

01/2018

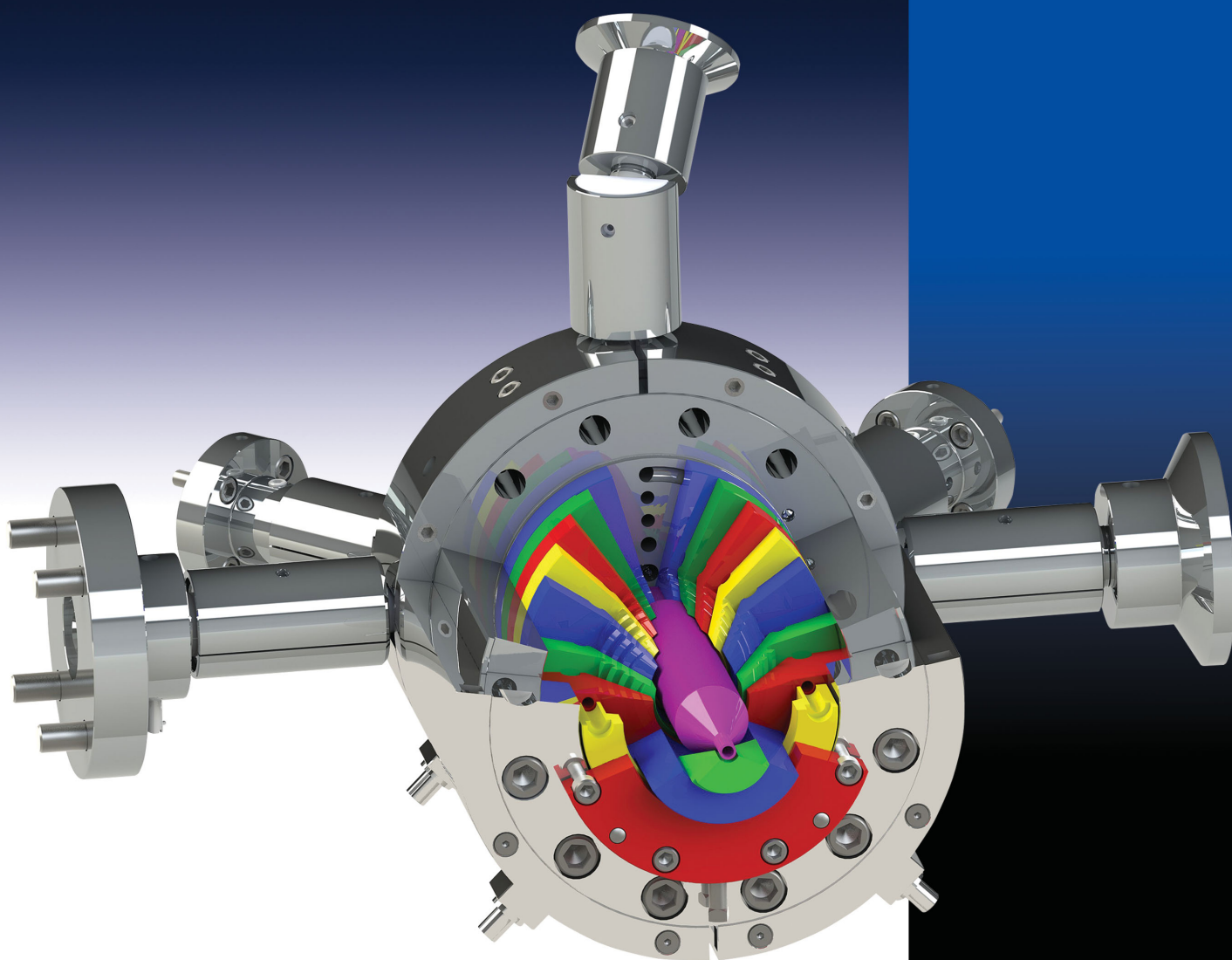
VM VERLAG
Cologne /Germany



EXTRUSION

INTERNATIONAL

DIGITAL



Guill
EXTRUSION TOOLING

Recycling problems? Not any more!



"PCL" separation combination: feeder (right), blade unit (centre) with several replaceable cutting blades, haul-off unit (left). The caterpillar pairs are fitted with standard pads like the ones generally used in profile production.

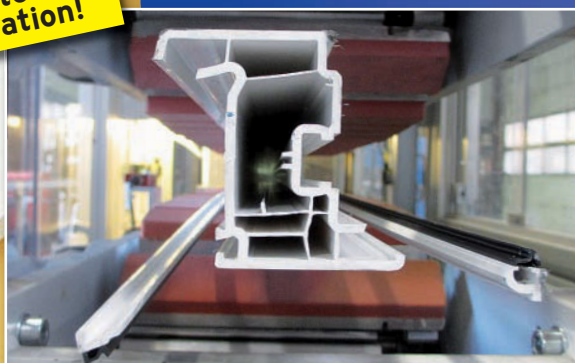
You know the problem. Cassettes of window profiles pile up with sharpened sealing lips or co-extruded top layers since recycling of this material bond has previously been very complex.

"PCL" non-cutting separation combination for unmixed RECYCLING of window profiles

This new STEIN machine generation solves the problem by moving the profile past specifically arranged stationary blades and cutting off the undesirable material components in the process. A pre-set blade block is locked in place for each profile type in order to reduce the set-up time.

You ultimately get an unmixed profile that constitutes about 80% of the original extrudate and can be 100% fed back into the production process after grinding.

Another new
and patented
innovation!



This new STEIN machine is easy on resources, saves material, storage costs and time-consuming sawing of window profiles and speeds up recycling.

A detailed description is available on request. You will be impressed with the functionality!

The non-cutting separated parts on the left and right stand out. The centre picture shows the unmixed profile that can be fed back into the production process.

in Extrusion

RAZ and RAZR caterpillar haul-off unit (pivoted)

The STEIN caterpillar haul-off units are suitable for removing a very wide variety of profiles with horizontal pads or high pads. The new patented **PIVOTED RAZR caterpillar haul-off unit**, first exhibited at the 2013 K Trade Fair, is continuously adjustable from 0-90 degrees, does not need any form pads and makes fast profile change possible.

The function of the caterpillar haul-off units with their innovative details:

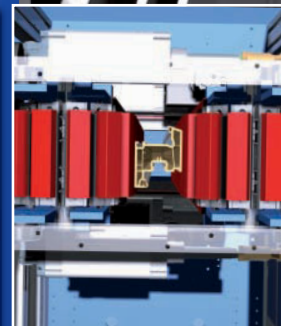
- ✓ The pre-stretched double chains do not prevent any other elongation during operation. The chains are supported by high-molecular anti-friction material that can be easily changed.
- ✓ The lower caterpillar guide is permanently connected to the machine base. The upper caterpillar can be guided sturdily upwards on the infeed and discharge sides. The contact pressure is ensured by a precision controller with adjustment of the back pressure to relieve weight.
- ✓ The innovative **TILT LOCK** is designed to be supported on the next pad part, thus preventing tilting even with high pads. They can be quickly replaced via a quick-release lock.
- ✓ The caterpillar haul-off unit can be pivoted 90 degrees so that the upright extruded profile on the even surface can be removed. There is thus no need to change the pads (see image on right).
- ✓ The specific drive concept provides optimal **anti-slip control** that minimises wear and tear of pads even when critical profiles are used. No need to worry any more about pad imprints. This type of control guarantees optimum production conditions since both caterpillar speeds align.

STEIN MASCHINENBAU arrived in the future long ago! Use this innovation to give you a competitive edge.

„STEIN BLUE-LINE - for a sustainable future“ stands for sustainable and energy-efficient equipment. Nearly 100% domestic production and high vertical integration guarantee maximum demand.



Pivoted RAZR caterpillar haul-off unit



Pad with tilt lock



STEIN Maschinenbau GmbH & Co. KG

Wartbachstr. 9 · D-66999 Hinterweidenthal/Germany
Tel. +49/63 96/92 15-0 · Fax +49/63 96/92 15-25
stein@stein-maschinenbau.de · www.stein-maschinenbau.de



Made in
Germany

Firms in this issue	6	material handling	
Imprint	7	Automatic Raw Material Handling	24
industry news	8	measurement	
Calendar	8	QUANTUM 360 for Pipe Extrusion: 360-Degree Measurement of Wall Thicknesses and Diameters	26
Friul Filiere: 40th Anniversary	8		
First Converting 4.0 network meet in at KAMPF	11	inspection technology	
Reifenhäuser + EDS: Acquisition	11	100% In-Line Inspection of Composite Materials for the highest process reliability and resource efficiency	28
Maag + Ettlinger: Acquisition	12	measurement	
European Plastics Industry works towards 50% plastics waste recycling by 2040	12	All Components in View – Measure any Offshore Flexible	30
TPEs for Medical and Pharmaceutical Markets	13	pharmaceutical packaging	
First Recycling Line equipped with Odor Reduction Technology put into Operation	14	CCIT Technologies for Pharmaceutical Packaging	32
Post-consumer PE Film Recycling – also in South Africa now	14	blown film	
Aerospace composite solutions at JEC World 2018	15	New Blown Film Line with Numerous Innovative Features	34
Automation of Roller Shutter Production	16	extrusion tooling	
Automated Blender Cleaning introduced	16	Getting the Most from Extrusion Tooling	36
More Turnkey Production Systems for High-Volume Production	17	measurement technology – success story	
recycling		„Our cooperation is driven by the highest quality standards“	38
Cooperation to improve Plastic Bottles Recycling & Sustainability	18	extrusion technology	
The New Compound Rework System 1000	20	New Equipment & Innovative Control System to meet Challenges in Extrusion	40
A New Take on Bottle-to-Bottle	21		
Sensor-Based Sorting Technology	23		

A new CarbonLITE recycling facility, located in Dallas, Texas, started operations in September 2017. The washing line supplied by AMUT has the state of art of the technology and is the second plant of this size in operation in the USA.

Page 18



On the occasion of TireExpo 2018, KraussMaffei Berstorff showcased the new Compound Rework system 1000 (CRS 1000). This innovative solution is designed for processing scrap material generated during extrusion processes in the rubber processing industry.

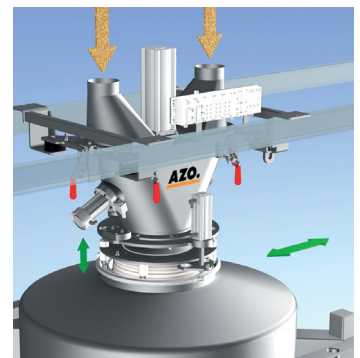
Page 20



It is hard to imagine packaging without the use of plastics. Everything reaches the supermarket shelves in containers made of PP, HDPE, or PET. But in contrast to PET bottles, the collection of used containers made of polyolefins is still in its early stages.

Page 21

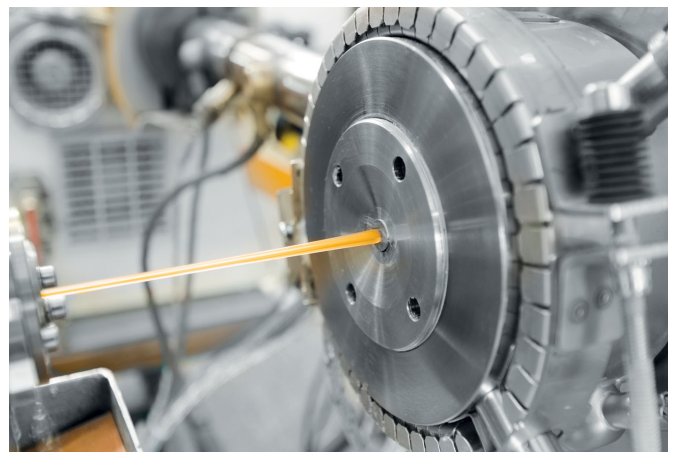
At Powtech 2017 the AZO Group demonstrated solutions for automatic handling of large and medium components and the integration of small components and ingredients in the automated process.



Page 24

Pfeiffer Vacuum can offer its customers a complete range of leak testing and leak detection solutions. At the Pack Expo, Pfeiffer Vacuum and ATC was presented a wide range of CCIT (Container Closure Integrity Testing) technologies for pharmaceutical packaging.

Page 32

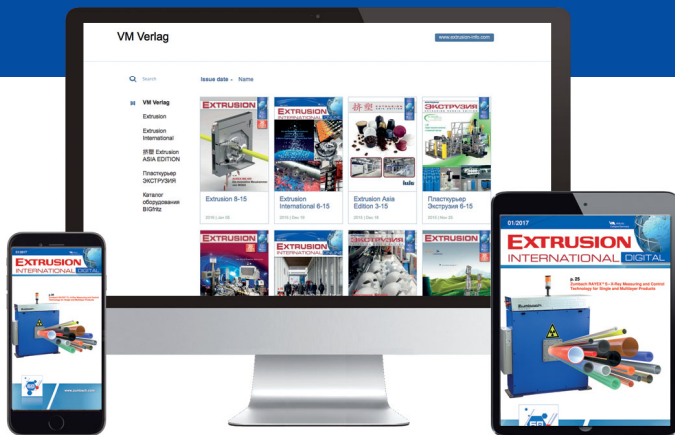


The Collin blown film line presented itself completely updated at the Fakuma 2017 booth. Because the technically and optically optimized machine enables perfect blown films via the Collin bubble control.

Page 34

Index of Advertisers, companies and fairs referred in this issue

Advanced Blending Solutions	16	Jwell.....	13
AMUT.....	18	Kampf	11
AZO	24	Kraiburg TPE.....	13
Baruffaldi.....	16	KraussMaffei Berstorff.....	15, 20
battenfeld-cincinnati.....	40	Maag	12
Collin	34	motan-colortronic.....	7
Dieffenbacher.....	17	Pfeiffer Vacuum	32
EDS.....	11	Plastics Converters.....	12
Ettlinger.....	12	Reifenhäuser Group	11
Friul Filiere.....	8	Sikora.....	38
Guill	Front Cover, 36	Starlinger.....	14, 21
Henkel	15	Stein Maschinenbau	Inside Front Cover+3
Herbold Meckesheim	14	Tomra.....	23
iNOEX.....	26	Weber, Hans	9+10
IPTF 2018.....	41+Back Cover	Zumbach	30
ISRA	28		



**Subscribe
for a year
free of charge!**

Annual subscription to the digital magazine

Extrusion International

- **Free of charge**
- **Just** leave your **e-mail address**. No spam. Your data is safe
- Get **immediate notifications** when new issues are published and read online

www.plastic.expert



The Extrusion International Digital/Print Magazine is published bimonthly by VM Verlag GmbH. P.O.Box 501812, D- 50879 Cologne, Germany

EDITORS

Dr. Yury Kravets (Editor-in-chief)
Tel. +49 2233 979 2976
y.kravets@vm-verlag.com

Bettina Jopp-Witt
Tel. +49 221 546 1539
redaktion@vm-verlag.com

Alla Kravets
Tel. +49 2233 949 8793
a.kravets@vm-verlag.com

ADVERTISING SALES

Martina Lerner
Tel.:+49 6226 971515
lerner-media@t-online.de

ADMINISTRATION

Alla Kravets
Tel. +49 2233 949 8793
a.kravets@vm-verlag.com

PRINTING

h-mailconcept e.K.
directmarketing
Venloer Str. 1271, Cologne, Germany

SALES REPRESENTATIVES

Quaini Pubblicita (Milano IT)
Tel. +39 02 39216180
grquaini@tin.it

Worldwide Services Co., Ltd.,
(TAIWAN)
Tel. +886-4-2325-1784
global@acw.com.tw

Tokyo PR Inc. (Japan)
Tel. +81 (3) 3273-2731
extrusion@tokyopr.co.jp

Reprints, Translation etc

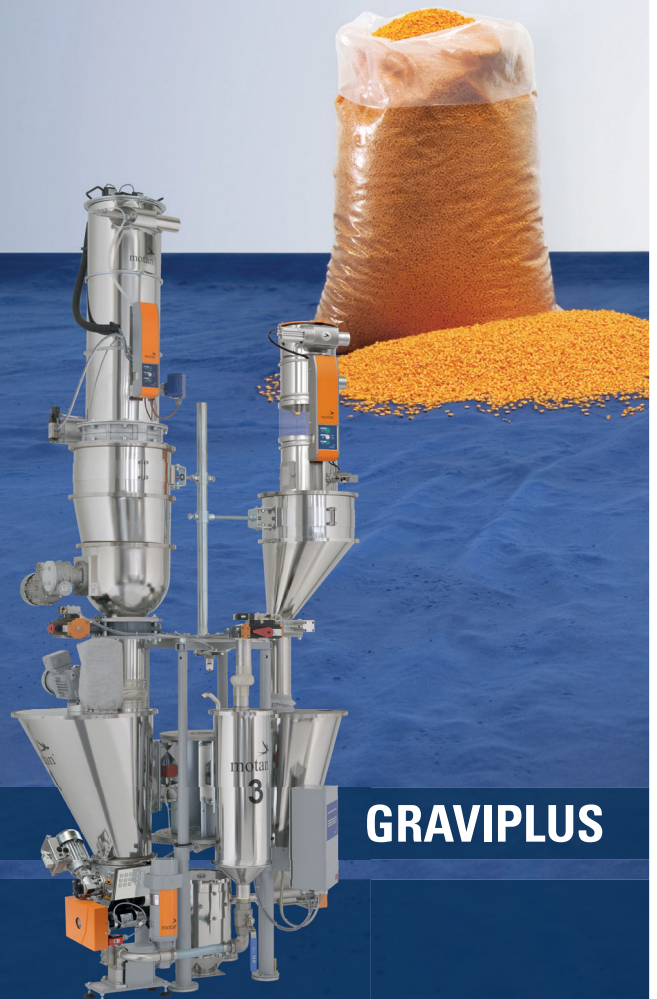
No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photographic, recording or otherwise, without prior permission of the publisher.

www.extrusion-info.com



For the smallest to the largest volume

 think materials management



GRAVIPLUS

Ideal for any throughput.
Hassle-free consistent dosing.

motan-colortronic gmbh - info@motan-colortronic.de
www.motan-colortronic.com



JEC World 2018

International Composites Show

06. - 08.03.2018, Paris, France

www.jecomposites.com/events/jec-world-2018

Plastics & Rubber Vietnam 2016

International Plastics & Rubber Technologies and Materials Exhibition

20. - 22.03.2018, Ho Chi Minh City, Vietnam

www.plasticvietnam.com/the-exhibition

Latin American Summit on Innovation in Plastic Packaging

18. - 19. 04. 2018

Mexico City / Mexico

www.cumbreenvases.com

CHINAPLAS 2018

International Exhibition on Plastics and Rubber Industries

24.-27.04.2018, Shanghai, PR China

www.chinaplasonline.com

NPE 2018

The Plastics Show

7.-11.05.2018, Orlando FL, USA

www.npe.org/

PLAST 2018

International exhibition for plastics and rubber industries

29.05 - 01.06, Milano, Italy

www.plastonline.org

3D PRINT Congress & Exhibition

05. 05. - 07. 06. 2018

Lyon / France

www.3dprint-exhibition.com/en

Colombia Plast 2018

24. - 28. 09. 2018

Bogotá / Colombia

Acoplasticos

www.colombiaplast.org

Powtech India

11. - 13. 10. 2018

Mumbai / India

NuernbergMesse India Pvt. Ltd.

powtechindia.com



40th Anniversary

■ Friul Filiere after a year of intense research and results with high technological value, celebrated its 40th anniversary (17 January 2018). The new extrusion line, FUTURA40, with its name wants to pay homage to this event. Finding roots in the past of which it has treasured, it is projected – literally – in a new and avantgarde dimension but together with the whole company.

It is only the latest of many new features that have followed each other to satisfy customer demands. The market (Italian, European and international) requires more and more special products and the possibility of finding, in Friul Filiere, a single point of reference, able not only to produce machines and equipment but also to provide technological solutions and process know-how on turn-key projects for the extrusion of profiles and pipes, becomes a guarantee of a complete service (represented by the Friul Filiere NEXTRUSION CIRCLE).

The commitment to research has been constant and productive, prompted by ambitious requests for applications in the most different sectors. This is witnessed by a series of technologies developed in 2017: Lines, toolings and process know-how for the extrusion of

- thermal-break multiple exits profiles in PA66 + glass fibers with application in the windows sector
 - PC profiles, transparent like glass and embossed, dedicated to the LED lighting sector
 - Resysta profiles, compound in granule or powder, consisting of 60% of rice husk, added to a vinyl matrix, highly performing in outdoor applications complete lines
- Complete lines, die heads equipped with TUBEASY system (patent for centering the flow thanks to only 2 screws), special calibration systems and know-how for the extrusion of
- 6-8mm diameter pipes in PA6-PA11 at the highest speed ever achieved (110 mt / min)
 - rods with and without inserts but also tubes, in special materials such as TPU
 - corrugated and no corrugated metal hoses coated with extreme thermoplastic materials such as TPU,

Technical solutions design and special machines production for

- punching, belling, cutting, stretching pipes and profiles
- all surface finishes
- coextrusion and post-extrusion of different materials.

FUTURA 40 new downstream



► Friul Filiere Spa
www.friulfiliere.it

Do you have a smartphone? Then you probably already **know** that complicated technology has **always** required very simple operation. Consequently some of **our** engineers received a **new** task last year: the development of an **extruder control** that would make operation of our systems even easier. This is **part** of our innovation claim. Are you curious about the result? We invite you to **discover** the simplest extruder control of all times. **Do** you want to know its name? It is called **WPS3**. And it is now used in nearly all WEBER extruders. Please contact us! Click and find out: www.hansweber.de



Extruder Technology



WPS3 – the brand new “cockpit” for WEBER extruders

More structured, more intuitive, simply better: Nearly all WEBER extruders now feature the WPS3 operating unit. This new development now makes controlling the systems even easier. The 21.5“ touch screen with full HD resolution (16:9) and the modern smartphone display structure make operation of the extruder easier than ever before.



Scan Code and learn more about WPS3
extrudertechnologie.de/1/features/

Features

- // Operating system on Windows 7® basis
- // Intuitive operation
- // Key pads and wheel integrated into the panel for precise setting of target values
- // Graphic display of the machine on a full HD touch screen (16:9)
- // All relevant machine data at a glance
- // Integrated analysis functions
- // Integrated SQL server for data recording and web server (PHP) for data queries
- // Integrated interfaces CAN bus and X2X bus
- // Optional: Profibus, Powerlink and OPC
- // Remote query if an internet connection is available
- // Pre-heating of the machine using timer function

Hans Weber Maschinenfabrik GmbH
Bamberger Straße 20 · 96317 Kronach · Germany
Phone +49 9261 409-0 · Fax +49 9261 409-199
info@hansweber.de · www.hansweber.de

WEBER

First Converting 4.0 network meeting at KAMPF

■ On November 16th, 2017, the first Converting 4.0 network meeting took place at Kampf Schneid- und Wickeltechnik GmbH & Co. KG in Wiehl (Germany). More than 70 visitors from 40 well-known companies dealing with the topic slitting and winding of web-shaped materials as well as specialists from the automation, IT and sensor industries gathered at Wiehl's main location.

The Federal Government communicated the project "Industry 4.0" with the aim of interlinking industrial production with modern information and communication technology. A networking of all systems in the course of the "Industry 4.0 Process" is of central importance for the metal and electrical industry as well as the exporting machine construction industry. KAMPF made this topic a lead theme of its development agenda at a very early stage. The company founded the "Converting 4.0" network. The goal was to create solutions for the digitized processes of the future in interdisciplinary teams – to great success. In spring 2017, KAMPF presented the new product "the@vanced" as the basis for a partner network to map the entire value chain, and the first external network pioneers started together with KAMPF.



The lectures in the "Wissenswerk" here Professor Dr.-Ing. Christin Brecher

The absolutely new integrative platform the@vanced received a thoroughly positive market feedback. This software serves as an instrument to increase efficiency, not only of the slitting and winding technology, but of the entire production process. Products or components are networked on this platform, and the data is holistically evaluated and used to initiate appropriate optimization measures.

► www.kampf.de

Acquisition

■ As of January 17, 2018, EDS GmbH an international supplier of high-end extrusion tools is part of the Reifenhäuser Group. EDS is a specialist for flat dies with headquarters in Reichshof-Wenrath, North Rhine-Westphalia, Germany. EDS GmbH will operate within the Reifenhäuser Group as a separate independent business unit. Johannes P. Müller, the previous owner, will continue to run EDS GmbH, together with Uwe Gaedike, Director Operations at Reifenhäuser,

Johannes P. Müller, managing director and former owner of EDS (left) and Bernd Reifenhäuser, CEO of Reifenhäuser Group



who is also responsible for developing the components business of the Reifenhäuser Group.

"EDS and Reifenhäuser complement one another excellently when it comes to design and production expertise. As an effective team, we will use and expand on our strengths together," says Bernd Reifenhäuser, Chair of the Management Board. "Both companies have a reputation for close and responsible collaboration with our customers. This means that customers can avail of the expertise and support that they require." Johannes P. Müller, Managing Director of EDS: "We are proud to now be a part of the Reifenhäuser Group. We will combine our strengths and pool our technology and production resources. This, along with a worldwide sales structure for our customers, will considerably increase our ability to perform."

With this take-over, Reifenhäuser remains faithful to its strategy: To ensure its long-term success, the Troisdorf company strives for technological leadership through in-house developments and the acquisition of know-how in market-relevant technologies. "This take-over perfectly complements our existing expertise in die production," emphasizes Uwe Gaedike. With the die specialist EDS, Reifenhäuser takes a great stride towards its goal of always delivering the best extrusion process. When it comes to die production, EDS stands for tailor-made products. "Together with the Reifenhäuser production know-how we will develop a strong business for the sale of first-class dies," explains Uwe Gaedike.

“With the latest acquisition we continue to move towards our goal of designing and producing core competencies in-house. Besides machine manufacture, we are positioning ourselves as a leading technological component provider for extruders and dies,” says Gaedike about Reifenhäuser’s strategy. With the new unit, the design know-how for die and film tools will be strengthened significantly.

“The excellence of EDS’ work and our common understanding of values were the basis for our decision to enter talks on a future together,” Bernd Reifenhäuser says about the acquisition. The two companies stand for highest quality, well-trained employees, advanced technologies, and sustainable

business models. “We would like to welcome all the employees from EDS and look forward to collaborating with specialists who are well-known in the industry. Together, we will pick up momentum,” says Bernd Reifenhäuser. In addition, Reifenhäuser is strengthening the Troisdorf site and making new investments in the manufacture of components. The EDS site in Reichshof will be turned into a technology and service center for dies.

Reifenhäuser Group
www.reifenhauer.com

Acquisition

■ Ettliger announced that they have been acquired by the Swiss Company Maag, a business unit of Dover Corporation. Ettliger Kunststoffmaschinen GmbH was founded in 1983 and is today a globally recognized brand. The German company has its headquarters in Königsbrunn, near Augsburg and an American sales and service subsidiary in Atlanta, Georgia. Its core expertise is the development and manufacture of high performance continuous melt filters and injection molding machines. Ettliger melt filters are used for processing heavily contaminated material streams as well as extrusion applications where pressure stable filtration is desired.

Switzerland-based Maag Pump & Filtration Systems is a worldwide leader in the manufacture of gear pumps, pelletizing systems, and filtration systems for demanding applications in the plastics, chemical, and petrochemical industries. Maag and Ettliger with their combined expertise, innovative products and advanced technologies will leverage the polymer, compounding and recycling industry. Ettliger will benefit from Maag’s global network and will be able to strengthen its worldwide service and support.

Both companies will go to the market under their existing brand names. Ueli Thuerig, President of Maag, will head the combined business.

“Maag’s strong sales and service channel will provide us a greater penetration into new markets and will allow us to provide excellent local support to our existing customers,” says Volker Neuber, CEO of Ettliger.

In the coming weeks, Ettliger and Maag will be focused on seamlessly integrating their teams, to better serve their customers through vertically integrated product offerings and services.

Ettliger Kunststoffmaschinen GmbH,
www.ettlinger.com

European Plastics Industry works towards 50% plastics waste recycling by 2040

■ Six European organisations from the plastics value chain have committed, in cooperation with the European Commission, to launch Circularity Platforms aiming to reach 50% plastics waste recycling by 2040. These will drive the recycling of plastic products in Europe and considerably reduce littering volumes.

Plastics Recyclers Europe (PRE), Petcore Europe, the European Carpet and Rug Association (ECRA), the Polyolefin Circularity Platform (PCEP Europe), European Plastics Converters (EuPC) and VinylPlus® have adopted a framework of voluntary commitments to continue and expand existing plastics recycling activities and create additional circularity platforms inspired by the good example set by VinylPlus® and Petcore Europe.

The transition towards a more circular economy is a herculean task that demands a strong commitment and concrete actions from all involved parties. A real industrial transformation can only be accomplished through the strong engagement of the plastics converting industry, backed up by stakeholders from the entire plastics value chain. Divided actions will not make a significant difference. Accomplishment of ambitious sustainability targets also depends on the support of national authorities and European legislators.

The aim of the various Circularity Platforms and their voluntary commitments is to develop common goals and actions for a sector as large and fragmented as the European plastics industry, representing more than 60,000 companies (mainly SMEs). The extremely ambitious goal to reach 50% recycling and reuse of plastics waste as well as 70% recycling and reuse of plastic packaging can only be reached through platforms involving the entire value chain: from raw material producers, designers, converters, collectors and recyclers to brand owners and specifiers.

www.plasticsconverters.eu

TPEs for Medical and Pharmaceutical Markets

■ With the development of THERMOLAST® M the manufacturer KRAIBURG TPE offers compounds that are approved for use in direct contact with blood and medications. These materials can be colored in conformity with medical compliance requirements and open up new potential fields of applications. TPE compounds of the THERMOLAST® M portfolio can be used for medical and pharmaceutical applications such as primary medical packagings, hospital care applications and resealing membranes.

Medical and pharmaceutical products must fulfill uncompromising requirements for safety, quality and reliability. THERMOLAST® M compounds from KRAIBURG TPE have passed standard biocompatibility certifications. These portfolio materials are certified according to DIN ISO 10993-5 (cytotoxicity), -10 (intracutaneous irritation), -11 (acute system toxicity), USP Class VI (chapter 88), and DIN ISO 10993-4 (hemolysis). These certifications enable processing of the compounds for use in direct contact with medications and blood. In addition, a drug master file (DMF) for the materials is on file with the US Food and Drug Administration (FDA). KRAIBURG TPE is therefore committed to consistent adherence to the specified formulation and manufacturing process. Any necessary changes are announced and implemented in accordance with a defined change control process. After announcement of a change, KRAIBURG TPE guarantees delivery for a period of 24 months and also has the purity of the raw materials guaranteed by its suppliers.

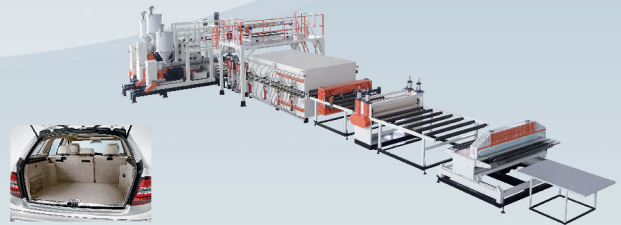
Compounds for medical technology or medical applications are manufactured at KRAIBURG TPE only on special equipment reserved for these products. The company offers its customers in the medical and pharmaceutical sector an extensive service package that ensures maximum control with respect to quality, safety and reliability. THERMOLAST® M compounds can conform to cleanroom processing standards and can be sterilized using standard techniques such as gamma or beta radiation, ethylene oxide or steam.

TPE compounds of the THERMOLAST® M portfolio can be used for medical and pharmaceutical applications such as primary medical packagings, hospital care applications and resealing membranes (Photo: © 2018 Aptar Pharma)



■ KRAIBURG TPE
www.kraiburg-tpe.com

JWELL®



PP Honeycomb Board Extrusion Line



Double Wall Corrugated Pipe Extrusion Line



Fast Loading Wallboard Extrusion Line

SHANGHAI JWELL MACHINERY CO.,LTD.

Add:No.111 Chun Yi Road,Jia Ding District., Shanghai

Tel: 86-21-69591818 69591111

www.jwell.cn

E-mail: sales@jwell.cn



First Recycling Line equipped with Odor Reduction Technology put into Operation

■ Following the installation of the first of two recycling lines type recoSTAR dynamic 165 C-VAC in Houston, Texas, Avangard Innovative LP is now ready to start processing of post-consumer film at its new recycling plant. Depending on filtration fineness, the line achieves an output of up to 3,300 lb/hr. To ensure that the regranulate not only performs but smells like virgin material, both lines are equipped with Starlinger's odor reduction technology.

Avangard's material comes from retail packaging film that contains a high amount of paper labels. The initial goal of the test run at Starlinger's technology center was to remove as much paper contamination as possible with minimal melt loss. Processing went smoothly, but when the client inspected the material in the US, it was discovered that the pellets had taken on an unpleasant odor. An investigation showed that the smell had been caused by the exposure of paper residues to heat during the extrusion process. Consequently, Avangard asked an additional requirement of Starlinger's technology: production of odorless recyclate.

LDPE film was obviously not a challenge, but the high paper content called for an extension of the line with an extra process step: odor reduction. Through optimal preparation of the material in the SMART feeder and excellent

degassing in the C-VAC module, this process already extracts a large part of the smell during extrusion, and the Smell Extraction Unit (SEU) further enhances the quality of the final pellet.

Avangard Innovative has a long history in trading LDPE film that it obtains from a variety of sources, and expanding into processing this film seemed like the next logical step. In March 2017, the company announced the opening of a brand-new LDPE film recycling plant for post-consumer waste at its existing facility in Houston. A major reason for venturing into film recycling is availability of input material – an evaluation of material streams showed PE film to be available in large quantities (up to 100 million pounds of film per year). Another reason is the advancement of recycling technology over the past years; due to cutting-edge extrusion and filtration systems, washing is no longer an absolute necessity for the recycling of post-consumer film. With a second Starlinger line being installed early this year, Avangard is all set to supply the US market with odorless, high-quality regranulate.

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

Post-consumer PE Film Recycling – also in South Africa now

■ The first large-scale plant for the recycling of heavily contaminated PE film waste has now started running in Germiston South, near Johannesburg.

Charles Müller (Managing Director) and Deon Swart (Technical Manager in front of the HERBOLD plant)



Delivered by HERBOLD MECKESHEIM, the plant can process up to 8,000 tons per year of film, used big bags and similar waste. The waste coming in bales are pre-sorted, shredded and foreign bodies are separated by means of a pre-washing unit in which also a first washing takes place.

Afterwards, further contaminations are dissolved in a wet granulator under intensive friction; a subsequent friction washer separates the dirty water from the product.

A hydro cyclone separates foreign plastics and specifically heavy contaminations from the target fraction. This separation process has a particularly high separation effect and ensures the high quality of the produced film flakes.

In two drying steps, centrifugal dryer and hot air dryer, the product reaches a residual humidity which is suitable for the further material processing to pellets in a downstream extruder. With this recycled material high quality film can be produced.

■ HERBOLD MECKESHEIM GmbH
www.herbold.com

Aerospace composite solutions at JEC World 2018

■ Sky's getting busy: Boeing and Airbus forecast a worldwide demand for up to 40,000 new aircrafts over the next two decades. With a 10-year production backlog and new aircrafts increasingly counting on light-weight composites, both Henkel's expertise in process automation and its high-impact solutions for the aerospace industry are in high demand. To serve this growing demand for high-impact solutions in the market, Henkel has started the construction of a new production facility for aerospace materials at its site in Montornès del Vallès, Spain. The facility will include new buildings and equipment for additional production and warehouse capacities to further support key trends in the industry such as light weighting and automation. Due to the proximity to several sites of global key customer Airbus, Montornès will become Henkel's European hub for the aerospace industry.

At JEC World 2018 on Booth G48 in Hall 6, Henkel's specialists will be available to discuss the benefits of the company's broad product portfolio and global service capacities for composite applications in aerospace. One of Henkel's major spotlights at the show will be on newly developed Loctite potting compounds for honeycomb sandwich assemblies used in the aerospace industry. Particularly in terms of micro-cracking resistance, density/strength ratio and flame retardancy, these advanced materials feature major improvements over conventional potting compounds.

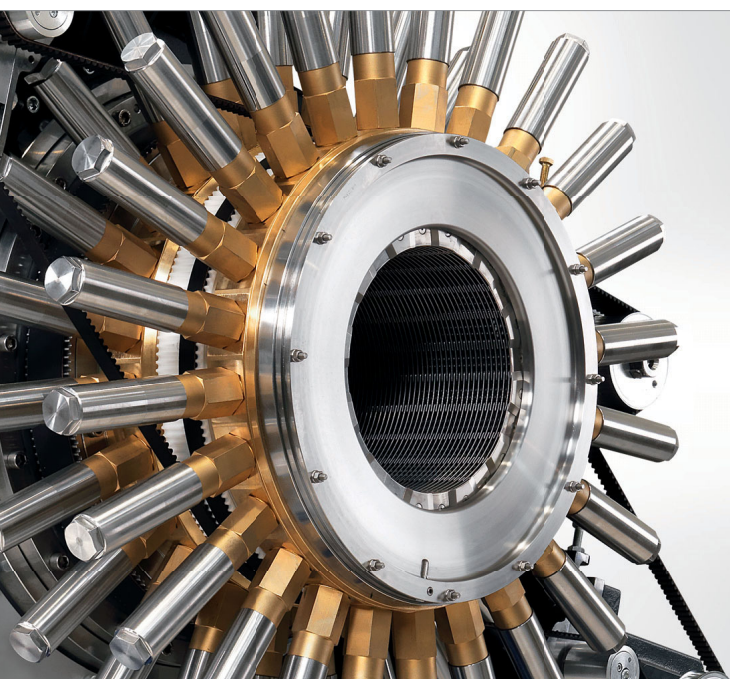
Typical applications include primary and secondary structures, such as fuselage and wing components, as well as interior panels.

The new "Aerospace Potting Compounds" will be featured in a special presentation scheduled on March 08 at 13:00 hours.

"The aerospace industry has a growing demand for consolidated structural designs capable of providing significant reductions in weight, fuel consumption and CO₂ emission as well as manufacturing time and system cost," says Ron Habermas, Global OEM Market Development Manager for Henkel. "Our comprehensive product offering is addressing these challenges, while we also provide extensive engineering expertise to support the rapid development, testing and optimization of composite applications. In addition, the new Montornès plant will significantly improve our supply capacities for European customers."

Further highlights on display will include a broad range of fast-curing Loctite liquid shim materials, lightweight high-quality Loctite surfacing films (including Lightning Strike) as well as various priming and surface treating solutions.

■ Henkel AG & Co. KGaA
www.henkel.com



www.kraussmaffeiberstorff.com

With QuickSwitch technology, benefit from maximum flexibility and availability

- Flexible dimension and wall thickness changes at the push of a button
- Reduced stoppage and changeover times
- Minimum scrap
- Lower costs due to time savings
- Small lot sizes and special dimensions also possible
- PE, PP and multi-layer pipes possible

Chinaplas, hall 2H, booth T01

NPE, West Hall Level 2, hall A, booth W403

QuickSwitch – The best in fully automatic in-line dimension changes

Engineering Value

KraussMaffei
Berstorff

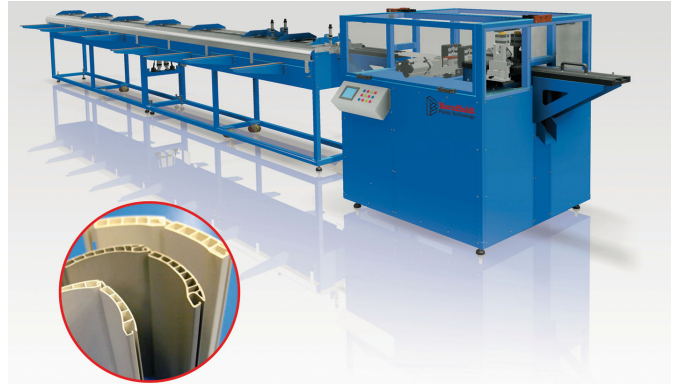
Automation of Roller Shutter Production

■ Since it was established in 1953 Baruffaldi has created a solid reputation at an international level as a manufacturer of extrusion tools and extrusion lines for plastics, automatic in-line and off-line machines for PVC profiles, cable and installation ducts for the electrical industry as well as special machines and turnkey projects. One of its flagships is its wide range of assembling machines for PVC and aluminum roller shutters. This includes a rich variety of solutions for the most different production needs.

For the roller shutter systems all started by studying special high productivity inline machines dedicated to the production of roller shutters i.e. Combiroll and 6.5mt long slat packs i.e. Combipack, in single and dual strand, with productivity up to 2 x 15m/min. These are automatic modular machines complete with punching, interlocking, cutting and assembly units, also available in the pneumatic version and with brushless motors for high performance.

In the course of the last decade, the company completed their automatic roller shutter system range with Pin Inserters and Cap Inserters. This new generation of machines represents the off line evolution of the traditional Combiroll in-line technology. They come with different degrees of automation, to meet the production needs of the customers and can be used for both PVC and roller shutter profiles.

Pin Inserters and cap inserters are off-line systems especially designed to produce PVC and aluminum roller shutters starting from 6,5 meter long slat packs or from profiles already cut to length, thanks to the modularity of the Baruffaldi systems. Pin inserters are equipped with a pin interlocking unit, whereas cap inserters are equipped with two interlocking units that insert plastic caps at both profile ends. Both plants can process all different profile geometries thanks to the flexibility of the Baruffaldi system.



The last cap inserter named CAP-SP, where SP means special, is a customized machine that can process both PVC and aluminum roller shutter profiles and represents the results of the efforts of Baruffaldi's R&D team to design a high performance and automated solution only for the cap insertion phase.

In the latest versions of PINCO 6.5 for PVC and aluminum profiles, the company enriched the plant configuration with a built-in computer and a labelling unit that interfaces with the customer manufacturing system.

Baruffaldi exhibits at the forthcoming exhibition R+T (Stand 9D52 in Hall 9), the world's leading trade fair for roller shutters and sun protection that takes place in Stuttgart/Germany from 27th February to 3rd March 2018.

► Baruffaldi Plastic Technology Srl
www.baruffaldi.eu

Automated Blender Cleaning introduced

■ Advanced Blending Solutions (ABS) introduced its first automated self-cleaning blender, the Chameleon Simplicity 3000. Designed to meet a significant market demand, the



Chameleon Simplicity 3000 is a fully automated material cleanout system that can complete a blender material change without operator assistance.

Material is removed from the feeder tray using an automated vacuum system, and can be sent to a material collection station or bin for later use. Compressed air cleans the side walls of the component hopper. Changeovers can be done in as little as 20 seconds with the smallest ABS feeder, assuming that the rundown feature was used.

Chameleon can significantly reduce purge waste, and increase equipment run time. It can be retrofitted to any Advanced Blending Solutions blender.

► Advanced Blending Solutions
www.adv-blend.com

MORE Turnkey Production Systems for High-Volume Production

■ At the JEC World trade show 2018 on March 6-8, Dieffenbacher will present its new solutions for the high-volume production of fiber-reinforced plastic components at Stand C 31 in Hall 6.

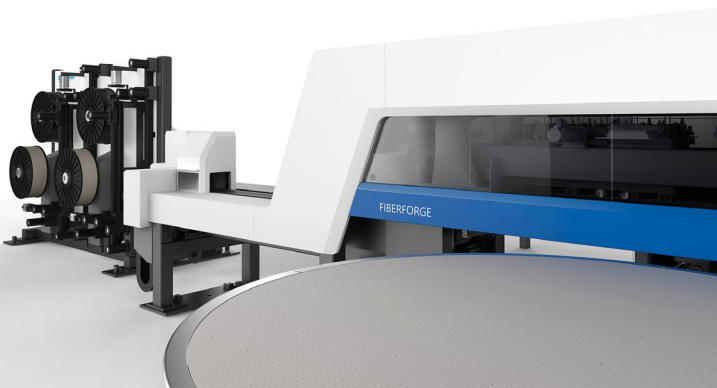
Dieffenbacher is a supplier of automated, turnkey production systems for the high-volume production of composite components. The production procedures presented at JEC World enable shorter cycle times and more efficient production processes, making it possible to use large-series fiber-reinforced components in the automotive and aerospace industries. Three procedures are the stars of the show.

Tape-Laying Process – Faster and more precise with the tailored blank line: With the tailored blank line using the Fiberforge and Fibercon systems, Dieffenbacher offers a solution for the large-series production of locally reinforced thermoplastic components.

In the first step, the Fiberforge produces near-net-shape composite lay-ups from unidirectional carbon fiber and/or glass fiber pre-preg tapes. One laying cycle lasts about one second, making this system the fastest tape laying system in the world. After a laying pattern is defined, the tapes can be rolled off of coils and laid according to that pattern. The Fiberforge system can carry four of these coils. This makes it possible to mix different materials in one tape lay-up. Even the width and thickness of the tapes can be varied.

With a new angle-cutting system, the start and end of the tape can be cut variably either straight or at an angle of plus or minus 45 degrees. Precise and near-net-shape tape laying reduces excess bleed cuttings. An automatic coil exchange system guarantees uninterrupted production.

Fiberforge is the fastest tape laying system in the world: Within a mere second, the tapes are laid in a defined pattern



New Dieffenbacher CompressLite

In the second step, Fibercon uses vacuum-assisted forming to form the tape lay-ups into a near-net-shape laminate. The Fibercon can process several lay-ups simultaneously and has impressively short cycle times. The vacuum-assisted forming system minimizes air pockets and material faults and reduces the level of oxidation, producing unparallelled laminate quality.

Together with downstream systems such as handling robots and compression molds, the Fiberforge and Fibercon systems make it possible to produce more than one million components per year.

New generation of CompressLite – Product design combines advanced technology with maximum profitability and efficiency: The new generation of the successful CompressLite press series offers improvements in many respects. Thanks to high speeds and short pressure build-up times, CompressLite has been optimally adapted to thermoplastic processes. The newly developed control and visualization of the CompressLite allows a comfortable and intuitive operation. The result is a modern product design that delivers the latest future-proof technology along with maximum profitability and efficiency.

Cooperation to improve Plastic Bottles Recycling & Sustainability

"We are glad to have scored another top reference in the Northern America plastic recycling market. The CarbonLITE PET recycling project comes after the two mega PET recycling plants that AMUT supplied in North America to UNIFI in Reidsville, North Carolina, and to PETSTAR Coca-Cola Mexico" stated Piergianni Milani, the President of AMUT GROUP



The new CarbonLITE recycling facility, located in Dallas, Texas, started operations in September 2017, as per the schedule. The washing line supplied

by AMUT has the state of art of the technology and is the second plant of this size in operation in the USA, capable of producing over 12.000 pounds

per hour of highest quality PET from MRF post-consumer bales. Leon Farhanick, the President of CarbonLITE, declared "I'm very sat-





ified with quality, punctuality and technology. Among the many OEM we had in this project AMUT is the one that pleased us best”.

This 250.000-square-foot bottle-to-bottle PET recycling plant processes more than 100 million pounds plastic bottles annually and the AMUT washing section is capable of reaching six metric tons per hour (the Dallas facility will double the company’s annual capacity of food-grade PET) and permits the transformation of old plastic bottles into PET resins, flakes and pellets that can then be used to produce new beverage bottles and other sustainable products. Closing the LOOP ON RECYCLING and increasing the sustainability of the PET containers. “CarbonLITE management has over a decade of experience in PET wash lines and selected the AMUT solution to face the new challenges in the market conditions for their Dallas operations. Considering that AMUT is one of the major OEM supplier for their system, we integrated our De-Labeler AMUT’s patent technology and as well the wet whole bottle pre-wash”, stated Anthony Georges, President of AMUT NORTH AMERICA.

Georges further discussed how the AMUT De-Labeler won the prestigious PLASTIC RECYCLING INNOVATION AWARD from the APR (Association of Plastic Recyclers) in 2017.

“When you are dealing with comingled MRF bottle bales you need to be able to detect and remove all non-PET and colour PET containers prior to entering the final washing process. Georges continued – “by utilizing our double stage we perform with the first De-Labeler the dry cleaning action able to detach most of the shrink sleeve labels, while the second unit is a wet De-Labeler process to pre-wash the whole bottles and reduce wear effect on grinders blades. This wet bottle washing technology utilizes the filtered recycled flake washing water therefore it does not increase the consumption of fresh water used in the complete cleaning process, and contributes to the elimination of outside dirt as well as remaining labels on the whole bottles”.

Critical to the AMUT technology is that the bottles stay intact through these two machines and are not damaged during the actions of

De-Labeler therefore improving efficiency and the functionality of the following automatic sorting equipment so that the non-PET and colour PET can be easier removed from the clear PET bottle stream. The clear PET bottles will be washed directly in the AMUT wash flake system.

AMUT scope of machinery & technology supplied includes as well, the wet grinding system to turn bottles into flakes, along with two of the AMUT patented Flake Friction Washers, and two of their newest advance technology ‘Sink-Float’ separation machines, which are able to capture the polyolefin caps so that these cleaned caps can also be valued. The whole process is engineered to increase the grade quality of the clear PET flakes which comply with the most demanding bottle-to-bottle applications, optimizing the value of every bale, while minimizing operational costs, fresh water usage, energy and cleaning agents.

AMUT GROUP
Via Cameri, 16, 28100 Novara - Italy
www.amutgroup.com

On the occasion of TireExpo 2018 in Hannover in February 2018, KraussMaffei Berstorff showcased the new Compound Rework system 1000 (CRS 1000). This innovative solution is designed for processing scrap material generated during extrusion processes in the rubber processing industry. The CRS 1000 stands out for maximum ease of operation and is suitable for a wide range of different materials

The new KraussMaffei Berstorff Compound Rework system 1000 is designed for one-man operation



The New Compound Rework System 1000

for Cost-Effective Reprocessing of Scrap Rubber

"Most extrusion processes inevitably involve the production of a certain amount of recyclable scrap, i.e. residual material that remains in the extruder or in the extrusion-head in the event of compound or extrusion tool changes. In order to maximize added value, tire producers strive to recycle this scrap material by returning it to the production process," says Joachim Brodmann, Key Account Manager at KraussMaffei Berstorff. "The CRS 1000 processes large-volume rubber residues removed from the flow channels as well as start-up scrap converting the material into sheets or strips with a thickness of 8 mm. This means that 100% of the residual material can be returned to the production process."



The new KraussMaffei Berstorff Compound Rework system 1000: easy and reliable conversion of large-volume compound residues into sheets or strips

Optimum recycling solution for large-volume scrap rubber

The CRS 1000 is equipped with two (optionally) heated roll sand a hydraulically adjusted roll gap. It can be fed with residual material of various sizes up to a width of one meter. The generously dimensioned feeding unit with automatic intake gap is equipped with all required safety features to minimize the risk of personal injury.

Compact plug-and-play solution

Easy access substantially facilitates maintenance and cleaning operations. The simplified control of the complete line enables one-man operation, which gives easy machine handling and enhanced operational safety. In addition, the sturdy design and energy-efficient drive technology ensure cost-effective and high-performance system operation on a sustained basis.

As the CRS 1000 comes with the complete electrical equipment and control system, it is ready for start-up immediately upon installation. With a total weight of about eight metric tons, a volume of just under 4 m³ and 5 m² footprint, the complete unit can be easily transported to any place of installation using industrial trucks.

► KraussMaffeiBerstorff GmbH
An der Breiten Wiese 3-5, 30625 Hannover, Germany
www.kraussmaffeiberstorff.com

A New Take on Bottle-to-Bottle

Detergent bottles are given a new life (©Starlinger)

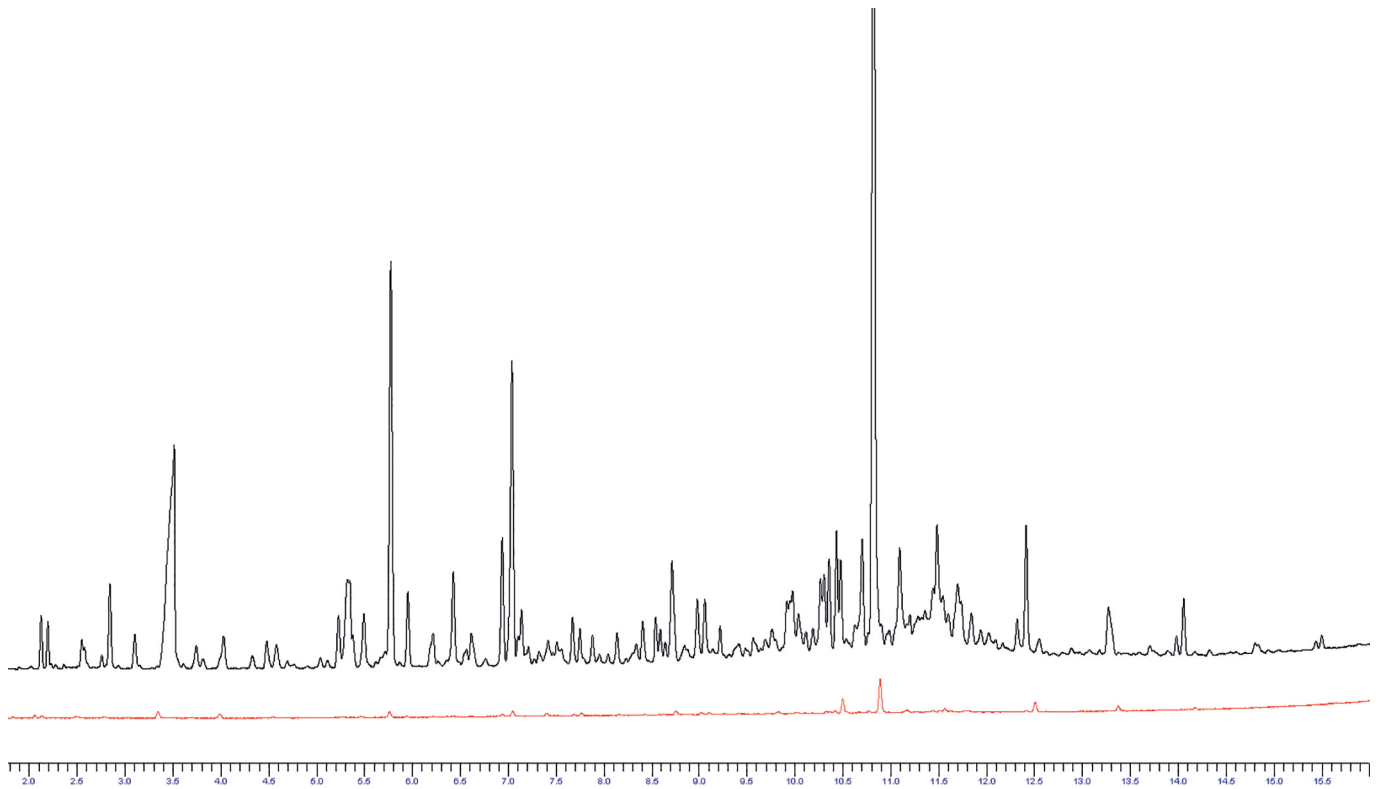


It is hard to imagine packaging without the use of plastics. Whether it is shampoo, shower gels, liquid laundry detergents or household cleaners – everything reaches the supermarket shelves in containers made of PP, HDPE, or PET. But in contrast to PET bottles, for which extensive collection systems 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

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 post-consumer collection that had maintained a persis-



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)

tent 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 knowl-

edge 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.

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-VACmodule. 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.
Sonnenuhrgasse 4, 1060 Vienna, Austria
www.starlinger.com

TOMRA Sorting Recycling (TOMRA) announced its newest partnership with SKM Recycling (SKM), headquartered in Laverton North, Victoria, Australia. As an industry leader in processing recyclables from household and commercial streams, SKM has selected TOMRA to supply 40 AUTOSORT units with the latest features and new 3D laser technology for three new sorting facilities



AUTOSORT

Sensor-Based Sorting Technology

To meet the constantly changing demands in the market, SKM is building three new plants to process over 350,000 tonnes of kerbside collected material, also called single stream, per year. Primary focus of the SKM Recycling plants is to process paper, plastics, metals and glass, sorting them into high quality products. The plants are expected to be operational in the beginning of 2018. SKM's Laverton plant aims to become the most technically advanced and automated recyclables processing plant on the continent or even worldwide by integrating multiple steps of TOMRA Sorting technology into the sorting of paper and other recyclables. This world's-best technological capability will provide SKM with a unique and strong competitive advantage, and will position SKM

well to meet increasingly stringent end-product quality demands.

This improved sorting technology will also result in a greater percentage of recyclable product being extracted from the residential recycling stream, reduce materials unnecessarily ending up in landfill, facilitate the development of new recyclable grades to meet the demands of a changing market and deliver greater environmental benefits.

Renowned worldwide for its leading sensor-based sorting technology, TOMRA Sorting was also recognized in Australia for its expert knowledge and consulting. Robert Italiano, Business Manager of SKM, commented on the new partnership: "We are convinced by TOMRA's robust and dependable technology, but it's their ability to support in creating the best plant concepts that made us choose to partner with TOMRA. Our confidence in their technical knowledge and support is unwavering and is backed by TOMRA's guarantee to perform. We are proud to be developing the most advanced materials recovery facilities in Australia."

Tom Jansen, Sales Manager at TOMRA Sorting Recycling, adds: "Winning such a big contract means SKM have placed a lot of trust in TOMRA and our newest technology. I'm looking forward to seeing the ultra-modern plants in operation."

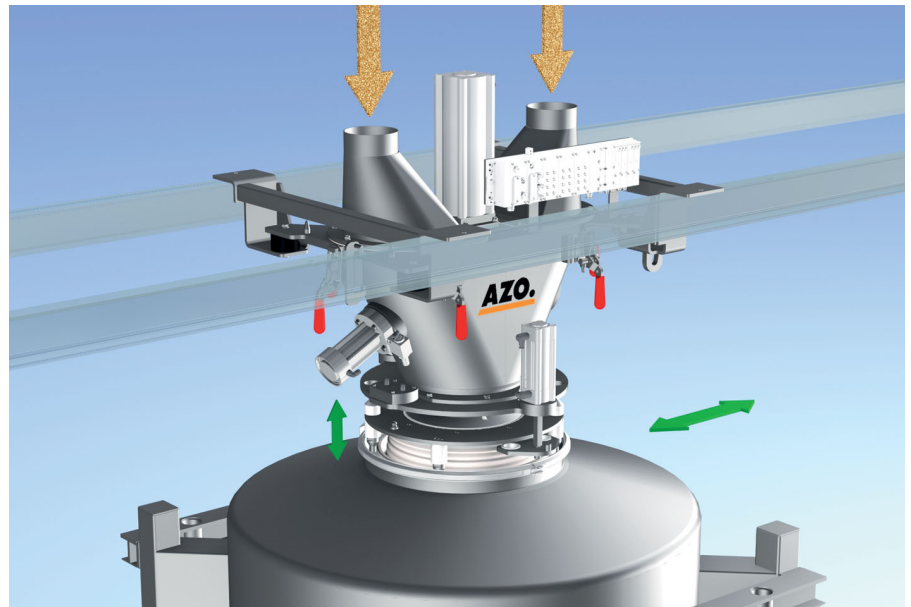


Jansen Tom, Sales Manager at TOMRA Sorting Recycling

TOMRA Sorting Recycling
www.tomra.com/recycling

SKM Recycling
www.skmrecycling.com

*The AZO CleanDock®
is a system for docking containers at
upstream dosing units*



Automatic Raw Material Handling

The AZO Group, together with the three specialists AZO SOLIDS, AZO CONTROLS and AZO LIQUIDS, provides complete turnkey plants for automated processes with solid and liquid substances.

At Powtech 2017 in Nuremberg/Germany the AZO Group demonstrated solutions for automatic handling of large and medium components and the integration of small components and ingredients in the automated process. "Solids meets Liquids" - This slogan makes it clear: AZO can also be liquid. AZO LIQUIDS also offers systems for the handling of liquid and pasty substances in addition to

AZO DOSITAINER® for use in areas with ignition sensitive dusts



vacuum process plants and solutions for continuous processes.

AZO CleanDock® – Clean docked

AZO CleanDock® is a system for docking containers at upstream dosing units. Apart from dust-free transfer between dosing units and mobile containers and decoupling from scales, it provides further functions.

The AZO CleanDock® allows mass flow rates of up to 25 t/h. Its design is characterised by simple, time-tested components and it affords robust operating performance with emergency running properties. Several tens of thousands of operating cycles have already been implemented in continuous operation without need for maintenance measures.

The AZO CleanDock® double-cone system surpasses conventional docking systems as regards emissions of dust. It effectively prevents generation of dust from the partially or full container. The AZO CleanDock® reliably holds back any product residue, which, in conventional plants, would adhere to the dosing unit after dosing and fall on the floor or into the plant. The connection between the dosing unit and container is secure at all times during dosing thanks to the frictional and form-fitting connection. The AZO CleanDock® aims to keep accumulation of dust below the minimum dust concentration as regards dust explosion. This goal has been met reliably. Any adverse effect on the weighing result due to force shunts is kept to a minimum thanks to the flexible connection. The AZO CleanDock® cannot be classed as a containment system.

However, where automation and subsequent operating cycles are concerned, the AZO CleanDock® compared with the familiar split valve system is far superior.

Modular big bag discharge station – cost-effective and versatile

Flexible bulk materials receptacles such as big bags have become firmly established for handling powders in a variety of branches. They have clear advantages over sacks when it comes to transporting and storing bulk materials. They are environmentally friendly, require less operating staff and storage space and reduce costs for transport and processes.

AZO DOSITAINER® and discharge base for highly flammable dusts

The AZO DOSITAINER® is a container with integrated dosing screw. It is an ideal transport and storage bin for bulk solids at medium throughput. As a mobile storage container that can be automated, it is also used in automatic processing plants. The integrated dosing screw makes it possible to dose accurately into automatic weighing processes. The bulk solids are emptied from the AZO DOSITAINER® by means of a discharge base. This AZO DOSITAINER® and the discharge base are designed to be suitable for highly flammable dusts with a minimum ignition energy of $1\text{mJ} \leq \text{MIE} < 3\text{mJ}$.

Key advantages:

- The AZO DOSITAINER® and discharge base can be used for highly flammable dusts with a minimum ignition energy of $1\text{mJ} \leq \text{MIE} < 3\text{mJ}$
- Low-dust, reliable emptying of AZO DOSITAINERS® using patented docking collars, optionally with vibration discharge
- The AZO DOSITAINER® can be changed over without intermediate cleaning

- Integrated dosing screw with frequency-controlled drive acts as a very accurate dosing unit with coarse/fine dosing for downstream weighing processes
- The AZO DOSITAINER® is rigid and stackable
- Can also be used for bulk solids with poor flow characteristics
- Optional identification systems prevent confusion between containers and enable exact batch tracing and documentation

Secure product feeding through integrated screening

The hopper serves to feed bulk solids in powdered and granular form into closed materials handling systems, such as pneumatic conveying systems. Products can be fed from sacks, boxes, barrels or similar receptacles. As different branches will have very diverse requirements regarding quality and hygiene, the feeding hoppers are available in a variety of materials and surface finishes.

AZO cyclone screening with ultrasonic assistance

AZO cyclone screeners combine operationally safe technology with high performance and easy maintenance and cleaning. The screeners can easily be integrated into existing systems thanks to their compact design.

AZO COMPONENTER®: Batch and minor quantity automation

During the manufacture of food, pharmaceuticals, chemical and plastic products, precise adherence to the recipes is decisive for the product quality. As the producer, you must have absolute confidence in the exact supply of your raw materials. Each ingredient must be meticulously documented.

Reasons for the automation are:

- High precision for small and large weight units
- Product and operator protection through contamination-free solutions
- Reliable batch traceability and permanent documentation
- User-friendly control and visualisation
- Great flexibility, meaning weighing various weights from 10 grams up to several hundred kilograms, variable design possible, simple to expand, easy to change recipes
- Minimised non-productive times, e.g. through process-optimised collection of components results in high speed
- Sustainable, economic solutions with high energy efficiency
- Safety thanks to experience and fully developed technology
- Global service



AZO COMPONENTER®, circular for manufacturing crisps

QUANTUM 360 for Pipe Extrusion: 360-Degree Measurement of Wall Thicknesses and Diameters



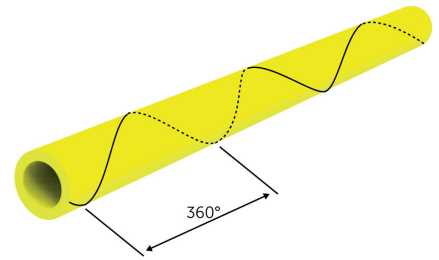
With many years of experience and revolutionary technology, iNOEX based in Melle/Germany has for 33 years developed systems and technical concepts specifically designed for the pipe, profile, cable and film extrusion industry

For some years now, iNOEX has been intensively working on the technical development and sale of Terahertz (THz) wall thickness measuring systems for the plastics industry and can justifiably call itself the pathfinder for this key technology. Terahertz radiation is in the frequency range between mi-

crowave and infrared radiation. Only a few years ago, this Terahertz frequency range was not at all or only partially usable due to the lack of transmitter or receiver units – also referred to as the „Terahertz gap“ in the electromagnetic spectrum. It is to this very issue that iNOEX has addressed its R & D

activities. The results are compact and inexpensive transmission and receiver systems tailor-made for the pipe extrusion process, with sufficient output power for wall thickness measurement. The technological progress of the past years has made these THz transmitters and receivers increasingly powerful and

	Pipe dimension [mm]	Wall thickness [mm]
QUANTUM 360 / 250	10 – 250	100 µm – 60 mm
QUANTUM 360 / 400	63 – 400	100 µm – 60 mm
QUANTUM 360 / 630	250 – 1200	100 µm – 60 mm
QUANTUM 360 / 1000	250 – 1000	100 µm – 60 mm



also more and more cost-effective. This forms the basis for the economic utilization of THz technology which offers undoubtedly great benefits. One of these benefits is that Terahertz radiation is a long wave, non-ionizing radiation. Contrary to X-rays, the use of Terahertz radiation does not involve any health risk. Another interesting aspect is one of its physical properties related to varying temperatures. A temperature change of 10 °C of the measuring object would lead to a mere deviation of approx. 0,001 mm in the measured wall thickness which is a value that is significantly lower compared to other measuring systems. Due to this fact, measuring values do not need to be calibrated in practical use during the extrusion process of smooth or corrugated pipes. An additional and very significant advantage of this technology is the contactless measurement which makes the system very flexible. The mounting or use of dimensioned system components can thus be completely avoided. QUANTUM 360 features a Terahertz sensor which reverses 360° around the measured pipe.

Wall thickness sizes between 100 µm to 60 mm can be measured easily. High-precision measurement of every layer

of a multi-layer pipe is possible, given different refractive indices. Depending on materials and measuring methods, generally a measuring accuracy of 25 µm can be achieved. The combination of a THz sensor and an opposing laser sensor provides simultaneous diameter measurement.

QUANTUM 360 covers a broad spectrum and is currently available in four different sizes. All common plastic materials such as PE, HDPE, PP, PA6, PA12, PVC are measurable. All SDR classes contained in DIN 8074 for pipe diameters of 10 to 1000 mm are measurable by QUANTUM 360. (see table)

80 percent or more of the total costs of the extrusion of plastic pipes can be attributed to production materials. Depending on the throughput rates of a pipe extrusion line, the materials and the produced standards, there are enormous savings potentials between minimum and maximum permissible pipe dimensions. Through appropriate measuring and control technology such as QUANTUM 360 combined with continuously performing gravimetric systems, five percent or more can be saved in raw material. All proven control algorithms such as e.g. mass throughput control, weight per meter or thin point control, equally the „Thermal Die Centering“, are available and complete this measuring system which thus becomes a full automation system.

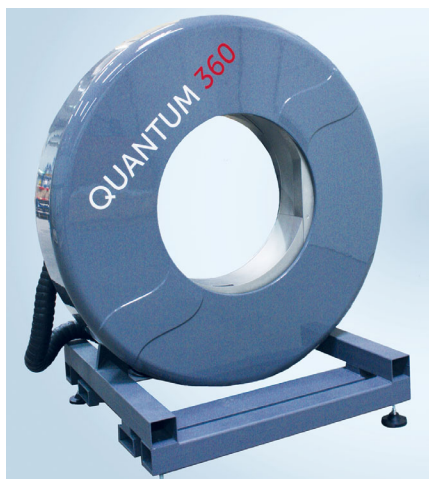
Producers of foam core pipes are in intensive price competition with each other. The decisive criteria here is always a cost-efficient production process which uses as little material as possible. Particularly the combined use of “Thermal Die Centering” and thin point control will lead to substantial raw material savings in the production of PVC foam core pipes. This is due to the fact that the thermal die centering will ensure a homogeneous wall thickness which offers potential for optimization by thin

point control. Furthermore, QUANTUM 360 is frequently able to measure all 3 layers individually. To the pipe producer, this opens up for the first time the possibility to measure and accurately control the important interior layer. The process can be automated through weight per meter control carried out by a gravimetric system.

Not only the savings potential influences the success of a measuring and control system but also a comfortable operation. In this respect QUANTUM 360 sets new standards. The automated centering performed by an XY cross table and the lack of dimensioned parts enormously simplify the reset of the system, specifically after a change of pipe dimensions. Added to which is the user-friendly visualization software which is based on a state-of-the-art software architecture and a 21” multi-touch display, all designed for the optimum support of the line operator. It leaves him to select the pipe recipe and start the measurement. Numeric or graphic representation is available besides trends or statistics data and various interfaces. Especially to be emphasized is inoTREN for the almost playful visualization of production and process values via „multi-touch“. Display of process data and production times can be adapted individually by the operator. Each system disposes of a TeamViewer Client requiring minimum configuration to set up a remote session.

Author:
Arno Neumeister, Director Marketing
iNOEX GmbH

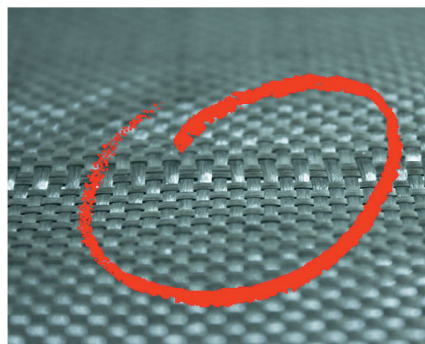
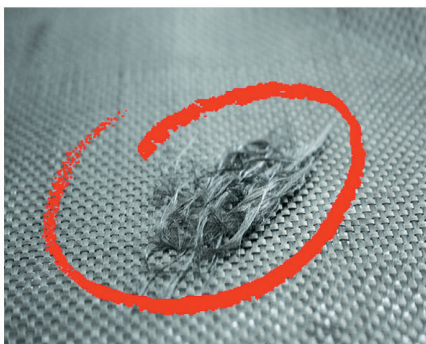
iNOEX GmbH
Maschweg 70, 49324 Melle, Germany
www.inoex.de

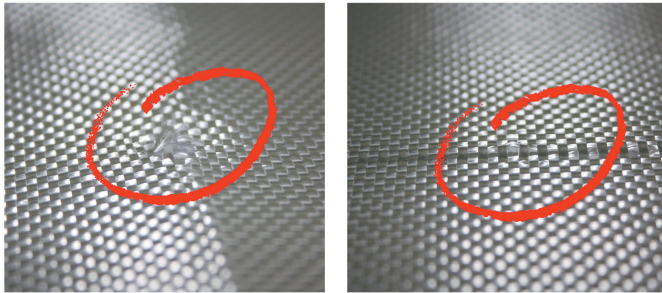


100% In-Line Inspection of Composite Materials for the highest process reliability and resource efficiency

Composite materials are playing an increasingly important role in numerous industries, and they are often used in safety-relevant areas such as aviation, the automotive industry, and in the construction of wind power plants. Thus the inspection of fiber-reinforced plastics is of crucial importance for manufacturers. State-of-the-art tools now enable a completely new level of quality assurance: In addition to the monitoring of raw materials (fabrics, roving) and epoxy resin coatings (pre-pregs), they ensure that the individual rovings/tapes are measured and inspected, while also determining the height of topological material defects in three dimensions. This significantly increases the range of applications and improves production monitoring considerably

For the highest production efficiency: Reliable detection of loosely attached fibers (fuzz balls) in fiber-reinforced plastics and additional 3D height measurement in topological expression





Typical defects on fiber composites are detected, classified and visualized for the user in real time

Increasing competitive pressure to ever higher quality standards means that the requirements are becoming ever greater for manufacturers of fiber-reinforced plastics and other composite materials, especially given that most of the products are used in applications with very high safety standards. End customers, such as in the aviation and automotive industries, require their suppliers to have all materials certified, which is why the quality produced must be fully recorded and documented. Camera-based, all-in-one inspection solutions ensure that composite materials are reliably inspected at high resolutions. The new systems can be deployed and integrated in a targeted fashion, even in highly specialized manufacturing processes, while covering all customer-specific requirements.

Complete inspection and quality documentation in roving/tape production

In the manufacturing of rovings/tapes, where a large amount of windings are produced right next to each other simultaneously, the inspection system monitors the individual rovings/tapes with extremely high accuracy. All relevant defects are detected and classified in realtime. This enables the machine operator to take corrective action and eliminate defects, thus significantly increasing the share of usable product. In the production of rovings/tapes, the system is able to measure and evaluate each roving's/tape's width, as well as detect split or protruding filaments. The system creates a defects log for each individual spool, thus ensuring 100% inspection and quality documentation. Comprehensive tools for statistical evaluations enable additional conclusions to be made regarding the manufacturing process, helping to optimize production lines – saving time, costs and resources.

3D height measurement and synthetic resin inspection for flawless production

One of the new and unique methods for surface inspection of fiber-reinforced plastics and composite materials is the 3D height measurement of loosely attached fibers, defects and foreign particles in material lines in topological expression. The defect height serves as an important criterion for the exact classification of material defects.

Damaged areas are fully measured in three dimensions via the 3D sensor (z sensor) to ensure that height-relevant defects can be precisely distinguished from other defects, such as holes, weaving defects, or contamination. This is particularly important for detecting “fuzz balls” (fiber bundles) located on the surface of the materials. Another remarkable feature is the inspection of synthetic resin on pre-preg (pre-impregnated) materials. During the inspection of synthetic resins, cameras are used to inspect the uniform and complete epoxy resin coating of the material. By doing so, the system also inspects the functional properties of the material.

100% in-line inspection for all process stages

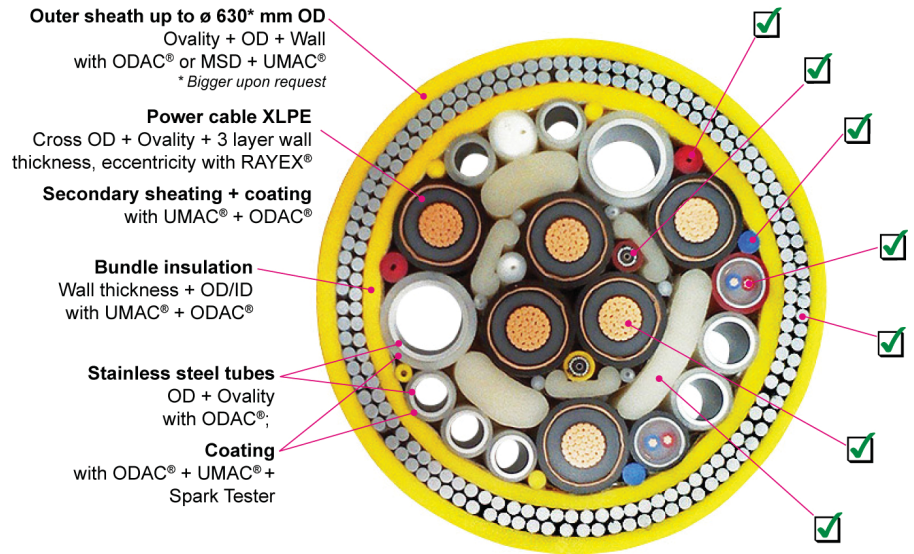
Unwanted metal particles can also be reliably detected by integrating metal detectors into the inspection systems. The latest inspection technology has also been upgraded with several other tools. For example, offline recipe optimization now makes it possible to improve the inspection recipe based on recorded video, independent of ongoing operations. This allows for worldwide compliance of the highest quality standards with minimum reject rates, particularly for production on different lines and for frequently changing production orders and quality settings. With these new features, the inspection systems will become an indispensable tool for achieving the highest level of production efficiency and transparency, ensuring top quality for end customers. The highly sophisticated imaging analysis algorithms provide users with comprehensive evaluation options in real time. This is made possible by the state-of-the-art camera and lighting systems, which detect even the smallest and lowest-contrast defects in all process stages.

Efficient use of resources thanks to customized data reports

All data, such as the classification of defects, is archived for evaluation and subsequent analyses, including fault images. Customized reports support users in avoiding defects, reducing reject rates, and minimizing costs – a decisive factor in the efficient use of resources. In addition to data analysis, the system is equipped with an interface for the higher-level software architecture EPROMI (Enterprise PROduction Management Intelligence). Thanks to the vertical and horizontal data integration, EPROMI enables data from various lines or even different plants to be displayed and analyzed across the company in a comparable fashion.

■ ISRA SURFACE VISION GMBH
Albert-Einstein-Allee 36-40
45699 Herten, Germany
www.isravision.com

Any Offshore flexible can be measured with gauges from ZUMBACH



All Components in View – Measure Any Offshore Flexible

3-axis ODAC 550 system, measuring an Offshore cable of 500 mm OD



The production of offshore Flexibles involves complex process's requiring varying individual performances for quality control. Any deviations from the required standards can risk horrific consequences if failure occurs depending the applications scenarios

In order that the risks for future product failure are eliminated during the manufacturing processes, such as wire drawing, profile rolling / extruding, stranding and sheathing, ZUMBACH provides reliable solutions for the measurement of all critical parameters.

Step by step all values under control

From the first seconds of extrusion, ultrasonic measurement systems (UMAC®) with up to eight real measurement points, allow the eccentricity, independently of the material temperature to be measured. Once the eccentricity of the cable is optimized, it comes down to the next stage of maintaining the required average wall thickness and then further to derive the minimum wall thickness limitation. These measurements are typically performed before and after the extruder by ODAC® and UMAC®. An additional measurement of the outside diameter at the

end of the line allows the integration of the measured cold diameter value. This allows the determination of the shrinkage, which can thus be fed back within the process to realize optimum configuration.

Similar approaches generate quality improvements in pipe extrusion. At the beginning of the process, the eccentricity of the pipe must be brought under control, then the wall thickness and finally outer diameter as quickly as possible. The optimization of the wall thickness and the monitoring of the outside diameter is also ensured by the combined and cost-effective ultrasonic and laser measurement technology from Zumbach.

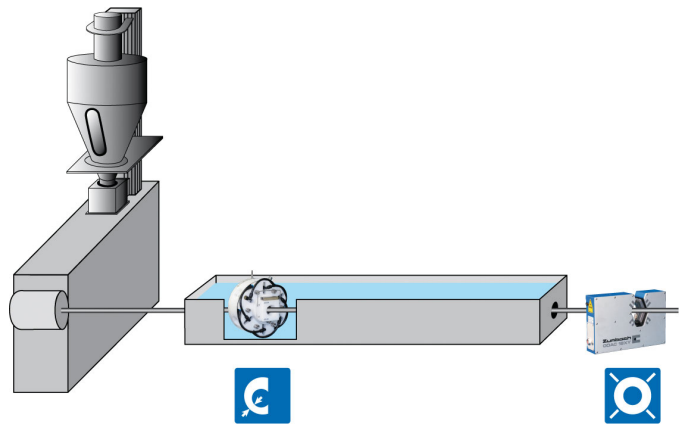
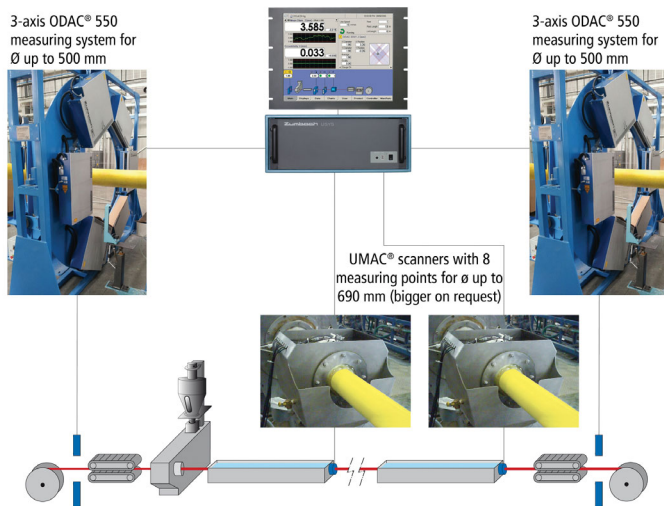
Accurate process monitoring and quality control during cable and pipe extrusion

In the extrusion of cables or pipe jackets, UMAC® ultrasonic measurement ensures early notification of product centralization and achieved Wall thickness. UMAC® measures and controls parameters such as eccentricity and wall thickness for up to five layers of materials at a maximum of eight individual measuring points around the circumference. Additional installed ODAC® or MSD® diameter measuring heads benefit by checking the diameter and ovality. Using these technologies, allows the manufacturer to closely monitor the extrusion processes and thus continuously maintain the quality requirements.

Dual Loop Strategy maximizes quality on extrusion lines

Control solutions such as Zumbach’s dual-loop method, as example, takes into account the product properties in both the hot and cold conditions. The resultant reported data is determined from a combination of the diameter measurement using ODAC laser measuring heads and UMAC ultrasonic eccentricity and wall thickness scanners.

Customer specific solution with ODAC® and UMAC® gauges in an extrusion line for products up to 500mm OD



Dual Loop configuration with UMAC® at the hot end, and ODAC® at the cold

Wherever several ZUMBACH systems are used in combination, remarkable successes can be achieved in DLP measurement and control.

Considerable thought should always be given to investing in several high precision and reliable control technologies within the extrusion line. After all, global material costs are rising just as fast as quality requirements. Whether it is quality improvement for very precise cables or further material savings for commodity tubing – with the ZUMBACH hot end dual loop control strategy, the extrusion can be monitored and controlled even more precisely and quickly.

The unique and cost-effective process exploits the benefits of ultrasonic measurement and perfects it in combination with laser scanner technologies.

The intelligent solution offered by the ZUMBACH control strategy makes allowance for the product’s properties at the hot and cold ends of the line. It utilises data from the diameter measurement, determined from the ultrasonic eccentricity and wall thickness scanner UMAC®. These data measurements are automatically adjusted based on the data from the ODAC® laser diameter scanner at the end of the line and evaluated. This creates a very fast control feedback loop (due to the short distance from the point of change to the point of measurement) while still basing the control decisions on the final diameter measurements. Using this dual loop, transient deviations can be minimised, in turn leading to a significant reduction in standard deviation and ultimately an increase in the process capability index (CPK).

CCIT Technologies for Pharmaceutical Packaging

- Leak testing with Mass Extraction (air)
- Leak testing with tracer gas
- Optical emission spectroscopy



CCIT application examples

Since February 2017, ATC is a 100% subsidiary of Pfeiffer Vacuum, a global leader in vacuum and detection solutions. With this merger, Pfeiffer Vacuum can offer its customers a complete range of leak testing and leak detection solutions. At the Pack Expo trade show, Pfeiffer Vacuum and ATC was presented a wide range of CCIT (Container Closure Integrity Testing) technologies for pharmaceutical packaging

ATC's patented Micro-Flow technology and Mass Extraction technology ensure product sterility and comply with regulatory expectations and USP standard for container closure integrity testing. The non-destructive, deterministic leak testing uses Mass Extraction technology to detect defect sizes as small as 1-2 micron (microbial challenge). With short cycle times, high sensitivity and repeatability these systems are very cost-effective.

Pfeiffer Vacuum was presented its helium tracer gas leak detection solutions as well as the AMI non-destructive integrity test system which conducts qualitative and quantitative leak measurements in real time without using any specific tracer gas.

This self-calibrating method offers the widest test range in the market and has higher sensitivity than conventional methods. For all leak testing solutions, Pfeiffer Vacuum offers FDA 21CFR Part 11 compliant software as well as IQ/OQ qualification support.

Leak testing with Mass Extraction technology (air)

At Pack Expo Pfeiffer Vacuum was display products from its new subsidiary Advanced Test Concepts (ATC) from Indianapolis, Indiana, USA. The leak testers that will be exhibited work on the basis of leading leak testing technology using air, and therefore do not require any special tracer gases.

The devices operate according to patented Micro-Flow and Mass Extraction technology. The USP 1207 recognized Mass Extraction thereby works on the

Leak testing with patented Mass Extraction technology: ME2 from ATC



Pfeiffer Vacuum ASM 340 multipurpose leak detector

principle of rarefied gas flow. Testing takes place in vacuum conditions to attain higher sensitivity. This type of testing is particularly suitable for packaging or enclosed objects, such as pharmaceutical packaging as for example IV-bags or glass vials. Defect sizes smaller than 2 µm respectively leak rates of down to 5•10⁻⁶ mbar l/s can be detected with this method. The method is thereby suitable for laboratory applications as well as for the use in production environment allowing stability control as well as automated 100% testing.

Leak detection with tracer gas

The ASM 340 leak detector delivers very good performance for tracer gas leak detection using helium (or hydrogen) as a tracer gas. The device combines high performance, reliability and repeatability with fastest time to test. This leak detector is easy to use thanks to its user-friendly and intuitive color touch control panel.

The ASM 340 is the leak detector for MALL (Maximum Allowable Leakage Limit) testing within the packaging development process, e.g. for syringes. Pfeiffer Vacuum also supplies corresponding adaptations for specific test parts as well as process support.

Optical emission spectroscopy

The Pfeiffer Vacuum AMI integrity test systems measures leak tightness using a patented process that does not require a tracer gas. Instead, this method uses the existing gas mixture in the cavities



Pfeiffer Vacuum AMI 121 Integrity Test System

inside the packaging to perform high-sensitivity testing over an extended measuring range. The procedure offers great flexibility: a variety of different packaging types such as blister packs, pouches, vials, plastic bottles, and sealed parts such as battery casings, can be tested in this way.

A big advantage of the AMI is its wide measuring range that also offers higher sensitivity than conventional tests, down to 1 µm respectively leak rates of down to 1•10⁻⁷ mbar l/s. As a result, the AMI device provides gross and fine leak test in just one device. The procedure delivers deterministic test results with high repeatability, irrespective of the user, and with reliability and accuracy that comply with USP 1207.1. It can be used in laboratory testing as well as IPC (In Process Control) during production testing. Depending on the packaging the simultaneous testing of multiple parts at the same time is also possible.

New blown film line (© Collin)

New Blown Film Line with Numerous Innovative Features



The Collin blown film line presented itself completely updated at the Fakuma 2017 booth. Because the technically and optically optimized machine enables perfect blown films via the Collin bubble control

„Among other things, the take-off unit plus lay-flat unit but also the winder have been further developed. Depending on the customer's requirement, with the new line, contact, central or central winding with gap is possible“, says Dr. Friedrich Kastner, CEO Collin. „By means of the comprehensive optimization, nearly perfect bobbins are realized and thus the further processing for our customers is easier and the resulting products have a better quality“, explains Kastner.

„Furthermore, the standard speed of 30 m/min has been increased to 50 m/min. If desired, higher speed is possible – in order to approach product speed if necessary“, says Corné Verstraten, CSO Collin. Online, the quality of the films is permanently controlled via the COFIS Film Inspection System. At Fakuma 2017, Collin presented another new product – the new Collin die, integrated into the blown film line and perhaps a little bit diverted from its intended use.

„Modularity in every single layer – our product philosophy is perfectly reflected in our new die. This die is used for the production of medical strands and catheter tubes. Moreover, the die is flexibly designed and customers can use it for the production of a wide variety of blown films“, comments Dr. Kastner.

„At the moment, the innovative, modular design allows up to nine layers. Strips can be integrated into any desired layer. It is possible to integrate two, four or eight strips with a width as required. Furthermore, the geometry of the strips can exactly be influenced.“ The Collin die is suitable for a variety of polymers and can be used as tube, strand or blown film die.

Entrance Extruder – the entrance version for laboratory, R&D

The E Entrance Extruder series is the cost-efficient basic version, perfectly suitable for the first steps into extrusion. The lines are designed for laboratory operation and R&D test series.

Multi-inspection – allrounder for testing film quality

The compact, robust and cost-efficient multi-inspection of the product line Polytest Line is used for analyzing different plastic materials and mixtures but also for the processing of virgin materials, compounds, masterbatches or for analyzing recycled materials. The modular design of the measuring system enables the adaptation of measuring methods to the corresponding customer requirements.

Via three main modules, rheological melt characterization, optical film inspection and mechanical film testing are possible:

- Real-time control of the melt viscosity by the MVR, $\dot{\gamma}$ -value or the apparent viscosity

- Statistical error detection (gels, black spots, ...) at the film

- Color control at the film by CIE L*a*b system

- Detection of foreign polymers by NIR-analysis

- Detection of stress-strain-values by film traction test

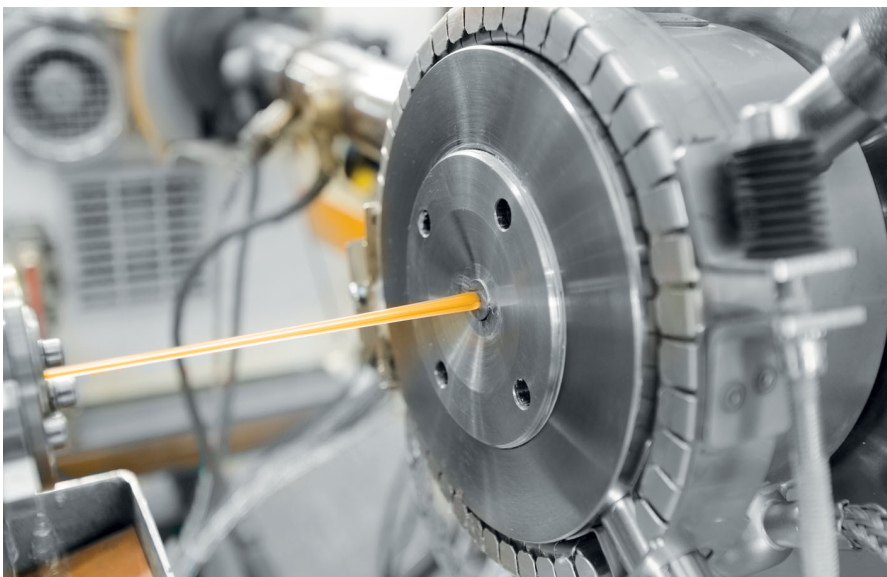
Via an upstream melt pump, the multi-inspection system is provided with a constant melt flow and the pressure necessary for the rheological characterization is built up. The compact design and the options to use the multi-inspection online directly at the extruder or offline in the laboratory are also convincing aspects. By the modular design, the multi-inspection unit enables an individual configuration of the line, however, there are still all options for retrofitting available for the customer.

Collin Lab & Pilot Solutions

With headquarters in the Bavarian city of Ebersberg, Collin develops intelligent pilot and laboratory lines in modular system for plastic processing companies as well as for research institutes. The owner-managed company has been in business for more than 40 years and, as premium provider, the company sets worldwide technical and qualitative standards. Collin solutions are used for the development and the production of plastic products, material analysis, test series up to pilot tests which allow a scale up to production scale.

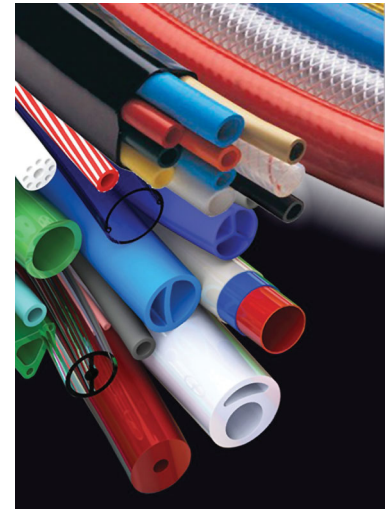
As part of the product lines Teach Line, Lab Line, Pilot Line, Medical Line and Polytest Line, Collin develops individual solutions – platen presses, roll mills, calenders, extruders, compounders, mono or coextrusion lines, pressure filter tests, rheometers or optical inspection systems. Material manufacturers, compounding companies, film manufacturers, companies in the medical, pharmaceutical and industrial sector

New medical die(© Collin)



Getting the Most from Extrusion Tooling

Tooling maintenance improves extrusion efficiency, enhances quality and boosts overall productivity for medical tubing applications



By utilizing state-of-the-art production equipment and processes, machining tolerances are held extremely close on today's multi-lumen and multi-layer medical tubing. It is important to note that any misalignment of the tools may be exaggerated in the final product output. Clean parts, especially with sealing and locating surfaces, are key to product performance and successful end products. These surfaces receive the most care and attention during manufacturing and are the control surfaces that ensure uniformity throughout the tubing. Remember, precision-machined alignments are affected by even a speck of dirt measuring only a few thousandths of an inch. A human hair is about 0.08 mm, and since there are many such surfaces in a quality tool, cleanliness is critical. Checking of the tools for any deformities is also important. Burrs, scratches and scrapes are usually a result of careless handling and/or storage of equipment. Double and triple-layer extrusion heads pose an even greater challenge for maintenance. The number of sealing and centering surfaces multiplies and can magnify the results of dirty tools. During changeovers, the head may be disassembled in order to change compounds and/or tips and dies. Foreign matter is usually introduced at this point and residual materials must be thoroughly removed. Physical tool damage often occurs during this phase, due to mishandling and poor storage techniques. These are highly precise parts, but can also be heavy and bulky to remove by hand. Use of a dedicated work cart exclusively reserved and equipped for extruder head maintenance is recommended. This cart along with a supply of spare components and hardware is easily justified, especially when examining the potential cost savings that result from well-maintained tools. The following should be considered:

- Maintain a clean, organized work area with soft and clean renewable work surfaces
- Using a vise with soft jaws, such as copper, and special equipment such as tip removal tools, etc.
- Standard tools include wrenches, soft-faced hammers, etc.
- Maintaining a supply of soft, clean rags
- Using cleaning solutions in spray bottle
- Using spare parts as suggested properly organized and stored

- Keep handy your equipment's repair/maintenance manual
- Have a small surface plate to provide a true flat surface
- Using a set of appropriate gauge and tip pins for initial tool location adjustment

In most situations, the head and tooling will still be at elevated temperatures, therefore lined gloves are needed when handling. Today, tubing manufacturers compete with companies all over the world. To be a successful and profitable company, quality and efficiency are essential. This is especially true in extrusion, where material costs are usually much higher than labor costs. Like a racing car stuck in the pit, many extruders sit idle because of poor or damaged tooling, plus excess maintenance time. Overhead costs add up and losing money is the result. Some start up quickly and make scrap, whereas others start up and run a product oversized to hold minimum tolerance. They waste 10% to 20% of the material, which can run from 50% to 90% of the product cost. The tooling supplier goes to great lengths so that tips and dies are machined to a determined specification, ensuring perfect concentricity and alignment. The material is then distributed in the proper location as part of the finished product.

In this example, with an improperly centered tool, a calculated out-of-tolerance area of 38 mm² was derived. When the two surface areas were compared, the calculated material waste was 11.8% of the finished product. % wall = $\frac{\text{min. wall thickness}}{\text{max. wall thickness}} \times 100$.

Get help for heavy parts and awkward situations:

Surfaces and edges are hard and therefore somewhat brittle, so dropping a part or striking parts together can result in damage. Store your tools properly in a dry, clean area. These areas should have soft surfaces and each instrument should be covered after cleaning. Also, tools should be segregated so that they do not come into contact with each other. And tools and all instruments should be cleaned thoroughly before storage. For disassembly of tools, it is imperative to use purpose-built tooling to facilitate disassembly. Here are some useful tips:

- Clean the equipment while it is still hot as the residue is easier to remove
- When cleaning a dual compound crosshead, (plastic and rubber) clean the plastic tooling first; the rubber second
- Never use steel tools
- Do not use open flames

Recommended cleaning tools and materials include:

- Brass pliers to grip material and aid in pulling
- Brass scrapers
- Brass bristle tube brushes (ideal for cleaning holes and recesses)
- Brass rods
- Copper gauze for cleaning and polishing exposed round or conical surfaces
- Copper knives for removing residue from recesses and other hard-to-reach areas
- Compressed air, which is more effective for releasing plastic, but also aids in rubber removal
- Using fresh, clean rag.
- Cleaning oven. If no temperatures are specified, do not exceed 850 degrees F (454 degrees C). Don't quench tooling to cool, as this could affect tooling hardness, concentricity and tolerances
- Purging compounds – several are offered to purge the extruder screw/barrel of residual polymer and rubber compounds

Removing Excess Material for Optimum:

Machining Efficiency Clean parts are critical to extrusion tooling performance and quality manufacturing. This is especially true for the sealing and locating surfaces – that control uniformity of the production process. For general maintenance of the tools, before storage or tooling changeover, a thorough cleaning and removal of the excess material assures the precision machining alignments required to produce end products to the precise tolerances. Equipment should be cleaned while it is still hot, since residual polymer and rubber will be easier to remove. Be sure to follow all MSDS recommendations when heating the tooling. Thermal gloves are used to protect the hands from the heated tooling surfaces. A brass scraper, as well as a brass or copper wool cleaning cloth are recommended because they are soft enough not to scratch the surface.

Make Tool Cleaning Easier:

The quickest way to remove the die is to employ the pressure of the extruder to push it out. Clean the body by using an air compressor and brass pliers so that the material cools down which increases the melt strength, making it into one-lump versus an elastic, gummy-like substance that is harder to remove. Cleaning the body feed port using compressed air and brass pliers to simultaneously cool and remove the excess residue from the feed ports. This procedure is followed by brushing with a round brass brush that polishes the surface. The flow area of the 51 mm flange adapter should be cleaned by carefully using a brass brush.

Examine all surfaces for any irregularities such as burrs and scratches since these must be repaired before the head is reassembled. Most manufacturers recommend using a hand polish-

ing stone to remove the offending burr. Follow stoning with a light application of 600-grit emery cloth if necessary, but avoid rounding edges that are intended to be sharp. Flat sealing surfaces can also be cleaned using a stone, followed by a 600-grit emery cloth. Place the cloth on a clean, flat surface, preferably a surface plate, then apply friction in a circular hand motion until the area is clean and even. The parts in question should all be hardened steel alloys and will not be adversely affected using these methods. Inconel, monel and Hastalloy® are typically not heat-treated, requiring special care and handling to avoid any damage.

Don't Overlook Repairs:

Tooling maintenance helps ensure a quality extruded product – one that meets dimensional specifications, maintains the specified minimum tolerance and is economically produced. Dirty, neglected and improperly adjusted tools contribute to excessive compound applications, which in turn complicate maintenance of minimum thickness tolerance. Excess material results in unnecessary costs and these directly affect the profitability of your company and the relationships with your customers.

Summary:

Working from your dedicated tool cart, follow the manufacturer's instructions for reassembly. Give each component a final wipe down with a clean rag before installing. Even the smallest amount of grit, dirt and residual material must always be removed. Use mechanical or manual assistance for heavy and awkward components to avoid unnecessary mishaps. Reapply anti-seize compound to all fasteners if required. Tighten fasteners to manufacturer's recommended specifications as well as in the recommended sequence. This fastening sequence should be specified in the manual and is generally in a star pattern. Tighten gradually until the proper torque is achieved to prevent distortion of the tooling. One of a die manufacturer's main goals is to form a concentric cone as quickly and accurately as possible in the primary section of the die – when the extrudate first emerges from the die's distribution capillaries. A properly designed and manufactured die has even distribution close to the extrudate entrance point, but this effort is negated once the die is adjusted, shifting the extrudate off to one side. An eccentric cone is formed in the primary area, and a concentric cone exists at only one point in the process, rather than a smooth, continuous flow path with decreasing volume. A properly manufactured and aligned extruded head, along with well-maintained tooling should require little or no adjustment. Another adverse affect of unnecessary die adjustment is the stress introduced to the extrudate caused by unbalanced flow. The net effect is the final product retains memory of this imbalance and unpredictable die swell occurs.

■ Guill Tool & Extrusion Co., Inc.
10 Pike Street West Warwick, RI 02893 USA
www.guill.com

During brake hose production at ContiTech in Korbach SIKORA's X-ray measuring technology ensures inline quality control. From left, Peter Hügen (Area Sales Manager SIKORA AG), Jan Eric Theis (Director Plant Engineering Hoses ContiTech GmbH)



“Our cooperation is driven by the highest quality standards”

ContiTech in Korbach is using SIKORA's X-ray measuring systems for inline quality control of brake hoses

ContiTechSchlauch GmbH, a division of the technology company Continental, is a specialist in manufacturing automotive and industrial hoses. Since 2006, the company situated in Korbach, Germany, has been using SIKORA X-ray measuring systems in its plants for quality control during the extrusion of brake hoses. The cooperation between both companies is based on a future-orientated solution for automated quality control in the inline process.

Quality and performance requirements for automotive hoses are extremely high. Whether fuel, oil or brake hoses – all specifications must be complied with during the extrusion process. More than ten years ago, ContiTech was looking for a possibility to further automate production processes with regard to quality control of brake hoses during manufacturing. Instead of the offline camera inspection of hose cuttings common on the market, the

company chose continuous process control with SIKORA X-ray measuring devices. “The concentricity of brake hoses is a decisive quality characteristic”, says Jan Eric Theis, director Plant Engineering Hoses at ContiTech. “Brake hoses must be precisely connected via joints with the suspension components. This can only be ensured by an impeccable concentricity”, explains Theis. Several measuring methods for quality control are available on the

market. Due to its functionality, however, X-ray technology has proven itself as a leading method for measuring rubber hoses. Conventional technologies like ultrasound are reaching their functional limits, for example, because the signals of the individual layers are mainly absorbed in the rubber hose, and therefore, cannot be analyzed clearly. Before SIKORA devices were applied, the concentricity of the hoses was controlled manually after production. "Today, this kind of inspection is not competitive. We manufacture about 40 kilometers of brake hoses daily. This corresponds to about 15 million meters of hose per year. The increasing production volume was the incentive to further advance the automation of our production", explains Theis. Today, due to the inline application of the X-ray devices, the manufacturer can intervene in the production process, identify eccentricities of the hose and eliminate them as well as their causes.

SIKORA X-ray measuring systems are used at ContiTech for final quality control before vulcanization. Therefore, it can be ensured that the end product meets the required concentricity. Further geometrics, such as diameter, are measured by Laser measuring systems in previous production steps. Even though the X-ray measuring systems can contribute to material saving, ContiTech focuses on the highest quality. "Brake hoses are safety products, thus, concentricity is paramount", says Theis. There are other production advantages: "During co-extrusion, for example, the inner layer of the hose is applied a little thicker to ensure it actually exists to 100%", explains Peter Hügen, Area Sales Manager at SIKORA AG and direct contact for ContiTech. "With the X-ray measuring devices, both layers are precisely measured and visualized, so that the inner layer can be extruded to minimal thickness", continues Hügen.

ContiTech's aspiration for the highest quality of brake hoses was not the only reason that lead to the cooperation



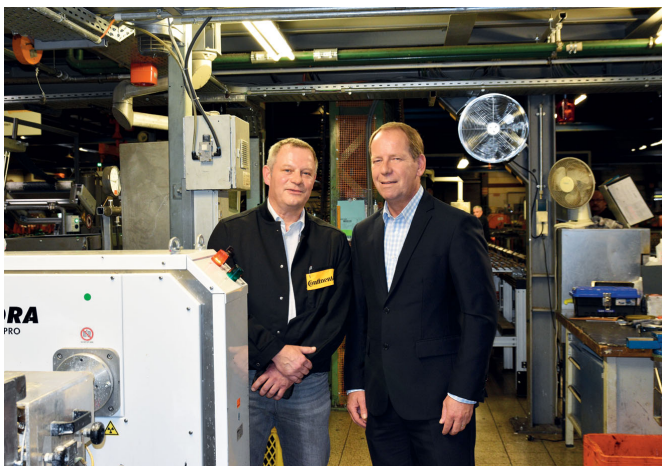
ContiTech brake hoses of highest quality

with SIKORA. International standards also give guidelines for quality standards and measuring methods that have to be met by companies and their products. Today, customers demand a 100% quality control and repeatability, which cannot be done by manual visual inspection. "Our customers are familiar with our quality strategy and know that X-ray technology is an integral part in our production process to produce premium hoses", says Theis.

For the implementation and enhancement of quality standards, ContiTech is collaborating with suppliers like SIKORA for a continuous improvement process. "We understand that our cooperation is driven by our high quality standards", says Theis. Due to an increase of the production speed for a strengthened performance, for example, ContiTech and SIKORA have successfully developed a technical solution in order to increase the sample rate of the X-ray systems and to fulfill quality requirements at the same time.

For product data collection and management, the X-ray measuring systems are connected as standard via interface, such as Profibus or Profinet, to processor systems and the system control. In future, ContiTech is planning — also with regard to Industry 4.0 — to connect plants and systems with machines and operating data logging via OPC UA. Hence, the networking of plants and systems can be improved and relevant data can be archived permanently. SIKORA and ContiTech are also cooperating in this matter to continue ensuring the highest quality of the brake hoses during production.

SIKORA's X-ray measuring system is used at ContiTech for measuring the concentricity. From left, Jan Eric Theis (Director Plant Engineering Hoses ContiTech GmbH), Peter Hügen (Area Sales Manager SIKORA AG)



SIKORA AG
 Bruchweide 2, 28307 Bremen, Germany
www.sikora.net

battenfeld-cincinnati USA has increased its sales coverage in North, Central and South America. The sales managers will be available to meet interested visitors at booth number W2771 at the 2018 NPE show in Orlando, FL from May 7 to 11. battenfeld-cincinnati USA will present the solEX NG single screw extruder, the conEX NG twin screw conical extruders and the STARextruder. These are equipped with the latest Industry 4.0 compatible BCtouch UX control. The extruders represent our latest technology for the infrastructure, construction and packaging divisions, servicing the pipe, profile and sheet industries

conEX NG: flexible, energy-efficient extruders for PVC processing



New Equipment & Innovative Control System to meet Challenges in Extrusion

NG extruder series save energy and improve performance

The solEX NG is a single screw extruder for high-performance applications that offers up to 20% higher outputs, up to 15% lower energy costs and approximately 15-20°F lower melt temperatures. Thanks to this, it is well suited for the production of PO pipe from micro ducts to large diameters of 2.6 m.

The conEX NG is a conical twin screw extruder with a flexible design that covers a wide range of outputs for PVC pipe, profile and sheet extrusion. Its innovative design allows for energy savings of up to 20%. The mechanical design platform offers many configurations for primary or coextrusion applications.

Choice of extrusion systems for thermoforming sheet

For high-grade food packaging production, the use of PET as raw material is on the increase. STARextruders combine a single screw for plastification with a planetary roller section for efficient degassing, making them ideal for direct PET processing. Energy savings can be achieved thanks to reduced drying times.

battenfeld-cincinnati also has comprehensive experience in multi-layer sheet extrusion. The product portfolio includes high-speed extruders with 75 and 45 mm diameter screws and, depending on the customers' requirements, standard 3-roll roll stacks or the Multi-Touch roll stack for high-speed extrusion.

New control system compatible with Industry 4.0 applications

battenfeld-cincinnati's extruders are equipped with the BCtouch UX control system. The "UX" stands for "user experience" and refers to the intuitive operation of the user interface, thanks to a graphic depiction of the line and its components. The intuitive multi-touch display function is modeled on well-known user interface designs from mobile phones and tablets. The control comes with a 21.5" landscape format with swivel-and-tilt functionality as well as multiple language options and individualized control surfaces for each operator.

The "Industry 4.0" concept is a means to optimize production. The four main functions that BCtouch UX offers to customers in this area are:

1. OPC UA functionality: this refers to a standardized interface that allows customers to check the data of battenfeld-cincinnati machines on other providers' visualization systems (provided these are also equipped with an OPC UA function). This enables easier synchronization and an overview over the complete production hall, and therefore better production planning and maintenance.
2. Preventive maintenance: this helps the operator to plan the maintenance schedule and/or spare parts orders due to a better control of drive and oil quality.
3. Uncomplicated remote maintenance option for quicker service.
4. Simulation of a running line for training purposes.



**Battenfeld-cincinnati
at NPE 2018:
Booth number W2771**

battenfeld-cincinnati
32547 Bad Oeynhausen, Germany
1230 Vienna, Austria
www.battenfeld-cincinnati.com



IPTF

2018

6th INTERNATIONAL POLYMER TECHNOLOGY FORUM

June, 7-8, 2018
AZIMUT Hotel
St. Petersburg
Russia

PLASTICS PROCESSING: PRACTICAL SOLUTIONS



55+ companies-converters

150+ participants

KEY TOPICS

- Optimization of each production process (transportation, dozing, mixing, heating-cooling, extrusion or molding, quality contro, etc) – best way to increase profit
- Low self cost not equal high profit?
- Know-how from market leaders (machines and equipment supplier, raw materials and additives producer, converters) – cases and presentations

Organized by

 PR.EVENTS

EXTRUSION



Sponsors

 BOREALIS

Leistritz


بروج
Borouge

Contacts

IPTF.RU

in Russia

+7 499 346 68 47
info@iptf.ru

+7 917 011 45 47

russia@vm-verlag.com

+7 846 276 40 45

reklama@plastics.ru

in Ukraine

+38 098 1226234

info@fprevents.com

in Germany

+49 2233 949 8793

a.kravets@vm-verlag.com

TERMS and CONDITIONS

REGISTRATION FEE

Registration fee includes	Before April,16, 2018	After April,16, 2018
Access to conference panels Coffee breaks Printed materials Lunches Buffet reception Excursion tour	265 EUR for each delegate	300 EUR for each delegate

ADVERTIZING and SPONSORSHIP

Exclusive! Only for sponsors - opportunity to present products and services in the conference program, place logo on the website of the event and put printed leaflets in the delegates bags!

Advertizing options	Price for separate option	Special Sponsor Package	Leading Sponsor Package
Presentation 25 min. (including registration fee)	850	+	++
Logo on the website, conference bags, conference program, conference banners	-	+	+
Banner in the conference hall	300 EUR	+	++
Advertizing materials on the registration desk	75 EUR	+	+
Including advertizing materials into delegates bags	450 EUR	+	+
Promo-video demonstration	520 EUR	-	+
Working place in conference hall (for exhibition)	370 EUR	+	+
Printe advertizing in conference catalogue (A5 size)	185 EUR	-	+
The branded tapes for badges	-	-	+
Delegates from company included to the package	-	2	4
PACKAGE PRICE		1 800 EUR	3 700 EUR

Also available packages of the «Beer party Sponsor» and «Excursion Tour Sponsor»

Buy sponsor package and get new clients!