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PLASTICS INDIA

AN OFFICIAL ORGAN OF INDIAN PLASTICS FEDERATION

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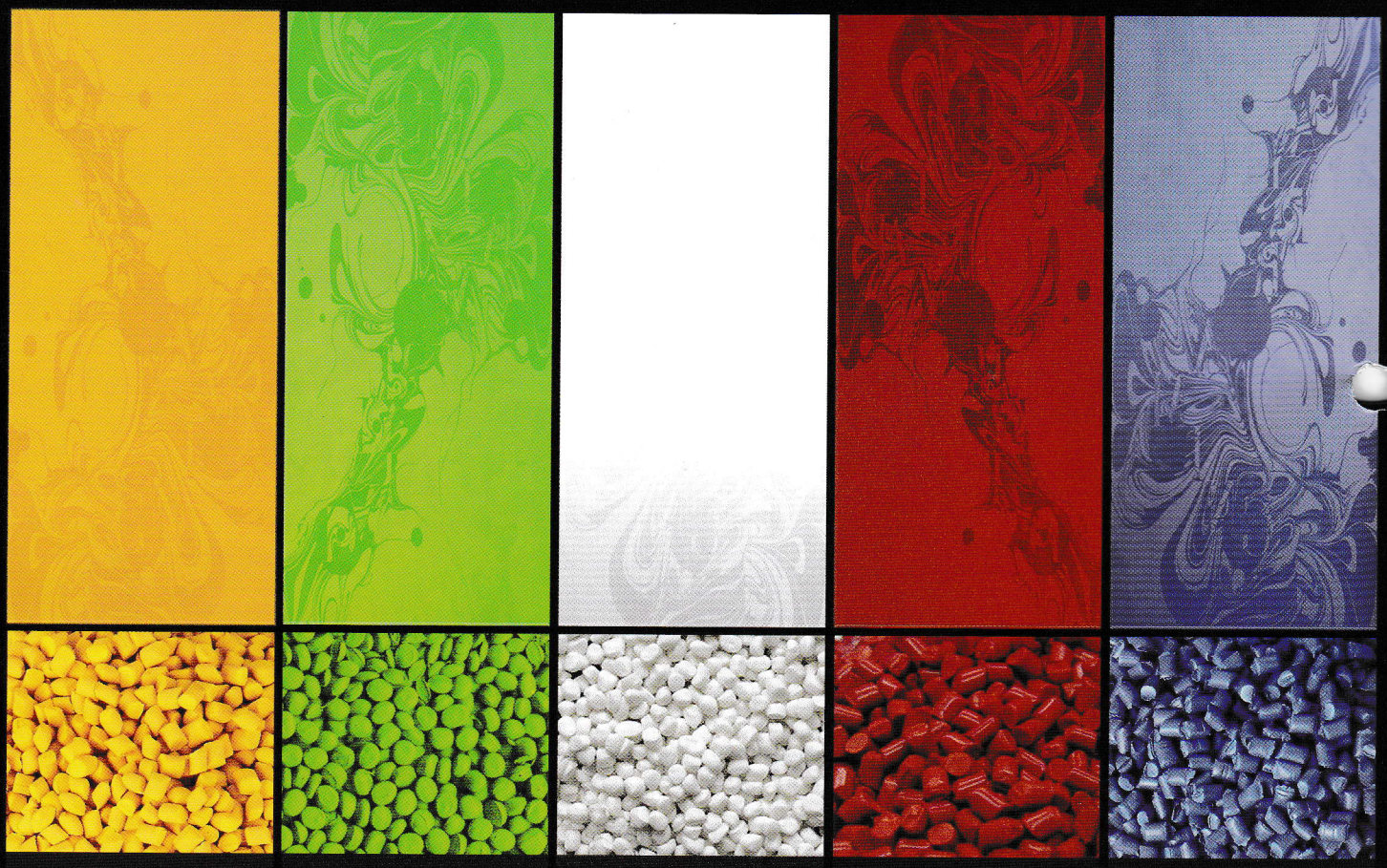
SHRACHI RENU POLYMER

SHRACHI



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PLASTICS INDIA

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

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Editorial

Dear Members,

Good day !

The much awaited Plastindia 2012 exhibition concluded on 6th February 2012. The members who participated in the show are back in Kolkata with their exhibits when this issue reaches on their tables. The show which happens every three years and held its latest edition February 1 – 6th at Pragati Maidan, New Delhi was a grand success. Compared to last edition with over 1500 exhibitors and over 77000 sq mts area, this year it was 1700 exhibitors and over 1.07 million sq ft of exhibition space making it the third largest plastics show in the world.

The Indian Plastics Industry has been growing at a rate of 12% over the years and with its true potential harnessed, it is all set to reach the 12.5 MMT by consumption making India the 3rd largest consumer of plastics by 2012. India has made considerable progress, in the last ten years, in attracting private investment into the infrastructure sectors in telecommunication, ports, roads, power etc. The sector is estimated to grow at the rate of 10 % over the next few years. This sector offers tremendous opportunity for consumption of plastics.

The enormous scope for expansion and development in the Indian Plastics Industry was witnessed during Plastindia 2012, where there was global recognition that India is the destination for the future of global plastics industry. The processing industry, in fact, offers a huge potential for upgradation in terms of innovative technological advances.

As far as IPF is concerned its stall was located amongst the founder members of Plastindia Foundation. IPF has got an opportunity to conduct its all India Launch Function of Indplas'12 – 6th International Exhibition on Plastics at Pragati maidan during Plastindia 12 exhibition on 3rd February 2012. Over 175 persons, mostly from the exhibitors participated in the launch function. IPF distributed calendar, Indplas 12 promotional CD, amongst the exhibitors and those present at Launch function. In the launch function Mr. Rajesh Mohta, President, IPF welcomed the participants and spoke on the history of Federation in promoting the plastics industry in India. Shri Amar Seth, Chairmen of Indplas'12 Exhibition organizing Committee and IPF Knowledge Centre highlighted on the noble objectives for holding Indplas'12 exhibition. Shri Ashok Goel , President – Plastindia Foundation was the Guest of Honour and Shri S.C. Meshram, Executive Director, Petrochemicals, Business Development, Indian Oil Corporation Ltd. was the Chief Guest.

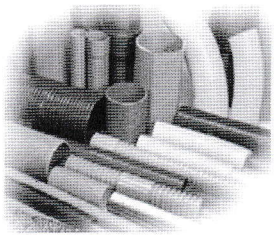
Amongst the stalls - The Theme Pavilion at Plastindia 2012 with the theme **"SAY YES TO PLASTICS"** was a main attraction. The pavilion has been developed around the concept of edutainment to drive home the message **'there is no life without plastics'**.

Plastindia Foundation has signed a deal with the University of Massachusetts-Lowell and the University of Wisconsin to build a university specializing in the study of polymers in India, which is a good news to all those who are in the field of plastics.

We had also the honour of Hon'ble Shri Firhad Hakim, Minister of Urban Development and Municipal Affairs, Government of West Bengal's presence at our stall on the closing day of Exhibition.

Yours truly,

Pradip Nayyar
Editor



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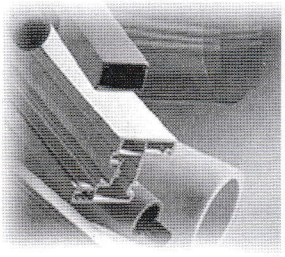
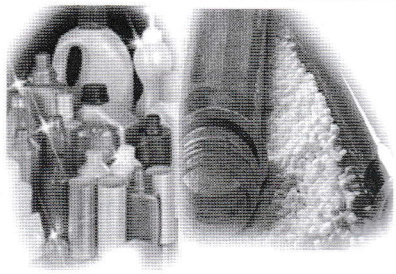
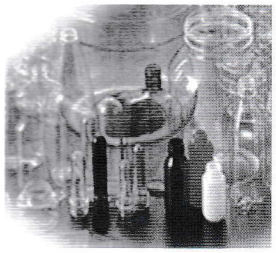
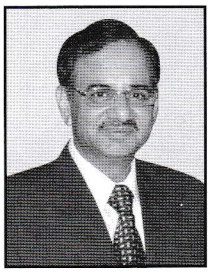






PRESIDENTIAL ADDRESS



Dear Members,

Most of you must have visited Plast India-12 Exhibition at Pragati Maidan, New Delhi. My sincere thanks to the IPF Team which worked in Plast India'12 to make it a grand success. Indian Plastic Federation Team was praised by all present.

The All India launch of INDPLAS-12 was held on 3rd of February 2012 at Pragati Maidan, New Delhi. Mr. S. C. Meshram, Executive Director – Petrochemicals, Business Development, Indian Oil Corporation Ltd. was the Chief Guest and Mr. Ashok Goel, President of Plastindia Foundation was the Guest of Honour. Over 175 persons attended the launch Function mainly representative of various association & exhibitors. Our objective of holding INDPLAS-12 was appreciated by Mr Ashok Goel, President, Plastindia Foundation. Mr. Goel stressed on the need of trained manpower requirement of the industry.

Now the time has come for all of us to get together and work seriously for the success of INDPLAS-12. We must show the world that we in the eastern part of this great country are no less than others.

I hereby call upon all the members to come forward and join hands together to work for our dream project that is the Knowledge Centre.

With warn regards

Rajesh Mohta
President

SECRETARIAL REPORT

Dear Members,

Members may be aware that Indian Plastics Federation (IPF) jointly with Indian Plastics Institute (IPI) Kolkata Chapter organises technical lectures for its members. These lectures are held in the Conference Hall of the Federation. The last lecture was held on 25h January 2012 on "Applications of Polypropylene Geo-Synthetics in India". The speaker is some expert from industry or from the academia. IPF charges no fee from its members for attending these lecture. These lectures are very informative and not only helps in building members knowledge on various facets of plastics but can also open one's eye on new investment opportunities. Since the information for holding these lectures are sent through email, members are requested to kindly keep the IPF Secretariat updated about their email ID so that these mails reach you timely and enable you to participate in the same. I understand all members have not given their up-dated email ID to the Secretariat and hence these members are not able to share in the activities of the Federation that we sincerely desire. We would like to see members participate in these technical lectures in larger numbers.

As informed in my earlier message IPF arranged for issue of multiple entry on-line tickets for PI-12 exhibition and PI-12 Exhibitor's Directory at subsidised rate to its members. 288 members availed the opportunity for entry tickets and 35 members copies of Exhibitor's Directory.

The All India Launch Function of Indplas'12 was held in the auditorium above Hall No. 8 at Pragati Maidan, New Delhi on 3rd February 2012. The Chief Guest in the Launch Function was Mr. S. C. Meshram, Executive Director – Petrochemicals, Business Development, Indian Oil Corp. Ltd. and Mr. Ashok Goel, President – Plastindia Foundation was the Guest of Honour. Over 175 persons mainly exhibitors participated in the launch function. A kit containing indplas'12 brochure, Indplas'12 calendar and January 2012 issue of Plastics India was given to each participant. The launch function was a great success.

Calendars, CD's, Brochure, Leaflet of Indplas'12 were also distributed to each stall in PI-12. One to one meeting was also held with prospective exhibitors for Indplas'12.

A barter deal has been made with Trade India (Infocom Network Limited) for Indplas'12.

Shri Firhad Hakim, Hon'ble Minister of Municipal Affairs and Urban Development, Govt. of West Bengal visited Plastindia exhibition and IPF stall at Pragati Maidan during the exhibition. IPF took a 18 sq. m. stall at PI-12 exhibition. The PI-12 exhibition was taken as an opportunity for promoting Indplas'12. Enquires regarding Indplas'12 exhibition was answered from the stall.

With best wishes,

Pradip Nayar
Hony. Secretary

Pluss Polymers Unveils Technology for Recycling Packaging Laminates Waste

– A step towards sustainable growth

Mr. Nikhil Bansal
Pluss Polymers Pvt. Ltd.
nikhil@pluss.co.in

Recycling of plastics enables sustainability by eliminating the environmental cost of waste disposal. Effective recycling leads to an overall reduction of waste, cost, and energy consumption effectively reducing Green House Gas emissions and an overall low carbon footprint for the industry.

Plastics are indispensable part of the society. Plastics provide Packaging solutions for almost all the applications including medicines, cosmetics, consumable items, beverages, etc. The broad range of applications served by plastics in packaging industry is due to their better strength, durability excellent barrier properties. They also render very high value for money.

Very high applicability and usage of plastics in packaging is also creating a barrier for themselves. Plastics are now depicted as an ineluctable burden on mankind. It poses a deep threat to the environment as Non-biodegradable and highly inert nature which increases concerns of disposal of post-consumer packaging plastics. These are also difficult to recycle. Properties of these plastics deteriorate after recycling.

Post consumer plastics wastes accounts for more than 50% of plastics consumed in India. Very large quantity of these waste end up in landfills. Post-consumer and Industrial PET/PE/PP laminates waste accounts for major share of these wastes.

Packaging Industries cannot sell their in-house laminates waste, because of restrictions by their customers of the printed laminates landing into the hands of unscrupulous dealers. These wastes also cause high cost of incineration and increase Green House Gas emissions.

Disposal of post-consumer and industrial waste laminates is an area of great concern for packaging industries, municipal corporations and several government authorities. Recycling is the best way to fight this problem. But it is difficult to recycle these mixed laminates waste. Recycling of laminates is difficult due to following barriers:

- Compatibilization of PET, PE & PP.
- Presence of Inks in case of printed laminates which may affect properties of recycled compounds.
- Presence of Aluminium in case of metallized laminates.
- Presence of various adhesives for binding different layers in laminates.
- Difficulty in handling of laminates.

These problems of recycling mixed wastes have been the basis for underlying research at Pluss Polymers in association with Manas Research and Technology. A process with the right additives to compatibilise the waste has been developed for conversion of Post-consumer and Industrial PET/PE/PP Waste Laminates to high value products. This technology is delivering a new dimension of capabilities to a wide range of packaging film wastes. The technology facilitates the conversion of unusable waste materials to high value products.

Pluss Polymers has designed the whole process and formulation required for the conversion. The compatibilisers required during recycling process have also been developed. Recycling of Mixed Laminates waste involves the following steps:

- Collection of mixed plastic waste – bags, packaging materials
- Washing and shredding of plastic wastes
- Agglomeration of waste materials
- Conversion into pellets
- Pellets made into a useful new product

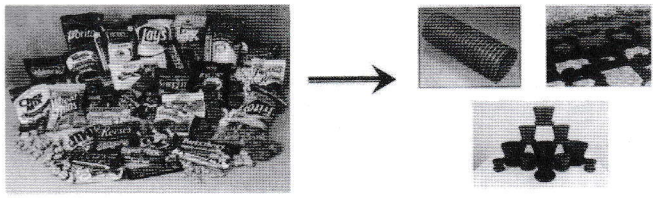
Every step in the whole process is specially designed to meet the requirements of the different materials that may be present in the laminates. A complete system for detection and removal of unwanted material from the post-consumer & industrial laminates waste has been developed.

Various proprietary additives are added to improve the quality of the recycled compounds. The recycled compounds developed from PET/PE/PP waste laminates offer a unique combination of various mechanical properties. These are injection mouldable compounds with good tensile, flexural and impact properties. Properties of these recycled compounds are comparable with engineering plastics like Impact Co-polymers.

These recycled compounds finds wide range of high value applications. Applications areas for these recycled compounds are:

- Outdoor furniture
- Garden pavers
- Brush bristles
- Crate handles

- Shipping pallets
- Electrical products
- Drainage pipe



The specific attributes of different applications can be customized in multiple ways by using different formulations designed by Pluss Polymers. Further, by exhibiting good properties, they offer countless opportunities for innovation.

Pluss Polymers being pioneer in developing innovative solutions to the polymer industries offers complete consultancy of the recycling process - A complete package has been developed for conversion of so-called burden materials to high value products.

It is time the Government Agencies and Plastics Industries join hands to address the issue of waste collection and recycling to tackle the growing menace of plastics waste.

About Manas Research and Technology

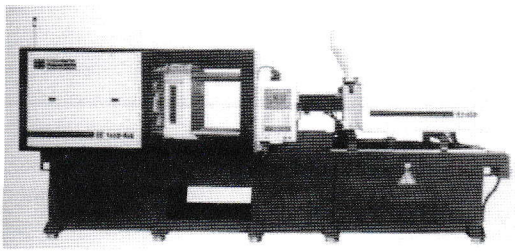
Manas specialize in new product development, troubleshooting in extrusion related process industries, and setting up of Research and Development facilities. Manas has its own laboratory setup to carry out development activities. The company is backed by qualified and practicing plastics technologists.

About Pluss Polymers

Pluss Polymers is an offshoot of Manas, established to develop and market new technologies and products developed in house. Pluss Polymers was incorporated in 1993 to commercialize the technology for grafted modified polymers and alloys and blends. Backed by competent technical staff, laboratory facilities, a good library and technical database with a retrievable wealth of information marketed the OPTIM® brand of grafted polymers for the first time in India in 1996. Since then, Pluss has shown a remarkable growth and developed a brand image among Indian Plastics Industry.

All-Electric - The New Generation of High Performance Injection Molding Machines

All Electric Injection Molding machines are fast replacing conventional hydraulic machines in several applications in health care, medical, electronics, packaging and automotive segments. Due to elimination of hydraulic components and circuits, these machines have higher degree of transmission efficiency and reduced losses. This results in not only savings in energy but also faster cycle times, material savings and lower utility costs.



Why All-Electric Machines?

Fast
Precise
Clean
Quiet
Energy Saving
Eco Friendly
Economical & Profitable

Advanced Controls and Drives

The machines have advanced B&R-Control and Drives, Ball-Screws for linear movements such as Mold movements, Ejector, Injection and Sled. The position control is directly by means of motor axis without the use of external stroke transducers, and ensures reduced scrap and better mold safety. An intelligent combination of Drives and Servo Motors helps in closed-looping of all axes, faster clamp response in terms of acceleration and deceleration. Thus the startup time for achieving a stable process is faster.

Precision - Dynamic -Speed

- Exact - Position Controlled Movements
- No Deviations through Oil Viscosity & Compressibility
- Servo Motors Reach Maximum RPM in 100 milliseconds
- Parallel Movement of all Axes (As Standard Feature)

Constant High Part Quality at Higher Output

Energy Saving

- High Efficiency Factor ($\eta > 0,9$ for Servo Motor + Mechanical Gears)
- No Idle time Power Consumption
- No Cooling Water Required for Machine Cooling

Reduced Energy Costs

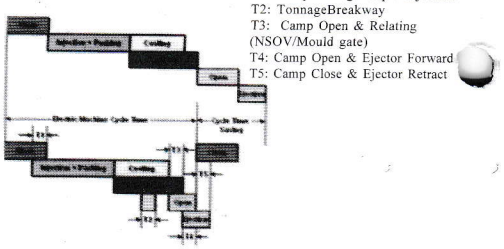
Environment Compatibility

- No Hydraulic Oil
- No Oil Filter Systems - No Disposal of Filter Material
- No Oil Leaks - No Special Protection in Production Area
- Low-level Noise Emission (< 70 db) - lesser operator fatigue

Guarantees a Low Emission Production Environment

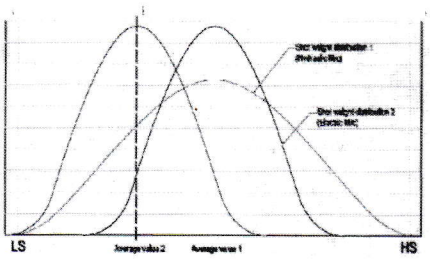
Cycle Time Advantages of Distributed Power

Since each function is driven by individual servo motors in All-Electric machines as compared to a central power pack in hydraulic machines, all functions are independent of each other thus making parallel operations possible. The following sketch shows how cycle times are faster in all electric machines due to faster dry cycle time, parallel ejection during clamp open/close and parallel refilling using a Nozzle shut off valve.



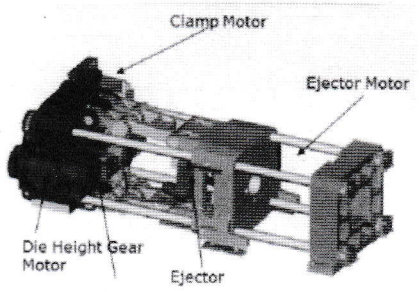
All Electric Machines

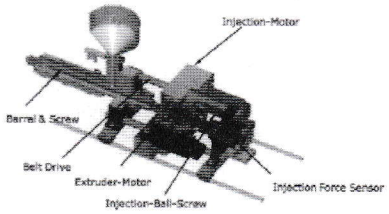
Due to a combination of precision, accuracy and repeatability by using servo motors and ball-screw, the dimensional accuracy and shot-weight consistency in all electric machines is very good. Zero load sensitivity on injection velocity means injection fill time does not change with pressure change. All this helps in reduced tolerances, lesser deviations and a narrow band of shot weight distribution as shown in the following graph:



- Better closed loop control of electro mechanical drives
- Higher precision of the injection stroke
- Less scattering of part weight
- Average part weight can be closer to lower specification limit (LS)
- Material saving

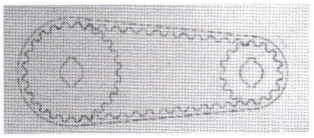
Clamp & Injection Unit Construction



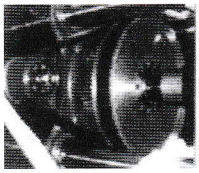


- Precise linear guide for injection units
- Quick barrel change upwords
- Electric Sled Movement
- Pneumatic closing nozzles (optional)

Gear Mechanism: Belt Drive arrangement



- Less "connected load" demand of the machine.
- Positive drive with timing belt.
- Simplified design.
- Ease in maintenance.
- Flexible link between the motor and load. No vibration transfer on the load.



Summary: Benefits of All-Electric Machines

Electric machines are quiet - 70dB which is nearly 15 to 20 db lower compared to hydraulic machines. The cycle time is faster due to parallel operations. The energy saving is 40 - 80%. There is major water savings for machine cooling and 60 - 70% savings in air conditioning. The scrap rate is reduced appreciably. It has cleaner operation (no oil) for clean room medical and electronics molding.

Case Study and Applications

Parameter	All Electric 50 Ton	Hydraulic 50 Ton	Remarks
Power consumption	1.41 kwh	4.63 kwh	70 % power saving
Cycle time	18.1	20.6	14% faster cycle time
Shot weight consistency	0.09%	0.17%	Higher material savings

DSM Engineering Plastics launches 5 new grades of its Bio-based ECOPAXX Resin

This is a polyamide (PA) 410 belonging to the family of "Long chain Polyamides". It pairs typical long-chain polyamide properties such as low moisture absorption and excellent chemical resistance with high melting point (highest of all bio-based polyamides: ca. 250 deg C). It combines the best of both worlds and is therefore suitable for many high-tech applications. EcoPaXX is bio-based and has zero carbon footprint: EcoPaXX has been shown to be 100% carbon neutral from cradle to gate, which means that the carbon dioxide which is generated during the production process of the polymer is fully compensated by the amount of carbon dioxide absorbed in the growth phase of the castor beans. Presently, both the Life Cycle Assessment and the Carbon Footprint analysis are being validated against the international standards ISO14040/44 and PAS2050. Recently, EcoPaXX has been awarded the Silver Certificate by the EPEA Internationale Umweltforschung GmbH in Germany, indicating its Value in the Cradle-to-Cradle® concept.

5 New Grades of EcoPaXX: The 5 new grades of EcoPaXX, especially for injection molding purposes are:

EcoPaXX Q150-D: A general purpose, unfilled injection molding grade. Potential applications: castor wheels, household equipment, etc.
EcoPaXX Q-HG6 and Q-HG 10: Glass-reinforced (30% and 50%) heat stabilised injection molding grades.
EcoPaXX Q-HGM24: A glass/mineral reinforced injection molding grade, especially suited for the injection molding of large parts which should have low warpage and excellent surface quality.
EcoPaXX Q-KGS6: A halogen-free flame-retardant glass reinforced (30%) compound (V-0 at 0.75mm)

DSM showcases Industry-leading Portfolio of Green Thermoplastic Technologies

DSM Engineering Plastic's complete portfolio of Halogen free engineering plastics is developed for a wide range of high-performance applications. Following the recent introduction of Stanyl® CR, this growing product family now includes Stanyl®, Stanyl®ForTii™; Akulon®; Arnitel® XG and Arnite® XG. Complete Halogen Free portfolio in High Performance Polyamide: DSM offers particular expertise in anticipating and proactively addressing market demand. It has developed several Halogen Free materials. The first of these is Stanyl ForTii, a completely new high performance polyamide that extends the application range of current Stanyl products

Bayer's Rigid Polyurethane Foam - an essential link in effective refrigeration chains

Polyurethane foams in the insulation of cold stores, refrigerated containers, refrigerated displays and refrigerators are an effective conventional insulating material, a good contribution when it comes to saving energy and cutting CO2 emissions. *Rigid foams with nanopores:* Bayer's plan is to use a new foam technology and microemulsions to create rigid polyurethane foams with "nanopores". With new technology, they are aiming for cell sizes less than 150 nanometers. Smaller the pore size, lower the thermal conductivity and better the insulating properties of the polyurethane foam. *Refrigeration Chain-not just for foodstuffs:* Numerous pharmaceutical products, including many vaccines, have to be temporarily stored in refrigerated rooms.

Contact: Dr.Frank Rothbarth, Tel +49 214 30-25363,
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PG Kuppuswamy, Ex-Wavin, Consultant, Chennai-600020;
Ph:24418307 kuppu@vsnl.com

PVC Pipe Extrusion for Beginners

General Description of PVC Pipe extrusion

PVC raw material in the form of powder, compounded with additives is extruded into semi solid molten form and then pushed through a die. The hot pipe comes out continuously, and is then calibrated, sized, cooled and pulled though haul off. Then the pipe is cut into required length.

PVC Structure

The most common method of manufacture of PVC resin is from Crude oil to Naphtha to Ethylene. Then the Ethylene is combined with Chlorine to get VC Monomer which is polymerized into PVC. The formula of PVC Molecule is (CH2-CH.Cl). Since Chlorine occupies significant proportion in the mass of PVC, creating a given mass of PVC requires less Petroleum than many other Polymers. PVC of K value 67 is a very common grade PVC for Pipe production. PVC grain with a normal size of 100 μM is the largest component in PVC resin. This grain is in spherical shell shape of solid PVC, filled with smaller PVC spheres (called primary particles) of size approx 1 μM. These smaller primary particles, in turn, contain PVC molecules (spaghetti like structures) on a micro scale bonding to each other via crystalline zones. The PVCV we get consists of about 10% of this crystalline material. The size of such crystalline structure is approx 400A (1 A = 10 power minus 4). These crystallites start melting at 140 deg C and completely melt at around 250 deg C. The crystallites bond the PVC molecules. In fact, this property of PVC gives it the required hoop strength to hold continuous internal pressure. The phenomenon of extrusion is to bind the PVC primary particles via this crystalline zone (called Gelation) and to turn it into Pipe shape.

PVC Compounding

It is a very important topic in PVC. PVC molecules are thermally unstable at elevated temperatures. At higher temperatures, PVC molecules can break off into Hydrogen chloride (HCl). This HCl will initiate more HCl and it is like a chain reaction, degrading PVC. A stabilizer such as Lead Sterate or Zinc Sterate traps this HCl and prevents the chain reaction. The next important additive is Lubricant. As the name implies, this reduces the viscosity of the gelled PVC and reduces frictional force in the extruder. More friction means overloading of extruder motors and also over heating of the PVC compound.

In fact, the grade and amount of Lubricant controls the Gelation speed (rate). The next important step in compounding is Calcium Carbonate (CaCO3). 2 to 4 parts of CaCO3 (per 100 parts of PVC) is considered as a processing aid, reducing waviness and improving wall thickness control. Though CaCO3 reduces the cost of compound, addition of more than 5 parts affects the quality of pipes, like impact strength. Other additives are pigments, flame retardants, UV stabilizers, etc. Total additives is in the region of 5 to 6 parts (per 100 part of PVC). All the additives are added to PVC in a hot mixer, during which the temperature is increased to approx 110 deg C. The lubricants melt and form a coating on the PVC grains to which other additives stick. The compound is cooled to about 45deg C in a cold mixer and then transferred to Silos (storage).

In double batching process only 50 parts of PVC is mixed in the hot mixer with full additives (meant for 100 parts of PVC). Here each PVC grain receives double the amount of additives. In the Cold mixer the compound is then cooled to 80 deg C and an additional 50 parts of PVC is added and finally cold mixed at 45 deg C. The advantages of Double batching is reduction of energy costs and hot mixing time. This, in turn, increases the compounding capacity. Many processors have switched from Lead stabilizers to Zinc, Tin and Bio stabilizers for health and environmental reasons.

Extrusion Process

Barrel and Screw

PVC Pipe extrusion takes place in a Twin Screw extruder. The two screws are intermeshing and rotate in opposite directions. The screws function as compression/ shearing agent as well as transporting agent for the PVC. The trapped PVC moves forward inside the screw. The shear energy produced between the barrel and screw causes heat and gelation. 90% of the heat energy required to gel the PVC comes from shear action and 10% comes from external heating of the barrel.

In the screw design, the depth of the screw slowly decreases in the forward direction. This forces PVC to come in closer contact with barrel and screw resulting in effective transfer of external heat from barrel and shear energy heat from screw. The entire screw length can be sub divided into the following zones - Powder entrance zone, First compression zone, Powder lock zone (to seal the vacuum in the degassing zone), Degassing zone and Second compression zone. When PVC reaches the Powder lock zone, the temp is approx 100 deg C. In the degassing zone, the volume of the chamber suddenly increases and by means of an external vacuum pump excess air is removed from the PVC as small air bubbles will be trapped in the PVC pipe and affect the material properties as well as visual appearance. By the time PVC leaves the screw, the temp is approx 190 to 200 deg C and pressure approx 300-400 bar. The screw is made of special alloy steel (15 Cr Mo V6.9) and L/D ratio is around 25 to ensure slow heating of material.

Throat, Spider and Diehead : The semi solid, gelled PVC has to be converted into Pipe shape. The material is pushed out of Screw in "jerks" and this causes waviness in the pipe surface. The die acts as shock absorber and this waviness is reduced in this area. PVC leaves the screw and enters the

Contd. to Page - 25

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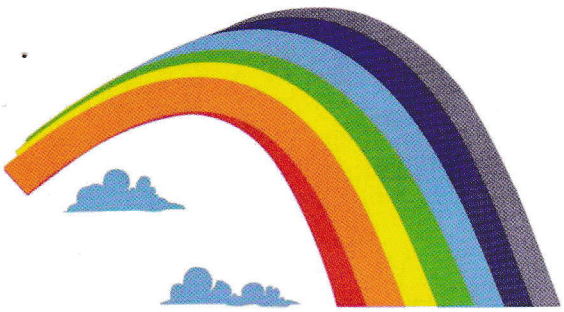

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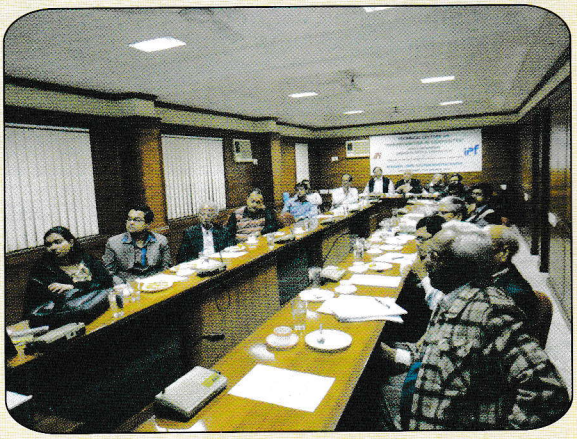
Technical Lecture on "Opportunities in Composites" on 11th January 2012 at IPF Conference Hall

Shri Goutam Bhattacharya gave Technical Lecture on "Opportunities in Composites" on 11th January 2012 at IPF Conference Hall.

Mr. Goutam Bhattacharya started his lecture with seven cardinal principles called 7 M i.e. MARKET, MAN, MONEY, MACHINES, MATERIALS, METHOD & MANAGEMENT.

Mr. Bhattacharya expained the various composites materials and the latest trends..He dwelt extensively on different materials used for composites and the variables as per the suitable applications.



Mr. Bhattacharya showed the slides of Hybrid Insulators which has huge market potential in Electical Transmisson and Distribution sectors and also Shuttering made of Composites for Building construction where the replacement of wood is possible..He also showed the slides of various Electical laminates which has great market potential.

After the concusion of lecture, a very lively and interesting question answer session followed.

Technical Lecture on "Application of Polypropylene Geosynthetics in India" on 25th January 2012 at IPF Conference Hall.

Mr. Anindya Pal of Reliance Industries Ltd presented a Technical Lecture on "Application of Polypropylene Geosynthetics in India" on 25th January 2012 at IPF Conference Hall.

Mr. Pal started his presentation with introduction of different types of Geosynthetic products in PP like geotextiles, geonets, geogrids, geomembranes and geocomposites and also showed the samples of these products.

Mr. Pal showed the slides and video on application of Geotextiles in building and reinforcement of Roads. He also discussed how geotextiles with geonets can save river embarkments including canal linings, bank protection and costal engineering. Mr. Pal also showed the utility of Geosynthetics in Railways for reinforcement of weak soil, slope protection and rock fall protection. Mr. Pal explained how geosythetics provide new cost effective application across various sectors.

The Lecture was well attended and was beneficial to the participants.

GLIMPSES

Report on Launch Function of INDPLAS'12 held at New Delhi

The all India Launch Function of Indplas'12 - 6th International Exhibition on Plastics was held on 3rd February 2012 at Pragati Maidan, New Delhi. The programme was held during Plastindia 2012 exhibition to generate awareness amongst PI-12 exhibitors on the need to participate in Indplas'12 exhibition. Over a 175 persons mainly exhibitors, participated at the launch function.

Shri Rajesh Mohta, President - IPF in his welcome address spoke on the history of the Federation, its activities and the important role being played by the Federation in promoting the plastics industry in India. He briefly introduced Indplas '12 jointly organized by IPF and Plastindia Foundation and supported by Dept. of Chemicals & Petrochemicals (DCPC) and all leading Plastics associations. Invited exhibitors to TAP growing eastern India market since there already exist a ready market of Processed goods of around 2 kg per cap

Shri Amar Seth, Chairmen of Indplas'12 Exhibition Organising Committee and IPF Knowledge Centre highlighted on the noble objectives for holding this exhibition. Substantial surplus from the exhibition would be utilized for setting up IPF Knowledge centre on a One Acre land already registered and ready for construction at Poly Park near Kolkata . The IPF Knowledge Centre will require Rs.25 crores when fully developed in phases. Apart from imparting Training with hands on experience for processing industry, IPF has also decided to install a demo reprocessing Plant to convert Mixed Scrap with laminates to Wood Lumber. Plasticulture will be showcased in open area. The surplus from the exhibition would help fund part of the project.

Shri Amar Seth solicited participants to join the exhibition either as exhibitors or visitors. He also invited industry to support this cause by accepting to be one of the Sponsors under various category. Sponsors name shall be permanently acknowledged at the IPF - KC.

GLIMPSES

Guest of Honour , Shri Ashok Goel, President - Plastindia Foundation spoke on the difference between other exhibition and Indplas'12. He greatly appreciated the objectives of the exhibition. He also stated that PIF has made a commitment to DCPC that they will set up Demo Recycling units in four METROS of India and the first recycling unit for conversion of waste plastics -including laminates - into wood lumber will come up within the premises of IPF Knowledge Centre. The total cost of the project is estimated to be around Rs.2 crore and PIF has made a commitment to fund 75% of the Project cost. . The balance money will come from the surplus of Indplas'12. He was confident that IPF - KC will certainly take shape soon. He requested industry captains to come forward for sponsoring this exhibition.

Mr Goel also appreciated and thanked IPF team for working relentlessly in management of PI'12.

Chief Guest, Shri S. C. Meshram, Executive Director - Petrochemicals, Business Dev elopment, Indian Oil Corporation Ltd welcomed the objective of exhibition and setting up badly needed training centre. Plastic Industry is growing year after year and to run machines industry will need trained man power. He outlined growth prospects of Processing industry in India. Conveyed good luck to IPF for both Exhibition and IPF - KC. Mr Meshram also assured full co-operation to IPF.

As a mark of respect mementos were presented to Shri S. C. Meshram and Shri Ashok Goel.

After presentation of mementos a short promotional film on Indplas'12 was shown to the audience.

Brochures on Indplas'12 along with stall tariff, Indplas'12 calendars,Indplas'12 promotional film CD and a copy of our magazine 'Plastics India' January 2012 issue were distributed amongst the participants.

Shri Sourabh Khemani, Co-Chairman - Indplas'12 Exhibition Organising Committee thanked the Guests and audience for participating in the launch function.

The programme concluded with High Tea.

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Some Views of IPF Stall at Pragati Maidan, New Delhi

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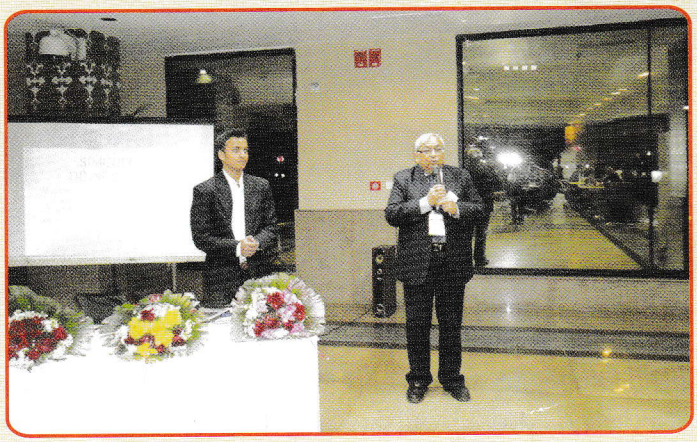


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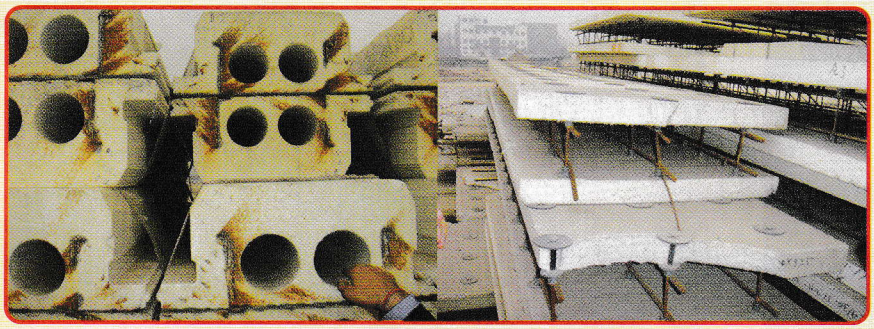
Report on visit to the Building constructed by Reliance Industries Ltd with help of Plastics.

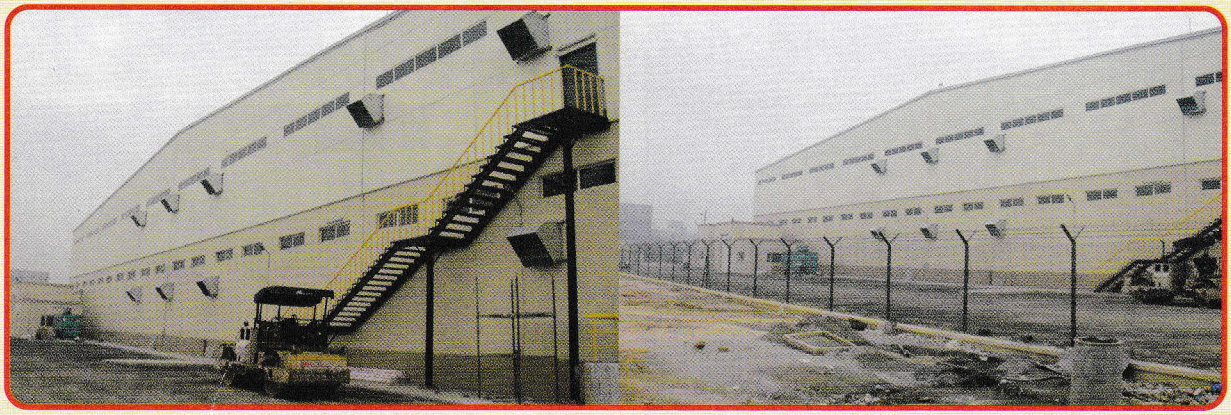
IPF team consisting of Mr. K.M.Tibrewala, Mr Sourabh Khemani, Dr N.R.Bose, Mr. Pradip Nayyar, Mr. Ashok Jajodia and Mr Hemant Goenka alongwith Reliance representative Mr. Rajiv Sharma, visited the warehouse building built by Reliance Industries Ltd, with the help of plastics on 4th February 2012, during the Plastindia Exhibition at New Delhi.

Reliance has constructed the building near Sonipat, about 60km from New Delhi. It is a warehouse, G +1 building. The construction of the building is cement concrete sandwiched between the EPS (Expanded Polystyrene) blocks. We moved around the entire building and to the first floor as well and spent around 2 hours. We found the temperature inside the building cooler than the outside temperature which must be 2-3 degrees lower, which will be cost effective during summer time for IPF building, if we go for full air conditioning.

The building foundation and Pillars are made with conventional method. The flooring, outside wall and inside partition walls are made from EPS sandwiched panels with concrete mixture. These EPS panels are finished with cement plaster from outside. As per Reliance representative we can modify them for any concealed wiring point by cutting and plastering.



Finally, most of us were of the opinion that IPF can adopt this technology in our forthcoming Knowledge centre building, even though the cost of construction may be higher by 2 percent. This will help IPF to showcase Plastic being use in construction beside other plastics being used like PVC Pipes/fittings, Doors/windows, switches etc. Few of the photographs taken during our visit are printed here for your reference.



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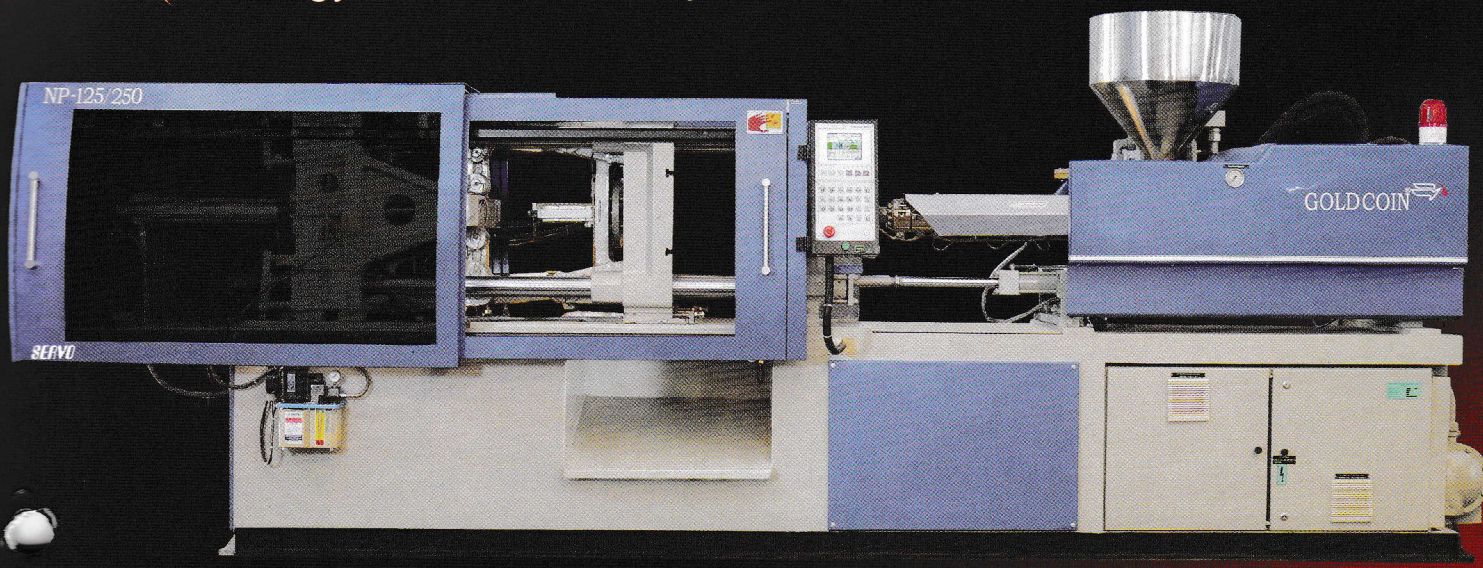

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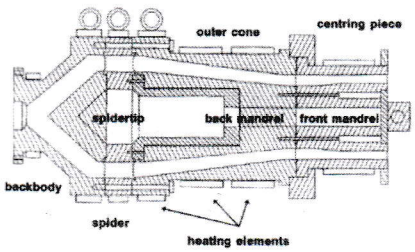
Diehead through Throat piece. The Back body and Throat tip deform the melt into a big annular shape. The Spider is used to mount the Spider Tip and Mandrel to the Back body. The Spider Legs cut the material into eight or more pieces. The split material has to be welded together again at the mandrels of the Die. The Front Die is called Centering piece since it centers the melt. The Mandrels decide the pipe size and wall thickness. In Plastic Pipes, the OD (outer dia) is controlled and kept the same for pressure classes. Only the wall thickness is changed per pressure class and this can be done by just changing the front

Die Head



part of the mandrel. The maximum diameter of pipe that can be made from a given Die head is the average diameter of outer and inner mandrel near the spider. To make a further larger dia pipe, a larger mandrel is required. Therefore, for the whole range for a particular extruder, 3 or 4 Die heads and several front mandrels are required. The last part of the die is called Dieland. The size of the extrudate and resistance of the Die is controlled by the dimensions of the Dieland.

Die Swell and Heat Reversion (Calibration sleeve)

As the material flows from Spider to Dieland, the cross sectional area reduces resulting in a stretch in the axial direction. This causes axial stress. When the material leaves the dieland, part of this stretch contracts causing an increase in extrudate wall thickness (die swell). In this condition the extrudate enters the Calibration sleeve.

Now the PVC melt is fixed in the required shape and dimension by immobilizing the molecules in a stretched state. This is an unfavourable condition since the Plastic pipe has a memory property (elastic memory) - when the pipe is heated again, it will go back to the original, unstretched shorter length. When the melt leaves Dieland, the temp is approximately 200deg C.Calibration sleeve also adds to this heat reversion due to the friction between the sleeve wall and pipe wall. This is limited in the specifications and can be controlled in die design and adjusting the output. Calibration is done by applying vacuum between pipe outer wall and cylinder inner wall. Pressure calibration is done by using an internal bung which is connected to the die using a chain.

This is a simple system but can be used only for pipes of 50mm dia and above. This method is not ideal for Wavihol or Multilayer pipes since the internal pressure may destroy the wall structure at this stage. Vacuum calibration can be done for all pipe sizes and types. No internal Dung is required here. The sleeve wall has perforations through which water enters between extrudate and sleeve.

This reduces friction to some extent and is very useful to reduce heat reversion in thin wall, high speed production. Vacuum calibration is more expensive than Pressure calibration. Initial cooling is done in the calibration sleeve and further cooling is done in a cooling bath. The length of the cooling bath depends on the size of pipe, wall thickness and output speed. The Pipe should be cooled to such an extent that it cannot be deformed in the haul off.

Haul Off

While the screw pushes the material out, the Haul off pulls the pipe. These two work in a synchronized way. The wall thickness of the pipe can be changed by haul off speed.For different applications, 2, 3, 4 or 6 track haul offs are used. When highly accurate in-line socketing is required, the pipe must be thickened and cut at the right place and to the right length. Special speed reduction sensors can be installed in the machine to reduce speed of the tracks at pre-set intervals.

Cutting and Chamfering

In the early days, a simple saw blade or milling wheel system was used to cut the pipes. Later, planetary cutters using real cutting tools were made for high tech cutting and chamfering operations. A start signal triggers a pneumatic cylinder and moves the carriage and adjusts its speed to that of the pipe ensuring the pipe and carriage speed are kept constant. The Pipe clamps move inward and grip the pipes. As the pipe moves, the rotor rotates around the pipe and pressure rollers move in against the pipe and apply pressure. This pressure causes slight deformation in the pipe which ensures unbroken contact between the pipe and cutting/ chamfering tools. High precision optical cutters are under trial now.

Wall thickness control system (PCS Process control system)

Pipes are made as per standards and they specify tolerance limits for wall thickness. It is ideal to stay close to lower tolerance limits to save cost. For example if the wall thickness is 4.5 to 5.2 mm, it is ideal to make the pipes between 4.5 to 4.7 or 4.8mm. This is achievable using PCS. The working principle is as below. An automatic scanning device measures the wall thickness around the pipe at regular intervals. Based on the OD and wall thickness settings, this information takes the following action. If the wall thickness is uniformly high or low, then the signal goes to haul-off and changes the speed to low or high to enable an increase or decrease in the thickness. This is the simplest wall thickness control system.

If wall thickness is high at one point and low at another point in the same section, the solution is more complex. The computer feeds the data to an ATC (automatic thermal centering) device located at the die. The temp at different segments is increased or decreased resulting in more melt flow or less melt flow at that segment. There are other methods like Gravimetric control system which control the input material feed (increase or decrease).

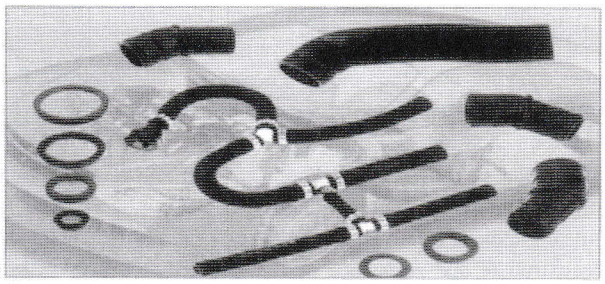
Waviness is also directly related to overweight in pipes. Waviness is primarily caused by jerky material outflow from screw to throat piece. To some extent this can be reduced at the Die head level. Extruding with screw speed as low as possible and keeping the temp. at the last barrel zone as low as possible reduces waviness to some extent. PCS can also control waviness to some extent as a part of wall thickness control.

Injection Moulding: A Vital High Technology Innovation Driver in Medical Technology

There seems to be no limit to what injection moulding is capable of. With the varied injection moulding processes available, seemingly any plastic article can be conjured up, however complex the geometry. Such specialised innovative methods as co-injection, in-mould decoration, insert moulding, foam injection moulding, gas- and water assisted injection moulding, combined processes, thin-wall technology and, increasingly, micro- and nanotechnology help to satisfy the wide-ranging needs of the various user industries. Injection-moulded plastic parts are part and parcel of everyday life. Be they mobile phone casings, beverage crates, toy figures, gearwheels for adjustment mechanisms, bumpers on cars, drinking cups, CDs and DVDs, or syringe bodies in medical technology, injection mouldings are encountered everywhere in all sizes, ranging from a few micrograms to several kilograms. Uniting several components in a single injection moulding, integrating as many functions as possible in a single component, and converting production methods comprising several steps into a single-stage process-these are the chief innovation goals in the injection moulding sector. It is in medical technology above all that injection moulding offers scope for endless possibilities. Along with ongoing progress in process engineering, the development of new types of materials is opening up additional fields of application. Sterilisibility, biocompatibility, antimicrobial finishes, special barrier properties, nano- and microsystems technology, and biodegradable and absorbable materials are some of the key areas in which materials developers are advancing progress in this vital field. Medical technology will continue to be a sector with an exciting future and a driving force for wide-ranging innovation. However, anyone wanting to gain a foothold in medical technology has to be not only innovative and engage in high-quality and cost effective production, but also master the guidelines that apply in this sector.

Safety across the board

Compared to other sectors, the standard of quality and documentation here is outstanding. Production to GMP guidelines is a must. Continuous monitoring, compliance with the hygiene regulations and the full documentation of all process data over a period of years is integral to these guidelines. In view of these requirements, the status of component supplier to medical technology obviously is not something that can be acquired overnight. "The rules that apply here have to be mastered and embraced throughout the company organisation. Smaller companies, in particular, are often at a disadvantage in that they cannot afford to go to these lengths. However, anyone who gains a foothold here has a pretty secure position, because switching suppliers also involves a high degree of regulatory effort," says Christoph Brand, GM of Polymec AG in Langendorf, Switzerland, explaining the situation from the point of view of a supplier certified to ISO 13485. Under these conditions, it goes without saying that product development takes place in extremely close cooperation between the medical technology and pharmaceutical company on the one hand and the supplier on the other. Systems suppliers are in a strong position particularly on this market. Numerous suppliers provide a full one-stop service covering everything from the development and production of the injection moulds to the injection moulding process itself and the assembly, packaging and inspection of the medical technology products.



Cleanliness from start to finish

The production of medical and pharmaceutical injection mouldings is closely associated with cleanroom technology. Whether these are single-use products such as syringes and pipette tips or functional components such as inhalers, the demand is always for hygienically impeccable products with 100% quality. For this, the manufacturers of injection moulding machines get together with cleanroom specialists to offer a variety of cleanroom solutions tailored to the article being produced and factory conditions. A simple and inexpensive approach is the mounting of a laminar-flow unit over the clamping plates for the injection mould. This excludes any exchange with unclean outside air. The injection moulding machine itself stays in the gray room and the injection mouldings are fed for further processing via an airlock into the cleanroom proper. Even if a cleanroom tent is placed over the parts of the injection moulder, the latter can still be operated from outside the cleanroom. The most elaborate solution involves the operation of the injection moulding machine in the cleanroom itself. Along with operating staff wearing special clothing, the machines and moulds themselves are also potential sources of particulate contaminants. The all-electric injection moulding machines now rapidly gaining ground can fully exploit their advantages here. Compared to conventional hydraulic machines, they generate barely any waste heat and as a result of their encapsulated drive units, are free of lubricants and other abraded particles that might contaminate the injection mouldings. Rexam Pharma GmbH,

for instance, appreciates the benefits of electric injection moulding machines at its plant in Neuenburg (Germany). The plant specialising entirely in the production of medical and pharmaceutical articles operates with almost one hundred injection moulding machines in a cleanroom. Among them are EX fully electric injection moulders from Krauss Maffei Technologies GmbH, Munich. The managers value not only the machines' reliability and cleanliness, but also their process control which is more precise and easier to adjust than that of hydraulic machines.

Mass production with maximum precision

Last year, at its Kussnacht plant in Switzerland, Gerresheimer Medical Plastic Systems also stared gradually replacing its lines for the production of cuvettes with new high-performance equipment including fully electric Elion injection moulding machines from Betstal-Maschinen AG, Nafels, Switzerland. Gerresheimer manufacturers these cuvettes on behalf of a leading diagnostics group. These single-use articles are employed in photometric laboratory tests, among other things for identifying the blood groups of donor or transfusion blood. The optical components have to meet extreme quality standards. They must not react with the test substances employed nor show any shortcomings such as impurities or scratches. Furthermore, continuity of supplies must be assured, because delivery bottlenecks might make the performance of vital tests impossible. Single-use medical articles are items that are usually mass-produced fully automatically and to an exceptionally high standard of quality under 100% quality control. The manufacturers of the necessary automation systems are constantly refining their handling strategies. The requisite speed is provided by ever lighter and slimmer removal system currently available. Within just 0.25 seconds, this removal gripper enters the injection mould, removes the pipettes from a 32-cavity mould, carries out a presence check and exits the mould again. The injection moulds used for the mass production of medical technology items also of course have to be highly precise, cleanroom-compatible and at the same time economical. Along with the realisation of thin-walled products to save materials and cycle time, there is also a demand for multiple cavities and sophisticated cooling systems. Multi-level moulds with up to 192 + 192 cavities are made, for example, by the Swiss mouldmaker Schottli AG from Diessenhofen. Over 90% of their cleanroom-compatible moulds for medical technology components are exported.

Injection mouldings in the human body

However, it is not only single-use items that originate in the injection mould. For when it comes to replacement parts for the human body, injection moulding is a preferred process. Particularly spectacular are "components" for use in the inner organs. For instance, the Moscow-based company Roscardioinvest produces a new generation of tri-leaflet heart valves from a modified polyamide. The mechanical heart valve weighing only 0.25g proved to be a severe test for its developers. The main challenge was to design the mould in such a way that the valves are free of sprue and ejector marks. This is absolutely essential so that neither clots nor turbulence can form at the mechanical cardiac valve. Until now, the only way to achieve this was by subsequently polishing the valves. The world's first mould for the fully automatic, finishing-free injection moulding of such heart valve leaflets has been developed and made by Kobelin Formenbau GmbH, Eichstetten (Germany). The mould was approved for series production last year.

Microtechnology for the tiniest parts and structures

Numerous high-precision components find their way into the human body by other avenues, among them components for use in minimally invasive surgery. Such functional parts are becoming steadily smaller, more complex and more precise-trend towards miniaturisation in medical technology is advancing apace. BCR Plastics AG in Vallorbe in Switzerland, for example, manufacturers miniaturised guide elements for stents that can only be viewed properly under a magnifying glass. Microtechnology also plays a major role in diagnostics. Microstructures are required here particularly in microfluids. A fine example is the "lab-on-a-chip", which is a miniature analysis system with a network of intelligently interconnected microchannels. These are far less expensive to produce from plastics than from glass or silicon. Working in this field since 1999, Greiner Bio-One GmbH in Frickenhausen (Germany) has engineered highly diversified microfluidic product solutions and engages in extensive research. Microscopically small surface structures can be utilised in implant technology for the controlled growth of human cells. Scientists at the Fraunhofer Institute for Manufacturing Technology and Applied Materials Research (IFAM) in Bremen (Germany) are busy investigating suitable solutions made of plastics, ceramics and metal. For all three materials groups, IFAM makes use of injection moulding technology and operates a Microsystem 50 from Wittmann Battenfeld GmbH, Kottingbrunn, Austria for this purpose. IFAM's researchers focus not only on microstructured surfaces, but also on ultra ultra-small implants. By applying micro metal injection moulding, they thus produced in series as micro injection-mouldings made of titanium, biocompatible stainless steel or aluminium oxide. There are many other examples show that injection moulding technology is playing an increasingly important role in the health sector. With innovative product developments, it has captured for itself a large market with huge growth potential. And not least thanks to the long-term supply agreements customary in the health sector, medical technology is becoming increasingly attractive for many suppliers. As the world's leading trade fair for the plastics industry, K 2010 Plastics and Rubber will present the latest state of materials, machine and medical technology plastic components.

TECHNOLOGICAL DEVELOPMENTS IN PVC PIPES

PVC was one of the earliest plastic piping systems to handle fluids and today is one of the most commonly used piping materials in the world. PVC Pipe industry has remained competitive against traditional materials on the life cycle cost concept. Significant development have been taken up in the field of PVC pipe to improve the competitive postion of PVC pipres via material savings with improved performance.

In pressure pipes. Advances in technology have brought us (Modified PVC) PVC-M and Oriented PVC (PVC-O) pipes. The improved performance of these products has allowed pressure pipes to be manufactured with lower wall thickness. This has many benefits, including improved hydraulics and reduced environmental impact.

In non-pressure pipes, development of multilayer Foamcore pipe has allowed significant weight reduction with improved stiffness.

PVC-M is formed by the addition of compatible modifying agents usually Chlorinated Polethylene (CPE) or acrylics to the PVC matrix, formed alloy rather than a copolymer. The addition of modifying agents increases the ductility by altering fracture mechanism while retaining similar strength.

The modifying agents significantly improve toughness, impact and resistance to crack growth, a key performance requirement. The change in the material matrix gives greater ductile behavior and thus enables the factor of safety to be lower than the UPVC. Short and long terms tests on PVC-M pressure pipes have demons trated consistently ductile behaviour, particularly in the presence of notches. The reduced factor of safety enable higher allowable stress levels, reduced wall thickness providing greater higher hydraulic efficiency.

- The optimum combination of strength, stiffness and toughness.
- Notch insensitivity with the corresponding reduction of rapid crack growth phenomenon.
- Enhanced fracture toughness properties allowing for higher design stresses Major International Standards.

Properties

The rubbery nature and plasticity of PVC-M are important characteristics. With the new polymeric alloy-PVC-M, the yield stress or strength is reduced a little comparted to UPVC, but the toughtness is enhanced, so we always have a ductile material.

Long-term pressure testing of PVC-M has been carried out as per ISO 9080. The minimum required strength (MRS) at 50 years is determined as 25 MPa for PVC-M.

The wall thickness and mas of PVC-M pressure pipes are approximately 30% less than the equivalent UPVC pipes, with obvious advantages in hydraulic capacity, transport, handling and installation.

Due to its flexibility, it is very easy to handle during installation, the pipes can be cold bent.

Application:

Modified PVC pressure pipes are suitable for applications including:

- Major potable water supply mains
- Industrial process pipelines
- Effluent pipelines for pumped sewage, industrial and rural waste
- Slurry pipelines carrying abrasive and corrosive mine or quarry materials.
- Irrigation and turf watering systems
- Gas supply network
- Compressed air, chilled water and aggressive in harsh gold and coal mining environments.

International Status

PVC-M pressure pipes are in use in South Africa in water supply, Agriculture and in mining industry.

Major International Standards

- Australia/New Zealand Standard
- AS/NZS 4765-2007 Modified PVC
- (PVC-M) pipes for pressure
- Applications
- SABS 966:2000-Modified poly (Vinyl Chloride) (PVC-M) piping systems for
- The supply of gaseous fuels - pipes for a maximum operating pressure of 1 bar (100 kpa)
- British Standard PAS 27: 1999 - Unplasticized poly (vinyl chloride) alloy (PVC-A) pipes and bends for water under pressure.

PVC-O Pipes

PVC-O pipes are molecularly originated polyvinyl chloride pipes which were developed in Europe in the 1970's.

PVC being an amorphous polymer, molecules are distributed randomly. However, under controlled conditions, by stretching the material, it is possible to orient the polymer molecules in the direction in which the material has been stretched.

The extent orientation is greatly depended on the parameters of the process especially the stretch ratio. It results in a layered structure by greatly enhancing physical and mechnical properties without affecting its original chemical resistance.

PVC-O pipes are designed to operate at higher hoop stresses than tractional UPVC pipes and therefore have a thinner wall for the same pressure class.

Design stresses of 32 MPA are used for these PVC-O pipes resulting in material savings around 50% against the equivalent UPVC pipes.

Enhanced physical properties after orientation include:

- HDB (Hydrostatic design basis) of 7,100 psi, approximately 80% greater than PVC

- Tensile Strength approximately 80% higher than PVC
- Impact strength approximately 80% higher than PVC
- Increased resistance to cracking

PVC-O pipes is substantially tougher than standard PVC water distribution pipes and enables water agencies to significantly reduce pie installation costs.

PVC-O pipes - The Process

Initially molecular orientation technologies were applied step wise in batch and the orientation was carried out on each pipe individually. Later the In line system was developed, which works continuously with the extrusion line.

The Process - bath process

In first stage thick-walled feedstock pipe is extruded and then cooled. In the second stage of process, this pipe is subjected to internal pressure at a carefully controlled elevated temperature in a specially designed steel mould. This blows the pipe up to its final dimensions, causing orientation of the polyer molecules in the hoop direction. Rapid cooling then freezes in this orientation and with it mechanical properties are increased. As result, the pipes can be used at higher service pressures or, alternatively, at the same pressure pipes with thinner walls can be used, giving material and cost savings.

However, this is a relatively slow process and more expensive in terms of energy and labour as it creates intermediate stocks.

In recent developments, the extrusion and orientation processes have been combined into a single operation. Here, orientation is carried out continuously using a metallic mandrel. This avoids the need to reheat the feed stock pipe and this allows savings in energy and thus cost. The process is very fast as compared to In -batch process. However, developments have been taken up in batch process as well and thus both the processes have their own individual advantages.

- High burst strength - increased material strength allows reduced wall thickness and therefore a reduced pipe weight per meter.
- High impact resistance - provides better protection against damage during storage, handling and installation than the conventional UPVC pipes.
- Resistance to low temperatures - increased toughness allows pipe installation at temperature down to -20OC
- Resistance to point loading-The layered wall structure reduces the premature failure under point loading conditions.
- Light weight-lighter than UPVC pipes providing ease in handling and installations
- Improved properties against surge and fatigue/

International Status

PVC-O pipes have been in use for some years in the UK, France, Netherlands, Portugal, USA, Australia, South Africa and Japan.

Applications

- Pumped water reticulations systems
- Rising sewer mains and installations
- Suitable in the mining environment
- Industrial application for chemical slurry transport
- Agriculture water distribution

Major international Standards for PVC-O pipes

- SANS 1808-85-2004, oriented polyvinyl chloride (PVC-O) for the conveyance of water under pressure specifications.
- AS4441 (Inst) 2003, Interim Australian Standard, Oriented PVC (PVC-O) pipes for Pressure applications.
- AWWA C-909-2002, Molecularly Oriented Polyvinyl Chloride (PVC-O) Pressue pipe, 4 in-24 In (100mm 600mm) for water distribution.
- British Specification WIS 4-31-08-2001. Specification for oriented polyvinyl chloride (PVC-O) pressure pipe for underground use.
- ASTM-F 1483-2005- "Specification For Oriented Polyvinyl Chloride (PVC-O) Pressure Pipe".
- French Standard-XPT 54-948:2003. Tubes en poly (Chlorure de vinyle) orients biaxilla (PVC-BO) et leurs assemblages.
- Spanish Standard - UNE ISO 16422 Tubos y unions de poli (cloruro de vinilo) orientado (PVC-O) para conduction de aqua presion.

Foam core PVC Pipes

Foamcore PVC pipe is a multilayer (three layer) pipe with integral skin layers and the middle "Sandwich" layer with uniformity distributed foamed structure.

Concept

In a typically three layer pipe structure, the foam created by blowing agent replaces the virgin PVC compound in core layer.

The cellular structure of the core PVC layer plays major role in producing quality PVC foam core pipe. To develop maximum savings and physical properties, the core must have uniform cell structure.

Foam core pipe permits possible raw material savings of up to 30%.

A feature of foam core pipe is the unique "I-Beam" structure it assumes. The skin is designed to take the initial load, while the foam gives rigidity and maintains the shape of the pipe under load. The foam core pie under equal load, distributes the load more evenly and does not show the same amount of distortion compared to solid wall UPVC pipe.

Presently three processes are commercially available for production of foam core pipe. Two processes involve tow extrudes, one for non-foamed skin layers and one for foamed core layer and die with two flow channels.

The third system uses three extrudes, one for each layer, the Genca die with three flow channels.

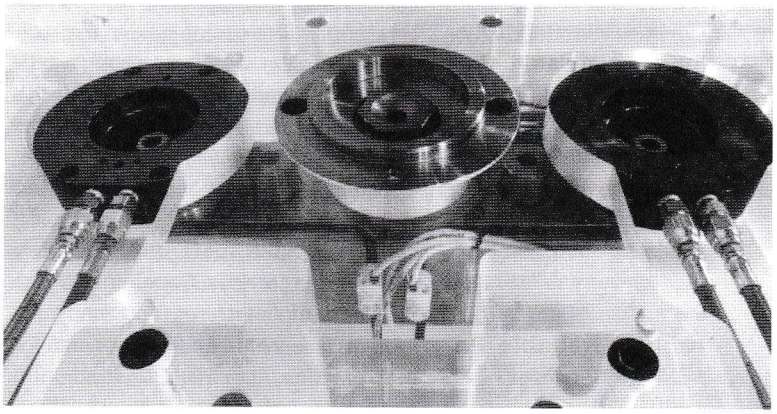
Features & Benefits of foam core pipes

- Lower density with similar volumes i.e. much lower weight.
- Easier to handle and install with lower transportation and Installation costs as compared to solid wall PVC pipes.

Hot Runner Update

New Quick-couple Actuator For Its Line Of Valve Gate Hot Runner Systems

Synventive Molding Solutions, a global leader in hot runner system solutions, has introduced a new patented Quick Couple Actuator that enhances its readily removable and replaceable clamp plate design. The QCVG16, a product that was previously available only on a limited basis with certain Synventive hot runner nozzles, has been redesigned so it is now available for use with the company's entire global product line of valve gate hot runner systems.



This new actuator offers numerous patented advantages for easy assembly, disas-sembly, and valve pin adjustment for moldmakers and molders, including:

-'Quick couple' design facilitates easy assembly and disassembly; top clamp plate can be removed without removing the QCVG16 actuator or valve pin, and valve pins can be removed without removing the QCVG16 actuator or top clamp plate

-Pin axial adjustment feature permits valve pin adjustment with or without top clamp plate -Integrated self-bleeding feature reduces installation assembly time and cost by elimi-nating need to bleed air from hydraulic lines "This new actuator makes valve gate hot runner maintenance and valve pin adjust-ment significantly easier for users," said Brian Bechard, President of Synventive North America. "By simplifying installation and maintenance, this actuator reduces mold/hot runner downtime and allows for better finished part production." In addition to the above-mentioned features, the QCVG16 also incorporates a forgiving design where cooling lines for the hydraulic valve gate cylinders are drilled in the top clamp plate. This eliminates the need to run lines to each cylinder, thereby eliminating the chance of water leaking or condensing within the hot runner manifold pocket.

About Synventive

Synventive Molding Solutions is one of the world's leading manufacturers of hot runner systems and components for injection molded plastic parts. Since the 1970s, Synven-tive has served thousands of customers in the automotive, electrical/electronics, medi-cal, packaging, and consumer/industrial industries.

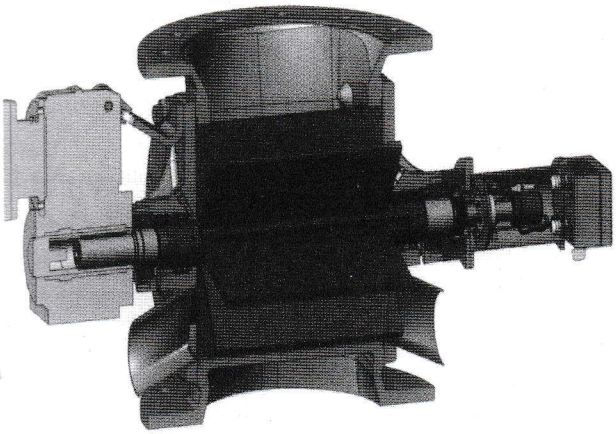
Synventive has manufacturing facilities in North America, Europe and Asia, each with its own research and development, manufacturing and design departments. The Euro-pean market is served by the company's facility in Bensheim, Germany, while North America is served by the company's Peabody, Mass. site. The Asian market is served from Suzhou, People's Republic of China. Additionally, the company has sales and ser-vice representatives in 26 countries.

For more details :
www.synventive.com

Product Update

Rotorcheck Protects Both Rotary Valve And Product

Coperion GmbH is presenting its patented RotorCheck system at K 2010 (Duesseldorf, October 27 to November 3, 2010). As a demonstration model on Coperion's exhibition stand B33 in Hall 14 shows, the RotorCheck system is based on a monitoring device that detects any metallic contact between the rotor and the housing. This contact may result either from the presence of foreign



particles or from a process malfunction, such as a sudden increase in product temperature, for example, which may cause the rotor blades to expand and grate against the housing. Further causes may be a damaged bearing or incorrect installation and/or maintenance of the rotary valve.

In all these cases, RotorCheck not only prevents serious damage to the rotary valve itself but also protects the product, which in most cases is conveyed by a pneumatic conveying system, against contamination by metallic particles (abraded metal). It is precisely this aspect of product purity – always at the top of the list of priorities in baby food production – that has now become so important in the plastics industry, too. Typical examples are the handling of polycarbonate pellets for the production of CDs and the handling of insulating polymers for high tension cables.

Highly Reliable In Operation – No False Alarms

With the RotorCheck system, the rotor is insulated against the housing and subjected to an electric charge. Any metallic contact between the rotor and the housing causes a drop in voltage, which is detected by the system and signalled by an alarm. The contact monitoring device featured by the RotorCheck differs essentially from existing systems in that the new, fully system-integrated evaluation logic circuit serves to set the product parameters – the moisture content, for example – of the conveyed material. As the evaluation logic circuit operates in conjunction with a highly efficient microcontroller, false alarms are largely excluded and the RotorCheck operates with a high degree of reliability. Also contributing to this high degree of reliability is the electronic self-monitoring system: any interruption in the circuit – caused by a broken cable, for example – is signalled by an alarm. Coperion is the international market and technology leader in compounding systems, bulk materials handling systems and services. Coperion designs, develops, manufactures and maintains systems, machines and components for the plastics, chemicals, food and aluminium industries. With its three Competence Centers Compounding & Extrusion, Materials Handling and Service, 1,700 employees and nearly 30 sales and service companies worldwide, Coperion achieves annual sales of 400 to 600 million euros.

For more details:
www.coperion.com

NEWS ROUNDUP

New mode for low-carbon production of polymer products

Polymers are used in almost every consumable goods. Yet when these indispensable materials combined with traditional production methods, the environment is dealt a great blow with each product produced. There is an urgent need for the plastics and rubber industry to take counter actions before damages done to the eco system became irrecoverable. For environment friendly, low carbon manufacturing to be effectively implemented, a full range of green factors ranging from materials, design, manufacturing, packaging to the use and disposal of products has to be systematically considered.

Green materials

Green polymers are defined by two categories, its composites and its application and disposal after lifecycle. The former refers to polymer synthesizing process without causing any harm to the environment, while the latter means usage and recycling of degradable and environmentally stable polymers. In pursuit of harmony between production and environment, green material for low carbon manufacturing is a completely new concept that incorporates technological, economical and environmental principles. Material selection in coordination with the environment mainly takes into account its availability, environment friendliness and recyclability.

Degradable polymer is a hot topic in recent green material research. Degradable means a material has similar characteristics of plastics but can be degraded and assimilated by nature due to changing in molecular structure after its lifecycle, thus minimizing the harm on the environment caused by conventional and non-degradable petrochemical-based materials.

Based on degrading format, degradable plastics can be divided into three main types: Photo-degradable plastics, bio-degradable plastics and photo-bio degradable plastics. Currently, research and development mainly focused on bio-degradable plastics and photo-degradable plastics. However, two main obstacles hindered their developments.

3,528 recycled plastics bottles were transformed into a four-metre high Alive Bottles Tree at CHINAPLAS 2011, aims at driving the plastics and rubber industries to actively apply the recycling technology and carry out environmental protection and low emission production.

Green materials must also be safe to human. At CHINAPLAS 2011, specialty chemical company Lanxess displayed phthalate-free plasticizer and bonding agents which meets the strict safety requirement of toy industry.

First of all, the costs is too high, with which the market price of degradable plastics are several times or even ten times higher than general plastics. The second disadvantage is technical difficulty, especially the control of degrading

speed needs improvement. To deal with such problems, researchers have been trying to integrate bio-degradable plastics and photo-degradable plastics into bio-photo degradable plastics based on their unique features. It has become a key direction of degradable plastics development.

Another important trend in recent years is to identify the green nature of conventional petrochemical based polymers.

Green design

Research showed that 70-80% product performance is determined at the stage of design, headstream of a product lifecycle. Plastics are used extensively because of their outstanding performance, flexibility in design and possibility of high-efficiency mass production. Green design means taking into account the overall impact on the environment of the whole product cycle, in the aim of protecting nature. In addition to function, quality, development cycle and cost, the product should be designed to minimize the impact on the environment, resources consumption, along with applicable recycling methods to avoid any waste. The core conception of green design is to implement "Prevention Come First" approach instead of "Treatment after Pollution".

The following principles are references for designing polymer products with a green concept:

1) Select eco-friendly materials, i.e. materials that rarely pollute the environment, consume few energy and resources yet provide excellent performance and technical function, beneficial to human health, high recyclability and degradability, remain environment friendly throughout the entire lifecycle which is beneficial to sustainable development.
2) Select new production technology that consumes less material and energy.
3) Select alternative materials in place of scarce resources.
4) Reduce the types of materials used.
5) Select recyclable materials.
6) Design removable structures to facilitate sorting and recycling of used materials.
7) Design reusable packaging methods with reusable materials, stop using ultra thin plastics to minimize waste.

Green manufacturing process

Conventional manufacturing industry prioritizes three targets: Time (T), Quality (Q) and Cost (C). In order to achieve green production industry must also takes into account Resource consumption (R) and Environmental impact (E) besides (T), (Q) and (C). Its overall target is to save time, improve quality, reduce cost, minimize resources consumption and reduce impact on the environment, in other words, high quality, efficient, clean, low consumption and low cost production. Considering resources consumption and environmental impact during production process, green manufacturing should include the following features:

1) Technical advancement is the precondition for implementing green production. Specifically, it refers to using advanced technology for eco-friendly manufacturing instead of impractical use of latest technology disregarding cost.
2) Typical features of green production are to reduce resources consumption and minimize pollution during the process while keeping the labors safe and healthy.
3) Cost-effective is a must. Nobody will buy your products if the price is too high. Therefore, it is necessary to consider the cost carefully of green manufacturing.

Green packaging

Based on relevant statistics, packaging waste accounts for 1/3 of weight and 1/2 of total volume of urban solid waste. Conventional packaging methods resulted in dramatic waste of natural resources and jeopardize the environment and human health. Therefore, green packaging is an important part of recycling economy and green manufacturing conception. Also known as harmless or environment-friendly packaging, green packaging causes no harm to the natural environment, can be reused or recycled for sustainable development. Its two aspects, protecting the environment and saving energy, is supplementary and inseparable.

Packaging sector is the most important part of the plastics industry. 35-40% of plastic materials in the industry are used for various types of packaging, of which 60-70% of those are for one-time use. Therefore, green packaging is of great significance to green manufacturing for the plastics industry.

NEWS ROUNDUP

Green packaging is not a separate process. Instead, it includes choosing material and designing packages with green concept. More importantly, it encourages green consumption.

Typical green packaging materials include: reusable and renewable packaging materials; edible packaging materials such as film, polysaccharide film, protein film, microbial copolyester film and composite film; degradable material includes bio-degradable material, photo-degradable material and bio-photo degradable material; paper-based material, of which made of natural vegetable fiber, can also be easily recycled and integrated.

Green packaging design means considering comprehensively every factor, from material, structure, manufacturing process, packaging format, storage format to usage and disposal after use for the principle of reducing volume, simplicity, light weight, harmless and clean production.

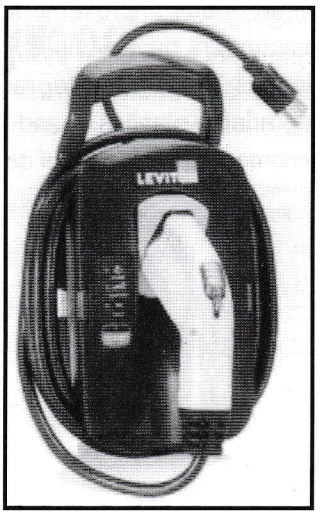
Green packaging could reduce pollution and energy consumption, but it can only be supported by market mechanism if the whole consumption chain becoming green. Meanwhile, green concept also encourages consumers to properly dispose their garbage, concern environmental protection and reduce resource and energy consumption. In this way, we can solve packaging related challenges from headstream.

Green usage and disposal after use

Research on green usage mainly focused on two areas: one is to extend a product's lifecycle. Prolong the life of a product can eventually reduce the pressure on dealing with discarded products, thus directly protect the environment and better utilize resources. It can be achieved through improving product maintenance and design. Another area is energy-saving design. The US Department of Energy estimated that $US one billion electricity charge per year was paid for shutoff TV sets and video recorders.

It is very important to use a product efficiently. Improper disposal after use often has greater impact on environment. Currently, after-use disposal of polymer products includes: Simple reuse, modified reuse and resource-like treatment.

The most important topic nowadays is the use of modified waste plastics to produce new materials with high added value. This is a hotspot for research of waste plastic recycling technology, such as PET bottle-to-bottle recycling and modification of waste plastics to produce high-performance engineering plastics. Waste plastic recycling through modification not only eliminate adverse environmental impact, but can also turn wasted materials into badly-needed materials, thus replenishing the supply of materials in short supply.



Recycling is an important aspect of environmental protection. SABIC Innovative Plastics developed a new material Valox iQ which is made from used PET bottles to produce a portable charger for electric vehicles

Regenerating waste plastics into usable materials not only helps saving resources and reduces processing cost, but also helps eliminating or reducing the impact of waste plastics on the environment, which is why it becomes a focal point for research in recent years. Methods for resource regeneration include: oil regeneration, blast furnace injection, coking with coal and residual derivative fuel (RDF) technologies.

Modern manufacturing spurs the rapid development of material civilization of human society. While bringing a lot of conveniences to the world, polymer products have led to severe ecological damage.

Therefore, it is of extreme importance to develop green, low-carbon manufacturing and recycling, an inevitable trend in the polymer sector. To save energy, we should implement environmental friendly manufacturing technology, promote comprehensive utilization of resources, develop alternative materials in place of scarce resources, promote secondary use of resources, reduce resources consumption, reduce wastes and pollutants and promote harmony between natural environment, production and consumption of industrial products to obtain a sustainable social and economic development.

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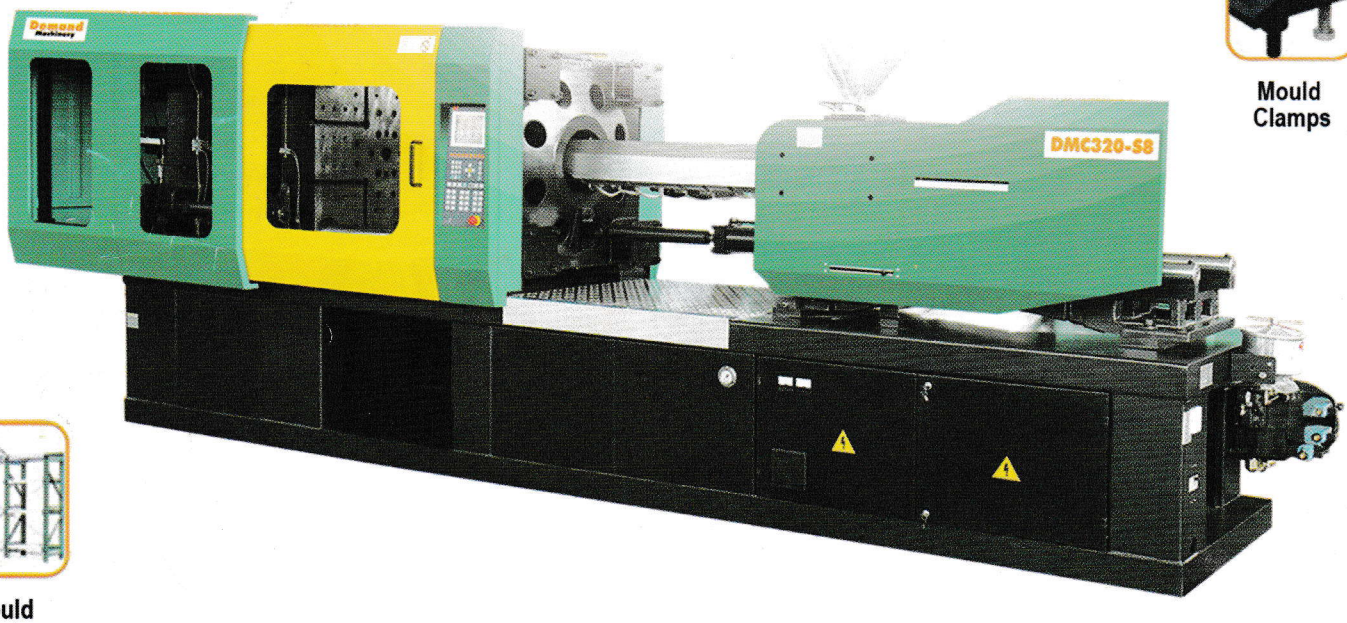

Mould Racks

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