TECHWATCH LANKA

"A vital link between global technology developers and the local technology practitioners"

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Promoting business & technology incubation for improved competitiveness of SMEs

As one enters into the 21st century, both industrialized as well as industrializing countries are arguably poised on the threshold of a major economic transition from manufacturing-based economies to knowledge-based economies.

Simultaneously, nations around the world are showing renewed interest in entrepreneurship and technological innovation. Because of these results, many developed and developing economies have been nurturing and supporting technology-based entrepreneurs or technopreneurs in their early stages of development through various types of services available at the technology incubators.

Recommendations for developing countries:

National commercially oriented research expertise and expenditure, both public and private, should be enhanced continuously so that R&D facilities and expertise in universities and R&D institutions could be strengthened and researchers/academicians are encouraged to become entrepreneurs, especially technology-oriented entrepreneurs.

Government and donor agencies as well as private sector should support and encourage the setting up and networking of technology/business incubators within the country and outside.

Exchange of experiences, organization of trade fairs and exhibition for technologies and products of incubatees, at national and international levels, should be encouraged.

Since incubatees and graduated companies have generally small and limited resources, such activities would assist them in marketing and promoting cooperation.

International collaborative arrangements and agreements at government level should identify opportunities for possible linkages with institutions and incubators in different countries and seek expertise or technical assistance.

Government should develop entrepreneurship promotion programmes and allocate resources for its implementation. In this context, a combination of physical technology incubators with larger investments and virtual incubators with minimum investments may be developed for a developing country like Viet Nam.

While new knowledge economy and information technology create brilliant opportunities for reinventing the traditional business incubation model, in particular through development of business e-coaching services, new generation types of hybrid physical-virtual business incubators – business e-incubators – capable to service much wider audiences of both start-up companies and would-be entrepreneurs should be promoted.

In such programmes, the private sector should play a leading role.Exchanges of R&D manpower between incubators and manufacturing companies and also training arrangements should be encouraged by both R&D institutes and academia, and industrial organizations.

Private corporations should be encouraged to enhance their R&D efforts in basic sciences or generic technologies, besides setting up universities and specialized research centres, specially in thrust areas identified by the Government.

In developing counties, the open wall type or "virtual incubators" with access to R&D facilities and support services including professional services, requiring minimum investments are desirable and need to be promoted to speed up innovations.

What is also now emerging is the "third generation" system, more appropriately called an: "International Enterprises Centre", which will bring under a single aegis the full range of support services for development of knowledge-based business, with linkages to universities, research institutes, venture capital and international joint ventures. This trend is already evident at the convergence of support mechanisms at business incubators/techno parks in South-East Asia.

National workshops on promoting business and technology incubation for improved competitiveness of SMEs...New York 2004

Inside "TECHWATCH LANKA"

"STRIDE INTO THE FUTURE BEFORE IT ARRIVES"

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Other brochures published by the TWC

· Noise Pollution & Control Technologies
· Test kits for the Food Processing Industry
· Waste Tyre Disposal Methods
· Good Practices in Latex Processing
· How to make a crunchy loaf of bread for the bakery industry
· Organic Shirmp Farming for Aquaculture industry

These are available free of charge on request.

The TWC disseminates information on new technologies related to the above ten thrust areas with a view of upgrading the technology status of local industries.

The TWC also provides suggestions, from the point of view of technology management, so that local industries could improve their technological capabilities and standards. On your request, the TWC along with the experts in the relevant field, will visit your factory.

BIOTECHNOLOGY

Diagnostic kits for *Escherichia Coli* and *Salmonella*

A reliable and sensible method to detect food bornepatogens such as *Salmonella* and *Escherichia Coli* has been developed by a team of research scientists at the National Institute of Molecular Biology and Biotechnology (BIOTECH) of the University of Philippines Los Banos. This finding will provide the food and feed industries to enhance the safety measures against food borne pathogens, which causes diseases like typhoid and diarrhoea.

Based on the Polymerase Chain Reaction mechanism this kit perform the test with in 26-28 hrs assuring accurate identification of DNA levels. This surpasses the traditional method which has certain drawbacks such as longer time to detect (5-7 days), labour intensive and expensive. The PCR based method increases the number of copies of certain regions of deoxyribonucleic acid unique to an organism in order to produce enough DNA detectable for testing. DNA is the molecule inside every individual's cells that carries genetic information, which is passed on from one generation to the other. The PCR based methods has the potential to detect all most all strains of *Salmonella* compared to the conventional method which mostly relies more on morphological, biochemical/ physiological and seriological characters to identify and distinguish microorganisms and failed to detect all *Salmonella* strains.

For more information:
Dr. Mercado,
BIOTECH University of Los Bagos, Phillipines

Genes for developing disease resistant rice

Biotechnology companies and seed companies would be benefited by the genes that has been developed to produce disease resistant rice.
Scientists at the Agricultural Research Service (ARS), USA have discovered genes that can be particularly useful against rice blast disease caused by fungus *Magnaporthe grisea (M.grisea)*. *M. grisea* is a multiple strain fungus that could attack rice plants, barley, wheat, corn, pearl millet, and perennial rye grass causing yield loses of 10 to 30 % in infested rice fields.

This genetic modification containng one or more genes will allow the plant to defend itself against strains carrying the corresponding AVR1-CO39–a gene that triggers a host defense response thus limiting disease progression. Further this allows breeders to incorporate the disease-resistance gene(s) into susceptible plants, which will increase pathogen resistance. No doubt that this invention would pave the way to create other disease-resistant grasses specially like perennial rye, which suffer from gray leaf spot caused by *M. grisea*. Gray leaf spot is an emerging problem in USA, where even the use of fungicides for longer period of time becomes ineffective in controlling the disease.

For more information: twm@ars.usda.go

Omega 3- fatty to protect breast cancer

Researches of the Keck school of Medicine of the University of California and the National University of Singapore found the protective effects of omega-3 fats in fish oil and its by- products potential against breast cancer. The study reveals that the oil will aid in making special genetic make up to combat breast cancer. It is found that the women with common DNA patterns could obtain more breast cancer protection compared to women who have other common patterns.

This study led to identify a novel gene-environmental interaction between certain genotypes and omega-3 fatty acids on breast cancer development. According to research findings postmenopausal women who ate the most n-3 fatty acids (from fish such as salmon and mackerel) were 34 per cent less likely to be diagnosed with breast cancer than women who ate the least n-3 fatty acids from fish. Enzymes known as glutathione S-transferases (GSTs), help flush out and get rid of lipid peroxidation products, which form as a result of fatty acid breakdown. These products act as main protective agent against breast cancer. Each person has certain genes that carry the recipe for making GST. Since these genes exhibits polymorphism in a population, the efficiency of clearing peroxidation products vary from fast to slow.

It is found that the low-activity versions of genes associated with GSTs (known as GSTM1, GSTT1 and GSTP1) had a lower risk of breast cancer. Women with a combination of the lowest-activity forms of GSTM1 and GSTP1 had 64 percent lower risk of the cancer, and women with a combination of the lowest-activity forms of GSTT1 and GSTP1 had a 74 percent lower risk of the cancer. Since the oxidative mechanism of the n-3 fatty acids and the anti oxidant vitamin supplements are same it's advisable to refrain from taking these drugs to get better understanding on the activity of marine supplement.

www.usc.edu

Fish to help stem severe bleeding

The professionals in the medical field will be delighted to get the prospects of cheaper alternatives to treat patients suffering from heamophilia. A blood clotting agent known as factor VII made from genetically modified *Thilapia*, a fresh water fish could be used to treat internal bleeding caused by accidents and gun shot wounds. This discovery made by scientists at the University of Southampton, UK could be further used to treat stem internal bleeding, a rare form of haemophilia, and to treat people who fails to answer traditional forms of treatments for haemophilia A& B.

AquaGene, the co-partner of this development has produced the protein by adding a human gene to the fish and subsequent extraction of factor VII to the blood. The extracted protein is then transferred to human blood where it works on forming clots. Though the fish driven protein is still being away of the market it will provide insight to researches to work on human therapeutic proteins derived from fish to treat diseases such as lung, liver and tumours etc. Since the fish is readily bred and cheap in price this technique would be a fruitful solution to replace expensive drugs to treat haemophilia patients.

For more information, contact: nm4@soton.ac.uk

New technology to identify SARS virus

A genetic fingerprinting technique to identify different strains of Severe Acute Respiratory Syndrome (SARS) virus has been developed by the scientists at the Genome Institute of Singapore (GIS) and the NimbleGen Systems Inc, a US based Biotechnology firm. This collaborative effort help determine the origin of the virus quickly and accurately. The methods allow the molecular test to be completed in three days and will complement in existing methods, which take two to three days to verify the SARS virus. The new technique relies on the use of an " Oligo nuclear tide microarray", a tiny glass surface containing hundreds of thousands of pieces of genetic material from the SARS virus. Since the micro array can process up to 50 samples at a time the system has the potential to treat patients simultaneously in an effective manner.

For more information, contact: :jrau@nimblegen.com

DNA computer kills cancer cells

Researches from the Weizmann Institute in Israel have constructed a molecular sized computer that is programmed to find signs of cancer cells, and dispense DNA molecules designed to eradicate those cells. Though it is a proof of concept that works only in a test tube, but device is meant to eventually work in the human body. This molecular computer consists of three modules made from strands of DNA named as input, computation and output. The input module strand contains stretches of bases that pair up with, and identify, certain stretches of messenger RNA. The computation module processes a series of input modules to determine whether the balance of certain types of messenger RNA indicates the presence of cancer cells. The out put module administers a drug in the form of another DNA strand when cancer cells are indicated. The prototype includes a second DNA computer that is programmed to release a DNA strand that inhibits the first computer's drug molecule in the absence of cancer cells. Both DNA computers must register the presence of cancer cells for the cancer fighting DNA strand to be administered. Though the materials are biologically compatible the system requires some more time to reach the market since the device needs certain modifications to be compatible with the living systems.

Asia Pacific Techmoniter vol.21, no.04, pg.10

Bacteria are genetically modified by lightning

Scientists at the University of Lyon in France reported that the lightning enhances the opening up of bacterial spores to pick up any stray DNA in the environment. Scientists are in the view that the bacteria could be genetically engineered by exposing to lightning as routine method of supplying mild electrical shocks. But those bacteria in close proximity to the shock are in danger and those further away have the potential to react. Similar type of work done using artificial lighting source on soil bacterium *Pseudomonas* as well as lab strain *E.coli* found to take up the bait. So the researcher suspect that process would have involved in the evolving bacteria to a great extent.

For more information, contact: vogel@univ-lyonl.fr

New technology in *Tilapia* culture systems

A green-water tank culture system with efficient waste management and water-saving features is the best solution with respect to the biology of tilapia and to fulfill the requirements of Hazard Analysis Critical Control Points (HACCP) in achieving a comparatively low eco-footprint status. The use of vacuum swing adsorption oxygen generators, hanging mats, improved cage construction materials, automation for real-time trending of system parameters, automatic feeders and well-designed filtration systems offers various options to develop and modernize culture systems for *Tilapia* enabling the farmer to "manufacture to order". The installation of an emergency aeration system would reduce the risk of mortality caused by dissolved oxygen deficiency. Health monitoring can prevent or reduce disease problems. In the year 2000, Malaysian farmers produced 16,383 Mt of the Red Hybrid *Tilapia* in cages, tanks, pens and ponds with use of the above techniques. Growth rates of about 5 gm/day were consistently obtained for fish of an initial weight of 50 gm to a harvest size of 800 -1200 gm. Waste management is fast becoming an environmental issue.

Aquamats

Aquamat is a carpet-like material that is hung in the water column by a sealed PVC rod and anchored to the bottom by means of two simple hooks. This mat becomes a substrate for the growth of periphyton which is grazed by fish. Its bacterial flora also aids in the breakdown of nitrogenous wastes. Trials conducted by the Freshwater Fisheries Research Centre, Malaysia, in tanks with Aquamats rarely experienced mortality and *Tilapia* were healthy. The Aquamats also functioned as hides for *Tilapia* that were harassed thereby reducing stress.

Ozonizers

A great amount of energy is released, when ozone breaks down into oxygen. This energy breaks other chemical compounds and destroy bacteria, fungi, viruses, and large organic molecules. Ozone has the advantage over chlorine, because it does not form chloramine which is toxic to fish. In high concentrations, ozone is dangerous to all living tissues. Therefore, ozone should never be added directly into culture tanks. Water to be treated is passed through a contact chamber. In the event of a leak in the ozone system, there should be a leak detector installed to trigger off an automatic shut-off. Most of the aquaria in the US as well as many European and Japanese facilities, make use of ozone for water purification

Vacuum Swing Adsorption (VSA) Oxygen Generator

Vacuum swing adsorption oxygen generators have been used for purposes such as chemical processing and energy conversion process. Using a well designed valve, a VSA oxygen generator is capable of producing 93-99% pure oxygen. With the VSA, a continuous supply of oxygen is available to aerate culture tanks or cages permitting the aquaculturist to use higher stocking rates. The VSA is a very robust machine and could be used in bad weather conditions.

Nutraceuticals

Nutraceutical is a hybrid of nutrition and pharmaceuticals. Probiotics have been used for some years to treat digestive problems by encouraging the formation of healthy intestinal bacterial flora in the gut.

In studies conducted by the Freshwater Fisheries Research Centre, Malaysia, bacterial concoctions mixed in the feed have been shown to improve *Tilapia* growth by 20%. Fish treated with nutraceuticals continued to have the advantage over untreated fish after the termination of treatment. It is probable that nutraceuticals improve intestinal bacterial flora of tilapia and also help to improve the general well-being of the fish through better digestion and the prevention of the colonization of harmful pathogens in the digestive system. Immunostimulants can also be added to *Tilapia* feeds to improve resistance against diseases. Peptidoglycans are being used to increase the non-specific immune system of *Tilapia*.

Automatic feeders

Automatic feeders can help farmers to obtain better feed efficiency besides being power-saving. The Freshwater Fisheries Research Centre, Malaysia has used solar-powered automatic feeders for cage culture trials. Solar-powered automatic feeders would be a solution for high energy cost where it is nedessary to feed fish several times a day.

For more information, contact: Freshwater Fisheries Research Centre (FFRC), Batu Berendam, 75350 Melaka, Malaysia.
E-mail: pppat@streamyx.com

Integrated Biotechnology-Aquaculture

1. *Vaccines:* Biotechnology already has contributed to the development of vaccines against enteric redmouth disease, vibriosis and furunculosis in finfish and gaffkemia in lobsters. In addition to reducing the use of antibiotics, these new vaccines have had a major impact on the survival of salmonids during net pen culture.

2. *Diagnostics:* The application of biotechnology to disease diagnostics has led to the development of highly sensitive diagnostic procedures based upon fluorescent antibodies, enzyme-linked immunoassays and the polymerase chain reaction (PCR). Improved technologies would help detecting and diagnosing pathogens and diseases and for enhancing the genetic basis of disease resistance, thereby reducing the need for antibiotics and other drugs.

3. *Hormones:* Recombinant DNA technologies have provided an array of potentially useful preparations for aquaculture. Carp pituitary extracts, semi-purified and purified hormonal preparations and synthetic peptides and their analogs play an important role in the aquaculture industry. Hormones are being used to control and induce spawning. More recent innovations in the application of hormones to aquaculture include teleost sex control (reversal) measures, thereby supplying so-called "monosex" lines and development of agents for smolt-enhancement, growth acceleration and enhanced feed conversion efficiency.

4. *Transgenic fish:* Advancing the application of molecular biology and genetic engineering techniques help improve growth rates, food conversion, disease resistance and product quality and composition.

For more information, contact: Robert A. Curtis
E-mail: rcurtis@capecod.net

Shrimp thrive on sugarcane waste and cassava byproducts

Scientists at Oceanic Institute, Hawaii have developed and tested a sugarcane-based feed for shrimp. The experimental pellets are made from inexpensive forms of protein, fats, minerals and bagasse, the crushed stalks that remain after sugarcane is processed. Results indicated that young, pond-raised shrimp grow well on the pellets. Growth of shrimp fed with bagasse-based feed was comparable to that of shrimp in fed with low-cost commercial feed. Fibres of the bagasse pellets, resulted increased population in the bacteria, algae, and microscopic zoo-plankton after the introduction of the pellet. Pellets that sink to the bottom of the pond provide an additional food source as well as new surfaces for the tiny pond. The bagasse pellets with low nutrient content could not sustain intensive shrimp farming. Soybeans are rich in proteins and are readily available and may be able to partially replace squid, fish meal, and other more expensive ingredients in the best quality shrimp feeds.

Cassava production has contributed greatly in booming shrimp farming business in Equador. New ways to process the root in order to utilize its high content of elongated starch granules with sticking properties has been explored. Cassava would replace the imported and reportedly toxic commercial agglutinants. The shrimp farm technology is changing what had been principally a subsistence crop into a key component of an international food marketing industry. Shrimp growers cannot get enough cassava to fill production needs.

For more information, contact: Chhorn E. Lim
USDA-ARS, Tropical Aquaculture Research Unit,
Oceanic Institute, Makapuu Point
Waimanalo, Hawaii 96795

Sea cucumber-shrimp polyculture

According to a recent study conducted by the Infofish, Malaysia sea cucumber and shrimp polyculture help reduce sludge content and noxious gases in shrimp culture ponds. Sea cucumber is a benthic animal, feeding on sediments and restricting the activity of microorganisms, thus purifying the pond environment. In addition, because of their protein and mineral content, sea cucumbers have a high economic value and have several applications in industries such as nutritionals, pharmaceuticals and bird breeding.

In the results of the study, control ponds were found to contain a high level of residues (sludge) while in the ponds with one sea cucumber per cubic meter the amount of sludge was lower. In the ponds with two sea cucumbers per cubic meter, there was only a small amount of sludge. In addition, the shrimp in the three ponds with two sea cucumbers per cubic meter gained 3 g more weight compared with the controls. According to the IFRO Newsletter, the project is still under way and is showing promising results in enhancing shrimp quality and culturing sea cucumbers.

Inforfish International, September/October, 2004
Inforfish International is a newsletter published by the Infofish, Malaysia

A tablet to overcome problems in aquaculture ponds

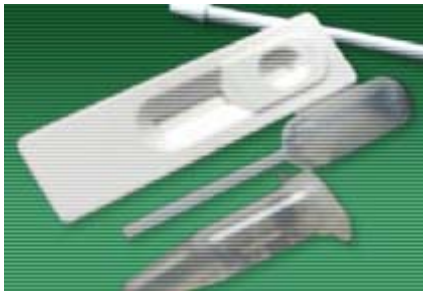
It is a concentrated bacteria tablet which provides solutions to problems in aquaculture environments by reducing Ammonia, Nitrite, Nitrate, and H_2S. It sinks to the bottom of the pond and attacks the bottom layer of sludge improving water quality.

Functions of the tablet

1. Controls the fluctuations in pH values
2. Reduces sludge accumilation at the pond bottom
3. Helps reduce environmental problems.
4. Provides essential nutrients to promote rapid bacterial growth.

For more information, contact: Bio Solutions, 2532 Rama III Tower, suite # 506, Bangkok 10120
E-mail: sales@biohero.com

A new WSSV detection kit for fast and quick identification



This virus detection kit is a lateral flow, one step and immunoassay method for WSSV detection in shrimps. It is fast and easy. Results are read visually. This test system employs unique monoclonal antibodies to identify WSSV selectively in shrimps with a high degree of sensitivity.

Features of the kit:

1. Cost effective management tool for shrimp culture ponds.
2. Monoclonal antibody based detection system.
3. All in one. No additional special equipment is required.
4. Results within 20 minutes.
5. Room temperature preservation is possible.

For more information, contact: Enbiotec Laboratories Co., Ltd., Japan
E mail: info@enbiotec.co.jp

A new aeration system to reduce energy cost

With this new system, a hole in the water is created to flow large quantities of air down from the water surface to create large amounts of micron level air bubbles. These tiny bubbles, because of their high surface area to volume ratio and their reluctance to leave the receiving water, are more effective than the best diffusers at transferring oxygen to the water.

Advantages of the system are,

1. Bubble size is reduced to micron level (10 micron -100 microns).
2. Energy is not directed at lifting or accelerating massive quantities of water since props, paddles and pumps are not being used.
3. Energy is not directed at compressing air or forcing air through tiny holes as there are no compressors, diffusers or air pipelines.

For more information, contact: Daniel E. Lyford
E-mail: dlyford@bellsouth.net

Plant extracts to counteract irradiation

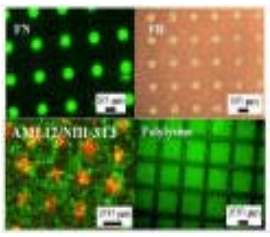
A grape seed and green tea extract has been developed by the researches of the Food Consortium at the University of Arkansas, USA to eliminate the undesirable features attributed to irradiated meat products to make it more acceptable to customers. Since the irradiation process induces chemical reactions in the food, which can lead to carcinogenic products, shifting to natural or synthetically pure antioxidants is recommended to keep the meat products away from oxidation. A dash of grape seed extract or green tea extract found to soften the texture and discoloration associated with the irradiated chicken. Despite the elimination of foodborne pathogens irradiation brings certain undesirable properties such as changes in colour, odours and off flavours. Study reveals that infusing grape seed extracts and green tea extracts into skinless, boneless chicken breast before irradiation could minimize the most of the undesirable changes.

TBHQ, is the pure synthetic anti oxidant which could minimize the development of off flavours through its optimum activity in preventing oxidation. But still the chemical reactions associated with this synthetic antioxidant could make sensory changes in the food. Respective plant extracts are found to be cost effective as the 8% water is being introduced to the meat in very small quantities. Further the sensory tests have indicated that the extracts at the concentrations used doesn't impart any off flavours. Among other characteristics adhered to these plant extracts are extended shelf life and the maintenance of the quality such as juiciness, the water holding capacity , which is the critical property in meat quality and the succulence. Though the colour change and the quality of meat is independent to each other consumer attraction is more or less depend on the colour of the food.

For more information, contact: nhetti@uar.edu

Optical biosensor to detect *Listeria*

The antibody-based fibre-optic biosensor created by food scientists at Purdue University, USA can detect the potentially deadly form of listeria belonging to the species monocytogenes in less than 24 hours at concentrations as low as 1,000 cells per millilitre of fluid, which is equivalent to the size of a pencil rubber. *Listeria monocytogenes* (Lm), an emerging foodborne disease act as a source for abortion and stillbirth, and in infants and persons with a weakened immune system it may lead to septicemia (blood poisoning) and meningitis. Since the Lm is well grown under low temperatures, keeping soft cheese and processed meat products in the refrigerator for longer period will boost the generation of this poisonous pathogen.



The sensor is made of a small piece of optical fibre - a clear, solid, plastic material that transmits light through its core. The fibre is coated with a type of molecule called an antibody, which specifically recognises *L. monocytogenes* and captures it, binding it to the fibre. When the fibre is placed in a liquid food solution, any *L. monocytogenes* in the sample will stick to the fibre. According to food safety experts presence of 100 to 1,000 cells would be enough to cause the illness. Though the cooking kills most of the *L. monocytogenes* cells that can grow at refrigeration temperature, ready-to-eat products, will easily get caught with this pathogen since the consumers never tend to heat it before use. *"The selectivity, sensitivity and rapidity of this sensor represent a vast improvement over the types of test kits that are currently available commercially,"* said Arun Bhunia, associate professor of food microbiology and one of the sensor's developers.

For more information,contact: bhuniaa@foodsci.purdue.com

New aseptic packaging system

Accomplishing a long felt need, Gold peg International (GPI) has launched an aseptic packaging system to help food manufacturers to keep the consumable foods securely till it enters to the global market from the manufacturing stage. This new RotaTherm aseptic system equipped with high temperature short time cooker heating profile, long run non-stop production and more compact footprint delivers improved taste and nutritional value to the food items while providing solution to spoilage, limited short shelf life and expensive refrigeration. Moreover with this technically improved packaging system food manufacturers would be able to make food at prime freshness and peak supply, to store and ship the product at ambient temperature for future use. Ability to handle highly viscous products and aseptically process particulates up to 25 mm combined with the lack of burnt residues make the system excellent compared to the traditional methods.

Being totally enclosed sterile system, it commences with steam sterilisation of the entire Aseptic RotaTherm system, which is running straight to product (not water), so minimising start up waste. Steam barriers located in the process line prevent ingress of unsterilised air and the proprietary steam injectors holds product suck back. The aseptically processed product is supplied to aseptic packaging in a sealed sterile chamber. This aseptic RotaTherm system offers diverse application flexibility to produce safe ambient consumable product for manufacturers in various key markets including consumer products, industrial food usage and seasonal food processors such as fruit purees and tomato pastes.

Aseptic processing through heat sterilisation destroys all microorganisms and spores, giving food products a longer ambient shelf life. According to the Aseptic Packaging Council (APC), the aseptic process combines the best attributes of paper, plastic, and aluminium. The multi-layer, high-performance aseptic package is designed to lock out light and air, seal in nutrients and flavour and allows its contents to remain un-refrigerated for months. The APC says that the aseptic process, which goes hand-in-hand with the packaging, is a major advance over traditional canning techniques; so it has been hailed as the method which is environmentally friendly, with less material and uses far less energy to manufacture, fill, ship, and store than virtually any other comparable package on the market.

For more information, contact: enquiries@goldpeg.com

Food tester for high-speed analysis

With the continuous formulation of food safety laws, standards and regulations to protect the consumers, there is a rising concern among food industrialist to deliver consistent high quality products to the market.

NDC Infrared Engineering has introduced a user-friendly easy to operate software named Infralab 710 analyser to achieve accurate measurement of multi-component food parameters. The intuitive analyser enables single or multi-component measurements of critical parameters of moisture, fat and protein in a wide range of foods including biscuits, cheese, coffee, dairy powders and snack foods as well as food ingredients such as colourings, flavourings, dried fruit and breadcrumbs. Specially in cheese manufacturing, the device can be used to analyse fat and moisture content.

NDC believes that a major strength of the updated version is its ability to perform high-speed measurements in seconds, compared to the hours needed for off-line laboratory tests. Traditional laboratory measurement techniques are generally time consuming, costly, and operator sensitive. With the launch of this advance technique, food manufacturers would find solutions to certain drawbacks experienced with the traditional testing methods. For instance the moisture content results that may be around +/- 0.25 for traditional methods would be due to sample handling, weighing, temperature inconsistencies and the monitoring cost of fat and protein analysis by traditional chemical analysis. The analyser has no food traps and is sealed to IP65, allowing it to be cleaned to food hygiene standards easily.

www.ndcinfrared.com

Scanners to detect baking batches

Campden and Chorleywood Food Research Association (CCFRA), UK has been developed a first ever infrared scanner to be used in the bakery industry which can indicate the perfect formation of dough in making baked goods such as breads, cakes *etc*. The scanner has been designed to fit inside dough mixers and to monitor detailed changes and characteristics in the dough, such as moisture content, down to the number of hydrogen bonds formed, and protein content. Uniformity of the products could be achieved as the scanner has the ability to inform manufacturers when the dough is adequately mixed to get optimum texture or product. Quality and consistency improvements through this technique enable manufacturers to cut down the wastages while increasing the potential output.

CCFRA has also developed a computer tomography scanner equipped with a baking chamber fitted inside to monitor the progress of baked goods at the time of cooking. The scanner will send out images of the product in the baking chamber. According to Dr. Paul Catterall, groups baking Manager, the scanner provide facilities to bake many items and simultaneously it gives images of the products in the baking chamber including the development of texture and bubbles. Excessive crust and bubble formation during baking are both potential pitfalls for bakers, which might make the difference between products good for retailers' shelves and those fit only for the bin. Further CCFRA is stepping towards to use the CT scanner in the future to identify the reasons for occurrence of problems during baking and to find measures to prevent and control such problems.

www.campden.co.uk

Curry ingredient could clean food

Collaborative research done by the scientists at the University of California, Berkeley, and the University of California Institute for Mexico and the US, revealed presence of powerful antibacterial agent identified as Dodecenal in coriander. The compound found to be present in the leaves and the seeds of the plant and it is twice as potent the commonly used gentamycin, which kills *salmonella*. The compound also seems to sidestep the problem of antibiotic resistance thus help keep people healthier and to boost cleanliness of food products.. Most commercial antibiotics work by interfering with bacteria's protein-manufacturing mechanisms, which the bacteria can counter. Dodecenal, however, works by destroying cell membranes, against which the bacteria have no defence. Large amounts of fresh coriander, in salsa perhaps, might be a safeguard against food poisoning, but it's more likely that the dodecenal could be used in a tasteless formulation to provide disinfection in food processing. It could be used as a protective coating for meats, for example, or as an ingredient in cleaning materials, both for equipment and for hand washing.

For more information, contact: ucmexu@ucr.edu

Natural food preservative from grape

Natural alternatives to commonly used food preservatives in processed foods are growing in demand as consumers reluctant to use synthetic food additives in favour of a natural equivalent. Scientists in Turkey have developed an anti-microbial agent from grape pomace extract, which is a combination of grape seeds, skin and stems. When tested on all bacteria species at a concentration of five per cent it showed antibacterial properties. Role of food preservatives have become more important in recent past due to launching of wide variety of food products to the global market. Preservatives will slow down the activity or kill the disease causing bacteria leaving a fresh and flavoursome product. Chemical preservatives commonly used are benzoates (such as sodium benzoate), nitrites (such as sodium nitrite) and sulphites (such as sulphur dioxide). In addition to being able to destroy food pathogens, pomace is also a rich source of phenolic substances that are believed to reduce the risk of heart disease and cancer by inhibiting human low-density lipoproteins. Pomace is already used as an important by-product of winemaking in the production of foods such as vinegar and molasses.The product will no doubt be a strong competitor with other natural food preservatives such as sugar, honey, alcohol, antioxidants (vitamin E) and glycerine.

www.crciyes.edu.tr

Detection of foreign yeast cultures in Yoghurt

Youghurt manufacturers will get a sigh of relief with the electronic nose technology developed by the Sensor Array Instrumentation to detect the foreign yeast cultures in the yoghurt. It features quick analytical detection and classifying of sample with out expensive lab procedures. Data will be presented in the form of "good" or "bad". Using sensor arrays instrument is able to pick up the different metabolic products originating from the various fungi in an early stages saving the time and minimizing the product loss.

www.foodproductiondaily.com

Innovative textile finishing

Enzymes have been developed for the finishing process of cellulose-based textile materials such as cotton, linen, viscose and their blends with synthetic fibers. After the treatment, garments and fabrics become soft, drape better and tend to crease less. It stays pill-free and appeared to be looked like new even after repeated washing. It also improves the properties of fabrics made from Cupro, Lyocell, Tencel or other Polynosic fibers.

This treatment gives woven textiles softness and fluidity. The fibrillation characteristic for Lyocell is easily controlled by treatment with Cellulases producing soft fabrics with luxurious feel and drape. Enzyme treated fabrics could be dyed in deep and bright colors. Advanced enzymes act on fibers to remove surface impurities and loose fiber ends but ensuring that fibers themselves are not damaged.

For more information, contact: AB Enzymes Singapore Branch, Singapore
E-mail: trandinh@abenzymes.com.sg

New generation of digital textile printing machines

Most of the digital textile printing machines used for general textile applications deliver a high-resolution image but its speed is relatively slow. For anything approaching production volumes, banks of these printers must usually work in parallel. This is one practical, but still barely more than experimental, approach to the development of the digital method in a production environment.

This new digital printer competes head-to-head with rotary screen-printing and it has a printing speed of 20 linear metres a minute (1.6m wide) at 144 dpi using either reactive or pigment inks. Crucially, the machine can run on standard screen printing inks reducing the cost per metre.

Based on its option called three colourways per design, the print cost for runs of less than 1,000 metres would be equal to or less than rotary screenprinting. However, longer runs (eg. 1,500m) will be slightly higher.

For more information, contact: World Textile Publications Ltd., United Kingdom
E-mail: info@world-textile.net

Tufted-carpet sampling technology with flexibility

This new machine has the capability to use eight different types of yarns or colors in one sample, but only one package of each yarn is required. A needle is used to stitch a line of tufts from right to left and the backing is advanced for the next line.

This advance of the backing between lines of tufts becomes the gauge of the sample. The gauge, therefore, is controlled by a computer and is adjustable with a software. The stitch rate is precision controlled by the computer and also adjustable. The software selects the required needle. The traverse from right to left can be modified to 'zig-zag' and sliding needle bar product can be reproduced following a cam pattern. It gives remarkable flexibility as it has capability to sample any type of tufted carpet. It could be an economical alternative to expensive Full-repeat scroll (FRS) sample machines. It replaces many dedicated fixed-gauge sample machines. This gives flexibility and adaptability to the sample department. The machine has a dual-screen.

For more information, contact:
World Textile Publications Ltd.

New fibre-glass fabric

Owens Corning has launched new woven, roving-based glass fibre fabrics for composites with an infusion rate up to ten times that of current products. This product is made from glass fibres, combining woven- roving and continuous filament mat in a patent-pending construction. Its outstanding performance characteristics could assist boat builders to switch from open to closed molding while making it comfortable and profitable.

For more information, contact:
World Textile Publications Ltd.

Nano-Technology based new textile processing technology

Toray Industries, Japan has devised a "nano-scale processing technology" that enables an even coating of functional material onto each monofilament of the treated fabric.

According to Toray, this technique allows the formation of molecular arrangement and molecular assembly necessary to bring out more advanced functionalities in textile processing than the existing processing. The technology has succeeded in forming coatings of functional material in the order of 10 to 30nm gives on each of the monofilaments that forms a fabric. A such uniform coating was not possible with existing technology which put functional material in the gaps between the monofilaments and the intersections of the fabric. By forming an even coating of the functional material on the monofilament, this technology provides stable high functionality without losing the texture of the fabric. The company also comments that this technology results in a marked increase in the surface area that is coated, making it possible to improve functionality and durability.

For more information, contact : Toray Industries, Inc. Toray Bldg., 2-1, Nihonbashi-Muromachi 2-chome, Chuo-ku, Tokyo 103-8666, Japan

Spinning spider-silk fiber from goats

Now researchers believe that they have found the perfect spider-silk factory in dairy goat farms. On farms in the Montreal suburbs and in Upstate New York, researchers are breeding hundreds of goats genetically engineered to produce milk rich with spider-silk proteins that can be spun into fiber. Nexia Biotechnologies Inc., Canada raises the goats, envision a burgeoning market for its spider-silk fiber, which it calls BioSteel. The military wants comfortable body armor strong enough to protect against bullets. The company also sees medical applications such as artificial ligaments and super-strong thread for surgery. Other products include biodegradable fishing line and designer clothes.

Now the company wants to demonstrate that it can produce spider-silk protein on an industrial scale. The company is breeding the transgenic goats with more than 1,000 ordinary goats on a farm outside Montreal. With genes for several kinds of spider silk it could be possible to produce a variety of fibers with different properties.

www.jesus-is-savior.com

Assessing textures and performance characteristics of fabric online

A Patent-pending technology, which will enable the textures and performance characteristics of fabrics to be assessed online would shortly be introduced by fashion retailers in the UK. It is a computer software, which uses a series of interactive virtual-reality animations to accurately mimic the movement of various fabrics as the mouse pointer is dragged across them. It would be a crucial tool in minimizing the amount of returns of clothes purchased via the internet.

For more information, contact: World Textile Publications Ltd.

Solar- powered jacket

Technology Enabled Clothing (TEC) has teamed up with ICP Solar Technologies, Canada to develop solar powered jackets designed to allow wearers to carry, connect and charge their portable digital devices.

The solar panels are attached to the jacket with removable sleeves and over 30 hidden pockets. The jacket features Personal Area Network (PAN), which conceals wires associated with power sources and ear buds. The solar panels in the jacket consist of unique flexible thin-film photovoltaic material made from copper indium gallium diselenide (CIGS) sunlight absorbing material placed onto a thin stainless steel substrate. The panels convert sunlight into electricity that charges a hidden battery pack about the size of a deck of cards. The battery pack in turn can charge any device compatible with USB chargers such as cell phones and MP3 players and other mobile devices.

The solar panels are removable and can be used separately from the jackets. The jacket's battery can begin powering devices almost immediately after the solar panels are exposed to sunlight. Once the battery is fully charged, the panels can be removed.

For more information: contact, Scott Jordan
E-mail: sjordan@scottevest.com

Jacket which has keyboard on sleeve

Infineon, Germany has developed a jacket that includes a textile keyboard on the sleeve.

According to Infineon, this product is intended for "technologically progressive, fashion conscious men" and said it would be available in the market in near future. This jacket is made up of woven electrically conductive fabric connecting to a textile keyboard on the left sleeve, to headphones and to a microphone built into the collar. The memory module built into the jacket has 128MB of memory, a Bluetooth gateway for mobile phones and a rechargeable eight-hour battery.

When a "fashion conscious man" wants to make a phone call, the stereo system becomes a headset and the music pauses. You could wash the jacket but you must remember to take the electronics module out of its holder.

For more information, contact: SPLS LP MS - Infineon Book Shop, P.O. Box 2352
90713 Fürth-Bislohe
Germany.

"Sunset" phase of the textile technology

Possibilities of merging textiles with electronics will take things much further. Elisabeth de Senneville, a French designer has designed an initial range of purpose-built garments containing new flexible colour screens developed by France Telecom. The ability to get moving images with sound into fabrics is likely to be the significant change in fashion in the industry. Not only would it open up a whole new area of designing capabilities it could allow clothing to rise above being 'paid-for-once' commodity. In principle, it would operate in the same way with endless new images of TV icons, football games and pop stars *etc*.

A second breakthrough would be the introduction of an improved low cost Quantum Tunnelling Composite (QTC) textile switch and sensor technology which will rapidly open up the market for incorporating electronic equipment into textile goods. QTCs can transform from a virtually perfect insulator to a metal-like conductor when deformed by compression, twisting or stretching. As we moved from the Industrial Age to the Information Age at the end of the 20th Century, every industry is in the process of being reinvigorated and textiles will be one of the first.

For more information, contact: Adrian Wilson,
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MANAGEMENT OF TECHNOLOGY

An empirical investigation of the roles of prior knowledge and learning activities in technology transfer

This study analyzes 120 university–industry technology transfer projects. A significant positive relationship was found between the learning activities performed by the firm during the development and implementation stages of the technology transfer project and the benefits to that firm from the project. In contrast, prior knowledge of the firm about the existing technology was found to have only a marginal contribution to the project benefits. However, further exploratory analysis based on high and low levels of technical and organizational uncertainty revealed more provocative relationships

For more information, contact: Abdelkader Daghfous , School of Business and Management, American University of Sharjah, Sharjah, UAE.

An empirical study on the correlation between knowledge management capability and competitiveness in Taiwan's industries

There have been dramatic changes in business enterprise management since Internet technology has been widely applied. Worldwide network users can share all kinds of knowledge through the Internet. Knowledge has currently become a main part of manufacturing resources and a prerequisite for success in the production environment. Competitiveness and the resulting rewards can be obtained by taking advantage of knowledge management (KM) and intensive learning. This empirical study validates the relationship between knowledge management capability and competitiveness in Taiwan's industries. A hypothesis test and theoretical model are proposed in this study.

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Investing in new materials: a tool for technology managers

A technology management tool has been developed to determine the attractiveness of a materials innovation by systematically assessing the technical and economic viability, along with the likelihood to capture profits created. The Investment Methodology for Materials (IMM) may prevent companies from pursuing investment strategies destined for failure. Small and medium sized enterprises (SMEs), often started by the inventor of a new material, have had particular difficulty in commercialising new materials—either due to the upfront and risky expense involved in displacing an incumbent material in a mature industry or due to the need for complementary innovations to enable a radical innovation.

IMM helps identify promising materials innovations at an early stage, helps to direct research and development in directions most likely to lead to successful exploitation, shortens the gestation time of materials substitution and guides investment strategy. IMM adapts existing and emerging predictive software tools and business strategies to materials innovations, linking them to give a practical, comprehensive procedure. It consists of three interwoven strands: *viability analysis*, *market assessment* and *value capture*.

For more information, contact: Elicia Maine, Simon Fraser

An exceptional development pattern

India's exceptional development pattern, specifically the major importance of information technology services (ITS), was studied comparing with China's development pattern. Both countries want to develop capabilities for carrying out the innovation of technologies that compete at the state-of-the-art in the world market. This posits that technological/economic success in the contemporary world market requires the ability to innovate complex technologies and complex technology-related services. The share of trade represented by complex technologies is compared with the "high-tech" share. The trading patterns of the two countries are compared using United Nations data. Historical and cultural differences appear to explain some of the differences in the development patterns of the companies located in the two countries.

For more information, contact: Don E. Kash, Robin N. Auger and Ning Li, School of Public Policy, George Mason University, Fairfax, VA, USA

Defining and improving technology transfer business and management processes in university innovation centres

The aim of this study is to investigate how potential business and management inputs can be used to define and to suggest improvements for two key technology transfer business processes, namely the technology licensing process and the business building process. A stratified pathway process mapping approach is used. This research approach includes semi-structured interviews with University Innovation Centre small firms, focus groups with Innovation Centre stakeholders and best practice benchmarking. The findings indicate that a modified processual approach can be adopted to define key business processes within technology transfer. Using this approach it is possible to show where business and management interventions can most effectively be deployed in each process.

For more information, contact: Rodney McAdam School of Business, Organisation and Management, University of Ulster, UK.

Managing public–private partnerships: the enactment of a new business venture

Phoenix was established to encourage nascent entrepreneurs to set-up technology-based companies. The project developed as an informal partnership between a small number of staff from X Business School and the business contacts of a retired entrepreneur. Data are drawn from participant-observation and interviews with all main actors to illustrate the process of enactment over an 18-month period. It is concluded that the failure of *Phoenix* was due to difficulties in reconciling substantially different objectives between public and private sector participants. In addition, the micropolitical activities of key actors associated with the new organization contributed to the lack of trust between the two groups.

For more information, contact: Oswald Jones, Manchester Metropolitan University Business School, Manchester, UK .

Cooperation, competition, and innovative capability: a panel data of European dedicated biotechnology firms

Small and medium high-technology firms usually develop upstream and downstream ties in order to perform their new product development process. Many of these alliances are characterized by co-opetition dynamics, that is, partners collaborate and compete simultaneously.
Traditionally, competitive and cooperative theory has been analyzed as different research streams. Although scholars and managers have recognized that striking a balance between both strategies (co-opetition) plays a key role in the performance of innovation process, little empirical research shows evidence about this relation. In this paper, firstly, a review of theoretical perspectives of co-opetition is made, and then, we identify alternative strategic behaviors from the combination of competitive and cooperative attitudes. Finally, we show the results from a study of a sample of European dedicated biotechnology firms, where we analyze the effect of co-opetitive strategy on technological diversity and new product development

Technovation, International magazine

The role of export-driven entrepreneurship in economic development

In the puzzle of economic development, there is moderate agreement around one issue: that entrepreneurial, export-led development is likely to produce higher economic growth rates than inward-looking development.

This paper begins by taking an overall look at the size and competitiveness of the economies of India, China, and Taiwan, with particular reference to the software and the information technology (IT) sectors. It then focuses on the role of software export entrepreneurship in India and Taiwan as exemplars for other sectors and for formulation of government policy. In Taiwan, successful exporters constitute a model deemed worthy for other companies to emulate. In India, whether the booming software sector will prove to be a sufficient exemplar and

catalyst for change throughout the economy and government remains an open question. The paper concludes by taking a look at another related export sector—IT-enabled service exports. Throughout the various sections of the paper, government policy implications remain an important backdrop.

For more information, contact: Farok J. Contractor and Sumit Kundu[b] ,Rutgers School of Business, 111 Washington Street, Newark, NJ 07102, USA

Resonant R&D structure for effective technology development amidst megacompetition

Under the megacompetition in globalizing economy while facing long lasting economic stagnation, the effective utilization of potential resources for innovation has become a crucial strategy for R&D intensive industries. The construction of a smart cooperative R&D structure has thus become significant. Among Japan's R&D intensive industries, the transport machinery industry has constructed an effective cooperative R&D structure by smartly -complementing both comparatively advantageous and disadvantageous technologies by means of integrating the effective utilization of technology spillover and joint collaborative R&D.

Prompted by this complementing system, this paper attempts to elucidate the mechanism enabling the transport machinery industry to construct the smart cooperative R&D structure. Resonant R&D structure is identified as a source of such R&D cooperation leading to increasing its marginal productivity of technology.

For more information, contact: Chihiro Watanabe and Jae Yong Hur,Department of Industrial Engineering and Management, Tokyo Institute of Technology,, Tokyo, Japan..

Technology diffusion management in East Asia

The success of East Asian firms in high technology industries, such as semiconductors and information technology products, is now an established fact. Against all the advantages of incumbents, these latecomer firms have found ways to insert themselves in worldwide production systems and to compete in advanced markets. But this very success poses a number of challenges for organisational and management theory. According to the conventional view, firms ground their success in R&D and innovation. When the firm wishes to expand abroad, it exports its technology.

Yet it is clear that successful firms from East Asia have not built their competencies on conventional foundations through R&D, nor have they been recipients of technologies transferred by advanced firms for reasons to do with product cycles. On the contrary, the East Asian firms and agencies act as instigators of the processes of technology acquisition, acting in accordance with their own strategic impulses.
Nevertheless a coherent and plausible account of East Asian success in knowledge intensive industries can be built on the basis of a ''competence'' or ''dynamic capabilities'' approach, where the focus is not on individual firms' own competence development, but on the processes of collective competence acquisition, through technology diffusion management, where firms and public agencies utilise various technology leverage devices.

The goal of such an account is the construction of a ''mapping'' of the processes of diffusion, so that the degrees of leverage involved may be displayed, and the firms' own efforts to ''internalise'' the acquired capabilities may be captured. The paper presents a model of technology diffusion management, couched in terms of the strategic goals of the process, the pathways of diffusion, the dynamics of the process, and the institutional vehicles involved. The paper examines the limits to applicability of such an approach to industry creation, and the uptake of technology leverage processes in advanced environments, in conditions of rapid technological change, or ''hypercompetition''. The paper draws on these ideas to develop the notion of a ''national system of economic learning'' where the focus is on technology diffusion management, in contrast to the conventional notion of a ''national system of innovation

International Journal of Technology Management (IJTM)

Vein camera keeps injections on target

Herbert Zeman, a biomedical engineer at the University of Tennessee in Memphis has invented a device, which projects a creepy green video image of a patient's veins onto their skin. This vein camera will help medical staff to pinpoint a suitable vein for an injection or a drip preventing the discomfort and delay of botched attempts to pierce veins for injections and blood tests. According to Herbert Zeman, to stick a vein properly the user has to get it in exact position as if it hits off position it will rolls out of the way. The prototype of the system, introduced as Vein Contrast Enhancer (VCE), uses a near-infrared camera to capture a real-time video image of the patient's veins, a PC to enhance the contrast of the image and a desktop video projector to display it on the skin in real time. The vein contrast enhancer can detect veins up to 8 mm below the surface of the skin.

An array of near-infrared LEDs surrounding the camera's lens illuminates the skin at a wavelength of 740 nanometres. This wavelength is strongly absorbed by blood, and subsequently scattered by the surrounding tissue making tissues light in colour and veins and blood darker. The image from the camera is fed to a PC running imaging software that maps the image onto a bright green background in real time and boosts the contrast between the veins and surrounding tissue. The PC then feeds this image to a projector that beams it onto the skin. The image of the veins has to be projectedin exactly the right place unless the system becomes utter failure. The key device called a "hot mirror", is transparent to visible light but reflects infrared (hot) wavelengths. The video projector and camera are set at 90 degrees to each other facing the mirror, which is set at 45 degrees to both of them. After calibration, this ensures that a vein always appears within 0.06 millimetres of its correct position. Green light is used as the backdrop because the infrared camera does not sense it. Now the VCE system has been miniaturized to fit it in a package the size of a shoebox, making it portable enough to be mounted on an intravenous drip stand. Three prototypes of this kind will begin clinical trials at a hospital in Tennessee very soon. Easy placement of the intravenous drip may make the patients comfortable and the children having small veins and thick fatty deposits will enjoy the spooky green image of the vasculature on their arm.

For more information, contact: hzeman@utmem.edu

The world's first hands-free binoculars

HiStar, Inc., the original hands-free binocular company, dedicated to the innovation and development of high-quality consumer optical products in Florida has introduced its line of hands-free binoculars. The headset features a padded, adjustable headband and focus-free, wide-angle binoculars. Optional radio headphones are a welcome addition to this patented combination. Hands-free capability offered by this systemwill be an asset to sports enthusiasts, nature buffs and surveillance users This patented technology is an innovative approach to enhancing the viewing experience.

Previously, spectators were forced to deal with the awkwardness of traditional binoculars, the extended binocular viewing can be experienced hands-free, in addition the optional AM/FM radio combination allows spectators to hear the play by play of their favorite sporting event.

For more information, contact: info@sportbinox.com

Silicon wafers to power electronic devices

Engineers have moved a step closer to batch producing miniaturised, jet engine-based generators from a single stack of bonded silicon wafers. These chip-based "microengines" could one-day power mobile electronic devices. David Arnold and Mark Allen of the Georgia Institute of Technology, US, have built the first silicon-compatible device capable of converting mechanical energy a rotating microturbine. The key advantage of microengines is that they pack in at least 10 times more energy per volume of fuel than conventional lithium batteries, take up less space and work more smoothly than much-touted fuel cells. Stuart Jacobson at the Massachusetts Institute of Technology, US, collaborate researcher of this study identifies this equipment as a remarkable piece of work to generate macro sized amount of energy from micro-scale device.

David Arnold and Mark Allen of the Georgia Institute of Technology, US, have built the first silicon-compatible device capable of converting mechanical energy produced by a rotating microturbine - into usable amounts of electrical energy. Investigations are underway of spinning a flat metal ring about the diameter of a penny made up of alternating 45° sections of magnetic north and south poles to generate 1.1 watts to power a cellphone or GPS receiver. This advance technique will attract the attention of soldiers who currently rely on battery-powered laptops, night-vision goggles and GPS systems to face power problems.

For more information, contact: DARNOLD@coe.eng.ua.edu

Commercial terrestrial DMB chip

Samsung Electronics has developed the world first terrestrial Digital Multimedia Broadcasting (DMB) chip, the next generation broadcasting service. The media processor chip and channel chip that the company newly developed are smaller in size and higher in energy efficiency, thanks to the high integration technology. Samsung Electronics explained that the new DMB chip achieved both mobility and energy efficiency, which is critical to the mobile receiver. The company emphasized that the terrestrial DMB chip along with the satellite DMB chip that the company developed in February would strengthen its prowess immobile DMB technology.Samsung's media processor chip can work with MPEG2 transport Streaming and MPEG4 audio- video data on a real-time basis at low energy consumption, while the channel chip is compatible to Korean terrestrial DMB channels and European DAB standards as well.

www.sasungelectronics.co.uk

Mobiles double up as bus tickets

By year 2005 commuters in the City of Hanau, near Frankfurt, Germany will be provided with a wireless ticketing system to make the travelling easier by reducing the long queues. Using the Nokia 3220 handset, passengers will be able to pay for tickets by passing the phone over a smart card reader installed on the bus. Nokia has worked with electronics giant Philips to develop a special shell for the mobile phone that will be compatible with Hanau's existing ticketing system. The ticketless trial will enable to access transport information and timetables via the phones. The system opens up possibilities for mobile devices to be interact with everyday environments used in shops to get product information, at bus-stops to get information about the next bus or, for example, by being passed over an advert of a rock star to find out details of concerts or get ring tone. Transport systems around the world will get the advantage of this technology and this could further offer access to a lot of services and makes it easy to get the information according to the clients need.

www.nokia.com

Chips flip to lead-free

International Business Machine Coorporation has revealed details of its next generation, 100 percent lead-free flip chip packaging technology called "C4NP" (Controlled Collapse Chip Connection New Process). The company claims C4NP will be the first flip chip technology to be lead-free and offer high reliability, fine pitch, lower material costs and offer the flexibility to use virtually all types of solder compositions. C4NP allows the creation of pre-patterned solder balls to be completed while a wafer is still in the front-end of a manufacturing facility, potentially reducing cycle time significantly. The solder bumps can be inspected in advance and deposited onto the wafer by using a process similar to wafer-level bonding.This process technology is said to retain the simplicity of solder paste (stencil and screen) printing but instead uses pure molten alloy to produce the fine pitch capability of electroplating. C4NP could easily accommodate binary, ternary and quaternary alloys while minimising the additive costs of consumables since only the solder balls are created and transferred to the wafer, without waste. It is fairly independent of wafer size, allowing 200 and 300 mm wafers to be processed with similar efficiency.To accelerate the commercialization of C4NP, IBM is collaborating with SUSS MicroTec which will develop a full range of 300 and 200 mm processing equipment that will enable successful fabrication of C4NP. IBM is offering on-site process training to customers that buy these systems.

www.ibm.com

CMOS image sensor

The world's first 5 megapixel CMOS image sensor developed by OmniVision Technologies had been displayed recently in Germany.The OV5610's new architecture is based on recently launched OmniPixel technology. The sensor's 2.775-micron pixels allowed the company to design the device with an optical format (footprint) of just 1/1.8 inches, making the OV5610 small enough to meet the increasing demand for smaller, low-cost cameras. The new device incorporates a 2592 x 1944 image array and an on-chip 10-bit A/D converter capable of operating at up to 4 fps in full resolution (QSXGA).OmniVision's sensor technology uses advanced algorithms to cancel fixed pattern noise (FPN), eliminate smearing, and drastically reduce blooming as well as dark current.

For more information, contact: marketing@ovt.com

Optical proximity sensor for mobile uses

A new miniature, low-cost optical proximity sensor developed by Agilent Technologies will enable a variety of applications in compact mobile devices. In mobile phones, for example, Agilent's proximity sensor enables an automatic change from loudspeaker to earpiece mode when the phone is placed near the ear. Current phone models require user intervention to switch between loudspeaker and earpiece mode.The new device can also detect the opening and closing of popular clamshell mobile phones and can activate the power-saving mode in notebook computers.The proximity sensor is ideal for paper-edge detection in printers, photocopiers and fax machines.It can also be used to switch on/off home appliances, such as table lamps, without the need for mechanical switches.

There are many other potential applications within the consumer, industrial and automotive markets. Agilent's HSDL-9100-021 optical proximity sensor is specifically optimised for size, performance and ease of design in mobile appliances.Its small footprint (7.1 x 2.75mm and only 2.7mm high) is ideal for space-constrained applications, and it offers a variable detection range from approximately 0 to 60mm that allows manufacturers to easily customise the device for multiple applications.The proximity sensor is packaged in a metal housing to shield the LED emitter from the photodetector.The surface-mount, lead-free package eliminates optical crosstalk between the LED emitter and the light sensor to assure high signal-to-noise ratio for reliable performance.The unit also features an integral ambient light filter and guaranteed performance over the -25 to +85C temperature range.The HSDL-9100-021 proximity sensor is available now through Agilent's direct sales channel and worldwide distribution partners.

www.agilent.com

Optical fibers enhance communication

Rather thin optical fibres to combat the leaks that can severely weaken a telecommunication signals conveyed over long distances, have been created by Eric Mazur of Harvard University in Cambridge, Massachusets. Being delicate, smooth and flexible they can guide light signals around tight bends avoiding leaky corners experienced with the conventional ticker counterparts. In order to keep the signals uninterrupted conventional systems have been installed with amplifiers every 50 Km. Maintenance of these require investment of considerable amount of money specially the cables when laid in remote areas and sea floor while the new super thin fibres might negate the need of in line amplifiers

For more information,contact: mazur@physics.harvard.edu

The Internet's next big step

The Internet is about to take its next big leap. Imagine being instantly connected anytime you opened the lid of your laptop, anywhere

WiMAX, the high-powered technology that promises to bring true mobility to the Web, is just around the corner.

It is a step beyond Wi-Fi, the wireless technology already being installed on many laptop computers today.Putting that kind of capability inside the computer, so the buyer doesn't have to worry about it, is a big part of the puzzle that determines when a new technology reaches widespread acceptance in the market. That — and price.

Make things easy and cheap, and the customers will come. At least that's what wireless technology companies are hoping for. Not so long ago, most computer buyers took for granted that their new machine would come with a dial-up modem installed. In those days, you typically could download 1 megabyte in about five minutes, depending on the speed of your connection.

With Wi-Fi, you might find yourself downloading up to 1 megabyte in less than ten seconds as you lounge by the pool. WiMAX will offer even higher speeds over even larger areas. Your super-powered laptop could have the coverage of a cell phone.

www.cnn.com

Phone and PC phone battery optimizing technology

As cell phones and PC phones become more functional by sending and receiving e-mails, web access, video and other signals – the drain on the batteries increases as well. In spite of new battery technologies such as lithium ion, there never seems to be enough battery life to get through the day. Sharp Laboratories of America developed a technology that greatly extends the life of cell phone or PC phone batteries.

Sharp's new technology saves battery power by having the device initialize requests for data transfer, such as a wireless packet switched connection network. The method is especially practical in the transfer of large amounts of data that need not be received in real-time. Since only the mobile unit user or mobile unit embedded applications program initiates requests for data transfer, the mobile station need not monitor the forward link signal. The mobile station Deep Dormant. mode saves battery power by completely disabling the receiver circuit when no data is to be sent or received. As a result, the mobile station enjoys longer battery life.

For more information, contact:Sharp Technology Ventures, , Washington 98607, USA..

Sony takes on iPod with new Walkman

Sony Corp unveiled its first MP3-compatible, hard disk Walkman music player in an attempt to recover ground lost to Apple Computer's iPod.

From gramophones to iPods, the technology of recording and playing music has continually evolved since it first captured a human voice on a record. The world's biggest consumer electronics maker aims to reclaim the market for portable and personal music devices, which it helped to launch 25 years ago with its first Walkman.

The new hard disk player is the successor of Sony's first hard disk Walkman, which it introduced this summer but which can play back only music compressed with Sony's proprietary Atrac software. Atrac is the format Sony uses on its Internet music shop Connect, which opened in Europe this summer.

Putting MP3 playback capability in the new Sony Walkman NW-HD3 means consumers can directly import and export tracks in the MP3 format, which is more popular than Atrac.

www.sony.com

Cities find Wi-Fi future

It's not Silicon Valley, but Chaska, Minnesota, that may be moving to the leading edge of Wi-Fi technology as it begins offering the service for all city residents.

As the Internet is going to be just as much a part of everybody's future as the telephone or electricity is and Bradley Mayer, Chaska's information systems manager wants to make sure that everybody has equal access to it and to ensure there is some sort of broadband activity that could be affordable by Chaska residents.Chaska joins a spate of other cities preparing for or launching municipal-run Wi-Fi networks.

Currently, the city with a population of around 18,000 has signed up about 2,000 subscribers for the service, Mayer says. While the city works on tweaking the 200 access points placed throughout town, the service is free. When it becomes fully operational in October, subscribers will pay $15.95 a month.The low cost is one of the advantages of having a municipal-run Wi-Fi network over a private company.

www.edition.cnn.com/2004/TECH/internet/10/18/wireless.city/

A smart web browser plug-in

A smart web browser plug-in which promotes skimming of electronic documents by automatically analyzing the contents to produce both a relevance score and the location of all relevant text. Individuals seeking information on the Internet or in large document databases typically use a search engine to search for keywords contained within a web page or document. However, once a potentially relevant document is loaded into a user's document browser, it is often difficult to determine how relevant the document actually is and where the relevant areas of the document are located, especially in longer documents. The typical user would benefit from having a tool which provided a measure of relevance each time a document was loaded and which allowed the user to quickly skim the document to view the relevant areas. Our system offers a way to supplement standard search techniques with an enhanced method of analyzing the contents of a web page or document based on a user's persistent goals.

www.yet2.com

Method and system for communication access restriction

A network-based telecommunications system and method that restricts the dial-in access to a resource of a subscriber to only a communication from an authorized user of the resource. A switch receives a communication directed to a subscriber from a calling party. Prior to connecting the communication to the terminating equipment associated with the subscriber, the switch requests processing information. An authentication unit determines whether the calling party is an authorized user by checking whether a passcode provided by the calling party corresponds to a passcode being held by the authentication unit. If the passcode corresponds, then the authentication unit identifies the calling party as an authorized user, and the communication then may be connected to the terminating equipment of the subscriber. If the passcode fails to correspond, then the authentication unit fails to identify the calling party as an authorized user. The communication is not connected to the terminating equipment of the subscriber.

Industrial inspection techniques, e.g., cell colony counting, discrete part inspection, identification of discrete carpet features and counting pigment elements embedded in a polymer. Also, due to their adaptive nature, the methods of this technology make image analysis independent of variations in imaging conditions such as lighting, positioning or electronic amplification.

For more information, contact: BellSouth Corporation, Atlanta, brent.fowler@bellsouth.com

Short range microwave data system and transponder offer high data rate, overcome noise

The world is filled with radio frequency interference (RFI). Engine distributors, microwave ovens, integrated circuits, electric motors, two-way radios, and power lines all disturb the ether with noise. Short range radio and transponder systems must contend with such noise and continue to exchange data in that harsh radio environment.Such radio systems with passive transponders have many applications.
Smart cards, retail and warehousing goods identification, and toll systems can all make use of a transponder system that does not require contact between the central station and the transponder.

For more information, contact:France Telecom, emmanuelle.pierga@francetelecom.com

Knowledge system captures and leverages an organization's expertise

The Caterpillar Knowledge Network is a web-delivered software system that provides on-line collaboration and access to expertise through "communities of practice"— groups of people associated by common interests that cross business unit, geographic, and even corporate boundaries. Users ask and answer questions, share information, research specs, and otherwise organize, preserve, and leverage an organization's collective expertise. People outside the organization can also participate under the control of the Caterpillar Knowledge Network's security levels.
ROI studies have shown a 200%–700% return. People associate in "communities of practice" by their expertise, interest, or by the task at hand, rather than being restricted by artificially imposed boundaries such as business unit, engineering function, or career path. 2) "Communities of practice" established as needed, for as small or as large a group as needed, and exist as long as they're needed. 3) Decentralized control imposes no large management overhead. Users seek their own "communities of practice" and can join at will (security levels allowing) and leave at will. Negotiations are currently underway to license the Knowledge Network.

www.yet2.com

Activity monitor system non-obtrusive statistical monitoring of operations on a shared bus of a multiprocessor system

The technology described in this listing is an apparatus for monitoring the hardware activity of a multiprocessor system. The apparatus nonintrusively monitors certain physical operations within a parallel processing system to determine the time each processor spends performing these activities.This information is critical to determining the contributing sources of performance degradation and of their sensitivities to various exigent conditions.

For more information, contact:Harris Corporation,West NASA Melbourne, Florida.

Adaptive image analysis systems for object identification

This technology is comprised of a comprehensive set of methods and systems for automated image analysis — useful for object identification and characterization. The technology employs a variety of recursive, iterative and parallel processing methods which are well suited for use in analysis of images (such as satellite imagery or materials characterization images) or for industrial inspection techniques, e.g., cell colony counting, discrete part inspection, identification of discrete carpet features and counting pigment elements embedded in a polymer. Also, due to their adaptive nature, the methods of this technology make image analysis independent of variations in imaging conditions such as lighting, positioning or electronic amplification.

For more information, contact:dupont@yet2.com.

Rapid prototyping facility

The state-of-the-art Rapid Prototyping Facility has been recently devised by Indian Institute of Technology, Bombay. and several companies now employ the technique for their product development.

Rapid Prototyping (RP) is involved in manufacturing of complex 3D objects as easy and simple as printing a letter or drawing a picture. RP machines are also called '3D Printing' or '3D Faxing' machines. This fairly new and fascinating technology has revolutionized the way that products are being designed and manufactured today. It enables manufacturing of physical objects directly from its CAD models without any human intervention or use of any tools, dies specific to the geometry of the objects being produced. The object is built in an automated layer-by-layer manner, requiring only a definition of its geometry. Rapid Prototyping & Tooling (RP &T) has distinct benefits since the process shortens the product development cycle and with less number of tools in manufacturing cycle enabling organizations to launch new products with short lead times.

Objects as large as 25cm x 25cm x 25cm can be made out of plastics using this facility. Bigger objects can be built in pieces and joined using adhesives, mechanically or both. Its major uses include: building concept models in various disciplines of mechanical, aerospace, civil and bio-medical engineering and product design directly from CAD files.

For more information, contact: Prof. K P Karunakaran
E-mail: karuna@me.iitb.ac.in

Internet based robotic assembly planning system

Globalization has posed many challenges for product designing and manufacturing due to shorter product life cycles and frequent design revisions. To realize telemanufacturing, collaborative CAD/CAM solutions are needed to enable seamless integration of distributed physical and knowledge resources so as to provide anywhere anytime access. The Computer Aided Manufacturing laboratory at the Indian Institute of Technology, Bombay has developed an Internet based Assembly Planning System for intelligent task level programming of assembly robots. Its Client-Server architecture enables a client to graphically model and synthesize the assembly world. A feature-based CAD modeler enables the user to create and position solid models of parts to be assembled in the virtual world. Unlike the standard robot programming systems that need Teach-in or Joint level information, this new system enables the client to specify tasks at assembly (functional) level in a user-friendly manner. Specific issues addressed include grasp planning, motion planning, collision avoidance, operation sequencing and post processing the programs to suit the controller of the robot in shop.Using this technology, robot programs could be automatically transferred by the client to the remote robot site through the server. According to the developer, it provides an efficient web-based solution for virtual assembly modeling from client-end to its execution in the real assembly environments. The software can be customized to suit specific robot controllers.

For more information, contact: Prof. S S Pande
E-mail: sspande@me.iitb.ac.in

A composite wire featured with best of steel and the best of other metals

This composite wire combines the best of every metal in a single wire. Metals have interesting properties but none has all of them. By bringing several metals together in a composite wire virtually any combination of properties could be achieved. The composite wire combines the strength properties of steel with properties of other metals such as corrosion resistance of zinc or aluminum, rubber adhesion of brass, electrical conductivity of copper or aluminum. The final properties of the composite wire could be tailored by selecting a proper composition of the raw metals. The composite wire is highly flexible in comparison with plain steel wires.

For more information, contact: www.yet2.com
e mail: info@yet2.com

Variable temperature seat cushion

The Variable Temperature Car Seat Cushion, (VTC) is the only product of its kind. It is a seat cushion that actively cools air or heats air that circulates through a seating structure. It is the first thermoelectrically air conditioned seat called Climate Control Seat, (CCS). This seat would be one of the biggest new options in automotive interiors.

Benefits of the VTC are:

1. In its cooling mode the VTC allows the driver to turn off the central AC in warm weather while still feeling as he is sitting in an air conditioned environment. It allows the vehicle to achieve high fuel economy as its maximum power consumption rate is 60-100 watts. Conventional vehicle air conditioning systems use thousands of watts that have to be provided by the vehicle engine.
2. The VTC uses a thermoelectric heat pump which is inherently very rugged and reliable and is also harmless to the environment because it does not use any refrigerants.
3. Driver and passengers can adjust their seat to their individual cooling and heating preferences.
4. The cushion itself is more reliable because there are no wires within as the VTC does not use resistance wires in heating mode.

For more information, contact : www.yet2.com
info@yet2.com

Nano flash welding

A team of chemists at the University of California have discovered this new nanoscale phenomenon. An ordinary camera flash causes the instantaneous welding together of nanofibers made of polyaniline, a unique synthetic polymer that can be made in either a conducting or an insulating form. This technique potentially could apply for areas such as chemical sensors, separation membranes and nano devices. Instead of a camera you could also use a laser, or any other high-intensity light source.

The camera flash induces a chemical reaction; it starts a chain reaction where the tiny nanofibers interact to form cross-link producing heat. This heat leads to more spontaneous cross-linking across the entire surface of the nanofibers welding them together. The technique could apply to weld conventional polymers as well. It would be an alternative for the laser welding which consumes more energy.

For more information, contact, Media Relations Officer
E-mail: lbartlett@support.ucla.edu

Advanced hydraulic braking and propulsion system to recover energy

The energy normally lost as trucks and buses brake going downhill can be saved and stored, then released back into the drive line when acceleration is required, using an innovative system developed by Permo-Drive Research and Development., Australia.

In this technology, the normal driveshaft has replaced with a unique variable displacement Hydrostatic Pump/Motor known as a regenerative drive shaft (RDS). This can retard the forward momentum of a vehicle by pumping hydraulic oil storing this braking energy in two purpose-built light-weight accumulators. Propulsion is derived from a reversal of this procedure. The Electronic Energy Management System (EEMS) ensures the energy is stored only during minimal or non-fuel usage periods, and pressurised accumulated energy is released back into the RDS at maximum efficiency so that the greatest advantage is gained from this normally wasted resource. The system would revolutionise the transport industry worldwide and take it to previously unobtainable levels of economy, efficiency and safety.

For more information, contact: Permo-Drive Technologies Ltd, Australia
E-mail: allan@permo-drive.com

Low leak rate joints

Frequently organic sealing materials cannot be used in high-pressure fluid systems because of their incompatibility with the working fluid. A technique has been developed to achieve extremely low leak rates on high-pressure commercial fluid fittings. A soft material fills the gap between mating surfaces to prevent or reduce the flow of fluid through the gap. Low leak-rate joints provide both cost and safety benefits. This technique is applicable to any industry managing high-pressure fluid systems.

For more information, contact : www.yet2.com
info@yet2.com

Antiwear/antioxidant additives for lubricants

Organophosphorus compounds have been identified which are effective antioxidants and antiwear agents in lubricant formulations at low phosphorus levels. The compounds could be prepared by reacting widely available organophosphorus materials with components normally used in lubricants. Higher molecular weight analogs could be prepared by reacting carboxylic acid derivatives with inorganic phosphorus compounds before reacting with dispersants..

For more information, contact : www.yet2.com
E mails: info@yet2.com

A brushless, ironless DV electric motor

This motor is more significant development in electric motors in the last 50 years. Because of its light weight, small size and high efficiency, it can be used in a wide range of appliances and motor vehicles. The motor is basically a brushless, ironless, DC electric motor which uses rare earth magnets in its rotor and a revolutionary design to produce a highly efficient, small unit with a large power to weight ratio.

The motors could be built into the agitator of your washing machine, impeller of your vacuum cleaner, making these lighter and more efficient while dramatically increasing their reliability and life. Its ability to deliver extraordinary starting torque in a light compact package overcomes a deficiency of conventional electric motors.

For more information, contact:T FLux Pty Ltd, Australia
E-mail: tflux@tpg.com.au

Pulse tube cryo-cooler

Industrial Research & Consultancy Centre, India has developed a state-of-the-art technology for stirling type pulse tube cryo-cooler (15 W capacity at 77K). The technology finds applications in re-condensation of nitrogen gas for MRI shield cooling, liquefaction of hydrogen and oxygen for space applications, and helium liquefaction.

The cooler has a modular compressor designed and produces cryogenic temperatures without the use of displacers. Hence, it has no displacer seals, moving cold parts or vibration leading to greater reliability and longer mean time between maintenance schedules. Additionally, damage to the cold head during operation is eliminated due to the absence of moving parts.

The novel design combines two major technical breakthroughs:

1. Dual opposed pistons driven by moving coil type linear motor using flexure bearings, minimizing compressor vibrations and acoustic noise.
2. Pulse tube with inheritance tube and reservoir

These features make the Stirling type cryo-cooler more efficient than other cryo-coolers.

For more information, contact: Prof. K G Narayankhedkar
E-mail: nkhedkar@me.iitb.ac.in

New P-type black for premium performance in pressure pipe applications

This new product is a new P-type carbon black developed by the Cabot Corporation, for pressure pipe applications that provides important improvements over existing grades for both compounders and end-users.

The new product shows a significantly improved performance balance with regard to the five most important criteria for carbon black in this market sector – particle size, compound moisture absorption, microscopic dispersion, dispersability and chemical impurities and produces a higher UV light absorbing efficiency and better weathering performance than a conventional carbon black.Processing problems, surface defects and internal cavities in the finished part caused by moisture absorption of carbon black during compounding has been significantly reduced by this exceptionally high purity of new grade and the process technology developed by Cabot . This has an improved microscopic dispersion rating compared with the existing, reducing the risk of premature failure in the pipe wall and bringing improved flow performance in service.

www.mpma.org.m

A production method for monodisperse polymer particles as small as 20 nm

This polymerization method allows the production of nanoscale polymer particles of nearly identical size. An aqueous dispersion is obtained which has a high colloidal stability, and a narrow size distribution. The method uses a cyclodextrin as a complexing agent for hydrophobic monomers, thereby creating polymerisation sites for the polymerization reaction. The method has been applied to polymers such as polystyrene and polymethylmethacrylate, but is widely applicable to the polymerization of other hydrophobic monomers.

The technology allows the production of polymer particles with a narrow particle size distribution for sizes ranging from 20 nm to micrometer scale. Aqueous dispersions with good colloidal stability are obtained without the use of any surfactant. This is achieved by semi-continuous addition of monomer in the presence of cyclodextrin to assist the polymerization.

www.yet2.com

Thermally stable, sinterable polymer with high abrasion resistance

This new high performance polymer with outstanding thermal and chemical stability can be used as an additive. It improves the wear and creep resistance of PTFE, Liquid Crystalline Polymers (LCP), Polysulfone (PSU) Polyetherketone (PEEK) and many more and provides substantial improvements of adhesion to metals. Creamer (TM) is a sinterable polymer with a glass transition temperature (Tg) of >330°C. Creamer(TM) has no melting point and therefore cannot be processed like a thermoplastic polymer.

This is why it is used primarily as an additive, e.g. to modify the abrasive properties of fluoropolymers and to simplify the metallization of polymers. Intensive efforts are being made to develop methods whereby pure Creamer(TM) can be hot pressed or processed using green body technology.

For more information, contact: info@yet2.com

Plastic materials with improved surface gloss properties

High gloss surfaces are especially pleasing to both consumers and users for several reasons: (a) their aesthetically attractive visual appearance and (b) their ability to repel dirt better than low gloss surfaces. Plastic materials, such as bottles or packaging films, are no exception to this rule - a high gloss surface is an essential part of a product's attractiveness. However, plastic materials, prepared from (i) Polyolefins; PVC polymer that has been produced using organic zinc derivatives as processing stabilizers (i.e. do not contain lead, cadmium, barium or tin stabilisors) or (ii) Recycled plastic materials, frequently possess a low surface gloss and therefore are less attractive to consumers and of less value to manufacturers of plastic materials. This poor surface gloss problem is solved by adding to the polymer during its processing a combination of (a) a polyfunctional epoxy compound and (b) an imidazolidone compound. This results in dramatic improvements in surface gloss properties of the plastic materials made from the polymer. The polyfunctional epoxy compounds are diglycidyl ethers based on bisphenols. The imidazolidones are selected on the basis of possessing low volatility at the polymer processing temperature. Such gloss improvements are obtained without having adverse effects on the thermal and weathering properties of the plastic material.
Gloss-improving compositions for thermoplastic polymers, especially for: - polyolefins, - for "alternatively stabilised, halogen-containing polymers" - recycled plastics materials. Additionally such compositions do not have an adverse effect on the thermal and weathering properties of those polymers.

www.yet2.com

Reactor-blend process now handles condensation

Polymer blends are, with few exceptions, made in extruders. The extruders combine a base resin with additives that impart certain properties, such as impact modifications. Extrusion can be costly, and it requires that the previously made starting materials be isolated, often dried, and generally handled — all of which adds to production expense.Eastman Chemical has developed their Optiloy technology to extend the reactor-blend process to a broad range of condensation-type polymers and to an even broader range of addition-type polymers so that they can be made using in-reactor processes similar to ABS polymers. This opens the field of reactor-made blends to include extruder-blended engineering polymers. The Optiloy technology allows for blending and compatibilization strategies not accessible through conventional methods — for example, diol latex compositions and silicon polymer diol compositions. The technology also reduces cost because of the fewer steps involved and the reduced amount of material handling. The technology uses existing equipment, with only minor modifications, thus requiring no great capital outlay.

www.eastman.com

New technique predicts life of rubber

A new technique for testing the condition of rubber products could lead to cost and time savings for industry and improve safety, by making it easier to check the likely performance life of parts in service.

Scientists from CSIRO and Monash University have developed a technique that can evaluate the condition of rubber products such as conveyor belts or vehicle tyres.

The technique uses nuclear magnetic resonance (NMR) techniques, which involves putting the sample into a magnetic field to measure the "health" of the rubber. It could lead to the development of a hand held scanning device used to check components while they are in service, eliminating the need to take samples. This will mean that people will be able to get the full life out of components but replace them well before they fail.Current inspection techniques for rubber condition rely on observing the subsequent effects of ageing, for example cracks or tears in the rubber — by the time these appear it can be too late to prevent failure. This new technique will give earlier warning if a rubber part such as a conveyor belt is degrading or losing elasticity, so that the part can be replaced well before failure occurs.

The research has been applied to the failure analysis of rubber conveyor belts and processing tank liners, but is equally applicable to other rubber products that are subjected to wear, such as vehicle tyres. NMR techniques can be used to characterize the polymers in the rubber so that over time we can detect molecular symptoms of rubber ageing, such as changes in polymer chain length, cross linking and the presence of degradation products. From this we can get some idea of the likely performance life left in the rubber.

For more information, contact: Dr Maria Forsyth, E mail: Maria.Forsyth@eng.monash.edu.au

Measurement of dry rubber content of fresh natural rubber latex by a titration method

A quick method, for measuring the dry rubber content (DRC) of fresh natural rubber (NR) latex is presented. Addition of potassium oleate soap was found to sensitise latex for quick coagulation. The volume of 0.05 N sulphuric acid required for coagulation of potassium oleate-treated fresh NR latex showed a linear relation with its DRC. From a calibration curve of volume of 0.05 N sulphuric acid required, for coagulation and the corresponding DRC of latices of known DRC it is possible to determine the unknown DRC by noting the volume of the acid required for quick coagulation. The accuracy of the DRC values obtained was found to be much better than that obtained by the hydrometric method. The presence of metal ions and volatile fatty acids at normal concentrations infield latex was not found to affect the DRC values determined by using the new method.

For more information, contact: rosamma@rubberboard.org.in

New powder coating with low stoving temp and good flow

In general powder coatings provide a way to coat objects in a cost-effective way with no use of solvent, and to obtain good protection of the object against all kinds of external influences. With this new powder coating technology a coating can be made with a significantly improved flow, leading to smoother surfaces.

Also it can be cross linked at temperatures (> 130 °C) lower than usual, giving the coater the opportunity to coat heat-sensitive substrates, save energy, or simplify the production process. The technology also combines properties like good UV- and chemical resistance, good flexibility, and high gloss. This makes these coatings suitable for application in automotive or domestic appliances.

www.yet2.com

Australian scientists' revolution in casting technology

Australian researchers who have worked quietly over several years in a long ignored area of metallurgy have been rewarded with a startling discovery, which is set to reshape the way metals are manufactured around the world.

Advanced Thixotropic Metallurgy (ATM) casting technology is now in the final proving-out stage and the results herald a new age of quality high-pressure die-casting (HPDC).

ATM is particularly suited to aluminium or magnesium alloys and offers consumers lower costs and improved quality across a wide range of product applications from safety critical automotive components to cases for mobile phones, laptops and cameras.Traditional high-pressure die-casting (HPDC) involves molten metal being rammed into a casting through small tunnels called runners, which traditionally have overflows zones or over-flow spaces on the exit side of the die to reduce/ improve internal porosity.

Early applications of the technology were hampered by the need for computer modelling and simulation, which is expensive and time consuming, involving special skills to simulate complex shapes and to analyse data produced.

Other benefits offered by the CSIRO ATM include:

reduced projected area, resulting in the possibility of a smaller machine than conventional HPDC or more die cavities per casting shorter cycle time improving plant productivity finer microstructure (associated with improved strength)

redesign of components for thinner sections, offering weight/ cost reductions expanded design limits for components beyond the capability of HPDC increased energy efficiency

For more information, contact:Ken Anderson, Ken.Anderson@csiro.au

Multilayer film structure especially useful for packaging

This multilayer film structure comprises at least one fluoropolymer film, at least one thermoplastic polymer film, and at least one adhesive layer selected from the group consisting of alkyl ester copolymers of an olefin and an alpha, beta-ethylenically unsaturated carboxylic acid, modified polyolefins comprising an olefin and a functional moiety selected from the group consisting of unsaturated polycarboxylic acids and acid anhydrides, and blends of alkyl ester copolymers and modified polyolefins. Multilayer films so produced exhibit high adhesion strength, exceptional moisture and gas barrier properties, outstanding transparency, and improved appearance — at significantly lower cost than is obtainable with other approaches. The present invention is especially useful for making packaging materials, such as a "blister" pack, for packaging and retaining medications and pharmaceuticals, as well as other materials, such as foodstuffs. (Liquids/ gelatinous materials).

www.yet2.com

■ PATENTED LOCAL R&D

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Above multipurpose wheel & upland penetrometer are available for commercial exploitation. Companies who are interested in getting into agreements, please contact the Technology Promotion Division of the National Science Foundation..

■ ENVIRONMENTAL SCIENCE & TECHNOLOGY

Green cars starting to take root

Environmentally friendly hybrid cars are finally being mass-produced — thanks to an increase in demand due to rising fuel costs, cheaper technology and growing public acceptance.

Viewed in the industry as the most important innovation since automatic transmission or the self-starting motor, hybrid vehicles run on two power sources: a standard combustion engine, backed up by an electric battery. And while hybrids still make up a fraction of all vehicles manufactured, the two automakers look set to put the latest eco-friendly technology up against each other, as the hybrid vehicle becomes accepted by the masses.

Toyota's hybrid Prius sedan, the first mass-produced environmentally friendly vehicle, is so high-tech, it can even park itself.This car is not a science experiment. It's a real car — it's very practical — that you can use in daily life.In the future we see this (hybrid cars) as an interim technology. In the future — long-term — fuel cells (may be) the best alternative.

The combustion engine in hybrids kicks in only when required, at higher speeds, for example. When the vehicle is stationary at lights or stuck in traffic jams, the combustion engine is less likely to be running, which means less fuel use, and no polluting emissions.There is no need to recharge the car's battery; it is replenished by the engine or from energy created by friction from the car's brakes.

www.cnn.com

Concrete from waste

CSIRO, Australia has developed a way of making more versatile concrete, not only with fly ash, but with other waste products, slag from steel mills and silica from silicon production. With this type of concrete CSIRO are looking up to 70 per cent replacement of Portland cement.So far it's been used to make the Sydney Harbour tunnel, in airport construction as well as watercourses for shooting the rapids.

Using fly ash to make concrete not only improves the quality of the concrete, it gets rid of a previously useless industrial waste.

For more information, contact: Dr. Vute Sirivivatnanon, Sirivivatnanon@csiro.au

A new nanoparticle test for dangerous bacteria

A new nanoparticle test for dangerous bacteria such as *Escherichia coli* O157:H7 is so sensitive it can detect a single bacterial cell within minutes. The food industry, medicine and the fight against bioterrorism could all eventually benefit from it, researchers say. Even a few cells of the *E. coli* strain in food can be dangerous so it is important to be able to detect them in low numbers. Current tests, however, need a higher number of bacteria to be present before they can detect it, which can lead to long delays.

The new test, developed by Weihong Tan and colleagues from the University of Florida, US, could offer a sharper and faster way of detecting contamination. One bacterial cell in a sample can be detected. The whole test can be carried out in just 20 minutes, compared with up to 48 hours for conventional tests.

Shelved beef - Waiting a day or two for the results can be costly and inconvenient, says Andrew Brabban, who works on *E. coli* at the Evergreen State College, Washington. "One of the basic problems at the moment is what is called 'Test and Hold'. Samples are held at US plants until they are shown to be free of O157:H7. This is obviously expensive for the industry, having large quantities of beef as shelved stock," he told **New Scientist**.

www.newscientist.com