

## PACKAGING REPORT

### 1. FILM AND FILM PRODUCTS

#### 1.1. Hamack Système Pack for Fruit Packaging

Developed in France the Hamack Système Pack is a method of protecting ripe fruit by placing the fruit between two special films and then keeping it suspended in two rigid, transparent plastic half-shells that are ultrasonically welded together. The pack not only preserves the fruit in an optimum state of ripeness, but also cushions it against damage from handling to which fruit packed in bulk is at risk. In addition, it is claimed, that aroma retention is improved.

The packs are designed for the best quality produce with the fruit sold in two's or three's at a premium price. The intention being to keep the unit price below 10 French Francs, bearing in mind that the retail price per pack is determined by weight rather than the quantity of fruit and that the pack occupies significantly more shelf space than loose fruit. In calculating the price the fact that the Hamack pack makes up between 25 per cent and 30 per cent of the total cost of the product has had to be taken into account.

A new company was set up, Idéal Fruits, one year ago to market fruit using this system. The product is sold under the brand name Perles du Verger.

In order to convince the consumer to accept a more expensive product in an unusual pack point-of-sale merchandising has proved to be particularly important. This has taken the form of a 'metal tree' display stand from which the packs are suspended. Using the Hamack system it is possible to market fruit with special requirements such as having the stalk left on. Also

there are savings for the supermarket in a reduction in loose fruit that has to be thrown away due to over handling by the consumer or mishandling by the distribution chain.

Fruit currently supplied by Idéal Fruits includes peaches, nectarines, apricots, pears, avocados, plums and mangoes, but it is intended to extend the range to include grapes, kiwi fruit and tomatoes. The company claims that for peaches and nectarines the repeat purchase rate achieved is 95 per cent. For pears, in stores stocking this product, sales are around 10 per cent of the volume of loose pears.

The packaging machine employed although patented by Idéal Fruits is manufactured by Aripa, film is supplied by AEP (Borden) in the Netherlands and ultrasonic welding equipment by Rinco in Switzerland.

The only criticism of this interesting packaging concept is that it may lead to accusations of overpackaging.

#### 1.2. Desiccant Film

Interest in incorporating desiccants into packaging, to protect against moisture, is growing particularly for the pharmaceutical, diagnostic and medical device industries. The advantage being the elimination of the requirement for a separate desiccant sachet.

Initially, Desiccare Inc formed a joint venture with Capitol Vial to produce pharmaceutical containers. Now Capitol Speciality Plastics Inc has patented desiccant technology that enables polymers containing silica gel or molecular sieves to be processed not only into containers but also sheet and film.

Desiccant film is produced in a variety of widths and thicknesses to meet customer specifications in terms of adsorption rates and capacity requirements. The film changes colour from blue to pink as adsorption capacity is reached and

can reveal a cautionary message such as 'void', 'full' or 'replace', for example.

### 1.3. Recloseable Bag for Cereal

Cartons for breakfast cereal generally require an inner liner that acts as a moisture barrier essential to preserve the quality and crispness of the contents. Now Danish company Schur Flexible Europe has produced a film that is able to be reclosed maintaining freshness until all the cereal has been consumed.

Designated FlexPolyPaper B-Peel, it is a combination of their well known SchurFlex B-Peel liner film and polyethylene based SchurFlex PolyPaper. The inner and Middle layers of the three-layer polyethylene-ionomer film provides vital sealability and moisture barrier. Peelability to facilitate easy opening of the bag remains unchanged, the difference being in the outer layer which is SchurFlex PolyPaper. This gives the bag a paper look but more importantly dead fold characteristics which makes it possible to re-close the pack.

### 1.4. Carrier Bag with Pockets - Protects Contents

A novel carrier bag that protects its contents against damage has been introduced by Britton Decoflex. The bag features divided internal pockets welded for maximum strength. By putting purchases, especially bottles, into these pockets separation and protection is achieved decreasing the risk of breakage. Other advantages include a reduction in noise and the elimination of the need for extra packaging.

The patch-handled polyethylene carrier bag, flexo printed on both sides in four colours, has initially been successfully used by Stena Link ferries for duty free shopping. Supplied with two, four or six divided pockets other sectors where the bag is likely to prove of interest include off-licences, shoes, china and glassware.

#### 1.5. Flexible Modified Atmosphere Pack that Stays in Shape

For products, such as fresh meat, modified atmosphere packed in flexible pouches rather than lidded trays, the progressive absorption of carbon dioxide can result in a vacuum being formed inside the pouch causing it to distort or deform. This can lead to the contents being crushed which in turn may result in the squeezing out of blood from meat. Such an occurrence makes the product unsightly and can even shorten the shelf life because the exudation is a better microbiological growth medium than meat tissue. In addition, pack distortion may also make essential consumer information such as sell-by date impossible to read.

Now an Italian company, Valle Spluga, has patented a way of avoiding or reducing the problem. The modified atmosphere packs contain a gaseous environment usually carbon dioxide and nitrogen. In the development dry ice (solid carbon dioxide) is sealed into the pack. The carbon dioxide is absorbed by the product until equilibrium is reached, which may take up to a few hours. The amount of dry ice used is dependent on the product packed etc. If it corresponds exactly to the maximum which can be absorbed, the pouch will retain its shape, if slightly too much it will have a slightly 'puffed' appearance.

This approach is both simple and practical and is claimed to be effective in extending shelf-life because of the high concentration of carbon dioxide surrounding the product which compensates for the gas absorbed while leaving that in the 'modified atmosphere' intact, it is suggested.

#### 1.6. Polyolefin Leaflet Label

Avery Dennison Fasson Roll Division has devised what it claims is the simplest, most compact and durable form of leaflet label available, with an almost unlimited capacity for information.

It uses the company's patented 63 micron polyolefin labelstock

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Fasson Primax to create a wraparound label extended in length with the ability to wind around the container as many times as the text requires. Text is printed over the adhesive on the reverse of the face material. Adhesive in the text area is neutralised by overprinting a varnish to prevent label bonding.

Active adhesive tabs bond the label to the container at either end, allowing it to be opened and closed as often as required. The concept will be of especial interest for pharmaceutical packaging.

## 2. SHEET AND SHEET PRODUCTS

### 2.1. TiroFreeze - Frozen Food Packaging

TiroFreeze is a foamed polypropylene sheet for frozen food packaging from Dutch based TiroPak Convenience Food Systems. The pack, for which a patent has been applied, comprises a formed base web of foamed polypropylene and a high gloss OPP film top web.

These tray type packs can be thermoformed into a variety of shapes, incorporate a viewing window in the film lid, include an easy-peel opening feature and being produced from a single polymer are convenient to recycle. TiroFreeze is particularly targeted at carton replacement for such products as frozen pizza where the pack consists of a carton with an inner tray. Apart from reduced packaging the new packs also offer improved space utilisation in freezers, good product presentation and are microwaveable. They are proving to be particularly successful in Germany. (See brochure)

TiroPak Convenience Food Systems are now independent of TetraPak and Alfa Laval. They claim to be the largest

producer of polypropylene foam sheet that incorporates a barrier in the world.

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## 2.2. Bacon and Ham Packs from Multivac

Meat processor Malton, in the United Kingdom, and thermoforming equipment manufacturer Multivac have developed what they claim is the first recloseable pack for bacon. It is based on Multivac's recloseable pack for sliced cooked meat introduced in 1995.

The packs are produced on a specially customised Multivac R530 thermoformer designed to operate at 80 packs a minute, which is faster than conventional machines. The top web forms a hermetically sealed modified atmosphere pack with the base web and can be peeled away without difficulty and then snapped securely back into place after use. An additional seal at one end creates a robust hinge. A further original feature is the lid which incorporates a raised pattern, for ease of identification by the visually impaired.

Multivac have also introduced Deli Doubles which is being used for sliced ham in individual vacuum packed portions. The actual product from Hygrade Food contains seven two slice portions of ham, wrapped in polyamide/polyethylene peelable film. This is in an outer carton which has a window through which the product can be seen.

The pack has been designed to allow the consumer to use as much sliced meat as they want without the remaining product deteriorating. The target market for the product is single households and those with children.

Heart of the development is again Multivac's R530 thermoformer which has been fitted with a 16 pocket die and operates at 20 cycles per minute, enabling individual portions to be packed at a rate of 300 packs a minute. The high integrity seal possible with this equipment is essential to ensure a long shelf-life.

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### 3. INJECTION AND BLOW MOULDING

#### 3.1. Eurospray Air Powdered Spray in Orgalloy

Pump sprays have been around for some time in various forms. They are seen by the consumer as being environmentally acceptable as they do not require propellants like aerosols, are re-usable and can be recycled.

The Swedish company Swed Spray has an air-powered spray container known as Eurospray, that is available in 100ml and 330ml sizes. The re-fillable containers are supplied with a standard valve and actuator, but the company also has the capability of matching most liquids to an optimal spraying combination. The system is ideal for a wide variety of liquids.

Foam head and gel actuators are available and the body of the container being transparent allows easy monitoring of the contents. Eurospray is pumped up from the base with 20 to 25 strokes being sufficient to retain spraying pressure for months, it is claimed. (Mouse and foam products require move air).

These pumps are generally moulded in polypropylene but a recent development expands the potential market by using Orgalloy polyamide/polyolefin alloys from Elf Atochem. Although 20 per cent more expensive than polypropylene sprays, the Orgalloy containers withstand swelling and the corrosive effects of organic solvents. It will thus be possible to use these pumps for more demanding liquids and petroleum based

products such as degreasers, lubricants, polish and multipurpose cleaners. (See brochure)

### 3.2. Crushable Bottle Replaces Carton

In a significant move by the Lever detergent group crushable polyethylene bottles have replaced 500ml and 750ml cartons for Comfort fabric conditioner concentrates at what is claimed to be the price of a carton.

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The lightweight bottles are simple to open, reclose and store making it easier to measure out the product correctly and being crushable take-up less space in the rubbish bin. The convenience and ease of use of these packs is expected to invigorate this sector of the market.

### 3.3. PET Bottle keeps Drink Cool

Constar has introduced a silver pigmented PET bottle that they claim keeps soft drinks cooler longer.

Known as the Cur-V pet bottle it has been adopted by Virgin Cola for use throughout the summer for its Virgin Cola 500ml size cola drink. The silver colour of the bottle is said to reflect heat more efficiently than transparent PET bottles reducing the temperature of its contents by 3°C. The bottle is completed by a metallic label while advertising uses this feature to promote the drink with the slogan 'stays cooler longer'.

### 3.4. Revolutionary Two Piece Polypropylene Pack for Sweets

RPC Containers has designed and produced a revolutionary new two piece pack for Nestlé's new Polo Supermints. Supermints are an exact miniaturised replica of the well known Polo mint - the mint with the hole. RPC has developed a unique pop-opening container and dispenser, shaped like a giant version of the popular mint, to create a strong brand association.

The packs are injection moulded in polypropylene and feature



a variation of the 'Pop Lok' technology developed by RPC Celle in Germany for a range of standard closures. Application of pressure to the pack flips open a small lid with a novel 'popping' sound allowing the small mints to be dispensed one handled.

The new packs have been moulded with a matt, smooth feel to mimic the mints and also feature the famous Polo hole. Two new state-of-the-art injection moulding machines with automated

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downstream handling equipment are used to mould the packs, with tooling supplied by RPC Bramlage. (See sample pack)

### 3.5. Novel Tamper-Evident Closure

Cambridge Consultants has developed a screw-top closure for jars and bottles that is claimed to provide irreversible evidence of tampering in a highly original way.

The patented closure is cheap to produce and opens with the same action as the child-resistant closures of the push and twist type that are common in pharmaceutical packaging. The novel feature is that on opening, a food grade dye is released into a 'window' in the cap, resulting in an irreversible colour change.

In addition to being usable as a security device to protect pharmaceuticals, baby and children's foods the closure may also be of interest to prevent counterfeiting of high value branded alcoholic drinks. A further possibility is for promotional competitions where a winning pack would show on opening a different colour to normal.

The preferred material for the closure is likely to be polypropylene and Cambridge Consultants are currently seeking a partner to develop the concept to commercialisation.

### 3.6. Easy-open Champagne

An unusual development from France is a champagne cork that does not pop! Marketed and used by champagne producer Leclerc Briant it is intended for those of a nervous disposition who may be frightened by the pop. In addition there are numerous accidents each year caused by flying corks hitting drinkers in the eye.

Known as Easy Pop, it can be used on any bottle and comprises a food grade plastic plug placed in a pin hole on the side of the bottle's neck with a string attached. When the string is

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pulled the plug comes out allowing gas to escape. The wire cage and

cork can then easily be removed without the traditional pop, also saving champagne.

Although Easy Pop will never replace conventional corks it does have niche market applications, such as in confined spaces as on aircraft and in American restaurants where insurance premiums increase if champagne is opened near customers.

The patented device requires special equipment, supplied by Leclerc Briant that can easily be incorporated into the production line.

#### 4. NON-PLASTIC PACKAGING

##### 4.1. Active Packaging for Fruit Juice

Researchers at New York's Cornell University have developed an active container that they claim not only reduces the bitterness of packaged grapefruit juice, but can also improve its flavour.

Fresh grapefruit juice is usually packaged in either plastic

or plastic coated paperboard containers. The new development replaces the polymer with a thin, active cellulose acetate film containing an enzyme known as naringinase. This enzyme neutralises the compound found in grapefruit that gives the packaged juice a bitter taste.

The work at Cornell demonstrates that an active packaging system may be feasible. Unlike the current situation where most foods deteriorate in quality during storage, products exposed to enzymes bound to the packaging might actually improve during storage. The concept is yet to be commercialised.

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#### 4.2. Intelligent Packaging Shows Freshness

A freshness indicator for food has been developed at the Joanneum Research Institute for Chemical and Optical Sensors in Austria. The oxygen sensor comprises a piece of foil about a square centimetre in size to which a pigment is applied. A change of colour by the sensor indicates a certain oxygen concentration has been reached and that the product should no longer be sold. The concept is claimed to offer simple and automatic quality control and is of particular interest for vacuum packed foods making it possible to check them prior to delivery and again in-store before placing on the shelf.

### 5. ENVIRONMENTAL ISSUES

#### 5.1. Changes to German Packaging Legislation

Almost a year later than expected Germany's upper house of parliament, The Bundesrat, has passed an amendment to the 1991 Packaging Ordinance that sets new recycling targets.

The revised legislation is a compromise between the bill drafted by the environment ministry and the changes wanted by the Bundesrat. If finally approved, it could rescue the

Duales System Deutschland (DSD) packaging waste collection system. Increasing pressure has been put on the scheme with retail chain Rewe withdrawing, while Germany's largest retailer, Metro has threatened to join them. This could have led to a mass withdrawal and the collapse of the programme.

The large supermarket groups are critical of those using the scheme without paying the licence fee. In particular, small food merchants are exempt from payments on service packaging. The latest compromise is for butchers or bakers, for example, who wrap goods in throwaway packaging still not paying fees. However, their obligation will be taken over by packaging material manufacturers starting in 2001.

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The amendment also sets new recycling quotas to bring German legislation into compliance with the European Union Packaging Directive. The material recycling quota for plastics will rise from 40 per cent to 60 per cent and the 72 per cent quota for refillable bottles is reinforced. Plans to set a 36 per cent

target for mechanical recycling of plastics have been condemned as impractical by the Association of Plastics Manufacturers in Europe.

DSD collected 567,000 tonnes of plastics for recycling in 1997 an increase of 32,000 tonnes on the previous year and comfortably meeting its target. In terms of the Packaging Ordinance requirements that 64 per cent of all consumer waste is recycled this was exceeded at 69 per cent. A study has shown that 95 per cent of consumers are separating their waste in the Green Dot recommended way. However, the cost of the scheme is still too high at DM49 per year per consumer.

## 5.2. Packaging Recycling in France

Eco-Emballage, the organisation that takes over companies' obligations to meet French packaging waste legislation recovered 1.8 million tonnes of household packaging in France during 1997. This compared with 1.1 million tonnes in 1996. Of this total 72 per cent was recycled (52 per cent in 1996) and the rest incinerated with energy recovery.

In terms of plastics 1997 saw 28,000 tonnes of plastic bottles recycled (PET, PVC and HDPE). This year it is hoped to increase this level to 40,000 tonnes.

Eco-Emballage devotes half of its research and development budget, 32.5 million French Francs to plastics recycling of

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which about 10 million French Francs is for PET. This research is into new markets for the recovered resin and the development of chemical recycling. Total PET bottle waste in France is estimated at around 200,000 tonnes, of which more than 10 per cent must be recycled in 1998.

### 5.3. Draft European Union Proposal for the Recycling of Electrical and Electronic Equipment

Many countries in Europe are being driven by Producer Responsibility policy making to tackle a growing number of waste streams. An area of high priority is the recycling of electrical and electronic equipment. A pilot scheme has been operating in Eindhoven, the Netherlands for around two years. Swiss legislation now means that Swiss households are not permitted to discard old household electrical appliances with their garbage, manufacturers and importers must recover the products they supply.

The European Commission has published a draft directive with strict take-back obligations and high recycling targets for

electrical and electronic equipment (EEE). The objectives of the proposal are:

- to reduce the volume of the waste (through prevention, re-use and recovery)
- to reduce the hazardous nature of the waste
- to treat the waste in an environmentally sound manner

The proposal suggests targets of up to 90 per cent reclamation for items such as large household appliances, medical equipment and computer equipment. For other items including small household appliances, telecommunication devices and toys the reclamation level is reduced to the range 40 - 60 per

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cent. However, of this reclaimed equipment, 90 per cent should be recycled.

Most of the responsibility for reclamation of end-of-life equipment is put on the manufacturers who have been very critical of the proposals. The role of component suppliers (such as plastics processors) retailers and distributors is not clear.

Although the final owners of the equipment will be able to return them free of charge the cost of collecting, transporting and recycling the waste will be met by a tax on electronic goods paid by the consumer on purchase.

The proposal also lists a number of recommendations, including:

- the phasing out of the use of halogenated flame retardants,  
wherever possible
- a reduction in the number of different types of plastics

used

- an increase in the use of recyclable material

It is unlikely that any of the suggested targets will come into force before 2010.

## 6. PVC REPLACEMENT

### 6.1. Austrian Ban on PVC Toys not Followed by European Union

The debate concerning the harmful effects of phthalate plasticiser migration from PVC toys continues. (See December 1997 report item 6.2.). Austria has now banned soft PVC toys containing phthalate plasticisers for children under three. However, the European Commission has rejected attempts by the Commissioner for consumer policy and public health to have

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certain plasticised PVC children's teething rings, rattles and soft teats banned. Although the proposal can be re-submitted at a later date.

The PVC industry remains adamant that long term testing of phthalates does not support the claims that the materials pose a threat to human health. It has also stated that it will accept the limits established by the EU scientific committee using test protocol being developed by the Dutch Consensus Group ahead of formal legislation.

Meanwhile, Greenpeace claim that a number of companies have stopped manufacturing PVC toys. The Argentinean company Artbaby which produces various products for children and babies has withdrawn PVC toys. Several German toy companies have now replaced their PVC toys with alternatives, labelling them clearly as 'PVC-free'. The important Danish toy manufacturer Lego, is understood to be removing soft PVC toys from its product range.

### 6.2. Anti-PVC Advertisements by Timber Group

The Timber Trades Federation in the United Kingdom has been running a series of anti-PVC advertisements in the national press.

The caption for the first advertisement reads 'There's no getting rid of some of our competitors' with the body of the advertisement stating that 'Plastics can continue polluting for 500 years. PVC can introduce toxic chemicals including carcinogens and hormone disrupters into the food chain. But time need never outstay its welcome'.

Another advertisement reads 'PVC Windows? What a waste of energy' followed by 'It can take 8 times more energy to make a PVC window frame than a timber one. Once installed, timber frames can conserve more heat. So think wood. And save everyone's energy.'

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Understandably, the British Plastics Federation is referring the advertisements to the Advertising Standards Authority. They point out that the accusations contained in the advertisements are misleading and do not stand up to scientific scrutiny.

## 7. CONFERENCE PROCEEDINGS

### 7.1. Fast Moving Consumer Goods Packaging - Matters

Fast Moving Consumer Goods (FMCG) Packaging Matters was the theme of a recent conference that covered topics ranging from how packaging innovations are adding value to 'traditional' FMCG goods, to the impact of Smart Shopping and corrugated versus plastic transit cases.

The Safeway supermarket group noted the effects of demographic changes such as smaller families and more single-people having their own homes. This will lead to the demise of the traditional family meal and will require packaging manufacturers to confront this issue by developing new types



of packs for consumers 'eating on the run'. Greater communication would be required between converters and retailers, it was felt.

Drinks conglomerate United Distillers highlighted packaging innovations like shrink sleeving, twin packs, shaped, contoured and self-chilling cans, easy opening devices, PET bottles and temperature-sensitive labels as having increased 'added value' by maximising shelf impact and 'giving customers what they want'. A particularly good example of adding value to packaging was the plastic widget, a device for releasing nitrogen into canned beer to produce a stable creamy textured foam 'head' when the beer is poured into a glass and giving the product a much improved appearance. Cost of the widget was between 1.1 to 1.2 pence but it increased the value of a can of beer by 30 pence.

'Intelligent' tagging and bar coding devices were discussed as they were giving major benefits to producers and retailers.

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However, costs still needed to be reduced and this was being addressed by moving towards the large scale manufacture of tags which could provide not only traditional security and anti-counterfeiting features, but also other data. This included product origination and manufacturing information, asset tracking and logistics details.

In future, sophisticated tag, hologram and tear tape technology would further improve product security and integrity, while simultaneously opening up unprecedented sales, marketing and product differentiation opportunities. Tagging innovations

could also impact heavily on warehousing and distribution systems, while as tag prices drop, so tagging would be more widely used.

Another paper examined the battle between 'Smart Packs' and 'Smart Shopping'. Brand awareness could be enhanced by innovative 'Smart Packaging' while 'Smart Shopping', which

allows consumers to shop from home, has special packaging requirements.

The Institute of Grocery Distribution reported on their initiative to standardise plastic returnable crates for large retailers. Such a scheme was unlikely to take place until the year 2000. Meanwhile a recent study had shown that some 30 - 40 per cent of total distribution and supply chain costs incurred by retailers take place in the last 100 yards of a product's journey from factory to supermarket shelf.

EDWIN G FISHER ASSOCIATES