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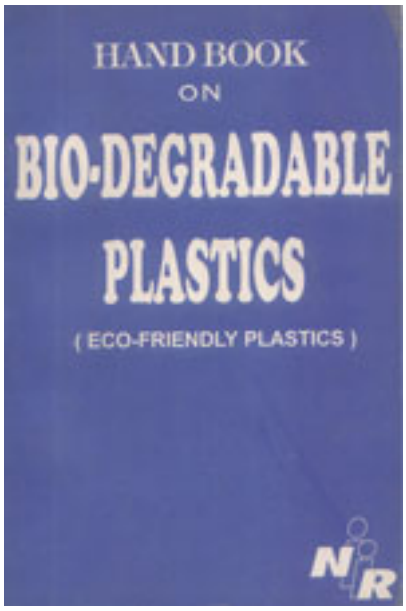
Handbook On Bio Degradable Plastics (Eco friendly plastics)



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Plastic has brought immense benefits to the whole human race. The light weight, cheap chemical resistant and strong material has got almost omnipotent presence. When we talk of its strength we talk of the time till it survives and to everyone’s knowledge plastic does not bio-degrade. Yes, plastic the greatest invention of mankind has the power to even destroy mankind. Plastic that is not biodegradable brings a lot of environmental issues. It deteriorates the ozone layer. For the most part plastic is produced from oil. The world is progressively running out of oil. Research says plastic brings number of harms not only to humans but also the entire cosmos. The plastic which cannot be recycled has to be disposed off in some or the other way. Let’s say if we dispose in water it has the tendency to destroy marine life. So the only way left to reduce the ill effects of plastic is to use eco-friendly or biodegradable plastic.

Biodegradable plastics are plastics that will decay in usual aerobic environments. These include plastics that are made from vegetable oil and other organic matter. The book, Handbook on Bio Degradable Plastics (Eco friendly plastics) is one of its kinds which give the information about biodegradable plastics. The book gives comprehensive information about Standard Methods for Biodegradation of Plastics, Commercialization of Eco-Friendly Plastics, and multipurpose exploitation of municipal solid waste (plastics), management of non recoverable plastic waste, guidelines to be followed in recycling of plastic and several other crucial topics required for the understanding of recycling of plastic. According to a report out of 200 million plastic produced in the world 26 million is produced by the United States and only 6%(approximately) of plastic waste gets recycled posing both a challenge and opportunity. Challenge in the sense that it is causing environmental issue and opportunity for the young entrepreneurs to penetrate in this sector. The book provides important and descriptive information on the whole topic of biodegradable plastic, the benefits and the techniques used.

The book also contains information on topics arising social concern like present technologies for recycling of polyethylene terephthalate (pet) waste, how to minimise the impact of packaging materials on the environment and also provides information on new bio-degradable plastic, as business options for entrepreneurs.

The book at the end contains a list of directory providing information on List of Plant & Machinery, List of Raw Material, Plant/Machinery Suppliers, Overseas Suppliers of Machinery and Raw Material Suppliers.

Content:

Recent trends in recycling
Feedstock Recovery
Biodegradable plastics
Energy Recovery
5.MANAGEMENT OF NON RECOVERABLE
PLASTIC WASTE
Photodegradable plastic
Landfill and composting
Biodegradable plastics from microbial origin
India Scenario
Conclusions and Future Outlook
6.STANDARDS ON ENVIRONMENT FRIENDLY
PACKAGING AND ECO MARKING
ECO-Mark Scheme
Criteria for ECO-Mark
Product General Requirements
Product Specific Requirements
Procedure for Grant of Licence
ECO logo
General Requirements
Product Specific Requirements
Guidelines for Recycling of Plastics
International Guideline
7.DREAMS AND MYTHS ABOUTBIODEGRADABLE POLYMERS
FOR PLASTICS PACKAGING
Origin and Myths of Biodegradable Polymers
Paper
Starch Based films
Suitability of Biodegradable Plastics in Packaging
8.PRESENT TECHNOLOGIES FOR RECYCLING OF POLYETHYLENETEREPHTHALATE (PET)
WASTE
Introduction
Methods for PET Recycling
Mechanical Recycling
Flotation/Hydrocyclone Process
Water Bath/Hydrocyclone Process
Solution/Washing Process
Solvent/Flotation Process
Depolymerisation
New Chemical Recycling Technique for PET
Recycling in India
9.BIO-DEGRADABLE PLASTIC FILM
MADE OUT OF SOYBEANS: A BREAK
THROUGH INPLASTIC INDUSTRY
10. BIO-DEGRADABLE PLASTIC: A NEW
PTIONS FOR ENTREPRENEURS

BYFUNGIIN CONTRARY
17.â€œBIOPOLâ€œ (PHB-CO-PHV) ARE PRODUCED ALREADY COMMERCIALLY.
Biodegradable Polymers for Medicine
18.BIODEGRADABLE PLASTICS
19.PROCESSING OF SYNTHETIC AND
NATURALLY-OCCURRING POLYMERS
20.INJECTION MOLDING OF PLASTICS
FROM AGRICULTURAL MATERIALS
21. PRODUCTION OF DEGRADABLE PLASTIC
FROM EGG SHELL MEMBRANE PROTEINS
22.PHOTO-AND BIO-DEGRADABLE PLASTIC
Technology Description
Innovative Aspects
Application Fields
Status
Intellectual Property Status
Business Potential
23.BIOPOLYMERS
Biodegradable Materials
Water Absorbing Materials Based on Starch
Chitin-Chitosan
Physicochemical and Physical Properties
Biomedical Applications
24.ENVIRONMENTAL PLASTICS
Introduction
Feature
Application
CALFIN C30F & C31F CYPORENE.....
(Introduction, Feature, Application)
CLEAN-PLAS.....
(Introduction, Feature, Application)
25.DEGRADABLE PLASTIC
Biodegradable Polymers
Background of The Invention
Summary of the Invention
Detailed Description
Examples
26.THE PROPOSED PROJECTS FOR INTERNATIONAL
ECONOMIC ANDTECHNICAL COOPERATION
Project Survey
27.RE-NEW STARCH POLYMERS
28.NEW PLASTIC MADE FROM POTATO
PEELS IS DEGRADABLE, INEXPENSIVE,
AND ENERGY CONSERVING
Food Wastes can be used to Produce 100%
Degradable Plastic

Raw Material Suppliers
Plant Economics
34.PET BOTTLES FROM PRE-FORM PET
Introduction
Injection Molding Machines
Blow Molding
Uses
Properties
Chemical Resistance, Environment Friendly
Manufacturing Process
List of Plant & Machinery
List of Raw Material
Plant/Machinery Suppliers
Overseas Suppliers of Machinery
Raw Material Suppliers
Market Survey
Plant Economics
35.INTERNATIONAL ENVIRONMENT ORGANISATIONS

Sample Chapter:

HOW TO MINIMISE THE IMPACT OF PACKAGING MATERIALS ON THE ENVIRONMENT

One can be held hostage behing the shopping cart. In fact, those bottles, jars, cans, tubes, pouches, boxes, blister packs, sachets; in varied forms, shapes, sizes, colours, labels and attraction can be very powerful in the making of choices among products and brands. This ability of packages to make decision in man's behalf and, perhaps, "brainwash" his consciousness is what makes packaging a great salesman in this modern lifestyle.

Packaging is indispensable in living. Primarily, it allows food to be distributed efficiently keeping desired product quality and reaching areas across land, air and seas. Undeniably, packaging mirrors the prefences of customers and the direction people are heading to. Packaging is indeed a part of who we are - sometimes wasteful, sometimes misleading, sometimes dull, sometimes full of life. Some even say that the history of present-day civilisation can be told by analysing the evolution of packages used over a given length of time. The study on the mother of all landfills in New York by a great garbologist named William Rathje revealed very interesting information about what people were reading, eating, consuming, and throwing.

Packaging pervades daily life as it can be found virtually everywhere. Used packages are seen floating on blue waters of lying on verdant greens. When everything seems doing well, people often times ignore packaging's value and rarely think about it apart from the product it contains. Over the years, there has been an improved appreciation of the roles of packaging in enhancing product sales appeal and distribution. People come to know the products of the world because there are shipping containers and creates to carry them. In the global trade perspective, packaging is aptly described as a language people understand. But there is the other side of packaging. When people struggle to open up packages, it becomes a source of irritation. When over-designed, packaging makes products not affordable and non-competitive. And when empty packages are not disposed of properly, they contribute to litter or overflowing landfills.

Consequently, packaging becomes an enemy or a foe of the environment. From a helpful and important beginning such is a miserable and ungrateful destiny. (But then, that is what life is all about - the beginning has to have an ending).

Today, the level of understanding between industry, on the one hand, and environmentalist and the general public, on the other, still leaves so much to be desired. Barriers have yet to be torn down to successfully match the environmental concerns of both the consumers and the packaging industry. Possibly, one way to bring about a healthy partnership in addressing environmental issues is through sharing of information to minimise or cushion the negative influences of uncertain situations.

The environment is everything and everywhere. Through its stages, products, packages and processes impact upon the environment. Environmental issues are never straightforward nor are cut and dried. Hence, absolute claim on environmental soundness of products, packages and processes is difficult if not impossible to justify.

It is wrong to believe that we can go on taking from the environment and not giving back in return. Each one should realise that "sustainable development" requires long period of time to ensure that suporting ecosystems do not jeopardise the continuing improvement of the quality of human life. Therefore, man should only take what he needs and allow the environment to replenish itself and be always prepared for future generations.

It is also wrong to believe that pollution only comes from big companies or industry operations such as chemicals, oil refineries, electrical utilities, vehicle and food manufacturing. All produce wastes whose

impact may be relative but no technology can be have zero environmental impact.
Nonetheless, consumers should not feel guilty of packaging as most of them today respond to consumer needs. To a very large extent, consumers and product processors dictate upon packaging suppliers, the materials and forms needed to push selling efforts. One should be reminded, however, that minimising environmental impact of food packaging should not compromise food safety, quality and nutrition presently provided to benefit consumers.

Where are we Today

Most countries are now facing tough solid waste management challenges in how and where to dispose of the garbage that is piling up each passing year. Landfill capacity is declining and finding new sites is often-times met by communities with fears and objections. Consequently, local solid waste management officials are faced with collecting more and more garbage to dispose of in fewer and fewer landfills.
But this is not to say that the packaging industry is producing more wastes relative to the national economic growth. In fact, the ratio of packaging production relative to GNP growth exhibits decreasing trend as a country improves from being least developed to become an industrialised one. This is one proof that packaging does save. For example, ratio of packaging to GNP in industrialised countries is reported at 1.6-1.8% in developed economics, the ratio is about 1.9-2.0%. In developing or least developed countries, such ratio is estimated at greater than 2.0%. This may be inconclusive statistics to prove the correlation between packaging consumption and gross national products; however, no one can deny, that as a nation progresses, she begins to appreciate the influential roles of packaging in product protection, sales enchancement and keep minimum cost of production and distribution. And in her sophisticated systems and equipment, optimisation of resources is undeniably forming part of the business economic lifeline.
Packaging, particularly plastics packaging, has always been charged as a major culprit in the mountain-size solid waste disposal problem. As a result, the packaging industry faces increased public and legislative pressures which may be politically expendient, but do little to truly reduce the amount of solid waste generated. Thus, the packaging industry should bring to the fore technology breakthroughs and sound information which will be helpful in the formulation of solid waste disposal blueprints, which problem is a complex one. A simplistic solution may do more harm than good. As what has often been said about finding solutions on environmental problems - "the problem is emotional, the solution is technical. The decision is political".
In their own home-grounds, packaging users and suppliers can begin to share in minimising the negative impact of packaging in the environment by incorporating environmental factors (e.g., ultimate disposal of used or empty packages) into the packaging designs. This will have real and positive impacts on both the amount of solid wastes and the methods utilised to manage it. For example, coding plastics containers with recycling codes is not only a tool to facilitate sorting activities by consumers but also serves as a reminder to recycle articles. These little but powerful messages, hopefully, also symbolise the cooperative undertaking needed in environmental protection. Each one has his role to play. No one can carry the responsibility of protecting the environment all by himself.

What options do we have

The hierarchy of solid waste solutions logically begins with source reduction, followed by recycling, incineration and landfilling. Industry embraces source reduction and recycling as business recourse. A company should avoid the use of insufficient materials which may result to increased product wastage due to breakage, spoilage and product deterioration.

1. Source Reduction

Less materials means reduced material to fill garbage bins. Reduced material consumption also means reduced pollution sources, and hopefully, lower packaging cost. In this very competitive marketplace, it

does not seem logical to use more materials than necessary. On the contrary, research and development activities on packaging should be accelerated to reduce material consumption but still provide the needed protection and overall performance. This move can also interpreted as providing value added. To name a few, source reduction can achieved by :

Lightweight/Down gauged Packaging
Refillable Packages
Distribution and Transport Packaging
Packages for Concentrated Products
Reduced Product Protection
Doing away with secondary packs
"Rationalized" package structures
Package size reduction
Bulk sizes

Minimizing material consumption is one of the simplest and most effective methods of improving a pack's environmental performance. Many products use extra packaging to help obtain high quality and premium positioning. However, through creative graphics and well-designed structure and graphics, similar results can be achieved with minimum amount of materials. Source reduction need not also be at the expense of convenience value-added packaging features. It need not be expensive to design and use environmentally - sound packaging.

Lightweight of packaging materials is a continuing goal of designers, packaging users and suppliers. Packaging designers have been able to achieve these reductions while maintaining or improving protection, convenience and communication functions of the packaging. Plastics packaging growth is due to its lightweight attributes as well as its lower cost, energy savings, durability and strength.

Reducing pack sizes is a tough challenge to the packaging designers who also have to meet all the various requirements for legal information and bar codes on each product. What can be resorted to include simple clear design solutions, with careful selection of colour, type and imagery, the latter being an important consideration in brand management. Another challenge to the packaging designer when making smaller pack sizes is to ensure that the pack retains its shelf impact.

Source reduction may also involve the elimination of secondary packaging or other package features, an example of which is a toothpaste tube without the folding carton. Migros, a major European supermarket chain, experienced initial reduction of sales volume when consumers were unsure why the cartons had disappeared. Sales immediately returned to their former sales volume levels after Migros explained to the consumers the environmental reason or benefit for such change. This experience brings about the importance of communicating to consumers in the successful minimisation of packaging imapct on the environment.

In terms of toxic or hazardous chemicals, the voluntary elimination of CFC is a move wisely taken. Chlorofluorocarbons which are synthetic or man-made chemical compound that contain chlorine, fluorine and carbon atoms and are used as synthetic foam, expanded sheets, refrigerants, solvents and sterilant have been proven to damage the ozone layer. Included in this category is the reduction of dioxin. Many of the chemicals used in processing involve reduced use of chlorine gas in the bleaching process by -(a) use of peroxide in early stages or multi-stage bleaching process, (b) use of less chlorine gas through substitution of chlorine dioxide.

At this point, let us look into distribution packaging, a part of packaging which is often unseen by consumers. A well-designed distribution packaging ensures products arrive from the manufacturer with minimal damage or spoilage. Damaged products are wasteful and also contribute to solid wate. It is possible to redduce distribution packaging without compromising product protection. Presently available are

paper grades which are lightweight but strong.

Abroad, a number of product manufacturers are testing new refillable packages for products such as detergents wherein customers buy durable containers for the product and subsequently purchase smaller packages of the product which can be placed in the container and mixed with water. These designs achieve high product quality while reducing the total amount of waste since repeat purchases are of smaller packages.

2. Recycling

Recycling initiatives is intended to reduce problems associated with waste disposal and to save raw materials. In the process, reduced packaging cost can also be achieved. Recycling can only be advantageous when it results to reduced packaging cost and does not jeopardise product integrity and public safety. However, a material cannot be judged to be environmentally sound only because it can be recycled. Recycling of a material is itself an industrial process with consequent environmental impact. The use of fuels and the wastes from preparing, collecting, sorting and transporting recyclables should be considered to come up with more meaningful measurement of its overall performance. It cannot be considered environmentally beneficial to recycle if the process uses more resource and energy than gained.

Recycled materials can be (a) used as its original article, (b) used to produce articles other than original use, (c) converted back to its raw material forms, (d) used for energy recovery.

The Packaging and Industrial Film Association (PIFA) in Europe conducted a study to show that in some instances the recovery of energy, by using waste plastics film as a substitute fuel in power generation process, has greater environmental advantages than recycling such films into reusable/recycled form. Instead, the waste plastic films were better incinerated and the heat energy recovered. The varying grades, thickness, quantity of the plastic film waste and the degree of contamination do not justify recycling.

3. Incineration

Incineration of solid waste reduces its volume by as much as 90% and its weight by 80%, substantially shrinking the overall amount of waste to be land filled. Recovery of the energy generated by incineration can offset some waste disposal costs.

Potentially harmful emissions from burning of solid waste, such as particulates, carbon monoxide, nitrogen oxides, hydrocarbons, hydrochloric acid, sulphur oxides and trace amounts of heavy metal are controlled in modern plants by maintaining proper combustion conditions, and by the use of pollution control devices such as electrostatic precipitators, wet and dry scrubbers and "baghouses".

In modern incinerator, furnace temperatures are guaranteed to achieve 1800oF for at least one second, and maintained under all conditions using auxiliary burners. It is reported that organic compounds in the flue gases will be destroyed by temperatures higher that 1500oF. Incineration plants using these methods guarantee effective eission control.

To further make incineration as an acceptable solid waste disposal option, a growing number of product and packaging manufacturers are now phasing out the use of pigments and dyes that are the sources of heavy metals, substituting more environmentally benign materials.

4. Landfill

New landfill regulations are forcing the closure of hundreds of poorly operated landfills and dumps generating toxic lactates which can affect soil and ground water. Sitting of new landfills is difficult; thus, landfill capacity is diminishing rapidly.

Organic waste is the source of much of the toxic leach ate and dangerous methane emissions from landfill. How toxic leach ate can be reduced to the minimum, if not totally eliminated, is an important package design considerations. Plastics, because of their inertness, are good stabilizing material in landfill and do not leach contaminants.

The role of biodegradable packaging. Misconceptions about the behavior of materials in landfills, combined with the capacity shortage and mistaken ideas about the composition of the waste stream have caused the media and legislators to turn to the use of biodegradable plastics. The ability of a material to biodegrade, or breakdown after its useful life is over, is severely inhibited in properly operated landfills. In fact many organic materials have been excavated intact from landfills decades after being deposited. Thus, mandating biodegradability as solution to solid waste disposal will do nothing to ease the landfill capacity problem.

Degradable plastics may have some limited applications in areas such as litter control. But concerns about premature breakdown of packaging and possible contamination mean that degradabloes have little future as primary packaging for food and beverages.

How do we measure up

How do we approach our objective on minimising the impact of packaging on the environment? What factors should guide us in designing environmentally acceptable packages and packaging systems?

On broad terms, the following serve as criteria or can be referred to in deciding which materials is preferred in specific packaging application:

Consumption of raw materials, water energy

Burden on air, water by materials and manufacturing processes

Weight and volume of materials

In more specific terms, the yardstick to guide coming up with packages and systems which results to the least negative environmental impact are :

Lowest possible consumption of raw materials and energy

Lowest possible burden on air and water from manufacture

Distribution, use and disposal

Optimal use of space capacity

Lowest possible contribution to litter problem

Reuse/Recyclable/Disposable

Lowest possible weight and volume

When assessing the environmental-soundness of alternatives, evaluations must consider the Total Packaging System or all materials which make the whole lot, such as :

Consumer or retail packaging

Transport packaging

Packaging components (e.g. labels, closures, adhesives, strapping, etc.)

Retrieval, Cleaning, Washing

Other transport and storage inputs

An important term in environmental assessment is Life Cycle Analysis or LCA which is a method used to quantify environmental burdens based on an inventory of environmental factors for a produce, process or activity from the extraction of raw materials to the final disposal. It should be viewed as a management tool to identify (ultimately) how to decrease environmental impact.

Let us review and understand the important environmental features of packaging materials as follows:

Paper - a renewable, natural material

Metals (aluminum, steel, tin) - only tin is reported to be short in supply. All require a large amount of energy in their extraction and processing, aluminum most of all.

Glass - abundant raw materials, energy intensive production, heavy containers.

Plastics - nearly all oil-based (but only 1% of the total consumption of oil is used for plastics packaging), versatile, lightweight.

In all of these discussion, still, preferred packaging position is ranked as follows:
[ol]

	Polyethylene	Kraft Paper Unbleached
Total Energy Consumption	67.0 GJ	95.0 GJ
Gaseous Emissins		
SO2	9.90 kg	19.40 kg
NOx	6.80	10.20
CH	3.80	1.20
CO	1.00	3.00
Dust	0.50	3.20
Liquid Effluents		
COD	0.50 kg	16.40 kg
BOD5	0.02	9.20
CH	0.003	(Not Applicable)
Phenols	0.00010	(Not Applicable)
Chlororganics	(Not Applicable)	(Not Applicable)

"Is biodegradable plastics better than the commodity plastics?" is the essence of the Senate Bill number 1673 sponsored by Senator Juan Flavier and is entitled "An Act providing for the phase-out of plastics bags as packing materials of goods sold or disposed by sari-sari stores, market vendors, department stores and similar establishments and for other purposes". In the Bill's explanatory note, it took mention of the recent flooding of the Metro Manila Area which "again highlighted the precarious balance and status of our environment." The Bill "proposes the phase out of plastics bags in three (3) years, not as the answer, but a practical contribution of our collective efforts to the many demands and needs to solve our environmental problems." After such phase-out period only biodegradable plastics shall be permitted to be used.
The paper versus plastics and the biodegradable vs non-biodegradable plastics questions need an answer. To some, the technical justification may be convincing in favor of plastics. To others, it may not be so considering the strong emotions against plastics. What is more important, however, is the industry or company taking its commitment on environementalism. In this manner, its moves and strategies are based on a set of beliefs, rightly or wrongly. Otherwise, moves will be all too confusing and costly. Companies would also have to appreciate the environmental commitments of consumers which have been classified according to the different shades of "green". Many surveys reveal that consumers no doubt will always express preference for environmentally focused packages. However, paying extra or higher price for such material does not follow. Again, the detailed strategy of today may not be the same as the strategy of tomorrow. That is why a position or commitment is an expression of assuming a leadership role.

What else can a company?

Therefore, a company must make clear its position on the environmental protection issue. It is going to be

difficult for company to formulate projects and programs without a policy statement or an overall position to guide the company's environmental initiatives. Some electronic companies, for example, have decided to substitute their plastics cushioning materials with something more environmentally sound. However, most of them are not going to implement such program at higher expense. The cost issue is too real to ignore.
Numerous ideas to reduce packaging materials consumption include the following:
Product concentration-removal of unnecessary fillers and waters (many water-based products can be reconstituted by the consumer before use). This allows for an equally substantial reduction in packaging materials required for each use of the product.
Elimination of Packaging Components-consumer products are often excessively packaged with multi-package systems which are both unnecessary and wasteful. Some packaging components can be eliminated entirely or substantially reduced in volume and/or weight.
Refillable-reduce chances of being sent for disposal and costs for consumes. But refillable bottles are heavier and more energy is needed to bring them back to the factory for refilling. As reported, it takes five liters of water to wash a dozen of beer bottles.
Reusable-some packaging may not be efficiently refilled, however, the type of package may be reused in another application, thus reducing the quantity disposed of while supplying the consumer with a valuable alternate commodity.
Reduction of volume/weight-actual weight or volume of packaging can often be reduced by selection of more efficient materials or redesign of the package shape or size, without compromising the safety and strength of the package. A good shelf impression can be achieved by innovative package shape like flat oval body.
Reduced transportation packaging-overall packaging can be reduced through the use of durable, reusable, and repairable transportation containers and pallets, or improved more efficient packaging components. Intermediate bulk carriers like bins not only lower transport cost but also facilities handling and actual use in production.
Bulk selling/Buying-buying and selling in bulk allows for easier use of reusable and refillable packaging while reducing the amount of product packaging and transportation packaging. (Transportation packaging may also be used as consumer packaging.)
Recyclable/Recycled Materials-incorporating recycled content into the package and by ensuring that packaging is recycled, valuable resources are conserved and reused rather than being landfilled. The inclusion of recycled materials also encourages the economic expansion of materials collection and recycling initiatives in the residential, industrial, commercial and institutional context. Many coextruded bottles and pots consist of recycled material layers sandwiched between a virgin layer and a barrier layer. Choose materials that are compatible or easily separable when two or more materials must be used. An example is a mono-material package which consist of PP bottles, PP labels and PP closures. Technically, recycling these materials is not that easy as it may sound. Nonetheless, such pronouncements sound very re-as-Suring.
Return incentives-Regardless of refill initiatives, incentives such as deposit for returning packaging materials (e.g. glass bottles, metal cans, etc.) have shown to successful in reducing the amount of packaging and recyclable materials going for disposal.
Identification of packaging components-proper coding of packaging materials with recognized symbols will aid in the sorting and recycling efforts and help consumers to differentiate between recyclable and non-recyclable materials.
New ideas-environmentally proactive innovation, e.g., paper body labels on plastics cups with perforations to facilitate material separation; water soluble refill pouches for chemicals, cushioning materials made of biodegradable components, on-site processing and filling of mineral water into plastics pouches instead of

bottles.
In the past, companies invested in facilities to put their environmental houses. However, many have reservations to go public with their environmental initiatives fearing the risk of being targeted for things they ae not doing, rather than getting credit for what they have accomplished.
Moreover, many have conducted studies to examine a number of strategies companies have adopted to minimise the impact of their packaging on the natural environment. Yet one cannot say with certainty what an "environmental-friendly" package is. One cannot point to environmental truths that are static and immutable, across all regions and all times. What may not be recyclable today may be easily recyclable tomorrow. Processes that voraciously consumer energy today may be energy-efficient tomorrow.
Today's assumptions about packaging and municipal solid waste management will change over time. Landfills, once considered a benign way to deal with waste, may emerge as the environmental nightmare of the 1990s, as more and more aging landfills are identified as contaminating ground water suppliers. Assumptions about degradability-hardly a useful concept when waste is sealed in landfills-may change dramatically if composting becomes more viable and widespread. Waste itself may ultimately be a meaningless term, if all that is discarded is increasingly reused, recycled, or concerted into energy. Perhaps the one packaging principle that will stand the test of time is source reduction. Whether we are dealing with aseptic juice boxes or plastics milk jugs, reducing or eliminating waste at the source will be a concept of lasting value.
Meanwhile, the challenge on the packaging designer innvolves balancing the packaging needs of the consumer (such as food preservation, product protection, economy, lifestyle considerations) against the demands of environmental protection which may be real or perceived. Industry cannot meet this challenge alone; rather, it is necessary to involve all key stakeholders - consumers, government, retailers, educators, the media - into consensus in pursuing environmental activities.
This is not to say that there will be agreement among the different players or stakeholders mentioned previously. While most people do not like the adversarial role of activists, they, too, have to be appreciated as they brought the environmental debate and progress into a high plane. Friendly or not, conscious or not, a loose partnership exists among the environmental stakeholders. "Each of us has role to paly in this complex system of checks and balance and knowledge is the best resource we can bring to the table.

What have you decided?

Packaging is a significant portion of the solid waste stream, and reducing the amount of waste generated from all sources, will require complex policy decisions and significant changes in solid waste management practices. Packagers are meeting the challenges of aiding solid waste management by incorporating those factors in the packaging design process.
Reducing the amount of materials in package; improving recyclability; incorporating recycled materials in new package production; making materials safe for incineration and land filling are important conncepts which more package designers are taking into account.
Industry is also faced with making packages that fit modern lifestyles, packages that offer convenience and ease of use and protection of the products. Packagers are committed to balancing these economic and social considerations with environmental issues to produce packages which meet the use and disposal needs of society.
In striving to achieve environmental responsibility, society faces daunting tasks. New technologies and infrastructures, as well as fresh insights are needed. Government must create adequate incentives for industry and take advantage of industry's know-how. Corporations must play a non-traditional and sometimes uncomfortable role, acting cooperatively with other corporations. Even more challenging will be the international cooperation needed to address environmental issues that, by nature, transcend national

borders. And all the stakeholders in the process need to abandon strictly adversarial postures and recognise that environmental problem is a common problem to all.

There is a need for better and improved communication among customers, retailers, suppliers and regulatory bodies to prevent over-reacting. This is to ensure that all are looking at the right target in a more rational and less emotional approach.

The packaging industry should not look at expedient solution to please interest groups; rather, look for environmentally and economically sound solutions. Moreover, the industry not look into dissenting opinions with malice; rather, it should be looked at as needing sound technical information no matter how myopic such interest group may be. After all, it is always right to do right.

To the government, there is no need to legislate the societal aspect of packaging. Consumers hold the only necessary weapons right in his own hand.

In view of these challenges, the packaging industry can either practice sound environmental strategy, and reap competitive advantage in the process, or be forced into playing reactive or follower role, at a far greater cost. Indeed, the costs of inaction can no longer be seen from the individual corporate perspective; the costs and consequences or our actions have taken on a global dimension.

"Among the partners, the packaging industry is best positioned and equipped to take the leadership role and effect meaningful environmental progress-by virtue of its investment in technology, its development of disciplines, existing establishments and infrastructures, and the breadth of its influence all along the supply and demand chain. All of us, as stake-holders and partners, now need to support the packaging industry as it leads the emerging partnership for progress."

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