04/2017

VERLAG
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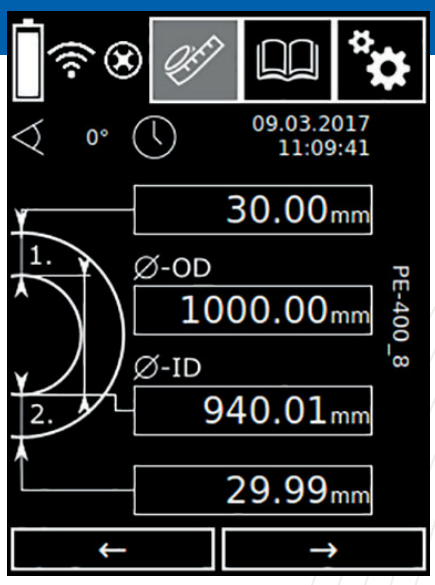
EXTRUSION INTERNATIONAL DIGITAL

WARP portable

First THz-based hand-held device for wall thickness and diameter measurement of plastic pipes.



page 22
WARP portable: Innovative hand-held device

STEIN BLUE-LINE
for a sustainable future

EXPERTS IN DOWNSTREAM

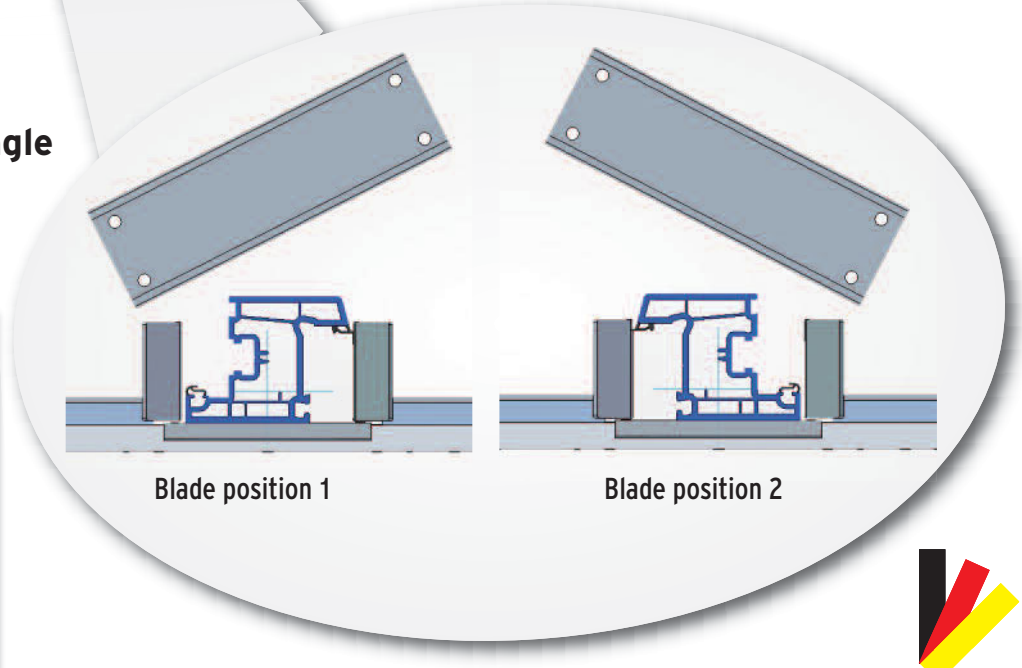
The NEW generation of cutters for profiles

- **Mirrored** changing of the **cutter angle** during **running production**
- For optimised cutting of the respective profile
- Changing within 10 to 15 seconds, between two cuts
- Without loosening screws, by hand, with pneumatic clamping device using two retaining cylinders
- **Sensational price thanks to increasing demand and manufacturing in large quantities**

The cutter was manufactured for the first time in 1998 and in constant use throughout the world. They offer the absolute best cutting quality for glass strips, small profiles, main profiles and technical profiles.

Additional devices such as automatic film wrapping, measurement wheels for precise length determination or lettering with inkjet or laser printers can be attached.

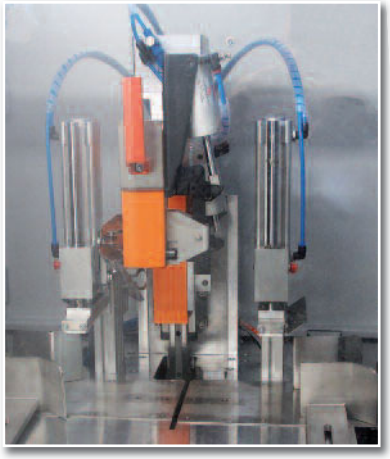
PTW-200
changeable cutting angle



Blade position 1

Blade position 2

Cutting Unit

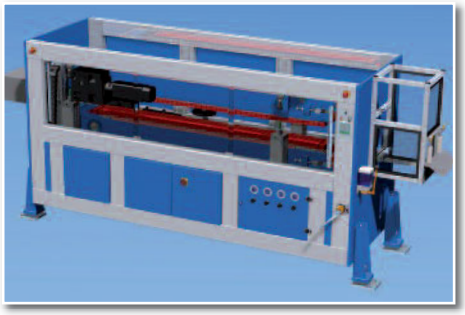


Made in Germany

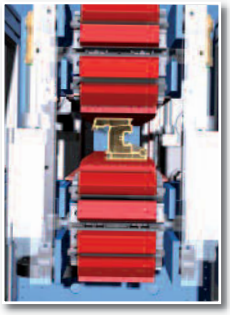
EQUIPMENT FOR EXTRUSION

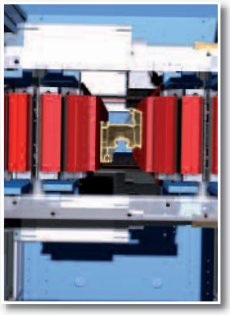
FOR PROFILE EXTRUSION LINES

Calibration table KTS 01, rear



Caterpillar Haul off

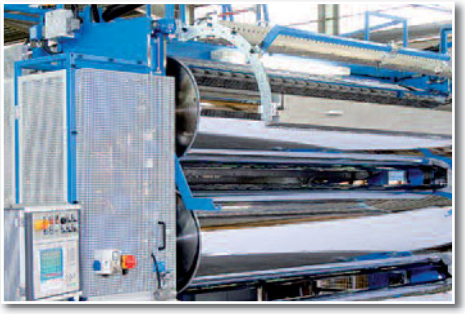




Haul off rotating 90°

PRO 63 automatic stacker

FOR SHEET EXTRUSION LINES



Calender

Roller withdrawal AZ 8, outlet side

Slitting RB 2 with four sawing stations

Transverse separating cutter QSS, inlet

„STEIN BLUE-LINE – for a sustainable future"
stands for sustainable and energy-efficient equipment.

Almost 100% domestic production and the high degree of manufacturing penetration guarantee compliance with even the most stringent of demands.

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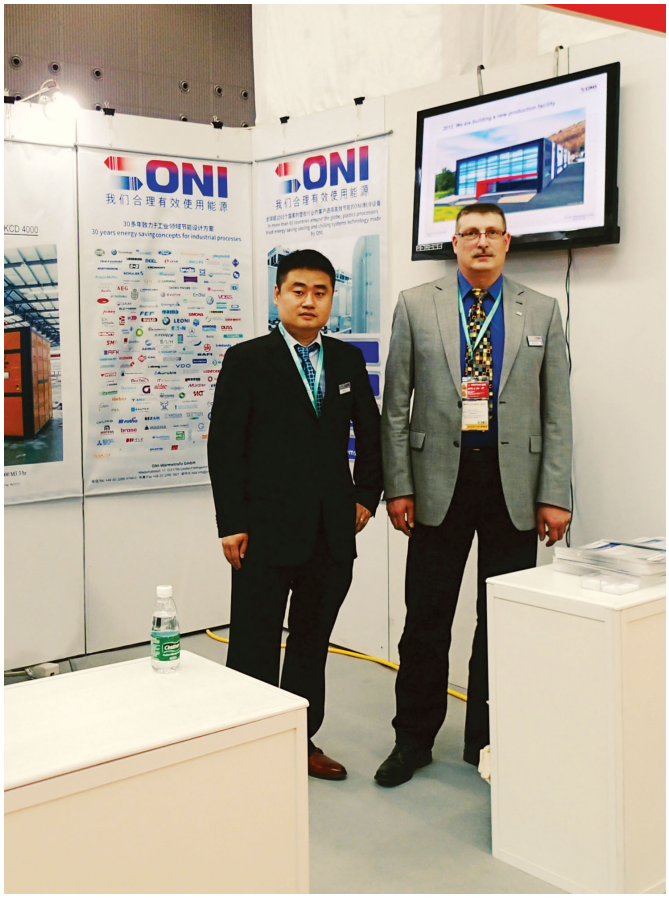

Traditionally what makes ChinaPlas unique is that it is the most notable event both for domestic trade in China and for international trade in polymer equipment and raw materials.

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Based on 30 years of experience and a variety of revolutionary ideas, iNOEX has for 30 years developed systems and solutions which are precisely tuned to the specific demands arising in the pipe, profile, cable, sheet and film extrusion industry.

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The production of plastic profiles and film is carried out with highly developed dies in which the geometries are coordinated precisely to the flow properties of the plastics. This coordination often requires long iteration loops in simulation and experiment.

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About 60 visitors to the Recycling & Compounding Tec-Day organized by KraussMaffei Berstorff and EREMA received insider information about state-of-the-art technologies, innovative machinery and unparalleled services around plastics recycling.

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Calibration in measurement technology means characterizing the measurement behaviour of a measuring unit by comparing the indications provided by the unit with a known "measurement standard" (a physical object) used in the calibration procedure. .

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Index of **Advertisers,** companies and *fairs* referred in this issue

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13th China International Recycled Polyester Conference & Exhibition
06. – 08. 09. 2017, Shanghai, China
www.ccfei.net/MeetingAttend/Repsf2017/RepsfMeeting.aspx

T-PLAS 2017
International Trade Fair for the Plastics and Rubber Industries
20. - 23.09.2017 Bangkok, Thailand
www.tplas.com

POWTECH 2017
Trade Fair for Processing, Analysis, and Handling of Powder and Bulk Solids
26. - 28.09.2017 Nuremberg, Germany
www.powtech.de/en

China PEC'2017
The 17th China Plastics Exhibition & Conference
12.-15-10. 2017 Taizhou International Convention & Exhibition Center Luqiao(Huangyan), Taizhou City, Zhejiang Province, China
http://china-pec.com/

Interplas 2017
The british plastics show
26. - 28.10.2017 Birmingham, UK
www.interplasuk.com

Equiplast 2017
The International Plastics and Rubber Event
01. - 05.10, Barcelona, Spain
www.messe-barcelona.de

FAKUMA 2017
International trade fair for plastics processing
17. - 21. 10, Friedrichshafen, Germany
www.fakuma-messe.de/en/fakuma/

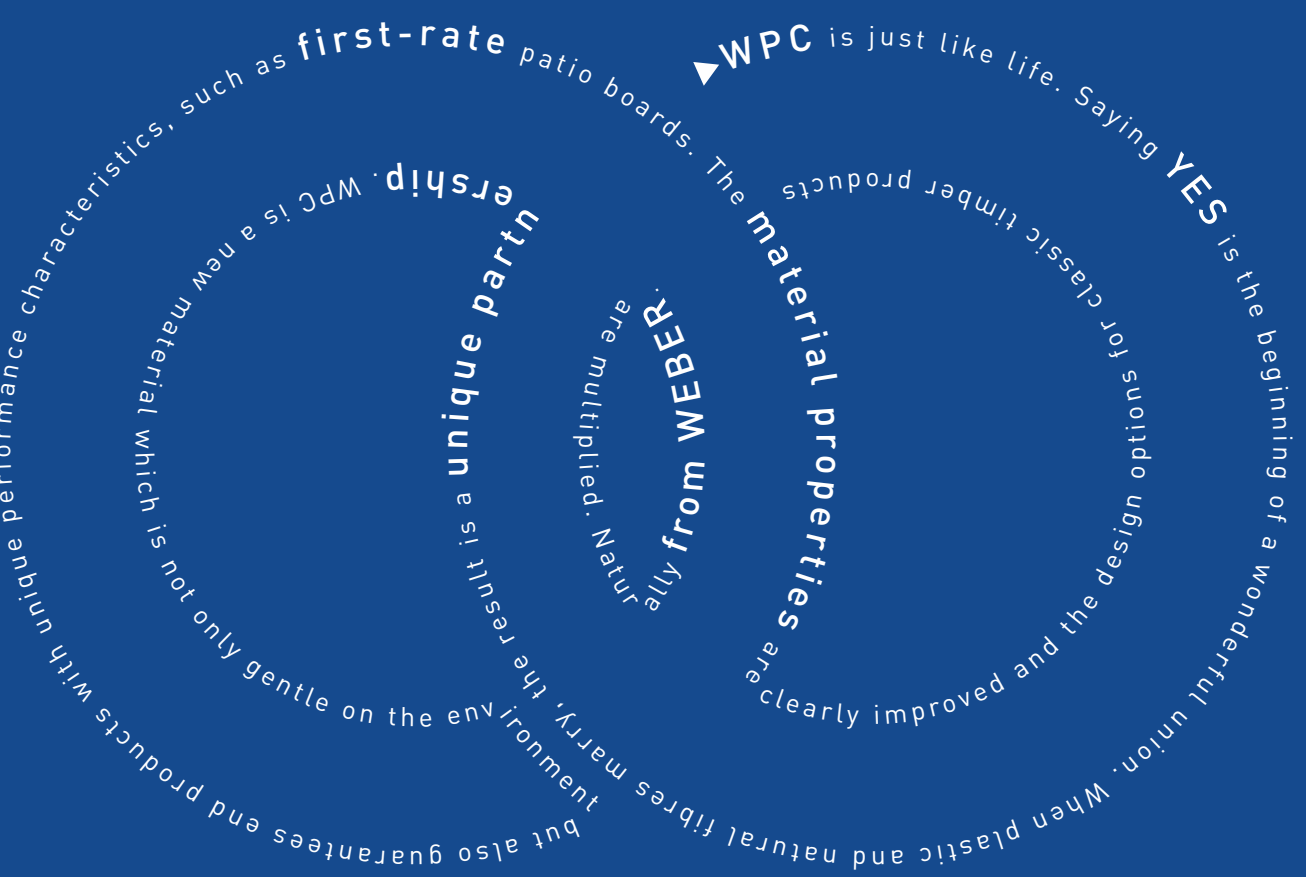
COMPLAST – SOUTH AFRICA
Complete Plastics Exhibition
16. – 18.11, Johannesburg, Republic of South Africa
www.complastexpo.in/southafrica/

New building at the headquarters in North America

■ Pfeiffer Vacuum, one of the worlds leading providers of high-tech vacuum solutions for the semiconductor, industrial, coating, analytical and R&D markets, is breaking ground in Nashua, NH, USA, on a new, two story 27,000 square foot building. This modern construction will house the North American headquarters for administration, sales, product management, marketing and customer care. In parallel, the existing 24,000 square foot building will be converted to a Service Center of Excellence, bringing together under one roof all service activities of the entire Pfeiffer Vacuum product portfolio. State-of-the-art automated cleaning and test equipment will be utilized to produce the highest quality repairs in a timely manner. These investments are further evidence of our ongoing commitment to support our valued customers throughout North America, while at the same time providing a modern, best in class work environment for our staff for many years to come, said Dr. Matthias Wiemer, Management Board Member at Pfeiffer Vacuum Technology AG.
Pfeiffer Vacuum was founded in 1890 in Asslar, Germany. It has about 2,400 employees worldwide and more than 20 subsidiaries. Its service program extends from vacuum pumps and chambers through measurement and analysis equipment, right up to leak testing and leak detectors and complete vacuum systems, as well as service and technical support.

Breaking ground for new state-of-the-art building at the headquarters of Pfeiffer Vacuum subsidiary in North America

www.pfeiffer-vacuum.de



hansweber.de

WEBER

DS 9

WPC – extrusion
that connects

Not all countries or continents are alike. For this reason, WEBER have continually optimised WPC extrusion during recent years. This means that customers can combine classic plastic materials with natural fibres which are from their region and therefore cheaper.
Whether wood, sisal, hemp, coconut fibre or rice hulls – the result is always perfect.

Scan code and
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extrudertechnologie.de/en/
WPC

Advantages

// Low shear rates and moderate melt temperatures
// Particularly suitable for sensitive materials such as WPC
// High torque
// Self-cleaning function, therefore close distribution of dwell
// Processing of different material types (loose fibres, compounds, pellets, etc.)
// High constant output across the entire speed range
// Outgassing
// Optimised wear protection

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info@hansweber.de · www.hansweber.de

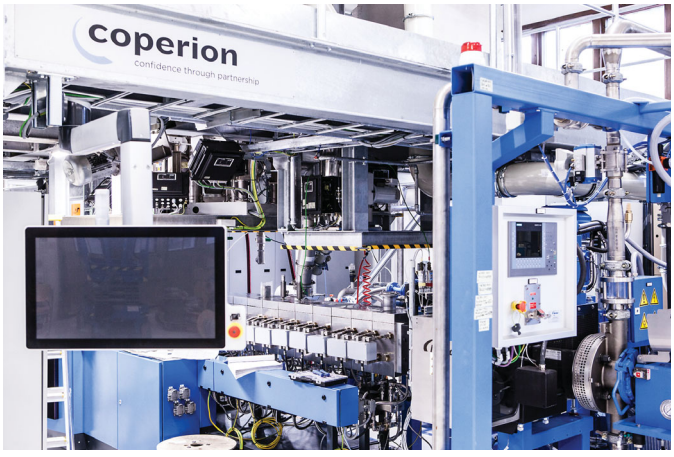
WEBER

Complete system for processing antistatic polymers

■ Coperion GmbH, Stuttgart, has implemented a complete system for IonPhasE Oy for the manufacture of inherently dissipative polymers (IDP). The scope of supply included the entire system – from raw material handling through conveying, feeding and processing the dissipative polymers up to handling the finished products. Inherently dissipative polymers are suitable for a variety of applications where antistatic plastic products are of considerable significance.

The Finnish technology company IonPhasE Oy is a leading manufacturer of static dissipative polymer additives, commonly known as permanent anti-static additives. These serve to control static electricity in plastics. They are used in a variety of industries – wherever anti-static properties are needed, for example in the electrical, chemical and automotive industries. They are also incorporated in consumer goods that need to be protected from electrostatic attraction, such as air-conditioning units, vacuum cleaners, switches and housings.

All key components for the main process steps were developed and produced in-house. All process steps and plant components were also optimally tailored to one another. The project included raw material handling and drying as well as material handling and the feeding equipment. A feeding station with eleven integrated highly accurate Coperion K-Tron feeders ensures continuous dispensing of precisely formulated raw materials into the extruder. The inherently dissipative polymers are compounded in a high-performance ZSK 45 Mc18 compact twin screw extruder equipped with a ZS-B side feeder and a ZS-EG twin-screw side devolatilization. Inside the process section of the ZSK twin screw extruder the base polymers are gently plasticized and reacted with multiple additives. An underwater granulator UG with optimized flow channels ensures a constant product flow and gentle handling of the product, and also facilitates high throughput rates. The downstream peripherals dry the product, which is then packaged by a semi-automatic bagging system.



The core element of the compounding plant is the high-performance ZSK 45 Mc18 compact extruder for the processing of inherently dissipative polymers

All the key components for the main process steps of Coperion's turnkey compounding plants are developed and produced in-house
Images: Coperion, Stuttgart, Germany

Besides supplying all the necessary processing equipment for the production effort, the project also included delivery, installation and system start-up. Coperion service staff were already integrated into the project when the system was installed and started up, so that after it had been handed over to IonPhasE Oy it was possible to guarantee complete local service. At the end of 2016 the system was successfully handed over to IonPhasE Oy, which has since then been using a Coperion production line to process inherently dissipative polymers.

➠**www.coperion.com**

New stacking robots for ACF thermoforming machines

■ Speed, accuracy and reliability: these are the three key factors that distinguish the new stacking robot series supplied with the ACF thermoforming machines. Presented for the first time during K Show 2016 in Düsseldorf the last October, the ACF is now for AMUTCOMI the top-of-the-range model because of the positive response received from both national and international markets. Such successful feedback is mainly due to the peculiarity of ACF series of ensuring a high flexibility in production, in terms of variety of articles and process materials, a high standardisation level, high performances and the best value for money.

AMUT-COMI R&D Division has designed and developed in house this technology to fulfil the potentials of all ACF models and to offer an unrivalled solution properly studied for this sector, as alternative to the standard systems available on the market.

The new stacking robots, proposed as an evolution of the classic vertical wall stacker, are available in two models:

- ER2X: consists of a vertical axe to pick up and discharge the articles and one horizontal axe to take the parts from the picking station to the stacking unit;
- ER3X: is equipped, in addition to the vertical and horizontal axe, with a third rotating axe, 0°-180°, to turn parts for A-B stacking or other purpose. This system allows getting different stacking possibilities depending on the characteristics of the products.

EASY, the performing software, made possible to implement a work circle of the robot completely harmonized with all operations of the thermoforming machine. The axis interpolation during the movements permits the optimized displacements of the articles, from the picking up to the discharging points, and to achieve higher speed, up to 40 cycles/min. The robot skills have been definitely enhanced.

A specific page has been purposely created to provide the operator with wide flexibility in setting all the cycle parameters of the robot. The interface is user-friendly and intuitive. EASY has been developed to comply with the concept of 4.0 Industry and enables the AMUT-COMI thermoforming machines to be networked with the DIGITAL FACTORY for a SMART PRODUCTION.

www.amutcomi.it

15,000 Square–Foot Addition Supports Blown Film Die Production

■ On Monday, July 17, Davis-Standard President and CEO Jim Murphy welcomed Connecticut Governor Dannel P. Malloy, Department of Economic Community Development (DECD) Commissioner Catherine Smith, Connecticut State Representative Diana Urban, Connecticut State Senator Heather Somers, Stonington Second Selectman Mike Spellman and more than 400 employees to celebrate the completion of a 15,000 square-foot addition to Davis-Standard's Pawcatuck facility. A ribbon cutting ceremony followed by facility tours commemorated the occasion. The new space houses manufacturing and precision machining of advanced multi-layer blown film dies, enabling Davis-Standard to move all blown film manufacturing from Gloucester, Massachusetts, to Pawcatuck.

Governor Dannel P. Malloy tours the Davis-Standard Blown Film Die Cell Center with Mike Newhall, Davis-Standard Director of Manufacturing

"The facility addition is the culmination of our vision to bring world-class blown film die production to Pawcatuck," said Jim Murphy, Davis-Standard President and CEO. "All Davis-Standard blown film die technology is now integrated under one roof, making us one of the largest manufacturers of seven to 11-layer blown film dies

in the world. These dies are used for making highly technical multi-layer films used in packaging and pharmaceutical applications, which are high-demand markets for us. We are grateful to Governor Malloy, Commissioner Smith, Representative Urban, Senator Formica, Senator Somers and Stonington First Selectman Rob Simmons for their support in making this possible."

Davis-Standard has operated in Southeast Connecticut since 1848 and is one of the oldest employers in the Southeast Connecticut/Southwest Rhode Island region. The expansion will bring more than 30 new manufacturing jobs to the site over two years.

The expansion of the Pawcatuck site reinforces the company's commitment to the local region. Through its long-standing position as a market leader, it is considered the "Center for Excellence" for Connecticut's extrusion technology sector. In addition to the Pawcatuck facility, Davis-Standard has manufacturing facilities and subsidiaries in the U.S., Europe and Asia.

➥**www.davis-standard.com**

Increases Precision in Medical Plastic Tube Finishing

■ A new, patent-pending medical traveling planetary cutter (M-TPC) from Conair features a fully-programmable, servo-driven cutting head that cuts small-diameter medical plastic tubing so precisely that the need for secondary, off-line tube finishing is virtually eliminated. The planetary knife spins around the circumference of tubing from 0.080 to 1 inch in outside diameter (2.03 to 25.4 mm OD), cutting it without deformation, particulates, burning or fracturing.

The M-TPC cutter, the latest in the Conair MedLine® family of cleanroom-ready, downstream extrusion equipment for medical applications, is being introduced at Plastec East, June 13-15 in New York.

Unlike other cutters that remove tube material and can leave particulates behind, the M-TPC planetary cutter actually splits the tubing apart cleanly through displacement, without the loss of any material. This cutting method never blocks continuous airflow through the center of the tube, so tube sizing and ovality are not affected as they can be when flying-knife cutters are used. The programmable, servo-driven cutting head enables complete and precise control of cutter speed (surface speed), rate of cutter penetration (feed speed), and final depth of the cut.

The new, patent-pending medical traveling planetary cutter (M-TPC) from Conair features a fully-programmable, servo-driven cutting head that cuts small-diameter medical plastic tubing so precisely that the need for secondary, off-line tube finishing is virtually eliminated

"Most rigid medical tubing today is cut-to-length using rotary or fly-knife cutters," explains Bob Bessemer, Medical Downstream Extrusion Sales Manager for Conair, "and the results have been mixed. Even with close-fitting cutter bushings and good blade technology, it is sometimes difficult to obtain a square, distortion-free/particulate-free cut on the extrusion line. When a rotary knife impacts a rigid tube, the tube is slightly flattened until the blade actually penetrates the tubing and this can affect ovality and edge squareness at the cut site. There are other undesirable effects, too, including scratching, angel hair or agglomeration. Depending on the fit and function required for the application, these flaws may be unacceptable. In that case, tubing needs to be cut oversized on-line and then re-cut off-line, by hand, to finish the part."

The planetary cutter is mounted on a precision, servo-driven traveling table that can handle tubing automatically at line speeds of up to 100 ft/minute (30.5 m/minute). The cutter's standard servo controls enable it to make distortion-free and particulate-free cuts at rates up to 45 per minute while holding cut-to-length tolerances of ±0.031 inch (±0.787 mm), even on shorter lengths of tubing. The cutter can be used with the full range of medical plastic tubing, including difficult-to-cut materials such as styrene, PET, HIPS, and PC.

The M-TPC cutter features a front-mounted touchscreen control that enables an operator to set table travel velocity, tubing size, blade velocity, and cutting depth. Once created, specific cutting programs or 'recipes' can be stored in on-board memory for easy recall and re-use. The cutter is engineered to allow for quick blade changes without the need to remove product from the machine, so the need to stop and restart the line for blade replacement is eliminated.

"The Conair M-TPC cutter was developed to eliminate the need for secondary cutting and finishing in the production of precision medical tubing," Bessemer adds. "Given the added level of blade control, and the ability to lubricate the cut using alcohol, the M-TPC cutter makes it possible to achieve an almost perfect cut.

For applications that require even tighter cut-to-length tolerances than those provided by the standard servo-controlled cutter, the M-TPC can be fitted with an optional dead stop that maintains cut-to-length tolerances of ±0.005 inch (±0.127 mm) or less. A switch initiates the cut cycle, starting table travel and clamping the tube so it comes to rest gently against the physical stop before being cut precisely.

➠**www.conairgroup.com**

battenfeld-cincinnati USA strengthens sales and service team

■ "Customer relationships, service and support are very important to us and we want to serve our customers more closely than ever before. This is why we have recently added new people to our US sales and service teams," says Paul Godwin, President and CEO of battenfeld-cincinnati USA.

Marko Koorneef has been named the new Director of Sales for battenfeld-cincinnati USA. He has twenty-five years of management and sales experience with global manufacturing organizations within the plastics industry. Michael Ferlic has joined battenfeld-cincinnati USA as Sales Manager with primary focus on Latin America. Mr Ferlic has more than twenty years of sales experience successfully managing teams delivering equipment to the plastics industry into the European, North American, and Latin American markets. Peter Hammer has worked for battenfeld-cincinnati for many years, most recently as Vice President Technology at battenfeld-cincinnati Austria and General Manager Service & Chief Quality Officer of battenfeld-cincinnati. He is now based in Florida and has taken over the position of Vice President Special Projects for North America for Construction applications. Albert Fuerst also comes from battenfeld-cincinnati Austria, where he has worked as Director of Service. He will use his experience at battenfeld-cincinnati USA as Manager of After Market Sales and Service. Mark Mulone has accepted the position as Sales Manager Infrastructure for North America. He has an extensive 25+ years' career in plastics and extrusion sales for North and South America. He has a wealth of experience in business development and account maintenance as well as work experience in both domestic and European equipment manufacturing.

Marko Koorneef, Director of Sales for battenfeld-cincinnati USA

www.battenfeld-cincinnati.com/usa

Mexico: Full House at the Open House

■ The all-electric PX series, surface decoration with dynamic mold heating (DMH), pipe extrusion, pultrusion of profiles, and dosing of polyurethane. No other company can present such a wide range of plastics processing as the companies of the KraussMaffei Group. The visitors at the Open House at the location in Querétaro / Mexico in July appreciated the diversity: 200 guests attended the presentations and live demonstrations.

That's efficiency: People visiting the Open House at the KraussMaffei Group Mexico could get to know the whole repertoire of plastics processing in just one day: From injection molding to reaction process machinery and extrusion. 200 guests took up the invitation, and Klaus Jell, General Manager of the KraussMaffei Group Mexico, summarizes the event with great enthusiasm: "The day was a resounding success. Our customers found the mix of live demonstrations and specialist presentations to be very valuable, and we could sense their positive and motivating mood."

Pleased with the resounding success of the Open House: Enrique Ponton (Automation Mexico), Carlos Schimpf (Training Cordinator), Ana Claudia Menconi (Training & Marketing Manager), Jose Luis Garcia (Senior Instructor) and Felipe Reyes (Marketing)

Klaus Jell, General Manager KraussMaffei Group Mexico, welcomed the guests at the Open House in Queretaro

At present there is great demand for machines on the Mexican market, in particular in the areas of packaging, agriculture, automotive and construction. The three segments of Injection Molding, Reaction Process Machinery and Extrusion Technology in the KraussMaffei Group therefore showcased technologies and developments that provide the customer with solutions precisely in these areas – of course, with a little local color. Reaction Process Machinery thus demonstrated its RimStar Compact metering machine using the manufacture of small tequila barrels, and presented the new training program in Querétaro and Monterey. Extrusion used presentations to showcase pipe and profile manufacture from various materials, as well as compounding.

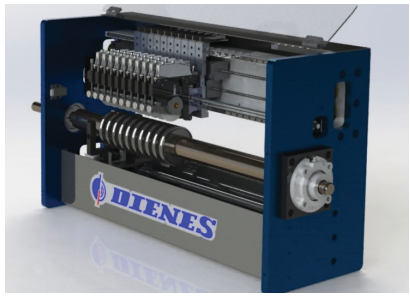
➠**www.kraussmaffeigroup.com**

New automatic knife position system "QUICK SET NW"

■ Dienes is proud to present on Labelexpo 25th to 28th September 2017 in Brussels booth 4/A52 the "QUICK SET NW" a new automatic knife position system for the area narrow web.

For more than 100 years DIENES stood for holistic solutions and service features in the slitting industry cutting. More than 600 successful installed slitting systems and the good cooperation with the clients are the best basis for a new automatic knife position system for the area narrow web, which will be represent on the Labelexpo. This system is either for crush cutting or for shear cutting. The compact design as well as an intuitive handling ensures a high compatibility to the integration into existing or new machines. The proven slitting tools of our company ensure high-quality slitting and reduces amount of dust.

Technical Information: material width: max 600 mm, slitting width: min 20 mm.



➠**www.dienes.de**

Covestro launches expanded film production

■ After a construction period of a year and a half, Covestro is ready to commence operations in a new production facility for high-quality, multilayered flat films at the Dormagen site. The total investment of around EUR 20 million also includes the associated infrastructure and logistics. The films are used in security cards, automotive interiors, medical devices and displays. Some 15 new jobs will be created to operate the coextrusion plant.

In 2014, Covestro commissioned a new large-scale facility for TDI foam components there. Last year, a pilot plant was opened that for the first time uses carbon dioxide (CO_2) as a raw material for high-grade plastics precursors, thus replacing some of the petroleum.

Nina Schmarander, global head of the Specialty Films business at Covestro, welcomes the new facility as an opportunity to respond more quickly and flexibly to customer requirements in future: "This enables us to meet the growing demand for high-quality flat films and align ourselves even better with market trends. At the same time, it expands our range of tailored products, which create added value along the entire value chain."

Covestro offers a diverse range of polycarbonate and thermoplastic elastomer films for a wide variety of applications, as well as a range of premium specialty films. The new facility is a further developmental step for multilayer film structures. These play a key role in ID cards because security features can be embedded, thus providing the best possible protection from counterfeiting.

Specializing in polycarbonate flat films, the competence center in Dormagen is home to production, a technical center for film processing, a showroom and two freshly renovated research laboratories. The other two centers are in Leverkusen and Bomlitz, and focus on film coatings and thermoplastic elastomer films.

Symbolic start of the new production facility (from left to right): Site manager Dr. Klaus Jaeger, Chief Technology Officer Dr. Klaus Schäfer, Nina Schmarander (Head of Specialty Films), Project Manager Rene Ahlers und Thorsten Dreier (Head of Production and Technology Business Unit CAS)

➠www.covestro.com

New Service Partner Improves Customer Focus

■ The Austrian company Next Generation Recyclingmaschinen GmbH (NGR) develops and manufactures plastics recycling equipment for industrial and consumer waste. As part of the reopening of the three year-old Customer Care Center in Taicang, NGR is expanding its sales activities in China and Southeast Asia.

New sales director and new address. With its move into the German Center Taicang, which will provide better infrastructure for customers and employees, the Chinese NGR subsidiary is laying new groundwork for China and the entire Southeast Asia region.The sales office will be led by the new sales director Jeffrey Tan, a native of Singapore. Jeffrey Tan has developed a strong technical background over his years working in the plastics industry, and will take over the appointment books for our customers starting in July.

NGR recycling-line at Anhui Green Recycling and Environmental Protection Research Center for test runs

Test runs and engineering support. With Sven Heine, CEO of Anhui Green Recycling and Environmental Protection Research Center Co., Ltd., NGR has added an authorized partner for customer trials and technical support in Hefei. As a recycler of industrial plastic waste, Heine counts on NGR technology and also provides prospects the chance to carry out test series for customized recycling solutions with his company's S:GRAN 85-70 V HD system.

Short response times, years of experience. Technical support will be strengthened by a well-experienced service engineer. And an expanded spare parts warehouse will provide more rapid customer support.

"With our service partner, we can get closer to our customers in China and Southeast Asia," states Regional Director Karlheinz Berger, who expects sales of NGR recycling machines to grow further thanks to this partnership.

With a license to recycle. Concrete objectives on the part of the Chinese government to promote renewable energies and better use of resources are increasingly focusing on environmental protection. The company's own license for recycling plastic waste meets these very high environmental standards. The growing demand for plastics makes the Chinese and Southeast Asian plastics industry an important driver for the global market.

www.ngr.at

Three strong trade fairs for the plastics industry

■ In September 2017, export-oriented companies from the global plastics and rubber industry will be able to explore some interesting markets: interplastica Kazan in Tatarstan/Russia, T-Plas in Bangkok and IRAN PLAST in Tehran will offer machine manufacturers, raw material producers and processors excellent opportunities for acquiring a new circle of customers. Messe Düsseldorf, organiser of the K, the global flagship fair for the plastics and rubber industry, will accompany its customers these trade fairs, which are part of the Global Gate product portfolio.

Based on the interplastica Moscow, which has emerged as the industry's leading trade show in Russia, the interplastica Kazan – International Trade Fair Plastics and Rubber in conjunction with Tatarstan Oil, Gas & Petrochemical Forum – was launched in the economic region of Kazan/Tatarstan in 2015. The autonomous Republic of Tartastan is one of the most widely industrialised and fastest growing regions of Russia. Thanks to the region's extensive oil and natural gas deposits, the government is currently able to invest substantial amounts in related industrial segments. The interplastica Kazan will take place from 6 until 8 September 2017; more than 200 exhibitors are

Thailand's plastics processing industry is considered an important pillar of the country's economic development – a development that has been characterised by a steady increase of domestic demand for plastic products at an average annual growth rate of 3.3 %. Rated Thailand's top event for the industry, the T-Plas in Bangkok has a regional focus on the prosperous industrial region of Southeast Asia and as such has become a magnet not only for the processing industry but also for relevant consumer industries. According to the national industrial concept of "Thailand 4.0", the upcoming

T-Plas, which will take place from 20 until 23 September, will focus on six application segments that have been earmarked as areas with major potential for the future and therefore qualify for government funding: automotive, biopolymers, lifestyle, medicine and health care, E+E. About 300 exhibitors from 20 nations will present their products and solutions at T-Plas. Official exhibition partnerships registered come from China, Germany, Malaysia, Austria, Singapore and Taiwan. More than 8,000 visitors from the industry are expected at the Bangkok International Trade & Exhibition Centre (BITEC). PACK PRINT INTERNATIONAL, 6th International Packaging and Printing Exhibition for Asia, will be hosted at the same time. In combination, these events offer exhibitors and visitors interesting synergies and a comprehensive overview of the dynamic and closely connected growth industries.

Only a short while later, Iran will shift into the focus of the international plastics and rubber industry. Iran, a country with a population of 75 million, has a solid oil and gas industry that accounts for more than 50% of the country's exports. IRAN PLAST, hosted for the 11th time this year, has emerged as the most important specialist trade show in Iran. Established in 2015, the extensive partnership between the host, Iranian National Petrochemical Company NPC, and Messe Düsseldorf is still going strong. The previous IRAN PLAST, which took place in April 2016, welcomed 920 exhibitors. This year's event, taking place from 24 until 27 September 2017 at Tehran's expo centre, will most likely experience a similar attendance. Interest from international exhibitors in this trade show has increased significantly, which is also evident in the fact that those exhibitors who work with Messe Düsseldorf alone come from 21 different countries and have booked a net exhibition space of over 2,800 square metres – almost 40% more than on the previous trade fair. The largest contingent, consisting of about 60 companies, comes from Germany, closely followed by Italy, Austria, France, Switzerland and Korea. Official national participants are Germany, Finland, France, Austria and Switzerland.

➠**www.k-globalgate.com**

"Long night of industries" at KAMPF

■ On June 29, 2017, the „LANGE NACHT DER INDUSTRIE" (Long night of industries) took place in the Oberberg region. KAMPF Schneid- und Wickeltechnik participated in this event for the first time and welcomed about 100 registered visitors. The guests experienced on guided tours the modern training workshop, the technology center and the new assembly hall. In order to give the visitors an idea about slitting and winding, the moderators focused not only on the impressing machines, but also on the use of the web-shaped materials that KAMPF customers produce on the high-tech slitting and winding machines. Films made of various plastics, as well as aluminum and papers are used not only for packaging of foodstuffs and pharmaceutical products. For example, the usage of films was impressively presented by displaying a hybrid vehicle type BMW i8: in the safety glass, as a display or decorative film, and especially in the electronic components such as capacitors and the modern lithium batteries. Not imaginable without materials produced on KAMPF machines.

Usage of films explained by hybrid vehicle BMW i8 (Pictures (KAMPF)

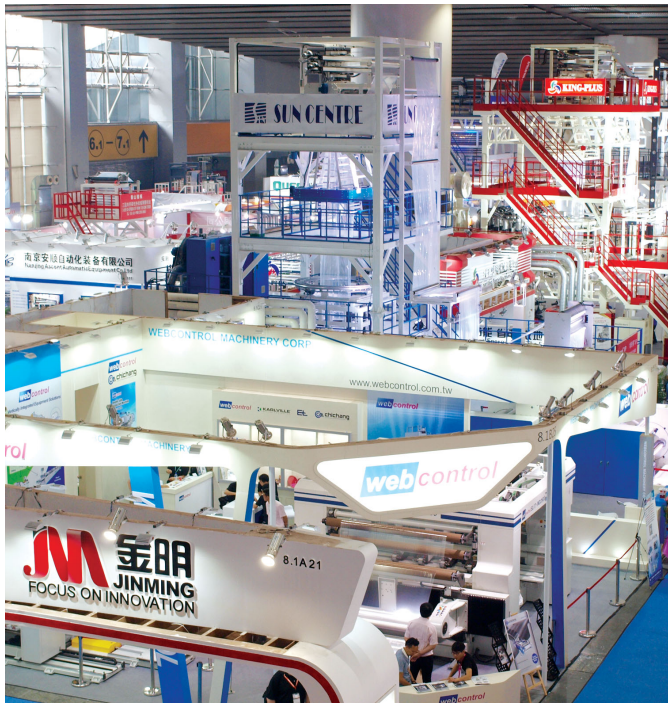
➠**www.kampf.de**

ChinaPlas–2017 – the key to the Chinese and Asian markets

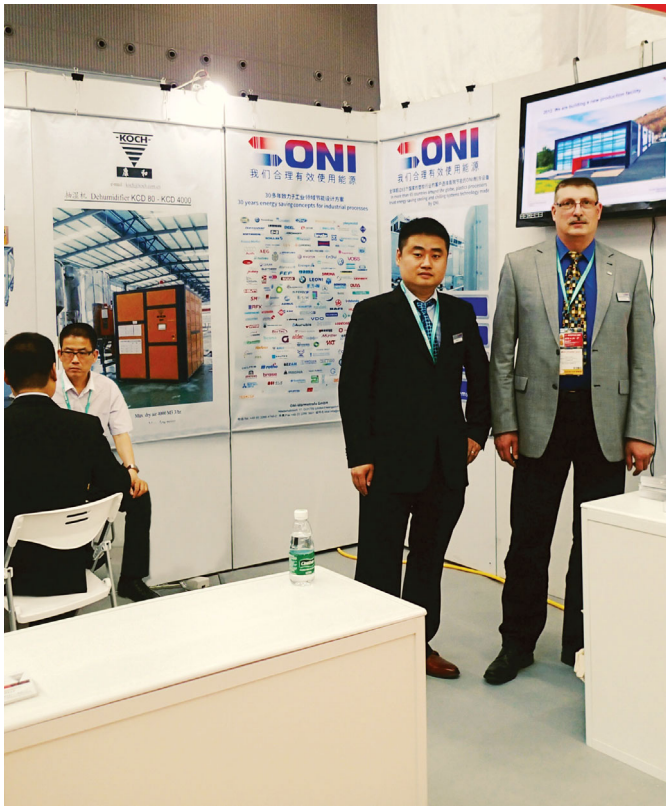
■ The exhibition ChinaPlas 2017 was held from the 16th to the 19th of May, in Guangzhou, on the territory of China Import & Export Fair Complex. At this exhibition, which Adsale Exhibition Services Ltd ran for the 31st time, more than 3,400 companies from all over the World demonstrated their products to more than 155,000 visitors. Our correspondent shared with us some of his impressions of this event.

When preparing to go to Guangzhou to yet another ChinaPlas exhibition visitors usually check whether they've got their umbrella. But this time the Tropic of Cancer was merciful and there was no need to contend with tropical rain…
Traditionally what makes ChinaPlas unique is that it is the most notable event both for domestic trade in China and for international trade in polymer equipment and raw materials. Several pavilions are taken up almost exclusively by Chinese products, and they are very crowded. Representatives of Chinese processing enterprises enquire about local equipment and raw materials prices, and these are quite affordable. The majority of exhibition areas was taken up by 'foreigners' exhibiting their more sophisticated, high-tech goods, where it was also very lively: advanced Chinese companies (and there are many of these) want to buy expensive innovative equipment, as do numerous visitors from abroad.

At the exhibition our publishing house VM Verlag concluded a mutually beneficial partnership agreement with Dalian Plastics Research Institute (China)



Besides really enormous numbers of exhibitors from mainland China, the following were well represented: Taiwan (132 stands), Korea, Japan and India. Among Western companies Germany led as to the number of exhibitors (138 stands). There were numerous stands of companies from Italy, Switzerland, Austria, UK and the US.
Among well-known foreign exhibitors of extrusion equipment at ChinaPlas-2017, one could mention, for example, Krauss-Maffei Berstorff, Bruckner, Buss, Entex, PlasMec, Tecnomatic, Zambello, Davis-Standard. What is characteristic is that many manufacturers of fairly expensive European controlling and automation extrusion equipment were represented by impressive expositions (Inoex, Sikora, Zumbach, Process Control, Kundig). Probably, these companies see good prospects for the sale of their equipment in China.
It should also be noted that exhibitors from Europe or Taiwan were frequently represented not only by sales managers but by company heads and even owners, which clearly shows the large share of China's orders in their portfolios. For numerous foreign exhibitors China is the largest and the most important buyer of their products.
As for Chinese exporters of equipment it is noticeable that many of them, especially the major ones, are gradually becoming international players. The quality of their products is improving, professional marketing after sales support is being put in place, the external appearance of their equipment is more attractive as is its ergonomics. Chinese and Taiwanese companies were in particular interested in visitors from India



„For the first time exhibited at the Chinaplas and with great success!". Mr. Guido Hamm (ONI-Wärmetrafo GmbH) with guests on the ONI-booth.

and Russia who came to this exhibition. They expect a growth in demand for this equipment in the above countries in the near future. 'The Chinese extrusion giant Jin Ming has been very prominent on the market in recent years', said Evgeniy Kolerov, representative of 'Polymerservice', Jin Ming's dealer in Russia. 'As one of world leaders in the niche market of multilayered film manufacturing equipment Jin Ming took part in K2016 exhibition where it had a very large stand. 'Focus on Innovation – is their motto at this exhibition. The task facing us now is to enhance the position of this company in Russia in expectation of growth.'

There was a lot of working equipment at the exhibition so the pavilions were not only crowded but at times quite noisy.

ChinaPlas 2017 organiser Adsale continues to promote and advertise high-tech solutions, as well as equipment corresponding to the concept of Industry 4.0. And so there was a special separate pavilion 4.2. 'Smart Manufacturing Technology Zone', and a special guide published for the visitors 'Intelligent Manufacturing – High-tech Materials – Green Solutions'. There was a wide programme of conferences and seminars and these also, as a rule, with an emphasis on high-tech.

Exhibition organiser took good care of the visitors. Special thematic guides were published and distributed free of charge to visitors from the packaging industry, the recycling industry, to those involved with medicine, construction, telecommunications and automotive industry.

At the exhibition our publishing house VM Verlag concluded a mutually beneficial partnership agreement with Dalian Plastics Research Institute (China). At present, in addition to the existing mailshots to our Asian subscribers an additional run of the magazine 'Extrusion – Asia Edition' will be distributed free of charge among Chinese extrusion specialists at all the domestic exhibitions in China devoted to plastics, packaging, film and pipes. Starting from June 2017 the new Chinese partner of our publishing house will distribute the printed version of this magazine for extrusion professionals at its stands.

Based on the reactions of the exhibitors their expectations from participating at ChinaPlas-2017 have been justified. Mr Toni Bernards, CEO of battenfeld-cincinnati (China), noted the buyers' significant interest in the acquisition of high quality pipelines: 'Potential buyers have serious intentions. Many accepted the invitation to see our plant while visiting the exhibition and to get acquainted with the whole range of our products and manufacturing conditions. Even on the final day of the exhibition the meeting activity at our stand was high.'

Exhibition organiser, inspired by the success of this event, has already opened stand booking for the next exhibition ChinaPlas 2018, which will be held next year from 24 to 27of April.

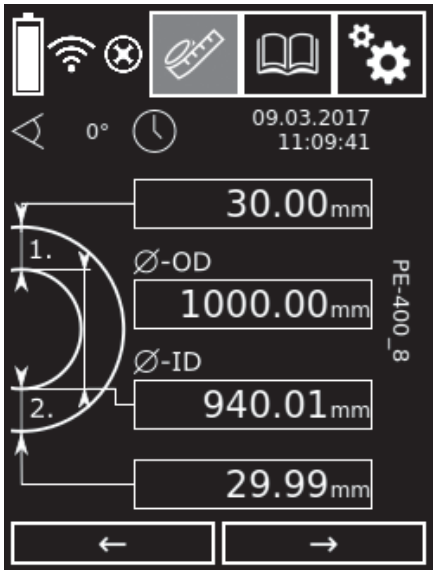
www.chinaplas.Online.com

WARP portable: Innovative hand-held device

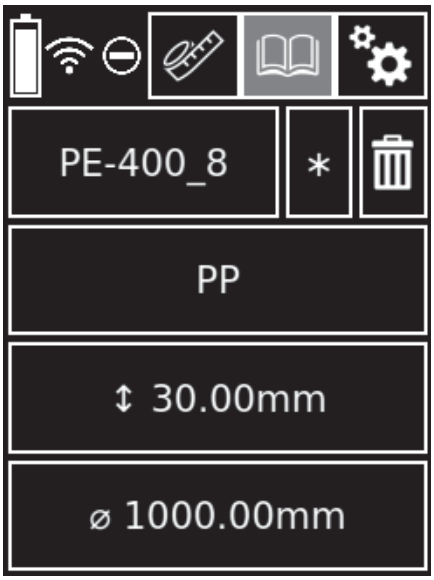
WARP portable incl. large centering aid and strap

Based on 30 years of experience and a variety of revolutionary ideas, iNOEX has for 30 years developed systems and solutions which are precisely tuned to the specific demands arising in the pipe, profile, cable, sheet and film extrusion industry.

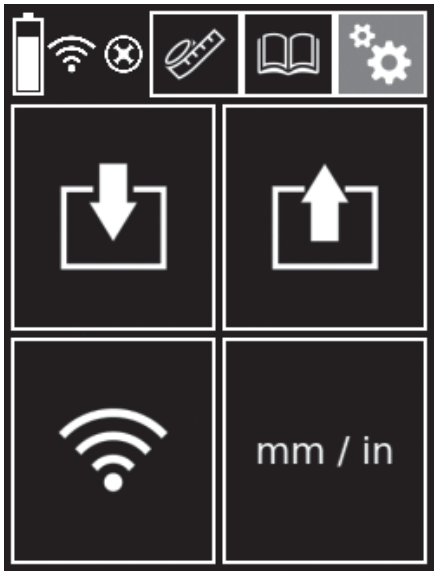
The latest innovation by iNOEX is the Terahertz based hand-held system called WARP portable. This new type of portable device supplies measured data (wall thickness at the measured spot, wall thickness on the opposite side, interior/exterior pipe diameters) on the LCD display at just the touch of a button. The advantage of Terahertz technology lies in its temperature-independent measurement and its electromagnetic ra-



WARP portable



WARP portable recipe mask



WARP portable configuration mask

diation which is harmless to health. The Terahertz source for WARP is a transceiver developed by iNOEX and a state-of-the-art THz chip. WARP is ideally suited for the measurement of all common plastic materials such as PE, HDPE, PP, PA, PVC etc.. The battery-operated hand-held device has been specifically designed for medium and large-sized extruded pipes. The modern ergonomic design offers great user comfort and thanks to the very simple operation, WARP portable delivers fast and reliable measuring results. Exchangeable centering aids for large or medium pipe sizes round off this product. A point measurement of the wall thickness of plastic pipes is carried out. The handheld is suitable for pipes having a wall thickness of 5 mm or more, measuring accuracy is 50 µm.The simple intuitive operation is based on a capacitive touch display featuring a resolution of 320 x 240 pixels inside the WARP portable. After the measurement, wall thickness data or – in the case of diameter measurement through the pipe cross section – both wall thickness values and the interior and exterior wall thickness sizes are displayed.The system features data logging including timestamp and measurement position on pipe circumference. For recipes only the processed material needs to be entered. Configuration will be done by way of a separate configuration mask. Data transmission is possible via WLAN or USB to Smartphone, Tablet or PC. Additionally, it is possible to switch between metrical and imperial units. WARP portable features a modern nickel-metal-hydride-battery which will last for several hours of continuous measurement. Thus, the user can dispose of up to 10 hours of operation time. The protection class of WARP portable is IP 54, this means it is well protected against water or dust encountered in industrial environments.

Author:
Arno Neumeister,
Director Marketing & IT

iNOEX GmbH
www.inoex.de

Complete production line for producing 5-layer PE-RT pipes

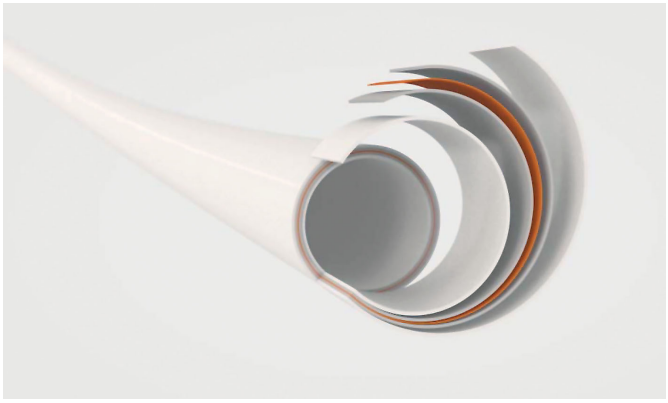
Unique pipe head is guarantee of maximum pipe quality

"Me too products were out of the question from the very start," reports Michael Frenzel, managing partner of Enetec Plastics GmbH in Kleve, Germany, a specialist in the production of 5-layer PE-RT pipes for surface exchanger systems. After intensive research, he decided to use complete systems from KraussMaffei Berstorff of Munich, Germany in order to produce pipes which are both competitive and high-quality. Today, Enetec Plastics – which was only founded in 2014 – operates two systems with a maximum production capacity of 40 million meters of pipe and has already ordered a third line to be installed in the course of 2017 due to its enormous success.

The parent company, which is based in Kleve on the lower Rhine, is part of the Italian E-Group. For about thirty years, Enetec has been highly successful as an OEM supplier of heating and cooling systems in all the world. "For the reverse integration to become a pipe manufacturer, we first decided to produce competitive pipes for the products of our Group," explains Michael Frenzel, managing director of the family-run company. For this reason, he founded Enetec Plastics and built up an ultra-modern pipe production plant which is unparalleled in Europe in a greenfield project not far from the existing location. "While searching for suitable extrusion lines, the KraussMaffei Berstorff team of system engineers and technicians were absolutely convincing." The engineering company was able to satisfy the specifications of the customer with respect to efficiency and delivery time. "The other thing that was very important to me was to have a partner who could offer me an integrated system – a turnkey system, so to speak – and one that worked impeccably," Frenzel underlines his satisfaction. Best proof of just how satisfied he is was the order for a second line after nine months; and now he has even ordered a third line. No longer does the specialist produce pipes only for the Group's own needs; it exports 80% to customers around the world. "The key to the success of our products can be found in the typical German virtues of precision, orderliness and punctuality," Michael Frenzel is convinced. With respect to his products, that means premium quality pipes with absolute dimensional precision and outstanding surface finish delivered just in time.

Demand for PE-RT pipes growing

Today, 5-layer PE-RT pipes are, along with PE-X pipes, in high demand for underfloor heating systems. They are flexible and can be individually routed. Their EVOH layer provides an oxygen barrier and they are extremely durable. "In contrast to the competition product, the PE-X pipe, the processing technology to produce PE-RT pipes is much simpler as there is no need for subsequent treatment, for example for cross-linking," Michael Frenzel explains his choice of PE-RT pipes. An additional growth market for these pipes is wall and ceiling heating and cooling systems, which are increasingly being installed in houses and offices around the world. The pipes typically have a diameter between 8 and 32 mm with a wall thickness of 1.1 to 3 mm. The KraussMaffei Berstorff pipe extrusion lines cover exactly this range of dimensions. For this, they are equipped with six single-screw extruders, each of which has its own gravimetric material metering, allowing different layer thicknesses to be perfectly configured. In detail, these are the KME 45-36 B/R main extruder for the PE-RT inner layer and the KME 30-30 B coextruder for the PE-RT outer layer. Two further coextruders of the KME 30-25 D/C type each plasticize the raw material for the layers of bonding material, into which the EVOH oxygen barrier layer is embedded. For these, a KME 30-25 is installed as a piggyback on the main extruder. Finally, the sixth extruder, a KME 20-25 D/C, also installed as a piggyback solution on top of one of the coextruders, takes over appliance of the strips.



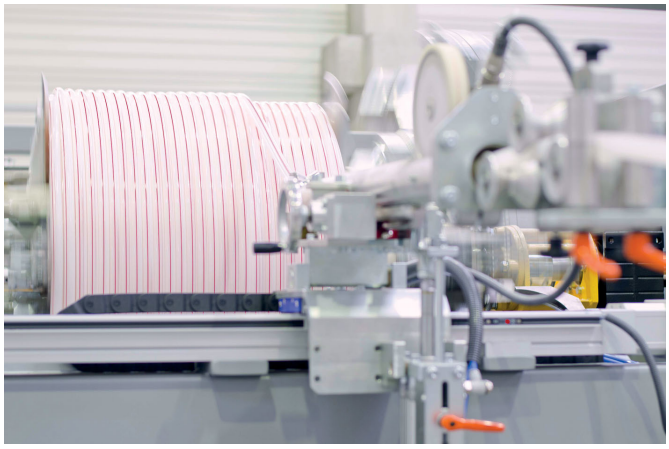
Schematic illustration of a 5-layer PE-RT pipe

New pipe head with many advantages

The core component of the overall line is the KM 5L-RKW 01-40 5-layer pipe head, which is not only a novelty in the product range of the Munich-based machine engineers; it also unique within the industry. "We have succeeded in designing a pipe head that combines multiple spiral distributor principles. The pipe head allows multi-layered pipes to be manufactured at high line speeds with perfect layer thickness distribution," boasts Andreas Kessler, General Sales Manager of KraussMaffei Berstorff. The inner layer is led over an axial spiral, while the layers of bonding material EVOH are distributed over three spiral distributors and a conical spiral has been selected for the outer layer. The main advantage of this design is the exact distribution of the layers, which allows for a significant reduction of the material costs in pipe production. "Short flow distances, complete self-cleaning and no dead zones for deposits to accumulate are the other decisive advantages of the new pipe head compared to conventional designs," explains Andreas Kessler in detail, adding: "The new pipe head concept is not only useful for PE-RT or PE-X pipes; it can generally also be used for other multilayer pipes in which precision and cost-efficiency are of the essence."

Detail views of the production system

Detail views of the production system



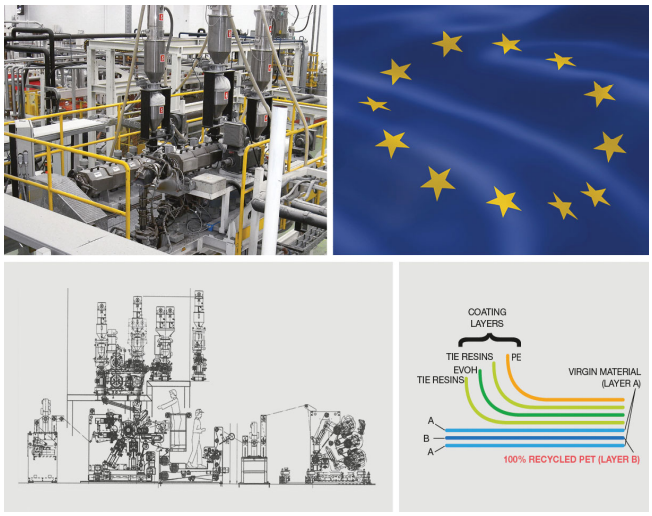
Control system rounds off complete solution

"By realizing the extrusion solutions for Enetec Plastics, we have proven that we are also able to design complete lines especially for this application from a single source," the General Sales Manager continues proudly. The complete lines designed for and installed at Enetec Plastics also include the material metering and the downstream unit, comprising vacuum tank, spray bath and extractor. The customer only has to provide the winder himself. Last but not least, the C6 control system rounds off the complete solution. "We consider the automation concept to be an ideal precondition for economical pipe production," explains Michael Frenzel. The control system, which is designed for a coextrusion system with up to seven extruders, features an extremely modern and intuitive operation. Parameter pages can be individually and flexibly compiled and displayed on the 24" HD screen. "In the Enetec systems, the main extruder acts as the master via which the other units can be controlled, either individually or all together as a whole," Andreas Kessler continues. And the Enetec managing director sums up by emphasizing that "the extrusion technology of tomorrow means that we are ideally equipped for the growing demands of the market."

KraussMaffei Berstorff
www.kraussmaffeiberstorff.com

Enetec Plastics GmbH
www.enetec.info/de/

More than a decade ago, Bandera supplied a couple of rigid film extrusion lines with integrated extrusion-coating systems to an important European Customer. This represented a challenge, since equipment design and manufacturing were customized and subsequent experimentation was carried out to attain the line performances expected by the Customer for his specific application. This experience was an enrichment and laid the basis for future supply of such type of technology to other important producers, i.e.: previously well-established Bandera Customers for standard extrusion equipment, who were fully confident to have Bandera walk aside them even when facing their more complex new endeavors.



Coating technology on rigid films: a challenge revisited

Throughout these years, Bandera has continued to experiment, in cooperation with its customers, to refine this technology for new performances, to make it suitable to fulfil different requirements, gaining ground in innovative fields.
Bandera's latest achievement in the sector: an important international player, again a well-established Bandera customer for both standard and specialized extrusion equipment, with wide concerns in the market, decided to renew their fellowship with Bandera. This customer awarded Bandera an order for the supply of a turnkey, High-tech Multilayer PET Rigid Film/ Sheet Extrusion Line for the production of thermoformed packaging products. The line integrates an Extrusion Coating Section for the production of barrier film for direct application to extruded PET sheet. This out-of-standard line, foreseen for an output of 2000 Kg/h, installs nine extruders:

- Three extruders for PET sheet production, one of which a co-rotating twin screw extruder, Bandera patented, fit to process PET regrind, equipped with volumetric melt pump and superfiltration screen changer, for higher purification; two single-screw co-extruders for the outer virgin material skin layers;

- Six smaller-size extruders, for barrier film production, representing the core of this hi-tech line, i.e: the extrusion coating section. These extruders are equipped with raw material handling/ conveying and gravimetric dosing systems, manual screen-changers, automatic single manifold flat extrusion die, chill roll group, haul-off silicone coating and drying device and an alternative oxy-dry group.

The line further includes the following main equipment:
- automatic flat extrusion die;
- cooling and polishing calender roll stack, with cross axis system to process even ultrathin sheets, equipped with in-line barrier film lamination system;
- thickness control system;
- semi-automatic cantilever winding system, capable of winding up to 3 reels on the same shaft,

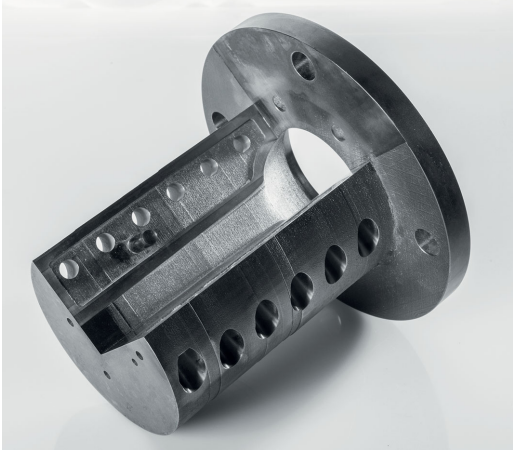
It is self-evident that an increasing number of customers, who have selected Bandera for their standard extrusion requirements throughout these years, are confident in trusting Bandera also with their more complex requirements. This reaffirms that at Bandera tradition and dedication to research for excellence and innovation move on parallel lines.

COSTRUZIONI MECCANICHE LUIGI BANDERA SpA
www.luigibandera.com

Fast product change in extrusion

Research in the Excellence Cluster shows improved rinse properties with additively manufactured extrusion dies

The production of plastic profiles and film is carried out with highly developed dies in which the geometries are coordinated precisely to the flow properties of the plastics. This coordination often requires long iteration loops in simulation and experiment. These loops represent a considerable cost and time factor, and threaten the prospects of manufacturing in high-wage countries.



Additively manufactured demonstrator die (Photo: IKV/Fröls)

The Institute of Plastics Processing (IKV) in Industry and the Skilled Crafts at RWTH Aachen University is, as part of the Cluster of Excellence entitled "Integrative production technology for high-wage countries", carrying out research together with its research partners CATS (Computer-Assisted Analysis of Technical Systems), the ILT (Institute of Laser Technology) and the WZL (Laboratory for Machine Tools and Production Engineering) at RWTH Aachen University, into a new approach to replace manual trials and evaluations with an automatic algorithm. The problem is that the algorithm supplies geometries that cannot always be replicated with conventional manufacturing processes. One possible solution is additive manufacturing, whereby steel powder is turned into a compact solid through local melting. The use of optical machining processes instead of conventional mechanical processes increases the freedom of design. On the one hand, very complex contours can be replicated, and on the other, there is no restriction to the maximum machining depth. This means that a profile die does not have to be built up from numerous plates. This new production technique saves a considerable amount of development and production work.

The roughness of the die surface that is unavoidably created on melting the powder is both a curse and a blessing. Although the roughness has to be minimised at the exit of the die so that the produced plastics surfaces have an acceptable finish themselves, it does bring about a much better rinse behaviour. It was shown in a laboratory trial, for example, that a colour change in an additively manufactured extrusion die can be carried out around 25 percent faster than with a conventionally manufactured die.

The research teams from the Excellence Cluster in the fields of flow simulation, additive manufacturing, tooling machines and plastics technology, designed an extrusion die as a demonstrator, and produced it by additive manufacturing. This demonstration die exemplifies a production system in which the design is performed automatically without any time-consuming trials. At the same time, the die is produced in a single, fully automatic process step. The number of assembly steps is reduced and the improved rinse properties allow, for example, much faster colour changes.

Funded by the German Research Foundation (DFG), more than 25 institutes at RWTH Aachen University are carrying out joint research in the Excellence Cluster "Integrative production technology for high-wage countries" on sustainable solutions to keep the production technology sustainable in Europe. The research findings will be further developed in a number of follow-up projects in which interested parties can become involved in various forms.

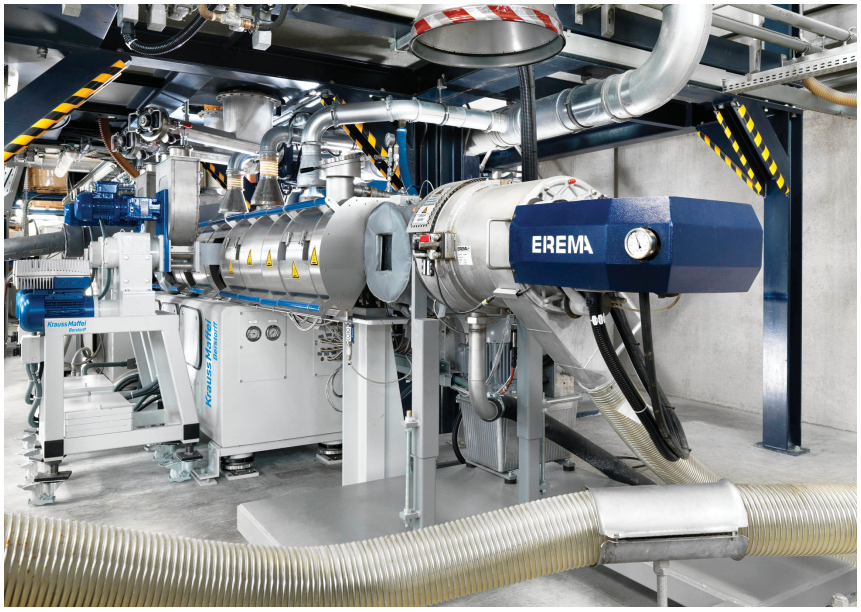
Institut für Kunststoffverarbeitung (IKV) at RWTH Aachen University
www.ikv-aachen.de,
www.produktionstechnik.rwth-aachen.de

About 60 visitors to the Recycling & Compounding TecDay organized by KraussMaffei Berstorff and EREMA received insider information about state-of-the-art technologies, innovative machinery and unparalleled services around plastics recycling. The main focus of the TecDay was placed on the EdelweissCompounding concept composed of an EREMA recycling extruder and a KraussMaffei twin-screw extruder. Plastics recycling and compounding companies can use this line for re-compounding tests performed under real production conditions.

Debut on the Recycling & Compounding TecDay: The new two-stage EdelweissCompounding line with EREMA recycling extruder COREMA® for outstanding cost-effectiveness

Successful Recycling & Compounding TecDay

The KraussMaffei Berstorff twin-screw extruder of the EdelweissCompounding solution is designed to perfectly incorporate all additives and fillers required



Live demonstration of innovative recycling technology

"For recycling specialists, compounding companies and university representatives, this event offered an ideal opportunity to participate in a live demonstration of premium-quality plastics recycling," reports Ralf J. Dahl, Head of the Twin-Screw Extruder Division at KraussMaffei Berstorff. "Customers and other interested guests used this unique platform for in-depth discussions with experts and industry colleagues and took a closer look at the EREMA/KraussMaffei Berstorff production solution."

World premiere: EdelweissCompounding line with EREMA recycling extruder

The EdelweissCompounding line with the EREMA recycling extruder

Manfred Hackl, Managing Director of EREMA GmbH is deeply convinced that by 2025, we will have completed a decisive step forward towards a true circular flow economy

The EdelweissCompounding technology offers forward integration for recycling companies and backward integration options for compounding companies enabling them to enter completely new markets," reports Peter Roos, President of the Extrusion Technology Segment of KraussMaffei Group

designed for reprocessing film, fibers and mats was the focal point of the TecDay. During the event, post-industrial PP film scraps with different degrees of contamination were converted into a PP compound with a 30 per cent talc share in a 2-stage extrusion process. The line is rated for filler contents of up to 80 per cent and a throughput range of up to 1,000 kg/h.

The recycling/compounding line comprises an EREMA recycling extruder (COREMA 1108T), melt filter and melt pump, a KraussMaffei Berstorff ZE 60 R UTXi twin-screw extruder and a water-cooled die face pelletizing system.

Robert Binder, Area Sales Manager of EREMA GmbH, introduced the guests to the production

Technical lectures held by Interseroh Dienstleistungs GmbH, Borealis Polyolefine GmbH, Veolia Polymers NL B.V., EREMA Engineering Recycling Maschinen und Anlagen GmbH and KraussMaffei Berstorff rounded off the TecDay.

New test facilities

"After the TecDay, the line can be used by EREMA and KraussMaffei Berstorff customers for tests performed under real production conditions," says Ralf Dahl. "Our customers will not only benefit from the excellent performance of the extrusion line, but also from the extensive support offered by EREMA and KraussMaffei Berstorff in the field of process improvement, screw and machine development and the optimization of the entire production sequence."

KraussMaffei Berstorff
www.kraussmaffei.com

EREMA Engineering Recycling Maschinen und Anlagen Ges.m.b.H.
www.erema.com

Detergent bottles are given a new life. ©Starlinger

It is hard to imagine packaging without the use of plastics. Whether it is shampoo, shower gels, liquid laundry detergents or household cleaners – everything reaches the supermarket shelves in containers made of PP, HDPE, or PET. But in contrast to PET bottles, for which extensive collection systems have partly been set up, the collection of used containers made of polyolefins is still in its early stages. One reason for the lack of effort in this area lies in the complicated recycling process of plastic containers that were filled with detergents; due to migrated substances, the plastic, and in turn the recycled material, takes on an unpleasant odor.

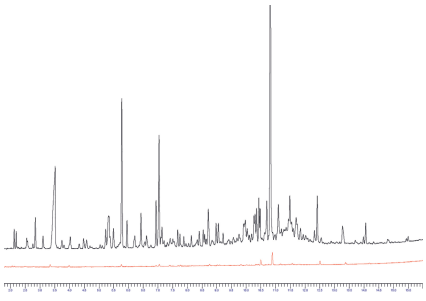
A new take on bottle-to-bottle:

processing of detergent bottles by Starlinger recycling technology

Pioneering work in odor reduction

The call for sustainable packaging solutions for polyolefins – especially by brand manufacturers – prompted Starlinger to engage with this topic on a deeper level. Over the last years Starlinger engineered a project for the recycling of the input material of a renowned European recycler. The material came from detergent bottles from a postconsumer collection that had maintained a persistent odor of dishwashing or laundry detergent even after undergoing a shredding and washing process. The goal was to produce high-quality regranulate, and to aim for optimum removal of the strong smell. In addition, the regranulate should not entail qualitative losses compared to products made from virgin material. Taking these requirements into account, Starlinger started a test production during which more than 100 tons of HDPE post-consumer material were processed. The subsequent production of bottles from 100% rHDPE fulfilled all expectations; this means that Starlinger was the first technology provider to offer a recycling solution for detergent bottles.

During test production, samples were extracted and sent to a German laboratory for analysis. The analysis consisted of an olfactory test with human participants and a physical analytical method called gas chromatography. The knowledge obtained through this analysis enabled Starlinger to optimize the recycling process – and thus the final product – one step at a time. As a result, the material was fit to be reused in the production of laundry or dishwashing detergent bottles: a new take on bottle-to-bottle recycling.



Gas chromatography: volatile substances in the regranulate as measured after conventional extrusion (in black) and after treatment in the Smell Extraction Unit (in red). ©Starlinger

First HDPE detergent bottle made from 100 % odourless recyclate

Starlinger does not only sell machines, but solutions: the development and transfer of know-how is an integral part of the full package. Thanks to the pioneering work of Starlinger, the first HDPE detergent bottle made from odourless regranulate could be presented on the market.

A special characteristic of odor reduction by means of Starlinger technology is its permanent nature. While conventional processes merely bind odors through the use of additives and therefore enclose them in the final pellets, Starlinger's odor reduction process permanently removes the substances causing the unwanted smell. In part, this removal already occurs during material preparation in the SMART feeder of the recycling line recoSTAR dynamic as well as during degassing with the highly efficient C-VAC module. As a final step, the regranulate receives the "finishing touches" in the Smell Extraction Unit – its configuration and process parameters may be adapted individually to the needs of the customer's material.

The technology stirs up lively interest worldwide; test runs at Starlinger recycling technology in Weissenbach can be performed upon request.

Starlinger & Co. Ges.m.b.H.
www.starlinger.com

Zumbach – (Self)compensation of Measuring Units Increases Accuracy of Measurements

Typical ODAC® laser diameter measuring gauge with a certified measurement standard used to calibrate the device

Calibration in measurement technology means characterizing the measurement behaviour of a measuring unit by comparing the indications provided by the unit with a known "measurement standard" (a physical object) used in the calibration procedure.
During the calibration, the measuring instrument is not subject to changes, as opposed to adjustment where a measuring unit is tuned or modified in order to minimize the measurement errors or to guarantee that the measurement errors do not exceed predetermined bounds. Verification in legal metrology, however, pertains to the examination and marking and/or issuing of a verification certificate for a measuring system. The examining authority thus verifies whether the measuring unit satisfies the corresponding legal prerequisites.

Unlike for legal verification, where the validity of a marking or certificate is defined by law, the validity of a calibration interval follows practical requirements such as manufacturer indications, requirements of the applied quality standards, or company internal and customer specific regulations.

Traceability and calibration hierarchy

In order for measurement results to be compared, they must be traced back to a national or international measurement standard To this purpose, the display of the measuring must be compared with the measurement standards in one or more stages. On each of these stages a calibration is carried out with a measurement standard, which has been previously calibrated with a higher-level measurement standard. According to the ranking of the measurement standard – from a working or company reference measurement standard to a national or international measurement standard –there is a calibration hierarchy to be respected by the organization performing the calibration. This stretches from the in-house laboratory through accredited laboratories up to the national metrological institute.

Correct Calibrations

Different standards, regulations and directive must be respected when carrying out calibrations. A measurement unit must satisfy basic requirements before it can be calibrated. One must also know and consider the physical conditions under which a calibration is carried out.

Regulations are essentially applicable when a company decides to respect a standard or directive or when it delivers products that are subject to legal requirements (like in the medical or transportation markets).

Standards for Quality Control – Statutory Regulations

Standards and directives, such as the ISO 9000 series, are becoming increasingly important for quality assurance in all industrial nations. This standard explicitly requires, among other things, to calibrate all test equipment that directly or indirectly influences the quality of the product. This includes, for example, test equipment that is used as reference measurement standard during the production process.

Zumbach Electronic AG adheres to different directives and standards. The regulations of the FDA (American Food and Drug Administration), for example, are important worldwide with respect to international trading relations. The CFR (Code of Federal Regulation) requires « the calibration of instruments, apparatus, gauges, and recording devices at suitable intervals in accordance with an established written program containing specific directions, schedules, limits for accuracy and precision, and provisions for remedial action in the event accuracy and/or precision limits are not met». European legislation has similar requirements.

Example of a Zumbach measuring unit:

Calibration and self-compensation functions of ODAC® Measuring Heads

Our measuring units are calibrated using reference and also working measurement standards which are certified by the federal office for metrology (www.metas.ch) or by accredited laboratories. Each unit is supplied with a detailed calibration protocol.

A regular check for measuring errors along with the corresponding protocol can be carried out according to the customer requirements. The regularity of these calibrations depends on the customer specific requirements (internal regulations). We recommend a verification of the measurement error every 12 to 24 months.

All the measuring heads of the ODAC® series have a self-compensation function (Patent DE3111356), which makes a regular calibration superfluous, except when components had to be replaced.

All the relevant parameters for accuracy are continuously monitored by the measuring electronics and automatically compensated. This is particularly important for counteracting possible ageing effects of the scanner motor or possible long-term drifts of the measuring electronics.

Documentation

A calibration protocol presents the results of the calibration and documents the traceability to a national measurement standard for the considered physical units in accordance with the International System of Units (SI).

ZUMBACH Electronics
www.zumbach.com

In SKZ technology center

Compounding experts meet in Wuerzburg

In one of 14 presentations at the 12th Compounding Conference, organised by SKZ Süddeutsches Kunststoffzentrum in Würzburg, Germany, SKZ researcher Dr Nikola Kocic reviewed investigations made into biobased alternatives for plasticised PVC, compounded on a Leistritz ZSE27 Maxx co-rotating extruder and injection moulded into test pieces on a Wittmann Battenfeld TM 1300 injection moulding machine.

The work resulted in selection of a close alternative with a formulation consisting of 57 wt% PHB (polyhydroxybutyrate), 19.5wt% biobased plasticiser, 16wt% filler, 5wt% elastomer, 2wt% compatibiliser and 0.5wt% lubricant, resulting in 64% renewable content.

The PHB based compound was perceiveed as suitable for children's toys. This was due to lower Shore D harness of 35 (plasticised PVC 44) and almost three times higher elongation at break of 307% (PVC 97%), offset however by lower tensile strength (9 MPa) compared with PVC (17 MPa) and slightly higher price of €3.0/kg compared with €2.5/kg for PVC. Migration was still low at 0.3% after seven days at 70°C, even though higher than 0.1% for plasticised PVC.

As Manager of the Hexpol TPE Central Technology & Development Centre, Dr Thomas Köppl spoke about Dryflex Green biobased thermoplastic elastomer (TPE) compounds sourced from renewable resources such as plant & vegetable crops. These TPE compounds range in hardness between Shore A 20 and Shore D 50 and in renewable content from 20% to above 90%

Köppl said Hexpol faced a challenge in combining high mechanical properties with high renewable content. In order to perform as well as or as close as possible to conventional fossil-based TPEs, renewable alternatives should have good adhesion to various fossil-based polymers and to PLA (polylactide acid) as a biodegradable bioplastic.

He showed how renewable content for Dryflex Green compounds increases with hardness, from over 20% for Shore A55 through to above 60% for Shore A 80 and above 70% for Shore D 55, with corresponding reductions in carbon dioxide footprint of 1.0, 2.5 (Shore A 85) and 3.5 kg CO_2 equivalent per kg TPE.

Köppl said Dryflex Green is a whole range of materials based on combinations of "building blocks", resulting in "thousands of possible materials and possibilities that make sustainability in daily life a reality". Further opportunities will arise as high renewable content is extended to also include low hardness versions of Dryflex Green, Köppl stated. He likened this with the TPE product development life cycles of observed for conventional TPEs by consultants Robert Eller Associates.

Max Guntern, process engineer at Swiss compounding machinery producer Buss, talked about efficiently compounding highly filled masterbatches with Buss MX Kneader extruders. MX kneading action extruders are characterised by gentler processing than conventional twin screw extruders, resulting in less fibre length reduction and opening up of filler agglomerates without destroying structural properties.

This gentle yet effective processing is achieved with features such as dual rotational and oscillating screw motion to obtain both axial and transverse mixing action, interaction of kneading flights in the mixing screw, station-

ary kneading pins ("teeth") inserted through the barrel, injection of liquid additives into the polymer melt and use of screws with kneading and conveying flight sections.

The result is homogenous filler distribution in the polymer matrix melt, with fillers completed "wetted" by polymer and firmly bonded by use of adhesion promoters, such as silane on aluminium hydroxide (ATH), a filler with flame retardant properties.

Guntern described trials masterbatch production trials with 40wt% carbon black (CB) compounded with 57% LDPE and 3% additives. As low-density filler, CB needs to be precisely metered and homogenously mixed into the melt with optimum shear, Guntern stated.

This highly filled CB masterbatch was compounded at 5wt% with 95wt% LDPE, producing a semiconductive compound with 2wt% CB content, as used for intermediate power cable sheaths, where good CB dispersion is key to formation of an effective conductive network in the plastic.

Extruded film photographs showed better CB filler dispersion with low filter pressure values (FPV) and with the Buss MX Kneader running at 150 kg/h rather than towards or at 250 kg/h. But with CB fed partly at the first screw section together with LDPE and additives, as well by later side feeding on its own, the film strips showed dispersion benefited more from a 60/40 ratio of CB split-feeding than with 70/30.

Overall cost per litre of compounds produced from highly filled masterbatches is lower than with direct compounding of fillers into polymers, Guntern said, although there are theoretical limits to high filler content, depending on spherical particle packing between fillers.

He criticised that raw materials are purchased by weight, irrespective of pressure, temperature and bulk density, while in reality, compounds are used by volume. His compounding cost comparisons therefore focussed on cost per litre.

Dr Jan Diemert of Fraunhofer ICT institute for chemical technology described how "extractive compounding processes" result in virgin and especially recycled compounds with low emission and odour.

He said materials and process parameters affect emissions while compounding and in injection moulding part production, as do the part's final environment and e.g. decoration.

Diemert addressed both total volatile organic content (VOC) and emissions causing fogging. For example, flax fibre reinforced PP composites typically have a high 1,000 µg/kg VOC level, within which over 200 µg/Kg fogging.

Emissions can often be reduced, but in practice only usually to a limited extent, by attention to dispersion, throughput and machinery wear, as well as processing temperatures, residence time, shear energy and the extent of oxidation, Diemert said.

Significant reduction can however be obtained by using the compounding process to reduce emissions. This is achieved by combining process stages, appropriate use of vacuum venting, use of scavenging agents, ensuring continuous extraction, extension of "dry" strand length prior to granulation and venting over extruded strands, Diemert suggested.

He said injection of process gas such as carbon dioxide (CO_2) into the polymer melt at an early stage acts as a scavenger by extracting and stripping out of "contamination" from the melt when it is vented out further along the barrel.

Diemert also spoke about scavenging chemical trials in PP compounding, where nitrogen performed similarly to CO_2 (60 µg/g), water less well (just under 60 µg/g), but isopropanol was better (30 µg/g). CO2 scavenging with fibrous cellulose fibre (FCP) reinforced PP resulted in VOC falling from 78 to 22 µg/g and fogging from 360 to 125 µg/g.

He said extractive compounding with scavengers is highly effective, requires low investment cost and has great potential for optimisation, even though it is laborious to introduce on compounding lines. In general, intelligently optimised processes result in lower emissions, along with significant reduction in odour perception, he observed.

Although extractive compounding hardly affects established process stages, Diemert said care must be taken that to avoid polymer hydrolysis or machinery corrosion. Scavanger material costs range from practically zero for water to 5-10 Eurocents/kg for highly concentrated CO_2 or alcohol, he added.

Dr Ralf Kühn from the R&D department at extrusion machinery producer Coperion described simulation in design and operation of the Coperion ZSK 40 twin-screw extruder. He said material transport simulation in extruders has become an integral part of the design and optimisation process, as verified calculation methods can be applied to e.g. distribution and directions of pressure and shear at different points in the pressure build up zones prior to and just before the die plate.

Partially filled areas and simple mixing processes can be simulated, as can mixing element capability. Simulation of more complex processes, as well as of transport of solid material and melting in the extruder feeding zones represent "challenges that still have to be solved in future", as they will also be "important tools in long-term future design processes", Kühn stated.

Among approaches adopted is mixing simulation based on mechanics of a falling highly viscose drop becoming dispersed through elongation and shear forces in a low viscosity polymer matrix, as well as a low viscosity drop in a polymer matrix of the same viscosity, and how the drop changes direction, deforms and is distributed under the pressure and shear as it is transported by distributive mixing and dispersive mixing elements.

Kühn showed an example of how FEM (finite element modelling) simulation has been used to optimise temperature distribution in ZSK heating and cooling elements, through consideration of the length of the heating process, peripheral loss of energy and distortion of sealing surfaces.

SKZ-KTT GmbH
www.skz.de

Innovative technologies for polymer processing and recycling

Quick and cost-efficient reprocessing of PET industrial and post-consumer waste

The Gneuss Processing Unit (GPU) has been available for several years now and has proven itself on the reprocessing of bulky PET waste such as post-consumer bottle flake and industrial waste from fibre and film manufacture. This Gneuss Processing Unit consists of the Gneuss MRS extruder with its unmatched devolatilisation and decontamination performance together with the highly-efficient Gneuss Rotary Disc melt filtration systems and the Gneuss Online Viscometer for intelligent dynamic viscosity control, monitoring and logging. Additionally to MRS design optimization since the last year, Gneuss has developed the new JUMP system. This is installed directly downstream of the Gneuss Processing Unit and thanks to its ingenious process ensures an accurate and controllable IV boost of the PET in the melt phase. The Jump system is a compact, quick and efficient alternative to conventional SSP (solid state) systems and enables direct reintroduction of the polymer into the production process without the need to re-melt the PET.

With the Gneuss industrial waste concept, industrial waste is first fed through a shredder or a knife mill until the size is reduced so that it can be fed into the extruder. This can mean either compaction of the size reduced waste or a crammer feeder fitted directly to the extruder.

The first important processing stage: melt decontamination takes place in the extruder. With its enormous devolatilisation capacity, the MRS extruder can process PET waste with high residual moisture levels and/or contamination (such as spin finish oils) without the need for any pre-treatment of the waste. In the Multi Rotation (MRS) section of the extruder a huge polymer surface area and extremely rapid surface exchange rate under vacuum ensure that all these volatile contaminants are reliably extracted. Solid contamination is extracted with the fully-automatic and process-constant Gneuss Rotary Melt Filtration System. With filtration fineness's of down to 20 µm and below, a pure and particle – free polymer melt is guaranteed.

During the second important stage of the process, the purified and homogenised polymer is fed by means of a melt pump into the JUMP. Here, too a large surface area of the polymer melt and optimum residence time of the polymer under vacuum are decisive factors. Subsequently, the purified and homogenised polymer is fed by means of a melt pump into the JUMP, where the second important stage of the process takes place. Here, too a large surface area of the polymer melt and optimum residence time of the polymer under vacuum are decisive factors. The polymer melt is kept under vacuum as it passes over slowly rotating elements. Through control of the residence time and the speed of the rotating elements, controlled polycondensation takes place whereby controlled IV boosting takes place of typically 0,02 to maximum 0,3 dl/g. The design of the Jump system avoids the ingress of oxygen so that the yellowing effect encountered during the recycling of PET is reduced to an absolute minimum. After the PET melt has passed through a stilling chamber in the JUMP system, the polymer is pumped directly into the production process (for example direct extrusion spinning, strapping) or to a pelletising (chip cutting) system. With the complete system consisting of the Gneuss Processing Unit with the MRS Extruder and a JUMP system, industrial waste can be quickly and efficiently reprocessed in one processing step to a high quality polymer melt which can be directly processed to a finished product.

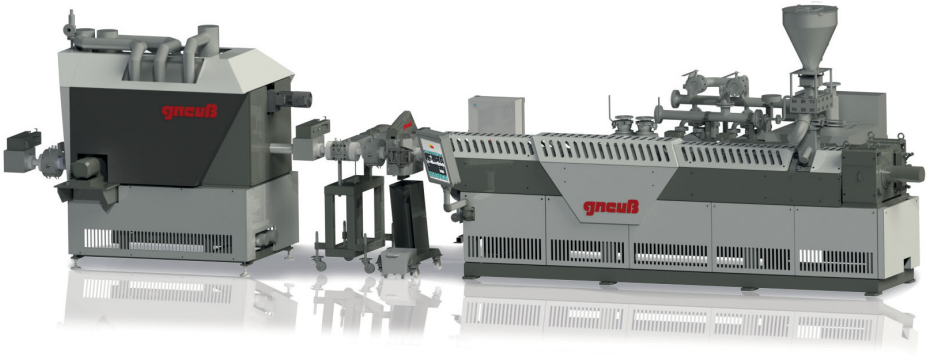
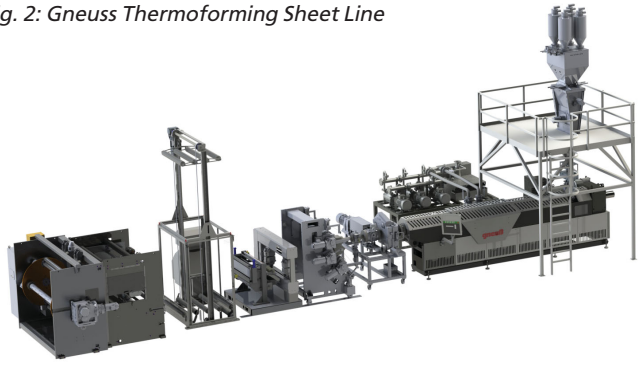


Fig. 1: JUMP Polyreactor with Gneuss Processing Unit GPU

Fig. 2: Gneuss Thermoforming Sheet Line



Gneuss Processing Unit (GPU) gives Sheet PET Lines increased Flexibility and Food Contact Certification

In the worldwide growth industry of PET packaging sheet, Gneuss has installed over 20 tailor-made sheet lines over the last few years. Gneuss´ customers find the extreme flexibility of the Gneuss Processing Unit (GPU), consisting of MRS extruder, Rotary Filtration System, Online Viscometer and Control System completely convincing when processing PET, whether virgin or recycled material and with or without food contact requirements.

Within the packaging industry, the use of PET sheet is on the increase and the use of recycled material is likewise on the increase. Whether the PET sheet is used for transparent packaging for food (trays or tubs for fruit, vegetables, meat, cookies etc.) or for non-food (such as blister packaging) it is always important to take account of the particular properties of PET and it is exactly this which Gneuss has done.

With the Multi Rotation System (MRS) Extruder, Gneuss has developed the only extruder specifically designed not only with the material PET in mind, but with the reprocessing of PET. With the MRS extruder Gneuss offers a processing unit which enables PET to be extruded cost effectively, without any pre-drying or crystallisation. This applies both to the processing of both virgin and post- consumer bottle flake with a residual moisture level of 1 % and in some cases more. The extruder will also easily handle PET / PE scrap (laminated sheet) and mixtures of PET and PETG. Thanks to the extremely high polymer surface exchange rate under vacuum in the MRS section, a vacuum level of only 25 bar is required in order to achieve 100 % moisture extraction. Another effect of the extremely high polymer surface area exchange rate under vacuum is the excellent extraction of volatile contaminants. The system achieves the requirements of the FDA, EFSA and Invima without restrictions. PET sheet made on the MRS extruder is therefore suitable for food contact applications whatever input material is used and without any pre-treatment of the input material.

The Gneuss Processing Unit includes also the unique Gneuss Rotary Melt Filtration System for the efficient removal of solid contaminants with fine filter elements even on post-consumer bottle flake. The Gneuss Online Viscometer ensures a consistent, defined IV value of the polymer thanks to the intelligent control system and is an extremely useful tool for quality monitoring and control.

Gneuss offers complete lines including the up- and downstream components from the material dosing system to the die, roller stack and to the winder, which are all tailored to the exact requirements of the individual customer.

The Gneuss GPU can also be used to produce foam sheet from PS or PET with up to 30% weight reduction and even higher depending on the application. The system is fully flexible and no mechanical changes are necessary when switching from transparent sheet to foam sheet production. Also the use of up to 100% PET Bottle flakes is possible in both applications.

Revision of process and pressure constant Rotary Filtration Systems for the widest range of different applications

Both the RSFgenius as well as the SFXmagnus ranges have been completely revised during 2016. Modifications to the screen changer housings permit operation on a wider range of applications at higher pressures, whilst offering enlarged active filtration areas. Components and modules have been commonised between the two ranges in order to offer even more attractive value for money and shorter delivery lead times.

The patented RSFgenius Filtration Systems operate fully-automatically, process and pressure-constant and with a back-flushing system with unmatched efficiency. They are therefore especially suitable for demanding applications with high quality requirements.

The SFXmagnus range of automatic screen changers is characterised by an extremely large active area in a compact unit. This range of screean changers is available with or without an integrated back-flushing piston depending on the exact requirements of the process.

New for PVC processing is the SFpvc R, a further development of the SFpvc. Both models are designed specifically for challenging PVC recycling applications but the new SFpvc R offers for the first time an integrated self-cleaning (back flushing) system whilst maintaining absolute process-constant operation.

Highest quality, short delivery times: even for individual, tailor–made sensors

Gneuss offers individually tailor- made melt pressure and melt temperature sensors even outside of the typical market standards. As a machinery manufacturer, Gneuss has the manufacturing capabilities to realise even unusual sensor requirements. The lean manufacturing structure at Gneuss makes this possible with shortest delivery times. Gneuss sensors are available to match regional or application – specific requirements such as Atex, Hart Communication or EAC.

The new DAIL melt pressure transducer range from Gneuss is a special addition to the range, specifically for pressure overload protection. Whether as an economic single sensor system for standard applications or a complete system solution for explosion hazard environments, Gneuss has a pressure monitoring system for every application.

Gneuss Kunststofftechnik GmbH
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