ENVIS

MANAGEMENT OF PLASTICS, POLYMER WASTES AND BIO-POLYMERS AND IMPACT OF PLASTICS ON THE ECO-SYSTEM

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INDIAN CENTRE FOR PLASTICS IN THE ENVIRONMENT

A Programme on "Environmental Management Capacity Building Technical Assistance Project", Sponsored by Ministry of Environment and Forests, Government of India.

Dr. R. Vasudevan making presentation to MCGM officials

Tar Road with Plastics Waste – A Successful Experiment in Mumbai

In the Volume 2-Issue 3 of Envis, an article on the "Use of Plastics Waste in Construction of Tar Road" was published. The advantages of using Waste Plastics in road construction was discussed in the article. Subsequent to this, ICPE organized a Technical Presentation to the team of road engineers and the officials of Solid Waste Management Department (SWM) of Municipal Corporation of Greater Mumbai (MCGM) on 8th October, 2004 on the subject. Dr. R. Vasudevan of Thiagarajar College of Engineering (TCE), Madurai, the Principal Co-ordinator of the ICPE co-sponsored Tar Road Project, and Mr. T. K. Bandopadhyay, Technical Manager of ICPE made the joint presentation.

The MCGM officials were satisfied with the technical presentation and invited ICPE to co-ordinate and assist MCGM in laying the road, using low-end plastics waste, which is causing a waste management problem to the Municipal Corporation. Accordingly a trial was organized for mixing of Plastics Waste with stones and bitumen in MCGM's high speed Central Mixing Plant at Worli and to use the mixed aggregate for the construction/repair work of Tar Road.

Accordingly the trial was organized on 6th and 7th December, 2004. Waste plastics replaced about 7-8% by weight of bitumen. (For new road, this goes up to 15%.) Stripping test conducted after the mixing operation proved that the adhesion of the "stone – plastics

Screening of plastics waste to the required size

ICPE as Envis Centre

MoEF has converted ICPE Envis Node to ICPE-Envis Centre w.e.f. July 2004 and considered continuation of its support to this Centre, as a member of Envis Network.

This has been the result of the effective contributions made by ICPE Envis Node towards the programme on Environmental Management Capacity Building Technical Assistance Project.

waste – bitumen aggregate" was good.

1st Road Laying/Repairing Place was at New Prabhadevi Road (G-S Ward).

2nd Road Laying/Repairing Place was Opp. Poonam Park, Parsee Lane, Lal Baugh area (F-S Ward).

It was observed that Plastics Waste could be successfully mixed with stones and bitumen at the high-speed asphalt plant and the condition of the tar road, when laid properly, was good. Cost of waste plastics was around Rs. 6 per kg vis-à-vis cost of bitumen being around Rs. 14 per kg. Hence there was a saving in cost of tar road construction. Condition of the road, inspected periodically, was found to be good. Proposal has now been made to MCGM to adopt this technology for constructing tar roads in the Mumbai Municipal area.

After successful demonstration of the tar road construction where the addition of plastics waste was by manual method, the Brihanmumbai Municipal Corporation has now invited ICPE for a large-scale trial using mechanical dosing device for mixing plastics waste with the aggregate at their asphalt plant.

This asphalt mixture will be used for laying longer stretches of tar roads across Mumbai.

Mixing of plastics waste with stone

Tar road laying in progress

View of the road – 7 days after completion

View of the road – 2 months after completion

Awareness Programme among School Children

ICPE has been in forefront in organizing programmes in schools to create Awareness on Waste Management and Clean Environment amongst school children.

Mr. Rajiv Tolat making the presentation.

On 4th and 5th March, 2005 Mr. Rajiv Tolat, Member-Executive Committee of ICPE, made presentations in 6 schools at Panchagani and Mahabaleshwar near Mumbai. More than 1,200 school children attended the programme in the schools.

The presentations prepared by ICPE covered Responsible Use of Plastics; the Importance of Clean Environment; Recycling of Plastics and Myths and Realities (Point – Counter-Point) about plastics.

The school children found the audio-video presentation very interesting. The students raised number of questions, which were answered by Mr. Rajiv Tolat to the satisfaction of the school children.

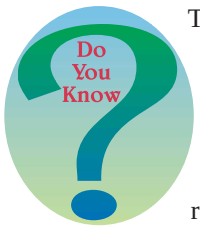
The usefulness of plastics in daily life and the need for its responsible use was quite well understood by the students and teachers.

Mrs. Karhadkar, President of the Panchgani Giristhan Parishad, requested ICPE to make similar presentations in other schools during the next academic year.

St. Kimmin's High School

Students of St. Joseph's Convent.

St. Peter's School



The creation of Vinyl can be directly attributed to Waldo Semon, a B.F. Goodrich organic chemist who was attempting to bind rubber to metal when he inadvertently stumbled across the first form of vinyl. Semon later discovered that the material was inexpensive, durable, fire-resistant and easily moulded. The result? Vinyl found a special place in the hearts of consumers as an upholstery material that would last for years in the average family's residences.

ICPE Participation

25th-28th Feb. 2005, Chennai Trade Centre, Chennai

The ICPE put up its Theme Pavilion at the above exhibition exclusively devoted to the area of plastics, organized jointly by the Tamil Nadu Plastics Manufacturers Association (TAPMA) and the counterpart associations from Andhra Pradesh, Karnataka and Kerala and Central Institute of Plastics Engineering & Technology (CIPET), Chennai.

Welcoming the exhibition participants, invitees, dignitaries and specially the Chief Guest His Excellency, Shri Surjit Singh Barnala, Governor of Tamil Nadu, Mr. C. K. Sekar, President, TAPMA, observed that this maiden effort by the joint participation of the associations in the Southern States with CIPET-Chennai and blessings of the Plastindia Foundation will indeed lay the foundation for similar events in the future spreading the expanded entrepreneurship and use of plastics in this part of the country.

Mr. Mahesh Shah, President, Plastindia Foundation, requested the industry and the Government to address the Plastics Waste Management in an appropriate manner and remove the myth in the minds of the public – that plastics litter the atmosphere and the fact that littering in effect is caused by the consumers. The realization needs to be driven home effectively considering the proposed quantum jump in plastics consumption in the country.

The Joint Secretary, Ministry of Chemicals and Petroleum addressing the gathering highlighted the advantages the plastics industry offers to the country and the benefits derived from thereof. He assured all possible help from the Government in the earnest use of plastics in the economic development of the country.

The Chief Guest, His Excellency Shri S. S. Barnala recalled the debates on sacks for foodgrains, cement, fertilizers in the earlier years and observed that since then the perceptions have changed. He added that Plastics play a significant role in everyday life of all in as much as plastics in one form or the other finds an inroad in every conceivable application. It is necessary to understand the utility of a product and display the same for economical benefit of all, he concluded.

In his address, Dr. Sushil K. Verma, Director General, CIPET said that the strong link established between the associations and the Institute has helped to revitalize the subject of plastics and such shows and conferences should take the goal forward.

Visitors – ICPE Theme Pavilion

The Theme Pavilion with an area of 225 sq. mtr. was put up at the entrance of the exhibition site. The display panels highlighted the concepts and use of plastics as well as better and beneficial utilization of used plastics, possible adoption of plastics recyclates into various useable forms and the overall benefits they stand to offer particularly in the context of environmental aspects. The text matter with illustrations depicted through a series of panels were also supported with actual products produced from recyclates that included partition boards, blankets, straps, consumer and industrial products, chains and fuel sample from post-consumer wastes.

The efforts to convey that waste plastics are not pollutants was further augmented by a continuous film show (in a separate block built within the stall), an internet connection to access ICPE website and a discussion room.

English/Tamil versions of the ICPE publication – "Plastics & Environment – Point Counterpoint and Frequently Asked Questions." were distributed to the visitors.

The visitors profile was a mix of general public, business community, potential entrepreneurs, academic community and significantly, a large number of school children with their faculty.

Considerable interest was witnessed for technology and source availability, for the Partition Boards and PET recyclate-based Blankets. The social representatives also evinced interest to have educative programmes and more literatures.

Conference

ICPE co-sponsored the Conference, held on 26th-27th February, 2005 at Le-Meridian, on the occasion of the exhibition. The Conference was organized by CIPET.

The paper "Plastics and Environment" was presented by Mr. P. V. Narayanan, Advisor ICPE, on 27th February, 2005.

ICPE Participation at FICCI Environment Conclave 2005

On the dais (L to R): Dr. V. Rajagopalan, Mr. Onkar S. Kanwar, Hon. Minister Shri Namo Narain Meena, Dr. Pradipto Ghosh and Mr. Salil Singhal.

ICPE participated in FICCI Environment Conclave on Sustainable Waste Management – Public-Private Partnership and Business Opportunities for Industries. The Conclave was supported by the Ministry of Environment and Forests (MoEF), Central Pollution Control Board (CPCB), The World Bank, International Finance Corporation and USAID. The Conference attempted to identify areas of public-private partnerships and promote waste management as a business opportunity in areas of Industrial Hazardous Waste Management, Municipal Solid Waste Management, Bio-medical Waste Management and Waste Water Treatment.

The Conclave was inaugurated by Shri Namo Narain Meena, Hon'ble Minister of State for Environment and Forests, Govt. of India. Dr. Pradipto Ghosh, Secretary, MoEF, GoI, Dr. V. Rajagopalan, Chairman, CPCB, Mr. Onkar S. Kanwar, President, FICCI, Mr. Salil Singhal, Chairman, FICCI Environment Committee, Dr. R. Mandal, Adviser (E&F), Planning Commission, GoI, were among the main dignitaries who attended the Conclave.

Some of the important informations shared during the Conclave were:

- Solid Waste Generation in India today is approximately 1,00,000 MT per day.
- Hazardous Waste Generation in India is approximately 4.3 million tonnes per annum.
- 85 Common Waste Management facilities have been created in India till the end of 2004.
- 70% of Hazardous Waste is generated by 5 States : Andhra Pradesh, Gujarat, Karnataka, Maharashtra and Tamil Nadu.
- 40 MT of MSW can be composted to 8 MT by weight. Fertilizer subsidy by the Union Government is Rs. 14,000 crore per year. A small part of this amount was proposed to be given to composting sector for encouraging the activity. The use of this compost in the agricultural field would reduce the use of synthetic pesticides drastically.
- 100 MT of MSW can generate 1 MW of power. One unit near Hyderabad generates 6.6 MW power from 500 MTD of MSW.
- Use of biodegradable plastic bags for collection of bio-medical waste at some of the hospitals was debated. It was opined in the open forum of the Conclave that as the bio-medical wastes are either incinerated or specially treated before any other mode of disposal, there is no need for using biodegradable plastic bags for this purpose.

Mr. T. K. Bandopodhyay of ICPE making a point. Dr. J. D. Desai of IPCL seen on his left.

Ms. Almitra Patel and other delegates discussing an issue.

Use of Recycled Plastics for Food Packaging

There has been growing interest to use, at least to the minimum possible extent, the recycled plastics in the packaging of food products, a single largest outlet for the plastics in packaging.

The acceptability of such material is related to the inhibitions with respect to:

- Foul odour
- Migration of undesirable
- Dirt/other contamination
- Colour change
- Thermal degradation

Very realistically, clean scrap of in-house recycling is routine in many processes for manufacturing plastics packaging and is normally not considered as recycled scrap at all. Examples of such are sprues and runners of moulded parts, flash and pinch-off blow moulded products, side trims of extruded sheets, punched sheets of thermoformed products or films rejected due to gauge variation or unacceptable winding. There is no scope to use adhesive laminate, printed pouches, etc., multiplayer films as well. If the recycled scrap is being brought from open markets and/or originated from the unknown source, it can have a doubtful purity and therefore, the acceptability. It may not be easy to identify the polymer by normal means available in the QC lab. Thus, some scrap may be suitable for recycling into food packaging and other material may not.

Generally, when one refers to the use of recycled plastics for any end use application, it generally means the post-consumer scrap such as PET bottles, carry bags, HDPE containers, woven sacks, thermoformed disposables, household products like buckets, bowls, mugs, milk bottles/pouches, etc. With this type of recycling, the degree of uncertainty about the purity of the recycled material increases dramatically.

First, the material may be a mixture of resin of different grades and/or from different suppliers. LDPE for example, has over fifty variants though for a common man, it is just a 'POLY'. It is also not possible to know or identify if the grades are those approved for food contact applications. There is no practical way to guarantee that none of the collected containers, for example, have been subject to misuse by consumer such as emptied container used for storing a pesticide powder.

Thus, the aim in providing for safe use of post-consumer recycled plastics waste and food packaging is to determine a combination of condition that provide a reasonable degree of certainty that there will be no adverse health hazards from such use.The most important criteria will be that any migration of substance from the package into food packed in it will be at levels which are within the acceptable daily intake, specific substances for that polymer, type of food, use condition or that the levels are low enough to fall below the threshold of regulation.

The Health's Authority position is that it is the responsibility of the manufacturer to assure that the polymers and additives used are those approved by the BIS for food contact application and has to issue a certificate to the effect, if the manufacturer has no problem using the recycled material from open market.

In some overseas countries, the dilemma was solved by putting into place a procedure by which a manufacturer could be issued a formal "letter of no objection' from FDA for given process and/or end-use of recycled plastics in food packaging. If a manufacturer seeks a letter of no objection, he must provide to FDA evidence that the process/application involved will provide the required degree of certainty that contaminants that may present in the recycled stream will not migrate to contained food product to amounts that are potentially harmful.

Approved or more precisely the 'non-object' ways of using recycled plastics in foods packaging is in three types:

1. Feed stock recycling, where a chemical process is used to break the polymer down to molecular weight compounds, which are purified and then repolymerised – generally for PET and HDPE for which the processed is approved already.

2. Use of recycled PET and PS is acceptable to produce trays, cups, troughs, etc., where chances of migration are not great.

3. Use of recycled material as a sandwich layer in 3-layer and as a non contact layer in 2-layer co-extruded constructions is the safest and the most accepted.

Manufacturer's responsibility

Both the end-user and the packaging material supplier has to ensure that the material supplied and being used is safe for food contact application and will not cause any health hazard.

Scenario

A few thousand tonnes of plastics waste in the form of films, bottles, thermoformed products, woven sacks, etc., is being recycled and also consumed. Unfortunately, the end-user, today, is more price conscious than the safety of health and has been making several compromises and most often, even getting through without any hassles. This is mainly because the related laws are not being very strictly imposed. In the USA for example the regulators both at the State as well as Federal level, have taken action significant to plastics packaging materials selection, primary manufacturer, recycled content requirement and the polymer coding. As of today, we have adopted the polymer coding only, which only helps a recycler to identify and segregate to avoid mixing of different polymers.

With the increase in exports of processed foods and also increasing awareness of consumers at home, a protective legislation as well as self-imposed discipline by the end-user as well as packaging material supplier has become the need of the day.

(Source: Plastics News, March 2005)

Sunny Side to Recycling

With the impact of plastic products on the environment becoming more of an issue, Motorola, together with the University of Warwick's Warwick Manufacturing Group and PVAXX Research & Development Ltd. has developed a novel way of recycling mobile phone casings. What is unique about the casing is that not only does it decompose but at the end of its life cycle it also grows into a plant, said Dr. Kerry Kirwan, the project team leader at the University of Warwick. The basic idea is that when the casing is finished with, it is removed and placed in a flowerpot where it will decompose. As it decomposes, a flower seed, which is embedded in a small transparent window of the casing, is released for germination. And as the plastic degrades, it releases nutrients to the soil around the seed. The expertise of the University of Warwick's horticultural research arm, Warwick HRI, was utilized to identify the type of seed best suitable for the casing.

Thus, the prototype casing has been embedded with a dwarf-size sunflower seed.

The polymer used has been formulated by PVAXX and is made up of polyvinyl alcohol (PVA). According to PVAXX's spokesperson, Peter Morris, "The grade used has been certified biodegradable in accordance to the CEN EN 13432 Standard. It contains plant-derived material and natural fillers as well as PVA." When asked if the material is safe for the environment, Dr. Kirwan said, "We are currently examining what gases, if any, are released when it decomposes."

One of the reasons for developing the casing is to encourage recycling. "We wanted to minimize the environmental impact created by consumers who throw away their plastic phone covers. And with the shorter product life cycles for mobile phones, this is beginning to become a problem. The new technology allows a phone user to plant the cover in a flowerpot instead of discarding it." He added that this process will reduce the cost and energy associated with collecting and segregating mobile phones that are to be recycled.

But mobile phone enthusiasts will have to wait until later part of this year before they are able to purchase sunflower cover. According to Motorola, more tests still need to be conducted before it can be commercialized. Based on the success of this product, PVAXX is looking at other industries that will be able to utilize its composite material. According to Morris, we are working with a number of blue chip companies. We expect to introduce many more new and exciting products later this year. The Bermuda-based PVAXX, which has a facility in Bahrain, also manufactures pallets using a composite material made of sand, additives and PE.

(Source: Plastics News, March 2005)

Ralph Wiley, a Dow Chemical lab worker, accidentally discovered "Saran". The material was first used to protect military equipment but it was later found to be ideal for food packaging. Saran would cling to almost any material – be it a bowl, dish, pot or even itself.

Compostable Water Bottle

Another novel recycling idea that is purported to be a first in the market is a compostable water bottle. Cargill Dow worked with Husky and BIOTA Brands of America Inc. to innovate the bottle that is made from its Nature Works polylactide (PLA) corn-based resin. The bottle is used for filling with BIOTA's new line of premium spring water and is said to be compatible with municipal/industrial composting facilities. According to BIOTA, the bottles will disintegrate in 80 days. The preforms are being produced on a 24-cavity Husky HyPET 120 system for the 12 oz., $^{1}/_{2}$ lit and 1 lit sizes of the water bottles. Husky said its team was also involved in the development of the preform and bottle design and worked with equipment supplier SIG Corpoplast, which supplied BIOTA with the Blomax ten cavity stretch blow moulding system. The bottles are designed with pressure-sensitive front, back and neck labels that not only provide an attractive look but, are also compostable. The front and back body labels are made of biaxially oriented PLA that is flexo-printed in eight colours. To give it a distinct feel, the walls of the bottle are thicker than a normal PET bottle.

(Source: Plastics News, March 2005)

DuPont's First Biologically-derived Polymer Receives Global Recognition

DuPont's newest polymer innovation, the first DuPont polymer derived from a biological source has been recognized by the China State Intellectual Property Office and China Central Television (CCTV) as "MostVisionary Innovation" at a recent award ceremony.

Also, on February 25, DuPont Sorona received the 2005 "New Technologies in Renewable Materials and Processes" award at the Global Plastics and Environmental Conference, sponsored by the Society of Plastics Engineers (SPE).

The story of Sorona is unique because it demonstrates that the use of renewable materials and processes can create new performance technologies and standards.

(Source: Canadian Plastics Industry Association)

www.envis-icpe.com

Website hits for the months January - March 2005

Months		Hits
January	:	28,289
February	:	43,195
March	:	56,671

Popularity of Envis-ICPE website is on the increase in the recent months. The dissemination of a great amount of information on plastics and environment on the website has attracted many browsers, including a large number of first time visitors, resulting in almost 100% increase in the hits during Jan.-Mar. 2005.

Innovations in Plastics Recycling Technologies

The biennial conference on the Recycling and Recovery of Plastics is set to begin on April 18. The two-day event organized by Plastics Europe (formerly the Association of Plastics Manufacturers Europe), is the fifth Identiplast held to date and is being supported by internal plastics organizations around the globe. The Environment and Plastics Industry Council (EPIC) remains a strong advocate of the event and is one of the sponsors of international conference.

Drawing on the very latest in plastics recycling and recovery techniques tabled around the world, IDENTIPLAST is truly an international event. One of this year's attractions will be Esteban Chornet from Sherbrooke-based Enerkem Technologies. Chornet will review the recent work undertaken by EPIC and Enerkem that involved the gasification of plastic residue from municipal collection programmes.

IDENTIPLAST brings together an international contingent of experts to identify the information about the opportunities in plastics recycling and recovery. Technology conference calls on the expertise and experience of the many different plastic organizations located around the globe to offer current discussions on best economics and latest technologies. Further information on IDENTIPLAST 2005 is available on the PlasticsEurope website or by contacting Hanane Taidi at 323 675 40.

(Source: EPIC)

Indian Centre for Plastics in the Environment

For further information contact :
Indian Centre for Plastics in the Environment
205, Hari Chambers, 58/64, Shaheed Bhagat Singh Road, Fort, Mumbai 400 023.
Tel.: 022-2269 4105 / 06, 3090 4633 • Fax: 91-22-2264 1468
E-mail: icpe@vsnl.net • Website: **www.icpenviro.org • www.envis-icpe.com**