PACKAGING

trends

The future of manufacturing

- Sustainability
- Materials
- Health protection
- Distribution channels
- Cost efficiency
- Food waste

PACKAGING trends

The future of manufacturing

The white paper is instigated by the GEPPIA

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GEPPIA

PACKAGING trends

The Geppia's Packaging Trends white paper: a nugget of collective thinking

In order to get a better hold on tomorrow's technological challenges, the GEPPIA (Packaging and Process Machinery Manufacturers trade association*) initiated, in collaboration with its members, an industry white paper teaming with exclusive content.

The GEPPIA has brought together experts from a variety of backgrounds and countries to express their view on the future constraints that may be either a common denominator or an opportunity to grow.

Unveiling the packaging and manufacturing trends and shedding light on future opportunities will help market players anticipate the challenges and remain on the cutting edge in terms of innovation.

This white paper results from the expertise of our trade association's members, who have supported the publication since the beginning. It lays the grounds for an ongoing trend watch, with other packaging professionals and users joining in.

We hope the paper's content will spur your interest and provide guidelines for your business outlook.

We look forward to receiving your feedback and contributions.

Jean-Marc Doré
GEPPIA President and Founder

** The GEPPIA represents today over 80 manufacturers and 4000 professionals, mainly based in France. Their cumulated sales turnover in the sectors of processing and packaging machinery exceeds 1 billion Euros.*

ENVIRONMENT

protecting the environment and the consummers

Chapter 1

introduction

Protecting the environment and the consumers

Henri Saporta
Chief Editor
Emballages Magazine

Reducing the impact of packaging: in the last twenty years the trend has gained momentum in the developed countries, mainly Europe and North America. Packages are designed based on sustainability considerations, weights are reduced, materials are replaced, source reduction is introduced, waste is sorted and recycled.

Nowadays you often find packaging containing a high percentage of recycled material, such as polyethylene terephthalate (PET) and high density polyethylene (PEhd); we even tend to forget that glass, steel, aluminium, paper and cardboard have a high recycled material content. In the fields of energy and materials, most of the industry players have shifted from fossil resources to renewable ones. Green chemistry and recycling, or the combination of both, could lead the way to infinitely reusable packaging materials.

However the gap is tremendous compared to developing countries. When the package's end of life is not controlled, it generates unbearable pollution. Packaging no longer brings economic development and public health safety, on the contrary. Plastic wastelands degrade the image of an industry that supplies high performance materials. This is where the supporters of oxo biodegradable material have their word to say: better use a material that is biodegradable than one that is recyclable but isn't for want of infrastructure. In the future any new packaging plant should integrate the end of life of the product.

Protecting our environment goes hand in hand with public health. Packaging has become inherently suspicious; scientists, manufacturers and legislators are constantly on the lookout for traces, whether parts per million or per billion (PPM or PPB) of undesirable substances.

The incident brought about by the bisphenol A (BPA)– a chemical substance that we suspect of endocrine disruption–shows how difficult it is today to compromise between being precautionary, assessing public health risks and manufacturing efficiently.

Virtuous and healthy: those are the attributes of tomorrow's packaging.

Now is the time for the virtuous circle of recycling

Arnaud Rolland
Sustainable Development Manager
Coca-Cola Entreprise

We are entering a new era where the price of raw materials is increasing as they are becoming less available. Manufacturers are getting more involved in optimizing the materials used in their packages, in reducing their purchasing volume and recycling rather than buying new raw materials. The objective is both environmental and financial. It is a real long-term trend.

Recycled materials clearly are tomorrow's materials. Their potential is endless. Progress must be made in the supply chain and in public awareness.
This is what is called the circular economy, also known as «cradle to cradle». In the light of the shortage in resources, it is more necessary than ever to re-use those we have and invest in the search for new materials, that will allow us to do without non-renewable resources - like second generation bio-based plastic, a promising solution in the field of packaging.

Reducing the carbon footprint of packaging

At Coca-Cola, our objective is to reduce by one-third the carbon footprint of our beverages at the European level by 2020. We are working on the whole life cycle of our goods at six stages: ingredients, packaging, production in our plants, transportation of our products, refrigeration, and end of life.
The packaging production stage represents 47% of our overall carbon footprint alone !

In order to reach our overall objective, the first step consists in working on reducing raw materials. Packaging production is strongly linked to the extraction and processing of raw materials.

We therefore target to use 25% less non-recyclable materials in our packaging to produce the same quantity by 2020.

Partnering with our suppliers and distributors

Recently we decided to remove a carton undercoat when supplying our goods and found a new system which does not impair the product's integrity. We conducted tests over several months and, in certain cases, adapted our production lines. We are also working on the reduction of plastic films around our packs and on the thickness of our labels.

With our main can supplier, Ball Packaging, we are testing the can of the future, the lightest on the market. Our industrial teams are working hand in hand to find, within two to three years, the thinnest possible aluminum sheet.

The aim is to involve the whole supply chain to continuously invent new machines and new technologies in order to respond to the strategic challenges, make sure that we are gaining in productivity, efficiency and safety. All this without impairing the package's quality.

Maximizing renewable resources to produce tomorrow's bottle

Second line of action: reducing the carbon footprint, in particular of plastic bottles, and using renewable resources to produce packages. The PlantBottle™ is the first alternative solution to fossil-based PET. This technology has existed since 2009 in the United States and since 2011 in Western Europe. In 2010, the worldwide production of 2.5 billion Plantbottle™ packages made it possible to save the equivalent of 60,000 barrels of oil used in the manufacturing of PET plastic bottles.

We launched it in France at the end of 2011 on our 50 cl bottles, which contain up to 22.5% of plant-origin plastic. In the manufacturing process, in order to obtain the PET plastic molecule, we use bioethanol derived from sugar cane.

But our ultimate goal is to find, within 5 to 10 years, a technological and industrial solution that makes it possible to produce plastic bottles with 100% of plant residue. In the United States, together with other large companies, such as Ford, Procter & Gamble and Heinz, Coca-Cola Company has developed tomorrow's bottle.
Three partnerships have also been signed with leading start-up companies specialised in the development of second-generation plastic. The ultimate objective is to disconnect production of plastic from fossil resources.

Using more recycled materials

The third field of research lies in the use of recycled materials. Coca-Cola Entreprise is the first food company to invest directly in the recycling industry as well as participate in research and development: we have invested 6.5 million Euros in a joint-venture with APPE, the recycled PET leader in France, in order to increase the share of recycled plastic bottles in France.

Coca-Cola Entreprise has conducted the same type of project in the UK with the creation of Continuum Recycling, a joint venture with Eco Plastics, the English leader of recycled PET plastic for food products. This investment will increase by 70% the capacity of the Sainte-Marie-la-Blanche plant. The project is also aimed at improving plastic recycling technologies in France.

Most of the PET is recycled for textile, construction and automotive (e.g. dashboards) applications. In the food industry it is authorized only since 2007 in France. This is an advanced technology for food products and still a young industry. Investing in this sector makes it possible to develop it, consolidate it, and innovate with new machinery.

Although the use of recycled PET has no influence on the production chains of our bottling plants, it alters the pre-forms' manufacturing process.

The pre-form of our 50 cl bottles is comprised of recycled plastic (up to 25%), plant plastic (22.5%) and virgin plastic; i.e. three difference sources of plastic molecules which come from three different manufacturing processes to make a single pre-form which will give only one bottle!

Last important goal: make the public aware that waste sorting is important. This is what we do in music festivals for example for young people. This is what we will do with our project of an educational centre within our joint-venture in Beaune. We must all be part of this collective challenge. This is why Coca-Cola is committed at the world level to reducing the environmental impact of its packaging. This strategy takes local forms in each country with objectives and investments adapted to national markets.

Tomorrow's packaging: more functionalities, more sustainable

Bruno Guillemat
Head of Packaging Department
in the Pernod Ricard Research Center

For Pernod Ricard, packaging innovation is directly linked to an environmentally-friendly approach. The trend towards packaging 'premiumization' in the wine and spirits sector goes hand in hand with the sustainable development approach. However, packaging must also become more functional and more interactive. The development of new technologies is also involved in fighting counterfeiting and enhancing consumer experience; two topics which are particularly dear to Pernod Ricard.

In the wine and spirits sector, packaging development lies in the 'premiumization' of packs, with luxury packaging moving upmarket - while taking into account the environmental requirements (recyclability, choice of materials, reducing carbon footprint…). Sustainable development represents both a constraint and new innovation opportunities. Pernod Ricard has therefore started thinking abouthow to combine luxury and sustainable development; a true challenge and a source of inspiration for tomorrow's packaging innovation.

'Premiumizing' glass in an environmentally friendly manner

On our markets, glass remains the material of reference. It conveys quality, preservation and purity. Studies are regularly conducted to reduce the weight of bottles. Process development makes it easier to address distribution of materials, to monitor thickness profiles, and to work on design in order to 'premiumize' glass.
We may however use alternatives to glass for new markets and new products, like Malibu portable pouches, with flexible packaging.

In secondary packaging, the environmentally-friendly approach is more important yet. We innovate in order to increase the product visibility in the store displays while addressing the environmental aspects. Work is done in particular on gift boxes and limited editions. The issue is to avoid combining incompatible materials and excessively complex packaging to favor recyclability.

Innovating for enhanced consumer experience

Packaging must also follow the change in consumer habits and be user-friendly It is therefore more than a mere bottle: further functions and services have to be included in it so that it becomes part of the consumer experience, i.e. help the brand connectand interact with consumers. Facilitating handling and pouring may lead to changing the cap or customizing the product depending on the consumer's tastes. Innovating also consists in offering new ways of consuming and preparing our products.

The Pernod Ricard Research Center is working in that direction. It carries out many additional tasks: monitoring and sharing ideas to identify technological opportunities and innovative packaging solutions; providing our subsidiaries technical support to speed up the innovation process; and setting up transversal project teams to acquire new knowledge and devote it to product innovation. These three tasks allow us to identify opportunities. It should be pointed out that packaging is part of the product. Packaging innovation can only be achieved in combination with product innovation.

Adapting packaging lines

These innovations and constraints have an impact on production chains. Our suppliers' material has to be developed, or even integrated in new equipment used in other areas of application. As premium bottles have more fragile and sophisticated gift packs, further precautions must be taken on the lines. Alternatives to glass also require specific packaging lines.

The complex new capping solutions result in modifying the tools used to position these new caps.
Although traditional caps are crimped, we are moving towards more premium caps with more complex and appealing forms, which require other capping techniques.

Faced with the increased complexity of packaging, tomorrow's machines will have to be more flexible. Glass containers have a very specific design, forms that are no longer cylindrical, variable formats and caps that may differ depending on the country (in particular to address counterfeiting).

Fighting counterfeits

Our brands have to be protected, above all on sensitive markets. Pernod Ricard has therefore set up a specific structure to fight against counterfeits, in which the Research Center takes part at the technical level. In particular we are working on a tamper-evident capping system that ensures consumers that the packaging is tamper-free.

We use new technologies to better secure capping. Our caps are therefore difficult to copy and non-reusable. They act as a lock. We are also working on all packaging items in our bottles by including identification and authentication technologies.

Codes and marking are incorporated in the cap, the label and the bottle. QR Codes may be of interest in facilitating the interaction with consumers and involving them in the checking our products. Lastly, vision and robotics take part in quality control and the assembly of complex parts for premium packaging.

Developing increasingly functional packaging

Lastly, innovative packaging should be able to better communicate, adapt to its environment and protect it, give information and interact with consumers. Printed electronics and miniaturized energy might bring new functions - or new services - to packaging which are ideal to enhance consumer experience and interactivity with the brand.

For example, we could offer new functions incorporated into the packaging: help consumers better use our products (by providing advice on preservation and consumption), facilitating their use, suggesting recipes or giving more information on the brand. This could help go further in the brand experience through mobile and digital applications, QR Codes, or new technologies.

Food Safety - a zero tolerance approach to food safety hazards

Richard Mallet
Managing Director
HACCP Europe

During the latter part of the twentieth century and the early part of the twenty first century, food safety has been a major concern and this has been reflected in the evolution of food safety legislation worldwide. Food distributors and their suppliers must now prove their credentials to satisfy the requirements not only of food safety regulatory bodies but also of food retailers, who seek to mitigate risk arising from uncontrolled food-borne hazards.

Food safety issues regularly make the headlines worldwide. However what does that expression really mean? Food safety is defined as taking all possible control measures to ensure that food is safe. This means that the risk of food contamination should be eliminated or at least reduced to the lowest possible level so that food served or sold to customers is eaten without incurring any risk to their health.

A universal issue

Food safety concerns everyone. Companies have become aware that the topic is of critical importance. The most senior directors now seek to incorporate it as part of their overall strategy to protect their brand. They are increasingly sensitive to food safety issues including contaminated raw materials, hazards introduced during processing and packaging, and hazards induced by food contact with materials.

Manufacturers have good reason to be sensitive. Across the globe there are laws to prevent contamination from any source. In the field of food processing and packaging it is required that food be protected from chemical products that may migrate from the container or the equipment and get to the food product itself.

Awareness is important both at the distributors' and suppliers' level. The retail industry across Europe and indeed across the world have set up best practices, administered for the most part through the Global Food Safety Initiative, and in the form of Global Food Safety Standards to be adopted by food manufacturers. These standards require assessment and control of food safety from all potential sources, including raw materials, processing, packaging and labeling.

Labeling is a critical issue. A significant number of product recalls are a result of incorrect labeling, with incorrect allergy advice being one of the greatest causes. European regulations regarding labeling are constantly evolving. They lay out very clearly the requirements concerning clear labeling. However control of labeling, to ensure that food enters the distribution chain with the correct information is down to the food manufacturer.

Suppliers and equipment manufacturers are also concerned

The need to assess and control food safety hazards is extending rapidly now to non-food suppliers. The food processing industry recognizes the risk from this source and demands evidence of compliance that processing and packaging equipment can be used without risk to the HACCP (Hazard Analysis And Critical Control Points) based food safety management system.

Already an increasing number of suppliers within the food chain, right up to and including supermarkets, is searching for equipment manufacturers that can prove that their equipment or materials will not lead to health hazards through contamination or migration. Food processing and packaging equipment manufacturers are not forgotten when it comes to the Global Food Safety Standards, benchmarked by the Global Food Safety Initiative and used by supermarkets to approve their food suppliers.

As just one example, the BRC (british retail Consortium) Global Food Safety Standard requires control of food safety in materials, processing and packaging, and also equipment and environment. More and more food processing companies are looking for a guarantee from their food and non-food suppliers that using

their materials will not undermine their HACCP based controls. Equipment and material manufacturers supplying the food industry are beginning to see this as an opportunity to show that the design of their machines supports the principles of food hygiene control based on HACCP. It is becoming something of a competitive advantage for those equipment and material manufacturers that achieve a food safety based certification such as that provided by the HACCP International Certification body.

The HACCP mission

For over 50 years, The World Health Organisation has promoted food safety control through HACCP worldwide and its Codex Alimentarius publication. The principles require an assessment of food safety and security from all the sources, not only for ingredients and food production line operators.

Legislation across the world now requires that food manufacturers implement and maintain a documented HACCP system. The European Food Hygiene Regulations is one example of how this requirement is mandated across a whole continent! The major supermarkets also demand that their suppliers implement and maintain an HACCP system. For example the BRC (British Retail Consortium) Global Food Safety Standard used by retailers to approve suppliers within the food chain, require a food manufacturer to maintain, validate, verify and review an HACCP Plan.

The mission of HACCP, managing food safety, is also applicable to non-food, including packaging and processing equipment. Indeed the principle of HACCP is used by my own organisation, HACCP International, a certification body for equipment and materials, ranging from processing equipment, packaging equipment, chemicals and materials of fabrication such as hygienic wall and floor materials.

Equipment and materials are assessed, following Codex Alimentarius HACCP Principles, for any potential risk to food arising from unhygienic design, design characteristics that may lead to increased risk of food contamination, consequence of error in use or misuse, poor quality user manuals or service manuals, or unsubstantiated food safety based claims. The equipment or material supplier can then present the HACCP International Certificate to the food processor to demonstrate that the article or material is safe for use in a food environment. This in turn supports the HACCP plan implemented by the food processor or manufacturer.

Towards unlimited control

Generally efficient and full control is the only way of reducing the risk of food safety in the food industry. Automation will remove any elements associated with human error, but this does not mean that automated systems can be relied on without correct commissioning and verification - an operator must necessarily check that the quality of automatic control is constantly optimized and effective.

Integrity of packaging and labeling is also the last line of defense: if a food product is contaminated, improperly packaged or labeled, the probability that this food product ends up at supermarkets increases – the product will have entered the food distribution chain already.

A temporary competitive advantage

In the zero-risk race, the developed world, with a history of robust and mature HACCP based controls, may still keep a small window of opportunity and a competitive advantage in with regard to food safety. But for how long? Emerging countries learn and develop very quickly. Some have already tightened their rules regarding food safety, often using European Union Food Hygiene Regulations as a template for the improvements that they make to their own food safety legislation. Within five years, the differences between the two worlds will have disappeared.

Towards full control using vision inspection

Christophe Venaille
Food and Beverage Business Unit Manager
Luceo

Food packaging is strongly growing worldwide due to emerging consumer trends such as individual portions and ready-to-eat products. Health safety is more than ever critical: while packaging must preserve and protect the foodstuff it contains until it is eaten, it must also provide useful and reliable information for its risk-free consumption.
Manufacturers need to set up a control system as part of their food safety risk analysis. Vision inspection has many advantages in comparison to manual and statistical systems.

The press and the media regularly report incidents occurring in the food and beverage supply chain. Consumers have become increasingly wary of processed products and keep a watchful eye on the quality of what they eat; they are obviously looking for tasty products but will not compromise on health or safety. The pressure is passed onto the supply chain and the manufacturers in the food industry.

Distributors are thus seeking to avoid bacteriological and allergen risks which may occur if the product is packaged in an inappropriate container, if it is mislabeled or misprinted, or if the packaging is poorly sealed. This issue is even more sensitive for products sold under the distributors' own brand : if a defect is reported, the whole brand will be impacted.

Manufacturers are to solve the productivity/profitability, quality and food safety equation. Beyond the protection of their brand, they also eliminate the impact of a packaging defect on the product life cycle: waste of production time, consumables and energy consumption.

Advantages of vision inspection

Setting up a control system is therefore critical in order to optimize product packaging as it meets the food safety, productivity, profitability and quality requirements.

Artificial vision integrates cameras that operate like a human eye: they check first the markings (printed characters, sell-by date, stickers, codes...), second the perfect tightness of vacuum and modified atmosphere packs. They can even detect contaminants in the sealing areas of sealed or heat-sealed packaging.

Controlling sealing is part of the CCP (Critical Control Points) for sterilized product manufacturers. The advantage of a 100% inspection is that it ensures full control on this issue. Continuous control allows the immediate detection and withdrawal of the defective packaging. The manufacturer does not need to go back and control the batch from the beginning, which occurs in standard product control. Another advantage is that the volume of rejects tends to decrease and in some instances disappear.

The control equipment at the end of the packaging line is its eye and memory. All the packaged products are 'photographed', which is a real asset if there is a doubt on a production series. Manufacturers can refer to the saved data to validate later findings.

This automatic, reliable, non-destructive technology takes part in the continuous improvement of the production cycle thanks to the immediate correction of packaging discrepancies. It offers good traceability by making it possible to save and archive data.

Preventing all contamination and guaranteeing full traceability

The Tiama group has been the world leader in the glass container inspection sector for 40 years and entered the food and beverage industry in 2006 under the Luceo brand.

It has significantly grown since this date with more than 200 machines in operation.

The Intermarché retailer - 2,000 stores in Europe - has equipped its own facilities with Luceo solutions. It has invested in seal checking systems in order to avoid product loss during the pasteurization phase.

The Campofrio group, the European leader in the processed meat sector, has also opted for vision inspection in order to increase its productivity while guaranteeing flawless packaging quality.

Fratelli Tanzi, a cured meat producer, has invested in a vision system, upon the request of its English distributor, Marks & Spencer, which imposes on its foodstuff suppliers to meet three obligations: error-free labeling, full traceability of all products, and data archiving.

The US company Hausbeck Pickle Co has also equipped its plant with Luceo systems for the detection of leaks on its pickle packaging lines.

Today these same technologies are used on many applications : sliced cheese, fresh meat, pizza, deli maintained in cool or ambient temperatures, baby food....

Future development

Luceo's goal is to address all types of packages and be more and more efficient in the type of defects found. In short, the point is to push further the limits of detection and to cover the whole supply chain: from the arrival of bulk raw materials at the processing plant to packaged finished products. In the field of vision inspection we are definitely heading towards full control.

Having graduated from a telecom engineering school, Christophe Venaille joins Thalès in 1985 and manages medical imagery and robotics projects.

He later moves to the food industry, and more specifically MSC (a Danone subsidiary specialized in glass control machinery) as Diversification Project Manager in 1995. MSC becomes part of the Tiama group in 2003. In 2007 Christophe Venaille is promoted MSC Engineering Manager and in 2009 he becomes the Tiama Group R&D Manager.
Since 2012 he manages the Agro Luceo business unit.

In a tough economic and environmental context, we offer customized filling and capping machines that meet increasing levels of requirements in terms of filling accuracy, hygiene, reduction of downtimes, security standards.

PACK'R strength lies in its technological innovations that significantly reduce format changeover times, cleaning times and effluents generation.

Céline Leduc — *PACK'R*

We must address our customers' ecological and economical requirements.

We work on developing new technologies to decrease the use of virgin polymers (by reducing density and recycling plastic «waste» coming from customers) while reducing the final cost to offset the increase in raw materials.

Eric Maussion — *PACCOR*

The major step is to take an active pro-environment approach. In order to satisfy this need, as well as customers' standard requirements - productivity, cost and service - PDC Europe, prize-winner of the «Best Energy Efficiency Award, Inno-Bev 2013», offers a customized range of equipment.

A non-heat high elasticity PE sleeve applicator, a super-compact linear high-speed shrink sleeve applicator (up to 600 cpm), and a low-energy recyclable hot-air shrink tunnel showcase PDC's "eco-friendly" product line.

Derek Vandevoorde — *PDC Europe*

R&D department of Karlville Development consider Environment as a major concern.
That's why we develop shrink solutions that generate energy savings, like for example with our Tornado (unique air recycling system).

We also enable our clients to make our machines run at high speed with less thickness of film.

Making our machines easier to maintain is also a target we are achieving with servo motorization developments and Ethernet support.

Céline Francina — *KARLVILLE DEVELOPMENT*

CONSUMING

packaging reduces waste

Chapter 2

introduction

Packaging reduces waste

Henri Saporta
Chief Editor
Emballages Magazine

Waste or save ? It may sound like a strange question, and yet…the Save Food initiative, led by the FAO (United Nations Organization for Food and Agriculture) and the Interpack tradeshow held in Düsseldorf, revealed that on average one third of the food produced each year is wasted.

If you look at the figures in more detail you discover that the waste ranges from 20 to 75% depending on the food product and amounts to 1.2 billion tons. In the developed countries 300 kilograms (661 lbs) are wasted per year per individual, most of it occurring at the consumer level. As the world population is expected to increase by 50% and reach 9 billion in 2050 and famine remains a critical issue, food waste is both a curse and a global scandal.

Consumers in developed countries are over-cautious as a result of relying on highly sophisticated technology. Crucial information, such as use-by date or optimal shelf life are misunderstood by consumers, who end up throwing out by mistake products that are still fit for consumption. In order to limit the waste, the European Union along with other countries are considering a reform of the use-by dates.

In developing countries, lagging infrastructures and technologies are generating waste at the crop level. In those instances process and packaging, when properly applied, are a solution, not the source of the problem.

As with aseptic filling, modified atmosphere or vacuum-packaging, modern packaging methods deliver healthy and natural products and long shelf life. Time-tested solutions like canning stabilize food products for a long time without requiring sophisticated infrastructure.

As far as high value-added consumer goods, such as electronics, are concerned, secondary packaging and cushion protections ensure that the product is shipped and arrives in perfect condition. Beyond the obvious insurance issues, reducing product damage also contributes to preserving value.

Efficient and useful: those are the attributes of tomorrow's packaging.

There is still much to invent in processing and machine design

Annette Freidinger-Legay
International Packaging Expert

Let's be honest: today's society is rather gloomy. Economically speaking, we are not overcome with euphoria! And this affects the behavior of consumers who claim for smart shopping and increasingly favor snack food. This may lead to increasing innovation and inventing new ways of processing materials - while still looking for new sustainable materials. It is now essential to 'give added value to packages at a lower cost'.

In order to treat themselves despite this air of gloominess, French people want to make their everyday life different and purchase product with an emotional value that makes them happy. Limited editions take off, both in the high volume consumer goods and the luxury industry with Champagne.

Because people have less and less time, snack foods are more and more popular… with significant consequences on packaging. Packaging must preserve the food from extreme external temperature variations, include different ingredients, be easy to open, be heatable in the oven, microwave oven and in a water bath, while preventing burns! Brands, whatever the sector, have to innovate and meet both environmental requirements and the snack food trend.

How can we fight both against food waste and for packaging reduction?

Fighting against food waste has also emerged for some months. However, it might go against the fight for packaging reduction that has been on since 1992. For environmental protection purposes, we have worked on the reduction in weight

and thickness of packaging materials, and on a weight ratio favorable to the product rather than the packaging. This tends to favor large containers.
This brings up a critical issue : what should be favored: fighting against food waste by offering small quantities and individual doses, or protecting the planet by generating less packaging waste using large containers?

The solution might lie in 'portion-sized' or re-sealable packaging that would allow deferred consumption or in active and clever packaging that would allow a longer preservation of the product, including once it is opened (through food substances that fight against oxidation like Vitamin C), or that would avoid the development of micro-organisms on the packaging wall. Laboratories rely heavily on the properties of essential oils in this area. They undeniably are a great future for tomorrow's packaging.

Today's… and tomorrow's most used materials

According to the last market survey carried out by Pira International, the world packaging production ($670 billion in 2010) should reach $820 billion in 2016 (Source: The Future of Global Packaging - Smithers Pira - January 2012), with an average annual growth rate above 3%.
The growth is mainly driven by urbanization, the development of the health sector, and the development of emerging and transitional economies, like China, India and Brazil, but also some eastern European countries, where purchasing power is on the rise.

Overall the classification of the world's most used materials should remain the same in the next years: cardboard (corrugated and flat) should remain the leader (30.49% of the market, $250 billion in 2016), followed by rigid plastics (24.39% of the market, $200 billion in 2016) that are boosted by the drinks market, cosmetics, personal care products and detergents, and by flexible plastics (19.88% of the market, $163 billion in 2016), used in fresh and processed food products as well as drugs.

Number Four in the market, metal packaging (14% of the market) should decrease by 2016 in favor of rigid plastics. Lastly, number five on the market, glass should still increase but at a slower rate (6.46% of the market, $53 billion in 2016).
Countries with strong environmental sensitivity favor cellulosic fibers, i.e. paper-board. Japan, which has a strong culture of convenience fresh and individual food portions, favors complex flexible materials which ensure that those products are protected. By contrast, for developing countries, we note that rigid plastic materials rapidly take a strong market share since the processing industry for those materials requires significantly less capital than the glass, paper or metal industry. A closer look at the PET penetration rate for water and drink bottles worldwide speaks for itself.

New materials have adjusted their strategy

New materials have slowed to a standstill. 5 years ago, considerable publicity was made around biopolymers. But now we are realizing that using corn or wheat to make packaging materials was perhaps not the wisest thing to do knowing that one billion human beings have no food! Bio-based PET is still used but it comes from sub-products such as sugar cane residues. Some are looking for starch sources that could be available without using corn, such as potato wash water. Another reason for the standstill undergone by new materials derives from the regulations that have precisely defined what is meant by biodegradable and compostable materials.

The future technological developments should lead to a greater consumption of better defined biopolymers. The worldwide production of biopolymers should thus reach 5.8 million tons in 2016, according to the association European Bioplastics. Bio-based PET production would thus be 4.6 million tons, i.e. 80% of the worldwide offer in front of PLA (298,000 tons), PE (250,000 tons) and PHA (142,000 tons) (Source: Salon de l'Emballage, France, 2012).

The focus is also on incorporating recycled materials in packaging. As regards corrugated board, a traditional cardboard box often contains up to 80% of recycled fibers. A wine bottle may be manufactured with 100% recycled glass. Aluminum, whose transformation requires a high amount of energy, is worth recycling. Progress is being made not only on recycling processes which, for example, allow to put recycled PET in contact with food according to drastic European regulations, but also on automated sorting systems that in the future will allow consumers to put all their packaging wastes in a unique dustbin. There is no longer reference to waste but to secondary materials.

From my point of view, the future belongs to active materials whose permeability will be perfectly mastered in relation to gas and steam and which will be able to regulate the atmosphere, thus preventing the development of micro-organisms inside the packaging, and extending the life duration of food products once the packaging is opened. Nano-particles have interesting physical properties in this context… but for the future… and provided that regulations allow it. However, it is certainly an avenue worth exploring to fight against waste.

Packaging and manufacturing processes are continuously evolving

Daniel Magnin
Global Head of Packaging Equipment & Operations
Nestlé
Pierre-Etienne Hannecart
Head of Consumer Centric Packaging
Nestlé

Packaging has evolved from its basic protection function and has acquired enhanced features. It must be convenient, interact with the consumer, convey emotion and protect the environment.
Designing packaging is increasingly complex and requires both brands and equipment manufacturers to change the way they work.

Metal boxes were originally designed to merely offer consumers a flawless product. Packaging design then evolved, introducing the concept of functionality.

For example, making sure that consumers do not hurt themselves when opening a tin can, and that they do not need tools. Today we provide further convenience with easy-to-open lids and seals, and the ability to re-seal the packages for later consumption.

Packaging must thus not only preserve the product it contains but also ensure handling the product is an enjoyable experience, blending in interaction and emotion. The environmental impact must be as small as possible.

Packaging needs to serve the consumers' current lifestyles. They want to eat on-the-go, fast, in portions, and expect the product to be customized.

Continuously innovating

This drives Nestlé to continuously innovate. Our products – and their packaging – must be designed so that they can easily adapt to all the distribution channels: discount retailers (displaying products on pallets), supermarkets (with high visual appeal), gas stations, e-commerce (including home delivery and drive-through)…

Packaging is constantly integrating new materials and techniques. Sustainability is the number one priority, for the product itself and for the environmental impact of its packaging. Everyone is working to this end, focusing on two goals : reducing the quantity of packaging required and developing environmental-friendly material.

Inclusive Design, a major challenge

Consumer profile and habits are continuously changing and developing. Our challenge today consists in offering packages that are optimized throughout the supply chain and designed to be used by the largest number of consumers, regardless of their age and abilities. We must take into account the ageing of the population, longer life expectancy and the growing number of senior citizens living alone and independently.

We must offer solutions meeting all these demographic changes. Inclusive design is an approach that does not exclude anyone when using packaging. If it is designed for an older market segment, surely it is suitable for a vast majority of the population.

Nestlé rolls out the Inclusive Design approach

Nestlé has been developing this methodology for four years in partnership with universities and based on functional analysis criteria and simulations tools. They allow us to define the ergonomic performance of our existing and new products.
Since designers know and integrate consumer expectations and the interactions with packaging throughout its life cycle,

they design products that can easily be used by a large portion of the targeted consumer base.

NESCAFÉ® Gold is now packaged in a more ergonomic container featuring a better grip, a new seal and an easy-to-open tab. In the bottled water sector, the Hépar® bottle cap has just recently been fully redesigned. It ensures a better grip and is easier to open and close. Our aim is clearly to place consumers at the heart of our packaging development and to meet their expectations and requirements with simple, intuitive, easy to use and cost-effective solutions.

Redesigning machines and processes

Our machinery must meet the new production requirements, in particular with higher productivity and flexibility. One of our priorities is to implement the principles of Lean Manufacturing, that have proven their efficiency in the automotive industry. This consists in defining the needs from the early stages of the project, as well as extensive equipment specifications that integrate all the aspects of productivity:

- safety at work in order to eliminate any risk of accident caused by our equipment
- hygiene (product quality and machinery maintenance);
- line waste reduction (less material loss, less waste);
- decrease in efficiency loss due to scheduled or unscheduled production interruptions;
- and flexibility (it consists firstly in being able to make rapid and precise changeovers ; secondly in adapting to product and consumer changes, as well as new material technologies. New materials are generally more demanding, which requires stricter monitoring of the machine parameters while maintaining production speed.)

We first came up with a method to assist project managers in designing the new production lines. The methodology draws out which tasks they should carry out at each development stage.
Step two: set up models to define and validate the equipment, manage the project process, control performance and check that the project outcome is in line with the initial specifications. It is necessary to make sure that there is no loss of information and that the needs identified at an early stage have been perfectly met between the initial specifications and the machine production launch .
Step three: define standards on certain types of equipment and operating methods.

We are also working on communication between machines, in particular between the production lines and our centralized data management system. Nestlé is pioneer in this field ; one of our engineers is a member of the Board of Directors of OMAC (Organization for Machine Automation and Control). This is paramount in decreasing efficiency losses.

New technologies obviously result in developing lines and machinery; like mechanization and automation, which are aimed at reducing the risks related to manual operations. An emerging technology, digital printing is also a strong asset for the future. Digital or on-line printing of packages allows to customize them, to be more flexible on lines, to produce labels on demand and to reduce stocking up on materials. Although the technique is already in use, it is clear that it gets more and more industrialized.

Packaging innovation: “The problem is not to find ideas… but rather to find what the problem is”

Vincent Ferry
Packaging Manager
Danone Research

Successful innovation is a subtle mix of boldness and simplicity. “Why didn’t we think of it before?” - this remark about innovation precisely demonstrates that it is successful. In order to find a good idea, however, the right problem should be found first. Simplicity and meaning are in fact the two fundamentals necessary to design tomorrow’s packaging.

Innovation is above all a matter of finding the “true” problem to be solved; the one with potential. At Danone, our new yogurt pot, KISS, is a major example. Firstly, its name shows the search for simplicity: “Keep It Simple and Safe”. It was undertaken because the packaging of Danone Fresh Products had to be simplified. Thus, this brings consistency in the range and message and results in true differentiation on the retailer’s shelf thanks to its look and ergonomics. It has improved our operational flexibility through standardization. Lastly, Danone has thus initiated a return to basics by drawing on its roots and DNA: displaying its products in an original and friendly manner.

As a result, both packaging differentiation and ergonomics have been achieved with the KISS pot.

Reinventing the yogurt pot

The concept struck me during the Danone Convention in February 2009 : the special series of yogurt pots made for our 90 year anniversary aroused in me a creative flash. I told myself that the Danone pot had to be reinvented. Although the idea was simple, yet it had to be achieved with a modern technology adapted to

the contemporary world. And above all we had to convince the group’s senior executives to adopt it.

The design work consisted in analyzing and meeting the consumers’ needs while considering the numerous constraints (economic, industrial, logistic, environmental, legal …), in order to shake them up and enhance them in the end. In total, the development lasted two years in which we carried out an industrial pilot with ARCIL, our machine supplier, as well as consumer tests.

The group then decided to make a first “life size” launch in Spain in July 2010 on 5 of our brands. Since Spain owns ERCA machinery, this configuration made it possible to include the constraints of our two main suppliers by defining a standard fitting for the single pot concept, whatever the machine used.

Concurrently with the new packaging, we also improved our recipes and made our store displays more appealing. Velouté was the first brand to benefit from the repackaging in September 2012 and recorded a 20% growth in volume.

Integrating new machines and transforming the existing ones

This in-depth transformation obviously mobilized many resources within the company. It required that the company invest in new machinery. In particular, we changed the molds, the cutting devices, sealing pieces, and adapted conveyors and the wrapping system.

In the end, this work greatly exceeded the purely technical perimeter. KISS is more than a product: it is a unifying concept.
We had to organize the support of our personnel through, in particular, training, and redesigned our plants (moved walls, changed ceilings, gutters and tiles, reorganized our stock…), without stopping production. A true challenge! Today, we have upgraded half of the machinery with, overall, performance exceeding the set objectives.

Rethinking packaging

The objective of Danone Produits Frais France is to reduce or remove packaging, when possible, in order to improve its carbon footprint while retaining satisfactory protection, display and consumer information levels. April 2010 was a significant step with the removal of the secondary packaging on the Activia and Taillefine brands – 1,600 tons of cardboard saved, i.e. the equivalent of 2,500 tons of CO^2.
Then, in April 2011, four brands reduced secondary packaging on their large formats – i.e. 1,000 tons of cardboard saved or 1,800 tons of CO^2 equivalent.

In the wake of Activia and Taillefine, Velouté is starting its metamorphosis. Until now, we could not remove secondary packaging because the former pot had no individual decoration. Thanks to KISS, it is now possible.

We must bear in mind that packaging plays a major role in the life and identity of the products. They contribute to their protection, make them easy to find on the shelves and display consumer information. The difficulty lies mainly in graphic design. Basically the same brand visibility and amount of information must be conveyed over a smaller printing surface. A true challenge for graphic design agencies! What is at stake is worth the effort: from an environmental point of view, cardboard represents a total of approximately 20% of the packaging carbon footprint!

Choosing the right materials

The choice of materials is another research area. To minimize the environmental impact, eight levers have been identified: reducing packaging quantity, increasing transportation density, recycling industrial waste, using recycled and plant-based materials, integrating the existing collecting, sorting and recycling channels, favoring 100% consumption without waste and giving materials a second life.

In the years 2006-2007, we used expanded polystyrène on our yogurt pots, which resulted in reducing the quantity of packaging and decreasing the weight of the pot by 20%. Regarding the KISS pot, we wish in the future to reintroduce expanded polystyrène. The first tests have just started.

Constantly reinventing ourselves

And we are not going to stop there in terms of innovation. We must reinvent ourselves every day ! I recommend relying on common sense and respecting the rule “let’s keep on simplifying”.

Successful packaging connects consumers to their product. Let’s not forget that packaging is the first media that is in contact with them. They have it in hand when purchasing and consuming. It must therefore enhance the outlet shelves and convey a strong message. Successful packaging also connects the manufacturer to its partners and suppliers. What KISS does within the company can also be seen outside. KISS is the showcase for Danone’s expertise and its ambassador. Successful innovation is like hitting a strike at bowling: when the ball is launched in the right direction with the right energy, striking is systematic. To achieve this, technique, experience and a lot of common sense are needed!

Aseptic milk packaging: new trends

Roland Nicolas
Dairy & Aseptic Business Development Director
Serac

France has been a pioneer in the field of aseptic milk bottle filling in Europe. The French may even be the world's greatest plastic bottled UHT milk consumers! Serac's objective in this field is to meet the manufacturers' constantly evolving demand and to adapt its range of aseptic machines in order to address new trends.

Milk shelf life in France is traditionally high, in response to the retailers' requirements and the inconsistent quality of the collected milk, which forced manufacturers to use extensive heat treatment. The quality has improved significantly for a number of years. Now 95% of milk in France is UHT. Yet there is a variety of milk processing methods throughout Europe.

Belgium, Spain and Portugal follow the same pattern as France. By contrast, Northern Europe favors pasteurized milk. As for Germany and Italy, they offer both fresh milk and UHT milk. The European drinking milk market is therefore not homogeneous.
Bottled UHT milk has just started to develop in Russia, where the first aseptic line has just been set up.

The main advantage of milk aseptic filling is that it can be used to extend the milk shelf life with a lesser deterioration of organoleptic properties of the product compared with sterilized milk for example.

The reason is that milk, which is highly nutritious , is one of the most sensitive products from a microbiologic and organoleptic point of view.

Complex decontamination solutions

Today, as far as Serac's aseptic lines are concerned, there are several solutions to decontaminate plastic bottles for UHT milk. First of all, an aseptic blowing machine can be used to produce a sterile co-extruded and blow-molded HDPE bottle that consists either of six layers (light and oxygen barrier) or three layers (light barrier only). No chemical treatment is thus required inside the bottle.
The bottle is then trimmed just before being filled in a sterile atmosphere.

Second, for open-neck bottles, including PET bottles, "wet processing" with a peracetic-acid based liquid solution (PAA) or "dry processing" with a hydrogen peroxide-based gas solution (H2O2) can be used.
Unlike PAA processing, H2O2 processing has the advantage of not requiring sterile water rinsing after processing. It therefore reduces overall water consumption.

Innovating to add value

Although milk remains a staple product, its manufacturing requires complex processing: UHT sterilization of milk, aseptic filling, barrier materials, and therefore a high production cost.

In order to attract new market players, technical innovation is therefore important. As a pioneer in the design of aseptic filling machines, Serac is continually investing in R&D in this field. One of the major fields of research in packaging decontamination is the electron beam or "E-Beam".
With this process, it is possible to avoid using chemical products. Nowadays, there is growing interest in «chemical-free» processes. E-beam is therefore one of tomorrow's solutions.

Towards smaller and more flexible machines

Demand is also evolving in terms of machines. High output volumes enable the large dairy companies to write off their production units.

Newcomers on the other hand look for smaller machines with slower outputs, especially on the new markets. They also tend to favor bottles versus cartons because they stand out on the retailer shelf.

Greater flexibility is another emerging trend

In order to make investments profitable, food manufacturers also wish to fill different products on the same line, such as fruit juices (products with acid pH) or fermented milk (non-sterile chilled products). We are therefore starting to have requests for flexible multi-product lines in order to produce extended shelf life and cold chain products on a same line. Flexibility in packaging materials is also required, with lines that can fill both polyethylene and PET bottles.

Lastly flexibility is required in terms of packaging sizes, with lines filling both quarter of a liter and one liter containers. We have therefore developed neck transfer systems which are used to rapidly change the format without requiring machine sterilization.

To sum it all up, production lines must be more flexible in terms of products, materials and formats, while retaining their primary objectives: product sterility and integrity, as well as performance of the filling line.

Column written further to Roland Nicolas' interview

> *Marking is the ultimate link between a manufacturer and its customers. It is therefore a key player for two major trends in packaging : safety and customization.*
>
> *It will become increasingly complex as it will have to be able to reassure and communicate with consumers. We aim at providing solutions that address this growing complexity, while adapting our marking and coding systems as well as our CoLOS traceability software to more demanding requirements in terms of productivity and cost reduction.*
>
> *Arnaud Laugier* — *MARKEM-IMAJE*

> *Our customers for the packaging sector are mainly system integrators, looking for reliable and available solutions, allowing them to reduce considerably the "time to market" of their equipment.*
>
> *We provide them, on the basis of our unique and progressive hardware, all the opportunities for integrating a weighing function in their process.*
>
> *Dominique Ribet* — *PRECIA MOLEN*

> *In order to remain competitive, food processing companies need to work toward reducing both direct and indirect costs. This is what we are offering with the Liftvrac range, a new generation of lifting conveyors for bulk products, by significatively reducing losses of raw materials in production as well as the footprint of manufacturing lines.*
>
> *We also respect a quality level that meets consumers' expectations as our conveying system gently handles the most fragile products.*
>
> *Marcel Boursier* — *LIFTVRAC*

Ergonomics is a priority for our customers

Nathalie Pereira
Head of Strategic Marketing & Packing and Overwrapping Product Manager
Cermex

Our customers are increasingly demanding for ergonomics, both in relation to operators' musculoskeletal disorders and productivity and maintenance. This trend towards ergonomics grows stronger every year and encourages us to adapt our machinery. We are therefore working on improving format changeover, on better integrating robotics and new technologies, quite simply because ergonomics is one of our major concerns.

In order to constantly enhance the ergonomics of our packaging solutions, we are mainly working on five development focuses. First reducing the weight of tooling which must be modified when changing format in order to allow a better and quicker manipulation and a less restrictive storage in terms of required areas. For example, as regards our packing equipment, we offer ProSelex®, a product-collating solution for various formats and various primary packaging formats. With ProSelex®, we have significantly reduced:
- format changeover time as it is easy to remove the 'comb' and 'counter-comb' designed to pre-collate the products and form the batch;
- the weight of the interchangeable parts (very compact simple combs versus screws that are bulkier and heavier);
- Required tooling storage space.

We have also reduced by more than half the weight of certain parts in our top loading gripping, including on multi-articulated robots. This reduction results in a decrease in energy consumption necessary to operate the modules and functions concerned.

Second development focus: facilitating parameter setting and adjustments during format changeovers by integrating indicators and guiding systems. Generalizing settings is a trend that allows operators to avoid tooling interchangeability at every new format.

Third development focus: having universal operating principles, i.e. fully automated and motorized format changeovers, and also more flexible solutions. Ergonomics during machine operation is enhanced. It is sufficient to select the new format on a HMI for it to change automatically. For example, on our shrink-wrappers, our SFR (Regulated Flow Selection) system allows automatic adjustment to the product format. We have also developed an automatic changeover device for consumables. Also on this range of equipment, film reel changeover is automatic through a patented device called DIS, without stopping the machine.
The operator no longer needs to change a reel while the machine is still running with the previous film, which is ideal for very high speed lines.

Robotics 'for the benefit of operators'

Fourth development focus: integrating robotics in our machinery. This trend has been generalized for a number of years for palletizing and more recently for case packing. Robotics offer high flexibility thanks to the possible automatic part changeover function and also a possible adjustment of paramaters.

Cermex also stood out last year as the only one on the market to integrate operator interaction in its robotic packaging machines. We offer a compact robotic palletizing solution (new generation PR) with collaborative functionality. The combination of robotics with new technologies - including laser scanners - increases interactivity between the operator and the robot, line productivity, and machinery ergonomics. When an operator gets close to the palletizing cell, it starts reducing its speed. It stops only if the operator enters the unit. This collaborative aspect combined with robotics thus results in reducing production downtimes while increasing safety.

The other advantages are the extremely simplified use of machines and a machine footprint reduced by 10% as a result of optimized required safety distances.

Enhancing the human machine interface

Last development focus: operator interface or machine intelligence. We are developing screens that are as ergonomic as possible, intuitive user-friendly menus, and warning messages.
We are constantly seeking to further integrate in the packaging machines new technologies visible in consumer products.

Increased access to the main functions

The height of the work surface must also be optimal for operators. The reason is to avoid handling that is too sudden or results in unnecessary muscle tension. For example, on our VersaFilm® shrink wrappers, we have set platforms for a facilitated access to the work surface. And our film feeding tables are mounted on guide rails and can be removed by the operator, a major advantage also appreciated for maintenance. Lastly, on our case packing machines, we have also lowered the feeding height of cardboard consumable modules.

Moreover, maintenance is made easier with ground-level access for all machines manufactured by Cermex. We can also choose components that no longer need to be lubricated, or self-lubricating ones. Ergonomics, productivity and maintenance costs are thus improved for the operator with less downtime and human interventions.

Considering the Total Cost of Ownership and maximizing services

For those customers who are far ahead in terms of ergonomics, the Total Cost of Ownership is critical. In other words: the total cost of ownership of a material over its whole life cycle. It is not the immediate price of the machine that they are interested in, but its price over its whole lifetime.

Lastly we must keep on developing our services: always enhancing customer proximity, delivering readily-available spare parts, providing after-sale technicians 24 hours a day, offering breakdown assistance via remote maintenance (Internet or telephone) and many other services.

For Cermex, it is essential to provide a comprehensive package over the whole life cycle of our products: equipment and related services. This is our company's philosophy.

With the rapid expansion of selling and supply of products in flexible bags, packaging machine manufacturers must provide new solutions combining flexibility, versatility and performances.

Thimonnier's offer ranges from mechano-pneumatic machines to mechatronics machines. We develop machines driven by PLC and Servomotors. The electronic evolution facilitates controls of machine parameters and machine adjustment accuracy.

With these new technologies we optimize the efficiency, quality and flexibility of our machines.

Sylvie Guinard *THIMONNIER*

EFFICIENCY

how automation reduces costs

Chapter 3

introduction

How automation reduces costs

Henri Saporta
Chief Editor
Emballages Magazine

Whether it be primary, secondary or tertiary, packaging is the only way to market a product in good conditions. Its cost cannot be dissociated from the product's overall cost.

Depending on the packaging's requirements, whether it be ergonomics, safety, shelf life, traceability, protection against counterfeiting or branding, or all of the above, its share in the product's sales price varies.

During an economic downturn, priority is given to reducing costs; suppliers of materials, packaging and machinery are trapped in critical situations. Raw material prices fluctuate, there are frequent shortages due to increasing demand from the developing countries, taxes increase, competition is tough and demand waxes and wanes. The margins of manufacturers are thinning.

Adapting continuously to consumer cycles is the key to success. High volume standard products are behind us and have been replaced by short life cycle products. Today they are hyper-segmented, customized, seasonal, or attached to a short term promotion. Brands want to weave tight relations with their consumers and respond to their least requirement.

Social media and mobile technology have enabled information sharing. The consumer can comment on a brand to make it evolve, or decide to abandon it.

As batches are smaller, the production equipment, end-of-line procedures and logistics must adapt fast.

Brands want ever more reactivity and flexibility, which calls for integrating servo-controlled motors, automation, fast format changeover, short cleaning cycles, rationalizing workstation operations and throughputs, digital printing and delaying identification.

Investing in sophisticated machinery must be done in line with cost control. Product segmentation is often revenue-based. Differences in living standards and the long term effects of economic downturns push the brands to address all consumers from all backgrounds and from both developed and developing countries.

Economical and high performance: those are the attributes of tomorrow's packaging.

“We are dealing with a new cycle, with reinvented systems”

Fabrice Peltier
Packaging design Expert
Diadeis

Given the current economic slowdown, the packaging market is doing rather well; especially since it focuses on responding as closely as possible to the evolution of our patterns of consumption. Although today the sustainable design logic is an integral part of the manufacturing processes, innovation is on-going. With the continuous improvement of the materials’ preservation qualities and the renewed interest for cardboard, packaging is permanently reinventing itself.

Sustainable packaging is now well-established in our society. In this area, we are no longer at a crossroads but in movement and action insofar as brands are actually working on sustainable design and even on recycling design. Every customer meeting mentions these issues and the same goes for tradeshows where these environmental concerns give rise to innovation. Sustainability is no longer an abstract concept, it is an integral part of the companies’ strategies.

Brands are therefore directly affected since it can either be very costly or lucrative. Sustainable design is an integral part of the process.

Packaging Manufacturers are facing major changes

These new trends obviously affect packaging machinery suppliers. Some of them are already ahead on these issues. They have not waited for markets to impose their requirements. Packaging is evolving for good. In the beginning it was designed to solve an industrial problem: preserve its content and transport it to retail stores. However, nowadays, the retail industry model is facing major changes.

– *www.packaging-trends.com* –

Another issue is to reduce materials consumption. Packaging’s impact must be moderate on the environment and on the volume of materials required. The developed countries’ goal is to reach a 75% recycling rate. We therefore have two obligations: improve the environmental impact of packs and above all make them recyclable.

As a result, packaging and material manufacturers can’t afford to work separately. Partnerships are essential. We are moving towards joint solutions.
Yesterday’s material manufacturer will in the future have to take an interest in the machines and the end product – and the same goes for machine and end-product manufacturers. We are dealing with a new cycle, with reinvented systems.
Brands and machine manufacturers are challenging themselves in order to adapt their system in the long run. This revolution is both defensive and prospective. It is not related to packaging itself, but to the evolution of our society, our consumption and purchasing patterns, the supply chain, manufacturing, globalization, as well as local sourcing. Nowadays, we need to see the whole picture, not just isolated events.

Machines are evolving in sync with the end products. They need to be more flexible and communicate with one another.

Intelligent packaging and the return of cardboard

New materials, compacting and associating materials are particularly promising. After having been left aside for a long time, cardboard is back. It is considered the material of the future! Cardboard is becoming less rigid, it can be compacted with plastic film. These developments are directly linked to the price of resources and their image. With inexpensive oil, it was simple to produce plastic packaging.

This is no longer the case today; paper and cardboard have become competitive again, all the more so as thin plastic and polymer films can be added.

– *“We are dealing with a new cycle, with reinvented systems”* –

There is also much talk about smart packaging. However, the attribute applies if it is used to preserve the food product. It is inherently smart ! Add to that nano-materials and a number of technologies used to extend the food products' shelf life. Packaging materials' shelf life itself is continuously improving. Like this astonishing plastic film suitable for ovens at 220°C (430°F) !
Materials are evolving in two directions: they protect what they contain better and they are more convenient for the consumer.

What's the ideal packaging? Multi-purpose packaging

The idea is quite obviously to design multi-purpose packaging. And to this end, it should answer the fundamental issues raised by its four main customers: industrials who manufacture packages and products, retail stores who sell them, consumers who use them, and waste management companies which must recycle them. Therefore packaging has as many, if not more, functions as life cycles!

For the manufacturer, the ideal packaging preserves what it contains, is cost effective and facilitates logistics. Packaging thus meets all the company's logistical, economic and environmental requirements. For the retail stores, the ideal packaging is one that sells well and presents the product appropriately, which will in turn increase the value of the store's brand and its display.

Third, the consumer, for whom the ideal packaging should simplify his life: easy to open, to close, to store, and to empty completely. Finally, during its last phase, the ideal packaging should easily find its way to selective sorting containers, and be repeatedly recycled.

However, there is no single solution to packaging issues - quite simply because it is impossible to isolate packaging from what it contains. We should therefore stop talking about packaging and only packaging since, as such, it is useless! What is useful is a packaged product.

We should therefore talk about a "packaging-product" combination, and there are as many solutions as there are combinations. Most of the time, packaging is black-listed because only its end-of-life aspect is taken into account, it is only seen as waste.

It is time to stop thinking that way! The services rendered by packages are too often forgotten. The issue is thus to find the best "packaging-product" combination by taking all the parameters into account: from the content itself to its place of production and its place of consumption.

Offering complete lines with an overall performance warranties

Pascal de Guglielmo
President of Synerlink
Arcil Group

The packaging market is facing growing customer expectations. Machinery must not only be flexible and efficient, but also adapt to changes in formats, products and materials. In this context, finding complete line solutions that warrant overall performances is a strategic focus.
This is the mission of Synerlink, the global line engineering business of the Arcil Group.

In the packaging lines, a virtual line exists between primary packaging (in direct contact with the product), secondary (adding value to it and selling it) and tertiary packaging (protecting it during transportation). These three phases are generally considered independently, in particular in the food and beverage sector.

This is a mistake since the performances of a line are the result of the performances of every link in the chain. Arcil, when creating Synerlink, has initiated a strategic move in order to offer complete packaging lines with overall and consistent performance warranties (instead of individual ones for each machine).

Therefore we offer solutions that harmonize communication between each piece of equipment, and warrant stable and high overall performances throughout an entire line.

Guaranteeing overall performance levels requires taking two basic parameters into account: first, each machine should operate properly and efficiently; second, interaction between each machine should be optimal so that any incident on one of them induces as little disturbance as possible upstream and downstream

Increasing overall performances on a complete line

Synerlink acts as a project team who enhances production line performance and machine interaction, as well as finds ways to simplify the production stages and improve ergonomics.

We have developed and integrated equipment from suppliers with whom we partnered in the design phase in order to provide these reliability warranties. We have also developed tools to monitor line management, performance, operating and traceability.

We designed Efidrive, a software system that controls performance and enhances flows and naturally provides experts with all the data required to maximize line performance, in particular in between production phases.

The OMAC method used by our teams and the Efidrive operator interfaces set up on each packaging line component also allow us to drastically reduce the number of operators on the line while decreasing the time required for the initial ramp-up.

We have managed to reach over 90% in terms of overall performances on a complete line, compared with traditional lines whose performances vary between 70 and 85% in terms of performance, i.e. a performance increase of 5 to 20 points!

This is evidence that flow enhancing and monitoring between each machine is a highly important point to increase performance.

Improving flexibility

We have been working for over 20 years to design machines that are both efficient and flexible. This is a critical topic, especially now that brands aim to launch products which differ from what is available on the market, while requesting flexible machines that ensure high performances at reduced production costs.

It is therefore necessary to adapt the lines by achieving greater maximization of format change processes.

Another development focus is the product changes on the line. They can cause a drop in line performance. Multiple references produced on a same line with increasingly fragmented batches have led us to improve these batch changes by synchronizing machines during the transition phases and by anticipating procedures so as to reduce the time when performance decreases.

And when these production changes take place several times with the same shift, productivity gains are significant.

The last focus that should be taken into account is the adaptation of machinery to new materials. Equipment must integrate them while improving productivity.

This is why our structure makes it possible to carry out tests within our workshops and to give our customers alternative solutions to traditional thermoformed materials and/or to reduced plastic thicknesses.

Using robotics to simplify machinery

Robotics have gained ground over the past five years, bringing in digital solutions. The servo-motors have contributed to additional flexibility in the machines' operation.

In the end, whichever development you take into account, the same approach is adopted: finding solutions to simplify

machines at the kinematic (geometry and motion) level and add intelligence in order to improve performance; in other words, designing machines that are easier to clean, simpler, more streamline, more ergonomic and more reliable.

Flexibility, a key priority for the industry

Pierre-Yves Berthe
Managing Director – Equipment Department - Mecapack
PROPLAST Group

Flexibility and OEE (Overall Equipment Effectiveness) have become keywords to industrial production.
Today optimizing downtime when production formats are changed is a priority. The solution lies in machines that are more and more innovative and flexible.

The flexibility and just-in-time requirements in consumer retailing has never been greater. In some cases, it may give rise industrials overinvesting and overproducing by approximately 30%; a consequence I have witnessed to varying extents while meeting several manufacturers in the food and beverage industry. We have thus considered how to assist customers in being more flexible; quite simply through machinery that gives flexibility.

Shortening format changeover times

We have therefore focused on the time-consuming element in the packaging process: format changeover. And we have tried to reduce it to a minimum so that the customer's OEE (Overall Equipment Effectiveness) is increased.

As an interesting side-effect, the concepts of productivity, flexibility and OEE have led to improving the conditions of use of the machines (more ergonomic and easier to use).

All the studies have been carried out to minimize handling in an attempt to save time and, by extension, to improve safety; both on our tray sealing and thermoforming machines.

Innovating in sealing machines with the carrousel and line separation

The sealing machine is formed of upper tooling and lower tooling that corresponds to the format of the tray. Before, in order to change tooling, it was necessary either to lift weights of approximately 20 to 25 kilos, or to use a trolley with chains that removed the tooling, with the risk of tying it up inappropriately and dropping… Now, the machinery is equipped with a rotary carrousel system onto which 4 heavy upper tools are attached. All that is required from the operator is change a four-kilo sealing mask on the lower part of the machine. Depending on the choice of the frame, the machine automatically recognizes the format. The carrousel will then index itself on the appropriate upper part. Once the tray sealing frame is changed, the rest takes place on the screen without any handling.

With the carrousel, we can change a tooling format on tray sealing machines in 2 to 3 minutes, compared to the standard 15 to 20 minutes. The actual production time is therefore significantly increased. This carrousel technology is particularly recommended for small and medium rates.

On the other hand, for high rates, it is better to focus on the concept of "separate lines for different formats". The carrousel system cannot be applied to large capacity machines, since the installed weight is too high. We have thus circumvented the problem by designing larger machines and by installing the tooling permanently on the machine. Each tray sealer is then dedicated to two formats (with two distinct lines) in order to eliminate tooling changeover. The upstream flow will simply be directed either to format A or to format B. The transition takes place with no time wasted.

Improving flexibility on thermoforming machines

The same problem applies to thermoforming. However, in this case, three elements have to be altered when formats are changed: on-line manufacturing of tray; sealing tooling and cutting. Until now, the change could take between 40 minutes

and 1 hour. Now, thanks to flexibility-focused design, we are down to 15 to 17 minutes.

In order to get these results, we started by carrying out a SMED study. We listed and broke down all the production tasks and stages. We tried to reduce downtimes by working on a more straightforward procedure. From a technological standpoint, we have developed auto-locking handles that enable, for example, to lift upper tooling in only 5 seconds, compared with the usual 5 to 6 minutes.

We have also developed automatic depth adjustment systems; automatic sealing plate removal systems that eliminate the risk of being burned; and barrel cutting systems. It results that manual operations are reduced to their simplest form.

In the future we are going to bring format changeover to an even higher level, since it relates to the very heart of the machine. It is its very essence.

In order to address the demanding market of packaging machines, palletizing, conveyors or for the food industry, we are developing products and solutions that meet the latest Machine Safety standards CE, UL / CSA, hygienic (Ecolab, 3A) or ATEX / IEC Ex.

Our customers, users or integrators are looking for both safety and machine availability. We guarantee monitoring and transmission of information via appropriate gateway networks or bus protocols (AS-i).

Finally, in order to provide customized solutions, our TüV experts give them advice in the pre-project stage, from risk assessment to elaborating the certification report.

Jean Baptiste Fournaise — *SCHMERSAL*

Demand in practical and unique packaging is increasing. This long term trend pushes manufacturers to adapt their packaging lines to gain flexibility.

With the major advantages of robots and automation, these evolutions can be better anticipated.

MG Tech focuses on this to provide solutions that enable manufacturers to better control their packaging, find innovative solutions and answer new requests.

Philippe Robart — *MG-TECH*

New challenges for tomorrow's packaging machines

Andrea Barbolini
Application VP Packaging
Schneider Electric Automation Gmbh

The transition from a mechanical process to the mechatronic approach has led to a true sophistication of machines used in the packaging industry. The high degree of complexity makes it now possible to adapt to end-users' new requirements and gives rise to a new vision about future issues.

The 1990's marked a radical break in the packaging industry. Packaging machinery manufacturers had to completely reshape their machines in order to support their customers' needs as regards product innovation. The reason was simple: the mechanical principle which this generation of machines relied on could no longer meet the new production and innovation requirements. Back then, industrials became much more aware that placing new products or enhancements on the market could no longer be supported by the machines available on the market.

The breakthrough of mechatronics

It has thus been necessary to move from mechanics to mechatronics, a multidisciplinary approach involving mechanics as well as electronics and computer science. This technology - which is more relevant than ever – is used to introduce modularity, which was up until then impossible with a purely mechanical system.

The conversion from a mechanics to mechatronics has required machinery manufacturers to radically change their ways of thinking, since modularity requires separating the various modules and integrating software liable to manage independent units. It is also necessary to pre-define the structures, to program, to code without completely eliminating the mechanical aspect. Mechanics remains but its role is greatly reduced.

A fascinating concept for all industrial sectors

For end users, this approach has triggered significant progress. Each industrial sector has drawn advantages. The pharmaceutical sector was the first one to embrace the concept and greatly improved its modularity and flexibility.
The tobacco industry, which immediately followed, was seduced by the possibility to accelerate and increase the production levels. Lastly, the food and beverage industry adopted it since it allowed it to solve problems related to its complex production lines.
Throughout the years, the relevance of the approach has increased: at the beginning of the millenium, the rise in production became one of the manufacturers' central issues.

It was thus necessary to produce more while remaining flexible and the mechatronic approach has facilitated this transition while also integrating new materials and all types of labeling, including the RFID techniques. 'Producing more' has finally led the industry to adopt the principle of an open approach.

Ensuring unfailing security

These last years, new requirements from manufacturers have appeared and, among them, reducing energy consumption. Beyond the will to reduce their electricity consumption, companies are asking for new functionalities that may be used to reduce their raw material consumption, which can be a major cost driver.
Once used to reduce the costs of manual labeling, robotics are also now increasingly used in the packaging industry to replace humans in potentially dangerous tasks. The generalized use of orders on the internet has also given a new life to the industry.

Lastly, there is also a request for increasingly accurate information on these new packaging machines. Manufacturers want to be able to control the efficiency of these machines and of obtaining further diagnostics on the working condition of each module. For us, as suppliers of automation techniques, this means that we should be capable of ensuring consistent security on these highly sophisticated machines. This issue will probably remain one of our main challenges within the next few years.

Robotics automation: towards more flexibility and added value

Florence Bertaux
Business Development Director
Fanuc France

From the end of line where they were first employed and have revolutionized palletizing through the parallelogram construction brought in by Fanuc, robots have moved to primary and secondary packaging operations for all kinds of products.
This development is a consequence of the tremendous technical progress made over the past 15 years, coupled with a significant decrease in acquisition costs. With such a decrease, robots can now be part of any manufacturer's toolbox for automation.

Productivity is not the only reason that encourages automation

It is indeed not in order to increase productivity that robots were first used in palletizing, but because they helped prevent musculoskeletal disorders. Though production output remains essential, quality and employees' health are of equal importance to manufacturers and robots can help them achieve these goals by avoiding mishandlings or injuries due to repetitive movements.

Thanks to added functionalities such as vision, robots can also sort out any kind of product based on numerous criteria (size, colour, code...) without the slightest inattention error.

With this ability, they make precious allies in managing traceability and more generally in ensuring consumer safety for which expectations will with no doubt still increase in the coming years.

The challenge is to increase at the same time productivity and added value

Facing fierce competition and lower purchasing power, manufacturers must produce at a lower cost while still finding ways to stand out in the shelves. The packaging itself, but also the product presentation in the packaging, play here a crucial role and call for increasingly complex handlings that robots can carry out much more efficiently than the human hand, at speeds sometimes exceeding 200 strokes per minute.

Efficiency and flexibility: the inevitable cooperation between robots and dedicated machines

Tomorrow, production lines will have to best combine robots and dedicated machines in order to meet all manufacturers' expectations: maximum efficiency and flexibility with a minimum footprint.

Dedicated machines will probably remain a step ahead on outputs for simple operations. But robots are able to deal with complex handlings in a minimum of space. And above all, they can adapt much more easily to changes in production parameters, thus offering a greater flexibility.

The need for flexibility, widely claimed by manufacturers, allows to state that the number of robots involved in packaging operations (10% of worldwide installed robots today) is bound to grow. Flexibility is largely considered by all robot manufacturers, and by Fanuc in particular, who offers the widest range of delta robots on the market and works at broadening the scope of possibilities by increasing the payload or developing complex applications such as bin picking.

No matter where in the world, you have noticed that robotics and vision systems are increasingly popular.

For many machine manufacturers, these technologies offer versatile packaging solutions with automatic changeover functions which reduce maintenance and machine down time.

That's why our new Sysmac automation platform integrates motion, safety, vision and sequential control in a single controller.

Hadrien Maureille — *OMRON*

The major technological challenge for manufacturers of automation solutions is to optimize machine flexibility in order to allow quick format changeover that meets the needs of industrial innovation.

To do this, Rockwell Automation offers mechatronic solutions based on digital axes with communicating controllers for the horizontal and vertical integration while minimizing machine footprint.

Olivier Vallée — *ROCKWELL AUTOMATION*

Being reactive and offering peripheral services to answer standard or customized customer requests is key to today's success.

Weidmüller, an expert in industrial connectors, is your partner to advise you and develop solutions adapted to their customers' requests.

José Batista — *WEIDMÜLLER*

In a strictly regulated sector in which consumer trends evolve quickly, Bosch Rexroth offers automation solutions integrating adaptability, hygiene standards, and process performance.

The combination of Rexroth technologies, based on an acknowledged expertise in mecatronics, allows local and international support, from the project to the commissioning and from the components to the initial supply to the retrofit, with an energy efficiency focus integration.

Géraldine Daumas — *BOSCH REXROTH*

PACKAGING

adapting to all the distribution channels

Chapter 4

introduction

Adapting to all the distribution channels

Henri Saporta
Chief Editor
Emballages Magazine

In 2013 France celebrated the 50th anniversary of the opening of the first supercenter store, in the Paris region. Carrefour invented the concept and it was reproduced all over the world. The sector has come a long way since Geoffroy Guichard designed the first Casino outlet in 1898. Now shopping is carried out online and giants are occupying the market place: U, E. Leclerc and Auchan in France, Tesco in the United Kingdom and Walmart in the United States. The business models have evolved, the distribution networks have spread; yet the products are still and will always be packaged.

Parking your car in a huge car park to walk up and down the aisles of a superstore is no longer the only solution. Online stores, drive-throughs, home delivery and buying directly from the producer are changing consumer patterns in developed countries. In Europe as in the United States, private labeling pushes leading brands to compete with retailers. Supply chains lack transparency ; as a result quality control and transparency represent significant competitive advantages. In Europe, the 1169/2011, also known as Inco regulation, encourages brands and retailers to be more transparent.

Private labeled products are supplied by specialized manufacturers with specific equipment needs. As their customers are requesting new ways to differentiate their products, private labels are also coming to product customization. The era of “me too” private labels is behind us. Innovation is no longer used solely by the brands.

Changing deeply rooted consumer habits is challenging, and so is marketing a product in the same package in several countries.

There are a few breakthroughs that succeed in shaking up market segments. Coffee capsules are a recent example; every market player is now trying to get their share of the cake. Packaging remains a tremendous source of innovation for brands, private labels, retailers and distance selling players. New technologies will contribute to designing new store models where customization, electronic labels, barcodes and bi-dimensional codes (such as QR codes) will deliver new services. Connected packaging will bring new means of communicating between the consumer and his brand. Geolocalization and on-demand printing will enable custom-made packaging for a special occasion.

Innovative and custom-made: those are the attributes of tomorrow’s packaging.

Committing to smart packaging

Bruno Garnier
Quality Packaging & Sustainable Development Expert
Carrefour

There is no such thing as good or bad materials but there are choices to be made as to packaging components in connection with consumers' health/safety, marketing strategy, and essential packaging functions, while remaining price competitive.
Following market trends and implementing source reduction, assisting consumers when consuming, committing to reduce the environmental impact, all these amount to offering smarter packaging!

Today's main trend is packaging source reduction. Our suppliers are working on this issue on an ongoing-basis. In order to remain competitive, it is in their interest to reduce the size, weight and thickness of their packages. Source reduction is motivated first by cost, second by the environment.

However we must bear in mind that packaging has a primary function of protection and storage, well known by consumers. In 1997, Carrefour was the first one to remove toothpaste cardboard packages.
We had to stop after 4 months because the sales had greatly decreased! If we were to start this source reduction again, it would be necessary to check that the thickness of the tube is sufficient to protect the product and add a tamper-proof device on the cap in order to guarantee the integrity of the product in the store.

This leads us to check that we do not shift environmental impacts: are we removing cardboard from one place to put plastic on another one? Do we need to reinforce secondary packaging cardboard (Ready-to-sell)?

Drive-through has no incidence on primary packaging

Purchasing methods are also evolving. Drive-through outlets are increasingly popular. 15% of French households went shopping at least once in a drive-through in 2012 (Source: Carrefour Annual Report 2012 – Kantar Worldpanel Data – November 2011 - November 2012). But drive-through shopping does not have any influence on primary packaging. The fact that consumers are shopping differently does not mean that we will ask our suppliers to change their production chains. This is not what consumers are asking for.

Drive-through is a new way to shop. It is another purchasing system, not another consumption system. We could possibly remove the secondary packaging and imagine, for example, bottled water sold only per unit for drive-throughs. However, consumers still want to buy packs of six (in most cases) which offer a volume matching their compsumtion levels with an easy-to-carry handle. Moreover, it would affect competitiveness to start creating special packaging since manufacturing volumes are insufficient and additional storage areas would be required.
For the time being, there is thus no change in primary packaging due to this new purchasing method.

Consumers' primary expectations: health and safety

According to an Ethicity study that came out in 2012, health and safety are consumers' number one priority, followed in 2nd position by the quality/price ratio. This concern remains very strong and legitimate due to the recurring food scandals. Our packaging must be flawless in terms of health and safety. Packaging must also be easy to handle, preserve the product, and be storable. Next, can it be recycled? Once the product is consumed, packaging suddenly loses all its appeal and becomes mere waste.

As we are aware of being at the same time customers, consumers and citizens, and as we often think and act in a different way depending on the life cycle situations of packaging, we

must switch from the idea of waste to the idea that we have a 'new post-consumer material' in our hands. End of life is a true challenge for tomorrow and a high value-added issue for society.

I hope that we gradually move to packaging solutions with more and more recyclable materials (which really integrate a material recycling channel). Today, in France, a large part of packaging waste is not recycled. Sorting guidelines must be extended to plastic materials (tests are being made by Eco-Emballages, 51 local communities, 32 sorting centers and some 3.7 million citizens) in order to develop these new recycling processes.

It is important that the packaging sector make progress towards a better managed end of life, but also that the recycling industry adapts to new packaging and to our customers' new consumption habits.

Smart packaging… 'almost' invisible and truly responsible!

Lastly, smart packaging would be one which cannot be seen or detected, which is as transparent as possible in the overall life cycle of the product/packaging system. Packaging is useful, necessary and has essential and key functions. If packaging is removed, we risk making a backwards move, generating food waste, increasing food contact, reducing preservation, creating transport issues… Packaging is therefore recognized as taking part in the improvement of food and in the no-waste approach.

We carried out a study with PWC (PricewaterhouseCoopers), TetraPak and LSDH (Les Laiteries de Saint-Denis de l'Hôtel) on sustainable development and packaging indicators.
This concerned particularly milk and orange juice cartons. We understood that in terms of environmental impact, packaging represents between 5 and 20% on many indicators (CO_2, water, energy for example). The major part of environmental impacts is the product itself!

As I now know their impacts better, I am in favor of eco-design for packaging taking into account a key indicator: the packaging deliverability, i.e. the capacity of packaging to provide all or part of the product contained.I In some milk packages for example, the consumer is unable to pour between 1 to 5 cl of milk into his bowl. Likewise, in a square butter dish, several grams of butter are often not used! This represents worldwide a huge loss both in terms of food waste and environmental impact.

It is not acceptable for consumers to be unable to consume the product right to the end! And it is not acceptable for us, as distributors, to purchase a product that our consumers will not be able to fully use. Our packaging must offer maximum deliverability; as Danone has done with its new yogurt pot. I find that this is also smart packaging: packaging that is economical, ecological and marketed.

Focusing design innovation on sustainability

Eric Drapé
Executive Vice President - Technical Operations
Ipsen

In the pharmaceutical area, packaging is very important, and it is becoming an integral part of new drug development. Traceability, new materials, formats and ergonomics are the focuses for improving packaging. Traceability is critical for the safety and service provided to patients.

Packaging accounts for approximately 38% of our production purchases. We are therefore permanently working on optimizing it as we regard it as a competitive advantage that brings value-added to the product's marketing mix. We are therefore working closely with our franchises (urology-oncology, neurology and endocrinology) on new packaging concepts, both primary (for example, pre-filled syringes) and secondary.

For specialty care products, the 'device' is more and more often considered an integral part of the drug. It becomes essential in terms of quality of life for the patient: the objective is to offer ready-to-use formats, as user-friendly as possible with a maximum level of safety. The preliminary meetings between the marketing department, designers and manufacturing is therefore more and more meaningful in order to integrate very early requirements from the market and from patients in terms of efficiency and ease of use, but also of manufacturing costs.

Choosing compatible materials and adapting formats

When choosing materials, we are limited by their compatibility with our products. High quality glass remains our reference material, although it is very fragile.
Manufacturers have besides considerably improved glass, particularly with the development of different forms and more accurate molding.

We also use plastic (less fragile and lighter), for example on our pre-filled Somatuline Autogel syringe.

As regards conventional products (such as capsules and pills), we traditionally use PVC blisters or aluminum-based packs so as to keep moisture out.

Patient consumer habits differ noticeably between countries, depending on their living standards. This in turn impacts packaging size. Where in France a standard Smecta box contains 30 to 60 doses, we may market 10-dose packaging (and get closer to the unit dose form) in other countries in order to decrease the purchase price and adapt it to local market requirements.

Sustainable development, a major issue

As regards sustainable development, we find the PSCI (Pharmaceutical Supply Chain Initiative) approach very interesting. At Ipsen, all our calls for tender for choosing our suppliers systematically include questions relating to ethics, environment, safety and health. These are now essential selection criteria.

Lastly, as regards preventing waste, the issue is to rationalize packaging size by making sure that it doesn't contain an excess of air; in other words, reducing the packaging size to what is strictly necessary, obviously without impacting product quality.

Rolling out Datamatrix

Traceability is another important development focus. Unit dose traceability, such as vials, through the new Datamatrix-type coding system has been rolled out on all our facilities in order to meet French legal requirements. The progress towards unit dose traceability (serialization) is planned to meet the requirements of the European directive against counterfeit drugs. The globalization of distribution methods, particularly on the Internet, involves having an efficient traceability system in order to maximize safety for patients.

This implies significant developments at the level of packaging, production lines, information systems, production methods and processes. We must define the Group's common standard solution that we will implement on all our packaging lines.

Tracking and tracing is currently carried out per batch with a bar code system and easy-to-copy batch numbers.
The new Datamatrix systems allows unit traceability on tertiary (crate or pallet) or secondary (case, box) packaging, and also, as some countries are requesting, at the level of primary packaging (vial, blister). This makes it possible to customize the product that is distributed to the patient. If a doubt or a problem is brought up, it is easy to trace information on the vial or the box, which increases the level of safety but also the reliability and accuracy of information.
These systems are also capable of coding much more data than the traditional bar code system.

Moving towards smart drugs

Smartphone also opens up promising prospects with simple applications that for example allow a patient to check the dosage, the origin of the product, its purpose, its expiry date, etc., or also vocal systems that help visually impaired users. Smart packaging also connects consuming the drug to databases.

For example, if you suffer from diabetes, the IT system can make dosage recommendations depending on your blood sugar level.

If a patient is undergoing background therapy, one could easily imagine that he enters data regarding his medication in his smartphone, which would feed a database to which his doctor has access. The latter could remotely check his patient's condition and give him recommendations.

We would get to a more personalized, interactive, reactive treatment where you would no longer need to wait for your quarterly visit to the practitioner for a review.

Constantly evolving traceability

Cold chain management could also benefit from the new technology. A monitoring device integrated in each packaging is quite conceivable. Upon reading the code, for example when purchasing at the pharmacy, it would be possible to check, one vial at a time, whether the cold chain instructions have been respected.

The pharmaceutical industry has always been in the lead as far as traceability is concerned. Technological innovations make it possible to consider ever more efficient solutions and to go further in tracing a drug during its entire lifetime.

Packaging, a key vector of innovation

Philippe Thuvien
Packaging & Development Director
L'Oréal

Packaging and design are now key vectors of innovation in the world of cosmetics, especially in the current global economic environment which calls for faster innovation processes, in line with the macro-economic trends. Cosmetic companies must innovate more and faster in order to remain competitive.

The world of cosmetics is facing increasingly aggressive competition. Attractive designs are a must-have to differentiate new products. Our sector is also paying more and more attention to costs. With millions of new consumers, emerging markets are clearly beginning to see their incomes increase, allowing them to buy cosmetic products, provided that they are adapted to their needs, culture and purchasing power.

However, because of the economic downturn, many consumers in developed countries are reducing their expenses. Packaging should thus allow men and women to purchase cosmetics by offering products adapted to their market. For example we sell a Garnier shampoo in a 400 ml bottle in North America, in a 250 ml bottle in Europe and in 2.5 ml packs in India, in the Philippines or in some South American countries.

Offering even more efficient packaging

Our consumers' safety is a requirement. It is therefore non-negotiable. But beyond this prerequisite, they expect to our products have a true added value, i.e. more visible and measurable results and flawless quality.

In order to achieve this, we are improving the ergonomics of our products by developing new features such as, for example, a greater comfort of use or a more practical formula dispenser.

Olia for example provides ammonia-free hair coloring in a bottle which is both elegant and easy to handle.

Other packages enhance the anti-fatigue effect of the formula - as in Mennen Roll-On Eyes with an icy massage effect - or thoroughly clense the skin, like the 'Perfect Clean' of L'Oréal Paris and its massage-like applicator.

Packaging also makes it possible to create mixes by coupling formulas to a diagnosis in order to customize the treatment - as in Kerastase Fusio-Dose.

Meeting sustainable development issues

Another concern of cosmetic brands: meeting sustainable development issues with more environmentally friendly materials that preserve fossil resources and reduce energy consumption, like Lancôme polyethylene tubing, Kiehl's PET bottles and Biotherm recycled glass jars.

On the whole our materials will be the same tomorrow as those we use today, with one difference: they will no longer come from fossil energy sources but from bio-renewable, and/or recycled resources. We must also make sure that our folding cartons and paperboards (FSC or PEFC certified) are sourced in a responsible manner.

In addition we have introduced a policy to reduce primary and secondary packaging, for packaging used between our suppliers and our plants as well as for our products themselves. And we have committed ourselves to reducing the waste generated by our finished products by 50% between 2005 and 2015, alongside our water consumption and CO^2 emissions.

The L'Oreal plant in Jababeka (Indonesia) is, for example, LEED certified, an American standard that defines strict rules for sustainable building design (in particular, rational use of water and energy). Other Group production sites (for example, Settimo Torinese in Italy, Libramont in Belgium) have set the objective of rapidly reaching zero carbon footprint.

The cosmetics industry should also anticipate regulatory and media expectations. For example, we must focus on the 'fair' protection of our formulas. The quality of raw materials, the formulation, the manufacturing and packing processes and the packaging fall within this scope.

Finding the most suitable machines for each of our needs

We adapt our manufacturing processes and our packaging machines in order to address these challenges. Our objective is to find the suitable materials for our performance, quality and reliability requirements. On basic products and high volumes, this involves having powerful machines in terms of speed with very few adjustment points to make the process more reliable. On the other hand, for complex and/or high value-added products, the focus will be on flexibility in order to better respond to the brand requirements in terms of innovation and to adapt to several products.

The more we optimize our deadlines for making the machines and tools available, the better we are in regards to reactivity and capacity to produce at the best possible cost. And, because employee safety is a priority for L'Oréal, each investment is subject to a safety-risk assessment.

Traceability, a key factor

The traceability of our products is regulatory. It is a key factor to fight against counterfeiting and the parallel market, and thus to protect our consumers from purchasing counterfeited cosmetic products.

In addition, the interactive and multimedia packaging features are great vectors of innovation and differentiation. We keep a close watch on coding and authentication solutions in order to apply those most suited to our needs:
· Securing our products: always staying ahead of counterfeiters,
· Globalizing information and data exchanges by using the potential of new technologies (integrated electronics, miniaturization….),
· Interactivity with consumers: offering them more services and information, once again through new technologies (Smartphone and QR code…).

distribution networks

Smart packaging makes it possible - beyond its primary function which is to protect, transport and preserve the product - to inform and advise the consumer, for example on colors (make-up and hair coloring). It is also a promotion and advertising support for the brand. The challenge is to integrate the new communication channels (QR codes, RFID, conductive ink…) in our traditional media: folding cartons, labels and sleeve, with the constraints of monitoring retraction for the latter.

Over 70 packaging patents filed each year

In order to answer all these expectations and constraints, brands must innovate continuously. Packaging is therefore more than ever a key vector of this innovation. L'Oreal thus strongly invests in research and innovation, and, for example, filed more than 600 patents in 2012 (including over 70 packaging patents). Because it is through innovation that the Group will manage to achieve the objective it has set: winning one billion new consumers within ten years.

L'Oreal's Research & Innovation and Marketing departments are responsible for developing products combining high levels of quality and performance. We have just opened a new research center in India, and will soon open another in Brazil to develop products corresponding to local expectations.

A collaborative innovation

In order to reinforce the partnership with its suppliers and accelerate packaging innovation, L'Oreal, in addition, launched the Cherry Pack operation three years ago. It enables our suppliers' packaging innovations to enter 'at the heart' of the company while offering brands throughout the Group's divisions either 'ready to use' or more prospective innovations.

The process can be compared to an internal incubator, within which the selected suppliers share their expertise and invent ways of delivering new formulas, creating appealing looks and new ways of consuming the product. As a result L'Oreal creates closer links with its suppliers and accelerates the innovation process.

Innovative solutions based on ultra-specialized sleeving

Eric Fresnel
CEO
Sleever international

Sleeving technology (the film and machine combination) is a mature technology with a proven track record. It must now follow a new direction and switch from a standard to a specialty technology. A technological shift is underway with the aim of meeting the future requirements of brands. This relates both to entry-level products, requiring high speed and performance, and value-added products requiring flexibility and quick format changeover; like the dairy industry in the first case, and the make-up industry in the second case. Although these industries are completely different, common keys for the future must be found.

The dairy market (and more generally entry-level products) needs compact, high speed equipment. However, it also on the lookout for equipment that offers options in terms of rationalization and packaging reduction.

Combining economy and ecology on entry-level products

Just as packaging weight has been reduced, we are trying to reduce the weight of the sleeves. Research programs have been carried out for 5 years to reduce the thickness of the sleeves to 20 microns, i.e. a decrease in the weight/material ratio of at least 50% depending on the application. We are also working on reducing material densities, which generates savings of up to 35%. By combining them, we can decrease the share of the sleeve in the cost by 25% and in the weight of the packaging by 50%!

Concurrently this program has resulted in developing the 'Sleevercombi®' - a new machine technology - that transforms

the films on the packaging lines. The 'Sleevercombi®' range is a compact, modular, adaptable, high speed equipment, but most importantly with low energy consumption. For example, the 'SleevercombiSteam®' machine needs three times less steam than machines from the former generation during the shrinking phase.

The sleeve technology is reinventing itself. Although it guarantees personalization and protection of the primary packaging, it also offers manufacturers and brands an economical and sustainable solution, entering the virtuous circle of packaging source reduction and lower energy consumption on the packaging site. In short, we are moving towards the concept of continuous optimization of the primary packaging.

Offering smart packaging for specialty products

As regards the make-up industry – and more generally specialty products - the primary aim of sleeving is differenciation. We offer new low density digital print-ready films combined with a new concept of machines: the 'sleeverlogicpak®' range. It offers great reliability and reduces the format changeover times. Along with a modular concept including sleeve label intelligence, it allows the customer to create the whole identity of the product.

The customization module of the 'sleeverlogicpak®' equipment enables laser marking, inclusion of an RFID tag and Data Matrix code, or QR Codes. We are moving towards coding methods that offer a true traceability and the possibility to extend the information modes on the product. With smart machines, the customer customizes the products at the end of the line on small batches, down to only a few thousand units.

Enhancing traceability and fighting counterfeiting

Entry-level and specialty products, though on the opposite sides of the spectrum, both use new ranges of films and machines; they apply differentiation at the end of the line to address the wide range of product references;

they integrate smart components within machines to allow packaging lines to include identity and traceability using the latest technology, and they also include the most advanced anti-counterfeiting technologies.

This is a critical issue on which we are working with wine, alcohol, spirit and perfume brands. Sleeving is a safety technology (tamper-proof warranty). R&D is working on indicators that make it possible to identify whether there has been any product handling and whether anyone has tried to tamper a package. The issue is also to create technical solutions that are difficult to copy for counterfeiters, for example through 3D embossed into the material, or a combination of several technologies (such as holography and invisible tracers).

Consumers can have access to information (on how to use the product, the origin of the packaging…) via their smartphone and check that the product is not counterfeited. The sleeve integrates 'covert' or 'overt' technologies in the area of identity and safety. This step is a real turning point on how we see the market and our sleeving technology. We are revolutionizing the sleeve industry by closely matching the material to its equipment.

Innovation-driven Development

Lastly, everything is built around the process of innovation-driven growth. We are entering ultra-specialization by focusing on the specific needs of each market and its products. This is a true breakthrough from the past that combines cost and environmental concerns while integrating new manufacturing technologies (traceability, marking, vision, and robotics) into our 'sleeve' technology in the form of modules associated with the packaging machine.

The packaging industry is making a step towards convergence, since innovation requires packaging manufacturers to work more hand in hand than in the past and present brand new solutions to the markets.

> *PKB has specialized in filling and capping machinery for the Cosmetic industry in order to optimize the expertise our clients expect regarding higher segmentation and extreme format changeovers, ever stricter regulation, environmental concerns demanding drastic reduction of effluent discharge, waste, etc.*
>
> *Therefore, PKB has developed the newest range of filling and capping machinery on the market integrating the newest and most advanced technologies.*
>
> *Another strong asset: PKB is setting up foreign branches in areas of high growth potential to answer the growing globalization of the Cosmetic industry.*
>
> *Christophe Guyard* — *PKB*

We are identifying two major trends in the packaging industry: differentiation through packaging shape and customization, the latter leading to much shorter series.

As an answer to the first one we are cultivating our time-honoured expertise of screen-printing on complex shapes whereas we have developed for the second one an 100% digital ink-jet machine that allows to get rid of pre-press costs and to adapt texts and images at the last minute.

Didier Trolio — *MACHINES DUBUIT*

Overwrapping must be adapted to the logistical needs for each country, while ensuring that just the right amount of film is used.
Thimon invests in developing a wide variety of wrapping processes: spiral wrapping, full web wrapping and hooding and proposes the most innovative solutions.

We are participating in the development of plastic films to divide by 3 the price and environment impact.

Jean-Christophe Jaconelli — *THIMON*

Our two key drivers are flexibility and custom-made solutions. We are constantly improving our machines so that manufacturers can bag their products faster and change from one to another more easily.

And we are building custom-made devices to satisfy out of standard needs related either to the nature of the product to be bagged or to the workspace configuration that needs to be equipped.

Mathieu Zurro — *TECNIMODERN*

distribution networks

We strive to meet both demands of innovation in marketing packaging and efficiency with our equipment and complete lines.

New formats of products, packs and cardboard cases with a decrease in SKU.
Developing customized solutions with our experience as manufacturer, systems provider and designer of complete lines.

Supporting customers in their growth with specific solutions that take into account regional market prices; offering «simple and economic» alongside «high tech» solutions.
This requires capital, resources and extensive expertise.

Pierre Therville — *TECMA pack*

PACKAGING trends

Editorial

Innovation is the key to increasing industrial competitiveness

Jean-Camille Uring
Symop

Innovation is the key to increasing industrial competitiveness

Jean-Camille Uring
President of SYMOP
(French Association for Manufacturing Machine and Technologies), a member of FIM
(French Federation of Mechanical Industries)

Integrating technology in manufacturing is one of the pillars of industrial competitiveness. It enables the industry to respond to the fundamental market requirements : quality, flexibility and sustainability. A company that neglects its production tools weakens its competitiveness. On the opposite, placing it at the top of its priorities is a competitive advantage.

In order to respond to market demand, machines integrate an ever-increasing number of electronically controlled functions to automate handling. Sensors monitor more and more operations to follow the processes in real time and control the frequent product changeovers. They thus guarantee higher quality and flexibility on the production and packaging lines. In this domain new vision and measurement technologies are particularly valuable.

Promoting the digital plant

We expect this trend to continue. In order to progress in terms of flexibility and performance we need to promote the digital plant concept. This entails integrating and developing simulation software that enables complete visualization and modelling of manufacturing processes. Manufacturers benefit in many ways: finer parameter setting, faster production changeover, more efficient coordination of successive manufacturing operations.

Another major innovation priority is developing communication protocols that enable machines on a given production line to exchange data. But there are other items on the list:

simplifying the control panel flow chart to make it more accessible to the operator, designing smaller and more powerful components, moving towards new generation robots that integrate mobile and drone technologies to make machines even smarter.

Accelerate robotics integration in our manufacturing processes

Any progress made to accelerate robotics integration in manufacturing processes is a step in the right direction. The challenge is to get all the players to innovate concurrently.

In France, the SYMOP (French Association for Manufacturing Machines and Technologies) has initiated the “SME (small and mid-sized enterprise) Robot Start”. The project plans to help 250 SME’s purchase, set up and integrate their first robot in their production line. It consists of helping the manufacturer invest in the robot and participating financially in hiring experts to define the specifications of the robot, as well as assist during installation and commissioning.

In the U.K. the BARA (British Automation & Robot Association) also launched a manufacturing automation program in 2011, called “ Automating Manufacturing Program ». Less than 6 months after its launch over 150 manufacturer requests had already been registered. The program involved two stages: first identify opportunities to improve production through automation; second provide the manufacturer with the knowledge and information required to plan and successfully implement the automation solution. The program was highly successful and ended in March 2013, having generated 207 audits.

Encourage investment and cross-fertilization

Another initiative is in place in France to encourage innovation in machinery and support the robotics industry at large: “France Robots Initiatives” has been launched by the French ministry of “Manufacturing-based Trade Development”. The SYMOP, the CEA (Atomic Energy Bureau) and the CETIM

(Technical Center for the Mechanical Industry) head the “Smart Machines” group.
Their common objective is to give the suppliers easier access to the fundamental research centers in order to better implement their academic findings and accelerate the development of “Smart Machines” that are more flexible, more automated and in line with the requirements of sustainable manufacturing. In other words, integrate all the technological innovations that make their machines smarter!

Benchmarking with machine manufacturers from other industries, such as wood and paper, to identify how they evolve and working as a team to analyze how to integrate additional sensors and more evolved controls in their own machines is another asset to modernize manufacturing technologies. It will undoubtedly lead to increasing manufacturing competitiveness.

The SYMOP looks ahead towards the future

The SYMOP (French Association for Manufacturing Machines and Technologies) groups 240 manufacturers and suppliers of peripheral equipment, representing 16,000 employees and a sales turnover of 2 billion Euros. The SYMOP members get the opportunity to share their experience and communicate directly with their counterparts in robotics, CNC, software, as well as vision and measurement systems.
The SYMOP promotes manufacturing technologies and supports the industry as it strives to develop new technologies.
Within the SYMOP the packaging sector is undoubtedly one of the sectors that initiates the highest number of technical exchanges between members, whether it be suppliers or development partners, in the field of robotics, vision or measurement.

PACKAGING trends

Editorial

An American's stance on global packaging trends

Pat Reynolds
VP / Editor
Packaging World

Each geographical zone, whether it be Asia, Europe or North America, dictates its priorities based upon consumer habits, the weight of state in the economy and how much the companies invest in innovation. The packaging industry is no exception ; each zone pushes the industry to progress in specific directions. Often a zone is a trend setter, encouraging its neighbors to follow in its wake.

Innovation on the North American market

Starting with the pharmaceutical area, which is a big part of packaging industry in North America, there is a strong push for unit dose packaging to replace standard high density polyethylene bottles. Wal-Mart had made it very clear that they would like the industry to align themselves with other consumer goods and introduce blister packs containing unit doses.

Staying in pharmaceuticals, serialization is also an emerging request, meaning that every package should have a unique code. There is legislation coming out of California that will spread across the whole country. That is an opportunity for any company with an expertise in track and trace and serialization technology.
Lastly compliance prompting technology and calendarization are introduced in drugs, meaning that packs remind patients that they did or did not take their medication at the right time.

Generally moving out of the pharmaceutical area, stand-up pouches have not been that popular in the States. We have lagged behind Europe. But they are gaining market share as

filling speeds are almost matching those of rigid containers. The applications for stand-up pouches are expanding. The one-quart high density polyethylene bottle for motor oil is now displayed alongside the stand-up pouches in the outlets. For granular products like sugar the pouches can also replace the bag-in-box cartons.

In the controls area, information technology is impacting packaging machinery and complete lines. Real time visibility into packaging operations is becoming crucial. The main goal is asset utilization. If manufacturers cannot see and get data from their packaging lines in real time they do not know if their assets are properly used. These new software and data acquisition technologies are being pushed heavily.

Full-wrap shrink sleeves are increasingly popular for bottle labeling, largely because of the quality of their graphics. The solution is however encountering a setback. Napcor, the National Association for PET Container Resources, stated in a March 2012 position paper that when the shrink sleeve labels reach the PET reclaimers, the label materials sink to the bottom along with the PET flakes, contaminating them.
As a result Napcor is strongly recommending a switch to stretch sleeve labels, the ones that don't need to be shrunk at all, because the new materials, many of them PE, float in the float/sink process and don't contaminate the PET flake when they reach the recycle stream.

The 2012 edition of the Tokyo Pack unveils Asia's technology focuses

In the field of permeability control for fresh respiring produce, there are new laser technologies that operate at ultra-high speed and accuracy on flexible films.

In a separate development,Toyo Seikan introduced a laser technology that instantly eliminates the bubbles off the surface of carbonated drinks such as soda and beer. The presence of the bubbles has always been a drag on filling speeds, so this innovation could pave the way to faster speeds.

Asia food market specifics

The Japanese food industry is unique in more than one way: the vending machine is everywhere in Tokyo. One estimate suggests one vending machine for every 23 citizens. The other phenomenon is the convenience stores: there is one every five blocks in any urban center. Also, most of the raw materials needed in Japan are imported, so material recovery and resource planning are national priorities.

The Western consumer packaged goods companies are very active in China, but as Chinese labor costs and wages have risen they have begun to develop what one of my fellow journalists has named “China + 1” strategy. That is, stay active in Chinese markets, but turn to South East Asia (Thailand, Vietnam etc.) for manufacturing.

Printing innovations are featured worldwide : wider web, electronics integration

HP Indigo unveiled two new digital presses at the Drupa show, the 20000 and 30000. With their digital technology HP used to be limited to narrow web, mostly label production. These two machines transform package converting because they perform 30 inch wide web printing for folding cartons and flexible packaging applications.

Ink is now conductive, which means RFID tags may no longer be required in some applications where they are currently used. It’s packaging that you can read and write to. The joint agreement signed between ThinFilm Electronics (Norway) and Bemis flexible packaging converting (USA) is a tangible example of how this new breakthrough could pick up momentum.

Smart printing is an integral part of the shift towards Near Field Communication, or NFC. It intertwines itself with the consumers’ daily life. The package becomes its own data device. It can recognize the consumer, it can sell itself, it can even supply content.

Sustainability is here to stay in North America

Sustainability is not a roller coaster trend any longer, where interest would peak and drop over 5 year periods. It is level and won’t go away any time soon. PET recycling, one of the most successful materials in the recycling world, is becoming simpler: the flake used to be re-extruded and turned back into a pellet. Now, Germany’s Krones make it possible to go directly from the flake to the injection molder and skip the intermediary processing step.

A milestone was recently reached in sustainability: the Austrian company Starlinger Viscotec has received FDA approval for their decontamination dryer to make food grade flakes from post-consumer recycled high density polyethylene milk bottles.

Asia: The fastest growing packaging market in the world

Wong Tsz Hin
Editor
Asia Pacific Food Industry

Summarizing the Asian packaging market trends in one column is not an easy task. Asia is characterised by a wide spectrum of markets. On one end, there are the developed countries like Singapore, Japan and South Korea, where packaging markets are mature and behave very much like that of North America. On the other end of the spectrum are the developing economies like Laos and Myanmar, where purchasing power is low and packaging is only required to fulfil its basic functions. In between, there are fast growing markets like China, Indonesia and Thailand.

One common trend: plastic, in particular polyolefins, is the prominent packaging material

China is the world's top polyolefin consumer, a volume mostly supplied by South East Asia. Sourcing for plastic is carried out between the 14 member countries of the ASEAN (Association of Southeast Asian Nations) that allows trade at zero import duty. The China-ASEAN Free Trade Agreement (CAFTA) also offers zero import duty on most goods including plastics and since it was implemented in January 2010, has helped boost trade in the region significantly.
The principal motivation behind the prevalence of plastic is cost, as consumers in developing countries place this criteria at the top of their requirements.

As both China and Southeast Asia continue to develop their economies, the ever-increasing demand for polyolefins and the ease and affordability of trade is expected to see polyolefin imports to China continue to boom, and this will in turn boost the plastic packaging industry in Asia, which is already seeing high growth rates.

In the plastics array, flexible packaging is gaining market share

Asia will be the leading market for flexible packaging in terms of value by 2016. Its major advantage is that it is lightweight and thin, so more cost effective. For the consumer, it is easier to compact and dispose of than a rigid package. Another consumer benefit of flexible packaging is that it is more often than not re-sealable and maintains its content crisp and dry, a major concern as the Asian climate is humid.

Packaged food is increasingly popular in the developing countries

The number of women joining the workforce is increasing, time is accelerating, and cooking is no longer considered a priority in the women's daily routine. China has taken the lead on the baby formula milk market, as mothers give up breastfeeding. The long shelf life packaged goods are gaining market share, as they are more convenient to purchase and store than bulk. Rice, a staple food in the area, is also evolving in its packaging. The launches of packaged rices have soared, a significant share of which are microwaveable.

Recycling is not a critical issue yet

As the region's developing countries favour cost over environment, consumers are not ready to pay the premium that comes with recyclable materials. In the mature markets, reusing packaging is motivated more by aesthetics than by environmental considerations. Consumers are attached to brands and image. They will readily re-use packaging that displays the brands they associate themselves to. In other cases, packages are disposed of after use.

Food traceability concerns

China is the stage for a long list of food contamination crises, from melamine in baby formula milk to bacteria-laden pork that glows in the dark and repackaged cooking oil siphoned from the gutters outside restaurants.

Asian consumers have become wary of traceability, in particular in regards to China-sourced products. In March of this year, Beijing elevated the political status of the country's food and drug watchdog, in the hope that consumers would learn to trust the products produced within China.

Overall Southeast Asian countries are export oriented and need to maintain a high level of consumer confidence and make sure that their products meet the standards of their export destination.

Automated versus labour-intensive lines

While automated lines have been prevalent in the mature markets for a while now, hiring local labour is still the rule in developing markets. However labour costs are increasing in China, Malaysia, Vietnam and Thailand, so the manufacturers are gradually integrating modular systems that carry out part of the packaging process automatically.

According to a report by the International Federation of Robots (IFR), Asia Pacific is the most promising market for industrial robots. The combined effects of the harsher competition due to the ASEAN free trade agreement, the volatile raw material prices and increasing consumer demand pave the way for exciting business opportunities for automated packaging equipment manufacturers.

Conclusion

The future lies in virtuous packaging

Henri Saporta
Chief Editor
Emballages Magazine

Packaging Trends is all encompassing in its insight, embracing trends in Europe, the United States and Asia. The mature markets view packaging as a source of pollution; in developing countries that suffer from food shortages it is the key to economic and social progress.

Packaging has great development potential: in many countries it is the answer to fundamental yet unsatisfied needs such as preserving food, reducing waste and guaranteeing public health. Packaging is also a key element of international trade.

Modern packaging technology allows local producers to provide high quality natural products. General opinion believes there is an excess in packaging. Quite on the contrary, there is not enough! The industry's future is however forever intertwined with recycling and sustainability.

PACKAGING trends

Florence Bertaux

Florence Bertaux holds a Technical Degree (BTS) in International Business and is a graduate of ESSEC's Executive Master in Marketing Management. She started her career in the export department of EDF and Leoni. She joined Fanuc Robotics in 2002, where she first held the position of Marketing and Business Development Manager. Following the merger of Fanuc's European entities, she was appointed Business Development Director for France in 2013 and is now in charge of developing the sales for robots, CNC controls ans machine tools.

Pascal de Guglielmo

A high school dropout, Pascal de Guglielmo has become an expert in designing and building packaging and processing machinery. In 1969 he designs the first automatic fabric priming machines, followed in 1971 by the first disposable diaper machines. In 1974 he takes part, as an employee, in setting up Creta Engineering. In 1982 he is appointed the company's Technical Manager.

In 1988 he is hired Newtec to be their R&D Manager. In 1989 he takes part in creating Algora Engineering, and in 1992 Aries Packaging. During his carreer he is awarded the Champagne-Ardenne Chamber of Commerce «Prix Espoir» (1995), the INPI award (1996 and 1998), the French Entrepreneur Prize in the manufacturing category (2003), the Harvard Business School Self-Made-Man Victory (2003).

In 1999 he develops robot-operated high speed packaging lines. In 2000 he acquires Cetra Engineering.

Having retired in 2008, he sets up Champagne-Ardenne Angels on the Aube High Tech Business Center in 2009 and becomes consultant in industrial engineering. In 2010 he participates in the set up of Synerlink, the Engineering division of Arcil.

Andrea Barbolini

Currently VP application and motion in Schneider Electric Automation GmbH, Andrea Barbolini was formerly CEO of ELAU GmbH and after VP Packaging in Schneider Electric Automation between 2010 and 2012.
From 1995 to 2010, he founded and was the CEO of ELAU in Italy.

Bruno Garnier

Having completed his art studies, Bruno Garnier works in advertising agencies specialized in graphic design for sixteen years.

Carrefour identifies the wide spectrum of his skills and hires him for the new position of Non-Food Packaging Manager for France in 1998. When Carrefour and Promodès merge in 2002 he takes over the entire non-food packaging range for the group.
He takes part in a number of project groups (in particular the new graphic charter designed in 2005), which leads him to being involved in the Carrefour packaging think tanks, that came up with the first «Carrefour Packaging white paper».

In 2009 Bruno Garnier decides to focus his career on packaging and sustainability. He realizes the issue is a priority for the company, its outlets, the manufacturers in the supply chain, the consumers and the environment as a whole. He joins the Carrefour Group's Packaging team as Packaging Project Manager. In 2011 he is awarded, along with the Group's Design, Marketing and Purchasing teams, for an internal contest lead by the Maud Fontenot foundation (second prize) for the Carrefour branded sandwich cartons.

Beginning of 2013 the Carrefour Group reorganizes the headquarters' structure and Bruno Garnier is appointed Quality and Sustainability Packaging expert within the Quality and Development division.

Eric Fresnel

Eric Fresnel is President of Sleever International, a global leader in the sleeving industry. He graduates from a French Business School and completes his studies by obtaining an MBA in an American university with a specialization in industrial marketing.
He joins the family-owned group in 1980 and fills the positions of Sales and Marketing Manager, General Manager and finally President.

Roland nicolas

Born in 1957, Roland Nicolas has an Economics Master's degree, that he consolidated with a Business School Master's degree specialized in the food industry. He starts his career as Export Manager for Primel, then Cetra between 1982 and 1985. He joins Serac as Northern Europe Export Manager (1986-1990), then is promoted Aseptic Systems Sales Manager (1990-2000) and Food Division Sales Director (2000-2011). Since April 2011 he is Dairy and Aseptic Business Development Director.

Nathalie Pereira

Nathalie Pereira, 37 years old, graduated from the ESCE school (Ecole Supérieure du Commerce Extérieur – Paris) and carried on with a Marketing MBA from the AEP-ESADE. She began her professional life in Portugal, working as Customer Service and Marketing Manager for the number 1 steel bottle manufacturer for gas applications. Having held the position for seven years she decides to create her own consultancy business in Portugal. She develops her Marketing, Communication and Sales Management consultancy business for over two years.
In March 2007 Nathalie Pereira is hired by Cermex to be their Group Strategic Marketing Manager. She is responsible for the Product Development Plan for Asia and France, as well as Competition and Marketing intelligence.

Bruno Guillemat

An engineer with a degree in chemistry from the French ENSCP school, Bruno Guillemat is an expert in polymers.

He worked for several years in the Orkem group, developing polymers in partnership with the transformers worldwide. He later joins the Franco-German group Bericap as Material and R&D laboratory Manager. He was responsible for designing capping systems for liquid food products. He was hired by Pernod Ricard in 1997, within the packaging department of the Research Center.

Eric Drapé

Executive Vice President Technical Operations d'Ipsen, fait partie du comité exécutif du groupe.
Pharmacien à l'origine, diplômé d'un DESS de contrôle analytique des médicaments complété d'un Executive MBA au Danemark en management et gestion, il a commencé sa carrière chez Servier, au centre de développement d'Orléans. Il a ensuite rejoint le groupe Novo Nordisk de 1990 à 2007 où il a occupé diverses fonctions en France et à l'international. Il rejoint Ipsen en 2007.

Philippe Thuvien

A Chemistry engineering graduate, Philippe Thuvien started his career as Raw Material Purchaser at Pivert Coiffure (Rhône Poulenc Group) in 1979. He then worked for Jacomo Perfumes from 1980 to 1988, first as Purchasing Manager, then as Plant Manager for the Deauville, Normandy, facilities. In 1988 he joins Cosmopolitan Cosmetics France in the Wella Fragrances division. He manages the Edipar company (Escada) and is later appointed Manufacturing and R&D Manager. In 2004 he becomes Manufacturing and R&D Manager at YSL Beauté. Since October 2009 he is Packaging and Development Manager at L'Oréal S.A. in Saint-Ouen, near Paris.

Vincent Ferry

Vincent Ferry is a design engineer with a keen interest in packaging ever since his engineering studies, when he invented the garbage bag with a draw string. He works at Mars for eighteen years in the pet food division. During that period he introduces the unit dose meal pack for cats in 1994 and turns Sheba into a premium brand with the creation of the dome-shaped containers in 2004.

He is since 2006 Packaging Manager of Danone Research, managing a team of 5 people and representing 5 billion consumer units throughout 5 manufacturing facilities. His assignment, along with his team's, is to participate in optimizing the current packaging solutions and create new ones.
He works closely with all the company's services and its suppliers.Vincent Ferry is a visionary who finds the perfect balance between four aspects of packaging innovation: creating perceived value-added, optimizing operational feasibility and cost efficiency, as well as protecting competitive advantages in the long run.
He considers himself a « packaging architect » rather than a « designer ».
He has a particular gift for bringing up leading edge ideas that are often misunderstood but eventually are applied far beyond their initial scope.

Christophe Venaille

Having graduated from a telecom engineering school, Christophe Venaille joins Thalès in 1985 and manages medical imagery and robotics projects. He later moves to the food industry, and more specifically MSC (a Danone subsidiary specialized in glass control machinery) as Diversification Project Manager in 1995. MSC becomes part of the Tiama group in 2003. In 2007 Christophe Venaille is promoted MSC Engineering Manager and in 2009 he becomes the Tiama Group R&D Manager.
Since 2012 he manages the Agro Luceo business unit.

Pierre-Etienne Hannecart

A graduate from the Compiègne ESCOM school (Organic and Mineral Chemistry Engineering school), Pierre-Etienne Hannecart has 32 years experience in packaging, including 25 years in the Nestlé R&D and Operations departments.
He has been Head of Consumer Centric Packaging for the past four years in the CT-Pack department in Vevey. His role is to elaborate and roll out, within the Group's product and packaging development process, an approach involving the consumer from the very first design stages.

Pierre-Yves Berthe

Pierre-Yves Berthe, Mecapack's Equipment Division Managing Director (Proplast Group), graduated from the Louvin Catholic University in Business Administration. He begins his career as Supply Chain and Process Consultant with Kurt Salmon Associates in 1999.

He works for Accenture in the same position in 2000 and is hired the next year by Nutripack UK as their Managing Director. He is appointed Managing Director at Mecapack in 2004.

Fabrice Peltier

Artist and designer, Fabrice Peltier studied at the Ecole Estienne in Paris between 1980 and 1983.
He sets up the P'Référence brand agency in 1985. End 2011 he sells the agency to Diadeis, the leading French packaging manufacturer, having designed over 10,000 consumer good packages for small business and multinationals over the period. Fabrice Peltier now works as a consultant for Diadeis and other companies in the packaging industry. He hasn't given up designing unique furniture and decoration pieces.
Fabrice Peltier is acknowledged as a packaging design expert who focuses on sustainability. He is a seasoned keynote speaker and contributor to multiple professional magazines.
Currently President of the French Design Packaging Institute, he took part in creating it in 2003.
He sets up the Designpack Gallery in 2008, the first one that is open to the public, with a bookshop, a shop, exhibitions and a conference room. Next to the Louvre Museum in Paris he opens The Recycling Street, a permanent exhibit displaying best practices in packaging recycling.

Annette Freidinger-Legay

Annette Freidinger-Legay, International Packaging Expert, Conference speaker, is an engineer from the ENSAIA school.
She started her carreer as Engineering Manager at the French Beverage Institute, then co-directed the French Institute of Packaging for 14 years.
A consultant since 2003, she carries out four types of assignments: appraisal, studies, training and promotion in the field of packaging. Expert at the International Trade Center, the E.U. and OSEO, member of the European Packaging Institutes Consortium (EPIC), she is also keynote speaker at the Lorraine Polytechnique Institute (France).
She leads the Pack Experts Committee of the French Salon de l'Emballage tradeshow.

Daniel Magnin

Aged 47, David Magnin lives in Switzerland.
A Mecanics and Energy Systems graduate from the Lausanne Federal School of Polytechnics, he has 20 years experience in the food industry, 18 in packaging engineering, 16 of which were spent at Nestlé.
He has managed a number of projects, both in manufacturing and in R&D. He is currently in charge of the packaging production line strategy and coordinating packaging engineering activities at the Group level within Nestlé.

Richard Mallett

Richard Mallett is a microbiologist and food safety professional with 25 years of experience within the food industry. He has performed in food safety and technical roles within large organisations such as Rank Hovis McDougall and BioMerieux UK.

Within the last 10 years, he started and managed both a food safety consultancy group, MQM Consulting, and in 2010 became the Managing Director of HACCP Europe, the European arm of HACCP International

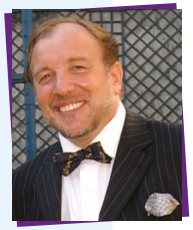
Arnaud Rolland

Arnaud Rolland, Sustainable Development of Coca-Cola Entreprise, 42 years old, with a Nice Business School Master's Degree, started his career in the retail industry, then in consumer surveying.
He later joined the Sales Department of Coca Cola Entreprise, then was in charge of the Sustainability strategy of the company.
His two main focuses are sustainable packaging and display advertising. He is also an administrator of the French National Packaging Council since 2010.

Jean-Camille Uring

Jean-Camille Uring, 62, started his career in the Fives group in 1975 after graduating from the Paris Ecole Centrale. Fives is an engineering group with locations in close to 30 countries. Fives designs, manufactures and installs process equipments, production lines and turn-key plants for the large industrial players in the fields of aluminum, steel, automotive, aerospace and logistics, cement, energy and sugar production.
Jean-Camille Uring entered the group as an engineer with Heurtey Métallurgie (now called Fives Stein). As from 1984 he managed Fives Celes, specialized in induction heating and industrial cooling technologies. In 1998 he was appointed Manager of Fives Cinetic and developed the automated manufacturing systems division (machining, assembly, automation, handling).
Today Jean-Camille Uring is a member of the executive board of Fives. He has been reelected President of SYMOP (French Association for Manufacturing Machines and Technologies) for the second time. He also acts as Vice-President of the FIM (French Federation of Mechanical Industries) and Vice-President of CECIMO (European association of machine-tool manufacturers).

Jean-Marc Doré



A business school graduate, Jean-Marc Doré begins his career in 1974 at Usinor and joins the press industry in 1875, working for Emballages Magazine and other publications. He then creates his own agency, Technimedia, specialised in B to B, and more specifically in packaging. Between 1987 and 2006 he works for the Mecaplastic Group, first as their Marketing Manager, later as their General manager.
In 2006 he creates the GEPPIA (The French Processing & Packaging Machinery Association). Previously Board Member of the SCIPAG-EMBALCO (SYMOP-FIM), Board member of UBIFRANCE and member of theCouncil of Agricultural and Food Exports, he is currently Board member of the ADEPTA.

Henri Saporta

A graduate from the IPJ school of Journalism, Henri Saporta manages the editions of Emballages Magazine, Plastiques et Caoutchoucs Magazine and France Graphique. Henri Saporta has written several books, including «The Packaging Cycle» in 1995 published by Masson, and, in collaboration with Fabrice Peltier, «The Virtuous Cycle of Sustainable Design» published by Pyramyd in the Idpack series.
Emballages Magazine, a reference published by Infopro Communications, targets the industry and reviews all the news and issues in an array of subjects: economics, technologies, manufacturing, innovation, R&D, regulations, public health, environment and design.

Pat Reynolds

Pat Reynolds has been a packaging journalist since 1983. He was part of the small group who launched Packaging World in 1993, and he was named VP/Editor of the magazine in 2002. Pat's career has taken him to countless packaging operations, technical conferences, and converting plants, not only across the U.S. but internationally as well. As for Packaging World, it's the leading U.S. publication in its field, reaching 65,000 subscribers each month in print and countless more every day through www.packworld.com.

Wong Tsz Hin

After graduating with a degree in mechanical engineering from Singapore's Nanyang Technological University, Wong Tsz Hin ventured into the field of trade journalism and has been reporting on different industries since.
He joined the editorial team at Eastern Trade Media in 2011 and was appointed as the editor of Asia Pacific Food Industry in 2012.

For their involvement and contribution

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