This fact has been highly under rated in this year's budget but make no mistake it is one of the best outcomes of the budget.

It's also good to see that the government has made direct investment by foreign investors into Indian Mutual funds possible. FDI into Indian Mutual Funds will prove to be helpful especially in cases of infrastructure Mutual funds.

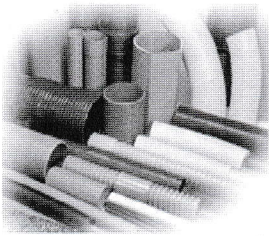
The big disappointment however remains that the Budget has not shown any intent to spread big scale financial reforms. It made little mention of FDI into multi-brand retail. The Insurance and Education Bills were treated as rank outsiders. We did hear about the new Direct Tax Code and its implementation in April this year but we heard the same in last year's budget as well.

The revised Fiscal Deficit target from 4.5% to 4.1% is good to hear but with India's dependence on hydrocarbon imports and unpredictable global oil prices this is a tough ask.

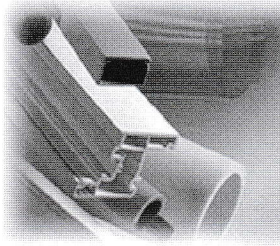
The FM also made mention of a disinvestment target of 40,000 crore. We are tempted to applaud the figure but we can't take it seriously simply because the disinvestment process in India is an extremely complicated one and unless the FM deals with the process we cannot look too far ahead on that number. I wish all the members **A Colourful Holi.**



Pradip Nayyar
Editor



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PRESIDENTIAL ADDRESS



Dear Members,

The Union Finance Minister presented the Budget for the year 2011-12 on 28th February 2011.

With oil prices rising, the cost of naphtha, the most important input for plastics, will also increase. It may not be out of place to mention that because of Assembly Elections in 5 States to be held shortly, the price of petroleum products has not been raised immediately, but if the situation continues as it is, the government will have to raise prices of petroleum products, sooner or later. The price of polymers has already taken an upward trend in the international market.

In my last message to you I had shared my views on fillers. **In this issue I will share my views on Nano-Fillers.**

A variety of nanofillers are available for use in nanocomposites, including natural clays, synthetic clays, nano structured silica's, nanotubes, etc. Over time, as the number of larger volume applications increase, leading to improved supplier economies of scale, it will impact the costs of nanofillers. Because the nano filler contains so many individual particles in a small amount of material, it takes very low loading to obtain a high concentration of constrained areas within the polymer. This leads to reinforcing effects at 5% loading equal to about 12-15% glass fiber. The nano filler also creates a torturous path for penetration of gaseous vapors and liquids into the polymer. This, in turn, leads to better resistance to chemicals and moisture.

Nanocomposites typically demonstrate unique improvements in material properties, including rigidity, strength and barrier properties, while maintaining a level of transparency and offering potential for recyclability. Nanocomposite polymers offer increased rigidity and stiffness while maintaining a high degree of the elongation inherent in the base polymer. Increased stiffness without brittleness is essential for many catheter applications, where increased torque and push/pull strength is required, without kinking. Also, new dilation balloons are required to withstand higher pressures without tearing, and may also be excellent candidates for improvement in mechanical performance from nanocomposite technology. Low loadings and filler dispersion result in compounded materials that maintain inherent polymer transparency in thin sections. Nanocomposites can be recycled and reprocessed without seriously affecting the physical properties. In the medical field, specific applications under development are highly proprietary. Nevertheless, applications receiving the most notoriety as candidates for nanocomposites are shafts, balloons, catheter, luers and similar precision device components.

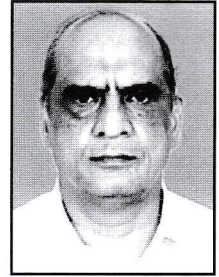
I take this opportunity to wish all the members and their families A Very Colourful and Peaceful Holi...!!!

With warm regards,

Sourabh Khemani
President

From the Desk of

The Hony. Secretary



Dear Members

The financial year 2011 is coming to a close and many members may be busy with the year end work and planning their budget for the next financial year that commences on 1st April 2011.

Members will be happy to know that IPF has been given possession of 1.02 acre land at Sankrail, in dist. Howrah for construction of their Knowledge Centre (Training and Testing). Since the Federation would like to construct a Centre with some innovative features we are seeking suggestions from large number of people. The Federation would be obliged to the members if they send their recommendation to the IPF Secretariat or Mr. Amar Seth, who is looking after the development of the Knowledge Centre, as to what we should incorporate into the new set-up to bring in some uniqueness. The Federation has also decided to form a separate Special Purpose Vehicle (SPV) who will be responsible for running of this Knowledge Centre. The Federation is now seeking counsel from various sources on the contents to be included in the SPV.

In my last message to you I had informed you that IPF will be taking a delegation to Chinaplas2011 being held in Guangzhou, PR China from May 17 – 20, 2011. IPF has appointed SOTC as its travel agent to take members to Chinaplas2011. The tour will be for 5nights/6 days commencing on 16th May 2011. The cost of the tour package has been fixed as Rs.49,000/- on twin sharing basis and Rs.59,000/- for single occupancy. Since only 25 seats have been booked with the travel agent, we request interested members to confirm / contact Shri Dipak Gathani, Convenor - Chinaplas 2011 Committee & Director, Rajda Group, Kolkata, Mob No.98300 39614; Ph: 091-033-2221 8342 OR Email: dipak.gathani@rajdagroup.com and IPF office.

Indplas'12 work is in progress as per schedule. On 26th February 2011 our President Shri Sourabh Khemani and Chairman – EOC Indplas'12 Shri Amar Seth represented IPF at the silver jubilee celebration of The Tamilnadu Plastics Manufactures Association (TAPMA) held near Chennai from February 26-27, 2011. This opportunity was taken by IPF in making a presentation on Indplas'12. The 8-minute promotional film developed by IPF for INdplas'12 was also shown to the delegates. A leaflet on Indplas'12 was also included in the delegate kit of participants. Shri Sourabh Khemani was given an opportunity to speak during the celebration. Shri Khemani presented the President TAPMA a memento on behalf of IPF on the successful completion of 25 years of TAPMA. **Happy Holi to all the members.**

With best wishes

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

Ramawatar Poddar

Hony. Secretary

Advances in Injection Molds

Hot Runner Systems Innovative Mold Parts

Mr. Gaurang Shah

MASTIP Hot Runner Systems Why Hot Runner Systems

The key to better plastic molding efficiency is to eliminate cold sprues & runners which helps a processor to instantly produce quality plastic parts, most importantly faster by removing the unnecessary production costs of wastage, rejects, regrinding & extra handling resulting in automated production which will ensure competitiveness.

Types of Runnerless Systems

These can be broadly classified (Fig.1) as internally heated systems & externally heated systems, with the latter being more popular worldwide & more so in India, the same are being considered in this write-up.

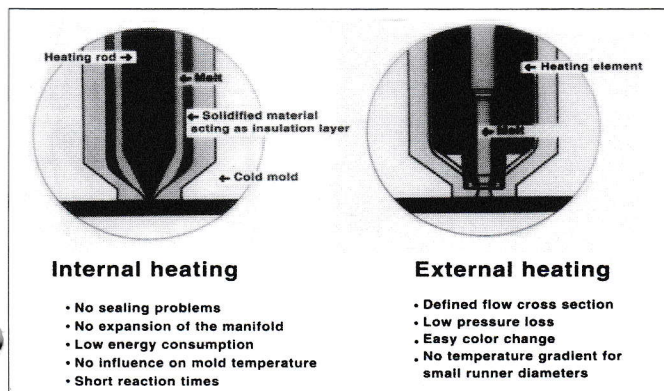


Fig-1 **Difference Between Conventional Molds & Hot Runner Molds**

The primary difference being in the flow of polymer (Fig.2). In

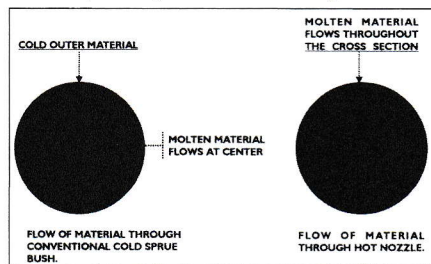


Fig-2

conventional system the molten plastic flows through center of the flow channel with the cold material forming a thick film at the inner periphery. In contrast the polymer flow in externally heated hot runner

system is throughout the entire cross section of the flow channel.

The effect of this behavior, in thermoplastic injection molding can be better explained (Fig.3) by considering the case of a single cavity 1mm thick part being fed by a cold sprue of 5mm dia at cavity face. The part is molded with a large 'unwanted' sprue giving an untidy gate, which needs to be trimmed. All aspects related to molding of sprue i.e. charging time, injection time, cooling time & mold open-close time contribute to increased cycle time, which is unnecessary. Additionally, during cooling phase, the difference in cross section of the sprue & part results in a differential rate of cooling between the two & hence stresses are induced in the part resulting in poor part quality. Stresses are also induced due to increased pressure requirement. Also if at all possible & permissible, the sprues need to be ground & reused consuming extra energy & lowering part quality. In contrast to all this a hot nozzle system with a cosmetic gate will give faster cycles, better part quality & much better efficiency of production. This effect is compounded in a multi-cavity mold.

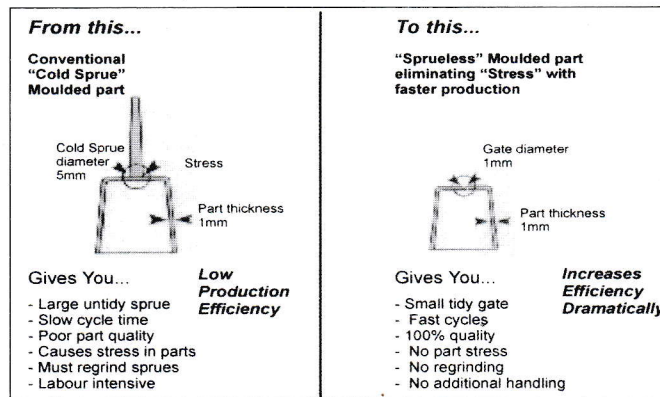


Fig-3

Main Objectives of Hot Runner System

1. To maintain the polymer temperature, uniform throughout the entire length of flow channel & right up to the gate.
2. To effectively retain the heat within the system with minimum transfer to the mold.
3. To enable fast material & color change & prevent dead spots.
4. To facilitate, interchangeability, user serviceability and ensure long term durability with the capability to process high temperature blends, alloys & abrasive polymers.

**New Generation Hot Runner Systems
Hot Nozzles**

Mastip provides a wide range of hot nozzles for single and multi cavity applications. The new MX range of hot nozzles (Fig.4) for multi cavity molds comprises of 9 parts. The design and material of construction of each part has been optimized to achieve the following objectives:

- Increased moulding window.
- Lower startup & moulding temperatures.
- Improved thermal stability with increased operating temperature range.
- Reduce moulding pressure.
- Reduced cycle time due to improved thermal insulation.
- Easier installation with front loading capability.
- Better designed profile to allow closer cavity pitching.
- Ability to mould large parts with smaller nozzles due to increased flow characteristics.
- Improved reliability.

The nozzles are available in various tip materials to process low, medium & high viscosity polymers. For processing abrasive polymers, a solid carbide tip with high wear resistance coupled with excellent heat transfer properties provides an ideal solution for processing of not only filled polymers but also very high temperature specialty engineering plastics.

All these 9 components that constitute the hot nozzle can be disassembled & replaced if required adding a feature which is of primary importance in Indian context i.e. 'economics of maintenance'



Fig-4

Manifolds

Every Mastip manifold is engineered for each application using advanced software simulations. Mastip manifolds (Fig-5) have external heaters, which are fully temperature tested after bending & before dispatch. The manifolds have very smooth gun-drilled melt channels. The melt channel size/profile is custom designed to match to the requirements of the application, taking into account material type, shot size, cycle time and any other considerations needed. The external heating ensures that the melt channel has an even temperature from the outside periphery through to the middle of the channel, thus creating total dynamic material flow. This feature along with the new 'taper' seated end plug 'blended' assemblies along with 'deviation' plugs keep material & color changes to a minimum number of shots with the correct processing

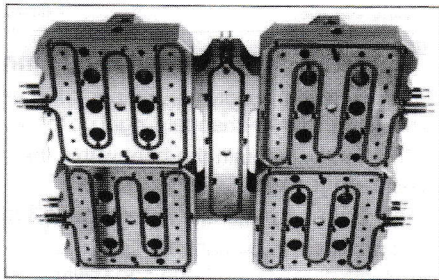


Fig-5

procedures. Also there are no degradation problems!!

These manifolds enable perfect balancing of flow channels ensuring that each cavity is filled with the same injection pressures thereby achieving uniform tolerances & part weights ensuring long-term repeatability. Once again design facilitates easy replacement of manifold heaters whenever required.

Mastip can also supply fully wired hot half solutions (Fig 6). The advantages are:

- Complete homogeneity of the system
- A leak proof warranty
- Front loading capability for easier servicing of tips, heaters and thermocouples enabling maintenance without disassembling the mold from the injection molding machine, saving valuable time.
- Ready to install without any further wiring, fitting or machining required.

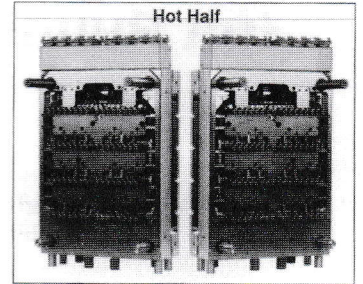
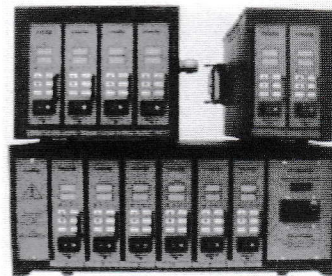


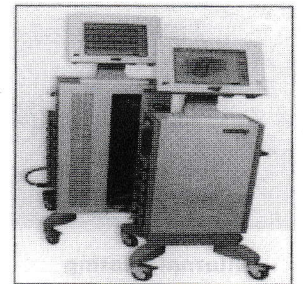
Fig-6

Temperature Controllers

This is a very important element of a hot runner system. Microprocessor based, PID/FUZZY logic selectable controllers with soft start facility ensure longevity of heater & maintain temperature within +/- 1 deg C. Various alarm functions & self diagnostic display indications make the system very user friendly. Controllers in options from modular to touch screen type upto 240 zones are available.



Modular Controller



Touch Screen Controller

Recent Trends in India

Valve Gate System, Stack Manifolds & Sequential Control

The reduced injection pressure requirement with a hot runner system is further curtailed with the use of valve gate systems with large gate diameters up to 8.0mm and even more. Valve gates are typically employed on one end for parts with large weights / thick sections & on the other for thin wall moldings. Fig. 6 illustrates sequential control of 3 point valve gates to mold a single cavity component enabling accurate positioning of weld lines and further reducing the injection pressure / clamp tonnage requirement.

Sequential control is also used in family molds with different part weights, each forming a part of one final assembly.

Stack hot runner systems (Fig.7) are common these days considering the various advantages that they offer. Melt transfer across the parting line is an area of critical importance for a hot

runner system built to suit stack molds. In addition to the conventional method of using an extended 'sprue bar', Mastip has a option of employing a 'stork feed' system with a valve shut-off mechanism. This enables the melt (fed through the center bush) to be transmitted over the parting line to the injection point requirement of the cavity on the moving side of the mold thereby eliminating the limitations of the conventional 'sprue bar' system and facilitating:

1. Complete thermal equilibrium since no components of the system are exposed.
2. Full casting area of platen can be utilized.
3. Cavity location along the axis of the machine nozzle is possible.
4. Possibility to manufacture stack molds with deep-seated cavities.

Here also sequential control enables molding of parts with varying article weights e.g.: Suitcase top & bottom shells, refrigerator top and bottom covers etc.

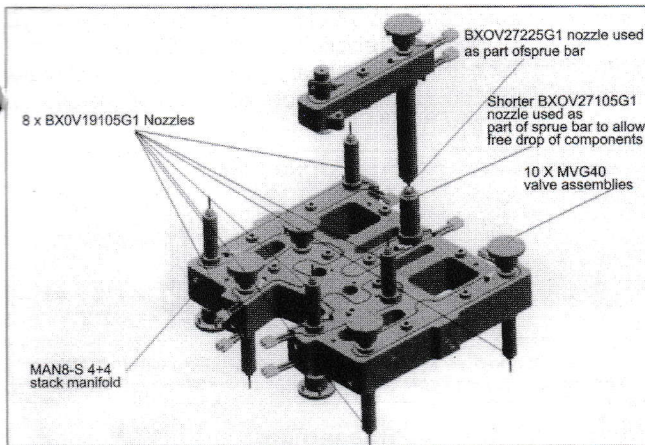


Fig-7

Conclusion

Hot runner systems in India, are playing an increasing role in production of quality parts more efficiently. In view of the advanced manufacturing techniques employed by hot runner suppliers, the advantages accrued have gone much beyond that of only saving of plastic material & cycle time as also improving product quality. New application areas have been opened up which were hitherto not possible with conventional cold sprue + runner systems.

Cumsa Innovative Mold Parts Introduction

Standardisation of mold parts is the buzzword taking rounds. Mold makers employing quality standard parts can guarantee the molders, long term enduring performance, ease of part availability for maintenance / replacement & most importantly commit shorter lead times for complete molds. The new generation mold maker can thus fully concentrate on what he knows best i.e. design & manufacture of core & cavities only.

Product Classification

The complete range of parts offered by leading worldwide supplier CUMSA, Spain, can be grouped under 6 headings:

Slides

Totally integrated, hardened, ground & adjusted with

interchangeability in all versions. This is amongst the very few systems available which do not require adjustment during assembly. The final adjustments, if any are done with the mold in closed condition. This group also contains several other integral mechanisms:

1. Angle pin housings & angled guide bush (Fig 1) in round & square form which incorporate a predrilled hole (upto 20°) for the angle pin, eliminating the need to angularly drill die set.

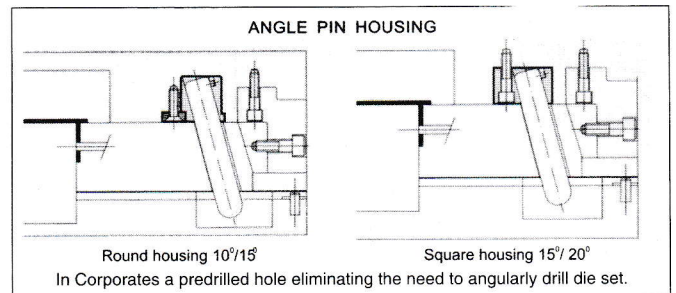


Fig-1

2. Coring unit (Fig 4) is a mechanism to form lateral holes with the advantages of automatic retention of core insert & requiring a very small area for installation. The core pin dia, can be machined to required shape.

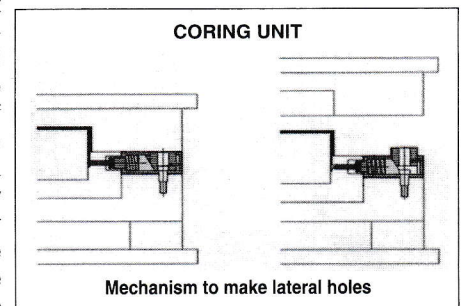


Fig-4

Undercuts

1. Undercut base unit (Fig-2) can be employed for internal movements, which need different angles of ejection. Importantly it does not require oil grooves since the friction area is covered with PETP.

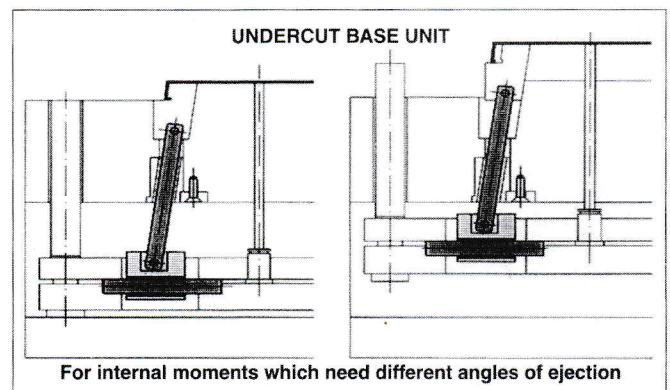


Fig-2

2. Expandable core (Fig-3) provides a very convenient method of release of parts with external undercuts & is an ideal compact solution for multi-cavity tools.

Ejection Systems

Ejector guide pin & bush, headless ejector pins & sleeve ejectors with ejector base, core pin base, magnetic return pins,

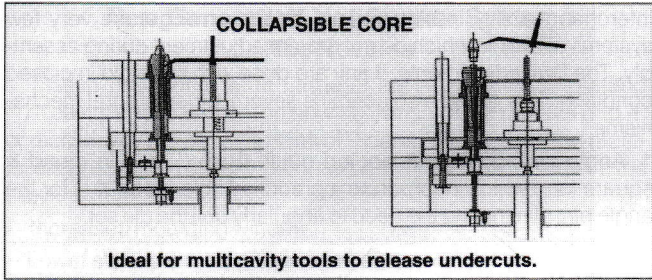


Fig-3

sprung cores, accelerated ejectors, double ejectors, etc are some of the standard parts available. Some application examples:

1. Ejector base unit (Fig 5) is an automatic unit which holds the ejector pin in position until the top of same is actuated releasing the pin. The pins can be maintained / replaced from the parting line of the tool eliminating the need to strip down the tool thereby saving valuable down time & increasing m/c up time.

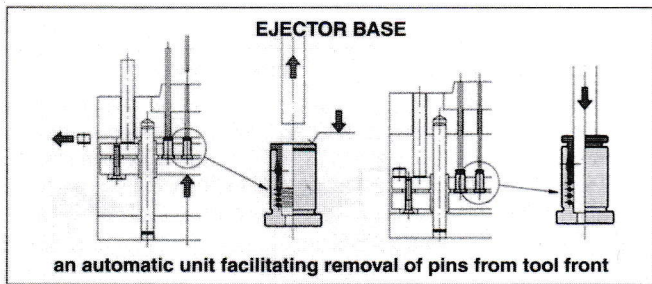


Fig-5

2. Sprung cores (Fig 6) manufactured from special spring steels allows the release of small undercuts. These are mounted & activated by the ejector plates just as in case of a standard ejector. Double ejector (Fig 6) helps divide the travel in two predefined steps & is useful to obtain automatic ejection strokes in molds with sprung cores & collapsible cores.

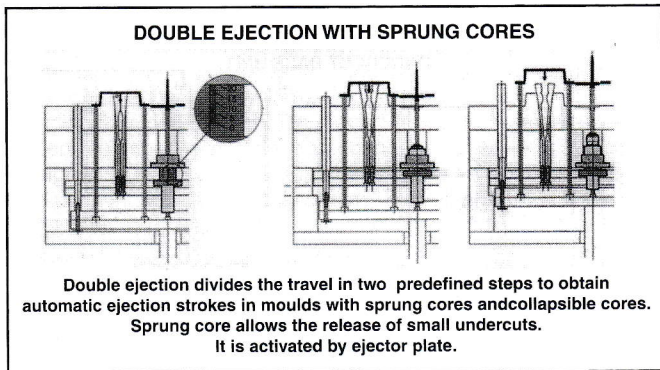


Fig-6

3. Accelerated ejector (Fig 7) which is very easy to install because of its cylindrical shape allows to increase the stroke of selected ejectors within the tool enabling automation of conventional tools.

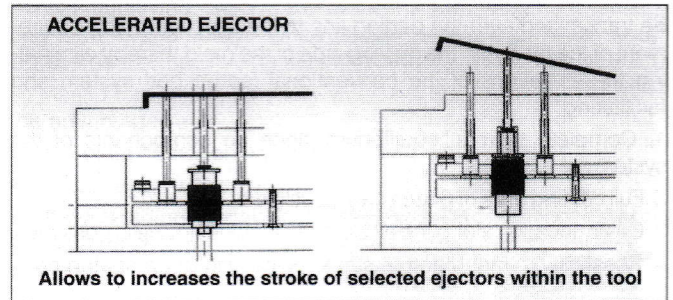


Fig-7

Cooling Systems

Variety of accessories for standardization and quick assembly / change i.e. water connectors & plugs, Spiral cooling tubes (Fig 8 - from metal & polyester), Telescopic & adjustable water (pom + brass) & oil (PPS) fittings, Seal bearings, multiple channel brass cooling fountains etc can help improve efficiency of operation of molds.

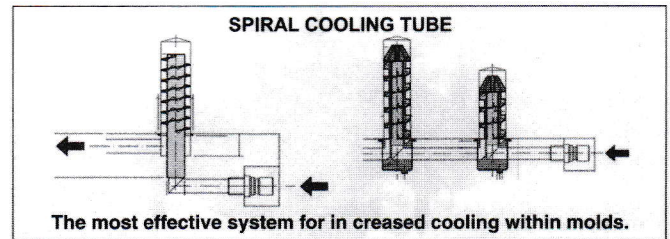


Fig-8

Traceability

This group (Fig 9) constitutes parts like reference blocks & inserts, mark inserts, date stamps, multi date stamps, electronic date stamps etc...

Accessories

This group constitutes parts like air poppet valves & double valves, filter valves, sprue adjuster, trimming knife etc...

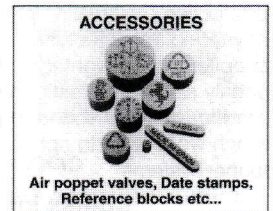


Fig-9

Conclusion

CUMSA Standard Mold Parts give following advantages:

- a) Facilitate designing of Molds giving solution to problems which are difficult to solve with conventional parts.
- b) Reduce Mold Production & Maintenance time.
- c) Help ensure enduring mold performance.

Source : IPI Journal

Synthetic (PP) Papers

- A Review

Mr. A. S. Athalye

In India, the Subject of Synthetic Paper as a Substitute for the Natural Paper, has been Seriously discussed, as far as I can recall, since early Sixties. The closest that was developed was the Thin Gauge Films of HM-HDPE in the late Sixties, which were mainly promoted for the Market of Carry Bags, which were mainly of LDPE. The HM-HDPE Bags could have Films in as low a Thickness as 12-15 Microns, even thinner, and with good strength, which made them readily acceptable. But this HM-HDPE Film inspite of having some characteristics of Paper like surface finish, folding, creasing, writing (with ball pen) surface, etc, this was no substitute to the Natural Paper in many respects.

One of the success stories, apart from Hoechst, Germany, themselves, is Yupo Corporation of Tokyo, who had a major break-thru for the Synthetic Paper in various thicknesses, surface finishes etc in the Year 1970 and they continued to evolve this for major breakthroughs end-uses with characteristics such as Water resistance, tear resistance, folding strength and tear resistance and good acceptability for printing.

The Salient features of Synthetic Paper

1. Superior Water Resistance
2. Its tear resistance far exceeds the level of normal paper.
3. The surface is very even and smooth. It is ideal for Laminating and Coating finish.

- The latest paper replacement is a unique end-use of Printing Currency notes displacing paper and the lead is taken by Australia. Even India is giving a serious thought and it won't be too long before the other Countries switch over.

4. This (PP) Paper has resistance to various Chemicals including Acid, Alkaline,

Organic Solvents or Grease.

- The largest user can be labels for drums that are used for transporting Oils, Chemicals, Liquid Foods, etc. and even Mould-in-labels.

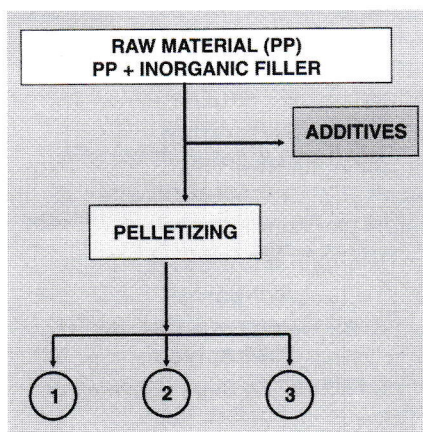
- They are ideal for Maps, Machinery Manuals, etc.

5. These Papers are excellent for writing with a Ball-Pen, for Typing, for Computer Prints, etc.

6. Paper made of PP is environmentally friendly. No toxic gases are emitted, when incinerated.

7. These Papers can be recycled at a much lower cost as compared to the regular paper.

Manufacturing Process



The three layers are two surface layers and one core layer, which imparts the strength and the Paper-like Surface.

The grain appearance is generally the direction opposite to that of Natural Paper.

Some Successful End-uses

The Synthetic (PP) Paper is resistant to Moisture, Oil and Greases and that's make

this Paper an ideal choice for various Packaging requirements.

Some of the already successfully used end-uses are :-

- In-Mould Labels
- Labels for various Packages
- Food Labels
- Labels for Containers, Composite Cans, PET/PP/Glass Bottles
- As a Wrapping Paper
- Binding Tapes
- Blister Packs
- Self Adhesive Labels with advantages such as high Print Quality, Toughness, Water-proof, Environmental friendly.
- With high print quality as compared to conventional LD/HD/HM-HDPE/Foil Labels.

Features of Synthetics [PP] Paper

1. Resistant to Water and Oils
2. Is strong against Stretching, Folding, Bending or Impact
3. Its tear resistance far exceeds the level of common paper
4. The surface is uniformly smooth and is, therefore, ideal for Lamination and Coating Finish
5. It is resistant to Acids, Alkalies, Organic Solvent, Grease
6. High Print Quality by all the common printing methods
7. In-Mould-Labeling
8. The possible range covers simple communication paper to, for example,
 - Laser Printer Paper
 - INK Jet Paper
 - Drawing Paper
 - Computer Forms
 - Thermal Papers
 - Business Forms Paper

9. Special Applications already established are :

- Ballot Paper
- Tags
- Various Manuals
- Business Cards
- Clock Dials
- Battery Insulation Paper
- Maps

10. Self Adhesive Labels

- Labels for domestic appliances
- Labels for Foods, Medicines
- Labels for Toys

11. Packaging

- In-Mould Labels
- Containers Labels
- Over Wrapping
- Binding Tapes
- Blister Packs
- Bottle Neck Hangers
- Neck Hangers

12. Paper and PE Bags Substitution

- Shopping Bags
- Designer Bags
- Courier Bags
- Preservation Bags
- Envelopes
- X-Ray Bags

With high print quality, toughness, waterproofness, the material is ideal for such usage.

13. Publication and Maps

With the inherent qualities like surface smoothness, water, resistance, toughness and the quality of print, this paper is outstanding for :

- Children's Books
- Machinery Manuals
- Maps, Road Maps
- Book Covers
- Magazine Covers
- Govt. related Papers and Records
- Outdoor posters
- Banners
- Pamphlets
- Backlight Posters
- Catalogues

14. General Graphics

With the proven properties, such as strength, waterproofness, durability, high opacity and high print quality, PP Synthetic Paper becomes a priority choice for usages such as :

- Outdoor Posters

Adhesives

- Shopping Bags : Hot Melt
- : EVA Emulsion
- Envelopes : EVA Emulsion
- : Double Face Tape
- Labels for Glass : EVA Emulsion
- : Hot Melt

- Banners

- Maps

15. MISC. – Books etc

- Children's Books
- Book Covers
- Tourist Map
- Thermal Papers
- Drawing Paper
- INK Jet / Laser Paper
- Business Forms

16. Labels

- In-Mould
- Containers
- Airport Bags
- Wrapping Paper
- Blister Pack

Finishing and Fabrication of Products using Synthetic Paper Binding

- EVA Hot Melt Adhesive around 180°C
- NOTCH Binding is suitable
- ULTRASONIC SEALING for Smaller quantity
- Loose Leaf
- SPIRAL WIRE BINDING

Lamination

- For wet lamination, EVA based adhesive is good
- For dry lamination, Solvent / Solventless Adhesives are good

Folding

- Easily folded along the grain direction on Folding Machine
- Set roll Pressure at maximum
- Roll Pressure evenly at both ends
- Paper should be fed at right angle

Perforation

Across the grain direction :

- Below 0.5 mm / cut 2 – 3 mm

In the grain direction :

- Below 0.8 – 1.0 mm, cut 2 to 3 mm

Adhesives

For Shopping Bags / Envelops / Posters, etc.

- Hot Melt / EVA Emulsion
 - Solvent type
 - EVA Emulsion
 - Double sided tape
- For very perfect binding, EVA Hot Melt is recommended

Other End-Uses – Packaging

Other than the natural paper substi-

- Posters : EVA Emulsion
- Binding : EVA Hot Melt

A Wrap-Up

Almost every one associated with the plastics industry is aware and talking about the Synthetic Paper for very many years. Yet, to my knowledge, there is no

tute, the properties such as Moisture Resistance, resistance to Oils and Greases and excellent Printing quality makes this paper a very preferred material for the Packaging applications.

This paper with its high print quality, toughness, water – proofness and environmental friendly makes it, preferred material for self – adhesive labels

Disposal of (PP) Synthetic Paper

Combustible Calaries	Approxly Calaries (KCAL 1KG)
Coal	8500
Oil	9600
PE	11,000
PP Paper	97,000
(Yupo, Japan)	--

In-Mould Labelling

The salient advantages are :

- Clear prints – gravure as well as offset
- Very good resistance to water, oils, chemicals and mildew
- Perfect adhesion because the label become integral part of the container & is therefore difficult to remove without distorting.

- Works most economical
- Such labels are available

In Mould Labelling

● Printing can be by Gravure for excellent Print result

- No Mildew
- Easier Stacking of Packages
- Perfect Adhesion
- Labour saving - economical

Recycling

The entire Container can be recycled without removing the labels

Envirnrometally Friendly

- And can be safely incinerated
- Office Waste can be processed as an Industrial Waste
- The cut-offs of waste can be recycled for Products such as Flower Pots, Nursery Pots and Trays.

Stationery Paper For

- Business Forms
- Ink-jet & laser prints
- Drawing Paper
- Computer Forms
- Various clean room uses
- Memo Pads
- Adhesive Tapes

commercial production of such a product. I feel that such a product, PP Synthetic Paper, would have a good demand for a large number of end-uses.

Courtesy : Yupo CORPN'S

Text & Photographs Tokyo Sales Manual

E-mail: mizoguchishinsuke@md.yupo.co.jp

Source : IPI Journal

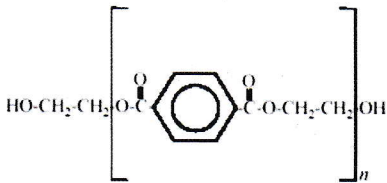


Dr. Srinivas R. ...
Mr. Chetan V. Limaye
 Reliance Industries Ltd.
 Patalganga

What is PET?

PET (Polyethylene Terephthalate) is a strong but lightweight form of clear polyester. It is used to make containers for soft drinks, juices, alcoholic drinks, water, edible oils, household cleaners, and other food and non-food applications.

Being a polymer, polyethylene terephthalate's molecules consist of long chains of repeating units only containing the carbon (C), oxygen (O) and hydrogen (H) organic elements.



Polyethylene Terephthalate

PET was first developed for use in synthetic fibers by British Calico Printers in 1941. The patent rights were then sold to Dupont and ICI who in turn sold regional rights to many other companies

Although originally produced for fibres, PET began to be used for packaging films in the mid 1960s and then, in the early 1970s, the technique for blowing biaxially oriented bottles was commercially developed.

PET is formed by step growth polycondensation from ethylene glycol and terephthalic acid. The synthesis of PET requires two reactions. The first of these is esterification of TPA with EG; forming so called "Prepolymer" which contains the monomer Bis-hydroxyethyl terephthalate and short chain oligomers. The second reaction is Polycondensation in which by-

products, EG is removed from melt by using high vacuum. High molecular weight PET grades for packaging applications are typically produced by further polycondensation in an additional solid-state process (SSP) under vacuum or in an inert gas atmosphere.

Two PET grades now dominate the global market, i.e. Fibre grade PET and Bottle grade PET. These standard grades differ mainly in molecular weight or intrinsic viscosity, optical appearance and the production recipes. Bottle grade PET appears 'Glass clear' in appearance in the amorphous state. The average molecular weight ranges from 24000 to 36000g/mol, which refers to an IV of between 0.74 and 1.00dl/g. The standard bottle grade has an IV of 0.80 dl/g.

Why packaging is required?

In early 1980 packaging was just required to hold the material without having any concern about the packaging material, aesthetics of the package.

In current scenario packaging is required for creating a brand, protection of the content inside the container from light or oxygen, ease in transportation and handling of the products and last but not least to attract consumer attention.

Why Polyethylene Terephthalate (PET)?

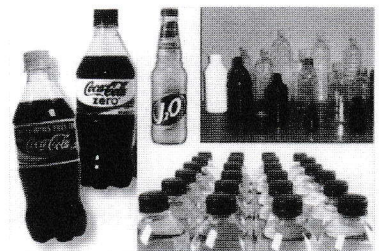
The reason that PET succeeded where other plastic material did not, is that PET has very special characteristics: when heated to a temperature where it's chain-like molecules are sufficiently mobile to unfold instead of breaking when stretched, PET can be oriented. 'Stretching' applied from two directions at right angles

gives 'biaxial orientation'. Oriented bottle is stronger because of the closely packed chains aligned in the direction of stretching. Not only tensile strength of oriented PET, the impact strength, barrier properties and chemical resistance are also improved, which means that bottles made from biaxially oriented PET can be lighter without sacrificing performance.

The advantages of PET are numerous. A typical 0.5Ltr PET bottle weighs a mere 28 grams against an equivalent glass bottle, which can weigh over 350 grams. PET is also crystal clear, giving the bottle the attractive, clean and sparkling look, which is so prized by mineral water bottlers. It can also be tinted, green or amber to suit the demands of the product and the consumer. The use of PET bottles eliminates the problem of breakage associated with glass and, like glass, PET is totally recyclable. PET resin is chemically inert and has FDA approval for food contact applications.

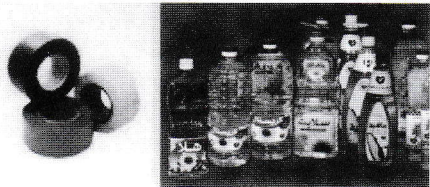
Food Packaging Applications

- Beverages, Soft Drinks, Fruit Juices
- Mineral Water
- Edible oil, sauces and dressings
- Confectionary products
- Beer and wine packaging



Non-Food Packaging Applications

- Strappings as an alternate to steel wires
- FMCG products like liquid soap, hair oils, gels, creams etc.
- Lube oils



PET Bottles are safe to use?

100% yes because PET is chemically inert, biologically inert if ingested, dermatically it is safe. With respect to safety and health of consumers, PET complies with 21CFR 177.1630 of the US Food And Drug Administration (USFDA). Apart from FDA compliance, PET also meets statutory regulations of various governments like European Union Directive 2002/72/EC, IS: 12252-1987 of Bureau of Indian Standards and Japan Hygienic Olefin and Styrene Plastics Association (JHOSPA).



Food and Drug Administration



Myths and Facts about PET

In spite of being approved by the various authorized agencies worldwide, certain apprehensions are being raised every now and then about the usage and suitability of Polyethylene terephthalate (PET) in the indirect food contact applications. Attempts has been made in this article mainly to clarify the apprehensions raised on the facts and reinforce suitability of PET material in indirect food contact applications.

Do PET bottles contain BisPhenol-A?

PET does not contain BPA and BPA is not used in PET's manufacture. Factual errors or confusing statements occasionally appear, even in respected publications.

Does PET contain any plasticizers and stabilizers that can transfer to Food?

PET used for food applications is in a very pure form, free from any plasticizers such as Diethylhydroxyl amine (DEHA) or added stabilizers. There are no additives of this type that could migrate into or affect the packaged foodstuff.

Can PET release other harmful chemicals to foodstuffs?

Despite many unfounded rumors circulating on the Internet, no harmful chemical has been detected in measurable amounts from PET under any condition of use.

This has been verified by all the national authorities that have authorized the use of PET for food packaging.

Does PET use up scarce oil resources?

Not really, more than 88% of the oil extracted from the earth is used as a fuel for transport systems, heating appliances or for generation of electricity.

The amount used for chemicals and plastics is less than 6% in comparison and PET used less than 0.2% of the world's total oil resources.

Migration of PET Components

For PET, European Union food contact Materials & Articles Legislation Directive 82/711/EEC prescribes OML and SML for the monomers commonly used in making PET.

Monomer	SML (Specific migration limit)
Terephthalic acid	7.5 mg/kg
Dimethyl terephthalate	No SML
Isophthalic acid (IPA)	5 mg/ml
Ethylene glycol (EG)	30 mg/kg
Diethylene glycol (DEG)	30 mg/kg
1.4 (bis hydroxyl methyl) cyclohexane	No SML

Study showed migration results are well below the SML.

What happens to the catalysts used in manufacture of PET, are they hazardous?

The metal-based catalysts used in PET manufacture are present at very low levels, typically less than 350 parts per million (ppm), and are chemically bound into the PET structure or locked within the polymer matrix. Repeated extraction tests with food simulants at normal use condi-

tions show that the amount of extractable is well below any FDA/EC legal limits; moreover, the extractables are neither toxic nor hazardous.

New and very comprehensive and detailed animal feeding study concludes that there is no risk arising from the use of antimony trioxide in PET products. A diet containing up to 20g/kg of antimony trioxide had no detectable toxic effects. Genotoxicity tests were also negative. The guidelines commonly recommended for Sb levels in drinking water by different agencies are as follows.

Agency	Sb Level (Microgram / Litre)
World Health Organisation (WHO)	20
Environmental Protection Agency (USA)	06
Health Canada and the Ontario Ministry of Environment	06
German Federal Ministry of Environment	05
Japan	15

Migration study shows only trace levels of antimony (less than 0.005 micrograms/liter). Other catalyst such as Germanium and Titanium are explored for PET manufacturing but these catalysts are very costly compared to conventional antimony catalyst.

Is it safe to leave a PET bottle in a hot car?

Yes. The idea that PET bottles "leach" chemicals when heated in hot cars is not based on any science, and is unsubstantiated by any credible evidence. FDA has stated: "The levels of migration expected, including during periods of exposure to elevated temperatures in storage and transport (such as might be experienced in a close vehicle in the sun) have, been determined by agency to be well within the margin of safety. Therefore the agency does not consider this situation to be a safety concern."

Toxicological status of PET

- No evidence of toxicity has been detected in feeding studies using animals.

Contd. to Page - 23

GLIMPSES

IPF DELEGATION TO ICONPLAS AT CHENNAI



The Tamilnadu Plastics Manufacturers' Association (TAPMA) celebrated its Silver Jubilee by holding a two days International Convention on Plastics (ICONPLAS) from February 26 – 27, 2011 in an exotic resort near Chennai. Shri Sourabh Khemani and Shri Amar Seth represented IPF in this Convention. TAPMA offered IPF some time for making a presentation on IPF Knowledge Centre and Indplas'12. Shri Amar Seth made a presentation on the same. The film of Indplas'12 was also shown to the delegates. Shri Sourabh Khemani also spoke to the delegates and presented a memento to the President of TAPMA for successfully completing 25 years service to the plastics industry. During the visit to ICONPLAS, IPF Team took this opportunity for discussing the development of IPF Knowledge Centre with the DG-CIPET and the assistance CIPET may provide to IPF for its development. A leaflet on Indplas'12 was also included as part of the ICONPLAS Kit. There were over 750 registrations and prominent speakers from industry presented papers in the Convention. The Convention was a great success. Overall the visit of IPF Team served the dual purpose for the promotion of Indplas'12 and IPF Knowledge Centre.

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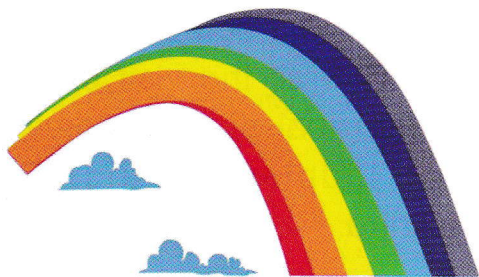
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bharat@vsnl.in

MR. ANANT GOENKA :+91-9830057880, MR. RAGHAV GOENKA : +91-9830065646
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TECHNICAL DATA :

Model	-	TFAT 1250/50 YEAR 2002
Extruder	-	03 NOS
Motor Rating	-	18/20/18 KW DC
Die -	-	KUHNE DIE
Die Size	-	250/300 MM
Heating Load	-	34 KW
Rollar Width	-	1250 MM
Surface Winder	-	2 STATIONS
Film Layflat Range	-	600-1150 MM
Film Thickness Range	-	25-150 MICRONE
Output	-	130kg/HRS
Connected Load	-	120 KW
Plant Dimension (LXWXH)	-	9x5.5x9 MTRS

KLOCKNER WINDSOR MAKE LAMINATION PLANT

Model	-	ECL 1500 Year 1996
Screw Die	-	75 MM
L/D Ratio	-	28 : 1
EDI Make Die	-	1500 MM
Chill Roll Length	-	1500 MM
Centre Type Turrent Winder	-	TWO STATION
Unwinder Fixed Station	-	TWO STATION
Output	-	130 kg/HRS
Motor Rating	-	30 KW DC
Pressure Roller (Rubber)	-	225 MM
Connected Load	-	125 KW

Price : Negotiable
 Name of Contact Person : Mr. Prakash Kandoi'
 Cell : 09830077449

● Negative results from Ames tests and studies into unscheduled DNA synthesis indicate that **PET is not genotoxic.**

● Studies conducted with monomers and typical PET intermediates also indicate that these materials are essentially non-toxic and pose no threats to human health.

Are PET bottles Eco-Friendly?

● PET bottles / jars / trays are 100% recyclable.

● The recycling code for PET is 1.

● This symbol is no-thing to do with the single use or repeated use of PET bottles.

● They require less fuel during transport, they also help saving energy. Transportation energy in PET beverage packaging is 13.7 MJ Diesel/Kg Vs 25.4 MJ Diesel/Kg for glass beverage packaging.

● Being extremely light, PET bottles help diminish the formation of packaging waste while at the same time they reduce the emission of contaminants during their transport.

● The use of PET in packaging significantly reduces energy demand & greenhouse emissions versus alternative materials like glass and metals.

● Report published by GUA (Gesellschaft für umfassende Analysen GmbH) 4 showed that packaging beverages in PET versus glass or metal reduces energy consumption by 52%.

● Greenhouse gas emissions were reduced 55% on the same basis.

● The complete combustion gases are carbon dioxide and water, the respiration gases of plants and animals.

● In controlled incineration, air emissions are contained below regulatory limits.

Benefits of recycling of PET Bottles

● Recycling one ton of plastic bottles

saves approximately 3.8 barrels of oil.

● Recycling one ton of plastic saves 7.4 cubic yards of landfill space

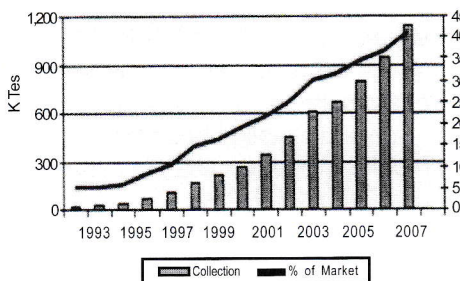
● Recycling one pound of PET (polyethylene terephthalate) plastic bottles saves approximately 12,000 BTUs (British Thermal Unit) of heat energy. And, producing new plastic products from recycled materials uses two-thirds less energy than is required to make products from raw (virgin) materials.

● When recycled material is substituted for virgin material, greenhouse gas emissions are reduced.

● Recycled bottles provide an environmentally friendly source for making new products and substitutes recycled materials for new plastic. Recycled plastic bottles make hundreds of everyday products, including fleece jackets, carpeting, and lumber for outdoor decking.

Recycling Trends

EUROPEAN PET COLLECTION 1993-2007



● In 2007 1.13m tones were collected for recycle, 20% more than in 2006. They end up in a variety of applications – new bottles, thermoforming sheet, strapping tape, fibres, non wovens and others such as engineering plastics.

Industry Initiatives for PET recycling

● Coca-Cola Inc. invested US\$ 60 M in PET recycling Plant. The company built world's largest Bottle to Bottle (B2B) recycling plant having capacity of 45 KTA. Coca-Cola will also increase recycle content in PET bottles from 10 to 15% by

year 2015.

● Coke bottler CCE (Great Britain, France and Benelux) sets target of 25% RPET by 2010.

● Nestle announced use of 25% RPET by 2013.

● Supermarket chain Tesco, UK is using 100% RPET bottles in their own brands.

● Reliance Industries Limited already started it's Bottle to Bottle (B2B) recycling plant at Nagothane, Maharashtra, facility, & has capacity of about 10000 tones per annum.

Abstract

Polyethylene Terephthalate (PET) is the material of choice today for most of the food packaging applications, mainly because of the certain inherent advantages associated with it. The major advantages over the other conventional materials are transparency and ease of fabrication and recycling. In spite of being approved by various agencies such as United States Food & Drug Administration (USFDA), European Union etc. for it's suitability for the indirect food contact applications and also having seen significant growth in consumption year after year, certain apprehensions are being raised every now and then about usage of PET and it's suitability. An attempt is made in this article to clarify the apprehensions based on the facts and reinforce suitability of the PET material for the intended food packaging applications.

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8. www.earth911.org6.
9. www.napcore.com

Source : IPI Journal

A formula for efficient production

In moulding shops which require frequent changing of moulds, there are several issues pertaining to cost, time and energy efficiency that need to be addressed. Today, there are many means to achieve reduction in time losses to manageable levels. This article takes a closer look at solutions that vary from simple logical measures that can be taken in most moulding shops to advanced solutions that help manage large mould programmes.

Generally, there are two types of moulding shops that pose interesting questions in mould management. The first type includes those which have long runs of production with every mould requiring almost no change and very little management of moulds on the shelves. Typical examples of this include packaging moulds for producing large quantities for the Fast Moving Consumer Goods (FMCG) and medical sectors. In some cases, the mould might be welded to the machine. Moulds for such shops can be managed with simple systems.

The second type includes those that require regular to very frequent mould changes. Requirements which increasingly face injection moulding companies include small series, different product versions, just in-time production and delivery. A typical example is that of a moulding shop for automotive parts.

The need for mould management

In the case where moulds require frequent changes of

models or variations – for instance the automotive industry – machines require myriad of parts with short batches. This results in frequent changeover procedures, when machines stand idle and fail to return profits, even though they continue to consume energy.

The cost implication of this is not significant while dealing with low end parts and machines. However, for machines with high clamping forces (with expensive moulds) or with advanced technology machines, these changeovers may add up to significant costs. Most companies look at the substantial number of machine hours lost, but fail to calculate the time lost for the mould costs and all the auxiliary equipment costs, all of which remain idle while changing moulds. Together, these could add up to big figures. One way to overcome the higher set-up times for every mould could be to produce larger quantities to improve machine utilization, but this would add to inventory carrying costs.

The first step to good management of moulds and changes is to standardize a few Parameters. This can lead to substantial time savings. A mould change typically has two parts to its management :

- Supply lines like water, oil, air, vacuum, electric supply
- The actual mould change

Managing Supply lines

The most common supply line to a mould is the mould temperature controller. As the demand for technical parts is increasing, this is being

increasingly deployed. In high speed mouldings (like packaging, PET) these supply lines could be typically cold water from chillers. In case the moulds have hydraulic or pneumatic lines for core pulls, and additional equipment like auto closures etc, then the need for quick connections also goes up.

A Simple way to manage fast changes is to use individual colour coded quick release couplings, preferably with non-spill shut off mechanism. Many productions shops have already adopted such practices. The next logical step is to fix good quality manifolds to the machine by the side of the machine. Certain manifolds also facilitate the connecting of all lines in one go. The basic requirement for this is to make the number of lines standard for a particular size of machines. This allows all the water/ oil lines used for mould temperature controllers to be connected in one go.

It is also possible to have complex manifold systems combining the temperature lines with pressure lines, pneumatic lines, vacuum and even electric connectors. However, in this case the planning must be really foresighted and should take the entire mould programme into consideration.

Speeding-up mould change

A frequently asked question among moulders is: How can the mould changes on injection moulding machines be performed economically, ergonomically, flexibly and safely? With large moulds, it is almost certain that

they will be changed vertically with the help of cranes. Only with extreme automation are large moulds changed horizontally.

However, a large number of moulders need to change moulds horizontally and many of them do not have overhead cranes. In such cases, the solution lies in perfect preparation while the previous job is still running. This is of crucial importance for a fast changeover. Checklists help ensure that nothing (for example the appropriate hoses) has been missed out. A well-organised cart with all the required tools and bolts should be available prior to every set-up. This means that everything is in place as soon as the machine stops. Nothing needs to be searched for or fetched, thus eliminating any possibility of time wastage.

A standardized clamping system should be chosen while designing the tools. It is important that the back plates are of same size when the moulds are mounted directly. This allows the use of same bolts and their position throughout. Work can be made even easier by using clamping elements that remain attached to the machine and that can be used flexibly for other moulds. If a large number of in-house moulds are used, it is advisable to standardize the clamping platens. There are simple mechanical rapid clamping systems available which can be left in place on the platens permanently. With such help, moulds can be changed in just a few minutes.

Types of mould change systems

There are several ways to quickly clamp the mould to the machine platens. The simplest is

to use quick clamping elements that are placed permanently on the machine platen in fixed positions. Other basic types of rapid clamping systems in the market include mechanical, hydraulic and magnetic mould change systems.

Mechanical Mould Change Systems

Mechanical systems always use some kind of mechanical interlocking between the machine platen and the mould back plate, without having to physically turn bolts on individual clamps.

In this type of system, there exist two bayonet plates fixed to both the machine platens. Each mould is fixed with a clamping ring on each side.

Their interlocking clamping rings swivel in the bayonet plate when the handle is moved, locking the two halves of the clamping ring and providing a strong bond between the mould & the machine.

In these systems, there is loss in daylight of the machine to accommodate the bayonet plates. In addition, every mould has to be modified with counter bores and tapped holes to fit the clamping rings. Moreover, if it is a custom moulding shop with the moulds provided by the customer, then it is not a practical proposition to implement. In addition, the machine nozzle tip and the ejectors have to be extended to pass through the bayonet plates. And if there are multiple ejectors then it poses more challenges. These are relatively inexpensive to install for a small number of moulds is large, because clamping rings are needed for every mould.

Hydraulic mould change systems

The hydraulic clamping systems use multiple hydraulic elements fixed to both sides of the machine platen. Since they are clamped at fixed positions, the mould back plates have to be necessarily of standard dimensions to fit the clamping elements' positions. The big advantage of this system is that it is relatively well priced, needs no modification of the machine and is easy to implement. For custom moulders, the only hurdle could be to have standard size back plates. These systems can be used for horizontal or vertical loading systems.

Magnetic mould change systems

One of the most interesting mould change systems is a magnetic system. This is a most expensive solution but also allows a lot of flexibility. However, there are several myths surrounding these systems.

Contrary to popular belief, these are totally fail safe systems. In case of a power failure, the moulds will not fall down. The magnetism is permanent in nature and to open the clamp, the poles have to be reversed with power. Currently, magnetic systems are being supplied for large clamping force machines up to 4,000 T. The larger the machines, the larger will be the number of poles.

Further, the magnet plates need to be fixed to the machine platens, resulting in loss of daylight. The nozzle tip and the ejectors have to be extended to go through the magnet plates. Multiple ejectors can be

accommodated, but the ejector positions cannot be changed subsequently. Additionally, the magnetic systems do cost significantly more than the hydraulic systems

One of the most interesting mould change systems is a magnetic system. This is the most expensive solution but also allows a lot of flexibility

The alternative 'vehicle'

Another solution for mould changing without overhead or slinging cranes could be a simple mould-changing vehicle for horizontal mould changing. The use of a mould-changing vehicle is appropriate, if no overhead crane or slinging crane is available at the location where the injection moulding machine has to be installed. This system is based on an electric forklift, which is capable of precise manoeuvring and positioning mainly due to its

electric steering. Its lifting unit also makes mould changing possible on machines of different sizes. At the same time, the moulds can be put into storage on vertically-arranged shelves. For this purpose, electronics provide for smooth and precise lifting and lowering movements. Both roller conveyors are equipped with guide strips, in order to laterally align and secure the mould on the roller conveyor during the transfer. The moulds are prevented from falling during transport by means of a front locking mechanism.

A swivel device allows the roller conveyors to be moved into the required position for the transfer, which facilitates manoeuvring of the mould-changing vehicle. Thus, mould changing is also possible in the most confined of spaces and is, in addition, faster, safer and more efficient. Conversions to the injection moulding machines for improvement of access are also necessary.

The roller conveyors are additionally equipped with a

laser Pointer for the purpose of horizontal positioning. When the correct transfer height is reached, this can be easily read off by means of suitable markings on the injection moulding machines or on the mould shelves.

Potential for process optimisation

Further measures aimed at reducing set-up times include the use of a pre-heating station for moulds and the provision of several cylinder modules. The advantage of the latter when changing colours to a completely transparent material is that it eliminates the cleaning process which might be very time-consuming. There still exists a lot of untapped potential for optimizing the set-up process in many injection moulding shops. Besides, set-up time reductions of up to 50 per cent are not unusual, if careful planning and thought is applied to all aspects of the mould and machine.

Source : *Plastics News*

PET firms reject French study on wine bottles

There are few industries as steeped in tradition as wine production, where change does not happen fast. But even in this most conservative sector some companies are looking at alternative and more sustainable packaging options. Top of the list is replacing the traditional glass bottle with lighter alternatives that reduce energy use and carbon emissions.

Producers such as Wrexham, Wales-based Artenius PET Packaging Europe and the Ball Corp. – now part of Amcor – claim their barrier PET bottles deliver all the shelf life required for everyday wines. And a PET wine bottle weighs just 50 grams, while the latest 'lightweight' glass design from Owens-Illinois weighs 328 grams.

Earlier this year, UK retailer Marks & Spencer announced it was to convert 100 percent of its single-serve wine bottles to multilayer PET. However, the Marks & Spencer announcement coincided with a study, from the Bordeaux, France-based Institute of Vine and Wine Sciences (ISVV), which said wine packaged in multilayer PET exhibits a noticeable reduction in quality within just six months.

The ongoing study is being run by the ISVV vice principal Martine Pietton-Peuchot together with senior lecturer Rémy Ghidossi. It uses gas analysis, color analysis and tasting panels to determine the quality of red and white wines packaged in a variety of formats, including 3-liter bag-in-box, 25 and 75cl monolayer PET bottles with screw cap, 25 and 75cl multilayer PET bottles with screw caps, and 25 and 75cl glass bottles with screw caps. The study does not include glass bottles with either natural or synthetic cork closures.

In its preliminary findings, ISVV says white wines packaged in the single and multi-layer PET bottles were "clearly oxidised" after six months, while the glass packaged wines were described as "stable". This was reportedly confirmed by both expert and novice tasting panels. For red wines, ISVV said it found "initial signs" of deterioration in the PET and bag-in-box packs but there was not enough evidence to draw a definite conclusion.

The published results include no details about the types of bottles used or the packaging conditions and Ghidossi refused to provide further information to European Plastics News prior to publication of the full study later this year. This refusal to put information in the public domain has been criticized by Cor Jansen, R&D Director of Artenius PET Packaging Europe.

"I find it very unprofessional to publish interim results, which are clearly up for debate, while the researchers are not available for a professional discussion and peer review," he told European Plastics News. "We have questions about the bottles used, the barrier technology, filling methods, empty bottle treatment prior to filling, head space volume and variation, exact closures and test protocols."

Jansen said Artenius, which expects to supply around 8m barrier PET bottles for wine packaging this year, has completed its own studies

on red and white wines packaged in its BindOx and MonoBlox barrier bottles. Professional taste panels can detect no difference compared to wine packaged in glass after one year, he said.

Jansen's doubts over the findings are supported by Marks & Spencer, which spent two years evaluating the performance of the barrier PET packaged wines it buys from specialist French wine negociant Paul Sapin via its UK partner Roger Harris Wines.

"We went through extensive testing and the results were very positive. We are absolutely confident that the plastics packaged wine is as good as that packed in glass," said a spokesman for the retailer.

Paul Sapin claims the MLP 75cl wine bottle – which has an Artenius BindOx active scavenger multi layer PET bottle and PE capsule closure from Novemba – has a two year minimum shelf life. Last year, Paul Sapin sold around 4m 75cl PET bottles and 8m single-serve sizes, including more than 1m to the Systembolaget alcohol retail monopoly in Sweden.

Source : Plastics News

"Thermoforming is gaining entry into automotive and infrastructure sectors"

Current Scenario in the global and Indian thermoforming industry....

The thermoforming industry, which is commonly known to cater to the food packaging and processing industry, has spread its wings to many other sectors with a new application hitting the market almost every day. Sectors like automotive and infrastructure are increasingly witnessing innovations in thermoforming. The developed world has already witnessed the application of technology in many different sectors and India is gradually catching up with this trend. Currently, the thermoforming industry in India is concentrated in the semi-organized large players to penetrate into other segments.

The plastics industry is moving towards an era of sustainability with reduced consumption of material and energy. In line with this, extra thin-walled containers for food processing products is the latest trend in thermoforming. Wherever thick-walled containers are mandatory, there is a greater tendency towards using composites.

Recent Trends in the Indian thermoforming industry with respect to choices of machinery....

Today, thermoforming machines are available with a myriad of options & capabilities and this allows thermoformers to focus on features that are specific to their product requirements. This helps them to be more competitive in the market. Due to this new emerging trend, they are shying away from all-purpose machines and focusing on machines specific to their needs.

Thermoforming has benefited from applications of engineering technology, although the basic forming process remains the same. Microprocessor and computer controls on modern machinery allow greatly increased process control and repeatability of the same job set-ups from one production run to the next, thus enabling savings on process timing settings between jobs. The ability to place formed sheet into an inline trim station for more precise trim registration has been hugely improved due to the common use of electric servomotors for chain indexing versus air cylinders, gear racks and clutches on older machines.

Electric servomotors are also used on sophisticated machines for actuation of the machine platens where form and trim tooling are mounted, rather than air cylinders which have traditionally been the industry standard, giving more precise control over closing and opening speeds and timing of the tooling. Infrared ceramic/ quartz

and radiant-panel oven heaters generally provide more precise and thorough sheet heating over older cal-rod type heaters and allow better zoning of ovens into areas of adjustable heat.

Of late, machinery manufacturers have made great technological strides in terms of speed and automation. Machines with considerably low cycle times and higher machine speeds are available in the market and with these, manufacturers are at the forefront of bringing automation to the shop floor.

Thick gauge versus thin gauge thermoformed products....

The thin gauge thermoformed products are in vogue around the globe. In India, 90 per cent of the market is concentrated on thin gauge products, which mainly comprise cups and trays for food packaging. Thin-gauge thermoformed products are flexible & compact and the materials generally used are PP, PS, PET and EPS.

Thick-gauge thermoforming on the other hand creates sturdy, rigid enclosures for enclosing products like critical electronic equipment, automotive parts, etc. Materials used in thick-gauge thermoforming include flame-retardant ABS, polycarbonate, and PC-ABS blend. Awareness – a requirement of initial capex and proper cutting systems are acting

as a deterrent for the growth of the thick-gauge market in India.

On energy efficiency and sustainability....

There is a lot of focus on energy efficiency in the plastics machinery sector and the extrusion industry is no exception. Machines today have been designed to offer more output, thereby automatically bringing down energy and material consumption per kg.

For example, thermoforming machines of a particular size and weight that had cycle frequencies of about 25 cycle per minute five years ago, now have reduced cycle times and give cycle frequencies of up to 45 – 55 cycle per minute. Hence, if the cost of power for heater bank, electric motors or any other prime mover is considered, the cost per kg comes down significantly due to reduced cycle times.

Another aspect of energy efficiency is focused on resource consumption. The trend towards extra thin-walled thermoformed products clearly point reduced plastic consumption. However, this has an upper limit as extra thin-walled containers are difficult to recycle and even pose a stacking problem.

Wonderpack's growth strategies for the years to come....

The overall thermoforming market in India is growing at the rate of 1.5-2 times of the growth rate of GDP. The demand for thermoforming machinery is cyclical, ie, it follows a similar

pattern on a yearly basis. The demand for thermoformed cups, glasses and trays shoots up during the festive season and this cyclical nature is strongly correlated with the demand for machinery. Wonderpack is highly committed to tapping the high growth rate of the market and we believe that our strategy of creating value through innovation will help us maintain a leadership position in this market.

Your vision of this industry in India.....

As mentioned earlier, there is lot of scope for Indian thermoformers to penetrate sectors like automobile and infrastructure. In the developed world, products like water drainage sheets have created

ripples in the construction sector, due to their unique application for water management.

However, this would require a change in the traditional mindset. Indian thermoformers are the trendsetters in thinwall tea / coffee / beverage container and do not wish to deviate from this high-growth segment. They should be educated & motivated for catering to the high-value and high-margin thick gauge segment & packing sector.

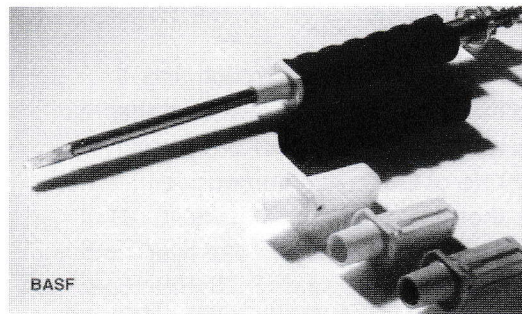
Apart from penetrating these virgin markets, the future of thermoforming lies in developing innovative products like thermoformed bottles and typically replacing injection moulded thin-walled products & flexible packaging replacement with thermoformed packaging.

Source : Plastics News

SYNTHETIC SURGERY

Sophisticated polymers for the improvement of operating procedures

Operation under control
A new operating procedure developed by Resoimplant will be able to simplify treatment of torn cruciate ligaments. The concept that the company is currently introducing to clinics with great success simplifies securing a cruciate ligament implant in the bone of the knee in an unusual manner: it employs an anchor made from a bioabsorbable material. A few months after the operation, it is resorbed, and the new cruciate ligament - usually a tendon taken from the thigh - is firmly attached. Previous operating procedures used metal screws to affix the tendon. These had to be removed again after the healing process was complete - posing the risk that the newly attached tendon might be damaged. The new procedure eliminates the need for the second operation. The screwdriver is replaced by a disposable applicator called Resofix Plus that helps to guide the critical anchor through the operating channel and expands it in the bone. The designers use the Ultraform PRO resin - a semi-crystalline POM copolymer from Basf - at two locations in the handle area: in the blue handle itself as well as at the tip of the handle,



the color of which allows the individual performing the operation to readily identify the applicator version. The primary characteristics of the material are very good strength, rigidity and dimensional stability in particular, since when introducing the anchor considerable force must be exerted; in certain circumstances, the physician may even reach for a hammer. Even a clip at the end of the applicator not facing the patient that is removed immediately prior to insertion of the anchor is made from Ultraform. This is where very good resilience was called for in the material and which makes this plastic ideal for use in spring elements. It ensures that the clip is held securely and can be withdrawn without complications at the critical moment.

www.plasticsportal.eu

Quality implants

Implants for the human body place heavy demands on the material used. They must, after all, be well tolerated and last a lifetime, which is why metals - titanium and cobalt-chromium - have so far been the number one choice, but a high-performance plastics such as PEEK Vestakeep from Evonik are gaining ground.

For example, when neither back exercises, nor massage, nor drugs could help her anymore, Wilma Wirbel decided reluctantly to speak to her orthopedist about a surgical solution. For a long time she had been suffering from a slipped disk in the neck region, which considerably restricted her movement and caused severe pain. Now a millimetre-sized piece of plastic sits between two of her cervical vertebrae.

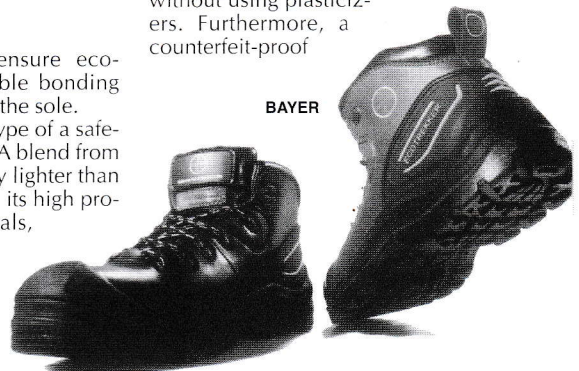
It has not really been possible so far to perform surgery with the aid of computer tomography or magnetic resonance imaging, or to monitor the healing process and check the result. Metals, because of their density, are opaque to x-rays. This gets in the way of a complete and reliable analysis of the image. High-performance plastics, on the other hand, are x-ray transparent and therefore invisible, allowing good monitoring of bone

Green shoes

A unique concept for a "green shoe" - developed by Bayer MaterialScience in close collaboration with the Simple Factory Group - uses a whole host of sustainable materials which include renewable polyurethane feedstocks, solvent-free coatings and adhesives, and a polycarbonate blend and thermoplastic polyurethane (TPU) based on renewable resources. Up to 90% of all components in the Ecotrekker concept shoe can be given eco-friendly properties by using the company's products. The proportion of renewable raw materials in microcellular polyurethane elastomer systems for outer soles and midsoles alone, is as high as 70%, and up to 40% in the polycarbonate blend used. While shoe soles depend on PUR systems having good processing characteristics and a range of properties typical of systems commonly found on the market, abrasion and wear resistance and high flexibility play a key role in water-based coatings with Impranol. Adhesives based on aqueous Dispercoll U

polyurethane raw materials ensure eco-friendly, long-lasting and flexible bonding between the upper material and the sole. The shoe cap used in this prototype of a safety shoe and made from a PC+PLA blend from the Makroblend range is not only lighter than the conventional steel cap. With its high proportion of biobased raw materials, this material with modified impact resistance is also more environmentally friendly and remains recyclable. Desmopan TPU products based on a high proportion of renewable raw materials have been used for the heel counter, shoelace eyelets and, not least, the manufacturer's logo on the sole. Due to its outstanding mechanical properties, the highly abrasion- and wear-resistant bio-based TPU can of course also be used for traditional shoe components such as outsoles or decorative upper parts. TPU films from the Dureflex range LLC form

a vapor-permeable membrane to reinforce the inner sole, without using plasticizers. Furthermore, a counterfeit-proof



label based on a high-quality polycarbonate film from the Makrofol ID range is used for the limited edition of the concept shoe. The inscription is carried out using high-contrast laser engraving. In addition, different security features like holograms can be incorporated.

www.bayermaterialscience.com
Source : Macplas Journal

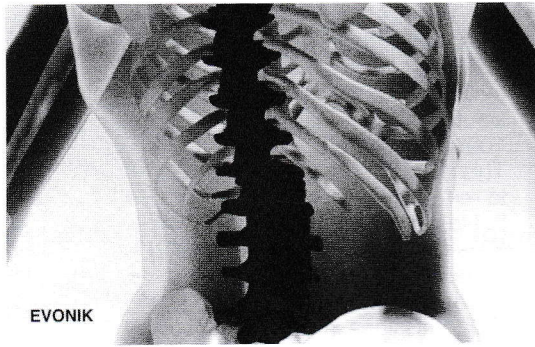
growth and the healing process. Another disadvantage of metals is their high rigidity, which is significantly above that of bone material. This means that the implant takes a large part of the mechanical load, while the bone is shielded from stress. This stress-shielding effect can have wide-ranging consequences. Because bones need mechanical stress both to regenerate themselves in the healing process and to retain their strength over the long term, healing can be protracted and the bone that is shielded from stress may even degenerate in the course of the years.

High-performance plastics, by contrast, have higher elasticity, lying in the range of that of bone material. For Wilma Wirbel this means that the load on her cervical vertebrae is not entirely relieved by the implant and so the vertebrae will retain their strength over many years.

In addition to mechanical properties and x-ray transparency, the excellent sterilizability and biocompatibility of PEEK are major advantages, for example, in spinal implants, orthopedic implants, dental implants, and trauma surgery, in which fractures are set or bone fragments replaced.

Biocompatibility is the crucial factor determining the basic suitability of a material for implants: the material must not be cytotoxic, mutagenic, or carcinogenic, and must have no allergenic properties.

www.evonik.com



Prosthetic fingers

When Matthew Mikosz, president of Partial Hand Solutions, saw the number of soldiers returning home with hand and finger injuries, he decided to develop prosthetic fingers that would feel and operate as naturally as possible for the recipient. The prototype for the M-Fingers device was built with material development assistance from custom compounder RTP Company. Moulding of components was performed by Vanguard Plastics (Connecticut). The M-Finger design uses an RTP 2300 Series glass-filled rigid thermoplastic polyurethane for the inner structure of the fingers and multi-position thumb. These are then overmoulded

with an RTP 1200 Series thermoplastic polyurethane elastomer. The latter provides each finger with dexterity to independently and gently conform to whatever it grasps, while the rigid polyurethane material provides the product with excellent strength and dimensional stability.

The mechanical fingers are actuated by wrist flexions and include moulded-in fingernails for picking up small objects such as coins. With so many M-Fingers being used by soldiers in rehabilitation, it was very important that their materials provide both structural stability and, at the same time, the ability to move and operate the prosthesis smoothly.

www.rtpcompany.com



Reinforced glass

Metal replacement continues to be a key theme in many industries as a contribution to reducing weight, CO₂ emissions and cost. Glass fibre reinforced thermoplastic composites have risen to the challenge to meet these demands while at the same time continuing to extend the boundaries of mechanical performance, long term durability and surface appearance.

As the gap between composites and metals gets closer, more industries and applications are benefiting from the advantages of low weight, design flexibility, corrosion resistance, colour and surface appearance.

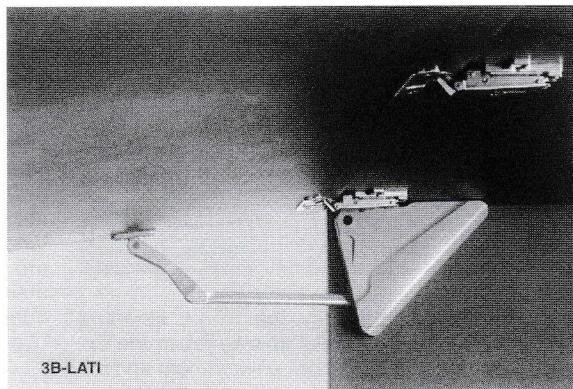
With the objective to deliver superior performance on these attributes as well as enabling opportunities on the aesthetic front, 3B-The Fibreglass Company and Lati have combined two worlds of expertise to develop a 50 and 60% glass fibre reinforced PA

66 identified as Latigloss 66H2 G50&60. In order to meet the product needs, 3B has developed a chopped strand made from Advantex glass with a unique, optimum fibre/matrix interaction. The product not only delivers outstanding mechanical perform-

ance in the form of stiffness in PA66, but also has excellent wettability which allows a very homogeneous dispersion at high glass fibre loadings of up to 60%.

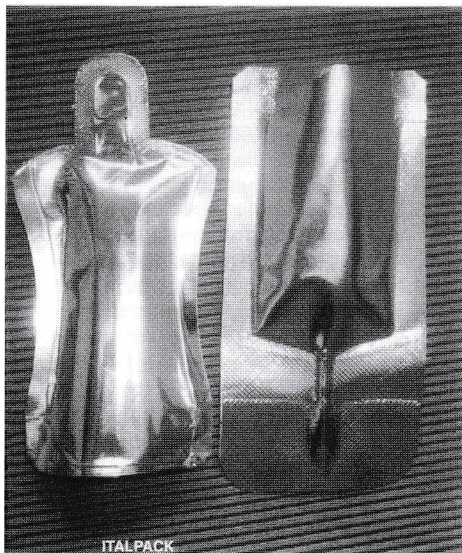
Latigloss is a tailor-made polyamide based and glass-reinforced compound. This innovative formulation has been successfully used to replace cast metal in many different structural applications, e.g. the vertical opening door hinges for high-end kitchen furniture.

To meet the demanding challenges of this very sophisticated system, Lati worked closely with the design group Effegi Brevetti, in order to optimize the geometry of the individual components that are tailored to the capabilities and benefits of reinforced PA. This resulted in a complete re-engineering of the hinge system based on finite element analysis, leading to an overall improvement of the geometry of the different parts.



www.3b-fibreglass.com

Source : Macplas Journal



ITALPACK

The second recipient in this category was Emulsio il Salvambiente, a product by Sutter, for which the solution chosen was a 100%-soluble refill. This makes it possible to re-use the original bottle, producing an 80% saving on materials, to the benefit of energy consumption, CO₂ emissions, and reductions in the volume of used packaging to be sent for disposal or recycling. Last but not least, the system offers monetary savings for consumers.

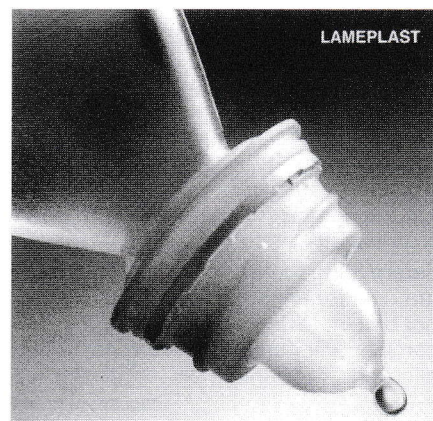


FINPAC ITALIA

It enables the liquid contained to be drunk immediately using the straw and exerting a light pressure on the container. In addition, it can be frozen to make ice lollies in which the straw becomes the stick. Sleeve Pack is a sort of pre-pierced plastic sleeve that can be used to make both a multi-pack containing up to 4 bottles for dairy products or soft drinks, plus the respective labels. Once the pack is opened, consumer information and brand decoration remain affixed to the bottle. This system reduces the amounts of plastic and adhesive used.

In the special section, prizes were awarded to Giochino by Lameplast (Technology category), Duo by Italpack (Quality Design) and Sleeve Pack by Finpac Italia (Communications). Giochino is a medical device used to administer sterile liquid solutions. It is made using plastics suitable for contact with products for ophthalmic and parenteral use. The bottle is made by means of injection blow moulding, and its shape is perfect, above all in the areas where it connects with the liquid supply components. Duo is a container for liquids fitted with a robust polypropylene straw incorporated in the pack. As the name suggests, it can be used in two ways.

www.istitutoimballaggio.it

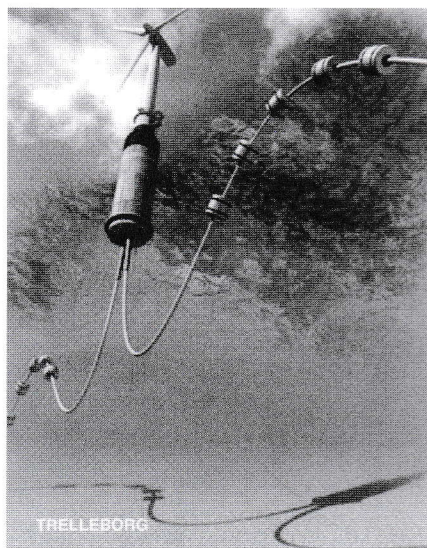


LAMEPLAST

per year respectively. This represents, in the first example (Snack) a reduction of 12% both in energy consumption and carbon dioxide emissions, and in the second example (Tubo) reductions of 52% and 60%. Two joint awards were made in the Eco-compatible Packaging section (Domestic Hygiene category). The first was for Henkel, for a design of household cleaning products that is based on bottles made using up to 25% of recycled PET, with no reduction in the quality of packaging. Over a year, this generates a saving of 885 tons of material, equivalent to over 27 million 1.5-litre mineral water bottles.

Offshore power

Statoil's innovative offshore floating Hywind wind turbine demonstrates how Trelleborg's syntactic foam buoyancy technology is contributing to the future of offshore power. Distributed Buoyancy Modules (DBMs) developed for deep-water support of umbilicals and risers in the oil and gas industry are ideal for this application; helping reduce project risk by using proven technology. People see the tower and turbine, but forget that the expertise in designing the subsea portion is also critical, as ultimately it keeps the whole turbine afloat. The dynamic floating structure weighs 5,300 tons and is 165-m tall; with a total of 65 m above sea surface. The 13 km of power offtake and communications cabling attached to the structure further adds to its weight. It is like the proverbial iceberg: the mass floating below the surface ensures stability. Unless the weight is supported by properly



TRELLEBORG

designed buoyancy the whole structure would be much less able to resist the extremes of the offshore environment and the cable could suffer premature damage.

For this application Trelleborg Offshore designed and supplied 45 off polymer-coated syntactic foam DBMs which supply buoyancy support for a 3-ton, 100-m section of cable as it exits the turbine spar and descends to the sea bed at -220 metres. The buoyancy modules include an internal clamp for secure fastening and precise positioning on the cable. The cable is supported mid-water in what is known as a "lazy wave" configuration, featuring gentle long radius curves that minimise stress on the cable while accommodating natural movement created by wind and waves. For optimum buoyancy under different sea conditions, the precise position of the buoyancy modules on the cable is pre-calculated. The positions must be maintained, despite stresses during launch and in operation. The clamp is crucial; the design, material selection and manufacturing technique are critical in ensuring the finished clamp maintains the buoyancy module position, during cable contraction and expansion, over the 20 year lifetime of the project.

www.trelleborg.com
Source : Macplas Journal

MONTHLY CIRCULAR OF THE FEDERATION

CIRCULAR NO. 39/2011 :

Sub: Membership of the Federation

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

1. a) Name & Address of the Applicant Firm : **M/S ADVENTEC POLYMERS PVT. LTD.**
40, Strand Road, 3rd Floor, Room - 9
Kolkata - 700 001
- b) Class of membership : **Manufacturer member**
- c) Proposed by : M/s Ori-Plast Ltd.
- d) Seconded by : M/s Stretch Plast
- e) Name of representative : Mr. Ashish Agarwal
- f) Items of manufacture : Manufacturer of PVC, HDPE pipes & fittings

2. a) Name & Address of the Applicant Firm : **M/S PARAM POLYMERS PVT. LTD.**
40, Strand Road, 3rd Floor, Room - 9
Kolkata - 700 001
- b) Class of membership : **Manufacturer member**
- c) Proposed by : M/s Rajda Sales (Cal) Pvt. Ltd.
- d) Seconded by : M/s Stretch Plast
- e) Name of representative : Mr. Ashish Agarwal
- f) Items of manufacture : Manufacturer of (i) PVC pipes & fittings
(ii) CPVC Pipes and Fittings (III) Water Storage
Tank.

3. a) Name & Address of the Applicant Firm : **M/S SANDIPAN POLY PACK**
118A, Chittaranjan Avenue
Kolkata - 700 073.
- b) Class of membership : **Life Manufacturer member**
- c) Proposed by : M/s PBS Packaging Pvt. Ltd.
- d) Seconded by : M/s Sanchar Polytubes
- e) Name of representatives : 1) Mr. Manoj Kr. Jalan
2) Mr. Sanjay Kr Jalan
3) Mr. Sandeep Jalan
- f) Items of manufacture : Manufacturer of Lay Flat Tubes.

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

CIRCULAR NO. 40/2011 :**Sub: Consumer Price Index Number for Industrial Workers
for Kolkata for the months of January to December 2010**

M o n t h	Consumer Price Index	
	Base (1982 = 100)	Base (1960 = 100)
January, 2010	855	4053
February, 2010	850	4029
March, 2010	850	4029
April, 2010	860	4076
May, 2010	870	4124
June, 2010	881	4176
July, 2010	896	4247
August, 2010	896	4247
September, 2010	901	4271
October, 2010	906	4294
November, 2010	906	4294
December, 2010	922	4370

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- BLADE SHARPENERS
- AGGLOMERATORS
- MEDIUM SPEED GRANULATOR

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


Scrap Granulator


Lump Cutter


Dry Blending Machine Conical


Mini Granulator


Vertical Dry Blending Mixture

Mfg. by
PIECO Pioneer Engineering Corporation

Regd. Office : 218, Veena Dalvai Industrial Estate, Oshiwara, S.V. Road,
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