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MAGAZINE FOR BOTTLERS AND BOTTLE-MAKERS
IN THE AMERICAS, ASIA, EUROPE AND ALL AROUND THE PLANET

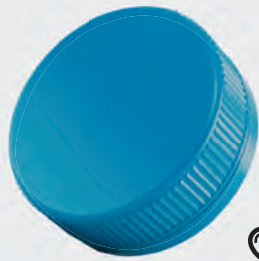
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 September 11-15, 2017
 Messe München, Germany
PART 2



CAPS & CLOSURES
special
 Page 12

MARKET survey
 Filling equipment
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 Page 39



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Dear friends of PETplaner Insider,

In the run-up to the Drinktec event in Munich, we were invited by the editorial teams of many exhibitors to find out more about the latest developments to be presented at the trade fair. For the most part, there seems to be more evolution than revolution – the improvement of already very good machinery into even better systems. But sometimes these ideas are being implemented in a revolutionary way.

This was the case at our meeting with Otto Hofstetter and BMB in Brescia, Italy. There, we were introduced to Otto Systems, a 50:50 joint venture between Yudo and Otto Hofstetter. Why would a South Korean and a Swiss manufacturer present their joint venture at the site of an Italian machine manufacturer? A good question.

The solution is as ingenious as it is simple: Otto Systems now sells complete preform systems, employing existing machine and supplier manufacturers as a basis. And BMB is just one such basis. This is how mould maker Otto Hofstetter is being transformed through its joint venture into a complete systems provider. CEO Stefan Zatti told us that it is precisely their knowledge of the preform that ultimately enables them to design the overall system in a suitable way.

Just a few days later information reached us indicating that it is not only he that thinks this; from now on, Robert Schad, founder of Athena and previously CEO of Husky, wishes to sell his PET systems only through mould makers.

This has signalled a change in the suppliers' market. Formerly it was the machine manufacturers who had mould makers as suppliers, now it is the mould makers who are being supplied by the machine manufacturers. In upcoming issues, we will question Mr Zatti and Mr Schad in detail on their ideas about this seeming, about turn in the supplier market and its resulting significance for preform producers.

Yours


Alexander Büchler

PET contents

08/17

Page
12

INSIDE TRACK

- 3** Editorial
- 4** Contents
- 6** News
- 68** **PET bottles**
for Beverage + Liquid Food
- 70** **PET bottles**
for Home + Personal Care
- 72** Patents

Page
27

BOTTLING / FILLING

- 43** Five yeras of solid growth for Twellium Industrial in Africa

INSPECTION

- 44** Every correct bottle represents cash in the bank

TRADE SHOW PREVIEW **drinktec**

- 48** Drinktec 2017 preview
- 59** Perfect PET milk bottles
- 60** The eyes of Industry 4.0
- 62** Foil closure for dairies

TRADE SHOW REVIEW

- 65** Chinaplas 2017

CAPS AND CLOSURES



- 12** Caps and Closures for water and special drinks
- 16** Put a cap on it - Five global trends that will transform closure production
- 18** Caps and closures trade show preview Drinktec 2017
- 20** Smart cap - Internet of Packaging (IoP) turns caps into smart devices
- 22** Compression technology for the North American and Caribbean closure market

EDITOUR MALAYSIA

- 25** A devided country - Regional Editour report Malaysia
- 26** Relocation - Entry into drinks caps
- 27** Functional & optical masterbatches



MATERIAL / RECYCLING

- 28** Process optimisation cut and dried
- 30** Optimally sized waste

BOTTLE MAKING

- 32** Material Basics / Reheat Stretch Blow Moulding machines - Stretch Blow Moulding, part 5

MARKET SURVEY

- 39** Suppliers of filling equipment and filling inspection systems

BUYER'S GUIDE

- 73** Get listed!

Page
51



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drink technology India 2017 almost fully booked

At around three months before the start of drink technology India (dti), the event is attracting strong interest from exhibitors. Over 90 percent of the available exhibition space is booked. Which means the event is approaching full capacity. Among the companies that have signed up to exhibit are leading names in the sector, for example, ACE Technologies, Anton Paar, Chemco Group, Krome Dispense, Repute Engineers, R J Brewing and The Brewmaster.

The strong demand from the sector underlines the importance of the beverage, dairy, liquid-food and associated packaging industry for the Indian market. "Alternating between New Delhi, Mumbai and Bangalore, dti now has excellent coverage of the north, south and also the west of India," explained Markus Kosak, Exhibition Director of dti. "As a result we can offer our customers lasting visibility across the whole of India and we enable the industry to target the individual sectors in the respective regions in a highly efficient way," continued Kosak.

Key trade associations in India are taking part, among them VDMA India, All India Distillers Association (AIDA), All India Wine Producers Association (AIWPA) and Uttar Pradesh Distillers' Association (UPDA). For the event in New Delhi dti has attracted the Food Safety and Standards Authority of India (FSSAI) as a supporter. "The beverage, dairy and liquid-food area is continuing to make good progress in India. In particular the themes of hygiene, recycling, resource-efficiency and packaging are playing an ever greater role for industry. In all these areas dti offers solutions tailored to meet the demands of the Indian market and we are very pleased to have FSSAI on board as a new strong partner, supporting our event," explained Avisha Desai, Project Director of drink technology India.

By switching to an annual cycle, dti is responding to the development in the Indian beverage, dairy and liquid-food sector. This rhythm, combined with alternating venues, takes account of the requirements of the Indian market and presents a needs-oriented platform in all the regions of India. The dates for the next events are already decided: from October 24 to 26, 2018, dti takes place at the Bombay Exhibition & Convention Centre in Mumbai and from October 17 to 19, 2019, dti is being held for the first time in Bangalore, at the Bangalore Exhibition Centre.

www.drinktechnology-india.com

Sesotec GmbH: New location

Sesotec GmbH, a manufacturer of machines and systems for contaminant detection and material sorting for the food, plastics and recycling industries, is growing in all segments, which correspondingly need more room. Early in July 2017 service acceptance at the company headquarters in German Schönberg therefore was relocated from Regener Straße 130 to Industriestraße 5. The new location lies close to the company headquarters and combines repairs department, spare parts storage, training rooms, technical support, and – now new – service acceptance.

All over the world Sesotec has twelve service locations in total. The spare parts storages are logistically optimally supplied from Schönberg. With its global service network Sesotec provides support for its customers all over the world within a short time.

www.sesotec.com

Constantia Flexibles sells labels division to Multi-Color Corp.

Constantia Flexibles has signed an agreement to sell its Labels division to Multi-Color Corporation for an enterprise value of approximately €1.15 billion (US \$1.3 billion). The transaction is expected to be completed in the fourth quarter of 2017, subject to regulatory approvals.

On completion of the transaction, Constantia Flexibles will hold 16.6% of Multi-Color's outstanding shares, thereby becoming its largest shareholder. Two representatives of Constantia Flexibles will join Multi-Color's Board of Directors.

Constantia Labels is a global supplier of labels to the beverage, food and home as well as personal care industries (HPC). It has 23 plants in 14 countries and has roughly 2,800 employees. The Labels division achieved sales of €605m in 2016. Established in 1916, Cincinnati, Ohio-based Multi-Color is one of the largest label companies in the world serving some of the most prominent brands in the following market segments: healthcare, HPC, food & beverage, specialty (automotive & consumer durables), and wine & spirits. With approximately 5,500 employees, it operates 45 manufacturing facilities worldwide. Multi-Color achieved sales of \$923m in fiscal year 2017.

This value-creating transaction will bring together Constantia Labels' food and beverage business with Multi-Color's wine & spirits and home & personal care platforms. It will also widen the joint Group's geographical footprint and create long-term synergies that will benefit all parties involved. Mike Henry, current EVP Constantia Labels, will become CEO-elect of Multi-Color, and will work closely with the current CEO Vadis Rodato, who will retire in early 2018 after a transition period. Nigel Vinecombe will remain in his current role as Executive Chairman of Multi-Color. After completion of the transaction, Multi-Color will generate pro forma sales of roughly \$1.6bn and EBITDA of \$300m.

www.cflex.com

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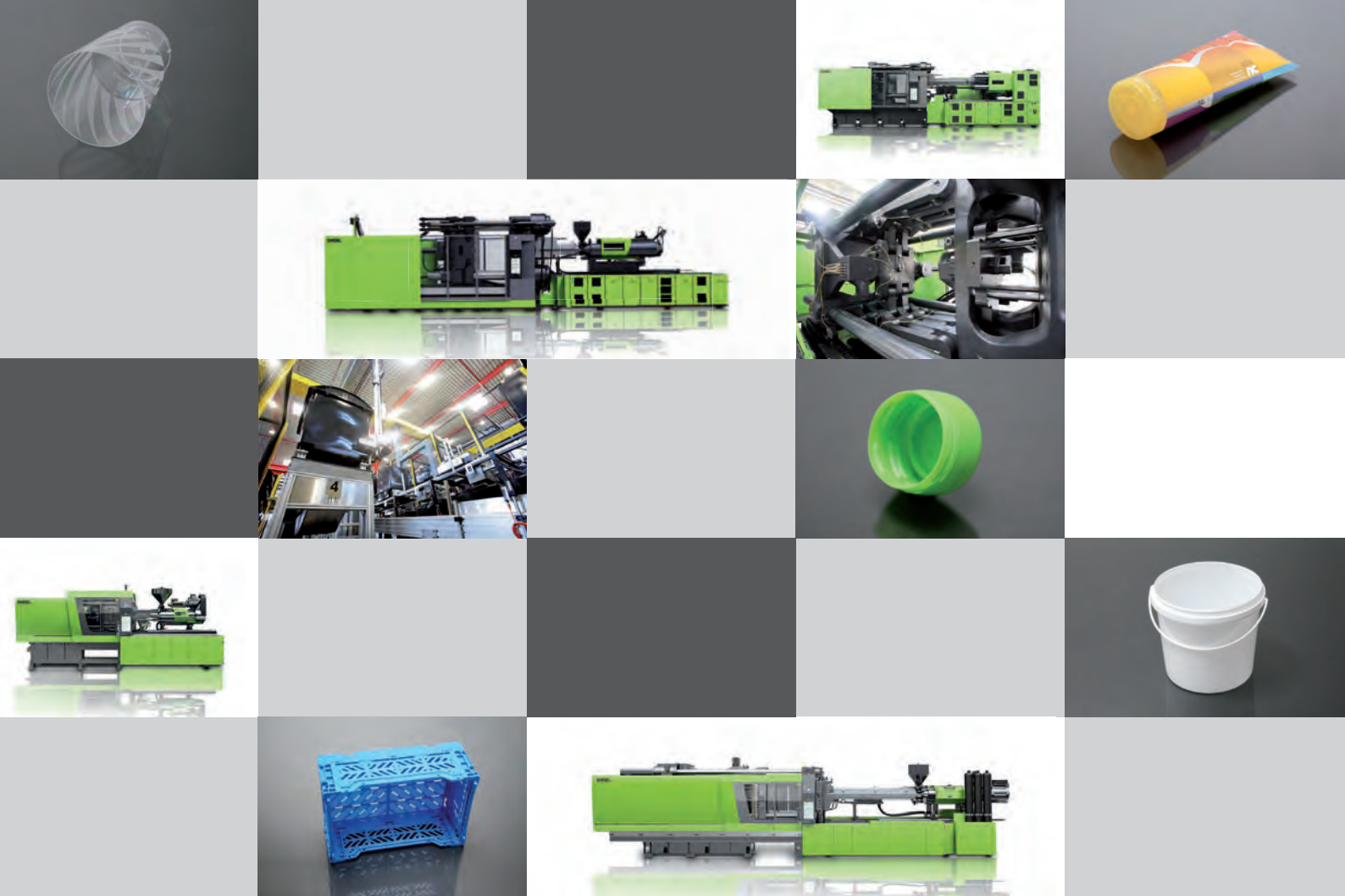
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Alessandro Paini is new General Manager of Sacmi Beverage

Alessandro Paini is the new General Manager of Sacmi Beverage, the company Division that, since 2009, covers all areas concerning the design and manufacture of machines and complete plants for beverage packaging. A mechanical engineer - and previously a key figure in a leading international Group that designs in-PET liquid packaging solutions - Paini has extensive Product Management experience. His past duties ranged from the coordination of R&D and global product portfolio management to developing and implementing of new sales strategies.

The new Sacmi Beverage General Manager takes over from Vezio Bernardi, who led the Division for nearly five years. During that time the Division strengthened its role as global partner to the industry while exploring new business avenues.

With the arrival of Alessandro Paini, who officially took over as head of the Beverage Division on Monday 10th July 2017, Vezio Bernardi now moves on to head Sacmi's other packaging 'pillar', the Closures & Containers Division.

Also facing a new challenge is Giuseppe Lesce. Currently General Manager of the Closures & Containers Division, Lesce will soon be taking over as General Manager of the newly-formed Customer Services Division, a unit that Sacmi has established to coordinate the Sacmi network and develop aftermarket services for all Group businesses and Divisions. The challenge is to link the various Business Units by supplying excellent training, technical assistance, spare parts, overhauls and maintenance engineering and, more generally, comprehensive customer care services that also focus on Industry 4.0.



www.sacmi.com

U.S. market for plastic bottles expected to remain upbeat

In the first quarter, U.S. gross domestic product (GDP) - in real terms or adjusted for inflation - was \$16.9 trillion. With personal consumption expenditures comprising 69% of GDP, that's \$11.7 trillion in the first quarter; the market can expect upbeat consumer spending as the U.S. economy remains in the expansionary mode.

U.S. personal consumption expenditures rose 3% in the first quarter from a year ago. The share of food and beverage purchased for off-premises consumption remains stable at about 7% of personal consumption expenditures. As a %age of household nondurable goods consumption, food and beverage purchased for off-premises consumption was 34% in the first quarter - up from 33% from the first quarter of last year. In dollar value, the expenditure on food and beverage consumed off-premises in the first quarter stood at \$857.5 billion, a solid 5.0% increase from the first quarter last year.

On a monthly basis, retail trade sales in healthcare and personal care stores, grocery stores and food and beverage

stores provide some encouraging signs of increasing plastic bottles and food packaging use. In June, retail sales for healthcare and personal care stores were up 0.3% from a year ago. Retail sales at grocery stores and food and beverage stores rose 1.4% and 1.8%, respectively, over the same period. The retail trade sales in these three sectors totalled \$140.0 billion in June - up 1.38% from June of last year, with a twelve-month average change of 2.2%.

"This data indicates the need for plastics manufacturers to be at the forefront of their industry, in order to continue to meet growing consumer needs and demands," stated Perc Pineda, chief economist of the Plastics Industry Association. "At an event like NPE 2018: The Plastics Show, manufacturers can gain unequalled access to processes, technology, innovation and ideas to help them achieve this goal."

Although the U.S. economy is expected to grow at a moderate pace this year and the next, U.S. consumer sentiment continues to stay positive. In

addition to such encouraging soft data, hard data points to higher household consumption considering that the household sector's balance sheets are in good form. The tailwinds of tepid inflation and a lower unemployment rate are keeping U.S. consumers more engaged. By extension, higher consumption should generate more plastic bottle use moving forward.

The positive outlook is part of why NPE2018, the triennial international plastics manufacturing exposition representing the entire plastics supply chain produced by the Plastics Industry Association (PLASTICS), will from May 7-11, 2018 feature the Bottle Zone, a dedicated section of the trade show floor full of supply chain solutions for the bottling industry.

www.NPE.org/Bottle-Zone

R&D/Leverage introduces the Liberty IBM System

When R&D/Leverage began building tooling for the injection blow mould (IBM) market, they found the opportunity to make improvements to the traditional design of injection blow tools. The company set out to identify and resolve problems related to traditional injection blow tooling.

The result is the Liberty IBM System. It uses patented technology to provide effective solutions to the challenges of conventional injection blow moulding. "The reason we became so interested in improving the IBM tooling is that when we got into the IBM tooling business we recognised there were many problems inherent in the traditional design that were not conducive to cost-effective manufacturing and productivity that today's injection blow moulders need to be competitive in their markets. Because of these design problems in IBM, especially for the start-up of the run, it was very labour intensive," says Jeff Chen, Director of Research & Simulation at R&D/Leverage. "Now, after much research, development and testing we have a proven IBM tool that really works."

Some of the problems inherent in a conventionally-designed injection blow mould tool that the Liberty IBM System solves are:

- eliminates the ill effect of thermal expansion related problems like bowing of the die-set
- enables the process technicians to do "cold starts" without having to torch the nozzles
- minimises thermal expansion induced wear at the nozzle tip and gate area, which also eliminates frequent replacement of the nozzle
- eliminates the need to engage and disengage the manifold from the injection cavity for startup and shutdown

- a high degree of manifold balance can be easily achieved
- minimise temperature bleed over between neck insert and cavity
- offers a solution for the galling and wear of traditional bottom mould retract components by utilising a unique retract system
- minimises parting line mismatch

The responsibility to make the product easy to process is with the person designing the preform, and the key to their being able to do that is in applying consistent standards to the preform and tool design, which the technician processes under strict guidelines during single cavity development. This way the moulder can ensure going into production without delays. "Through thermal isolation in our Liberty IBM System, we can achieve appropriate process temperatures without having to excessively run the thermolator only to achieve a lesser result," Wardlow adds. "With superior isolation in those areas you can achieve appropriate temperatures easier and without as much strain on your equipment. A thermolator is expensive to operate and requires a lot of maintenance, so the Liberty IBM System reduces maintenance costs".

R&D/Leverage currently has 16 Liberty IBM Systems running in the field with cavitation as high as 38 cavities. "The higher cavitation tools will have the highest return for our customers based on ease of start-up and tool maintenance," comments Wardlow.

www.rdleverage.com



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Coca-Cola European Partners doubles amount of rPET

Coca-Cola European Partners has unveiled its new UK sustainable packaging strategy – setting out an ambition for its GB business unit to work with local and national partners to recover all its packaging so that more is recycled and none ends up as litter.

Plans envisage doubling the amount of recycled plastic in every one of its PET bottles over the next three years – from the current average of 25% to 50% by 2020. To achieve this target it will continue its long term partnership with Clean Tech, which operates Europe's largest plastic bottle reprocessing facility in Lincolnshire, supporting the circular economy in Great Britain and allowing recycled bottles to return to shop shelves as part of new packs in as little as six weeks.

As part of the new strategy, Coca-Cola will launch a campaign to inspire more consumers to recycle and will continue to work in partnership with others – including the Governments of Great Britain – to improve the current packaging recycling system.

www.ccep.com

Erema founds Powerfil business unit

With the founding of the Powerfil business unit, Erema, the manufacturer of plastics recycling systems, extends its portfolio and now also offers the proven melt filter as individual components for existing extrusion plants. Technical modifications were made to the filter systems prior to the foundation of the business unit.

Potential users can upgrade their existing extrusion plant from alternative suppliers by adding one of the proven Erema melt filters. "Besides fast availability, customers will above all appreciate the filtering quality and the quick amortisation which comes with it," says Robert Obermayr, head of the new business unit Powerfil. "In recent years the growing recycling market and the noticeable parallel increase in more heavily contaminated input materials have led to a growth in the demand for efficient filtration systems – also in the case of existing extruders. We can meet this demand with Powerfil and offer – especially with the Laserfilter – a functional concept which unites high quality requirements and stable, inexpensive operating costs."

With the Erema Laserfilter, a continuous filter system with screen fineness of 70µm is now in operation for the first time. An even gentler filtration process has been made possible by rheological optimisation of the support breaker plate, enabling a reduction of flow resistance. Inquiries for the Laserfilter, which is already established in the post-consumer field, are also increasing from customers in the PET sector. The reason for this is that the increased use of rPET in end products requires high process stability despite higher degrees of contamination at times. The Laserfilter processes input material with a degree of contamination of over one per cent without any



Robert Obermayr, head of the new business unit Powerfil, next to a Laserfilter in the Erema assembly building

difficulty. The functional principle avoids dead spaces and makes for short dwell times which in turn prevents "black spots" with PET. Thanks to the newly developed discharge unit, melt losses are reduced from the normal 1 to 2 per cent with piston filters down to a tenth. The new business unit will be launched on the Erema stand at the Fakuma show in Friedrichshafen, Germany.

www.erema-group.com

PETnology Europe 2017: International conference on PET packaging and strategies

In conjunction with the drinktec exhibition, PETnology will celebrate their 20th international conference on PET packaging and strategies from September 11-12, 2017 at the ICM (International Congress Center) Munich. With Key Note speeches from John Galt, CEO at Husky Injection Molding Systems und Prof. Matthias Niemeyer, Managing Director at KHS, the event will be setting its highlights. Panel discussions and presentations will focus on all current aspects of PET technology: Sustainability & Circular Economy, Material & Recycling, Market Trends & Packaging Strategies, Multilayer & Barrier, developments in Preform and Bottle Technology.

Being part of the drinktec supporting programme PETnology Europe 2017 offers the opportunity to combine both events, the conference and the drinktec exhibition. The venue at the ICM is located directly on the drinktec exhibition grounds.

www.petnology.com

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Trends and developments

Caps & Closures for water and special drinks

Safe, light, cost-effective. Although these three requirements are never out of fashion, closures today have to do more than simply satisfy these three watchwords. More and more manufacturers are highlighting the closure as part of an overall packaging concept, conveying the brand message or offering additional functions. On the retail shelf this creates a comprehensive range of features and tempts customers to purchase.

Market movements

According to the India-based market research and consulting company Mordor Intelligence, the global production of plastic caps and closures in 2016 for all packaging types was 1,286 billion units and is estimated to reach 1,814 billion units by 2021. In terms this equates to a revenue of US\$29.34bn in 2016 and is projected to reach US\$38.5bn by 2021. The beverage industry leads the plastic caps and closure market and this in turn is dominated by the bottled water segment. This is expected to drive further growth in global demand.

Growth opportunities also include added value closures. This can encompass communicating a brand message or promotion by features such as laser-printed caps, or product-dispensing functions and extending to networking possibilities on smartphone or tablet, for example, to document hydration levels.



The petal-flower design by United Caps is not only eye-catching but allows end users to open bottles with very little effort.

Closure functions - catchword "convenience"

The closure is primarily intended to protect the packaged liquid and prevent it from leaking. Still, convenient solutions for special target groups are registering growth. While in the past few years, the development of the beverage closure inspired the creation of ever-lighter and more cost-effective

total bottle solutions, now "convenience" became the new buzzword of the industry. As a direct interface with the end user, this idea has recently moved back into the focus of closure developments. The industry is increasingly introducing user-friendly closures to the market, which can be opened and closed again with little effort and a good grip, especially important for certain consumer groups, for example children or the elderly.

The target group of the mobile generation is reflected in the solutions including sports caps, for example in the push-pull version with or without a hinge feature or with a snap-in function. Those closures permit the opening and closing of the bottle with one hand during physical activity. Demand for packing solutions for the "on the go" customer are expected to increase.

A similarly optimistic growth rate is also predicted for closures with integrated dispensing functionality. The

added value is here generated, for example, by dispensing a nutritional supplement into the beverage when the closure is opened for the first time.



Bericap's Thumb'Up two-piece sports closure for "on the go" customers

Closure material

The main resins used for caps and closure production are high-density polyethylene (HDPE) and polypropylene (PP) for compression and injection moulding in the leading position. Low-density polyethylene (LDPE), polystyrene (PS), polyvinyl chloride (PVC) and polyethylene terephthalate (PET) are other common used resin types.

In addition, sustainability initiatives are taken into account as a matter of course, and this includes using recycled or plant-based materials in the closures. An example is the Japanese Suntory Group, which has been using the 1.85g cap with 30% plant-based ethanol for its 550ml Suntory Tennensui water bottle since last year.



Suntory plans to gradually rollout plant-based ratios in bottle caps to other products of its brand.

However, recycled parts play a lesser role in the area of water closures, since most recycles from the closures segment are supplied to applications outside the food sector.

Has Plastik A.S.:

A range of issues and trends are driving global beverage markets, from the growth of beer, bottled water and carbonated soft drinks in emerging markets to functional and sports drinks in the developed economies.

For companies like HasPlastik, Inc., the key issues and trends driving beverage markets worldwide and the caps and closures sector in particular are tamper-evidence and product safety. Markets and customers, all the way through the value chain to the shelves of the retail outlets, are experiencing pressure for user-friendly applications; people want their products in convenient and easy to access and use forms. Competitive pressures make cost a constant issue, but savings must be achieved without negatively affecting or compromising product safety. The company also identifies a fourth significant factor: the growing demand for functional beverages.

HasPlastik's R&D agenda and strategy is currently led by activities focused on aseptic caps for Sports designs, along with "new generation" hot-fill applications. In addition, it is undertaking R&D in functional designs for applications including extract or powder dosing; sports drinks; low-presurised drinks; and similar products.

The company sees the biggest opportunities for growth in cap materials as being in HDPE, PET, barrier PET and recyclable additives.

Bericap Holding, Alexander Krautkrämer, Managing Partner Marketing & Sales:

The trend towards healthier food impacts the beverage market as it does other food markets. Water shows strong growth as well as juice and dairy products with strong health claims.



The impact on the closure sector is twofold. On the one hand there is a trend to further cost savings resulting in numerous proposals for further neck finish light weighting and corresponding closures although it must be admitted that the savings potential is much smaller than 10 years ago. On the other hand we see a clear trend to more consumer convenience and the desire for shelf differentiation.

More consumer convenience means for Bericap closures with a comfortable grip height, low removal torque and product safety through well performing tamper evidence systems. Bericap offers for differentiation on the shelf new printing methods, new closure decoration options and customised designs. Customised designs means customer specific closure designs but also overcaps which can be applied safely on all standard screw caps and hence allow the use even for limited promotions.

Five product development centres and an in-house mould making facility allow Bericap to react rapidly to customer requests. Safe and efficient application of its closures is supported from each Bericap site. With 23 production sites and many more sales representatives we are always close to the customer.

RPC, Marvin Pyritz, Marketing:

In beverage markets worldwide, what trends are particularly driving the caps and closures sector?

The trends driving our course are as a main point sustainability. As it is a well known fact that we have limited resources on our earth, we really need to think about how to use and even more important how to re-use/ recycle these resources in more efficient ways. In addition the changing climate is also a huge problem, concerning all of us. We, as a big producer and supplier of products that are used in several parts of our lives, are committed to find solutions to build a better and more sustainable future - specific to save our resources and to decrease the carbon footprint we are producing.

And following from this, a main point is lightweighting. We are seeking to find solutions to decrease the weight, which means the material needed to produce our closures, whilst at the same time delivering the same features and performance.

Our third focus is the continuing growth of e-commerce. E-commerce means often, to have really rough shipments and for this, current closures and packaging are sometimes not ready to arrive safe at the customer or consumer. We are working to improve our range to have our products ready for e-commerce.

What cap types are you focusing on as far as R&D activities are concerned?

Our R&D activities are always

focusing on value-added closures and innovation. For example our latest sport caps range which is a single piece (snap hinge) closure with an internally tamper evident band. You don't need to remove the tamper evident band with your hand and then find a waste bin, it just cracks when the closure is opened for the first time and afterwards it stays within the closure. Additionally, as it is a snap hinge closure, you will never lose the lid as it could happen with a two piece sport closure. Moreover, you can use it with one hand which makes it even more comfortable.



Sacmi Imola, Alessandro Falzoni, Closures Technological Laboratory Manager

In beverage markets worldwide, what trends are particularly driving the caps and closures sector?

We feel that the trend is still towards light weighting, with the double purpose of achieving:

- cost reduction
- the sustainability targets which several brand owners decided to adopt.

While a few years ago light weighting was the sole or main driver, new light weight designs are now often pursued with consumer convenience and new needs in mind. Practical examples of such trends are:

- extended-height caps for ergonomic gripping
- knurl patterns for easy gripping
- smart hinge cap.

What cap types are you focusing on as far as R & D activities are concerned?

Of course, we are following the trends described above. On top of that, considering that our technology, CCM Continuous Compression Moulding, allows to change the top wall thickness and thus the weight of the cap simply by pressing a button on HMI, we are proposing multi-purpose caps to our customers. For example, with the same mould you can produce a 2g cap for PCO1881

CSD and you can reduce the weight to 1.8g per cap if the cap is intended for use with still water only.

The process of weight reduction does not apply only to the short caps that are very common in Europe and USA.

In other markets, such as China and Africa, relatively tall neck finishes are still used. We revised and improved old designs in order to achieve weight savings as high as 30% when compared to caps used in the years following 2010. For example, we are launching a 30/25mm cap as light as 1.58g on the market, when, until not so many years ago, the same cap would have weighed 2g.

The beauty of the whole trend is that a well-designed and correctly manufactured lightweight cap will deliver the same performance of older designs, but with other advantages:

- shorter cycle time
- better size control
- colourants have less effect on shrinkage
- lower opening torque.

The drawback is that caps are more delicate and should be handled more carefully.

For which cap material (PP, HDPE, PET,...) are you seeing the biggest growth opportunities?

We see HDPE as the dominant resin and it is going to stay, thanks also to the huge resin improvements achieved in the past years by many resin suppliers. The growth for PP might come from sport caps or hinge closures, where transparency is required.

We did trials with PET several years ago, encountering several obstacles (removal torque, brittleness, long cycle time); we do not think PET will soon be a resin to be used for beverage caps. We also did trials using bio-polymers (biodegradable or/and from renewable resources) achieving results which could allow industrial application of the resins; we are waiting to see where the market will move.



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Five global trends that will transform closure production

Put a cap on it

By Michael Van Dord, Technical and Design Engineer, Caps and Closures Pty Ltd, Australia

Retiree Craig Williams, 82, enjoys his cups of tea in the morning and working in the garden in the afternoon. Unfortunately Craig has arthritis and struggles to do a task as simple as opening a new bottle of milk. People with a debilitating condition, like Craig, are being considered not only for their buying trends in relation to the look and taste of a product but also their physical requirements and ability to get into the product to consume it. And this is just one of the trends, Australian company Caps and Closures Pty Ltd discovered as having effects on future closures' design.

The Arthritis Foundation estimates that osteoarthritis will impact at least 130 million individuals worldwide by 2050; Craig is one of the 15% of people over 60 who are currently living with osteoarthritis.

Caps and Closures Pty Ltd Australia views the ageing population as a problem for individuals, families, governments and businesses and the food industry is no exception. This trend is not going away any time soon. Eurostat says that the proportion of the EU's population aged 80 years or above is expected to more than double between 2016 and 2080, from 5.4% to 12.7%.

People with a debilitating condition, like Craig, are being considered not only for their buying trends in relation to the look and taste of a product but also their physical requirements and ability to get into the product to consume it. The old approach of making everything lighter and more efficient to protect a product, reduce waste and improve profit is not enough. If Craig can't open the product and consume the food, he won't consider buying it in the future.

We realise the world is changing and Caps and Closures Pty Ltd Australia's designers actively consider a wider demographic when designing new products. The traditional "me-too market" sees large companies put money into designing and developing a product, with smaller companies following the trend. 3D printing, once prohibitively expensive, is changing the way we design and manufacture products. Today's low-resolution printers cost around \$1,000; one capable

of printing detail finer than a human hair can be purchased for around \$5,000. They can create multiple iterations of a design that allows the customer to get a true understanding of how a product will look, feel and function in timeframes never imagined a few years ago. Caps and Closures Pty Ltd Australia designers are using this technology to reduce the design and development process down to mere days.

This technology is just the tip of the iceberg. Companies are creating continuous printing methodology that enables completion in 10 minutes of a print that, in the past, would have taken 10 hours. We will soon be using 3D printing for large-scale customer interaction testing, and even trialling existing manufacturing and filling lines for compatibly with new product well, before expensive tooling has been begun.

3D printing is not just limited to plastic polymers. By combining small particles of metal with a laser, 3D printing of a metal object is already being used in the medical field to replace damaged bones with custom-designed titanium implants that are then inserted directly into a human body.

Metal 3D printing will revolutionise tooling manufacture for injection moulding, blow moulding and compression moulding. It will reduce tooling costs and improve the die's ultimate functionality, through being able to create shapes and waterways that are impossible to manufacture through existing machining techniques.

Outlook

The team at Caps and Closures Pty Ltd Australia sees the day where arthritis sufferers like Craig will one day be able to go to the supermarket and find a product on the shelf that does not require him to open it with a tool or, in some situations a knife; it will be specifically designed with him in mind. Manufacturers and designers will be using 3D printing and smart technology and materials to reduce development time and increase product variety. The products of today will be forgotten and the variety of products available tomorrow will be unbelievable – and truly exciting!

Five global trends that will transform production

Caps & Closures Pty Ltd defined five global trends that will transform production today and in the future. These were analysed in terms of what is new, next and game-changing in the worlds of consumer experiences, business strategy and emerging high-performance manufacturing trends across the globe:

1. How 3D printing will change the world

“3D printing will change the way things are produced more in this century than the industrial revolution did over the last 300 years.”

Rick Smith, Forbes June 2015



2. Ageing population and easy opening packaging

“The ageing population is the largest and fastest growing sector of the market – but when it comes to packaging design, they are often overlooked. With 73% (\$3,262bn) of Australia’s net household worth belonging to those who are aged 45+, surely it makes sense that their needs are actively considered through the design process? Failure to do that creates a barrier to purchase. Simply: if you can’t open it, you can’t eat it.”

Fergal Barry, strategic partnerships manager, Arthritis Australia

3. Developments in tamper evidence

Packaging security is absolutely critical. It can protect against everything from consumer tampering to bioterrorism to product counterfeiting.

Solutions may involve all phases of product production, distribution, logistics, sale, and use. No single solution can be considered ‘tamper proof’, so many levels of security need to be considered to minimise risk.



5. Materials and technologies that will change the world

How can we determine which technologies are likely to have the greatest potential to transform the future of the human race? What is the process to distinguish among the innovations that will have limited impact and those that will be milestones on the path of progress?



www.capsandclosures.com.au

4. How millennial consumers are transforming today’s packaging industry

Millennials have surpassed baby boomers to become the largest generation in history and, as a result, they have a significant influence on the decisions made by consumer goods manufacturers. They are not only the driving force behind a changing product mix; their purchase decisions are prompting manufacturers to differentiate their brands with creative and unique packaging.

Caps & Closures Pty Ltd is a leading Australian manufacturer of a comprehensive range of standard and custom-designed caps and closures for packaging, beverages, pharmaceuticals, cosmetics, and more. As well as providing injection moulding services and custom built dies, they are a ‘best practice’ organisation with a culture of innovative solutions and opportunities-opening service. Caps & Closures is committed to an on-going research and development program, constantly improv-

ing the quality and range of every product. This includes the development of new products that are intended to be ‘groundbreaking’ in Australia.

Caps & Closures Pty Ltd support the certification of its activities in accordance with the requirements of HACCP, and ISO 9001, which constitutes a tool for helping to implement its key company goals.

TRADE SHOW *preview*

Tried-and-tested closures and new product features

drinktec.com
Hall A4 - Booth 502

The closure manufacturer Bericap will be introducing types of closure that are intended to surpass usual standards. Examples include closures that combine the desire for consumer convenience – such as good grip, supporting easy opening of the bottle – with optimised material usage. This is particularly true for closures not only for still water, but also for beverages for aseptic and hot fill applications. Bericap will be presenting new closures for the carbonated beverage market as well.



Light DoubleSeal SuperShorty
28/16 7115

The company has also optimised its product portfolio in the area of sports caps and valves and will be presenting new ideas and applications. The 2-piece sports closure Thumb'Up Crystal allows a 2-colour look with a transparent PP shell and a coloured HDPE pourer section. The sports closure is designed with a tear strip, offering tamper evidence functionality for the over-cap, but it will also be available with bridges only. The reactive Double Galileo hinge allows an opening angle of 180°, so that the over-cap no longer comes into contact with the cheeks. The hinge is compliant with BSDA safety standards. Thumb'Up Crystal is available for the PCO 1881 and the 29/25 neck. It is also feasible for the 26/22 neck.

After two years of development and testing, Bericap Hungary has successfully introduced an extremely light 28mm PCO1881 flat closure in the market. The closure has been developed for the still water market and saves another 14% weight compared to its predecessor. In addition to still water, the closure can also be used for non-carbonated soft drinks. The closure has been validated for the N2 dosing allowing to pressurise light weight bottles for better bottle stability. Customers already using the Bericap CSD closure #7103 can use this new light weight still water closure on the same filling line without changing chucks. Industrial validation was completed successfully at the largest Hungarian mineral water bottler.

www.bericap.com

Sport closures and more

drinktec.com
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Aptar will exhibit its well-known Original family of flip-top sport closures, available in different neck finishes and valve capable. Also, Contender 38mm bi-injected, part of the Original family, is a liner-less flip-top sport cap designed for the hot fill bottling process. The closure's innovative bi-injected sealing system delivers good product protection but without the added foil liner.

Also based on the Original sport closure platform, Uno, a one-piece sport cap suitable for cold and ambient filling is already available worldwide in 28mm PCO 1881 and will be soon available in 38mm neck finish with a two-start or a three-start version.

Aptar Food+Beverage and GualapackGroup combined their expertise and consumer-trusted products into one package solution, the No-Spill Pouch. It is claimed to offer the safety and convenience of Aptar's SimpliSqueeze valve in the squeezable, eye-catching and fun-to-use Gualapack's CheerPack spouted pouch.

Aptar will also unveil more dispensing systems such as a closure for large PET beverage containers and the new sport cap generation with a visible and non-detachable tamper evident system. For instance, the new sport closure Advantage uses an intuitive press button tamper evidence system. Inside is the affordable value-added sport closure that differentiates itself in a competitive market. Guardian sport closure brings a safe consumer experience that will generate repeated purchases. All three of them are SimpliSqueeze valve capable.

www.aptar.com



Variety of caps for a variety of beverages

The Silgan Closures Drinktec stand aims to underline the company's expertise in the design and manufacture of both metal and plastic closures, demonstrating their ability to seal all types of containers with different neck sizes, including glass, PET and liquid cartons, for a variety of end markets such as still mineral water, dairy drinks, non-carbonated beverages and liquid foods.

Among its plastic closure highlights, Silgan will display its range of sports caps, combining a robust design with a tamper-evident spout and maximum consumer convenience, including variants offering one-step opening. For the still-growing water cooler sector, the company's new improved 5 gallon K-Seal closure incorporates Silgan's innovative Probe+ system. This is said to ensure full plug engagement to the cooler spike to keep hygiene levels high and bottles consistently sealed when not in use. A reduction in pigment usage also substantially reduces the risk of taint or odour issues, while the latest manufacturing techniques together with a new resin and low-power consumption moulding during production, help to reduce a company's carbon footprint.

Other plastic closures on display include Silgan's choice of flat caps for hot, cold and aseptic filling requirements, all helping to deliver line efficiencies, product integrity and ease of use. Silgan's metal closure ranges will underline the choice available for non-carbonated beverages and foods packed in glass or plastic containers, with aseptic, hot fill, pasteurisation and retort offerings.

In addition, the stand will detail the range of support services offered by the company in the development of its closure solutions. These include its Litho Design Service, taking customer designs from concept to production. This encompasses: the range of decoration options available for effective on-shelf branding; a food technology service that ensures process reliability and product quality to meet all food and drink standards; and finally customer technical service and line planning that provide a one-stop engineering solution with the supply of machines and support services for an efficient filling operation.

www.silgan-closures.com

Comprehensive closures collection

United Caps will demonstrate how their market-driven approach fosters the development of closures that perform as well in the plant as they do in the hand. With a healthy 50/50 split between customised and non-bespoke solutions, United Caps will also showcase the latest in customised solutions like the Wattwiller closure, which features a petal-flower design that is not only eye-catching but allows end users to open bottles with little effort.

The complete beverage and dairy standard portfolio has recently been enhanced by acquisitions and growth. True to the principle that "Less is More" - United Caps design capability has reduced the need for product line complexity. It encompasses solutions for the entire industry, everything from PET to glass bottles across a wide range of neck sizes. The optimised product lines on display constitute a comprehensive collection wide enough to meet industry needs but simple enough to avoid overwhelming with unnecessary choice, says United Caps.

New closures developed to answer the requirements of the latest industry trends will be also available to experience at the show. Enhancing this portfolio are differentiated finishing processes such as the cutting edge United Caps bi-injection process which yield exciting design possibilities and inspiration for brand owners. Experts from R&D, production and technical service will be on hand to explain how United Caps helps customers to deliver differentiated total packaging solutions.

www.unitedcaps.com

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Internet of Packaging (IoP) turns caps into smart devices

Smart cap

Israeli company Water. IO can transform any bottle into a smart bottle. Established in 2015 as a result of a medical problem that plagued the young daughter of one of the co-founders which was based on dehydration, Water.IO developed a cap helping users by reminding them when to keep hydrated throughout the day. Over the past two years, the company expanded way beyond water and today they are the only company with a commercially available disposable IoT smart-caps solution for the pharma, beauty, cleaning and additional industries. Water.io has build an Internet of Packaging platform (IoP); the name is derived from the wider Internet of things (IoT) concept. The platform enables CPG products, including PET bottles, to be turned into smart devices, which generate value to the consumers and data to the brands.



Innovative cap technology can transform any bottle or container into a connected device.

The IoP platform is built using three building blocks:

- Sensors and electronics attached to the package (either replacing or clipped to the existing package/cap)
- Consumer-facing app, fully identified with the product brand
- Brand Dashboard, aggregating and displaying all data collected (Big Data) and derived analytics

Consumer benefits:

- Reminder to use the product when needed
- Automatic re-ordering
- Personalisation of the product

Brand benefits:

- Improved product for the consumer
- Real usage data collected and displayed
- Direct consumer engagement via the app
- Know your consumer

The platform can serve a wide range of CPG verticals, including pharmaceuticals. Below are a few examples of use cases.

Connected cap

Water Connected is a smart cap that measures water consumption in real time and is fully connected to user's mobile phone.

The mobile app can take into account factors like user's weight, height, age, gender, weather conditions and activity level. These factors help Water Connected to personalise reminders to users about how much to drink and when.

It also connects to smart watches and fitness bands. This helps the smartcap and app record and analyse detailed activity information, which provides accurate hydration recommendations.

- Touch sensor: identifies user touch on the cap
- Light sensor: identifies a room's light status
- Closure/package sensor: identifies cap status (open or closed)

Automatic re-order / replenish

Other products can use the same platform to become smart. Items such as bottles of laundry detergent or washing-up liquid can remind customers, by flashing lights or customer alerts on the app, when they need to reorder. The system is 100% automatic.

The smart-cap will also measure product usage and the dashboard will give companies access to vital information about customer data and analytics.

The app and data dashboard

The smart bottle Water.IO app has many convenient features for its users. It collects detailed information gathered from your smartcap technology. Users can look at their personalised hydration data and analyse that information. The app will provide personal tips for their health and hydration needs.

The app can:

- Monitor daily hydration habits
- Monitor long term hydration habits
- View historical per hour hydration profile
- Build a personalised hydration profile, based on personal needs

The data dashboard is designed to help companies gather important information about their customers. It will allow water and beverage companies to monitor customers' habits and correlate with other information like weather, geography, and so on.



The Water.io app comes with private label options for water and beverage company brands, providing a first and unique opportunity to engage with their customers directly while the water dashboard (monitor) contains both real-time and historical hydration information and analytics.

The information collected will help companies grow and tailor their tactics to what their customers need and want. The app can monitor real-time usage, historical usage, geographical usage, interprets customer reactions to marketing (TV, radio, social media), and so on.

Healthcare and pharma

Water.IO also has tech to help pharmaceutical companies, healthcare, authentication, medical adherence, and more. The smart adherence cap, blister clip-on, and smart syrup cap all help measure and track medi-

cation levels, bottle opening and closing, count the contents of the bottle or pill pack and even issue an alert before an overdose.

They all help the user take their medications on time and in accordance with their prescription directions. The caps can also generate big data for analytical purposes, to relevant stakeholders. Each smart solution connects to the smartphone adherence app and dashboard, where information like adherence history, customer feedback, and the ability to re-fill a prescription is available.

www.water-io.com

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drinktec

Hall C1 - Stand 622



Hall B3
Stand 3208



www.moretto.com

Compression technology for the North American and Caribbean closure market

Major order and installation completed for a complete system capable of processing 2,000 caps per minute, with high quality, lower costs and increased process efficiency. These key advantages have now led one of the industry's key players in the North American and Caribbean water market to choose Sacmi compression technology.

Already a major supplier of pre-forms to some of the most important beverage players in North America and the Caribbean, the customer chose to enter the closures market, selecting Sacmi compression technology. The advantages include the ability to manufacture caps with different designs using the same mould. This is because the thickness of the top wall can be changed via the operator interface.

The Sacmi Continuous Compression Moulding (CCM) lets manufacturers cover the entire cap range on the market thanks to the versatile variety of available designs. Offering intrinsic advantages in terms of productivity, energy savings and reliability, this technology operates at lower temperatures, thus reducing on-material stress and extending the working life of both-machine and mould.

Production capacity

The supplied solution – a CCM 48SC – is designed to manufacture 26mm water caps at an output of 2,000 caps per minute with a cycle time of 1.44s. Compared to alternative solutions such as injection, the technology enables lighter and high performance caps to be manufactured, whose weight and other parameters can be modified easily via the operator interface.

Mould with doubled in-mould cooling system

The supplied solution is also equipped with COOL+ moulds. These constitute a highly developed boosted cooling system (i.e. more uniform, faster cooling), optimising the process

and improving product quality. Installable across the entire range of CCM Sacmi presses, COOL+ actually doubles the in-mould cooling circuit. The result: the cooling liquid flows closer to the inner wall of the cap and therefore reduces the cooling time that can have a considerable impact on the total process time. Major advantages are also to be had in terms of flexibility and ease of maintenance.

CCM technology represents a major investment choice for the customer, who was quick to grasp the advantages it offers in terms of lower production costs and higher quality output.

Designing the cap

One key element in the customer's purchase decision was Sacmi's Closures & Containers range of services, amongst which the assistance needed to ensure the cap responds perfectly to customer specifications. Certified by international beverage players, Sacmi packaging laboratory is fully equipped to provide customers with close support right from the design stage (e.g. via advanced seal tests on the cap and cap-bottle system) and throughout the working life of machine and mould.



Sacmi says, the order reaffirms its standing in this industry, thanks to their state of the art technology and worldwide installed machines (more than 1700) that make CCM a most competitive single-piece cap manufacturing solution.

www.sacmi.com





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Regional Editour report for Malaysia

A divided country

by Alexander Büchler

In terms of industry, Malaysia is divided in two. Industry around the capital Kuala Lumpur and further north produces primarily for Malaysia and exports around the world. In the south – in the Johor Sultanate – industry is oriented entirely towards Singapore. Many companies from the drinks industry are also drawn here from the city state.

Costs for land and staff are a fraction of those within the city. On the other hand, many raw materials are subject to import duties; an important example for our sector is sugar. Exporting to Singapore also has its costs: border crossings of two hours duration are more the norm than the exception. We visited Asia Farm and Pere Ocean, who supply Singapore from the south of Malaysia. Our reports about Spritzer, La Boost, Bericap, Diyou Fibre, Sukano and SMI belong to the first group that works around Kuala Lumpur.

As a result of the exports to Singapore, production figures in Malaysia are significantly higher than regional consumption. While imports are negligible, it is estimated that every fifth PET bottle of the 1.5 billion produced

in Malaysia goes to Singapore. The high proportion of drinks cans is a noteworthy part of overall consumption. According to Euromonitor, at 2.4 billion containers, it is twice as high as the number of PET bottles. It seems that in tropical countries, the can better suits the taste of the consumer. So the PET industry has some catching up to do here, although 400 bottles per head per year are already consumed.

Malaysia is a Muslim nation made up of several Sultanates, which are conservatively governed. The population of about 30 million consists of 50.1% Malay, 22.6% Chinese, 11.8% indigenous and 6.7% Indian (2010). 61% consider themselves to be Muslim. By law in Malaysia, a person is automatically Muslim by birth.

The government initially weighs up possible changes and when in doubt, is unlikely to implement anything immediately. In this way, the government tries to protect the culture, the country and the Malay people from too rapid westernisation. The individual sheikdoms follow conservative paths with varying strictness. The Johor Sultanate in the south is rather more open than the other ruling houses, which is a concession to the industry along the border with Singapore.

However, the state – which actually has the wellbeing of its residents in view – sometimes gets in its own way. So in fact no new wells are authorised for water bottling. This protects the existing bottling industry but leads to bottlenecks in provision for the population. Investment is made in new capacities only when the available systems have been working completely at capacity for a long period.

But even then the government is not entirely consistent. Factories that sell drinks with flavourings and/or sugar find it much easier to gain access to water. As a Muslim country, the production of alcohol plays a subordinate role.

Tour Sponsors:





Entry into drinks caps

Relocation

by Alexander Büchler

Bericap, Kulaijaya, Malaysia, April 13, 2017
We met: Mr Andrew Tan, Managing Director

It feels a little like being in Central Europe. In a region where driving on the left is the norm and people keep to the left on streets and pathways, on the stairs to the Bericap building we keep to the right. No problem for me, I'm used to it; but despite arrows on the steps and direction markings on the railings, I am almost half way up when I stumble into a Malay colleague, who as usual comes toward me on the left. And there the cultures collide. To ensure this does not happen in matters of business, Bericap Budenheim relies on local employees and above all on local managers. At Bericap Malaysia it is Andrew Tan who manages business locally.



On March 30, 2016 the new factory went into production but is already too small for Managing Director Andrew Tan. A new warehouse is being developed alongside.

supplies all South-East Asian countries. This led to the first large orders from Nestlé Water in Thailand. Also part of the portfolio is the closure for Coca-Cola for the new recognisable 250ml bottle from India for the Indonesian market.



Nestlé water from Thailand and Coca-Cola 250ml produced in Malaysia for the Indonesian market were the first drinks closure orders for Bericap Malaysia.

Christian Krautkrämer has always intended that Bericap grows in Asia (see interview in PETplanet 5/2016). The first step was taken in 1995 in China, the second in 2010 in Singapore. In the South-East Asian metropolis, Bericap limited itself at first to food and technical closures. The quantities are small in comparison to drinks closures but the profit margins are high. In 2013, Andrew Tan came aboard as Managing Director and focused on drinks closures. He believed that this was the only way for the company to grow quickly. And it grew far quicker than expected. After just 4 years, the factory was too small and a new factory was planned directly across the border in Kulaijaya, Malaysia. In 2016, it went into production with around 40% of the previously manufactured closures and 60% drinks closures. From there, Bericap

The competition is still on for orders from the Malaysia market. Although it is a region with high volumes of still water, the drinks bottlers has relied on the old PCO 1810 or for still water the similarly oversized PCO 1881. He wants a provider that converts to the simple 29/25. Then he would be in business. He estimates the potential to be 1.5 billion closures in Malaysia alone. However, after little more than a year, the new location has become too small. A new warehouse is being developed two properties further along so that he can use the existing storage areas for machinery installations. He is also thinking of a new factory in South-East Asia so that he can outsource production and make space for new orders. But final arrangements have not yet been made.

www.bericap.com

Functional & optical masterbatches

by Alexander Büchler

Sukano, Johor Bahru, Malaysia
April 14, 2017

We met:

Mr Colin Newton, Director of Sales
Mr Paul Steinauer, CEO

The Swiss masterbatch and compound manufacturer Sukano operates its South-East Asian activities from Johor Bahru. The site includes more than just offices and technical services; production also takes place here. "Wherever our products go into international markets, our customers appreciate the broad product range and value proposition that Sukano masterbatches can bring to their products," says Mr Paul Steinauer, CEO of Sukano in Johor. This includes many technical applications and a secure footing has also been established within the packaging films sector across the Asia Pacific markets for a number of years. In the field of PET bottles, the company offers an extensive range of both functional and optical masterbatches that will enhance the appearance and physical characteristics of the bottles, particularly when recycled materials are being considered. Historically, Sukano's manufacturing strengths were focussed towards the functional additive masterbatches, however recent investments in both Process and Colour Measurement equipment have allowed us to rapidly gain a market share of the Coloured Bottle and Container market.

"We see our strengths in both functional additive and optical masterbatches and can offer both quality and technical value to our rapidly growing customer base. One particularly example would be in the milk sector where we can offer excellent solutions to the market," continues Mr Colin

Newton, Director of Sales. Sukano continues to grow and a new warehouse has recently been built alongside the manufacturing facility.

www.sukano.com



Colin Newton, Director of Sales (left) and Paul Steinauer, CEO have a positive outlook.

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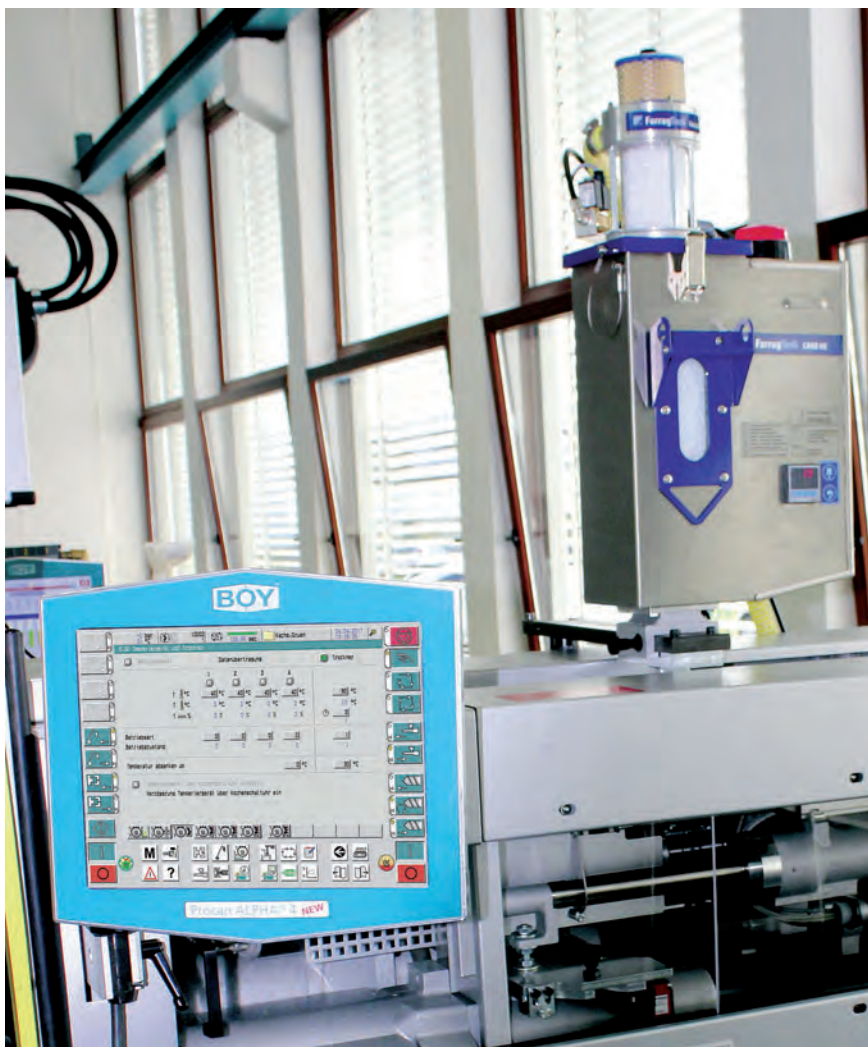
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Compact compressed air resin dryers easily combined with injection moulding machines

Process optimisation cut and dried

When the injection moulding manufacturer Boy put the Boy XS especially for small mouldings on the market in 2009, it was acknowledged that in the area of peripherals, and particularly in terms of material dryers, there were hardly any suitable devices available on the market for drying small material throughputs.



Due to the direct mounting on the feeder, remoistening of the treated material is avoided: It is a special solution with a very small material container that has been designed especially for the Boy devices.

Too large, elaborate and complex dehumidification units in terms of handling, with inherently high operating costs, did not offer a reasonable solution for smaller machines. That

is why in 2010, the choice fell to the small dehumidification units from the Card series of Austrian company FarragTech. Of special interest here was the compact design which made it



Together with FarragTech, Boy has developed another connection option – at the moment, however, this is only available for the Card G Fit series, because the Fit controller from FarragTech is required for that.

possible to mount the dehumidification unit directly on the machine without affecting the small injection unit of the machine and without limiting accessibility. The dehumidification units run smoothly with the new machine software Procan Alpha 4 which Boy has developed specifically for its machines.

A jointly developed bracket for the dehumidification unit offers the option of automatically conveying the dried resin using the shortest route into the small intermediate hopper on the plasticising unit. Here the filling level is monitored via a sensor, with the redelivery switched from the dehumidification unit. The filling up of the dehumidification unit can also take place automatically. Here, too, a sensor controls the suction of resin from a reservoir which is placed near the machine. The filling level in the dehumidification unit can be optionally adjusted. Due to the compact design of the expansion dryer, the system just needs the footprint of the injection moulding machine. In addition, the ease of use of the drying system is striking. The few settings on the dryer are placed at an ergonomic working height. This is important, as high-quality technical plastics, where water absorption cannot be prevented during transport and storage, are disproportionately often processed especially on small

injection moulding machines. These machines are very often equipped with the drying system at the machine suppliers and then tested and delivered. Using the new Boy - Procan Alpha 4 control, the dehumidification unit can be connected to the machine control, because improved connectivity and a more comfortable connection to peripheral devices is possible due to this control.

The purchase of this complete solution relieves the user on the way to process-reliable manufacturing. Moisture in the resin can lead to porosities, surface smears or material damage due to hydrolysis, which always has a negative impact on the characteristics of the moulded part. As often expensive plastics are selected and get lost due to damage, damage through moisture is virtually always a rejection criterion. "By using the compact Card dryer system, we are able to offer our customers an effective and cost-efficient system," explains Bernd Fischer, division manager for application technology and service at Boy. "The dehumidification units fulfil all common functions, they are easy to handle and can be mounted taking up very little space on the Boy XS," says Fischer. "Finally we have decided to offer a less cost-intensive, very effective system."

Saving energy by direct mounting on the feeder

The choice fell to the small material dryers of the Card compressed air dryer series of the Austrian manufacturer FarragTech. With the Card G as well as the Card 10S dryers from FarragTech only very small amounts of compressed air are consumed. The whole process is thus a lot less energy-intensive than with other material dryers. Due to the direct mounting on the feeder, remoistening of the treated material is avoided. This represents a special solution with a small material container that has been designed especially for the Boy XS and which works with this injection moulding machine only. The dehumidification unit – in this case the Card G – is mounted on the injection moulding machine outside the feeder and permanently supplies the small material container with dried resin, depending on the requirement of the filling level sensor. For all other Boy



The dehumidification unit – in this case the Card G – is mounted on the injection moulding machine outside the feeder and permanently supplies the small material container with dried resin. (Photos: Dr. Boy GmbH & Co. KG, FarragTech GmbH)

machines, the material dryers can be mounted directly on the small material container on the feeder. Additionally, the drying system from FarragTech runs completely maintenance-free.

Process optimisation through flexible adaption

"For us, collaboration with Boy started with the task of designing a suitable mechanical interface to the existing Boy machine system for our dehumidification units," explains Günther Scheifflinger, Technical Manager at FarragTech. "The mechanical connection options of our dehumidification units were changed in such a way that they fit without any problems to the flange of the Boy injection moulding machines and the dryers have been installed without undue effort since then." Consequently, the injection moulding machines from Boy could be offered from that date with a suitable dehumidification unit – with optimum efficiency in the area of material drying and conveyance: "When our customers order a dehumidification unit for the machine, we will immediately contact FarragTech," explains Fischer. "We could keep our sales program of peripheral devices for Boy machines up to a locking force of 350kN very lean." Moreover, since the start of the cooperation of both

companies, the costs of materials for Boy could be reduced and the internal processes in terms of speed be optimised.

Together with FarragTech, Boy has now developed another connection option: however, this is only available for the Card G FIT series, because the Fit controller from FarragTech is required in this case. This electronic interface has been in the program since 2016, making it possible to operate the dehumidification unit directly via the input panel of the Boy machine. The dehumidification unit records the process, with alarm messages being fed back by the system in case of faults and a detailed documentation of the entire process being made possible. In addition to supplying resin dryers, FarragTech also supports Boy at exhibition appearances by providing free-of-charge peripheral devices for the exhibits and applications. In return, Boy provides the exhibition stands of FarragTech with injection moulding machines, if necessary.

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Stretch Blow Molding, part 5

Material Basics / Reheat Stretch Blow Moulding Machines

by Ottmar Brandau

Ottmar Brandau has newly revised his book “Stretch Blow Molding”, first published by hbmedia / PETplanet Publisher, and now re-issued in a second edition under the Elsevier imprint. PETplanet Insider is publishing extracts from successive chapters in a series of articles.

AA creation

In the initial stages of PET resin manufacture, AA levels may be as high as 150 ppm. What happens is that –OH end groups combine with water, glycol, or oxygen that may come in contact with the resin at that stage to form AA whose formula is CH_3CHO . During solid-state polycondensation, the material is heated and AA is removed by nitrogen gas to a level of <1 ppm.

Drying is again critical to AA generation during preform injection moulding as moisture present in the resin will not only break the molecular chains but also create AA. A material temperature of 165°C (329°F), as

measured at the extruder throat of the injection machine, has been proved to be optimal to minimise AA generation. Residence time and temperature are the other crucial factors (Fig. 2.18).

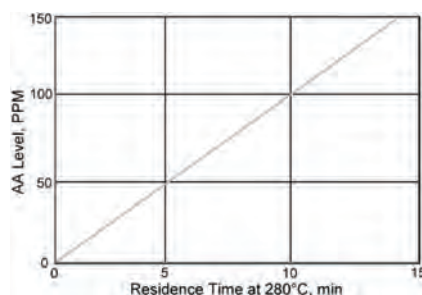


Figure 2.18 Residence vs. AA Level. A linear relationship exists. Diagram courtesy of Shell.

The relationship between residence time and AA level is linear. For the preform moulder this means that extruder size and preform weight should be closely matched. One intriguing detail of PET preform manufacture is that cycle times do not vary significantly depending on weight but rather on wall thickness. Two preforms with the same wall thickness where preform A is twice the weight of preform B may differ in cycle time by only one or two seconds. This means that the residence time of the lighter preform B is almost twice as long as that of preform A with corresponding effect on AA content. Over the last few years, water bottles especially have become lighter with the negative effect that their residence time has increased if they are produced in the same extruders as they were before light weighing.

The relationship between AA generation and temperature is exponential (Fig. 2.19).

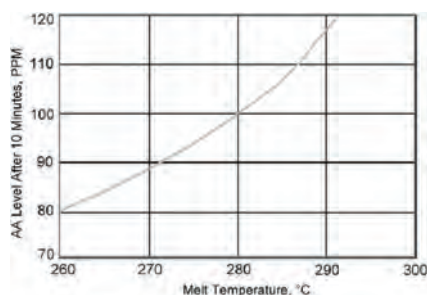


Figure 2.19 AA level vs. temperature. This relationship is exponential. Diagram courtesy of Shell.

Temperature, therefore, plays a more important role in AA generation.

To keep temperature at a minimum, processors should follow these procedures:

- Maximum heater adjustment should be 290°C (554°F)
- If there are percentage-controlled heaters such as is common for injection nozzles, they should be set at a minimum and raised only for start-up
- All thermocouples need to be firmly inserted into the respective machine parts to avoid false (too low) readings
- Injection time should correspond to 10–12 g/s/cavity, i.e., a 15g preform should inject in 1.5–1.8s to avoid shear stress
- Back pressure should be set to a minimum, again to avoid shear stress – typical range is 15–20 bar (200–300 psi)
- Screw speed should be set to a minimum. This can be done by measuring the time that the screw is not recovering (turning) during automatic cycle. This time should be between 1 and 2s. If it is longer, screw rpm can be reduced.

Co-polymers have a lower melt temperature than homopolymers and should be exclusively used for the production of preforms for water bottles. Another resin feature should be low IV because high IV increases the melt viscosity of the resin requiring higher injection force, and thereby increasing shear stress. Typical IV values for water bottle preforms are 0.72–0.76.

AA in water bottles

The process by which AA may be released from the bottle walls into then beverage is quite complex and both humidity and temperature play a

role over time, besides the initial AA level in the bottle (Fig. 2.20).

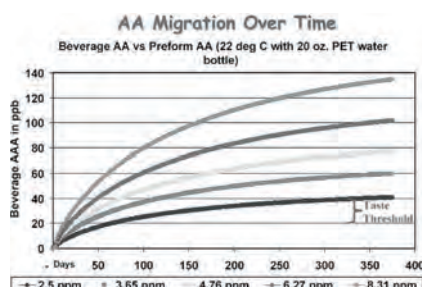


Figure 2.20 AA migration over time

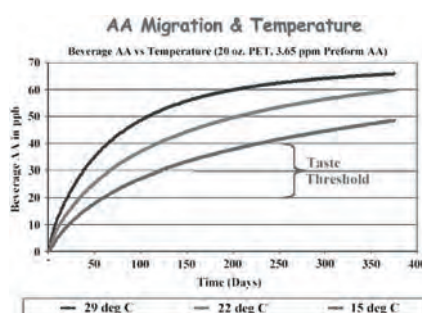


Figure 2.21 AA migration vs. storage temperature

Taste tests have shown that consumers can detect a level of

20–40ppb of AA in their drinks. Starting with the lowest possible AA level, it is paramount to delay this point in time as far out as possible. Temperature also plays a role (see Fig. 2.21). This effect can easily be experienced by leaving a water bottle on the dashboard of a car for a few weeks during the summer months. The water in this bottle will taste stale and have a light, unpleasant sweetness to it. Water bottlers have decreased the amount of AA they accept in their bottles. While 10 years ago 6 ppm was widely accepted, some companies now demand levels as low as 1.5 ppm. Machine manufac-

turers have responded by fine-tuning the screw and hot runner designs and are able to deliver preforms at those levels.

There are two ways to measure AA level. The most common one is the ground-parison method. Preforms, bottles, or resin are cut into small pieces and ground in to particles smaller than 1mm. In order to avoid creating AA during grinding, the specimen is cooled down with liquid nitrogen before entering the grinder. The ground material is then placed in a closed glass vial and heated to 150°C (302°F) for 30 min. The prepared sample now contains head space with AA in it and it is this gas that is being measured in a gas chromatograph.

The other method uses blown bottles. These are purged with nitrogen and stored for 24 hours. Then a fixed gas volume is extracted with a syringe and measured in the gas chromatograph. It is apparent that both procedures are cumbersome and time-consuming. With the development of 144, 192, and even 216-cavity preform



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injection tools, it is outright daunting in its scope. A more efficient method is to check only the so-called “hot cavities.” In Chapter 8 I have explained the mechanics of viscous heating, the fact that the resin heats up unevenly as it moves through the barrel and hot runner channels. While this has

undesired effects in injection stretch-blow moulding with respect to the bottles, in injection moulding the effect is that the preforms in some cavities are always warmer than the majority of the others. This higher temperature also increases the AA level in the affected cavities and fortunately it is

always the same cavities that show this behaviour.

After establishing the performance of all cavities, lab personnel can concentrate on the “hot cavities” and still make valid assumptions about the AA level of the entire tool.

3 Reheat stretch blow moulding machines

3.1 Overview

In polyethylene terephthalate (PET) bottle manufacturing, reheat stretch blow moulding (RSBM) machines are the second part of the so-called two-stage process, the first part being the injection moulding of preforms. All RSBM machines use injection-moulded preforms, heat them up, and stretch and blow them in a blow mould. However, besides these rudimentary basics, there is now a variety of machine types available for all output and quality requirements. A potential buyer should be aware of all the various differences in order to make an informed decision on what machine to purchase.

In the single-stage process, both preforms and bottles are manufactured in the same machine. The single-stage process is quite different from the two-stage process in many respects. There are also machines referred to as integrated two-stage machines, which fall between the two categories. These machines inject mould preforms, transfer them to mandrels, and rotate them in front of a short section of infrared lamps or other device before blowing. See also Chapter 8 for a discussion of single-stage machinery, integrated two-stage machinery, and a comparison between these processes.

3.2 Semi-automatic machines

Most semi-automatic machines are manufactured in Asia. They usually comprise a stand-alone oven section, set next to a blow clamp. An operator places one or two preforms on mandrels that spin through the oven section. He also takes one or

two preforms that have gone through the ovens off the mandrels and places them into the open blow mould. Typically, closing of the blow clamp requires a combination of two buttons to be pressed in order to protect the operator from injury. The mould closes and stretchblows the bottle(s). The operator subsequently takes the bottles out, adds preforms to the mandrels, and the process starts all over again. Outputs vary from 60/h for 20l (5 gal) water bottles in single cavity machines to 800 half liter bottles/h in dual cavity machines.

Most machines are sold with at least one mould, a compressor, and possibly a small chiller. Quality varies between manufacturers, and buyers should vet each supplier or purchase through a distributor to avoid disappointment. This is discussed in detail in Chapter 11.

3.3 Linear shuttle-type machines

In these machines, blow moulds are mounted together and all move with a common cylinder. Machines with up to eight cavities have been built (see Fig. 3.1), but the most common models have one to four cavities. Thus, these machines cover the lower output range of applications, often competing with the single-stage process.

Preforms travel from a common hopper to an unscrambler via an incline conveyor and fall between two rotating and inclined rollers so that gravity forces them to slide down the rollers supported by their transfer ring (Fig. 3.2). A rotating flap prevents unscrambled preforms from reaching one (or more)

rail(s) where preforms now hang and glide down toward the pick-up station. Preforms are still right side up and are usually turned upside down via a pick-up device that consists of the appropriate number of grippers driven by four pneumatically-driven cylinders.

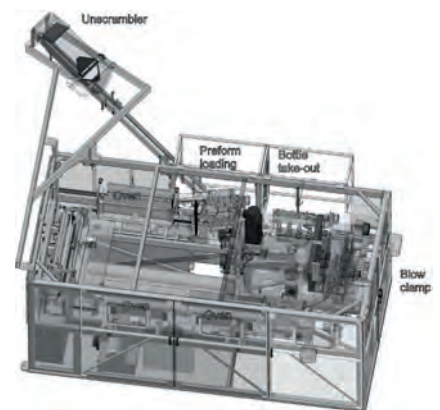


Figure 3.1 Layout of linear, five-cavity machine. Diagram courtesy of Amsler Equipment Inc.



Figure 3.2 Most preforms are blown upside down on this type of blow-moulding machine. Photo courtesy of Chumpower Machinery Corp.

These linear machines index, and grippers deliver, the appropriate number of preforms in one motion to the waiting mandrels (Fig. 3.3). Most mandrels are made of aluminium, with a diameter just below the minimum inside diameter of the preforms.



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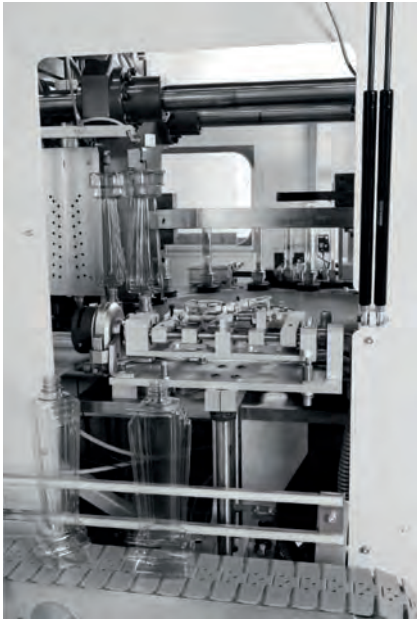


Figure 3.3 One electric servo drives all moulds on this machine. Photo courtesy of W. Amsler Equipment Inc.

Looking at Fig. 3.1, preforms follow the mandrel track counter-clockwise around the machine from the feeding station through the oven section. Equilibration happens in the turnaround section before entering the five-cavity blow clamp. Five mandrels are shuttled at the same time into the blow mould where the preforms are stretched and blown at the same time.

All blow cavities are located side by side. On some machines, both mould halves move with a common cylinder and other machines feature individual cylinders. In most machines, preforms travel upside down and the stretch rods are

engaged from the bottom. After blowing, the three bottles are shuttled to the take-out station where they are turned upright onto a conveyor belt (Fig. 3.4). Stand-up conveyors are common for the range of outputs possible with these machines.



Figure 3.4 Stand-up conveyors are most commonly used at the end of linear machines. Photo courtesy of W. Amsler Equipment Inc.

While these machines also offer a low entry level into the PET market, they do have some serious drawbacks. The most serious one is the way preforms go through the oven system. It is nearly impossible to have all preforms spend exactly the same amount of time inside the ovens as they are being indexed. This becomes more problematic as cavitation increases.

Furthermore, the heat an infrared lamp emits is not even along its length. The centre of the lamp emits usually 10–20% more heat through higher temperatures than the ends. The result of both circumstances is that preforms are not evenly heated up, and temperature differences as high as 8°C (14°F) between preforms in a four-cav-

ity machine are not unusual. This, in turn, leads to differences in bottle wall distribution. Some of these differences can be improved on if each cavity has a separate set of blow valves but not all machines are equipped with this feature. Some machines feature oven tracks where preforms run parallel to each other with lamps in between. These work better but are still not at the level of continuous motion machines that is discussed later in this book. Most machines also space the preforms in the same pitch as the blow cavities. This leads to an uneconomical use of oven power as the lamps heat up a large amount of air. Another downside of these machines is the rotating movement of first the preforms (upside down) and then the bottles (right side up). The mounted devices with three cylinders each (up/down, forward/backward, turn in/turn out) can be a maintenance issue that has plagued many companies.

The simple mandrel design is easy to repair but does not give the same security in holding the preforms concentric, as per the more sophisticated designs of different types of machines. This is because the mandrel outside diameter has to be about 0.02 mm (0.0001") smaller than the lower tolerance dimension of the neck inside diameter; however, many preforms are larger as the tolerance range allowed is about ± 0.008 mm (0.003"). In the worst-case scenario, preform necks are larger (0.17 mm (0.007")) than the mandrels and, as a result, preforms wobble and are heated unevenly on their way through the ovens.

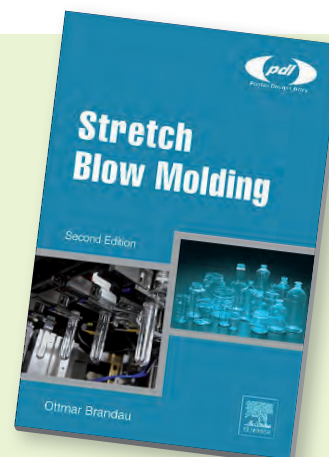
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MARKET survey

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Suppliers of filling equipment and filling inspection systems

This time PETplanet Insider presents in its market survey an overview of filling equipment suppliers together with inspection systems for filling!
Please have a look what is state of the art in filling and inspection:

KHS GmbH, Heuft Systemtechnik, Newamstar Packaging Machinery Co. Ltd., SMI S.p.A., Sacmi, Kronos AG, Fogg Filler, Sidel, Pressco Technology Inc, Sipa S.p.A. and GEA.

Although the publishers have made every effort to ensure that the information in this survey is up to date, no claims are made regarding completeness or accuracy.

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E-Mail		market@newamstar.com	pietro.volpi@smigroup.net	stefan.kraus@kronos.com	slamar@foggfiller.com
1. Machine designation / model number	InnoPET Blofill		Ecobloc Ergon compact systems of blowing, filling & capping	Modulfill	F series
2. Number of filling heads (range: from/to)	50/216	12 - 108	Electronic volumetric fillers: from 9 - 126	16 up to 216	Up to 120
3. Min to max bottle contents (in liters)	0.2/5.0	0.25 - 12.8	0.25 - 10l		50ml - 5l
4. Filling speed:					
output (bph) (min to max):	12,000 - 81,000	1,200 - 80,000	3,600 - 33,600		
specify:					
1l bottle / still water (bph)	81,000	Up to 36,000	3,600 - 33,600	Up to 72,000	Up to 48,000
1l bottle / CSD (bph)	80,000	Up to 20,000	3,600 - 33,600	Up to 65,000, with 8g CO ₂	Up to 48,000
1l bottle / Milk (bph)		Up to 15,000	3,600 - 33,600	Up to 60,000bph	Up to 48,000
1l bottle / Juice (bph)	60,000	Up to 36,000	3,600 - 33,600	Up to 60,000bph	Up to 48,000
5. Filling process					
Pressureless (still drinks)	NV filling system, free-flow, contact free	Yes	Yes	Volumetric filling system; net weight system; height filling system	Yes, gravity
Pressure filling (carbonated drinks)	DRV filling system, short tube volumetric	Yes	Yes	Volumetric filling system; net weight system; height filling system	Yes
Hot filling	NV filling system, free-flow, contact free	Yes	No	Volumetric filling system; net weight system; height filling system	Yes, gravity
Cold aseptic filling	Only Ultra-Clean-filling	Yes	No	PET Asept L/PET Asept D/Contiform AseptBloc	Cold extended shelf-gravity
Juices with high pulp content	NV-HF filling system, free-flow, contact free	Yes	No	Height filling system, pre-dosing system	Yes, gravity
6. Type of filling valve and metering system	Inductive flow meter (IDM), mechanical flow meter for beverages with no conductivity (water)	Water valve, hot filling valve, isobaric valve, electronic valve, Flometer, weigh, liquid level inspection	Electronic volumetric filling valves. Flowmeters (metering system)	Volumetric filling system; net weight system; height filling system	No metering system-gravity filling vales (to a level)
7. Special features (short description/keywords)	Low media consumption (pressed air, energy, CO ₂); complete servo driven for flexible capacity; high degree of availability; saving material regards preform (lightweight bottle); automatic CIP-cups (filler)		Compact modular frame, with a wide choice of customisation options; operating and maintenance costs dramatically cut; easy and quick format changeover, with no need to replace mechanical components; high hygiene and easy maintenance and cleaning; gearing in the upper part of the machine, completely; insulated form the working environment in a dry zone to guarantee long life.	Monotec, cap disinfection, clean room cover, foam cleaning system, nitrogen dropper, automatic CIP- caps, Capcade, bloc solutions	Rinsers, fillers, cappers, cap sorters, sanitisers

MARKET *survey*

08/2017

Filling Equipment

Company name	Sacmi									Sidel
Postal address	Via Selice Pro. Le 17/A 40026 Imola Bo, Italy +39 0542 607 111 www.sacmi.com									Via La Spezia 241/A 43126 Parma, Italy +39 0521 9991 www.sidel.com Mr Stefano Baini Filling Product Manager stefano.baini@sidel.com
Telephone number										
Web site address										
Contact name										
Function										
Direct telephone number	+39 0542 607 111									
Fax	+39 0542 642 354									
E-Mail	sacmi@sacmi.it									
1. Machine designation / model number	ESF	ECF	ELG	ELT	VSF, VSG, VCF	AWS, AWF	ALF, AHF, AHG ASG	EHF	Sidel Matrix SF 300 FM	Sidel Matrix SF 100 FM
2. Number of filling heads (range: from/to)	32 - 160	24 - 117	32 - 160	32 - 140	32 - 160, 24 - 48	12 - 120	12,32, - 80, 24 - 100	32 - 90	32 - 216	24 - 120
3. Min to max bottle contents (in liters)	0.05 - 3.3	0.15 - 0.7	0.13 - 2	0.5 - 3	0.13 - 3, 0.15 - 0.7	0.1 - 3.3	0.13 - 2.0, 15 - 3.3	0.05 - 3.3	0.2 - 3.0	0.2 - 3.0
4. Filling speed: output (bph) (min to max):									4,000 - 81,000 (18°C)	5,000 - 81,000
specify:	Data based on 330ml bottles:									
1l bottle / still water (bph)	15,000 - 66,000		12,000-64,000		10,000 - 66,000	7,000 - 62,000			80,000	70,000
1l bottle / CSD (bph)	8,000 - 50,000	15,000 - 100,000	6,000 - 45,000	5,000 - 34,000	7,000 - 50,000, 36,000				68,000 (18°C)	
1l bottle / Milk (bph)										
1l bottle / Juice (bph)	12,000 - 66,000		9,000 - 64,000		8,000 - 55,000	6,000 - 62,000	6,000 - 36,000, 90,000 - 38,000	10,000 - 30,000		
5. Filling process										
Pressureless (still drinks)	X	X	X			X	X		Yes	Yes
Pressure filling (carbonated drinks)	X	X	X	X	X				Yes	
Hot filling	X	X	X		X		x	X		
Cold aseptic filling										
Juices with high pulp content									Yes	Yes
6. Type of filling valve and metering system	flowmeters	flowmeters	level probes	flow-meters	level tubes	flowmeter + time	load cells, overfill, vacuum	flowmeters	Electropneumatic volumetric filler with flowmeter volume control	Electropneumatic volumetric filler with flowmeter volume control, with no bottle/valve contact
7. Special features (short description/keywords)		Suitable to fill can and glass with easy changeover			Standard mechanical control; electropneumatic control as option	Sacmi Patent: only one flowmeter per machine. Suitable to fill big bottles up to 11l		Remark: all Sacmi data based on 330ml bottles	Fully automatic operating computer control; External beverage tank (no ring bowl); Electropneumatic components integrated on filling valve; Carousels (rinsers, filler) and front base driven by servo-motors; Available in Combi configuration (blow-fill-cap system)	For mineral and demineralised water ie R.O.(Reverse Osmosis) water; Fully automatic operating computer control; External beverage tank (no ring bowl); All parts directly in contact with the beverage in AISI 316; Carousels (rinsers, filler) and front base driven by servo-motors; Available in Combi configuration (blow-fill-cap)

		Sipa						Gea	
		Via Caduti del Lavoro n. 3 31029 Vittorio Veneto (TV), Italy +39 0438 911511 +39 0438 912273 Mr Matteo Tagliaferri Marketing and Communication +39 0521 548111 matteo.tagliaferri@zoppas.com						Via Fedolfi 29, 43038 Sala Baganza (PR) Italy +39 0521 839411 www.gea.com Mr Alessandro Bellò Vice Pres.Head of Blowing, Filling & Pack. +39 0521 839411 +39 0521 833879 alessandro.bello@gea.com	
Sidel Matrix SF 700 FM	Sensofill FMa	ISOFill P	StillFill EVO	Flextronic C	Flextronic SE	Flextronic S	Flextronic W	BigFill	Aseptic Filling / ESL Filling
32 - 108	27 - 100	20 - 160	20 - 120	50 - 180	20 - 180	20 - 180	20 - 96	12 - 24	15 - 140
0.2 - 2.0	0.2 - 2.0	0.125 - 3	0.125 - 3	0.125 - 3	0.125 - 3	0.125 - 3	0.125 - 3	3 - o 20	0.06 - 2.5
6,000 - 60,000	6,000 - 60,000								6,000 - 60,000
		60,000	62,000	60,000	62,000	63,000	36,000	16,000 (3l)	
		51,000 (CMW)		55,000 (CMW)					Up to 54,000
	48,000				62,000	62,000	36,000		Up to 60,000
48,000	48,000	53,000	60,000	59,000	62,000	62,000	36,000		Up to 60,000
Yes		x	x	x	x	x	x	x	Yes
		x		x					Yes
Yes				x	x				Yes
	Yes								Yes
Yes	Yes			x	x				Yes
Electropneumatic volumetric filler with flowmeter volume control	Electronic volumetric filler	isobaric mechanical level filling valve	mechanical gravity filling valve	isobaric volumetric filling valve	gravity volumetric filling valve	gravity volumetric filling valve	electronic weight filler	gravity volumetric filling valve	Electronic / Weight Fillers; aseptic volumetric piston doser for drinks with fibres, pulps and large fruit pieces
Quick changeover procedure; Fully automatic operating computer control; Food safety due to recirculation and CIP (Clean In Place) minimum flowrate control during operation; Carousels (rinsers, filler) and front base driven by servo-motors; All parts directly in contact with the beverage in AISI 316; Flexible platform in terms of beverage category (limpid, with pulp, slurry with particles 10x10x10mm); Available in Combi configuration (blow-fill-cap system)	165 production hours without cleaning/sterilisation; 3 hours downtime for cleaning; High efficiency and filling accuracy; Quick beverage and format changeover; Available in aseptic Combi configuration (blow-fill-cap system) with Dry Preform and Cap Decontamination (Combi Predis FMa Capdis)	AISI 316L SS valve; product deflection without deflector on the filling tube quick; changeover for different neck diameters	AISI 316L SS valve; product deflection without deflector on the filling tube quick; changeover for different neck diameters	AISI 316L SS valve; product deflection without deflector on the filling tube quick; changeover for different neck diameters	AISI 316L SS valve; no contact between the valve and the bottle neck quick; changeover for different neck diameters	AISI 316L SS valve; no contact between the valve and the bottle neck quick; changeover for different neck diameters	AISI 316L SS valve; no contact between the valve and the bottle neck quick; changeover for different neck diameters	AISI 316L SS valve; no contact between the valve and the bottle neck quick; changeover for different neck diameters	3A- PMO - FDA - EHEDG

MARKET *survey*

08/2017

Filling inspection systems

Company name	KHS GmbH	Heuft Systemtechnik GmbH	Sacmi	Fogg Filler	Pressco Technology Inc
Postal address	Juchostraße 20 44143 Dortmund, Germany	Am Wind 1, 56659 Burgbrohl Germany	Via Selice Pro. Le 17/A 40026 Imola Bo, Italy	3455 John F. Donnelly Dr. Holland, MI 49424, USA	29200 Aurora Road, Cleveland, OH USA
Telephone number	+49 231 569 0	+49 2636 56 0	+39 0542 607 111	+1 616 786 3644	+1 440 498 2600
Web site address	www.khs.com	www.heuft.com	www.sacmi.com	www.foggfiller.com	www.Pressco.com
Contact name			Mr Stefano Severi	Ms Susan Lamar	Mr Tom O'Brien
Function			Area Manager	Media Relations Manager	Vice President
Direct telephone number			+39 335 6594236	+1 616 786 3644	+1 440 498 2600
E-Mail			Stefano.Severi@sacmi.it	slamar@foggfiller.com	sales@pressco.com
Fill level control					
Infrared	High frequency: Innocheck Fill Height Control HF	Yes (over- and underfill + quantifying and statistics per filler valve)	No		No
X-ray	Innocheck Fill Height Control X	Yes (over- and underfill + quantifying and statistics per filler valve)	No		No
Camera	Innocheck Fill Height Control MV	Yes (over- and underfill + quantifying and statistics per filler valve)	Yes		Yes
High frequency		Yes (over- and underfill + quantifying and statistics per filler valve)			
Contamination control	Innocheck Sniffer (for Ref-PET)	detection of foreign objects and dirt in filled containers, detection of foreign objects, dirt and residual liquids in empty containers	No	Exended shelf life line options. UV Sanitising, chemical rinsing for bottles & caps. Multiple options with optional HEPA air system.	No
Closure inspection			CVS3000 MACHINE		
Presence of cap	Innocheck closure presence detection	Yes (with camera or sensor technologie)	Yes		Yes
Crooked cap	Innocheck crooked/height fit cap inspection	Yes (with camera or sensor technologie)	Yes		Yes
Lifted cap	Innocheck crooked/height fit cap inspection	Yes (with camera or sensor technologie)	Yes		Yes
Wrong cap	Innocheck closure logo inspection or Innocheck closure color inspection	Yes (with camera or sensor technologie)	Yes		Yes
Tamper evident band control	Innocheck tamper evident seal inspection	Yes (with 360 ° all around view)	Yes		Yes
Camera: 360° / sensor	Innocheck base module for 360° closure inspection	Yes (with up to 9 cameras)	Yes, with specific Sacmi tools		Yes
Label inspection			LVS360 / LVS361 machines		
Torn label	Innocheck flagging label inspection (after labeling machine)	Yes (with 360° camera inspection)	Yes		Yes
Vertical / horizontal misalignment	Innocheck label position inspection (for PET: Rolfed labeling: label height fit inspection inside or after labeling machine)	Yes (with transmitted light or 360 ° camera inspection)	Yes		Yes
Best-before date control	Innocheck code inspection	Yes (presence check with sensor, or verification with camera)	Yes		No
Camera: 360° / sensor	Innocheck label position inspection (inside labeling machine)	Yes (sensors for label presence check or multiple cameras for 360° label verification in several levels)	Yes, capable to inspect round and non-round bottles		Yes
Pressure leak detector	Innocheck leakage detection by squeezer	Yes (active or passive pressure/leakage check)	Yes, application angle inspection through pull up marks		No
Applicable bottle type			Glass, PET, Aluminium, Steel		
Diameter	All standard PET bottle formats of beverage industrie	All usual diameters	190mm	8"	Up to 150mm
Height	All standard PET bottle formats of beverage industrie	All usual heights	340mm	18"	Up to 400mm
Rejecting bottle	Either by Innocheck pusher into bin or by Innocheck GRS guided rejection system onto collecting table	Yes (various rejection systems for different rejection tasks)	With single or multipush device		Push reject & Diverter Reject options available
Inspection speed	Up to 72.000bph / 86.000bph (depends on inspection system and rejection system)	Up to 100 000 containers / h, 2000 mm/s	Up to 60,000bph		Over 3,000ppm
Monitoring	Innocheck MMS Machine Management System for Filler and Seamer is standard. Extension for further rotary machines blocked with the filler, possible.	Yes (self explaining device interface, which gives all needed information about the inspection, additionally counters, messages and statistics can be transferred to data acquisition systems)	Statistical data saved in SQL database, shareable through lan connection; Correlation of defect by tool number, plate number and filling valve number		Filler Valve, Copper Head correlation

Five years of solid growth for Twellium Industrial in Africa



Twellium brings beverages - such as still water, carbonated soft drinks (CSD) and sensitive products which have proven popular among European and American consumers - to the African region. They meet the certification and safety standards of the Food and Drugs Authority in Ghana.

The award-winning company produces a wide variety of drinks, including Verna Natural Mineral Water, Rasta Choco Malt, Dr. Malt and the Easy range of products. Other products such as Rush Energy Drink, American Cola, Planet and Bubble Up are all produced by Twellium as a franchise of Monarch Beverage Company, a global company headquartered in Atlanta, USA.

Over the years Sidel and Twellium have forged a close working relationship based on continual improvement and cooperation. As well as supplying new lines as Twellium has grown, Sidel – with more than 40 years of experience in complete lines for CSD – has also worked on optimising the existing lines and solutions in terms of energy savings and through maintenance support.

A wide product range requires flexibility

As African consumers increasingly enjoy a variety of beverages, Twellium needed to increase pro-

duction capacity while still securing high flexibility. Hassan Kesserwani and Hussein Kesserwani, Chairmen of Twellium Industrial Company, explain: "Flexibility is imperative for the company because of the variety of drinks we produce – from carbonated soft drinks to juice drinks with preservatives and the non-alcoholic malt drinks that are popular in the region. In Ghana, our recent investment in a Sidel Matrix PET complete line has fulfilled these needs by offering faster changeovers and the ability to handle many different bottle formats."

In terms of equipment life cycle, the Sidel Matrix range can be adapted to meet future production needs and its upgradeable platform allows Twellium to take advantage of any technological developments. The Matrix equipment is said to offer high levels of performance with minimal downtime and easy maintenance. This results in a lower total cost of ownership (TCO), which, for a fast-growing company like Twellium, was important.

Cutting energy costs while expanding design options

The Sidel Matrix blower consumes less compressed air and electrical power, resulting in energy savings of up to 45%. The Eco Oven technology – patented by Sidel – can be used to upgrade existing blowers and cut energy costs because it uses fewer lamps for heating the preforms. This reduction in energy consumption was particularly welcome because Ghana has faced considerable rises in energy costs. In addition, Twellium trusted Sidel's PET packaging expertise and decided to adopt the StarLite base design. This base enables bottle weight to be reduced by 20% for 0.5l bottles, while improving stability and protecting against stress damage during production and transport.

"This was an important consideration for Twellium as logistics in the African region can be a challenge. With the StarLite base, the company saves on raw materials and also on energy as the container can be blown using less air pressure," says Dominique Martin, Sidel Africa & Maghreb Sales Director.

The importance of service

Throughout the past five years, Sidel has delivered the service necessary to keep all the lines running optimally: from delivering spare parts promptly in order to avoid expensive downtime to ensuring Twellium could take full advantage of options and upgrades that improve the lines.

Consumers in the African region continue to enjoy greater spending power and the Twellium brands have become firmly established in the market. This puts the company in the best position to achieve greater success.

www.twelliumind.com
www.sidel.com

Bad Dürrheimer relies on empties inspections by BBull

Every correct bottle represents cash in the bank

Not too long ago, the Bad Dürrheimer mineral spring received an innovation prize for its 1l glass bottle “Légère” with an extra-wide opening. The Black Forest spring bottles the majority of its water and sweet beverages in glass bottles. In terms of PET, it uses disposable bottles, which are sealed with film into multipacks, as well as three different PETCycle bottles, which are sold in cases. For these PETCycle containers, the spring has an agreement with the licence issuer in Bad Neuenahr, where the deposit is offset as part of the deal. However, Bad Dürrheimer is a “net declarer”, which means that all missing or incorrect bottles that return with the cases are reported to the main office and must therefore be deducted very precisely. Only the “correct” bottles with the distinctive eight or ten-sided neck ring can be offset; all others must be sorted separately. To do this, the spring relies on the tried and tested universal empties management system Compact LG 500 from specialists BBull Technology in Königsbach-Stein.



Up to ten large sacks of hundreds of incorrect bottles are removed during each shift. The sacks are then checked again precisely in a sorting centre to find disposable or reusable bottles. (Photos: Broesele)

Water from the high plateau

Each year, over 120 million bottles are filled by the mineral spring business from seven mineral water and healing water springs, all situated within a short distance of the German health resort of Bad Dürrhein. 60 per cent is processed by the 150 employees in seven different glass bottles, 40 per cent in three different PETCycle bottles (0.5l, 1.0l and 1.5l), and there is also the 0.75l disposable PET bottle.

Precise empties recognition without x-ray radiation

The PETCycle bottles are blown by the spring itself and then filled at a rate of 22,000bph. The system runs over two shifts in winter and three shifts in summer so all machines on the line must be extremely reliable. “We looked for a system that accurately recognises the empties: cases with bottles missing, or that include glass bottles or other PET bottles. For accounting reasons, we must be

quite sure to recognise the precise number of bottles with the eight or ten-sided neck ring. Furthermore, we do not want to have an x-ray source anywhere in the factory, so this recognition system has to function without radioactive x-ray radiation. And this could only be offered by BBull.” reports E-workshop Manager, Markus Link.

Empties management

Selected was the universal empties management system BBull 500 “Compact LG”. It features a compact, space-saving construction. In a stainless steel housing, there is a measuring bridge, which contains a universal ultrasound line with up to 16 individual sensors. The basic image processing module consists of a colour camera and a telecentric lens; its good resolution prevents any falsification of the objects, so any errors or deviations are recognised accurately. The Bad Dürrhein operation also uses an upper expansion level, into which two cameras and two different lighting techniques are built.

Special lighting and lens for bottle type recognition

The use of the universal ultrasound line removes the need to adjust sensors to different case formats and bottle positions. The activa-



The empties cases are brought at a set distance before the measuring bridge of the "BBull 500 Compact LG", checked and errors are sorted out.

tion of relevant sensor information is controlled by software without the need for operator procedures. This minimises set-up times and almost entirely prevents errors caused by incorrect operation. The basic system with a camera and telecentric lens creates an image of the entire case width for each bottle row. The individually recorded images are compiled by software into an overall picture that includes every detail.

The tasks performed at the Bad Dürrheimer mineral spring required the installation of an additional optic module. This enhancement module includes an additional camera and additional LED UV lighting. The two cameras each record one image per bottle row, the first in daylight and the second using ultraviolet light. The individual images are combined after the case has passed and are examined by the recognition software for the recognisable bottle features. Each case is therefore examined in two independent images. The different lighting methods enable the checking of features such as contours, labels or especially the carrier rings, which may not be visible in the basic facility or can be covered by other features. The wear-resistant high-performance LED lighting modules are sensibly installed above the transporter level and are therefore protected from dirt and damage, thus minimising maintenance requirements.

Recognition software

An outstanding part of the BBull empties management system is the application of universal image processing software "BBull Image". Each individual



Up to 7,000 cases per hour are checked against numerous criteria by a dual lighting module and ultrasound sensors.



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Cases with recognised errors are carefully transferred by the pneumatic “Sinus Sorter” to a parallel conveyor and transported for manual checking.

sensor and camera delivers raw data to this software. The height information from the ultrasound sensors is converted into grey tones so that the image processing software generates a three-dimensional image of the container to be examined. Using scalable evaluation algorithms, an assessment is then made of the contents and the case. Shortcuts and dependencies of different features can be set here so as to guarantee a high degree of recognition, even under variable conditions. The software contains a comprehensive database function, which ensures the saving and recognition of the widest range of different case types.

Recognition of many features

Up to 7,000 cases per hour can be precisely checked. They are fed into the system and are stopped for a brief moment. A second transportation conveyor then draws each case forward individually leaving a small distance between them and guides them under the measuring bridge. High-performance LEDs in different colours, a dual lighting module and ultrasound sensors check the case against numerous criteria as it passes. The system recognises foreign bodies, lying down, broken or upside down bottles, damage or misshaping of the case, missing bottles or one or more “incorrect” bottles (made of glass or without the distinctive eight or ten-sided neck ring) in the case. Another possibility is a clo-



Removed cases with errors are corrected manually and placed back into the production flow.

sure or case label recognition system and the recognition of case format and colour but these criteria play no role for the mineral spring. The entire system is controlled by a central operating and processing unit in a stainless steel housing and a logical 13” touch screen user interface.

Errors sorted and removed manually

All cases with one or more errors are passed carefully by the pneumatic “Sinus-Sorter” onto a parallel transportation conveyor for manual error rectification. Incorrect bottles are removed and collected in large sacks, then the case is placed back into the production flow. “When we’re running with litre bottles and 9x cases, we take out around two large sacks of incorrect bottles every shift. But when we run with 0.5l (20x cases) or 1.5l (6x cases), then there are eight to ten sacks per shift. Every incorrect

or missing bottle means ready cash for us because we offset the total number of bottles against the deposit at the PETCycle main office. So the BBull machine has been scrutinised carefully, by PETCycle too, and has been assessed as very good,” reports Business Economics Manager, Günter Höfler.



Tricky for the cameras and sensors to recognise are the “correct” PETCycle bottles with eight or ten-sided neck rings.

All sacks of removed bottles are then examined again bottle by bottle by a service provider in a separate sorting centre to find disposable or reusable deposit bottles. These are then offset. “On average, the returning empties are 5 to 8 percent incorrect bottles and naturally we want to identify these very accurately. Otherwise we would have to pay for them because each of our bottles has a deposit value of 25 cents,” says Markus Link.

www.bbull.com



Each year, the Bad Dürrheimer mineral spring fills over 40 million PETCycle bottles. Accounting for each individual bottle correctly with the licence issuer represents cash in the bank for the spring.



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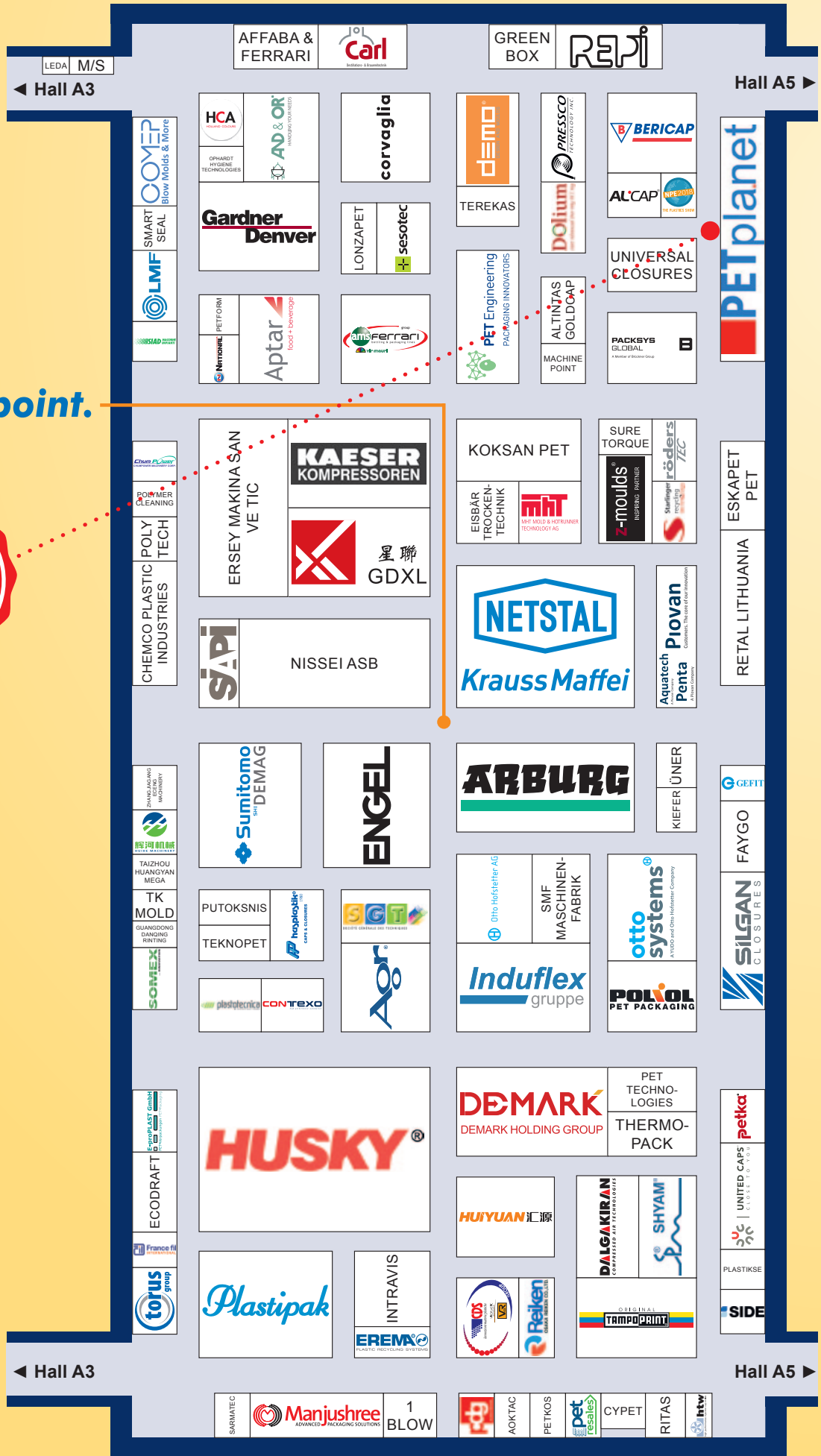


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HALL PLAN hall A4



TRADE SHOW

preview

drinktec Forum

Where? Hall A2, Stand 250

When? September 11-15, 2017

What is happening in the world of process engineering and packaging technology in the beverage and liquid-food industry? What challenges and opportunities are there - now and in the future?

The drinktec Forum focuses on the industry's leading future questions on all five days of the fair. Independent experts from the research sector and actual practice will answer questions and present pioneering ideas and practice-oriented solution approaches to the latest topics pertaining to techniques, production processes and automation technologies.

Technologies that have been developed at universities and research institutes and tested in pilot projects and practical applications are a strong source of momentum for all visitors. The fair gives them quick and easy access to additional information and valuable contacts with researchers included. All Forum presentations are included in the price of admission and will be translated simultaneously into English and German.

Main topics at the drinktec Forum:

Process technology for safe beverages

- **"Future applications of high-pressure technologies in the food- and beverage industry"** Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB, Dr Ana Lucia Vázquez-Cañedo
- **"The microbiological challenges of developing novel beverages"** Campden BRI, Karin Pawlowsky, Great Britain

New raw materials

- **"Chasing novel sweet solutions - a bittersweet job for industry"** B.R.A.I.N AG, Dr Michael Krohn
- **"The next generation of functional carbohydrates"** University of Würzburg, Institute of Organic Chemistry, Prof. Dr Jürgen Seibel

Batch size 1

- **"Industry 4.0 in the beverages industry – pilot project Robofill, flexible filling/bottling in batch size 1"** TU Munich, Chair of Food Packaging Technology, Dr Tobias Voigt
- **"Packaging customization and digital printing : promotion or mainstream?"** Cape Decision, Jean Schürs, Belgium

drinktec Forum Specials:

"5 o'Clock Topic" – great ideas and visions

A special new highlight will be held in the Forum at the end of every day: Visitors can experience visionary, stimulating talks in the "5 o'Clock Topic" on Monday, Tuesday and Wednesday at 5 p.m.

Special: Milk

On the last trade fair day, September 15, all those who deal with the topic of milk should stop by the drinktec Forum. The presentation program of ZDM Association Day of the previous day is on the agenda with numerous topics concerning milk processing and liquid food.

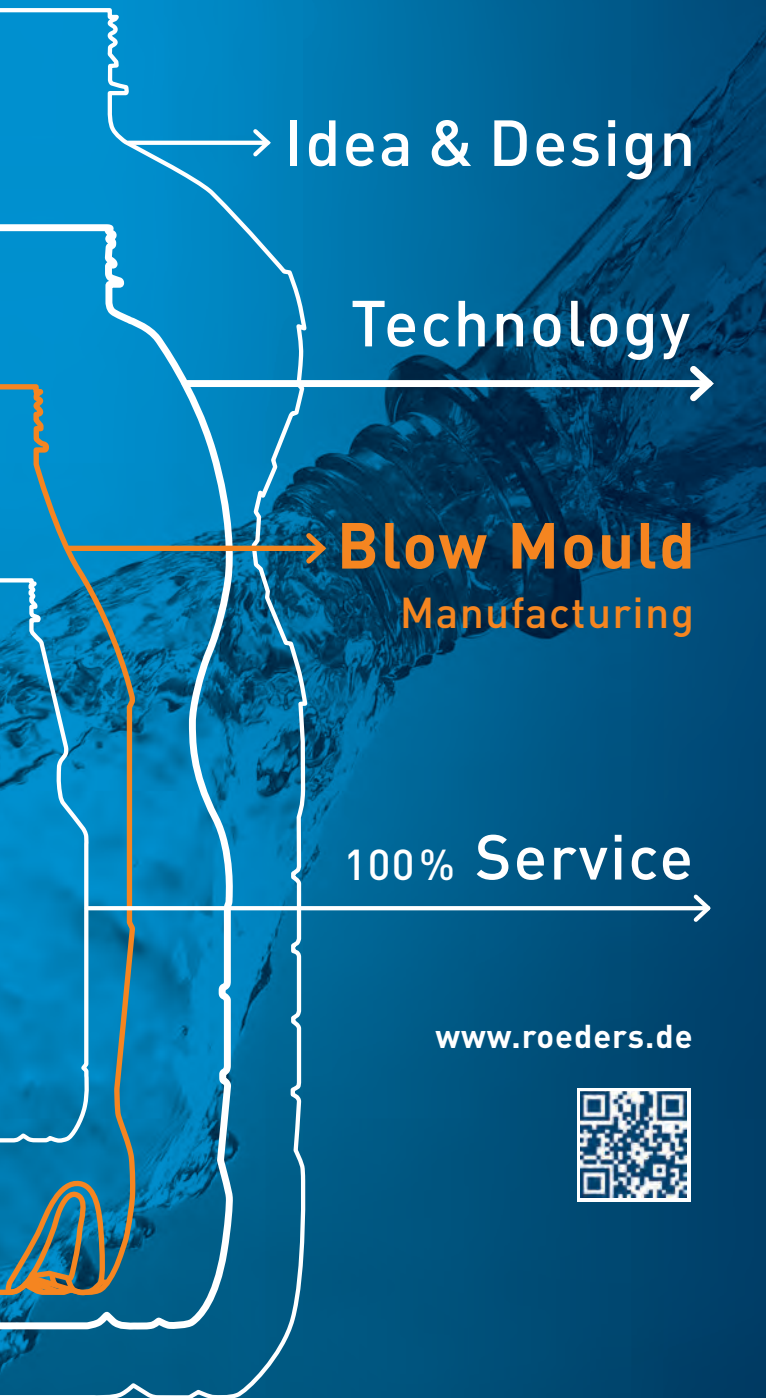


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All-in-one filler for PET, glass and cans



“All-in-One” rinser/ filler/capper block for glass and PET bottles as well as cans

The Slovenian specialist in filling plants, Vipoll, will be presenting a world premiere with its “All-in-One” combined rinser/filler/capper block for glass and PET bottles as well as cans. The “Visitron VKR-E 32-32-4K/4D” is able to process 9,500 330ml cans and 330ml bottles per hour. The system is suitable for carbonated and still drinks such as beer, soft drinks, wine or juice.

The new “All-in-One” carousel-type system for glass/PET/cans features multifunctional elements that process the individual containers without changeover of parts. The rinser is equipped with 32 grippers and the same number of filling valves plus a capper for crown caps and can lids. The rinser is a carousel-type system with universal grippers. This means that the time-consuming changeover from bottles to cans is no longer necessary. All containers, including cans, are subjected to double pre-evacuation. Product infeed and decarburisation are carried out in the tried and tested 2-channel-design. With regard to filling customers can choose between manually or automatically adjustable filling pipes and volumetric filling.

The capping tower with eight servo-driven capping stations comprising four capping heads for crown caps and four capping units for cans is another innovation from Vipoll. Rinsers, transfer systems and the capper are in sync with the filler; cable routing is designed as a closed system. All parameters can be easily set on the display. Depending on the container type every second head of the capper is activated. For the filling of PET bottles an additional capping tower is inserted into the housing. However, the tower could also be used to process two different caps without capping head changeover.

Besides the “All-in-One” filling block, Vipoll will also provide information about high-performance machines, filling systems and solutions for the filling of alcoholic drinks without preservatives in PET bottles. Other key products include de-gassing plants with low oxygen values as well as flash pasteurisation systems for beer and hot-filling, mixers for non-alcoholic drinks and beer blenders.

www.vipoll.si

Solutions for smart beverage facilities

Gebo Cermex, part of the Sidel Group, will showcase a range of material handling solutions, including the latest developments in automation and connectivity to help secure greater performance from bottling lines in evolving and demanding markets.

Among these latest developments on show are:

- AQ Flex - a universal all-in-one conveying solution which delivers good packaging line performance, high output speed and agility.
- EvoFilm - a robust, high speed, flexible modular shrink-wrapping solution.
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- OptiFeed - a new crown and cap feeder which optimises cap/crown availability at the capper in addition to ensuring the quality of the caps and their compliance with the relevant specifications.

www.gebocermex.com

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Hall A6 - Booth 330



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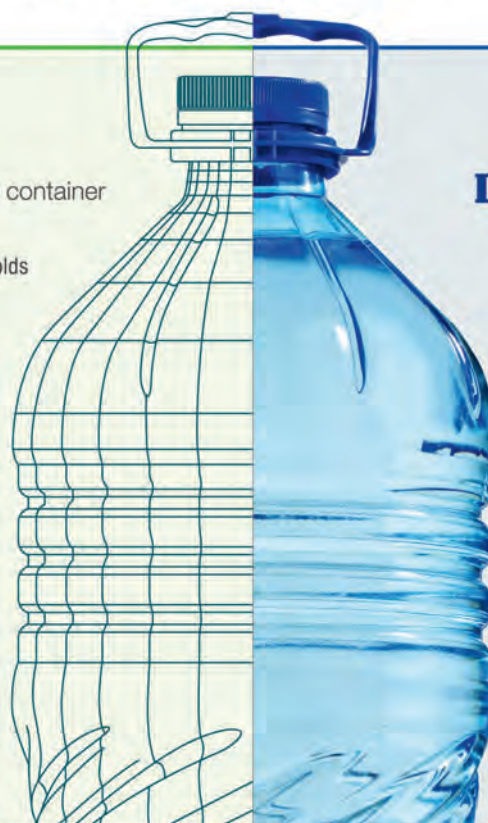
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Hall A4 - Booth 311

The new Sangemini Sport: The "Official Water" for the 2017 Giro d'Italia

Sangemini is not just water, it's real "sports nutrition" and is developed especially for its target audience, by athletes and, generally, by anyone who exercises. That's why this design takes its inspiration from the shape, strength and compactness of the flasks used by cyclists and marathon runners. The open/close cap has a drip-proof valve, the squeeze-grip makes it practical to use when running, and the carbon-look knurled pattern is inspired by the material used to make sports bikes, all of which make the new Sangemini packaging considerably technical and particularly well suited to its role as "Official Water" for the 2017 Giro d'Italia. Sangemini and other packaging project of PET Engineering can be discovered at their booth.



www.petengineering.com

drinktec.com

Hall B6 - Booth 100

Improved line performances

The principal focus of Krones' presence at this year's drinktec is on improving line performance, to ensure higher individualisation and flexibility, and to impart additional sustainability to the production operation. Digitalisation plays a key role in this context, and constitutes a unifying theme for the entire Krones stand. Because marrying iron and steel to clouds and data makes for an even closer intermeshing of all processes along the entire value added chain – and will in the end upgrade performance levels in the production environment as well.

Amongst the exhibits will be a high-speed line for filling bottles with beer as well as a varied spectrum of block concepts for complete lines.

Concepts for individualisation will be exemplified by a pilot line comprising a combination of filler, direct printing machine and intelligent conveyors on which Krones intends to show that even small batch sizes can be efficiently produced while retaining flexibility. This means that in future products can be filled on a just-in-time basis, and the containers individually dressed using a direct printing process – without order-picking and without warehousing.

www.krones.com

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Moretto Moisture Meter: the 4.0 drying revolution

drinktec.com
Hall C1 - Booth 622

Moisture Meter in-line resin moisture analyser is Moretto's latest product for the PET market. The company claims that it is the only device currently available that can assure an accurate, online measurement of residual PET granule moisture. The machine verifies residual granule moisture content in few seconds, which enables polymer quality to be ascertained and confirmed before processing.

Moisture Meter is installed directly on the processing machine and measures the actual moisture content of the plastic granules measures by means of the company's patented "Power Peak" technology. Moretto asserts that it does not require any calibration; the operator simply selects the polymer to be processed from a menu; Moisture Meter then takes and analyses samples every two seconds.

The system is designed for technical applications where precise measurement of residual moisture content is paramount. Moretto says that it is the only device on the market able to provide in-line operation; real-time control; certified resin production quality; and optimised energy consumption

Moisture Meter Plus facilitates control of dryer performance by comparing humidity from the initial part of the process with that at the end and automatically adjusts the dryer parameters to ensure optimal drying.

This concept creates a closed loop, connecting material, dryer, process quality and plastic processing machine. Moisture Meter is equipped with USB, Ethernet and RS485 Modbus communication ports and is compatible with the Moretto Mowis supervising system. All these features move straight ahead towards Industry 4.0.

The system has 40 material profiles, including among the most common technopolymers, such as PET, ABS, PMMA, PA6, PA66, PEEK and many others. Specifications for bespoke or custom materials can also be programmed into it; when new profiles have been created, no further calibration is required. Once the material to be treated has been selected, Moisture Meter ensures that all processed pieces match required quality standards.

Material profiles can be input through the USB port; the Ethernet port is used for remote monitoring and control. The touch panel controller can manage up to six devices.

www.moretto.com/eng



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drinktec

September 11-15, 2017
Messe München, Germany
Hall A3, Booth 313

GEA engineering for
a better world

gea.com

drinktec.com

Hall A6 - Booth 103

Optimise the product's packaging

The machineries that Lanfranchi will expose at Drinktec will be a two cavity blow moulding machine, a low speed and a high speed Orbital Stretch Wrapping Machine.



The range of the linear blow moulding machines offers the possibility to produce standard and customised bottles, from small sizes up to 40l, including special shapes and wide mouth containers at a high production rate. Lanfranchi supports its customers by offering the service for the bottle and preform design through its dedicated department for the container development and industrial sampling. The laboratory is committed to perform the test to qualify the products, including mechanical, physical and chemical characteristics.

The newest machinery AllWrapper on license of Colines, that is truly the star of the show for Lanfranchi. The AllWrapper system, covered by several patents, is the perfect tool to optimise the products' packaging, no matter if they are bottles, cans, pots or bags. It is presented in two options: low speed and high speed. This system is capable of saving more than 50% on packaging material and finally the elimination of the shrink tunnel, which considerably simplifies the process and drastically cuts down on energy consumption.

www.lanfranchigroup.com

drinktec.com

Hall A6 - Booth 330

Complete beverage packaging solutions

Exhibiting as part of the Sidel Group, along with Gebo Cermex, Sidel will be introducing a number of packaging solutions, intended to help producers meet the challenges of ever-changing demands in beverage markets.

Among the global PET-related launches taking place at Drinktec are:

- The Sidel Super Combi - an all-in-one system for water and carbonated soft drinks (CSD) production that delivers ready-to-sell products at high speed, with maximum uptime and ease of operation but low TCO. Integrated equipment intelligence means it continuously self-optimises for the best possible performance and efficiency, making it one smart solution.
- The new modular labeller which has the flexibility to accommodate different labelling technologies applicable to both glass and PET containers, for easy and quick format changeovers and increased productivity.

Another highlight will be the Sidel Group Agility 4.0 framework. This offers customers digitally-aided understanding, enhanced performance and packaging mass customisation opportunities. Additionally, solutions to handle aseptic and hot fill production in PET will be a particular focus on the stand with experts available to discuss these technologies.

Sidel will also be highlighting its Sidel Services portfolio which helps customers to build, maintain and improve the performance of bottling lines throughout the production lifecycle.

www.sidel.com



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textile packaging | consumer bags | recycling technology | viscotec

drinktec.com
Hall A4 - Booth 500

Colour explorers at Drinktec 2017

It's time for Drinktec again, after four years that have passed quickly and positively for Repi, multinational producer of liquid colours and additives for plastics, with a focus on plastic packaging applications. Located at the heart of the PetPoint hall A4, Repi will welcome visitors to present its latest developments in liquid solutions for the packaging industry.

Liquid colours acting as a barrier to extend the product shelf life, speciality additives to protect sauces, juices, dairy products from UV and visible light damage and analysis instruments to help packaging producers put safe and reliable containers on the market. Its high performance barrier line for long life (UHT and ESL) dairy product applications allow monolayer containers to extend products' shelf life by providing the necessary protection from UV and light degradation.

Custom made UV additive ranges, formulated to meet customers' requirements enable them to avoid over specified and expensive solutions, resulting in cost efficient packaging and providing the right protection every time. Repi will also present its Light Meter upgraded version. In the perspective of offering an all-round solution rather than just a product, Repi has been working over the years

next to its customers, building ties with them as partners. In this scenario, not only is the colour and additive formulation important, but also the availability of accurate dosing and analysis instruments to rely on for measuring the real presence and properties of the colour/additive in the final packaging. The bright white booth will function as a meeting point where its "Colour Explorers" team will welcome guests, to discuss new projects and perform live demonstrations of instruments and equipment.

www.repi.com



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Hall A4 - Booth 532

High quality PET blow moulds

Kiefer Werkzeugbau GmbH, headquartered in Schwaigern has been active in the field of tool and mould making for the plastics processing industry for 30 years. Global corporations from the packaging and food industry are also among the customers, as regional SMEs.



Synergy effects of thermoforming are being used and since 2004. As an independent mould maker, Kiefer produces blow moulds for all popular rotary blower machines from Krones, Sidel, KHS-SIG, Sipa and for linear blow-moulding machines from ADS, Arcor, Bekum, Kosme, MAG, Side, SIP, Tetra Pak. Kiefer stands for research and development, innovative design in light-weight, low-pressure base design and fast-changing systems, one-stage process, big container design - up to 30l, as well as prototyping and test runs in the company-specific competition centre. Kiefer is known in the international market of the beverage industry, and can number companies such as Coca-Cola amongst its customers, who appreciate the competent support of Kiefer.

www.kiefer-mold.de

"Technology 4.0" for filling and packaging systems

drinktec.com

Hall B4 - Booth 328

Together with its customers, KHS develops lightweight bottles with characteristics that are intended to be ideal for production, logistics and eye-catching presentation at the point of sale. Combined with the trend towards space-saving blocked systems that facilitate operation, KHS offers systems to meet all requirements. Visitors will have the opportunity to see such a space-saving system at the exhibition booth.

KHS also offers small- and medium-sized bottlers technology and know-how that have proven effective. The systems supplier has integrated established technology of can and keg fillers, for example, into new systems for smaller quantities. KHS will also be presenting a compact solution for labelling that is likewise tailor-made to meet the requirements of the lower capacity segment. Common to all developments is the capability of enabling the machines to grow in size in accordance with increasing quantities with simple upgrades.

In view of increasing digitisation, Technology 4.0 also focuses on the benefit for users. Effective control instruments become IT systems that are decisive for managing the entire system. Users realise more economical and more reliable processes thanks to further automated and precise control of all processes. Systems previously tried-and-tested in practical operation pave the manufacturers' way to the digitised smart factory.

At Drinktec, the KHS Group will also provide insights into disruptive and sustainable systems for filling and packaging in the food and non-food sectors that will soon open up to customers new opportunities within their production and product marketing activities.

www.khs.com

ASB to demonstrate first triple row, one-step ISBM machine

Nissei ASB Machine Co., Ltd. a leading manufacturer of machines for injection stretch blow moulding of PET and other plastics, will demonstrate live moulding on ASB's 215m² booth together with a display of some of the most interesting recent updates in injection stretch-blow moulded packaging technology.

The newly developed ASB-150DPX expands the company's flagship ASB-150 based models to three variants:

- ASB-150DP – single row moulding up to 16 cavities, for very large bottles and jars
- ASB-150DPW – double row moulding of medium sized bottles and jars up to 32 cavities and the
- ASB-150DPX – triple row moulding of small bottles in 36 or 48 cavities.

All models are built on a common architecture so factory layout, key functions, spare parts, maintenance and operator training are common to all, however the newly added DPX model has specific design features to maximise efficiency in small container moulding. The injection clamping stroke is optimised for short cycle small containers. The upgraded hydraulic components provide faster cycle of injection clamping while maintaining smooth machine movement and the servo hydraulic

pumps offer up to 30% reduction in energy consumption. The blow air circuit is optimised for small container production offering up to 50% reduced air consumption over standard systems. Although these features were introduced for the ASB-150DPX, items 2, 3, and 4 are also planned to be available in future updates of its stable-mates ensuring that the entire model range maintains its lead over the competition.

This introduction of triple row one-step injection stretch blow moulding is another in a long line of global firsts that Nissei ASB has achieved throughout nearly 40 years at the forefront of the PET container industry, with several areas of the machine design having patents pending or already approved. At Drinktec, the ASB-150DPX will be conducting daily moulding demonstrations of a 100ml, 5.3g yoghurt drink container. This lightweight container design requires a very short preform that would be impossible to handle and re-heat in a two-step system so the one-step moulding process, where the container is formed directly from resin within one machine and held securely by its neck throughout, is the only practical choice. The smaller the container is, generally the more advantageous it is for production using a large one-step machine with high outputs.

With its triple row moulding layout allowing 36 blow cavities, and at a cycle time of 6.4s the ASB-150DPX will achieve a production rate in excess of 20,000bph. Even if a container design such as this could be moulded by re-heat blow moulding, the required floor area for a similar capacity two-step production unit is typically 3-4 times greater, so this one-step solution provides not only technical superiority and enhanced quality, but manages to achieve it in a significantly reduced production space. With the recent rise in prices of PE/PS materials, demand for PET conversion of this type of small container is increasing with numerous specific inquiries from major food manufacturers so the company is confident of good demand for this new model.

The exhibit will also be demonstrating a full line of matched moulding ancillary equipment that ASB is able to supply, such as resin dryer, chiller, mould dehumidifier and mould temperature controllers. An in-house custom designed pick and place take-out unit with conveyor system will also be demonstrated allowing prospective customers to easily install the moulding machine up-stream of a filling line.

www.nisseiasb.co.jp



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Drinktec – the last lap!

All over the world, the beverage and liquid food industry is preparing for the next edition of the great event, held next month in Germany.

This year's „Go with the flow - South East Asia Roadshow“ has been successfully completed! It was certainly one of the biggest and most extensive tours that PETplanet has undertaken in recent years.

Our editors Kay Barton and Alexander Büchler, along with „Flowy“, the Drinktec mascot, spent more than 6 months travelling throughout South East Asia with various „Editourmobil“ vehicles visiting the PET industry in Thailand, Vietnam, Cambodia, Malaysia, Singapore and Indonesia. All the interviews, together with comprehensive background information on the companies visited in these countries are, as always,

in your PETplanet Insider and we look forward to sharing with you our experiences at Drinktec.

Visit us at our special Editour exhibition stand at the **PETpoint Hall A4, booth 501**, where we will be presenting all the companies visited. Enjoy some Bavarian hospitality in our beer garden and get a photoshoot in front of our “mountain world” photo backdrop!

We look forward to welcoming you!

Your PETplanet Team

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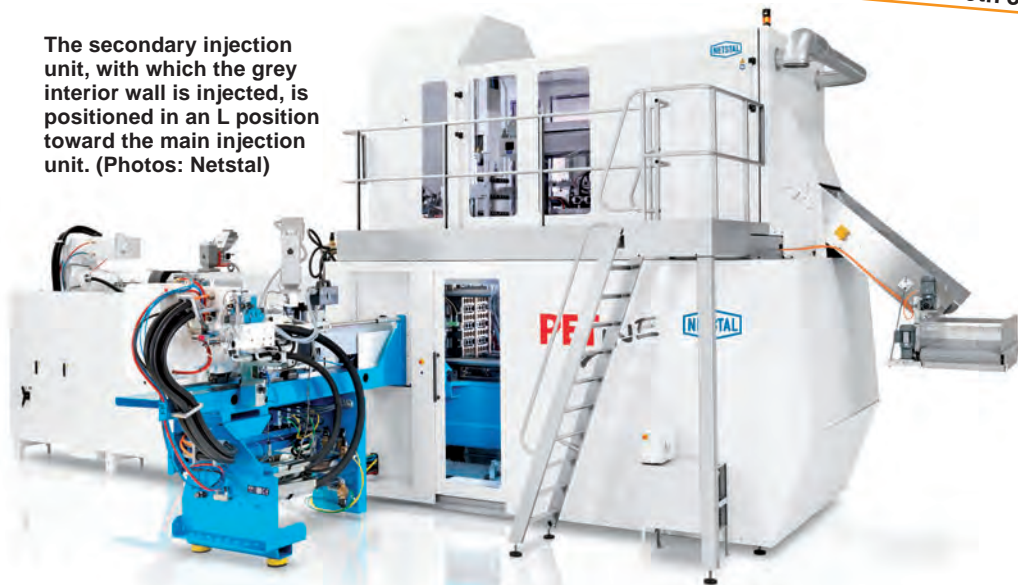


Otto Hofstetter AG



drinktec.com
Hall A4 - Booth 321

The secondary injection unit, with which the grey interior wall is injected, is positioned in an L position toward the main injection unit. (Photos: Netstal)



The milk bottle consists of two PET layers: the attractive white outer skin, and a grey interior wall that is impervious to light to protect the milk.

Perfect PET milk bottles

by Michael Birchler

At this year's Drinktec, Swiss injection moulding machine manufacturer Netstal will be producing double-layer preforms for milk bottles on its booth. With Prelactia, extremely long-lasting milk products and drinks can be safely, cost-effectively and attractively packaged.

The pure PET Prelactia preform is the product of the combined expertise of the Spanish mould manufacturer Molmasa and Swiss machine manufacturer Netstal. The basis for this is a preform with a double layer that reflects the primary functions: an attractive white outer skin to attract the customer's eye, and the grey, interior wall that is impervious to light and protects the tasty content. A Prelactia bottle blocks virtually 100% of the visible light, and is therefore ideal for extremely long-lasting milk products. In addition to UHT milk, these include trendy milkshakes, yogurt drinks and soy-based vegan milk drinks.

Flexible production system for single and double-layer preforms

On its stand at Drinktec, Netstal will use a PET-Line 2400-4000/1000 to produce 17g Prelactia preforms for 0.5l bottles. The additional 1000-series injection unit used for the grey interior wall is positioned in a so-called L position toward the main injection unit. In order to flexibly balance capacity fluctuations during the

manufacturing operation, the machine can also easily be used for standard preforms (water, CSD etc.). For this purpose, the secondary injection unit software is deactivated. The double-layer Prelactia preforms are produced through overmoulding: in the first step, the dark component is injected into the 32+32 cavity mould in order to form the 1mm-thick grey layer. The blanks are then covered in the 1.4mm-thick white outer skin in separate cavities.

Reduced use of expensive additives

Both of these precisely defined layer thicknesses provide an economic advantage when compared to other processes. In order to increase the barrier effect of PET against damaging UV light, the white pigment titanium dioxide has to be applied to the polymer for the preform production. The additive also provides the pure white colour of the milk bottles. For single-layer preforms, the proportion must be 15% of a preform's entire weight. With Prelactia, only the outer layer assumes this function, which is why the proportion of the additive can

be reduced to 5%. In the context of a yearly quantity of 105 million preforms at 17g each, the use of the high-grade titanium dioxide is reduced to around 180t.

The milk bottle as a three-dimensional trademark

In addition to featuring numerous technical functions and improving the bottom line, modern-day packaging should also be used as advertising media and a purchasing incentive. Within the soft drink industry, the leading companies have spent many years striving to attract customers by manufacturing their own increasingly sophisticated PET bottle shapes. This has been less prominent within the milk industry, mainly due to the limited options offered by the established HDPE or cardboard milk packaging. With PET Prelactia preforms, the manufacturers of milk-based lifestyle, convenience and health products are presented with brand new possibilities and bottle designs that ensure they stand out from the competition.

www.netstal.com

Intravis presents “Closed Loop”

The eyes of Industry 4.0

drinktec.com
Hall A4 - Booth 344

Intravis, a vision inspection expert for the plastic packaging industry headquartered in Aachen, Germany will be represented for the first time with their own booth at Drinktec. The vision system supplier is taking the opportunity to present a closed loop link between the vision inspection system and the injection moulding machine.



Industry 4.0 continues to inspire our industry. In plastic packaging manufacturing it stands for the fusion of state-of-the-art IT and current production technologies. The goal is to achieve an even higher cost and time efficiency in production as well as maintaining the highest product quality. Intravis supports the latter through the most recent inspection technology including hardware and software updates.

“Closed loop” implemented for the first time

In cooperation with Husky Injection Molding Systems (Hall A4-338), Netstal-Maschinen AG (Hall A4-321) and Sumitomo (SHI) Demag Plastics Machinery GmbH (Hall A4-123),

Intravis is presenting various solutions for a closed loop link between a vision inspection system and an injection moulding machine. This means that all quality-relevant information of newly produced objects captured by the vision inspection system is first collected in data packets, analysed and summarised into trends. These analyses and trends are subsequently reported directly to the injection moulding machine in data packets using a standard interface, for example based on OPC UA, helping to regulate the manufacturing process. Implementation in the sense of Industry 4.0 means the operator no longer has to intervene as the injection moulding machine regulates itself with the help of the analysis results.

Intravis presents various hardware and software solutions for this “closed loop” at multiple partner booths where closures and preforms will be produced live on site. In addition to the CapWatcher III for the quality control of closures, Intravis will be introducing a world premiere: Intravis will showcase its LayerWatcher combined with the PreWatcher III. This is claimed to allow for the inspection of barrier layers as well as comprehensive 100% quality control of preforms – all in one as an inline solution. The immediate feedback of quality data to the injection moulding machine provides an even greater influence than before on the production process of preforms with barrier layers.

Showcasing the Sample-PreWatcher

After successful co-exhibitions with several partners at past Drinktec participations, Intravis will have this year their own booth as a go-to location for their customers. The company will be presenting its latest generation of the Sample-PreWatcher. The system designed for comprehensive quality control of preforms and established both as an inline and lab system was again upgraded with multiple innovations.

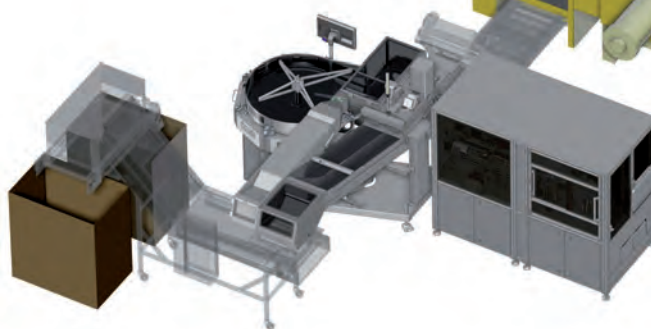
The most significant upgrade is the new lighting concept of the Sample-PreWatcher providing optimum quality control, especially of opaque preforms. The trend towards increased production of PET packaging and the use of different material and colour mixtures is therefore optimally supported.

In addition, the dust suppression is a feature which has resulted in a positive feedback in several applications at customer sites and is now

going into volume production. It allows for differentiation between real defects and damages of preforms and acceptable dust particles. False rejects due to errant dust is now a thing of the past, says Intravis.

For the first time, the latest developments in cavity number reading will be presented to the public using the Sample-PreWatcher. The proprietary OCRX engine manages to read any cavity fonts immediately after installation. Time consuming training of the software for a font type is no longer necessary. The new OCRX engine is based on Intravis's extensive experience of artificial intelligence in cavity number reading.

Intravis also offers a solution paving the way for industry 4.0 at their own booth. The Intravisualizer is an analysis software, being supplied with live measured data of the Sample-PreWatcher. The Intravisualizer converts the measured results of Intravis systems into easy-to-read graphs. It visualises different epochs such as shifts, days or even batches.



As a special highlight, trend statistics allow for prediction of the Estimated Time to Failure (ETF). This allows an early intervention in the manufacturing process preventing rejects.

Expansion of the product spectrum

In addition to the innovations mentioned above in regards to implementation of Industry 4.0 as well as improvements to the Sample-PreWatcher, Intravis is announcing yet more news. Also for the first time, Intravis will demonstrate their expertise in the field of conveyor technology at Drinktec. At the partner booth of

Netstal-Maschinen AG, both a cooling and a transverse conveyor belt for the transportation and cooling of plastic closures are being shown. With the expansion of the product spectrum towards cooling and conveying technology, Intravis is now able to offer their customers more in-house downstream equipment. This is intended to create advantages for the customer linking various post injection moulding process stations as well as for the service.

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Hall A3 - Booth 313

The sterilisation chute is electronically heated on both sides to avoid H₂O₂ (dry Hydrogen Peroxide) condensation and any foil jams that could affect the production efficiency. GEA uses silicon surface heaters to ensure that the temperature remains uniform along the surfaces.

Why foil?

HDPE bottles are demanded in the dairy industry especially for the packaging of ESL (Extended Shelf Life) milk, milk-based products and drinkable yoghurts. HDPE provides a natural barrier to light and oxygen – comparable with that provided by a cardboard carton – that would otherwise seriously affect the shelf life of these sensitive products. HDPE bottles can also be designed to look pretty on retailers' shelves as they can be easily decorated with branding and promotional messages and carry the required nutritional information direct onto the bottle surface.

However, HDPE is a naturally pliable material and so foils are mandatory for sealing as it is impossible to guarantee an airtight, robust seal using a screw cap alone. Screw caps are often fitted as an additional safeguard, especially to the large format bottles. Foils are also used on PET bottles when the cap design cannot ensure a perfect seal with the neck of the bottle or when the brand owner wants to deliver premium product awareness. Consumers recognise that the foil closure provides maximum product safety in a higher value product. This compensates for the slightly more complicated opening of the container.

Aseptic blow fill technology

It was back in 2011 that GEA responded to market demands for reduced footprint, greater flexibility, greater efficiency and better environmental performance with the introduction of the world's first rotary aseptic blow moulding ABF machine. GEA ABF, with integrated blowing, filling and capping functions within a sterile environment, transformed aseptic bottling technology and slashed the total cost of ownership at a stroke.

The principle of ABF is to sterilise the preform, not the formed bottle, with H₂O₂ at the exit from the oven,



Sterilfoil VHP L is an integrated aseptic system for closing PET and HDPE bottles with aluminium foil. (Photos: GEA)

GEA brings flexibility to dairy processors with Sterilfoil aseptic technology

Foil closure for dairies

GEA will be unveiling its Sterilfoil technology for the first time at Drinktec. This new technique for fitting sterile foil caps on PET and HDPE bottles makes GEA able to offer a complete range of aseptic closure options. This provides its customers with flexibility allowing them to choose the bottling and capping system that best suits their needs.

It is essential for today's dairy processing companies to be flexible. A plant must be capable of producing multiple product lines and offer the facilities for its technologists to develop new products and bring them to market quickly and profitably. By bringing its entire range of bottling and capping technologies together, GEA has provided its customers with flexible systems designed for today's market but also capable of being adapted to meet future demands.

Single aseptic line with foil closure

Sterilfoil VHP L is an integrated aseptic system for closing HDPE bottles, containing high or low-acid beverages, with aluminium foil. GEA has introduced it across its entire range of aseptic rotary bottling systems. When used with GEA's ABF (Aseptic Blow

Fill) technology, it is possible to blow the bottle, fill the product and provide the foil closure in a single aseptic line for PET bottles. The system that can cap up to 48,000bph in size ranges from 200ml to 2.5l. Screw overcaps can be fitted during a subsequent operation if required.

Decontamination up to 6 Log

Sterilfoil is a simple linear system mounted on the top of the capping area and integrated within the microbiological isolator of the machine. The system uses VHP (Vaporised Hydrogen Peroxide) to provide effective microbiological decontamination of the aluminium foil up to 6 Log (on *B.atrophaeus*) and beyond. Foils are pushed along a sterilisation chute and then treated on both sides to provide simultaneous internal and external sterilisation by pressurised VHP.



GEA's Aseptic Blow Fill solution, equipped with an H₂O₂ sterilisation system for aluminium foil closure and suitable for high and low acid drinks

then blow the preforms with sterile air in a sterile environment and maintain this sterility throughout the filling and capping process. This process minimises the use of chemicals, requires no bottle rinsing, enables a simpler and smaller layout and reduces energy consumption.

A key design of this system is that all non-cleanable components are located outside the sterile zone: electrical components are above the sterile zone; mechanical components and all components that require lubrication are located below. All surfaces in the sterile zone are accessible and easy to clean.

Efficiency and economy

The whole process is designed for efficiency and economy. For example, sterilising the preform rather than the bottle reduces the quantity of sterilising agent used, as the preform is smaller and an easier shape to sterilise than the bottle itself. The preform is made of thicker material so it is possible to increase the temperature of the treatment without risk of shrinkage that would affect the shape of the bottle.

The system uses almost no chemicals and energy usage is kept to a minimum by the elimination of air conveyors, sterilisation and rinsing turrets, water UHT (ultra-high temperature) sterilisation, and steam. The whole system is more compact than traditional technology and requires fewer operators.

Since 2011, GEA's engineers have continued to refine the design of the ABF. A recent technical upgrade, for example, is the introduction of electrical stretching rods that widen the blowing process window. The introduction of GEA Sterilfoil VHP L as part of the the company's ABF offering extends the flexibility and helps to keep costs under control.

www.gea.com

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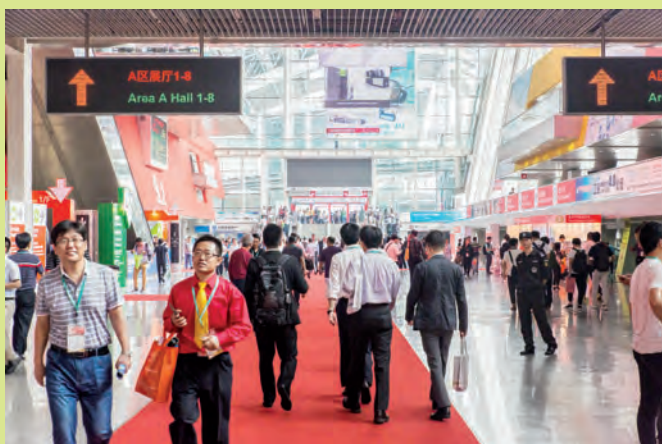
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TRADE SHOW *review*

The PET effect in China



Chinaplas is very much a “home fixture” for PETplanet. Over the past few years, our magazine has increasingly explored the Chinese engineering industry, and this is reflected not least in a multitude of highly interesting contacts and, subsequently, article releases. This is why we were again present on the spot both as visitor and also with our own booth. In addition to meetings with our local regular customers, Chinaplas is always a guaranteed showcase for new developments in the packaging industry with continuous growth for the PET machine and equipment market. And although the trade fair is an annual event, there is never any shortage of real innovations and surprises. Chinaplas is an excellent example of intercultural feasibility. That China’s economy competes against the West is a well-worn cliché, but the approach is always amazing. In mechanical engineering, the days of mere imitation are long since a thing of the past. On the contrary, technically highly skilled engineers, both local and recruited from abroad, are building on the future

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of Chinese products outside China. Thus, for example, completely new cooperation between local machine-builders and European component or equipment manufacturers is emerging. Almost everywhere is the



response of Chinese mould makers to European equipment offering cheaper alternatives and of comparable quality. The market has developed a strong awareness of the use of high-quality components and materials especially in the field of high-cavity injection moulding or in the blow-moulding segment, both in machine-building and in mould making. Summarising the past few years, I can confirm that the Chinese machinery market has reached a level which is technologically competitive with the West, which in the medium term will inevitably give many established companies from America or Europe pause for thought. In particular, conservative business models may well have to brace themselves for a flexible and fresh crosswind (if not a storm) from the Far East. I have put together here for you some impressions of the local and international exhibitors I spoke to during the exhibition.

Regards


Kay Barton

Separation of soiled rPET without caustic solution

PET bottle recycling systems producer Boretech, from Pinghu, near Shanghai, demonstrated its new Purifines system at this year’s Chinaplas event. Boretech has approximately 20 years of experience in the washing of PET flakes and has been manufacturing recycling equipment for over ten years. Division DM Alan Ou says that the Purefines machine is designed to cleanse sand and dirt from soiled rPET components, and to remove and separate labels and their remnants by a combination of centrifugal force and water. The Result is clean rPET.

“During PET recycling, companies experience a waste level of 2%, on average, in the washing process, which is something that they are unable to avoid. This is where our system steps in,” explains Mr Ou. “The purely mechanical separation and elimination of chemical usage puts a variety of environmental factors centre stage during operation.”

The machine, which has a footprint of approximately 12m², features simple one-button operation and can, if necessary, be run around the clock. It can process up to 500kg/hr, uses approximately 11kW of energy and consumes 0.5-1m³ of water per tonne.

www.bo-re-tech.com



Alan Ou (right) meeting up with Kay Barton (PETplanet)

Fully electric SBM PET blowers

At Chinaplas 2017 we met the Spanish machine manufacturer Urola – to be more precise, we met Mr Inaki Unanue, Commercial Director. The Basque company, which is from Legazpi near Bilbao, started its activities in the packaging segment way back in 1975. It is now part of the MCC (Mondragón Corporación Cooperativa), which brings together more than 260 companies from different segments. Urola develops and manufactures SBM PET machines and EBM rotary equipment, as well as SBM and EBM blow moulds. With its Urbi series, the manufacturer offers a range of six different fully electric SBM PET blowers for standard sized bottles in the 0.1 to 2l range at outputs of 3,200 to 12,000bph (2-8 cavities); and for larger containers (up to 10l) at 2,400 to 4,800bph and two and/or four cavities.

“The latest generation of six-cavity ‘Urbi 6’ blowers, which was introduced in 2013 is part of our recently developed eco-machines range,” Mr Unanue tells us. “The range combines a maximum hourly output of 10,000 bottles of up to 2l size with energy efficient attributes.” He explained that this means that the system can operate with up to 20% less air compression or can reuse energy for the optimum use of the servo motors. It is also very compact, with a footprint of around two metres by four metres.

“We are able to claim an energy saving of approximately 15%, compared with similarly sized competitor machines,” Mr Unanue explains. “The system has been configured with ergonomics in mind for everyday production operations. It offers easier access during mainte-



Inaki Unanue (right) with Kay Barton at Urola's Chinaplas booth

nance or when replacing the moulds.”

The company is represented on all continents and has approximately 40 sales and/or service locations.

www.urolasolutions.com

2-shaft granulator

At this year's Chinaplas, granulator manufacturer Avian from Shanghai presented the first 2-shaft granulator for PET bottle recycling, which has an hourly output of more than 6t of material and is about twice as large as a standard control unit.

Talking to President and Group Owner Mark Miao, we discussed the details of the new flagship.



Mark Miao and Kay Barton in front of the “Achilles” (from left)

First, a brief summary of Avian. The company was founded in 1962 in Australia. With the economic opening-up of the Chinese market and the increase in demand for packaging and recycling, the Shanghai manufacturing plant, which specialises in the production of granulators, shredders and pulverisers, opened in 1997. Today, the Group numbers more than 1,000 customers in the recycling sector, and has local representative offices in locations such as America, Europe, Africa and Asia, with around 300 employees worldwide. Mark Miao previously worked for Avian Australia before later taking the helm at the group. According to Mr Miao, Avian is the first overseas granulator manufacturer. “Within our group, design and manufacture are now fully automated,” explains Mr Miao. “We have equipment for the entire recycling process in the portfolio. With the “Achilles” granulator shown here, we are launching a machine that has the same energy consumption as a single-shaft granulator with relatively compact design.” Double-sided, large-area flaps, which can be opened at the push of a button, provide convenient access to the cutting tools for cleaning and maintenance. “The granulator is an alternative to stand-alone solutions with lower productivity,” said Mr Miao.

www.aviangranulator.com



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iPET preform injection system



Jason Xue from Demark (right) and Johann Lange-Brock (Media Consultant PETplanet) in front of iPET model 400/6000

Machinery manufacturer Demark, which is headquartered in Shanghai, presented its 400/6000 Preform Injection System from its iPET series at this year's Chinaplas. Demark maintains that all five injection moulding machines in the series offer the same standards and performance as those of European manufacturers, but with a lower initial investment. It has been co-operating for several years with German mould manufacturer MHT, in order to offer customers a range of options for complete systems (see PETplanet Insider No. 04/17).

All 400/6000 systems have independent electrically driven screws and up to five injection pressure accumulators, along with servo valve technology and 300-500t clamping force. Control systems are managed by an HMI software solution from Demark based on the Beckhoff hardware, also from Germany. The machine presented at Chinaplas demonstrated 6.2kg PET shot weight and 400t clamp, with an MHT 128 cavity preform mould.

"Our presence at Chinaplas is extremely important to us", says Jason Xue. "With the 400/6000 model, we primarily wanted to increase the trust of our customers, even in the high cavitation sector. The MHT tool running on our machine here demonstrates what our collaboration with that company is making possible for us," he continues. "With the iPET series we are primarily appealing to producers who already have experience with western machinery brands or are currently planning investment. We see ourselves as a more affordable alternative with the same preform quality. The system here is surely a good choice for the mass production of water or CSD preforms." The system's energy consumption is below 500kWh/d according to Mr Xue.

www.demark.cn

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PET bottles

Beverage + Liquid Food

Superfood Drink with Chia or Basil seeds

Friya, a young company from Austria, sells drinks with chia and basil seeds. The seeds are believed to have beneficial health effects. The chia drink tastes of lime and ginger, while the basil drink tastes of rose blossom and sour cherries. Both are lactose free, do not contain preservatives and will keep hunger pangs at bay. The 200ml bottles are transparent and stable with an easy-to-hold shape and a tamper-evident screw seal. The consumer can see the seed kernels in the product through a small window in the sleeve label.

www.friya.at



Isotonic drink



Pocari Sweat is already a classic among isotonic drinks in Asian countries. Since as early as 1980, when for many people health awareness was not yet such a feature as it is today, the product was sold in fluid, powder or gel format to support athletes during training or in regeneration after sport. A container size on offer is a 500ml PET bottle with compensation areas, a shrink sleeve label in the upper area and a tamper-evident screw seal. The label is perforated for easy removal before sorting for unmixed recycling.

www.otsuka.co.jp

Volvic Juicy now in pear flavour

Danone Waters Deutschland has expanded its Volvic Juicy range with a new flavour to keep interest in the products at high levels. "Pear" recently came onto the shelves, a refreshing drink with around 9% fruit juice content, which must be shaken before consumption so that fruit pulp is evenly distributed. The manufacturer does not use preservatives, artificial flavours or artificial sweeteners. This variety is sold in a characteristically grooved, transparent bottle with a transparent label and a screw cap with guarantee band.

www.volvic.de



Protein drink from Lidl



Alongside its own-brand presence in the smoothie market, the discounter also features in the market for sports and health drinks. So in its own-brand range "Milbona", the German discounter Lidl has as sports drinks two protein drinks with reduced fat content. The drinks, advertised as "protein bombs", are available in the varieties peach-passion fruit and orange with a hint of vanilla. The 330ml products are enriched with lactoprotein and come in a white bottle with contouring, a sleeve label and a screw seal with guarantee band.

www.lidl.de

Calpis concentrate in PET

1.5l of Calpis concentrate – a lactic acid based drink reminiscent of yoghurt dissolved in water – gives 7.5l of drink when mixed with six litres of still or carbonated water. The milky product comes in opaque bottles with compensation areas, easy-grip shaping and circular stabilisation grooves in the upper area. The sleeve label attracts attention with its vivid colouring and makes it quick and easy to find on the shelf.

www.calpis.net



Soup drink from Crealine

Florette Deutschland GmbH sells products from French foods manufacturer Crealine SAS in Germany, including a vegetable soup to be enjoyed cold, as is familiar in southern countries. The cold vegetable soup "Gazpacho" consists of 83% vegetables – tomatoes, cucumber, red pepper and onions – and is drunk directly from the bottle as a quick and light lunch, possibly with a sandwich. The clear, easy-to-handle bottle contains 240ml and must be stored in the fridge.

www.crealine.fr



Smoothie from Edeka deli

Smoothies with chia seeds have recently come on sale in the markets of Edeka under the label "Edeka deli". The smoothies are manufactured without fruit juice concentrate and contain the rediscovered chia seeds alongside various types of fruit. The slim, slightly contoured bottles each contain 250ml and are decorated with a transparent sleeve label, which enables a direct view of the contents. For market launch and as advertising, a cardboard collar is placed under the bottle neck and this is held beneath the retaining ring by two tabs.

www.edeka.de



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PET bottles

Home + Personal Care

“2 in 1” body spray from bilou

“Bibi” – an independent beauty channel made famous online on YouTube – is further expanding its range of self-developed products sold under the brand name “bilou”. Its latest addition is a “2 in 1” body spray, which can be used both as a deodorant and as a body spray. According to the manufacturer, the vegan and alcohol-free product “Fizzy Berry” smells like different berries and has a hint of lemon. The 150ml product comes in a slender white bottle with a screwed on pump spritzer with a pink protective cap. A self-adhesive label around the bottle gives information about the product and its application.

www.bilou.de



Sugar spray for the hair

To make hair shiny and tousled and/or to look like you’ve had a day by the sea, Balea – an own-brand from the German discount chemist dm – is selling a sugar spray that gives hair that “undone” look. The 150ml product comes in a balloon-shaped, sleeved and transparent bottle with a screwed on pump spritzer in soft pink with a protective cap.

www.dm.de



Golden Shine Body Spray

The discount chemist dm is continually extending its Balea own-brand range with fashionable body care products. Some of these are available only for a short time so as to arouse the interest of young consumers. An example of this is a body spray with gold shimmer. The “Body Spray Golden Shine” product is sprayed on from around 15cm away from the skin using the screwed on gold-shimmering pump dispenser. It leaves a shimmering effect on the skin as well as a fresh scent. To make the shimmer of the spray visible at first glance, the 200ml product comes in a transparent bottle with a self-adhesive label. At PoS, the pump dispenser is protected from damage by a transparent cap.

www.dm.de/balea



Shower Gel with white lotus & green tea

In many countries, reducing bottle weights for ecological reasons has gone so far as to make bottles hard to grip because they collapse, causing product to escape unexpectedly. However, there are some companies or brands that do not do this. In Canada, a 350ml bottle of shower gel with white lotus & green tea from the "Bath Retreat Spa" is on the market; it is so sturdy that it can only be minimally compressed. The opaque bottle is pressed directly and is closed with a screwed on hinged cap with wood effect and a dosage opening.



Fruity freshness from Lidl

In a promotional campaign, the German discounter Lidl is selling under its own brand "doussy" three differently scented fabric conditioners in unusually coloured PET bottles, each holding 2l of product. Yellow, pink and green attract the immediate attention of customers. The bottles are furnished at the front with curved surfaces and stabilising indentations and embossing. For secure gripping and pouring of the fabric conditioner, there are two sturdy and attractive-looking grip dimples on the side area. A screw cap with dosage indicator and two green self-adhesive labels enhance the visual attractiveness of the packaging.



www.lidl.de

Shower cream with coconut

Colgate-Palmolive has brought its fifth body butter shower cream, this time with coconut extract, onto the market in the Palmolive Gourmet range. According to the manufacturer, the rich formula cares for the skin and leaves a "luxurious" aroma. It is supplied in the contoured 250ml bottle typical for the brand and the hinged cap seal and corresponding sleeve label are adapted to suit the product in one or at most two colours.

www.colgate.de



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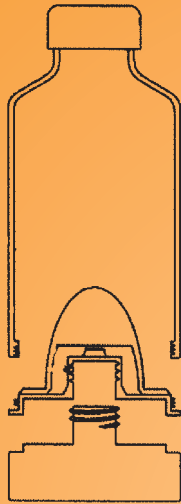
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PET patents

Mixed container

Internal Patent No. WO2016 / 201054 A1
 Applicant: Replenish Bottling LLC.,
 Los Angeles (US)
 Application date: 9.6.2016

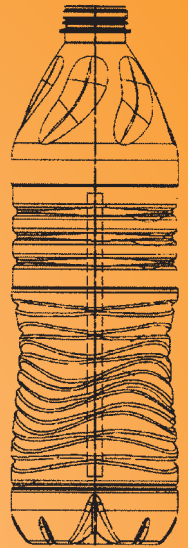
Multi-part bottle for screwing a concentrate container into the base. By pressing on this into the upper part, a concentrate shell is filled within the container. The container is then filled in the upright position with water and the product is ready to drink. The concentrate container holds sufficient product for three refills.



Light plastic bottle

US - Patent No. US 2014 / 0183202 A1
 Applicant: Niagara Bottling LLC.,
 Ontario (CA)
 Application date: 26.12.2013

Different features and configurations are described to make a PET bottle lighter, while maintaining or improving stability.



Plastic bottle

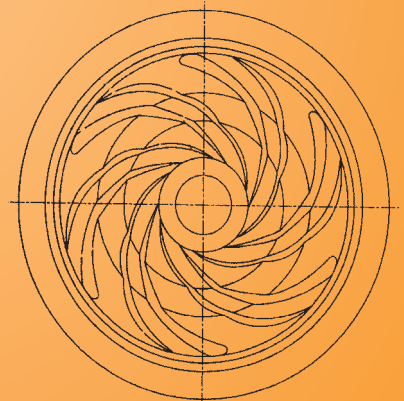
Europ. Patent No. EP 3088317 A1
 Applicant: Suntory Holdings Ltd.,
 Osaka (JP)
 Application date: 24.12.2014

A light and/or reduced-weight bottle is equipped in the "mid" section with circulating grooves to prevent "collapse" when gripped by the consumer. A bottle shaped like this has a high degree of stability when several bottles are stacked on top of one another.

Plastic container

Europ. Patent issue No. EP 2781461 B1
 Applicant: Toyo Seikan Group Holdings Ltd., Tokyo (JP)
 Application date: 4.9.2012

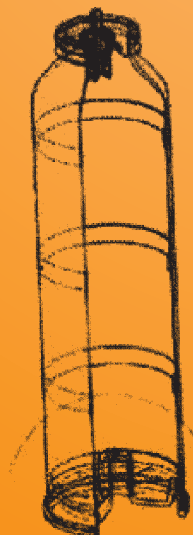
Elastically deformable areas are necessary to be able to offset pressure differences arising in a container. The awarding of a European patent describes a special base structure that performs this task appropriately.



Plastic aerosol container

Europ. Patent No. EP 3095731 A1
 Applicant: Resilux N.V., Wetteren (BE)
 Application date: 5.12.2012

The application describes the composition of a pressurised plastic canister, which is designed as an aerosol can and consists of an outer and inner container.



Elastic base

Internal Patent No.
 WO 2016 / 207213 A1
 Applicant: Sidel Participations,
 Octeville-sur-Mer (FR)
 Application date: 22.6.2016

The base of a plastic bottle must be elastic in structure so as to be able to absorb pressure differences arising from hot filling and cooling, without the external shape of the bottle being visibly changed.



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2.1.1 Injection moulding machines

2.2 Bottle production (machines and equipment)



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Tel. 0081-267-23-1565
Fax 0081-267-23-1564
sales@nisseiasb.co.jp
www.nisseiasb.co.jp



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Meiendorfer Str. 203
22145 Hamburg
Deutschland
T +49 40 67907-0
F +49 40 67907-270
E-Mail: info@khs.com
www.khscorpoplast.com



MAHATANEE INDUSTRIAL CO., LTD
Stretch Blow Molding Machines
PET Blow mold, Thailand
Tel: +(66)34135-628
Fax: +(66)34135-629
sales@great-pet.com
www.great-pet.com



SACMI IMOLA
www.sacmi.com



Eugen Seitz AG
Spitalstrasse 204
8623 Wetzikon, Switzerland
phone: +41 44 931 80 80
fax: +41 44 931 80 90
ffini@seitz.ch
www.seitz.ch



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Fax +390438912273
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I-24015 S. Giovanni Bianco (BG)
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Fax +39 0345-40209
info@smigroup.it
www.smigroup.it

2.2.1 Single stage stretch blow moulding equipment



R&D / Leverage
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Sutton-in-Ashfield
Nottinghamshire, NG17 5LD
England
Tel: +44 1623 556287
Fax: +44 1623 552240
www.rdleverage.com

1009 SE Browning Avenue
Lee's Summit, Missouri
MO. 64081, USA
Tel: +1 816 525 0353
Fax: +1 816 524 5068
www.rdleverage.com

2.2.2 Two stage stretch blow moulding equipment



F-95650 Boissy l'Aillerie, France
Tel : +33 (0) 9800 820 70
sales@1blow.com
www.1blow.com



No. 688-1, Zhong-shan road,
Sec. 3, Wuri, Taichung,
414, Taiwan
Tel: 886-4-23388289
Fax: 886-4-23380219
servers@chumpower.com
www.chumpower.com



Flex Blow - Terekas Sweden AB
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www.flexblow.com



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www.petkamold.com
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South America: (55) 11 3611 2400
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Asia: (60) 3 8605 3690
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www.serac-group.com



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contact@shyamplastic.com
info@shyamplastic.in
www.shyamplastic.com
www.shyamplastic.in



PET Blow Moulding Machines
Tel: +34 93 846 3051
www.sidemachines.com

2.2.3 Coating systems

2.2.4 Compressors



AF COMPRESSORS
www.afcompressors.com



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www.abc-compressors.com

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www.siadmi.com

**2.2.5 Heating boxes for blow
moulding machines**

**2.2.6 Conveyors
(air and mechanical)**



2.2.8 Unscramblers



www.lanfranchigroup.com



Unscramblers, Silos and Air
Conveyors for empty plastic bottles
Tel. +34 93 729 76 16
sales@posimat.com
www.posimat.com

**2.3 Cap production
(machines and equipment)**



www.bmb-spa.com



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Fax 0039-0542-642-354
valentina_gollini@sacmi.it
www.sacmi.com

**2.4 Crate production
(machines and equipment)**

**2.5 Ancillary equipment
for the production of
preforms, caps and crates**



Werner Koch
Maschinentechnik GmbH
Industriestraße 3
75228 Ispringen / Pforzheim
Tel.: +49 72 31/80 09 0
Fax: +49 72 31/80 09 60
E-Mail: info@koch-technik.de
www.koch-technik.com



Moretto S.p.A.
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2.5.3 Dryers

**3.0 SUPPLIERS FOR
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**Single stage ISBM tooling,
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sales@dnolab.com
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China +86-137-646-05384
phu@wtbvc.com
Argentina +54-11-4753-1111
simkosa@simko.com.ar

Buyer's guide

3.1 Preform moulds



PET Preform & Cap Molds
Acme Die Systems Pvt. Ltd
C-207, Mayapuri Phase II,
New Delhi-110064, INDIA
Tel: +91-98104 18975
+91-98110 39129
+91-11-47718888
sales@acmedisys.com
www.acmedisys.com



星聯
GDXL

**PET Preform, Blow
and Closure Molds**

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www.gdxi.com



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PET moulds & change parts
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+91 93288 85884
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Web: www.leopp.in



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Fax +41 55 285 22 44
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www.otto-hofstetter.com



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Taiwan
chad@passcard.com.tw
www.passcard.com.tw



www.petkamold.com
info@petkamold.com

3.2 Stretch blow moulds



**Awanti Polymoulds
Pvt. Ltd.**
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Telefax: - 91 20 24392805
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www.awantipolymoulds.com



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Fax: +39 0438 409046
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www.designandmoulds.com



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joern.herget@kiefer-mold.de



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info@petkamold.com



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MO. 64081, USA
Tel: +1 816 525 0353
Fax: +1 816 524 5068
www.rdleverage.com



29614 Soltau, Germany
mold@roeders.de
www.roeders.de



3.3 Cap moulds



THINK • SHAPE • MAKE • APPLY • CAPS
www.corvaglia.ch



Americas (905) 951-5000
EMEA (352) 52 11 51
Asia (86) 21 2033 1000
sales@husky.ca
www.husky.com



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www.z-moulds.com

3.6 PET mould cleaning



Americas: +1 513 831 3211
EMEA: +32 13 53 95 47
Asia: +81 3 6869 2665
info.eu@coldjet.com
www.coldjet.com/pet

4.0 FILLING/BOTTLING



Blow moulding, filling, packaging
Via Fedolfi, 29
43038 Sala Baganza (Parma) - Italy
Phone +39 0521 839411
sales.procomac.it@gea.com
www.gea.com



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sipa@zoppas.com
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4.3.4 Aseptic filling lines

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Turnkey Solution Supplier
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www.newamstar.com



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South America: (55) 11 3611 2400
Europe: (33) 0243 60 28 28
Asia: (60) 3 8605 3690
serac@serac.fr
www.serac-group.com

4.4.1 Labelling machinery



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GERNEP GmbH
Benzstraße 6
D-93092 Barbing
Tel: +49 9401/9213-0
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Email: info@gernep.de
www.gernep.de



P.E. LABELLERS S.p.A.
Via Europa 25
46047 Porto Mantovano (MN), Italy
Tel.: +39 0376 389311
pelabellers@pelabellers.it
www.pelabellers.it

4.5 Downstream equipment



Tel: +34 954779200
andyor@andyor.com
www.andyor.com

4.6 Liquid Nitrogen Dosing



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Fax: +1-781-932-9428
Email: sales@vacuumbarrier.com
Web: www.vacuumbarrier.com

5.0 RECYCLING



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Polymetrix AG
a former Bühler Group Company
Sandackerstr. 24
9245 Oberbüren, Switzerland
Direct +41 71 552 10 00
www.polymetrix.com

**PET-Recycling Plants
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Complete Solutions**

5.8 Complete recycling plants



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Shredders, Complete PET
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Fax: 06226 - 932 - 495
herbold@herbold.com
www.herbold.com



“PET washing and recycling
plants, turnkey and modules for
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SOREMA division of PREVIERO N.srl
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22040 Anzano del Parco (Co) -Italy
Tel:+39 031 63491250
sales@sorema.it · www.sorema.it



PET recycling equipment
www.recycling.starlinger.com



stf Maschinen- & Anlagenbau GmbH

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plastic recycling and washing plants (PET,
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Mail: sales@stf-group.de
Web: www.stf-group.de



Complete washing lines for PET
recycling, for fibre, sheet, B-t-B
applications
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45030 Ceneselli (RO) - Italy
Tel: +39 0425 849090
info@tecnofer.biz
www.tecnofer.biz

6.0 OTHER

6.1 Laboratory equipment



CanNeed Instrument (Zhaoqing) Ltd
Tel: +86 758 2788469
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6.1.2 O₂ barrier measurement

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6.1.4 Bottle, Preform and Cap inspection equipment

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www.agrintl.com

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6.2 Design and Prototyping

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