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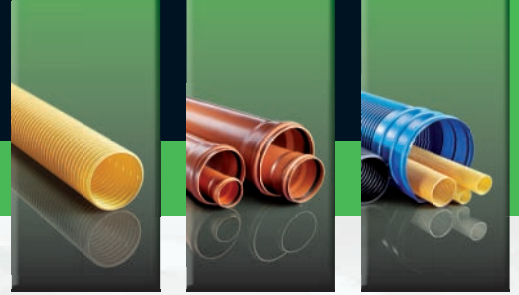
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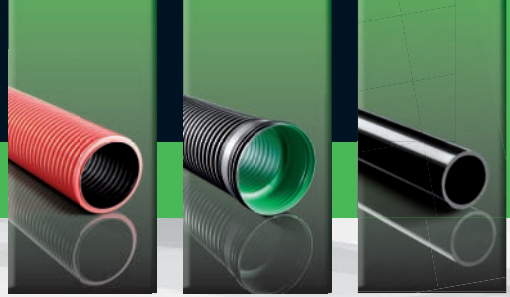
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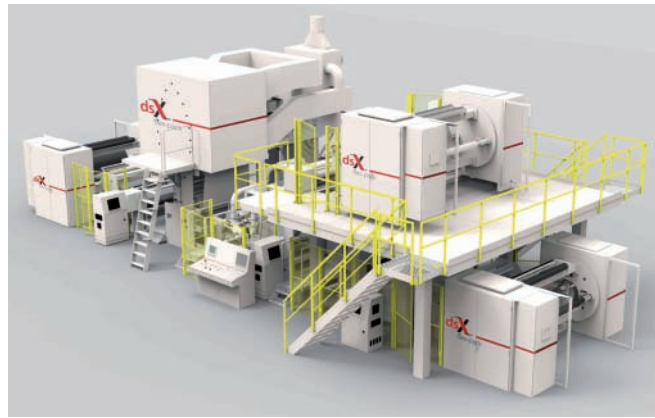
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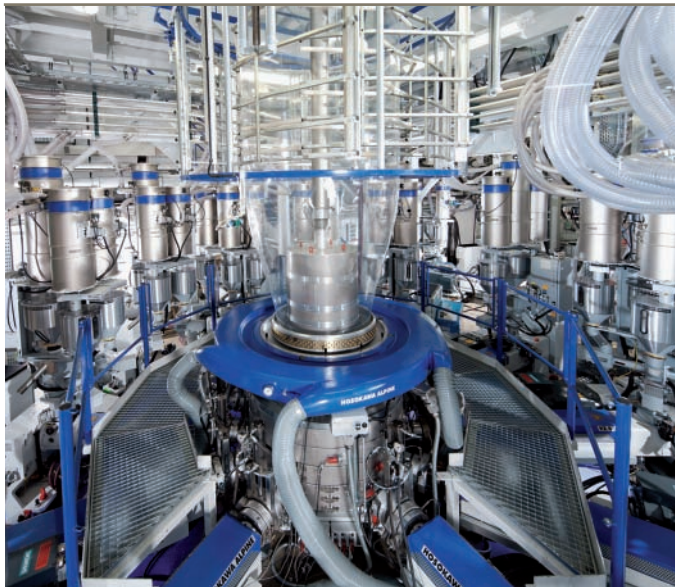


在2016中国国际橡塑展期间，戴维斯标准 (Davis-Standard) 公司将介绍其新技术和本地能力的提升。戴维斯标准已经看到：整个亚洲对于进料螺杆、控制系统、医用导管技术，以及公司生产的dsX™ 流延膜生产线、吹膜生产线和包装方面的应用都有着强劲的需求。

Davis-Standard's new technology and regional capabilities will be promoted during Chinaplas 2016. Davis-Standard has seen strong demand throughout Asia for feedscrews, control systems, medical tubing technology, and its dsX™ product line for cast film, blown film and packaging applications.

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十一层高阻隔薄膜产品要替代九层？从一方面看，要投资于复杂的现代化设备，而另一方面是增加了灵活性。无论如何，问题在于：这样做有价值吗？可以肯定地回答：是的。

The production of High Barrier Films with eleven instead of nine layers? On the one hand an investment in complex modern equipment and on the other an increase in flexibility. Nevertheless the question is: Is it worth-while? The answer is a very definite yes.

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Antoniterstraße 17, D-50667 Köln, Germany

CHINA Office:

Henry Xiao 肖晨
Matchexpo Co., Ltd.
Tel.: 0512-57696725
Mobilephone: 18915759645
email: marketing@matchexpo.com

VM 出版社有限公司 / 编辑+出版

VM Verlag GmbH – Editorial Office + Layout:

P.O. BOX 410907, D-50869 Köln
Bettina Jopp-Witt M.A.
(Chief Editor EXTRUSION, Extrusion Asia Edition)
Tel.: +49 221 546 15 39, Fax: +49 221 168 60 13
email: redaktion@vm-verlag.com,
b.jopp-witt@vm-verlag.com
Dr. Yury Kravets (Chief Editor Extrusion Russia Edition/PlastCourier),
Tel.: +49 2233 979 29 76, e-mail: y.kravets@vm-verlag.com
Dipl.-Ing. Alla Kravets (Project Manager Extrusion International),
Tel.: +49 2233 390 9090, e-mail: a.kravets@vm-verlag.com

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VM Verlag GmbH – Sales + Distribution:

Postfach 1260, D-76339 Eggenstein-Leopoldsh.
Scheffelstraße 5, D-76344 Eggenstein-Leopoldsh.
主编 / Head: Inge Böhle,
Tel.: +49 721 700 626, Fax: +49 721 62 71 02 66
e-mail: i.boehle@vm-verlag.com
Martina Lerner,
Tel.: +49 6226 97 15 15, e-mail: lerner-media@t-online.de

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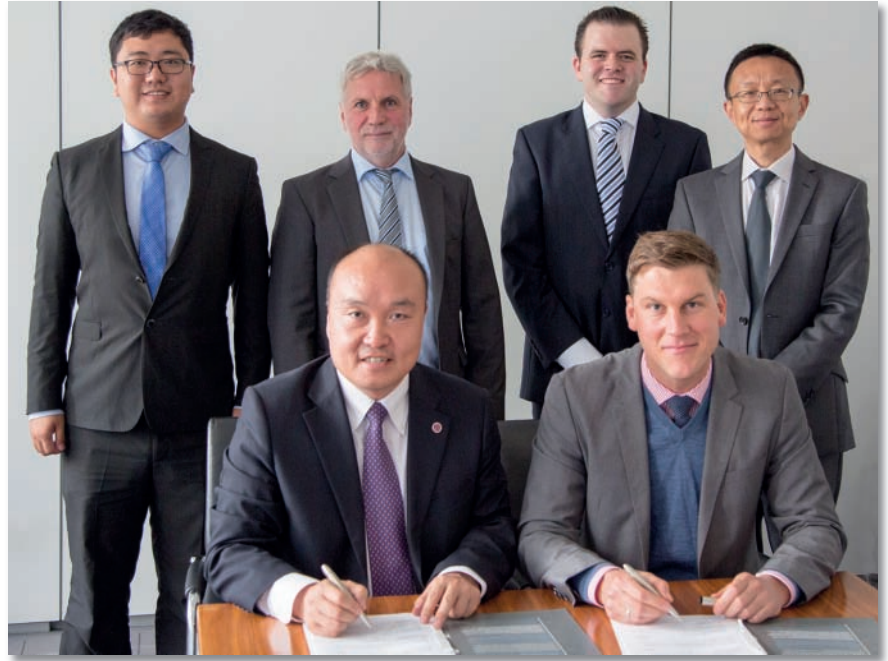
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业生产轻量化为中国电动汽车行零部件



康得复合材料公司与迪芬巴赫签订2条全自动高压RTM生产线时的合影

The partners of Kangde Composite Co., Ltd. and Dieffenbacher at the signing of the contract for two fully automated HP-RTM lines

■ 康得复合材料有限公司的专家在金秋10月签署了一份合同，购买2套全自动成套高压RTM设备生产线，为汽车行业生产碳纤维增强塑料部件。这已是在短期内与中国签订的第2份大订单，为轻量化零部件生产引进最先进的生产线。4月中美合资企业CPS Victall 曾订购了一条生产长纤维增强塑料部件的生产线。

这2条高压RTM(高压树脂注模成型)生产线采用新的表面成型方法用于生产A级标准的外饰部件。注射的核心是2台DCL压机，压力是3600和2500吨。

由迪芬巴赫共同开发的表面树脂注模成型工艺，碳纤维部件表面可以直接油漆无需任何手工再次加工。这个生产工艺的第一步就是压模一个常规的RTM部件，然后压机稍微开启，注入底漆可弥补缩痕或表面缺陷。这条生产线的成就是仅仅在一个生产周期内能完成A级部件的生产。

北京康得投资集团是康得复合材料有限公司的母公司，是中国最大的生产腹膜的生产商，今后重心是生产最先进的轻量化碳纤维部件。中国政府计划到2020年推广五百万辆电动汽车。

■ *Lightweight Construction for E-Mobility in China:* In October, the Chinese plastics specialist Kangde Compo-

site Co., Ltd. signed a contract for two fully automated HP-RTM plants for the manufacture of carbon-fiber-reinforced plastic components for the automotive industry. This is already the second major order for state-of-the-art production lines for lightweight components from China within a short period of time. In April, the Chinese-American joint venture CSP Victall ordered a production line for the manufacture of long-fiber-reinforced plastic components.

Both HP-RTM (high-pressure resin transfer molding) plants are used to produce parts such as class A-compliant exterior components using the new surface RTM method. The core of the delivery is two DCL upstroke presses with pressing forces of 3600 and 2500 tons.

In the surface RTM procedure, co-developed by Dieffenbacher, carbon components with surfaces that can be painted directly are manufactured without any manual reworking. The first step in this manufacturing process is to press a conventional RTM component. Next, the press is opened a small amount and a primer is injected to compensate for any sink marks or surface imperfections. The result is premium class-A components produced in only one cycle.

The parent company of Kangde Composite, the Beijing Kangde Investment Group, is the largest Chinese manufacturer of laminating films and aims to manufacture state-of-the-art lightweight components made from carbon in the future. The Chinese government wants to put five million electric cars on the streets by 2020.

► **Dieffenbacher GmbH**
www.dieffenbacher.de

雷孚斯扩大在中国的销售和生产

■ 两年前,销售公司雷孚斯 (LEHVOSS) (上海) 化学贸易有限公司成立, 接下来, 已经到了成功地扩展业务活动的时候了。此前发布的产品开发和应用技术现在已经定型: 2015年11月, 雷孚斯新材料(昆山)有限公司成立, 这家公司位于昆山的德国工业园, 这一位置物流便利, 大约位于上海以西

60km, 离虹桥机场40km。公司的占地面积为2,500 m², 有足够的空间容纳挤出工厂、实验室和开发部门、应用技术部门以及办公室。按计划, 从2016年下半年开始, 将集中生产LUVOCOM®高性能混合料以及LUVOBATCH® 添加剂和母料。

由于增长强劲, 雷孚斯(上海)化学贸易有限公司今年初搬迁到了上海的新址。新址位于上海市长宁区, 现在已经扩大了原有的团队, 有了充足的空间, 能够与客户数量的增长相适应。

■ **Expansion of sales and production in China:** Following the foundation of the sales company LEHVOSS (Shanghai) Chemical Trading Co. Ltd. two years ago, it has been possible to successfully expand business activities. The previously announced development of production and applications technology is now taking definite shape: November 2015 saw the foundation of LEHVOSS New Material (Kunshan) Ltd., based in the Kunshan German Industrial Park, which

enjoys a logistically favourable position approximately 60 km west of Shanghai and 40 km from Hong Qiao Airport. On a 2,500 m² area, there is sufficient space to accommodate extrusion plants, a laboratory, a development department, application technology and offices. According to plans, production will focus on LUVOCOM® high-performance compounds as well as LUVOBATCH® additives and masterbatches from the second half of 2016.

Due to the strong growth, LEHVOSS (Shanghai) Chemical Trading Co. Ltd. moved to new premises in Shanghai at the beginning of the year. The premises are located in Changning District in Shanghai and now provide the expanded team with the space they require to be able to serve the growing number of customers.

► **Lehmann&Voss&Co. KG**
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印度包装公司订购了德国吹膜生产线

■ 位于德国Troisdorf的莱芬豪舍技术中心，不断地向客户提供有关数据和参数，支持客户投资于EVOLUTION系列吹膜生产线。一个最新的例子就是：在莱芬豪舍吹膜生产线上生产出的样品薄膜，具有出色的膜材平整度，对于印度Shrinath Rotopack 私人有限公司的数百万采购订单来说，这一特性最终起到了极为重要的作用。“EVOLUTION 超级平整”是拥有专利的平整单元，它被装配在薄膜牵引单元中，从任何方面来看，这一技术都是十分值得信赖的。一方面，对于提升薄膜的质量带来了好处，并且，减少了复杂程度（从技术现状来看），而另一方面，节省了投资成本（从财务方面来看）。因此，莱芬豪舍的薄膜牵引技术可以受到用户的青睐。此外，事实证明，在薄膜的印刷和复合转换过程中，当使用优化平整的膜材时，可以明显地节省成本。不仅如此，薄膜的印刷质量和复合性能都得到了提升，尤其是减少了薄膜的卷曲和优化了复合时的粘性。

Naresh Rathi先生和Manish Rathi先生是来自Shrinath Rotopack公司（SRPL）的两兄弟，管理着公司的主要的投资。他们来到欧洲，针对他们制造高阻隔膜这一新的投资进行探讨和选择，评估知名的欧洲设备制造商。他们同时还携带着薄膜配方，并希望用这种配方在真实的生产条件下进行测试。在Troisdorf,他们最后终于发现了莱芬豪舍拥有专利的EVOLUTION超级平整吹膜生产线，这种生产线在牵引部分配备了薄膜平整系统。膜材通过膜泡折叠系统的不同阶段都可能产生表面的不平整现象。而这一系统可以纠正和完全消除薄膜表面的不平整。对于SRPL来说，除了购买这种吹膜机以外，没有更好的选择。

这样，SRPL就订购了两台高度自动化的吹膜生产线，并配备了采用当代最新技术的辅助系统，生产线将安装在他们最新建造的位于印度海德拉巴的工厂里。一投资组合包括一条用于生产不同用途的高质量复合薄膜的三层生产线，并配套EVOLUTION超级平整系统和高性能EVOLUTIONAI超低温冷却系统。这条生产线产量可以轻松达到800kg/h。另一条生产线订单是7层吹膜生产线，用于生产复杂结构的阻隔薄膜，这种薄膜可用于包装食用油、乳制品、液体、肉类、海产品、干果和用于真空包装等等。生产线还可用于生产罩盖和用于非对称热成型片材的高阻隔薄



印度Shrinath Rotopack 私人有限公司和莱芬豪舍吹膜股份有限公司在印度海德拉巴正式签署了数百万的订购合同(从左至右): Kurt Freye, Ulrich Reifenhäuser, Naresh Rathi (Shrinath Rotopack), Rajkishore T.D. (莱芬豪舍印度), Manish Rathi (Shrinath Rotopack), Bharath Yalla (莱芬豪舍印度)

Multi-million deal officially sealed between the Indian Shrinath Rotopack Pvt. Ltd. and Reifenhäuser Blown Film GmbH in Hyderabad, India (from left to right): Kurt Freye, Ulrich Reifenhäuser, Naresh Rathi (Shrinath Rotopack), Rajkishore T.D. (Reifenhäuser India), Manish Rathi (Shrinath Rotopack), Bharath Yalla (Reifenhäuser India)

膜。为了生产这种结构的薄膜，这条7层吹膜生产线配备了合适的水浴槽。

对生产线的技术特性引以为豪的莱芬豪舍吹膜公司销售总监Kurt Freye先生指出：“客户最终决定购买莱芬豪舍生产线。我们拥有值得信赖的技术，再加上莱芬豪舍印度公司与SRPL之间长期信任的商业关系，都为这一决定作出了相当的贡献。”

■ Indian Packaging Company places Order with German Blown Film Lines:

The Technology Center of Reifenhäuser Troisdorf/Germany is constantly delivering arguments in favor of an investment in the lines of the EVOLUTION series. The latest example was the superior web flatness of a sample film produced on a Reifenhäuser blown film line that served as ultimate argument crucial for Indian Shrinath Rotopack Pvt. Ltd's multi-million purchase. "EVOLUTION Ultra Flat", the patented film flattening unit integrated in the film haul-off could convince in every respect. On the one hand, this can be attributed to the film quality improvement function and reduced complexity (technical aspects) and on the other hand to the investment cost (financial aspect) the Reifenhäuser film haul-off

can score with. Furthermore, practice has shown that significant savings are possible when using webs of optimized flatness in converting processes on printing and laminating machines. In addition, the printing quality and laminating ability can be improved, in particular due to reduced curling of the film and optimized adhesion of the laminate.

Mr. Naresh Rathi and Mr. Manish Rathi, the two brothers from Shrinath Rotopack Pvt. Ltd. (SRPL), who look after the major investments of the company went to Europe for exploring the options of evaluating the renowned European machine manufacturers for their new venture of manufacturing high barrier films. They also carried the recipes of the films for which they would run tests under real production condition. In Troisdorf, they finally came across EVOLUTION Ultra Flat, Reifenhäuser Blown Film's patented film flattening system integrated in the haul-off. The system is able to correct and completely eliminate surface irregularities that may occur at the different stages of the web's way through the bubble collapsing system. For SRPL there was no better reason than this to buy the machines.

SRPL then ordered two highly automated blown film lines which will be equipped with the up-to-date assistant systems which will be installed in their newly built factory in Hyderabad, India. The investment package includes a 3-layer line for the production of high-quality laminating film for different applications. Also included are EVOLUTION Ultra Flat and the highperformance EVOLUTION Ultra Cool cooling system. The line enables output rates of 800 kg/h to be achieved without problem. A further order was placed for a 7-layer

er line for the production of complex barrier film for packaging of edible oils, dairy products, liquids, meat, sea food, dry fruits, vacuum packaging, etc. The line is also intended for the production of highbarrier film for lids and asymmetric thermoforming sheets. To handle such film structures, the 7-layer blown film line is equipped with a suitable water quench bath.

Convincing technology features Kurt

Freye, Director of Sales at Reifenhäuser Blown Film says: "Our convincing technology in combination with a longstanding trusting business relationship between Shrinath Rotopack and Reifenhäuser India has considerably contributed to the fact that the purchase decision was finally taken in favor of Reifenhäuser."

➔ Reifenhäuser Blown Film GmbH
www.reifenhauer-bf.com

新工厂开业

■ 位于中国南京的科倍隆（南京）机械有限公司近日在南京江宁经济开发区举行了新工厂的开业典礼。科倍隆集团总裁 Kimberly K. Ryan 女士协同江宁经济技术开发区政府，中国塑料 & 机械行业协会代表，各家媒体，150名客户和供应商，以及整个科倍隆德国董事会成员参加了隆重的新厂揭幕仪式。

南京新工厂的开业标志着新厂建设以及搬迁这一重大项目的圆满完成。在旧址被南京江宁区政府规划未来用于科研和商业用地后，新厂搬迁势在必行。在江宁经济技术开发区政府的大力支持下，科倍隆找到交通便捷和令人满意并且适合专业要求很高生产和制造用途的新厂址。厂房建设从2014年5月开始，于2015年6月结束。

超过15,000平米的新工厂将继续专注于STS 和CTE系列双螺杆挤出机的生产制造和工艺研发上。为了满足科倍隆制造需要，新工厂的设计采用科倍隆德国最先进的机械生产和工程设计技术，为科倍隆南京量身设计，物流和生产布局得以优化，从而提高生产效率。

■ **New Plant opened:** Coperion (Nanjing) Machinery Ltd. Co., Nanjing, PR China, recently opened a new facility in the Nanjing Jiangning District. Coperion President Kimberly K. Ryan inaugurated the new plant in Nanjing



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完美质量的保证

CENTERWAVE 6000, 专为外径范围 120mm - 2500mm 的超大管材设计，运用突破性的毫米波技术为管材提供外径、壁厚、偏心度和下垂度的测量与控制。即使是复杂的多层管材，也可精确测得所有数据。**CENTERWAVE**不受耦合材料影响，可精准地对管材壁进行多点高精度测量。因而，该系统具有很好的操作重复性，为大直径的塑料管材的品质保障提供了一个前瞻性的技术保障。

- 操作简单，不需要预先设定产品参数
- 检测不受材料及温度的影响
- 测量数据的实时显示及控制
- 可靠的测量数据，不需要校正



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www.sikora.net/centerwave

Jiangning District in a formal and festive ceremony in the presence of Government officials of Nanjing Jiangning Economic & Technology Development Zone, representatives of Chinese plastics & machinery associations, media representatives, 150 customers and suppliers, employees and the entire Coperion Executive Team.

The plant opening marked the completion of the new construction and the relocation from the old plant to the new one. The move was necessary as the old site in Nanjing Jiangning District was rezoned by Nanjing Jiangning Government for future R&D and commercial development. With the support of the Government of Jiangning Economic & Technology Development Zone, Coperion was able to find a new plant for manufacturing and production purposes nearby.



科倍隆南京新的制造基地，采用最先进的机械生产和工程设计技术，为科倍隆量身定制设计，物流和生产布局得以优化，从而提高生产效率。
(照片：科倍隆，斯图加特，德国)

Coperion Nanjing's new manufacturing plant (Image: Coperion)

Construction work started in May 2014 and was finished in June 2015.

With a footprint of more than 15,000 sq. m the new production will continue to

focus on manufacturing the STS and CTE twin screw extruder series. In order to serve Coperion's manufacturing needs, the new building is designed with the following features: the most advanced machinery production technology with engineering and manufacturing know-how from Coperion Stuttgart, Germany and an optimized, tailor-made workshop layout for highly efficient production.

科倍隆南京开业典礼剪彩仪式 (照片：科倍隆，斯图加特，德国)

Ribbon cutting at the opening ceremony of Coperion (Nanjing) Machinery Ltd. Co. (Image: Coperion, Stuttgart, Germany)

➔ Coperion
www.coperion.com



正式的分销伙伴

■ 在 Feddersen 集团里，K.D. Feddersen 专门从事高分子材料原料、添加剂和技术产品的分销和市场营销业务。通过其“聚合物和混合料技术”业务单元，公司从2015年11月开始成为正式的聚酮产品的分销商，该产品由韩国晓星公司 (Hyosung) 生产。

聚酮原来的商标名是 Carilon，从2000年以来，当石化产品公司壳牌停止了聚酮 (PK) 的生产后，这种原料沉寂了下来。直到今天，许多过去经常加工这种原料的公司都未能找到合适的替代品，不得不将剩下的能够找到的这种原料储存起来。

不过，最近几年来韩国做出了努力，恢复了这种令人关注的聚合物的生

产。2011年，晓星公司根据自己的经验在实验设备上第一次生产出了这种原料，随后，采用生产能力为每年五万吨的常规生产线，于2015年的年中在韩国蔚山将这种原料投入了生产。

K.D. Feddersen 公司的聚合物和混合料技术部门掌门人 Lukas Musial 先生说道：“我们在欧洲和拉丁美洲分销这种高分子材料，三种标准型号分别是高流动性、中等流动性和高强度的原料。我们明确地致力于面向挤出行业，并着重于混合料。”

脂肪族聚酮有着某些令人关注的特性，任何其它聚合物都不能匹配这些特性组合。例如，聚酮 (PK) 的回弹力明显高于聚甲醛 (POM) 和聚酰胺 12 (尼龙 12, PA12)。未经改性的 PK，其硬度为 1,500 MPa 因此与 PA12 水平

相当，但是 PK 的三元共聚物仅仅在 220°C 的温度下才熔化，比 PA12 高出 40°C。

PK 的耐受力强是其最大的优点之一。PK 能够抵抗腐蚀的原因在于：弱酸通常将分解为长链聚酰胺，例如 PA12。PK 甚至能够耐受卤代烃类化合物和乙醚。只有非常强的酸和碱才能够损害这种耐受结构。

此外，对于许多低分子介质如氧气或燃料，PK 同样具有高阻隔的特性。它还具有极为出色的润滑特性。除了非常出色的技术特性以外，这种聚合物还具有“对气候无害”的特性，这是由于其化学成分所决定的。

■ *Official Distribution Partner: Within the Feddersen Group, the K.D. Feddersen*

sen Ueberseegesellschaft mbH is specialised on the distribution and marketing of raw polymers, additives and technical products. Through its business unit "Polymers & Compounding Technology", the company has since November 2015 become the official distributor for the product polyketone that is produced by the Korean Hyosung Corporation.

Since 2000, when the petrochemical company Shell discontinued its production of polyketone (PK) that was formerly known under the brand name Carilon, it has been quiet about this material. Until recently, many companies that used to process the material were not able to find an adequate alternative and had to stock up on remaining quantities that were still available.

Nevertheless, efforts have been made in South Korea in recent years to bring back this interesting polymer. In 2011, the Hyosung Corporation made its first experiences with a pilot plant and later took a regular production line with a capacity of 50 kt / year into operation in Ulsan, Korea in mid-2015.

"We distribute these raw polymers in Europe and Latin America in the three standard types of high-flow, medium-flow and high-impact", according to Lukas Musial, Head of Polymers & Compounding Technology at K.D. Feddersen Ueberseegesellschaft. "The focus is clearly on

the extrusion industry with an emphasis on compounding."

Aliphatic polyketone has some interesting properties that cannot be matched by any other polymer in this combination. For instance, the resilience of PK is significantly higher than that of polyoxymethylene (POM) and polyamide 12 (PA 12). The stiffness of the unmodified PK is 1,500 MPa and therefore on par with PA 12, however, the terpolymer of PK only melts at a temperature of 220° C, which is 40° C higher than that of PA 12.

The resistance of PK is one of the greatest advantages of this material. This is how PK can resist corrosion due to mild acids that would normally decompose long-chain polyamides such as PA 12. PK even is resistant against halogenated hydrocarbons and aldehydes. Only very strong acids and alkalis are able to corrode this resistant structure.

Furthermore, PK is also characterised by a high barrier effect against many low molecular media such as oxygen or fuel. It also has excellent tribological properties.

In addition to its very good technical properties, the polymer is also characterised as climate-friendly due to its chemical composition.

► **K.D. Feddersen Ueberseegesellschaft mbH**
www.kdfeddersen.com

在亚洲拓展业务

■ 通过投资于中国创投基金GRC SinoGreen Fund III (GRC III), 德国赢创工业集团扩大了其在亚洲的风险投资活动。根据当事人商定, 投资的数额不公开披露。这样一来, 该公司现在在南美洲, 欧洲和亚洲地区都参与了最为重要的风险投资领域。GRC在大中华地区投资于



具有独特优势和巨大增长潜力的民营绿色技术公司。目标领域包括能源和资源再利用、环保交通工具、可持续发展和减轻及适应气候变化。GRC III 的办公室位于北京和台北。最近几年以来, 亚洲已经发展成为世界第三个最重要的风险投资地区。中国大约占上述活动的三分之二。

GRC III 的投资人除来自赢创集团以外, 还包括世界银行的子公司国际金融公司, 荷兰发展银行开发金融公司 (FMO) 以及壳牌的风险资本部门壳牌技术企业。

风险投资的院长在赢创Bernhard Mohr: "通过投资于GRC III, 我们打开了大中华区这一快速增长的新兴社会的大门。与GRC一起, 我们已经找到了有着可靠的工作业绩、并且直接与我们自己的业务活动有关联的强有力的合作伙伴。"

Bernhard Mohr, Chief of Venture Capital at Evonik:

"By investing in GRC III, we are opening the door to the fast growing start-up community in Greater China. With GRC we have found a strong partner with a proven track record and with immediate relevance to our own business activities."



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作为这一风险投资活动的一部分，赢创集团计划向那些拥有创新技术的有前途的新兴公司和领先的专业风险投资基金投资，总额为一亿欧元。投资区域的重点是欧洲、美国和亚洲。赢创当前控股了8家新兴企业和4只基金。

■ *Expanding in Asia:* By investing in the Chinese venture capital fund GRC SinoGreen Fund III (GRC III), Evonik has expanded its venture capital activities into Asia. The parties have agreed to not disclose the amount of the investment. As a result, the company is now represented in the most important venture ca-

pital regions of North America, Europe, and Asia. GRC invests in private, green technology companies with unique strengths and substantial growth potential in Greater China. Target sectors include energy and resource efficiency, cleaner transportation, sustainability, and climate change mitigation and adaptation. GRC III has offices in Beijing and Taipei. In recent years, Asia has evolved into the world's third-most important venture capital region. China accounts for around two-thirds of these activities.

Aside from Evonik, the investor base of GRC III includes the World Bank subsidiary International Finance Corporation, the

development bank Netherlands Development Finance Company (FMO) and Shell Technology Ventures, the venture capital arm of Shell.

As part of its venture capital activities, Evonik plans to invest a total of EUR 100 million in promising start-ups with innovative technologies and in leading specialized venture capital funds. The regional focus is on Europe, the US, and Asia. Evonik currently has holdings in eight start-ups and four funds.

➔ **Evonik**
www.evonik.com

创新拉动增长

■ 总部位于瑞士的奇石乐集团 2015 年尽管受到汇率的不利影响仍获得持续增长。全年销售总额达3.41 亿美元，并在全球新增了约 120 个工作岗位。作为动态测量技术行业领先的生产商奇石乐集团今年将继续有针对性地投资研发——旨在开发创新产品和提供面向应用的服务。

奇石乐集团的预期增长扣除汇率影响后约为10%。集团 CEO, Rolf Sonderegger 先生预计 2016 年又将会是奇石乐辉煌发展的一年：“奇石乐集团将凭借其独特的技术和强大的全球化布局继续发展。一部分增长源自我们的新产品和应用，扩展面向应用的服务项目和战略性的并购将是业务不断增长的另一动力。”

奇石乐集团将持续扩展面向应用的服务业务至 2020 年。2016 年，奇石乐集团的产品组合中将增加创新产品，包括新的应用和相关的服务，如新的战略业务领域热声学。集团 CEO, Rolf Sonderegger 先生在谈及未来几年的战略发展方向时表示：“和我们的客户一起，我们将努力探索技术极限并共同前行。作为开发合作伙伴我们也将融入客户的创新和优化过程”。

考虑到新型服务业务的开展，集团在德国、日本和中国的公司都已扩展。在东京和位于德国伯布林根-辛德芬根 (Böblingen-Sindelfingen) 的奇石乐集团新的欧洲总部，新建了两个技术中心。“每年我们都会投入销售收入的 10% 用于研发。2016 年奇石乐集团仍将在全球范围内对创新产品和服务业务进行投入”，集团 CEO, Rolf Sonderegger 先生表示。“表彰最佳企业转型的



位于德国伯布林根 - 辛德芬根 (Böblingen-Sindelfingen) 的奇石乐集团新的欧洲总部 (竣工前夕)
Kistler's new European headquarters in Böblingen-Sindelfingen, Germany, is nearing completion

瑞士 ASCO 金奖、德国最具创新力的前 100 佳中小企业奖和奇石乐的一个产品创新奖等殊荣均表明我们处于技术发展的前沿并准确把握客户行业的需求。”

■ *Successful Year:* With sales of USD 341 million in 2015, the Kistler Group overcame currency-related challenges at its Swiss site to achieve continued growth and create some 120 new jobs around the world. Kistler, the leading manufacturer of dynamic measuring technology, will again be making targeted investments in R&D during the current year in order to develop innovative products and application-specific services.

The Kistler Group is well on course, with growth of 10% after currency-related adjustments. CEO Rolf Sonderegger anti-

cipates another successful year in 2016: „Kistler will continue to grow, thanks to our unique technologies and our strong global positioning. We aim to achieve some of this growth through new products and applications, but a key part will also be played by a targeted expansion of our service offering in tandem with strategic acquisitions.”

Kistler intends to expand its service offering by introducing application-specific service products on a continuous basis until 2020. Innovative products will be added to the Group's portfolio in 2016, including new applications and the corresponding services: the offering from the new Thermoacoustics Strategic Business Field is just one example. Commenting on the Group's strategic orientation for the coming years, Rolf Sonderegger

egger notes: „Together with our customers, we operate at the limits of what is technically feasible – and hand-in-hand, we go one step further. As our customers' development partner, we actually become part of their innovation and improvement process.“

Facilities in Germany, Japan, and China have been systematically expanded to accommodate the new service offering. Two new Tech Centers are under construction in Tokyo and at Kistler's new European headquarters in Böblingen-Sindelfingen, Germany. „Some 10% of our yearly sales revenue is devoted to research and development. In 2016, the Kistler Group will again be investing in the development of innovative products and services across the globe,“ Rolf Sonderegger points out. “Accolades such as the Swiss ASCO Award Gold for the best

磨床机器在温特图尔的生产基地-最新的高性能五轴磨床机器只是符合高质量标准的奇石乐集团投资在高效率生产线的其中之一

The new high-performance 5-axis grinding machine is just one of many investments in efficient production in line with highest Kistler quality standards

corporate transformation, the TOP 100 Award that places us among Germany's most innovative medium-sized businesses, and the Handling Award for one of Kistler's product innovations show that we have our finger on the pulse of technological developments, and



we are fully aware of requirements in our customers' sectors.“

► Kistler Group
www.kistler.com

扩产计划

■ 科莱恩 (Clariant) 宣布了计划，投资超过七百五十万瑞士法郎购买专业设备和设施，扩大产品的品种和生产能力，用于生产工程塑料树脂和高温塑料，例如PEEK (聚醚醚酮) 颜色和添加剂色母料。这一笔大规模的投资已被确定用到位于上海工厂、新加坡工厂和位于美国的两家工厂。

在加工温度为300°C或更高的情况下，为了使高分子材料能够有效地工作，色母料必须采用特殊的配方，不仅要采用同样耐高温的基础材料，同时还要使用可以经得起极端水平的高温和剪切等特殊原料和添加剂。原料混合和挤出设备也必须进行相应的配置，能够在这一极端条件之下工作。科莱恩在美国有三家色母料工厂，分别位于马萨诸塞州的Holden，缅因州的Lewiston以及密歇根州的Albion。在工程塑料和高温物料方面，已经积累了大量的工作知识和经验。在亚洲，以前的生产能力是较多限制的，主要重点在工程物料 (如ABS，聚碳酸酯和某些尼龙)，这些原料都是在中等的温度下加工的。这一地区的客户因此常常需要从海外采购更为先进的产品，从而面临着较长的产品开发周期和交货期。这一现象现在即将发生改变。

在上海，科莱恩正在安装具有全系列产品生产能力的整套设备，生产工程

塑料和高温树脂所需要的新的产品生产线及相关的生产能力将在2016年年底准备就绪。

在美国，2015年下半年，公司在缅因州的Lewiston安装了加工含氟聚合物的设备，而在2016年第一季度，在马萨诸塞州的Holden，将会安装新的生产线，生产专业的工程混合料和高温树脂黑色母料。

■ **Expanding:** Clariant announced plans to invest more than CHF 7.5 million in specialized equipment and facilities to expand the capabilities and capacities for the production of color and additive masterbatches for use in engineering resins and high-temperature plastics like PEEK (polyether ether ketone). The largest investment has been earmarked for plants in Shanghai, Singapore, and at two plants in the U.S.A.

In order to work effectively in polymers that are processed at temperatures of 300°C or higher, masterbatches must be specially formulated using not only the same high-temperature base material, but also special pigments and additives that can stand up to extreme levels of heat and shear. Compounding and extrusion equipment must also be configured to operate under these extreme conditions. Three Clariant Masterbatches

plants in the United States – Holden, Massachusetts, Lewiston, Maine, and Albion, Michigan – already have vast knowledge and experience in working with both engineering and high-temperature materials. Capabilities in Asia have previously been more limited, focusing mainly on engineering materials (like ABS, polycarbonate and certain nylons), which are processed at moderate temperatures. Customers in this region have therefore often had to source the more advanced products from overseas and thereby facing longer product development and delivery times. That is about to change.

In Shanghai, where Clariant is implementing the full range of equipment, and procedures required for engineering and high temperature resins, new production lines and associated capabilities will be in place by the end of 2016. In the United States, the company installed equipment for processing fluoropolymers in Lewiston, Maine, in late 2015, and new lines for specialty engineering compounds and black masterbatch for high-temperature resins will be added in Holden, Massachusetts, beginning in first quarter 2016.

► Clariant
www.clariant.com

测量技术：精密测量速度和长度(零点)

■ 在生产薄板材和电缆时，长度和实时速度的精确掌握是成本和工艺最佳化的关键因素。生产过程中的磨损和滑动使得物料成本上升，但当今的企业不再能接受生产不良品。从一开始，质量就是必备的。

在钢铁、电缆、电线和管材生产行业，当需要检测产品质量时，仲巴赫的 LSV 1000/2000速度计对于生产厂家来说是十分理想的选择。这种速度计的性能超过了传统的接触式测量方法，并且具有最好的牢固度，维护需求和维护成本都降到了最低限度。

该装置结构紧凑，能够快速而可靠地提供长度和速度数据，适合于用在工艺控制和定长切断。因为测量精度不依赖于运动的速度，所以这种装置可以精密地探测出非常微小的移动。使用 LSV1000/2000速度计，你可以：

1. 快速调节预定的测量范围

该装置是结构紧凑的一体化系统，可以方便地结合到生产过程中。采用可见光激光，简化了在测量位置的校准工作。

2. 采用移动的或远程的监视，实现了立即测量重新校准是完全不必要的。重量轻，仅 4.3kg，提供移动套装，可以快速移动配置以及连接到移动电脑。一旦安装好传感器可立即投入使用，且采用通用电源以及可进行局域网联接。

3. 生产工艺最佳化-不管被测物体表面状况、物料种类和温度如何，LSV长度和速度传感器都可以在千变万化的环境中应用。

它足够坚固，即使在不利的环境下也能提供可靠的结果：LSV 1000/2000的测量结果可靠，适用于几乎任何表面，例如钢材、光亮铝材、油滑的片材、电线电缆。保护等级认证为 IP66和IP67（遵从EN60529），即使在严酷的条件下，可靠的传感器技术也能成为可靠工作的保证。

4. 有效通讯采用了当代最新技术的快速信号处理器，配备强有力的指令系统，通过串口或以太网接口，实现有效的系统通信。

新系统可以帮助你优化连续生产工艺目标，从而获得显著降低物料消耗的结果。由于这套系统具有优良的特性和非常低的运行和维护成本，所以投资回收率是非常有吸引力的。

■ Measurement Technology – Precision Speed and Length Measurement (down to Zero):

Precise knowledge of length and current speed is a key cost and process optimization factor in the production of sheet goods and cables. Wear and slip push material costs up, but companies today can no longer afford to produce rejects. Quality is in demand – From the outset.

The LSV 1000/2000 velocimeters from ZUMBACH support manufacturers when monitoring quality in steel, cable, wire and tubing production. They exceed the performance of conventional contact-based measuring methods, at the same time offering maximum robustness with minimized maintenance requirements and costs. The compact device provides length and velocity data quickly and reliably for both process control and cut-to-length applications. Precise detection of very small movements is possible because the measuring accuracy is not dependent on the speed. The LSV 1000/2000 makes it possible to:

• *Rapidly adjust the desired measuring field:* The device is a compact all-in-one system and can be easily integrated into production processes. The visible lasers simplify alignment in the measuring field.

• *Measure immediately – with mobile or remote monitoring:* Recalibration is superfluous. Its low weight of just 4.3 kg and the supplied mobility kit allow rapid mobile deployment as well as the connection to a laptop. The sensors are immediately ready for use and feature a universal power supply and a LAN connection.



LSV2000速度计
LSV 2000 Velocimeter

• *Optimize production processes – irrespective of the surfaces, materials and temperatures:* The LSV length and speed sensors can be used in a huge array of environments. They are robust enough to supply reliable results even in adverse conditions: the LSV 1000/2000 measure reliably on virtually any surface, e.g. steel, shiny aluminium, oily sheets, wire and cable. Certified for protection classes IP 66 and IP 67 (in acc. with EN 60529), the robust sensor technology ensures reliable operation even under harsh conditions.

• *Communicate effectively:* The rapid, state-of-the-art signal processor is equipped with a powerful command system for efficient system communication via serial or Ethernet interface.

The new system allows to support your objective of optimizing continuous production processes to obtain significant material cost savings. In the light of its performance and the remarkably low operating and maintenance costs, the ROI is very attractive.

➔ ZUMBACH Electronic AG
Postfach, CH-2552 Orpund, Switzerland
www.zumbach.com

创新的真空设备

■ 普发真空 (Pfeiffer) 将参加Semicon (半导体展览会) 韩国贸易展览会和Semicon中国展。

A4系列干燥泵：

A4系列干式多级罗茨泵可提供的抽气速率范围是100到2,300 m³/h。这种高效和高可靠的泵能够完美地满足半导体行业和涂料行业工艺的需求。例如，这一系列的泵涂有防腐蚀涂层并具备高抽气速率，非常适合于化学气相沉积 (CVD) 工艺的需求。

涡轮泵HiPace 2800 IT：

普发真空展示的HiPace 2800 IT涡轮泵是特别为离子注入应用而特制的。采用了复杂的涡轮泵转子设计，从而得到了最出色的轻质气体抽气速率。这样，对离子注入过程非常良好的工艺适应性就有了保证，这里氢是最易累积的气体。当氢气的抽气速率为2,750 l/s时，新型HiPace 2800 IT涡轮泵是这一等级最好的产品。

智能的温度管理系统，有效防止了泵抽吸系统内部工艺冷凝和沉积。可以独立地设定温度以最好地辅助工艺过程。转子涂有特殊涂层，对于所有离子注入工艺材料，涂层的牢固性都是有保证的。Hipace涡轮泵有着特殊坚固的轴承设计，以被称为“动静压轴承”的部件为基础部件，并在真空侧前部采用陶瓷球轴承，在位于高真空侧采用永磁向心球轴承。再加上有效的涂层，这些就构成了涡轮泵使用寿命长和正常运行时间最大化的基础。

磁悬浮涡轮泵ATH 2804 M和ATH 3204 M：

ATH-M系列泵适用于未加热的氮气，气体通过量超过5,000 标准毫升/分 (sccm)。它同样有着非常高的氩气气体通过量，达1,500 sccm。当应用于腐蚀场合时，泵的工作温度为65 °C。最挑战性的应用是带有副产品沉积物的敏感工艺应用，此时泵的工作温度可高达85 °C。这些泵都配备了集成驱动电路以保证碳足迹更小，并且可以即插即用，易于安装。DN320法兰型号的泵，总高度小于400mm。由于采用新型电子电路，泵可以在8分钟内启动和停止。ATH-M泵采用磁悬浮轴承和失衡自动补偿，因此运行无磨损且振动很小。这种泵免维护，不需要润

滑，能够持续地保持转子的稳定，从而保证了性能的可靠。在额定转速时，泵的能耗很低，冷却水消耗量也很低(1 l/min)，这也是新型ATH-M泵的特色。

■ Innovative Vacuum Solutions:

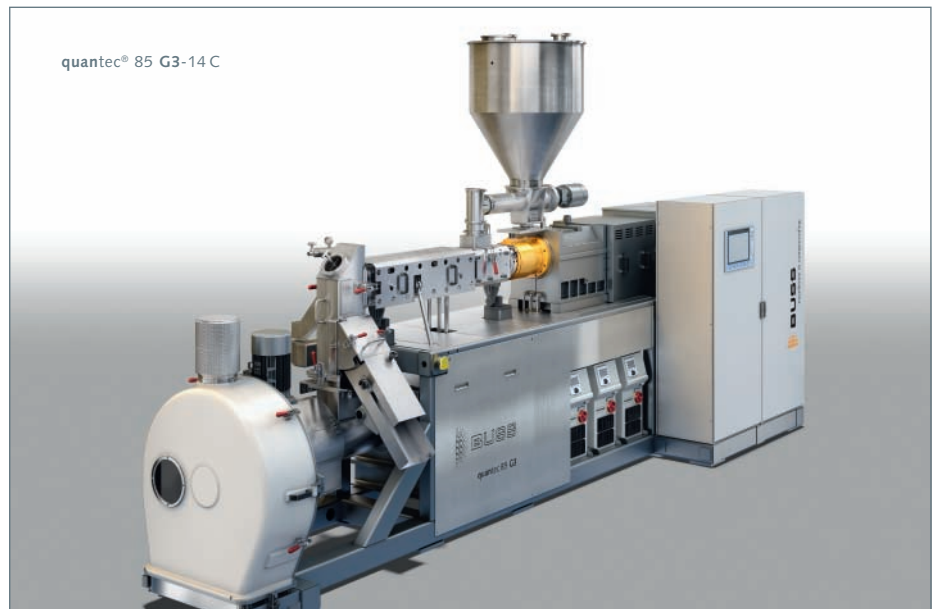
Pfeiffer Vacuum exhibited at the Semicon Korea Trade Fair and Semicon China.

A4 series of dry pumps:

The dry, multi-stage Roots pumps in the A4 series provide pumping speeds of 100



普发真空生产的磁悬浮涡轮泵ATH 2804 M
Magnetically levitated turbopumps ATH 2804 M from Pfeiffer Vacuum



重新定义的经济型 PVC 混炼 quantec® G3 布斯混炼机系列

热敏性和剪敏性物料混炼专家为质量和生产率
设定新基准

quantec® G3 – 延续成功故事的第三代产品

- 产能提高，成本更节省
- 加工窗口更宽，灵活性更强
- 产品转换时间更短，设备利用率更高

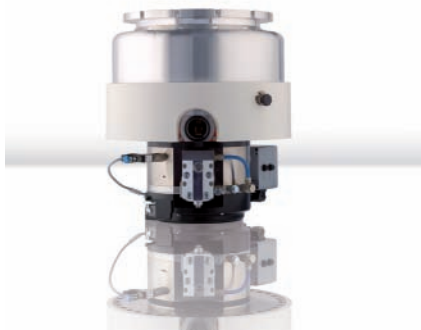
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普发真空生产的涡轮泵 HiPace 2800 IT
Turbopump HiPace 2800 IT from Pfeiffer Vacuum

to 2,300 m³/h. These energy-efficient and reliable pumps are ideal for use in demanding processes in the semiconductor and coating industries. With corrosion resistant materials and a high gas throughput, this pump series is optimally suited for use in CVD processes, for example.

Turbopump HiPace 2800 IT:

With the HiPace 2800 IT Pfeiffer Vacuum presents a turbopump especially dedicated for ion implantation applications. The sophisticated rotor design of the turbopump results in an optimized pumping speed for light gases. This ensures very good process adaptation for ion implantation processes, where hydrogen is the most accumulating gas. With 2,750 l/s pumping speed for hydrogen the new HiPace

2800 IT is the best turbopump in its class. The intelligent temperature management system prevents process condensation and deposition inside the pumping system. It allows setting the temperature individually to ideally support the process. The special coating of the rotor ensures robustness against all ion implantation process materials. Being based on a so-called hybrid bearing, a combination of ceramic ball bearings on the fore-vacuum side and permanently magnetic radial bearings on the high vacuum side, these HiPace turbopumps have a particularly robust bearing design. Together with the efficient coating, this forms the basis for the long life cycle and maximum up-time of the pumps.

Magnetically levitated turbopumps ATH 2804 M and ATH 3204 M:

The ATH-M pumps offer a gas throughput of over 5,000 sccm of nitrogen for non-heated applications. They also allow a very high throughput with up to 1,500 sccm of argon and a pump operating temperature of 65 °C in corrosive applications. The pumps operate at high temperatures up to 85 °C for use in the most aggressive applications with by-product deposition sensitive processes. These pumps include integrated drive

electronics to ensure a small footprint and easy plug-and-play installation. The total height of the DN 320 flange model is less than 400 mm. Due to the new electronics, the pumps can be started and stopped within eight minutes. Active magnetically levitated bearings and automatic out-of-balance compensation enable wear-free and low vibration operation of the ATH-M pumps. They are maintenance-free and require no lubrication. Continuous rotor stability is assured for reliable performance. Low power consumption at nominal speed and very low cooling water consumption (1 l/min) also characterize the new ATH-M pumps.



普发真空生产的A4系列干式泵
A4 series of dry pumps from Pfeiffer Vacuum

► Pfeiffer Vacuum GmbH
www.pfeiffer-vacuum.com

正式推出高端片材

■ 美国Advanced Plastic Extrusion有限公司 (简称Apex) 最近安装了戴维斯标准公司 (Davis-Standard) 所生产的片材系统, 设备已投产运行, 并获得了极为完美的结果。Apex公司位于美国北卡罗莱纳州, 是一家新成立的公司, 致力于高质量片材的制造, 生产“A级”表面的专用片材和复合片材。Apex公司从九月份开始生产片材, 已经加工了亚克力 (丙烯酸)、ABS、HIPS、PC/ABS和TPO等各种树脂原料, 产品的厚度范围从0.010到 0.187英寸, 宽度可达54英寸。从技术和服务的角度来看, 戴维斯标准所提供的系统, 包括挤出机和辊式压光机, 是Apex公司取得成功不可分割的一部分。

APEX公司的创始人和所有者 Ronnie Buck指出: “在考察了好几家挤出设备供应商之后, 我们选择了戴维斯标准公司, 这是考虑到他们的产品质量、对客户的支持服务以及长期从事这

一领域的业务。对我来说, 要生产非常特殊的片材, 即使要花更多的钱, 也必须选用最优良的设备。戴维斯标准公司不仅能提供久经考验的设备, 同时他们能够从经济低迷中坚持过来, 而其它许多公司做不到这一点。事实上, 他们

长期从事这一行业, 在质量、客户支持和售后服务价值观方面享有盛誉。”

APEX公司的团队同样赞赏戴维斯标准公司的研究和发展方面的能力。在订购这套系统之前, Buck将他们最为关键的两种树脂原料送到了戴维斯标准公



司位于康涅狄格州Pawcatuck的技术工厂，戴维斯标准公司能够在片材生产线上全方位地测试这两种树脂，并按照严格的质量要求，采用这两种树脂原料成功地生产出各种不同厚度的片材。对于Buck而言，他的新公司在作出如此重大的投资之前，已经准确地得到证明：这就是所要求的设备。

■ **High-End Sheet Operation launched:** A recently installed Davis-Standard sheet system has Advanced Plastic Extrusion, LLC (Apex), up and running with excellent results. Apex, based in North Carolina, is a new company focused on processing high-quality sheet with a "class A" surface for specialty and laminated sheet applications. Since starting production in September, Apex has been processing sheet using

acrylic, ABS, HIPS, PC/ABS and TPO resins in thicknesses ranging from .010 to .187 inch and in widths up to 54 inches. The Davis-Standard system, extruder through roll stand, has been an integral part of Apex's successful launch from the perspective of both technology and service.

"After looking at several extrusion vendors, we chose Davis-Standard because of their quality, support services and longevity in the business," said APEX founder and owner Ronnie Buck. "For me to produce the very best sheet, we had to go with the best equipment, even if it cost more. Not only is Davis-Standard's equipment proven, but they survived the economic downturn when many others did not. The fact that they are in it for the long haul and have the repu-

tation for quality is huge in terms of support and value after the purchase." The APEX team also appreciates Davis-Standard's R&D capabilities. Prior to purchasing the system, Buck sent two of his most critical resins to Davis-Standard's technical facility in Pawcatuck, Conn. Davis-Standard was able to test the resins on a full-scale sheet line, successfully running both resins in various thicknesses and to the exacting quality requirements. For Buck, this was confirmation that his new company would have exactly what it needed prior to making such a large investment.

➔ **Davis-Standard, LLC**
www.davis-standard.com
➔ **Advanced Plastic Extrusion, LLC (Apex)**
www.apex-extrusion.com

塑料包装的解决方案

■ 得益于按照客户的需求定制和承接交钥匙项目，AMUT集团的声望与日俱增，成为了无与伦比的供应商，可为塑料挤出、热成型、回收再生和印刷转换加工提供范围最为完整的机械设备。AMUT集团及其公司的产品，覆盖了完整的塑料使用循环周期，从原料的再生开始，到挤出加工，再到热成型，或许还有柔性印刷，直至成为最终产品。从去年起，AMUT集团以AMUT DOLCI BIELLONI的名称接手Dolci Extrusion & Bielloni公司，从此以后，集团可以向其客户提供灵活多样的包装方案：

- 生产多层薄膜的流延膜和吹膜生产

线，尤其是吹膜生产线可生产多达九层的阻隔膜、技术型薄膜、医用薄膜和复合薄膜，流延膜生产线可生产拉伸膜、尿片膜、PP薄膜、呼吸膜和掩蔽膜；

- 单工位涂覆，双工位或多工位涂覆生产线；
- 最多可达十色的无齿轮柔版印刷机；
- 无溶剂或多系统复合机；
- 高速全自动分切复卷机。

■ **Plastics Packaging Solutions:** Boosting a reputation on custom-made and turnkey projects, AMUT GROUP turns to be an unmatched supplier offering the most complete range of machinery for the plastics extrusion, thermoforming, recycling and printing/converting process. AMUT GROUP and its companies cover completely the plastic lifetime from its recovery and then passing through extrusion, thermoforming or even flexo printing to be transformed into the



final product. After taking over the Dolci Extrusion & Bielloni company, operating since last year as AMUT DOLCI BIELLONI, AMUT GROUP is able to offer to its customers also flexible packaging solutions:

- cast and blown lines for multilayer films, in particular blown lines up to 9 layers for barrier, technical, medical and lamination films, and cast lines for stretch, diapers, PP, breathable and masking films;
- single, tandem or multiple stations coating lines;
- printing machines with up to 10 colours gearless flexo presses;
- solventless or multisystems laminating machines;
- high speed and fully automatic slitter rewinders.

➔ **AMUT GROUP**
www.amut.it

五条EVOLUTION超平薄膜生产线出售到亚洲

Optimized Web Flatness: *Five EVOLUTION Ultra Flat lines sold to Asia*



EVOLUTION超平薄膜牵引系统使吹膜生产线薄膜的平整度达到最佳水平

EVOLUTION Ultra Flat take-off system optimizes the film flatness in blown film lines

在仅仅六个月的时间内，莱芬豪舍吹膜公司已经向亚洲销售了五条新的生产线。只需要一事实就可以取得客户的信任：生产效率达到高水平。莱芬豪舍吹膜生产线是极为可靠的：在整个生产过程中，生产线确保以零误差率恒定地生产出高质量水平的产品。就质量而言，莱芬豪舍长期以来都名列前茅。工程师们一直都在提出新的创意，进一步优化薄膜生产新工艺，其结果是令人钦佩的。

EVOLUTION超平薄膜平整单元拥有专利，与牵引单元结合在一起，是一个有助于提高产品质量的必不可少的模块。在生产薄膜时，膜面会出现不平整，超平单元可以消除薄膜表面的不规则现象。

Reifenhäuser Blown Film has sold five new lines to Asia within only six months. The company could convince above all with one thing: the high level of production efficiency. Reifenhäuser blown film lines are extremely reliable: They deliver products at a constant high level of quality while ensuring a zero error rate throughout the entire production process. In terms of quality, Reifenhäuser has been at the forefront since long. The engineers have consistently come up with new ideas to further optimize the film production process. The results are impressive.

The patented EVOLUTION Ultra Flat film flattening unit integrated in the take-off is an essential module used to enhance the quality. Ultra Flat is able to correct surface irregularities occurring in the production of blown film.

表面不平整现象为吹膜生产所固有的。根据薄膜尺寸和结构的不同，这一现象会出现在包装薄膜产品中，有的严重的轻微。受其影响，薄膜产品在收卷和进一步加工转换的过程中，可能产生严重的问题。莱芬豪舍吹膜公司采取了正确的解决方案：采用EVOLUTION超平单元，由于膜材通过加热冷却辊时进行了最小程度的拉伸，所以生产出的膜材有着最佳的平整度，这为进行收卷和采用下游设备进行转换提供了良好的条件。

全世界的薄膜生产商都赞赏超平薄膜单元这一创举。特别是在亚洲市场，薄膜生产商已经对莱芬豪舍公司的这一最新技术作出响应，并投资于未来：

第一条配备了超平系统的吹膜生产线22个月以前就已经在越南投入了生产。更多的订单很快就会继续跟进。不管是生产线的主人还是来自越南以外的对此感兴趣的客户，都对生产线出色的配置十分赞赏：在过去的六个月里，莱芬豪舍公司收到了来自亚洲的新订单，订购配备了超平整单元的吹膜生产线，总数为五条生产线。

从各种不同的角度来看超平薄膜生产线的成就：生产出的薄膜进行下一步转换时特别顺畅流利，无论是进行复合、印刷、还是再成型、包装或封口操作，由于莱芬豪舍吹膜生产线所生产的产品有着出色的膜材平整度，能够提高整个价值链的效率，包装工业从中获得了利益。

Reifenhäuser Blown Film GmbH

Cornelius-Heyl-Straße 49, 67547 Worms, Germany
www.reifenhauer-bf.com

Surface irregularities are inherent to the film blowing process. They can occur to a greater or lesser extent in the production of packaging film, depending on film dimensions and structures. The resulting waves can cause serious problems in winding and conversion. Reifenhäuser Blown Film has the right solution: With EVOLUTION Ultra Flat a web of optimum flatness can be produced due to minimised stretching of the film via heating-cooling rolls – a prerequisite for winding and conversion on downstream equipment.

Film producers around the world appreciate the Ultra Flat innovation. Especially the Asian market has responded to the newest Reifenhäuser technology with investments in the future: The first blown film line equipped with the Ultra Flat system came on stream in Vietnam about 22 months ago. Further orders followed soon. The superior line configuration convinced both the owners and other interested customers outside Vietnam: Over the past six months Reifenhäuser recorded orders from Asia for a total of five new blown film lines equipped with the Ultra Flat flattening unit.

Ultra Flat scores in many different respects: With an especially unproblematic conversion of the film, whether in laminating, printing, re-forming, packaging or sealing operations. It enables the packaging industry to benefit from the increased efficiency throughout the whole value chain – thanks to webs of optimized flatness produced on Reifenhäuser Blown Film lines.

The Planetary Roller Extruder



ENTEX®

30
Years



For more than 30 years of development ENTEX look back on an extensive product range of more than 140 property right applications and planetary roller extruders for almost all industrial applications. With the acquisition of the division planetary roller extruder of Schalker Eisenhütte in 1998 over 60 years of experience are bundled. The new generation of the planetary roller extruder, with now 12 modules (Size 70 mm), offers unique performance advantages for different process steps in the processing technology. From laboratory extruders for trial applications to the world largest calender feeding system, we provide specially adapted extrusion lines for the needs of our customers. Cooling and degassing at exactly tempering, the influence of the residence time, drying and extrusion in one step, are only one part of the development history.

Benefit from our know-how and experience and take advantage of this now 30-year unique innovative progress.

Please visit us
on CHINAPLAS
Hall E1, Stand B03

ENTEX®

Headquarters

ENTEX Rust & Mitschke GmbH, Heinrichstraße 67, 44805 Bochum, Germany
Phone +49 (0) 234/89122-0, Fax +49 (0) 234/89122-99
sales@entex.de, www.entex.de

Subsidiary Company

ENTEX International Trading (Shanghai) CO., Ltd., No. 6, Lane 360, Dongchen Road
Malu Town, Jiading District, Shanghai 201801, China
Phone +86-21-62340160, Fax +86-21-62334655
entexsh@entex.com.cn, www.entex.com.cn

世界首台九流道挤出模头投入运行，能够生产多层薄膜，将各层的厚度偏差减少三分之二

Film Extrusion: *World's First 9-Manifold Extrusion Die is Up and Running, Yielding Multi-Layer Film with Two-Thirds Less Layer Thickness Variation*

Nordson 最先进的多层复合模头可提供比同等水平的共挤喂料块系统更严格的厚度公差，从而节约材料成本，提高产品质量

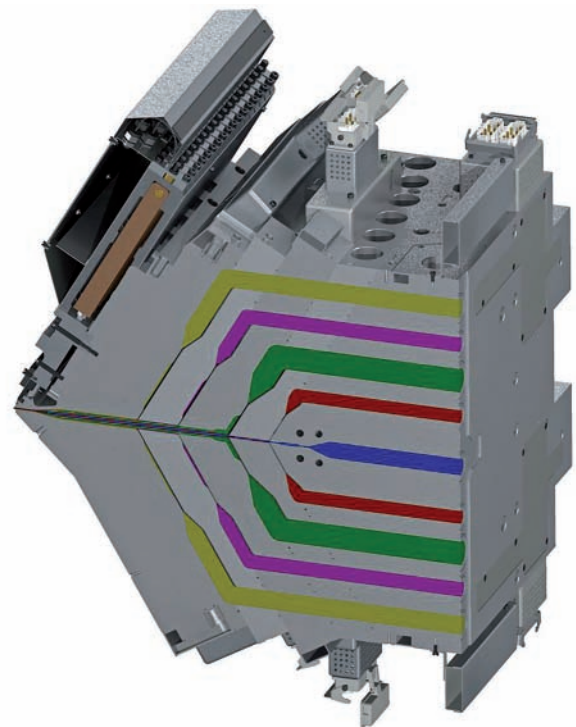
Nordson Corporation 最新发布的共挤技术使得薄膜加工商，尤其是那些使用高产量线专业生产特种产品的加工商，能够在多层结构中保证各个子膜层严格的厚度公差。

Nordson's Most Advanced Multi-Manifold Die Provides Tighter Tolerances than a Comparable Feedblock System, Saving Material Costs and Enhancing Product Quality
The latest advance in coextrusion technology from Nordson Corporation enables film processors – particularly those with high-throughput lines dedicated to a narrow range of products – to achieve tighter thickness tolerances for the individual layers in a multi-layer structure.

Nordson Extrusion Dies Industries 的九流道平模头在业界首开先河，已成功完成试运行，可以使用不同的树脂生产出九层薄膜。据 Nordson Extrusion Dies Industries 的首席技术员 Sam G. Iuliano 介绍，尽管质量改善程度因具体的应用领域而异，但一般来说，具有同等先进水平的喂料块系统生产的薄膜往往存在 +/- 15% 的层间厚度差异，而 Nordson Extrusion Dies Industries 九流道模头技术能将各个子膜层厚度公差普遍减少至 +/- 5%。

Iuliano 先生指出：“高性能的包装薄膜通常采用昂贵的特殊材料作为阻隔膜层。多层复合模头的精确度更高，使加工商可以使用更少的昂贵材料制作成更薄的薄膜阻隔层。同时又能提升产品质量，保证产品的一致性。”

流道是模头内部熔体流量的分配通道，专为特定的聚合物而设计，具有复杂的内部几何结构，以形成均匀、顺畅的流体，将材料分布其流道内的全宽。在多层复合模头中，每层熔体流都有自己专门的流道，只有当每一层熔体流分别铺展到全宽后，所有各层才会被汇聚到同一个单层结构中。相比之下，共挤喂料块将多层熔体流合并成一个狭窄的多层“三明治”结构，然后将整个“三明治”分配到一个单流道模头中，

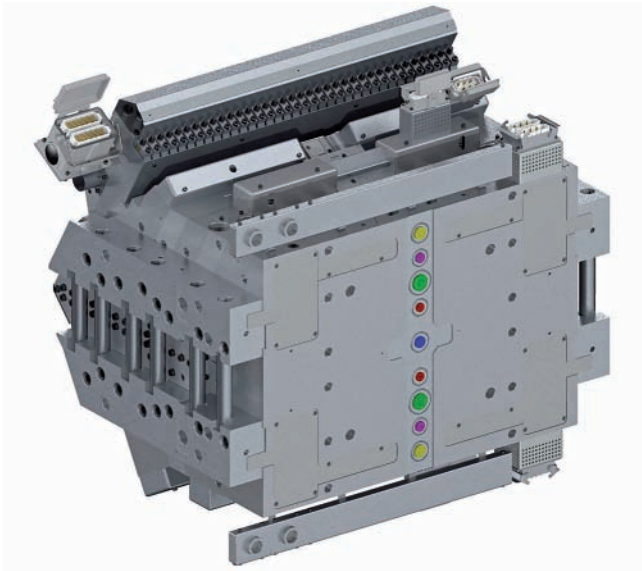


在 Nordson Extrusion Dies Industries 九流道模头的剖视图中，各条聚合物流以不同的颜色表示。这些聚合物流组合起来，形成一个多层结构，从左边的模头流出。位于左上方的是一个 Autoflex 自动唇口调节装置。

Cutaway view of 9-manifold Nordson EDI die, with polymer streams represented in different colors. The streams combine to form a single multi-layer structure which exits the die at left. Visible at upper left is an Autoflex automatic lip adjusting unit

A Nordson EDI nine-manifold flat die, the first of its kind, has been successfully commissioned, producing nine-layer film from various resins. While the degree of improvement will vary with the application, in general Nordson EDI's nine-manifold die technology promises to reduce variation in individual layer thickness from the +/- 15% tolerance often encountered with comparably advanced feedblock systems to +/- 5%, according to Sam G. Iuliano, chief technologist for Nordson EDI.

"This greater accuracy achievable with multi-manifold dies enables processors to run thinner layers of the costly specialty ma-



Nordson Extrusion Dies Industries 九流道模头的后视图，各条树脂流以不同的颜色表示。位于左边的是两个创新型外接管紧固结构中的一个，旨在防止模头的一端发生泄漏。在顶部的正中位置是 Autoflex 自动唇口调节装置上半部分的视图。

Rear view of 9-manifold Nordson EDI die, with entry ports for the polymer streams shown in different colors. Visible at left is one of two innovative outboard fastening structures designed to prevent leakage at either end of the die. At top center is a view of the upper portion of an Autoflex automatic lip adjusting unit

并铺展到全宽。多流道技术具有更高的模层均一性和厚度精确性的主要原因在于，它无需将多层熔体流预先排布在一个共挤喂料块中，再通过模头同时铺展，从而大大减少了层界变形的出现。

Iuliano 先生强调：“Nordson Extrusion Dies Industries 在世界各地的客户长期以来一直受益于多流道共挤技术，他们会使用带有两流道、三流道、四流道或五条流道的模头。”“设计一款九流道模头对我们而言是一项巨大的挑战，因为十个主模身都必须充分紧固并加热。此外，九个流动通道需要针对各自分配的特定层面分别进行定制设计，这意味着我们必须在设计中采用不同大小和布局的流道。”

多流道工具可提升质量与生产效率

为了将熔融聚合物从挤出机输送到多层流道模头，Nordson Extrusion Dies Industries 设计了一系列位于模头上游的接模分配器，具有多种不同的配置可供选择。最简单的版本有固定式设计，它按固定的分层顺序将聚合物熔体输送至多流道复合模头的入口处。更为复杂的分配器能够使熔体流改道，通过可更换的选择导流板改变各层的顺序。除了选择导流板外，最先进的分配块还集成了复合共挤子单元，用于在某些熔体流进模头之前将它们复合起来，以提高产品的多功能性，形成比模头中的流道数量更多的复合层。


Nordson Extrusion Dies Industries 制造的多流道模头在数量上超过了任何其他制造商。他们充分运用自己的经验，实现了产品的无故障运行。Nordson Extrusion Dies Industries 的许多四流道和五流道模头在使用时从未出现过任何泄漏，甚至在产量接近每小时 5,000 千克时也是如此。对于新的九流道模头，Nordson Extrusion Dies Industries 为模身主体设计了额外的紧固件（位于端板装配区），以确保妥善密封。

Nordson Extrusion Dies Industries 可以为客户的某个特

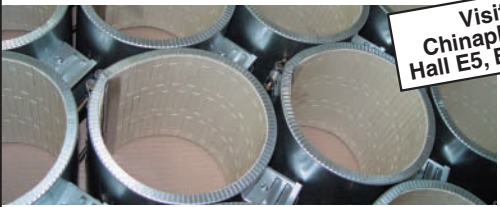
materials often required for high-performance packaging films, while at the same time enhancing product quality and consistency,” said Mr. Iuliano.

A manifold is a flow distribution channel inside the die whose complex internal geometry, engineered for a specific polymer, is designed to develop a uniform, streamlined flow and distribute the material to its full width. In a multi-manifold die, each polymer flow stream has its own manifold, and the layers are combined into a single structure only after each layer has been individually spread to its full width. By comparison, a feedblock combines multiple polymer streams into a narrow multi-layer “sandwich” that is subsequently distributed to full width in a single-manifold die. A chief reason why the multi-manifold method provides greater layer uniformity and thickness accuracy is that it avoids much of the layer-interface deformation that occurs when multiple layers pre-assembled in a feedblock are then spread simultaneously through the die.

“Nordson EDI customers around the world have long benefited from multi-manifold coextrusion, using dies with two, three, four, or five manifolds,” noted Mr. Iuliano. “Engineering a nine-manifold die was a big challenge for us, since ten major die body segments had to be adequately fastened and heated. In addition, the nine flow channels were each custom designed for the specific layer that they were distributing, meaning that we had to accommodate flow channels of varying sizes and layouts in the design.”



ERGE Elektrowärmetechnik
 Franz Messer GmbH
 91220 Schnaittach · Hersbrucker Straße 29-31
 Tel. +49 9153 921-0 · Fax +49 9153 921-117-124
www.erge-elektrowaermetechnik.de



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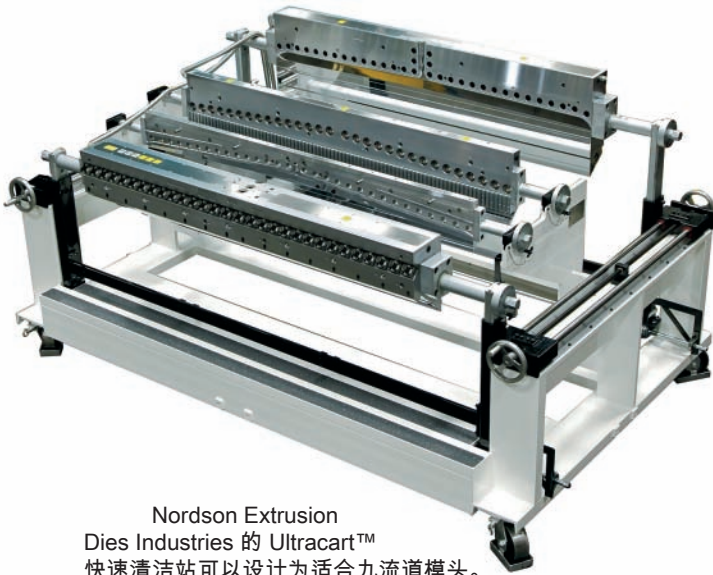
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Nordson Extrusion Dies Industries 的 Ultracart™

快速清洁站可以设计为适合九流道模头。此处显示的是一个拆解后的三流道模头。

Nordson EDI's Ultracart™ rapid cleaning station can be designed to accommodate 9-manifold dies. Disassembled die shown here is a 3-manifold unit

定的多层复合模头定制设计 Ultracart™ 快速清洁站。此外，模头上的 Autoflex 自动唇口调节装置是一种模块化组件，可以随时拆下，因此可以很方便地接触到模身紧固件。系统拆卸和组装方便，有利于模头的定期清洁和预防性维护。

Nordson Extrusion Dies Industries 为制造多层薄膜提供了众多备选方案

Nordson Extrusion Dies Industries 推出了诸多可选的共挤方案，九流道模头便是其中的最新成果。Nordson Extrusion Dies Industries 为特定的应用领域推荐的模头系统取决于一系列变量，例如总体产量、层厚和粘度比、模头宽度、所需的产品结构数量和类型，以及各层熔体工艺温度是否存在明显差异。推荐的解决方案可以覆盖从配备喂料块的单流道模头，到每个复合层具有单独流道的多层复合模头。但是，推荐的解决方案往往介于这些极端方案之间，通常结合多流道方案与喂料块方法。例如，如果一个五层结构中仅包含一个与其他几层都不不同的关键表层，则可能会建议采用双流道模头：关键表层会使用专用流道内铺展，而其他四个彼此相容的层则通过第二个流道完成共挤过程。

Iuliano 先生指出，Nordson Extrusion Dies Industries 虽然在多层复合模头领域中取得了一系列成果，但仍然致力于喂料块设计的不断创新。“在某些特殊的加工场景中，配备复合共挤喂料块的单流道模头从长远来看可能是最佳方法。例如，在需要用挤出层比差异极大的多种结构时。共挤块方法通常可以提高产品的多功能性，简化模头清理和产品转换的过程。但在产品质量和一致性方面，多流道模头则更胜一筹。如今，对于高端多层薄膜的生产商而言，这种方法无论实用性还是可行性都超过了以往的任何替代方案。”

Multi-Manifold Tooling Enhances Quality & Production Efficiency: For delivery of molten polymer from extruders to a multi-manifold die, Nordson EDI engineers distribution blocks, situated just upstream of the die, in a variety of optional configurations. The simplest versions have a fixed design, delivering the polymer melts to the entrances of the multi-manifold die in only one, dedicated layer sequence arrangement. More sophisticated distribution blocks provide the ability to re-route melt streams to change the sequence of the layers via exchangeable selector plates. The most advanced distribution blocks, in addition to selector plates, include feedblock sub-assemblies which combine some of the melt streams prior to the die, allowing for product versatility and for a greater number of layers than the number of manifolds that are in the die.

Having built more multi-manifold dies than any other manufacturer, Nordson EDI has applied its experience to make them trouble-free. Many Nordson EDI four- and five-manifold dies are in operation without leakage issues, even at throughput rates approaching 5,000 kg/h. For the new nine-manifold die, Nordson EDI designed for additional fasteners outboard of the main die bodies (in the end plate assembly area) to ensure proper sealing. Nordson EDI can custom-design its Ultracart™ rapid cleaning station for a customer's specific multi-manifold die. In addition, the Autoflex automatic lip adjusting units on the die are modular and can be readily detached, allowing convenient access to the die body fasteners. These systems make disassembly and reassembly simpler for periodic cleaning and preventative maintenance of the die.

Nordson EDI Offers Many Alternatives for Producing Multi-Layer Film: The nine-manifold die is the latest in a wide range of coextrusion options available from Nordson EDI. The die system that Nordson EDI recommends for a given application depends on such variables as overall throughput rate, layer thickness and viscosity ratios, die width, number and type of product structures needed, and whether the melt processing temperatures for any of the melt streams are distinctly different. While the recommended solutions could range from a single-manifold die with feedblock to a full multi-manifold die with separate channels for all layers, often the recommendation falls between these extremes, combining multi-manifold and feedblock approaches. For example, if a five-layer structure included only one unique and critical cap layer, then a dual-manifold die might be recommended: The critical layer would spread through its own flow channel and the other four more compatible layers would be coextruded through the second flow channel.

Even as it develops advances in multi-manifold dies, Nordson EDI is committed to innovation in feedblock design, noted Mr. Iuliano. "Depending on the particular processing scenario, a single manifold die with a coextrusion feedblock may be the best way forward – for example, in a case where the extrusion tooling needs to produce many different structures with vastly different layer ratios. The feedblock approach generally allows for more product versatility as well as simpler cleaning and product changeover procedures. The multi-manifold approach is superior, however, in terms of product quality and consistency. Today, this approach is more than ever a practical, realistic alternative for producers of higher-order multi-layer film."

用于创新和科技型薄膜的高性能拉伸生产线

Film Technologies at Chinaplas 2016: High Performance Stretching Lines for Innovative Packaging and Technical Films

在2016年上海举行的中国国际橡塑展（展馆E1，展台号K03），来自德国的薄膜拉伸生产线专家布鲁克纳机械有限公司将展现最新的解决方案用以高效生产多种具有高附加值的塑料薄膜。

At Chinaplas 2016 in Shanghai (Hall E1, Booth K03) German film stretching line specialist Brückner Maschinenbau will present newest solutions for the efficient production of a wide variety of added-value plastic films.

*Brückner Maschinenbau:
High performance stretching lines*

高性能拉伸生产线



高速，高产量，高性能的包装膜生产线

对薄膜生产能耗和原材料效益的一个决定性因素就是生产线的整体效能。布鲁克纳薄膜拉伸线在行业内提供独特的工作宽度和生产速度。参观者在布鲁克纳的展台将会看到高性能生产各种包装膜的全新发展。

灵活和高效地生产电池隔膜

布鲁克纳对生产电池隔膜的工业解决方案是基于自己的广泛研发活动基础上进行的，主要的电池隔膜制造商已经购买。整条生产线以及各个久经验证的部件具有下列特色：

- 工作宽度达4.5米
- 高生产效率，长期正常运行时间和高产量
- 低生产成本,减少能耗
- 稳定的高品质薄膜
- 操作简便和减少维护
- 最高的安全标准

用于各行业的高附加价值特殊膜

- 光学薄膜生产线：用于高效生产高价值光学膜的同步和逐次拉伸技术
- 多层技术：基于多层共挤出工艺生产超高阻隔膜（UHB），如5,7或9层的BOPP薄膜

High speed, high output, high performance for packaging film lines:

A decisive factor for a profitable, energy and raw material efficient film production is the overall efficiency of the production line. Brückner's film stretching lines offer working widths and production speeds unique within the industry. Visitors to the Brückner booth will see brand new developments for a high performance production of various packaging films.

Flexible & productive manufacturing of battery separator film:

Brückner's industrial solutions for battery separator film production are based on extensive in house R&D activities and have already been purchased by leading battery separator film manufacturers. The production lines as well as various well-proven machine components stand for:

- working width up to 4.5m
- high production efficiency, uptime and output
- low production costs and minimized energy consumption
- consistent high film quality
- easy operation and low maintenance
- highest safety standards

Added value specialty films for various industries:

- Optical film lines: Sequential and simultaneous technology for the efficient production of high value optical films

- 同步拉伸：高质量薄膜厚度在0.5和75微米之间，包括尼龙包装薄膜或超薄BOPP和BOPET电容膜。

非集中式电气系统布局

薄膜生产商在投资新设备时，对能够顺利和快速调试，获得快速开机和更快的投资回报率是非常感兴趣的。为了缩短这个时间段，布鲁克纳现在提出了全新的解决方案，所谓“非集中式电气系统部件”，所有的电源开关、电机控制单元、变频器，用于传感器输入和制动器输出均是直接连接到机器部件。有了这个“即插即用”的解决方案，可以更加优化调试时间。为客户提供更多的好处是降低成本，并为每个机器设备提供一个能量监测的可能性。

在布鲁克纳集团的综合展台上，除了布鲁克纳机械有限公司外，参观者也可以与布鲁克纳技术服务公司的人员会面，了解他们为保障薄膜拉伸线的长期盈利运转所提供的解决方案；以及参观凯孚尔公司在包装、汽车、医药和家电工业的最新发展的展品；而PackSys Global公司将展示其先进的包装设备。

2016 Chinaplas 布鲁克纳技术服务公司加大拉伸膜生产线盈利空间

2016布鲁克纳技术服务公司在Chinaplas (Hall E1, Booth K03) 展示世界一流解决方案，通过特殊升级和服务帮助现有拉伸膜生产厂家扩大盈利空间。

高利润产品所用特殊膜

对于多层膜生产，布鲁克纳技术服务公司将展示现有薄膜拉伸线的升级方案。多层膜用于高质量高利润产品，包括用于食品包装的白膜，中空膜和镀铝膜，名片所用合成纸和具有气味保护功能包装所用高阻隔膜。

链夹和链条翻新

将来，参观者会进一步了解布鲁克纳在中国强劲的链夹和链条服务，为双向拉伸薄膜生产提供滚动和滑动链轨系统的专业翻新和服务，也可应用在非布鲁克纳生产线上。这可以保证服务可靠性并减少在新工具和设备上面的投入成本。

拉伸膜生产线的搬迁

展位的另一个亮点即为拉伸膜生产线的搬迁。基于拉伸膜生产线的丰富经验，布鲁克纳提供高效专业的搬迁支持，从第一次咨询和工程设计，到拆卸服务，再到新址的重新安装和开机，直到客户满意生产线升级改造后性能。

新虚拟化概念

而且，中国薄膜生产商将逐步了解新的虚拟IPC服务器概念。这可以增加正常运行时间和设备可利用性。原有安装将通过增加名为“管理程序”的额外虚拟层与相关硬件分开。管理程序连接软件，应用和硬件。

中国新服务项目-TSP

在Chinaplas上，布鲁克纳技术服务公司将展示服务技术包 (TSP) 简要概述所提供服务的，比如24/7全天服务支持，现场培训和服务，备件交付及更多信息。

- Multi-layer technology: Manufacture of ultra-high barrier films (UHB) based on a multi-layer extrusion process, such as for BOPP films in 5, 7 or 9 layers
- Simultaneous stretching: Top-quality films of between 0.5 and 75µm, including polyamide packaging films or ultra-thin BOPP and BOPET capacitor films

Decentralized electric: Film producers investing in new equipment are highly interested in a smooth and quick commissioning leading to a fast start-up and to an even faster ROI. To shorten this time, Brückner now presents new solutions called “decentralized electric”. All power switches, motor control units, frequency converters, inputs for sensors and outputs for actuators are directly linked to the machine components. With this “plug and play” solution the commissioning time can be optimized. More benefits for the customers are a cost reduction and the availability of an energy monitoring for each machine unit. At the joint Brückner Group booth, besides Brückner Maschinenbau visitors will also meet **Brückner Servtec** with their solutions for the profitable operation of film stretching lines, **Kiefel**, showing the latest developments for the packaging, automotive, medical & appliance industry, and **PackSys Global**, presenting advanced packaging equipment.

Brückner Servtec: Enhanced Profitability for Film Stretching Lines

At Chinaplas 2016 Brückner Servtec (Hall E1, Booth K03) shows state-of-the-art solutions how film producers can enhance the profitability and the film quality of their existing film stretching lines with special upgrades and services.

Specialty films for high-margin applications: For the production of multilayer films Brückner Servtec will present upgrading concepts for existing film stretching lines. Multilayer films are used for high-quality and high-margin applications, including white, voided and metallized films for food packaging, synthetic paper for business cards and high-barrier film for packaging with aroma protection.

Clip and chain refurbishment: Furthermore, visitors will get to know Brückner's enhanced clip and chain services in China. It provides professional refurbishment and services at roller and sliding track systems for BO film production. The service is also available for non-Brückner lines. It ensures uptime, reliability and saves investment costs for new tools and equipment.

Relocation of film stretching lines: Another highlight at the booth will be the relocation of film stretching lines. Due to its vast experience, Brückner offers support for an efficient and professional relocation process. The scope spreads from first consultancy and engineering, over disassembly services, to re-installation and start-up at the new location. Customers appreciate the competence of upgrading and modifications for optimized line performance.

New virtualization concept: Additionally, Chinese film producers will get to know the new concept for virtualized IPC server. It increases the uptime and availability of the equipment. The original installation is detached from any hardware depen-

节能

对于能源密集型的生产方式，薄膜生产中的高效能源使用从未像现在如此重要。所以，布鲁克纳技术服务公司会针对“绿色”薄膜生产展示节能科技，比如：优质高效电机 (IE3)，热回收系统等等。

Brückner Group

Königsberger Str. 5-7, 83313 Siegsdorf, Germany
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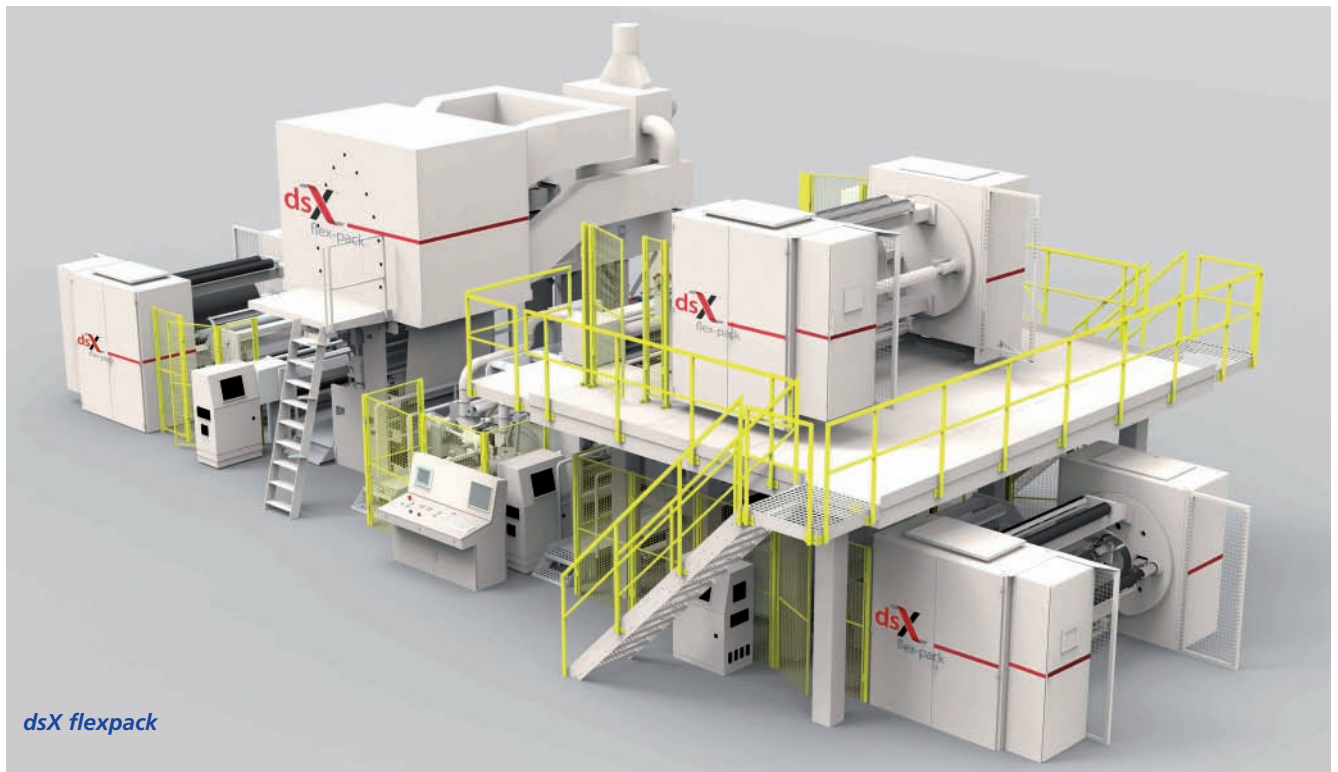
dencies by adding an additional virtualization layer called “hypervisor”. The hypervisor is the connection between software, application and hardware.

New Service Program in China – TSP: At Chinaplas Brückner Servtec will also present the Technical Service Packages (TSP) which provide service at a glance (e.g. 24/7 service support, on-site training and services, spare part handling, and much more).

Energy Saving: Efficient energy use in film production is more important than ever since it is an energy intensive manufacturing method. Therefore, Brückner Servtec shows energy saving technologies for “green” film production, e.g. premium efficiency motors (IE3) or heat recovery systems.

新技术和本地能力

Film Technologies at Chinaplas 2016: *New Technology and Regional Capabilities*



在2016中国国际橡塑展期间，戴维斯标准 (Davis-Standard) 公司将介绍其新技术和本地能力的提升。戴维斯标准已经看到：整个亚洲对于进料螺杆、控制系统、医用导管技术，以及公司生产的dsX™ 流延膜生产线、吹膜生产线和包装方面的应用都有着强劲的需求。

Davis-Standard's new technology and regional capabilities will be promoted during Chinaplas 2016. Davis-Standard has seen strong demand throughout Asia for feedscrews, control systems, medical tubing technology, and its dsX™ product line for cast film, blown film and packaging applications.

从两年前在苏州开设子公司以来，戴维斯标准在这一地区的业务有了持续的增长。这家子公司包括了戴维斯标准在中国的制造基地和用于工艺开发及培训的研发实验室。最近，戴维斯标准收购了Gloucester工程公司，这将有利于促进薄膜技术的发展和售后服务。

戴维斯标准亚洲商务发展副总裁Sekaran Murugaiah 说道：“由于亚洲市场强劲的需求以及我们在苏州的工厂的继续扩展，预料我们在中国国际橡塑展期间会非常繁忙。客户很欣赏我们在这一地区的本地化活动以及在苏州的医用导管实验室，这个实验室提供了测试新的树脂和工艺的可能性。对于我们的薄膜行业客户来说，Gloucester 的加盟是特别令人兴奋的，因为我们可以向客户提供薄膜技术方面最大的牢固基地并在同一个屋顶下提供售后服务。”

医用导管领域是戴维斯标准在中国最强壮的市场之一。位于苏州公司的实验室也一直在这一领域帮助和支持客户。实验生产线采用直接驱动的19mm和24mm单螺杆挤出机，每台挤出机都配备了融体泵，模头为精致的三层螺旋流道管模头。生产线采用PLC控制，带有数据采集功能，精密真空定型槽适合于生产硬管和软管两种产品，通过超声波测量系统对内径和外径进行闭环控制，伺服控制的牵引/切断组合系统，以及带有单区气动卸料的产品输送机。实验室还配备了特别设计用于生产静脉输液的FPVC（软质聚氯乙烯）单层导管生产线，可生产产品的尺寸范围为外径2mm到10mm，当生产线速度高达每分钟100米时，精度可达 $\pm 50\mu$ 。戴维斯标准位于康涅狄格州Pawcatuck的工厂同样配备了医用导管实验室的全套装备。

两家实验室都能够支持采用各种不同的高分子材料生产医用导管，尤其是微内径导管、多腔导管、气管及气管切开管、不透射线管、气泡管、锥型管、移液管和多层管。可提供交钥匙医用导管生产系统，挤出机产量可高达每小时700磅（315千克/小时），生产线速度高达每分钟800英尺（240米/分），原料适用范围包括聚乳酸（PLA），左旋聚乳酸（PLLA），聚醚醚酮（PEEK），软质聚氯乙烯（FPVC），聚氨酯（polyurethane），尼龙（nylon），尼龙弹性体（PEBAX）和全氟聚合物（FEP）。根据不同的加工工艺和应用场合，有不同的挤出机选项可供挑选，针对快速交货进行了设计，价格具有竞争力。

戴维斯标准公司另一类强有力的产品是dsX™设备。这些设备在整个亚洲都受到热烈的欢迎，这是因为在价格、性能和交货期方面都具备了竞争优势。戴维斯标准公司提供流延膜、吹膜和挤出涂覆应用方面的设备。由于市场对软包装的应用有着持续的需求，对于 dsX flex-pack™挤出涂覆设备的需求已经表现得特别强劲。那些生产成本敏感的软包装产品的客户，认为设备能够快速而可靠地运行是至关重要的，而dsX 设备就是专门为这类客户建造的。

2016中国国际橡塑展 展台号 W1C01

Davis-Standard, LLC

46 N. 1st Street, Fulton, NY 13069, USA

www.davis-standard.com

Davis-Standard's regional presence has continued to grow since opening a subsidiary in Suzhou two years ago. This facility is Davis-Standard's manufacturing base in China and houses an R&D laboratory for process development and trials. Davis-Standard will also promote the expansion of its film technology and aftermarket services with the recent acquisition of Gloucester Engineering.

"With strong demand in Asia and continued expansion at our Suzhou facility, we anticipate a very busy Chinaplas show," said Sekaran Murugaiah, Davis-Standard Vice President of Business Development, Asia. "Customers appreciate our regional presence and the availability of the medical tubing laboratory in Suzhou to test new resins and processes. The addition of Gloucester is especially exciting for our film customers because we are able to offer the largest installed base of film technology and aftermarket services under one roof."

The medical tubing sector is one of Davis-Standard's strongest markets in China. The lab in Suzhou has been instrumental in supporting customers in this segment. The lab features direct-drive 19mm and 24mm single screw extruders, each with a polymer melt pump, a sophisticated three-layer spiral flow tubing die, PLC line control with data acquisition, precision vacuum sizing tank for both rigid and flexible products, closed loop ID/OD control via an ultrasonic gauging system, a servo controlled combination puller/cutting system, and a transport conveyor with single-zone air eject. It also includes a single layer tubing line designed specifically for the production of FPVC tubing for IV & fluid delivery applications. Products ranging in size from 2mm OD to 10mm OD can be produced with an accuracy of $\pm 50\mu$ at line speeds up to 100mpm. Davis-Standard's facility in Pawcatuck, Connecticut, also has a fully equipped medical tubing laboratory.

Both labs support applications for alternate polymer, microbore tubing, multi-lumen and catheter tubing, edotracheal and tracheotomy tubing, radio opaque tubing, bubble tube, taper tube, pipette tubing and multi-layer tubing, among others. Turnkey medical tubing systems support extruder outputs up to 700 pounds per hour (315kg/hr) and line speeds up to 800 feet per minute (240 mpm) for a range of materials including PLA, PLLA, PEEK, FPVC, polyurethane, nylon, PEBAX and FEP. Extruder options are available depending on process and application and engineered for a fast delivery and competitive pricing.

Another area of strength has been the sale of Davis-Standard's dsX™ machines. These have been well received throughout Asia due to a competitive advantage in price, performance and delivery. Davis-Standard offers these machines for cast film, blown film and extrusion coating applications. Demand has been especially strong for the dsX flex-pack™ (extrusion coating) due to continued demand for flexible packaging applications. This machine is built for cost-sensitive flexible packaging applications where fast and reliable production is essential.

Chinaplas 2016: Booth W1 C01

新一代吹膜共挤模头

Film Technologies at Chinaplas 2016: New Generation of Blown Film Coextrusion Dies

Recognizing that not a single style of die design can accommodate all the applications in the industry effectively, Macro Engineering & Technology Inc. introduces a new generation of blown film coextrusion dies, the Macro-Pack™ series. The MacroPack™ series is composed of Macro's TP, CP, FP and MPC blown film coextrusion dies which are suitable for all your application needs.



麦可罗 (Macro) 工程和技术有限公司意识到，不会是只有一种模头设计风格去有效地适应这一行业的所有应用，因此，公司推出了新一代麦可罗-Pack™ 系列的吹膜共挤模头。麦可罗-Pack™ 系列模头由麦可罗公司的 TP、CP、FP 和 MPC 四种型号的共挤吹膜模头组成，能够满足吹膜生产线所有不同用途的需要。

所有新型麦可罗Pack™ 吹膜模头的共同特点，就是全都采用了流线型的融体流道，接触物料的流道区域面积有了减小。与同行的这类产品设计相比较，产品的这两项特点可以帮助客户减少流道清洁时间30%到40%。麦可罗Pack™ 系列模头的直径范围从3英寸到80英寸 (76 mm to 2.0 m)，可生产的薄膜厚度范围是从20到300微米，根据用途的不同，模头的结构可高达24层。

麦可罗Pack-TP 型模头与其它类似尺寸的模头相比，所用的螺栓减少了三倍。这种模头易于清洁和维护。它常常以双膜泡技术的方式使用，但也可以用于膜泡尺寸相似的3层到11层常规的吹膜生产线。

麦可罗Pack-CP 型模头主要用来加工聚烯烃原料，这种模头流道的融体接触面积有所减小，适合于快速更换原料。模头的尺寸范围从8英寸到40英寸(200 mm 到 1.0 m)，生产的薄膜可达5层。创新的设计不再使用传统的喂料块，这样模头内的压力下降就实现了最小化。这样一来，拓宽了模头的加工窗口，同时缩短了清料时间。与市场上类似设计的模头相比较，麦可罗Pack-CP 模头内的压力下降大约能够减少20%。

麦可罗的MCP模头特点是锥型芯轴，这是行业内唯一的自动定心装配的模头，这是至关重要的，特别是对于大直径模头的生产线，可避免出现非同轴的膜泡形状。经过特别设计，模头螺栓的数量只有市场上其它相同尺寸产品的一半，所以易于维护。有着专利的设计特色是在模头的中心有更大的空间，而对于传统的叠加式模头和同轴式模头，这是不可能实现的。这一特点有利于实现最佳化的空气交换，可应用于高产量的膜泡内部冷却 (IBC) 以及生产大直径膜泡的产品，例如农用膜及土工膜。这种模头的直径可以达到80英寸 (2.0 m)，生产的薄膜结构可高达11层。

麦可罗Pack-FP 共挤模头不仅采用流动混合流道以改善模头内部温度的一致性，同时还有圆形引导流动通道以缩短清料时间和提高融体质量。这种模头专门设计用于加工阻隔物料如EVOH (聚乙烯醇)、尼龙、PVDC (聚偏二氯乙烯) 和PETG (共聚聚酯)。由于这种设计特殊的性能，尼龙和PE之间转换的过渡时间可以缩短到15至29分钟。采用其它类似的模头，相应的清机时间要花费45分钟到12小时。这种模头同样可以用于特殊用途，包含膜结构多达24层的吹膜生产线。

All the new MacroPack™ blown film dies feature streamlined material flow passages and reduced wetted surface areas. Both features can help customers reduce purge time by up to 50%, and widens the process window by 30 to 40% compared to competitive designs in the field. MacroPack™ dies have diameters of 3 to 80 inches (76 mm to 2.0 m) and can produce films 20 to 300 microns thick, in constructions of up to 24 layers depending on the applications.

The MacroPack-TP die is designed to have three times less bolts than competitive dies of similar sizes. It is easy to clean and maintain. It is often used with double-bubble technology but can also be used for regular blown film of smaller diameter tubes from 3 to 11 layers.

The MacroPack-CP die is designed for mainly polyolefins applications with reduced wetted surface area for quick material changeover. It is available in diameters from 8 to 40 inches (200 mm to 1.0 m) and produces films of up to five layers. The innovative design which eliminates the use of a traditional feedblock minimizes pressure drops in the die. This broadens the process window of the die, as well as shortening the purge time. Compared to competitive dies of similar designs, the MacroPack-CP die reduces pressure drops by about 20%.

Macro's MPC die features a tapered mandrel, and is the only die in the field to have a self-centering assembly; this is crucial especially in large diameter dies to prevent non-concentric bubble shape. The special design uses up to half the bolts of com-

peting dies of the same sizes for ease of maintenance. The proprietary design features a large area in the center that is not available in the traditional stackable or the concentric dies. This allows an optimal air exchange for high-throughput internal bubble cooling (IBC) applications as well as large diameter bubbles such as in the agriculture and geomembrane applications. This die is available up to 80 inches (2.0 m) in die diameter and produces films of up to 11 layers.

MacroPack-FP coextrusion die not only has flow mixing channels to improve temperature uniformity in the die, but it also has round channeled flow passages to improve purge time and melt quality. This die is designed especially for running barrier materials such as EVOH, Nylon, PVdC and PETg. Due to the special features of this design, the transition time between Nylon and PE can be as short as 15 to 20 min. In other competitive dies, the comparative purge time can be from 45 min to 12 hours. This die can also be used in special applications containing up to 24 layers.

Chinaplas 2016: Booth W1 S21

2016中国国际橡塑展 展台号 W1 S21

Macro Advanced Extrusion Systems

199 Traders Blvd E, Mississauga, Ontario, Canada L4Z 2E5
www.macroeng.com, www.macrotech.ca,

软包装在亚洲市场的趋势和发展

Film Technologies at Chinaplas 2016: Trends and Developments in the Asian Flexible Packaging Market



软包装在亚洲是一个不断扩展的市场。采访中，德国温德默勒与霍尔舍公司的亚太区首席执行官 Michael Fischer 先生谈到亚洲市场的重要性，在工业领域的发展以及2016年中国国际橡塑展的创新。

*Michael Fischer,
CEO Asia Pacific at
Windmüller & Hölscher*

Flexible packaging is a growing market in Asia. Michael Fischer, CEO Asia Pacific at Windmüller & Hölscher, talks about the importance of the Asian market, the trends in the industry and the innovations shown at Chinaplas 2016.

Mr. Fischer, Chinaplas 2016 is coming up – how is the market for flexible packaging in Asia-Pacific developing?

Rising expectation on quality, productivity and sustainability gave a boost to the already growing market of flexible packaging. More and more rigid packaging solutions like glass bottles are being replaced by flexible ones, always considering environmental friendly raw materials to be used. PVC products were replaced by PP and HDPE. These developments fueled the growing importance of the flexible packaging market.

Which technological trends were especially important during the last years?

There are a few important developments, especially driven by

Fischer先生, 2016年中国国际橡塑展将至 - 软包装市场在亚太地区的发展如何?

对产品质量, 生产效率以及可持续性的期望的不断升高进一步推动了已经有所发展的软包装市场。越来越多的硬包装(例如玻璃瓶)将会被软包装取而代之。为了更多使用环保材料, PP和HDPE薄膜取代了PVC产品。这一发展给软包装市场日益增长的重要性作出了重大贡献。

在过去的几年里有哪些技术方面的发展具有重大意义?

有很多重大发展, 最主要目标是性价比和功能性的提高。相比于过去的单层挤出, 现在的3层和甚至5层的聚烯烃薄膜越来越重要。新的原材料被开发出来, 可增加具有功能性的挤出层而实现薄膜的减薄。在不改变薄膜性能的情况下, 同时降低薄膜的总厚度。W&H及早的认识到了这一发展趋势并为适应这一市场需要开发了新的设备和产品。成功地显示: 对于温德默勒与霍尔舍公司来说, 特别是在过去的5年里, 亚太地区的市场已经成长为一个非常显著的规模。

在您看来哪一种趋势将决定未来几年的市场?

未来的市场发展也还将趋向于更好的性价比, 更高的灵活性和新的功能性。在挤出领域, 关于设备宽度的明显发展趋势我们很清楚: 以前宽度是1600毫米, 现在宽度至少2200毫米。配有额外功能层的5层薄膜将继续占有重要意义且将逐渐替代3层薄膜。纵观薄膜在亚洲市场的最终用途, 尤其是由配有在线薄膜拉伸设备的吹膜设备生产出的透气膜, 将继续增长。在薄膜减薄的同时不改变薄膜特性这一趋势, 给薄膜生产厂家提出挑战: 他们需要进一步优化生产工艺。为了给客户提供最佳的解决方案, 我们携手客户以及原材料供应商共同来开发我们的机器设备。以此来确保新的原材料的加工处理并同时具有灵活性, 以快速应对不断变化的市场需求。

在过去的几年里, W&H亚太区有过哪些发展?

除了创新和为遍布世界各地的客户提供全面的产品设备系列以外, 在过去的几年里我们还在亚洲扩大了规模, 特别是客户支持和售后服务。为了以最好的方式服务于我们的客户, 我们已在亚太地区建立了一个高素质的服务团队, 在目前的开始阶段, 该团队拥有30多名机械工程师和电力工程师, 分布于中国, 泰国和澳大利亚, 并得到我们设在印度, 德国和美国的远程信息诊断中心7天24小时的支持。

在中国国际橡塑展上W&H将展现哪些创新?

今年我们的重点是放在已在中国获得很大成功的AQUAREX设备上。AQUAREX是我们推出的一个模块式的吹膜设备, 该设备的薄膜生产自上而下, 并使用水冷代替风冷作为膜泡冷却媒介。我们最新的创新是冷水环AQUACAGE。该水环能够实现膜泡直径在750 mm和1250 mm之间的自动调整。此外, W&H还将参加在4月26日举行的作为展会一部分的Nippon Goshei研讨会, 并有关于阻隔膜生产的专家演讲。其他的创新我们将在今年杜塞尔多夫5月/6月份的DRUPA和10月份的K展上呈现给我们的客户。

2016年中国国际橡塑展: 拜雷尔展台 E1J61

Chinaplas 2016: Booth E1 J61

better price-performance-ratios and increasing functionality. Nowadays, 3 and even 5 layer polyolefin structures gained in importance compared to mono extrusion in the past. New raw materials have been developed allowing the down gauging process, by adding different functional layers. At the same time, the overall thickness was reduced, without having lost the technical properties of the packaging material needed. W&H recognized these developments early on and reacted with the design of machines and products strictly according to market needs. With success: The market for W&H in Asia Pacific has grown to a substantial size, especially during the past five years.

What do you think will be the most relevant trends in the flexible packaging market in Asia in the next few years?

Improving price-performance ratio as well as flexibility while at the same time offering new functionalities – these goals will continue to be the drivers for upcoming developments. In extrusion, we can clearly see that the machine widths are getting wider: What once used to be 1600 mm has become at least 2200 mm. 5 layer polyolefin products with additional functional layers will continue to replace 3 layer products. When we focus on the final application we surely can say that breathable film extruded in blown film technology with inline MDO continues to grow fast in Asia. Additionally, the trend of down gauging whilst maintaining unchanged properties keep producers occupied with optimizing their production. Here W&H offers a great experience, because our machines are developed in close relationship with raw material suppliers as well as customers to safeguard the processing of various new materials and to keep the flexibility to react quickly on changing conditions.

How did W&H develop its offer in the Asian Pacific market during the last years?

In addition to the innovations and developments of our machines, that we offer our clients worldwide, we have especially focused on customer care and service in the Asian market during the last years. To serve our customers in the Asian Pacific region, we build a strong service team with highest qualification in the region. With approx. 30 mechanics and electricians W&H has started to roll out his service platform in China, Thailand and Australia. They are supported by remote diagnostic centers in India, Germany and the US, to attend service calls 24/7.

Which innovations will W&H show at Chinaplas?

We will be focusing on our AQUAREX – upside down water quench – process technology, which is very successful in China. Our new innovation is the latest AQUACAGE. This calibration basket is able to adjust to a flexible film size between 750 and 1250 mm. W&H will also participate at a seminar to speak about barrier film production on occasion of Nippon Goshei's barrier film seminar, which will take place on 26.4.2016 during Chinaplas this year. Benchmarking innovations are also to be expected during forthcoming DRUPA and K shows in Düsseldorf, Germany in May/June and October, later this year.

WINDMÖLLER & HÖLSCHER KG
Münsterstr. 50, 49525 Lengerich, Germany
www.wuh-group.com

新型11层吹膜生产线提高了灵活性

Film Technologies at Chinaplas 2016: *A Plus in Flexibility with the New 11 Layer Concept*

细川阿尔卑那股份有限公司 (Hosokawa Alpine AG) 执行副总裁Holger Niemeier博士, 以及细川阿尔卑那薄膜挤出部研究和开发经理Michael Heinecker

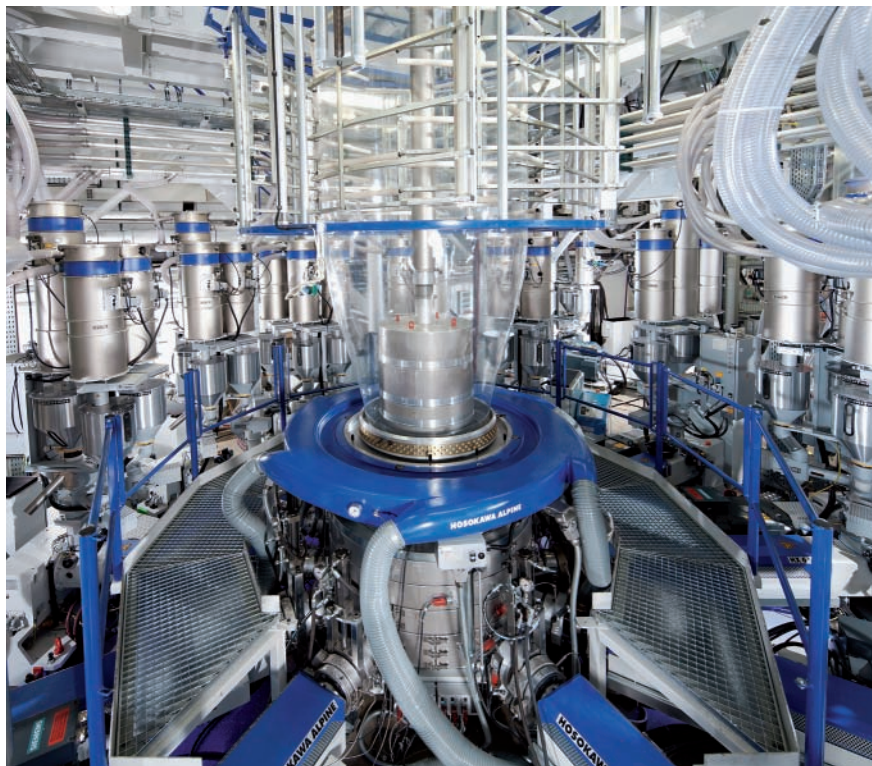
十一层高阻隔薄膜产品要替代九层?从一方面看,要投资于复杂的现代化设备,而另一方面是增加了灵活性。无论如何,问题在于:这样做有价值吗?可以肯定地回答:是的。投资于11层吹膜生产线代替9层生产线,由于灵活性增加而带来多种多样的机会,可以进行充分的开发,还有原料的节省和生产能力的增加,所以在不到一年的时间里,超额的投资会得到分期偿还。

根据Smithers Pira公司发布的市场报告“从现在到2019年的高阻隔包装薄膜的前景”,在2014年全世界所使用的高阻隔薄膜市场容量达到了一百七十六万吨,市场价值达到了一百五十九亿美元。直到2019年,预期高阻隔包装薄膜每年消费量将增长5%。在这种状况下,高阻隔薄膜被定义为:具有灵活性,厚度在250 μm 以下,在厚度为25 μm 时的氧气透过率小于5 $\text{cm}^3/\text{m}^2/24\text{h}$ 的薄膜。高阻隔薄膜用量增加的原因是:那些对保护产品确实有效的包装材料,其需求在增加。对于食品和饮料行业来说需求在增长,对医药产品来说需求更是增长的。

对于特殊的包装解决方案出现了强烈的需求

高阻隔薄膜对于氧气、氮气和二氧化碳都可提供极为优良的隔绝保护,不仅保证能够包装敏感的食品产品例如鲜肉,同时还能充分提高其保存期限。

在有着千变万化的生活方式的工业化国家里,出现了越来越多的单身家庭,且老年社区也越来越普遍,新鲜食品的小包装单元和现场包装盒子两者都要用到高阻隔薄膜,因此高阻隔薄膜的重要性正在不断增长。同样,采用高阻隔薄膜制造的自立袋也更为常见,因为这种袋子适合于灭菌消毒和应



位于奥格斯堡的细川阿尔卑那测试中心里,阿尔卑那11层共挤吹膜生产线

Alpine 11 Layer Blown Film Co-Extrusion Line in the Hosokawa Alpine Test Centre in Augsburg

Dr.-Ing. Holger Niemeier, Executive Vice President, and Michael Heinecker, Manager Research and Development Hosokawa Alpine AG, Film Extrusion Division

The production of High Barrier Films with eleven instead of nine layers? On the one hand an investment in complex modern equipment and on the other an increase in flexibility. Nevertheless the question is: Is it worthwhile? The answer is a very definite yes. In less than a year the investment in an 11 layer Blown Film Line instead of a 9-layer line can be amortised by fully exploiting the diverse opportunities offered by the gained flexibility, the possible savings in raw material and the augmented production capacity.



拥有专利的X系列11层吹膜模头

Patented X-blowing head in the 11-layer design

用于微波炉，对于消费者来说大有好处。根据Smithers Pira公司的报告，在未来的五年里，自立袋将有着非常高的增长速度。然而，不仅在工业化的国家里对专业包装方案的需求越来越多的，在发展中国家包装的使用同样在增长，这些都将成为市场的成长做出贡献。

当前，代表高阻隔薄膜发展水平的是九层生产线

与日用品包装相比，高阻隔薄膜代表的是一个相对较小的细分市场。无论如何，这一市场提供的不仅仅是上述的前景和增长预测，同时还有着令人瞩目的利润空间，从而对于投资者显示出了良好的机会。按照现在的状况估算，仅仅就吹膜而言，每年就有大约20条新的阻隔生产线安装投产。最近一段时间以来，高阻隔薄膜的制造商已经牢固确立了7层和9层生产线的主流观念，9层生产线已经代表了当前技术发展的最新水平。有代表性的是，生产应用于食品的高阻隔薄膜，聚烯烃与EVOH层和/或尼龙层通过粘合层结合，可以得到所需要的特性。除了复杂的生产设备以外，特别重要的成本因素是阻隔物料的用量，因此需要对这一层的层结构按照其确定的用途实现最佳化，阻隔物料的使用量越少越好。

采用最常用的阻隔材料EVOH，阻隔层厚度为1 μm ，可以可靠地连续生产阻隔薄膜。

增加两层附加层可以显著地提高灵活性

投资于11层技术，不仅对于那些已确定下来生产高阻隔薄膜的公司非常合适，对于那些希望配备理想的设备、着眼于将来的新发展和市场需求的后来者也非常合适。提高设备的灵活性，不仅涉及到生产5层到11层阻隔薄膜，而且涉及到

In 2014 the worldwide usage of high barrier films reached a market volume of 1.76 million tons with a market value of 15.9 Billion US\$ as announced by Smithers Pira their market report "The Future of High Barrier Packaging Films to 2019". Until 2019 consumption is expected to increase by 5% annually. In this context high barrier films are defined as films that are flexible, have a thickness of under 250 μm and, at a thickness of 25 μm , have an oxygen transmission rate of less than 5 $\text{cm}^3/\text{m}^2/24\text{h}$. The reason for the increasing usage of high barrier films is an increase in demand for packaging materials with improved product protection. This is particularly the case for food and drink but also for pharmaceutical products.

Special Packaging Solutions are in strong demand

High barrier films offer excellent protection against oxygen, nitrogen and carbon dioxide and not only ensure that sensitive food products such as fresh meat can be packaged but also enhance substantially their shelf life.

Particularly in industrialised countries, where changing lifestyles, an increasing number of single households and aging communities are becoming more common, smaller packaging units and case ready packs for fresh food, both of which require high barrier film, are growing in importance. Also stand-up pouches from high barrier film are becoming much more common as their suitability for retort and microwave applications are of great benefit to the consumer. According to the Smithers Pira report stand-up pouches will show the greatest growth rates over the next five years. However not only the rising demand for increasingly specialized packaging solutions in the industrialised countries but also the increasing use of packaging in developing countries will contribute to the market growth.

Current state of the art with high barrier blown films is 9 layer

In comparison to commodity packaging high barrier films represent a relatively small market segment nevertheless this market offers not only the described outlook and growth perspectives but also very interesting profit margins and thus presents a good opportunity for investors. According to current estimates around 20 new barrier lines for blown film alone are installed yearly, For the manufacture of high barrier films 7 and 9 layer lines have become firmly established whereby in the recent past 9 layer lines have come to represent the state of the art technology. Typically, for the production of high barrier films for food applications, polyolefin are combined with layers of EVOH and / or polyamide by means of tie layers in order to achieve the required properties. Apart from the complex production machinery required particularly the barrier materials represent a significant cost factor and are therefore used in as thin as possible layers optimized for a given application.

With the most common barrier material EVOH layers as thin as 1 μm can be reliably achieved in continuous production.

Two additional layers enable significantly more flexibility

An investment in 11 layer technology is not only suited for companies that are well-established regarding high-barrier films, but also for newcomers who wish to be ideally equipped for future new developments and market requirements. Flexibi-



高阻隔薄膜用于食品包装

High barrier film for food packaging

数量巨大的各种各样用途的原材料。对高度的灵活性起关键作用的是细川阿尔派新的拥有专利的X系列11层模头。作为吹膜生产线制造行业市场领袖之一，该公司以非常成功的X系列模头为基础，开发出了11层螺旋流道分配器共挤模头。模头设计的关键点在于使挤出生产线从11个同等的层次结构中获得巨大的灵活性。各层结构可以有着无穷无尽的变化，原料的适用性也涵盖了宽广的范围。尽管任意一台挤出机所采用的原料有着非常不同的粘度，各式各样的原料也可以进入任何一层，而不需要更换螺杆。不管是对称结构的薄膜（例如复合基材膜）还是非对称结构的薄膜（例如应用于热成型的薄膜）都是可以生产的，同样，各层结构的厚度可以是相同的也可以是非常不同的。较厚的层，例如采用低成本原料的层，可以采用相邻挤出机挤出相同原料的方式，形成相邻层。

最后一点然而同样重要的是：11层生产线层数的增加提供了全新物料组合的可能性，并因此而导致减小层厚和节省成本，或者可以开发出新的产品，例如不再需要采用下游设备进行复合的薄膜产品。

不到一年即可摊回投入的成本

为确保能够在生产的条件下充分利用极大的灵活性，在模头的设计阶段就对快速物料转换和缩短清除时间给予了极大的关注。例如，从采用11层生产线生产PE薄膜转换到生产高阻隔薄膜，所需要的时间可以缩短到一个小时以内。为了使客户自行证实这一点，细川阿尔卑那在其具备测试条件的客户测试中心开机运转11层吹膜生产线。在这条生产线上，可与客户一起，实际生产新结构的薄膜，同时还可与原料制造商一起，开发新的原料和原料组合，并研究新原料的加工特性。

采用11层生产线实现了高度的灵活性，下面的例子体现了生产线是物有所值的：

高阻隔封盖薄膜

High-barrier lidding film

ity, not only in respect of 5 to 11 layer barrier films but also in respect of the enormous versatility of raw materials. Primarily responsible for the high degree of flexibility is the new 11 layer die head of the patented X Series from Hosokawa Alpine. One of the market leaders in the field of blown film lines the company developed a co-extrusion die head with 11 spiral distributors based upon the highly successful X-die heads. The focus of the die head design was the enormous flexibility of the extrusion line which is facilitated by 11 equal layers. An unprecedented variety of layer structures is possible as the whole spectrum of suitable materials despite their very differing viscosities can be employed in any of the extruders and thus any layer without changing the screw. Both symmetrical for example for lamination film and asymmetrical structures for thermoforming applications are possible as well as layer structures with equal or very differing layer thicknesses. Thicker layers, for example from low cost materials, can be achieved by extruding the same material through neighbouring extruders and hence neighbouring layers.

Last but not least the increased number of layers of an 11 layer line offers the possibility of completely new material combinations which could lead to a reduction in layer thickness and result in cost savings or enable new products to be developed which e.g. eliminate the need for downstream lamination.

Amortisation in less than one year

To ensure that the enormous flexibility can be fully exploited under production conditions short material change-over and purging times were given a great deal of attention in the design phase of the die head. For example the change over from a PE film, which of course can also be produced on an 11 layer line, to a high barrier film can be achieved in less than one hour. To enable customers to verify this themselves Hosokawa Alpine operates an 11 layer line in their customer test center which is available for customer tests. On this line, together with customers, new structures are implemented and, with raw material manufacturers, new materials and material combinations are developed and their process properties investigated.

That the flexibility achieved with an 11 layer line is affordable is shown by the **following example**:

Based upon the assumption that the personnel requirement and energy consumption per produced kilogram of film remain constant a production comparison between a 2000mm wide, 40µm thick film with a symmetrical 9 layer structure and an 11 layer film with the same dimensions is made. The layer structure is as follows:

5 % mLLDPE, 33 % LLDPE, 5 % TIE, 5 % PA, 4 % EVOH, 5 % PA, 5 % TIE, 33 % LLDPE und 5 % mLLDPE.

With the 9 layer film a maximum output of 420 kg/h can be achieved whereas with the 11 layer film the output is 30% higher at 550kg/h. The higher output is achievable with the 11 layer structure as the two individual LLDPE layers in the 9 layer structure are each replaced by two neighboring layers with each layer totaling 16.5% layer ratio. Thus higher outputs are possible as the limiting factor is the throughput in the melt

我们设想，对生产2000mm宽40μm厚的九层结构薄膜和相同规格十一层结构薄膜进行比较，那么，每千克薄膜产品对人员的需求和所消耗的能源是保持恒定不变的。各层结构如下：

5 % mLLDPE, 33 % LLDPE, 5 % TIE, 5 % PA, 4 % EVOH, 5 % PA, 5 % TIE, 33 % LLDPE 以及 5 % mLLDPE。生产九层薄膜可实现最大产量为420 kg/h，然而生产十一层薄膜产量要高出30%，达到550kg/h。11层结构能够实现较高的产量，这是因为在九层结构中，两个独立的LLDPE层在十一层结构中分别由两个相邻层所取代，每层的层厚比例都是16.5%。由于对于产量的限制因素是融体流动，这样，两条流动代替了一条流动，就可以实现较高的产量。通过设备的灵活性获得了较高的产量，所带来的结果是，87.5%的投资在一年内可以得到返回。

采用九层生产线，如果要配置相同生产能力，随之而来的是，对于不同层灵活性就会有許多限制。

明智而审慎的投资

总之，人们开始考虑增加一些投资，购买11层吹膜生产线，增加的投资额大约是九层生产线的10%到15%。生产商将从高度的灵活性中获益，可以采用新的膜结构生产产品，增加竞争优势，可以生产几乎是结构变化无穷的薄膜，一条生产线就可以生产从单一的PE结构到11层高阻隔薄膜等各种产品，并且，从产量明显的显著增加可获得确定的产品收益。多层结构薄膜常常能带来商业上的好处，可以通过共挤来添加某些功能层，这样就不再需要进行后续的复合加工。这种情况下对于最终产品都会有着非常严格的要求，采用11层高阻隔薄膜，并与其他方式结合，例如采用金属化的外层原料就可找出解决方案。可以将在线MDO（纵向单向拉伸生产线）结合到吹膜生产线中来，这样就为提高阻隔功能和提高薄膜刚度提供了新的可能性。同时，经过MDO能够保证薄膜有着卓越的平整度和优异的厚度公差，这对于后续加工（例如印刷和复合）有着非常良好的正面效果。

2016中国国际橡塑展：E1D15

channel. As a result of the higher output by equipment availability of 87.5% a return on investment in under one year can be obtained.

Were a 9 layer line to be configured for the same output capability then substantial limitations in the flexibility of the individual layers would be incurred.

A sensible and prudent investment

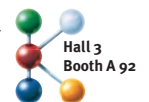
In summary, it can be stated that the additional investment costs for an 11 layer blown film line, which amount approximately to an additional 10% to 15% over those for a 9 layer line, definitely pay off. The producer profits from a the highest degree of flexibility, can gain a competitive advantage with new structures, can run an almost infinite variety of films from simple PE structures through to 11 layer high barrier films all on a single line and on certain products benefits from significantly higher outputs. Multilayer structures often offer commercial benefits in that certain functional layers can be added by co-extrusion eliminating the requirement for downstream lamination steps. Where very stringent demands are imposed upon the final product the combination of an 11 layer high barrier film with e.g. a metalized outer layer can offer a solution. The integration of an in-line MDO (mono-axial machine direction orientation line) offers an additional possibility to increase the barrier functions and the film stiffness. At the same time use of the MDO ensures that films display excellent flatness (planity) and thickness tolerances, which have a very positive effect on downstream processes such as printing and lamination.

Chinaplas 2016: E1D15

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第三代KCC系列中空成型机投产

Film Technology at Chinaplas 2016: Third Generation of KCC Machines goes into Production

在今年的中国国际橡塑展上，考特斯公司 (Kautex) 将展出新型号的中空成型机。从1997年开始，KCC系列中空成型机就已经在中国的顺德投入生产，这次展出的是成功的KCC系列中空成型机的第三代产品。这种新型中空成型机是在去年十月的工厂开放日活动中推出的，意味着KCC系列将全部重新换代。而且，这种设备整个进行了重新的设计，具备了许多新的和改进过的技术特性，从外观上看起来，这是新型的考特斯设备。

新一代KCC设备有着紧凑的外形，占用生产车间的场地面积较小。具有更好的无障碍环境，不仅使中空成型机易于维护，同时还使产品转换的时间更快捷。例如：模具现在可以从侧面更换，产品可以从设备的背面出货。采用大量标准化的模块和部件，不仅减少了新机器的投资成本，并且缩短了交货期。

Mark Lueddecke，考特斯机械顺德副总裁，计划向市场推出新一代的中空成型机，并逐渐地让整个范围的KCC产品都由新一代产品所覆盖。他指出：“我们向所有种类的消费产品和工业产品的包装应用以及向汽车行业提供KCC设备。这种高度的灵活性清晰地说明了为什么这种系列的设备能够在几乎二十年的时间里持续地取得成功。”

在中国国际橡塑展期间，考特斯机械公司将同样会首次展出新型KSB负压式中空成型机。这一全新的型号特别设计用于低闪点生产3D模塑部件。

全世界汽车工业领域对于塑料管道的需求始终在上升，从那时到现在，由于使用了特殊的原料如尼龙6.6或PPS（聚硫磺），已经能够生产出更高耐热性的排气管道产品。

考特斯的BC5控制器采用现代化的操作理念，因此KSB设备易于操作。此外，与以前的设备相比，新型负压中空成型机占地面积大约减少了50%，这样就节省了投资。

At this year's Chinaplas Kautex Maschinenbau will present a new model in its successful KCC series of extrusion blow molding machines. This is the third generation of the KCC series, which has been produced in Shunde, China, since 1997. The new blow molding machine model, which was announced at the Open House event in October last year, represents a complete relaunch of the KCC series. As well as a number of new and revised technical features, the machine has also been completely re-designed, to visually blend in with the look of new Kautex machines.

With its compact form, the new KCC generation takes up less floor space in the production hall. Better accessibility not only makes the blow molding machine easier to service, but also speeds change over times. Molds can now also be changed from the side, for example, and products are discharged from



the rear of the machine. A greater standardization of modules and components has reduced the investment costs of the new machine and shortened future delivery times.

Mark Lueddecke, Vice President of Kautex Maschinenbau in Shunde, plans to introduce the new generation of machines to the market on a gradual basis until the switch-over of the entire KCC range has been completed. "We offer KCC machines for all kinds of consumer and industrial packaging applications as well as for the automotive sector. This high degree of flexibility is precisely why this machine series has continued its success for almost twenty years."

Kautex Maschinenbau will also allow first insights in its new KSB suction blow molding machine at Chinaplas. This brand new machine type was specially designed for low-flash production of 3D molded parts.

Global demand for plastic ducts for the automotive sector is rising all the time, ever since the use of special materials such as PA6.6 or PPS has enabled the production of highly heat-resistant exhaust ducts.

A modern operating concept with Kautex BC5 controller makes the new KSB machines easy to operate. In addition, the new suction blow molding machine takes up almost 50% less space than previous equipment, thus reducing investment costs.

Chinaplas 2016: Stand E1 F41

2016中国国际橡塑展：展台号 E1 F41

Kautex Maschinenbau GmbH
Kautexstr. 54, 53229 Bonn, Germany
www.kautex-group.com

现场展示TVEplus®技术:回收重度印刷的物料

Live Demonstration of TVEplus® Technology for Heavily Printed Materials

在2016年中国国际橡塑展期间，埃瑞玛 (EREMA) 将在其展台W1A41展出INTAREMA® 1007 TVEplus® 塑料回收系统以及EREMA SW4/104 RTF 融体过滤器。

这套回收系统将以产量300到350 kg/h进行现场演示，高效率回收重度印刷的LDPE物料。为了让参加展会的观众看到回收造粒产品令人信服的出色的质量，这些粒子将在展台上进行回用，直接生产薄膜。

因为回收重度印刷物料的工艺面临着特殊的挑战，所以对TVEplus®技术的需求量很高。例如，困难之一就是当塑料基材在加工温度下融化并破裂分散时，经常会在油墨中发现粘合剂和其它添加剂。由埃瑞玛开发的TVEplus®技术提供有效的过滤、均化以及具有最高水平的排气。这些措施代表了高质量回收再生，例如，回收那些甚至是全表面印刷的多层印刷薄膜，并将粒子重新用于生产薄膜，只需要一道工序就可完成。

埃瑞玛的持续扩展：

在开发和生产塑料回收系统和部件这个行业，埃瑞玛是全球的市场领袖，有着最高的质量水平。从1983年公司成立以来，埃瑞玛从未停止过开发的步伐。迄今，已有超过4500套埃瑞玛系统在全世界运转。

去年，埃瑞玛继续保持了其最近几年以来的成功扩展业绩。除了埃瑞玛中国和埃瑞玛北美以外，2016年初，在莫斯科成立了“000埃瑞玛”。

在2016年春季，埃瑞玛北美有限公司的子公司位于美国的实验中心面积将扩大一倍以上，以满足客户的大量需求。

去年，埃瑞玛集团的业绩整体得到了增长，增长的里程碑是2015年1月1日建立了新的埃瑞玛姐妹公司PUREA LOOP GesmbH，这家公司专门回收清洁生产的废料。

埃瑞玛2015年的扩张取得了成功，这也是公司持续增长进程的证明。公司将继续致力于向塑料回收市场提供有竞争力的方案，并开发多种多样的应用领域，以满足客户的需求。

EREMA will be exhibiting the INTAREMA® 1007 TVEplus® with an EREMA SW4/104 RTF Meltfilter at Chinaplas 2016 (Booth no. W1A41). This system will be shown live in action



埃瑞玛 TVEplus® 技术：即使重度印刷的物料也能加工成高质量再生粒子
EREMA TVEplus® technology processes even heavily printed materials to make high-quality recycled pellets

with a throughput of 300 to 350 kg/h to present the highly efficient recycling of heavily printed LDPE materials. For visitors to the trade fair to see the convincing and outstanding quality of the recycled pellets produced these pellets will be reprocessed directly at the booth to make film.

The high demand for TVEplus® technology is explained by the special challenges faced in recycling processes for heavily printed materials. Binding agents and other additives that are constantly found in the inks, for example, are a problem as they melt at the processing temperatures of the plastic matrix and break down in parts. TVEplus® technology developed by EREMA offers efficient filtration, homogenisation and degassing at the highest level. This means that high-quality recyclates which are, for example, reused in the production of film, can be made even from full-surface and multiple-layer printed film scraps in a single pass.

EREMA's expansion continues: EREMA is the global market leader in the development and production of plastics recycling systems and components – at the highest quality level. Since it was founded in 1983 EREMA has never stopped developing.

Today, over 4,500 EREMA systems are in use around the world.

Last year EREMA was able to continue its successful expansion of recent years. In addition to EREMA China and EREMA North America, "OOO EREMA" was founded in Moscow at the beginning of 2016. And in spring 2016 the subsidiary EREMA North America, Inc. will more than double the size of its trial centre in the USA in response to the high demand. The EREMA Group as a whole grew over the last year. A further milestone was set on 1 January 2015 with the founding of the new EREMA sister company PURE LOOP GesmbH which specialises exclusively in the recycling of clean production wastes.

The successful year of expansion in 2015 is confirmation of EREMA's continuous course of growth with a view to offering comprehensive solutions to the plastics recycling market with its highly diverse application fields and customer requirements.

**EREMA Engineering Recycling
Maschinen und Anlagen Ges.m.b.H.**
Unterfeldstr. 3, 4052 Ansfelden, Austria
www.ereama.at

更高效经济的生产片材

Economic Sheet Production

适用于功能性及热成型片材的挤出加工工艺：

没有任何行业像汽车和消费品行业那样需要更高的生产灵活性。即使是小批量产品,速度和高适应性对高效生产来说也是至关重要的。对生产这类产品的挤出生产线而言,最重要的是灵活以及高效经济地生产片材。挤出生产线的效率基本上由原料利用的最大化确定。高可靠性、精密的公差,最少的废料和高产量的特性从而成为了合格的挤出生产线的标准。既可以处理ABS、HIPS、TPU、ASA、PMMA等原料生产单层或多层片材,也可以生产平整的、表面光泽或压花的片材。

Extrusion Process for Sheet for Technical and Thermoforming Applications:

There is hardly any other industry demanding higher flexibility in production than the automobile and consumer goods industry. Therefore the highlight of this kind of extrusion line is its flexibility and possibility of economic sheet production. The efficiency of the extrusion line is essentially determined by an optimized use of materials. High availability, low tolerances, minimum scrap and high throughput performance therefore are the standards by which the systems are conceived. Single- and multilayer sheet out of ABS, HIPS, TPU, ASA, PMMA etc. can be produced. Flat, shiny or embossed surfaces are available.

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Standing still is falling behind. (Images: Breyer)

布勒尔(BREYER)设计制造的挤出机运行能耗低,且尽可能地让操作更舒适方便。所有电气机柜都配备了西门子控制单元。通过触摸显示屏可进行舒适方便的操作。挤出机带有带排气功能,能够以非常经济的方式运转而不需要进行既耗时又耗能的原料预干燥。最值得指出的是挤出机有着非常高的产能,而水冷交流电机运转极为安静。

此外,挤出机可以灵活配备不同种类的换网器以及熔体泵。Breyer挤出机配备特有的熔体泵控制模式,挤出机在此模式下可以快速且安全地开机。采用这种方式可节省原料的浪费。T型挤出模头配备了快速间隙调整装置,能够在生产中快速调节模唇开口。

为了快速而安全地调节柔性模唇模头螺栓,可选配积料检测装置。该装置可以通过显示器告诉操作人员:哪一个模头螺栓需要进行调节。采用这种方式,片材的截面形状可以在非常短的时间内调节完毕,从而节省了原料。

压光机是挤出生产线的质量中心。在过去,为了调节辊间隙,压光机通常都配备了一套机械装置,这样以来,对于片材厚度或多或少地进行精确设定

有了可能。对两条辊之间的间隙进行调节采用的方法从简单的通过调节螺栓和手轮进行调节直到电动调节的方式,这些各种各样的机构都是采用机械方式,从而在压光机上调节片材的厚度。布勒尔(Breyer)的压光机辊间隙调整快速而简单,不需要任何机械调节部件。这套精密的系统能够精确地定位,精度达到千分之五毫米!在满负荷的生产中还能实现这种精度实在叹为观止!该系统的间隙设定的调节范围是0到100毫米,每个间隙都具有准确而相同的精度。通常来说,在薄膜和片材挤出时,间隙在0.1到20毫米之间。

参数的输入通过彩色触摸屏进行。当手指触摸按钮时,辊间隙会立即进行调整。这种间隙调整技术向用户提供了非常大的自由度,并且在产品厚度设定的速度和精密度方面树立了新的标准,因此这种技术代表了挤出技术上实实在在的新进展。

由于压光辊的排列方式经过了精心的设计,所以无论从侧向接近辊筒以及观察辊筒间隙都是毫无障碍的。这样就带来了诸多便利,例如使用于带有封边装置的模头时,不会碰撞到机器的支架、若

压光机上已安装好的装饰薄膜放卷装置,装饰薄膜可以更方便地引导通过压光辊的间隙。

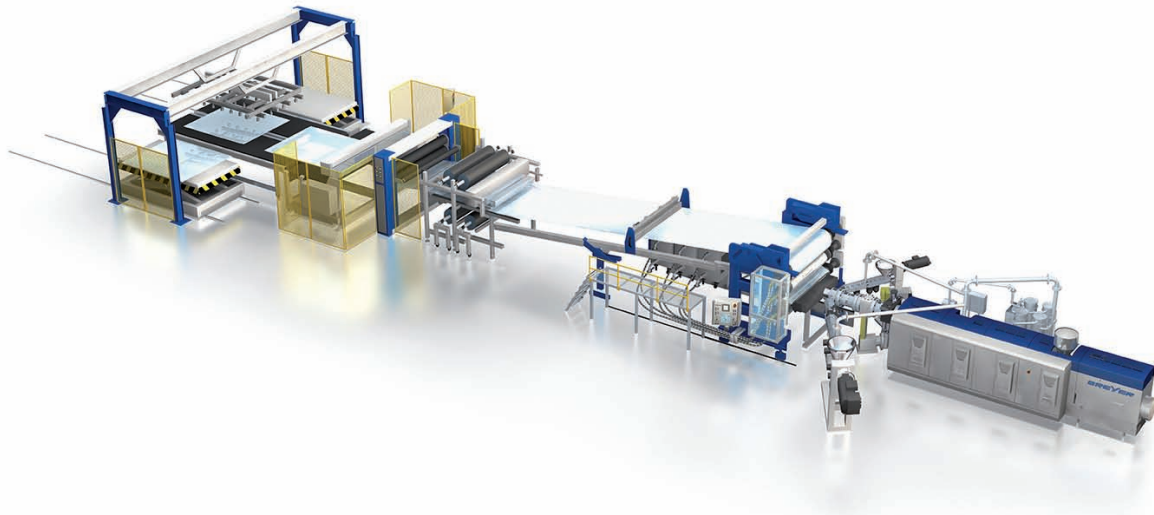
更换压花结构辊筒:

为了快速更换中间压辊,可将这条辊安装在抽出器上,换辊时只需要按下按钮几秒钟就可取出这条辊,然后可以更换为另一种花纹设计的辊筒。这一功能对于操作人员来说非常方便,因为有了这个功能,辊筒可以方便更换,并能通过起重机吊出来。

由于辊筒两侧的驱动和冷却端装有分离轴承和快速联轴器,所以能够快速拆装精密连接。在工作模式下,辊筒通过液压锁定即可立即投入生产。采用这一系统后,辊筒的更换可以在几分钟之内完成。

当然,为了提高整条生产线的效率,生产线还具备其它的特点。布勒尔(Breyer)将在2016年中国国际橡塑展期间采用3D视频动画展示这一系统。

2016年中国国际橡塑展:布勒尔(Breyer)展台 E1F15



BREYER extruders are designed to operate with low energy use and as much as comfortable for the operator. All e-cabinets are equipped with Siemens control unit. The comfortable operations works via touch-display. The vented extruders are running very economically, since time-consuming and energy-intensive pre-drying of the resin is not necessary. On top the extruders showing a high specific output. The water-cooled AC motor is running extremely quit.

Furthermore the extruder can be flexible equipped with different kind of screen changers as well as with a melt pump. The special melt pump control allows a quick and safe start-up. In this way it saves raw material. An extrusion T-die with rapid gap adjustment allows the quick adjustment of the die lip during production.

To adjust the die bolts of the flexlip quickly and safe, an optional bank measuring system permanently control the melt bank. It informs the operator via monitor which die bolt has to be adjusted. In this way the profil can be set in a very short time an safes raw material.

The calender is the quality hub of the line. For gap adjustment in the past, mechanism were built into the calenders which allowed a more or less precise setting of sheet thickness. From a simple adjusting screws and handwheel

adjustment right through to a motorized adjustment method, which adjusted the gap between two rolls, all kinds of mechanism were available. By these methods the sheet thickness was adjusted in the calender. The BREYER gap adjustment fast&easy does not involve any mechanical adjusting parts. A sophisticated system permits precise positioning, accurate to within five thousandths of a millimeter! Amazingly, this precision is achieved during production and at full load! The system allows gap settings to be set in the range of 0 to 100 mm with exactly the same precision. However, with film and sheet extrusion this is generally between 0.1 and 20 mm.

The set-points are entered via a color touch screen. The gap immediately changes then at a touch of a button. This technology of gap adjustment represents real progress in extrusion technology, as it gives the user much greater freedom and sets new standards in terms of the speed and precision of product thickness settings.

Free lateral accessibility and view into the roll gap is given by the arrangement of the rolls. Thus also e.g. dies with dekeling systems could be applied without colliding with the machine frame. Decoration films could easily be guided into the roll gap by means of a prepared unwinding device at the calender.

Changing embossing design:

For the fast change of the middle roll this roll is located in a drawer which ejects by push of a button within few seconds and could be exchanged by a roll with another embossing design. This function is very comfortable for the operator because with this the roll is freely accessible and could be lifted out by means of a crane.

Split bearings and fast couplings at the drive and cooling side allow a rapid release of the precise connections. In operating mode the roll is hydraulically locked and immediately ready for application. With this system the change of rolls could be finished within a few minutes.

Yet another feature which improves the efficiency of the complete extrusion line. BREYER will present this system at the exhibitions 2016 in a 3D video animation.

Chinaplas 2016: Stand E1F15

Breyer GmbH Maschinenfabrik
Bohlinger Str. 27, 78224 Singen, Germany
www.breyer-extr.com

UC 36 G2波纹管成型机

Chinaplas 2016: UC 36 G2 Corrugator

UC 36 G2 可生产直径从4.8到36mm的波纹管，具有长期的盈利能力

G2 是UNICOR最新一代波纹管成型机系列的名称，该系列用于制造技术型管材，最大直径可达135mm。UNICOR向全世界管材制造商提供的是全套系统无可匹敌的价格加上贯穿整个寿命期的极高的产品质量。

Long-term profitability in the production of corrugated pipes with 4.8 to 36 mm diameters

G2 is the name of the latest generation of UNICOR corrugators for manufacturing technical pipes with diameters up to 135 mm. The concept provides pipe manufacturers around the world with utmost quality at unbeatable prices across the entire life of the system.

高效率是UC 36 G2的承诺

UC 36 G2波纹管成型机从属于G2系列。这台设备的生产速度可以轻松达到60m/min。UC 36 采用80对模具夹，在生产PVC波纹管（电缆导管）时产量可以达到250kg/h。

产品质量和生产的便利性都达到了新水平

UNICOR完全重新设计了模具夹，从而进一步优化了管材的质量。现在，模具夹外侧的所有四个方向都被均匀地冷却，这就为模具夹提供了非常一致的热量分布。设备的调节同样成为了过去的事了，因为模具夹采用了机械定位方式。耗时间的调节方式从此被淘汰。

部件在德国制造

为保证波纹管成型机使用寿命更长并且维护工作量最小，UNICOR的产品都来自德国的供应商。伺服电机、传动机构、触摸显示器和更多其他部件都带有“德国制造”这一优秀品质的标志。

基本型UNICOR的UC 36 G2配备了50对模具夹。任何时候都可以将模具夹的数量增加到65对或者80对，用以增加生产能力。作为选项的真空装置同样能够提高各种各样用途的波纹管的产量。

关于UNICOR公司G2新型波纹管成型机的更多信息，敬请访问我们的网页。



UC 36 G2 (Image: Unicolor)

UC 36 G2 promises high efficiency: The UC 36 G2 Corrugator lives up to the G2 name. It can achieve production speeds of up to 60 m/min without breaking a sweat. The UC 36 with 80 pairs of mold blocks can reach production outputs for PVC corrugated pipes (cable conduit) of up to 250kg/h.

Achieving new levels of quality and convenience: UNICOR completely redesigned the mold blocks to further optimize the quality of the pipes. Now all four external sides of the mold blocks are uniformly cooled, providing a very uniform heat distribution in the mold blocks. Adjustments have also become a thing of the past thanks to a mechanical allocation solution for the mold blocks. Time-consuming adjustments are therefore completely eliminated.

Components made in Germany: To guarantee a long lifespan for the corrugators with minimal maintenance, UNICOR uses products from German suppliers. Servo motor, gearing, touch display and much more carry the "Made in Germany" seal of quality. The basic version of the UNICOR UC 36 G2 is equipped with 50 pairs of mold blocks. This can be expanded to 65 or 80 pairs at any time to increase production capacity. The optional vacuum can also enhance the production of corrugated pipes for a wide variety of applications. More information about the new G2 corrugators from UNICOR is available online at:

UNICOR GmbH
Industriestr. 56, 97437 Hassfurt, Germany
<http://qusac.unicor.com>, www.unicor.com

热备份-高实用性

Chinaplas 2016: Hot Backup – High Availability

在今年的中国国际橡塑展期间，摩丹-卡勒多尼塑料机械有限公司（太仓）将参展，摩丹和卡勒多尼双方现有技术的融合是关键METRO G物料加料器是重点，这种加料器现在可以完全连接到现有的卡勒多尼系统中。与此同时，现有的卡勒多尼物料加料器可以与新的摩丹系统结合起来。这样就提供了最大的灵活性，同时节省了费用。MINIBLEND V是一种新的同步计量单元同样也是融合了来自摩丹和卡勒多尼久经考验的可靠性技术，也将成为一个展示亮点。

During this year's Chinaplas motan-colortronic Plastics Machinery Co., Ltd (Taicang) will show that the combination of established technologies from both motan and colortronic is key. The focus will be the METRO G material loaders, which can now be fully integrated into existing colortronic systems. At the same time, existing colortronic material loaders can now be integrated into new motan systems. This offers maximum flexibility and saves costs. This highlight will be complemented with the new synchronous dosing unit MINIBLEND V, also a combination of time-tested and reliable engineering from colortronic and motan.

模块化构建原理可以优化物料的输送

摩丹的工程师将来自摩丹和卡勒多尼的最好技术融合到了METRO G中，并增添了一些新的特性。METRO G的模块化构建系统，让用户能够针对任何用途配置和创建最佳的物料加料器。可选择不同的物料入口尺寸，从而能够准确地与物料的产量和输送距离相匹配，并且现在还能根据不同的物料，选择不同的上料机容量。加料模块配备切线方向喂料口，工作时带有旋风分离效应可以继续用于具备不易分离特性的物料。客户还可以选择不同种类的真空阀。这样，采用特殊的隔膜真空阀，标准型的加料机可以升级为洁净室型。当后续加工过程对物料的质量有特殊高的要求时，选择除尘模块，可以使细的粉尘在输送过程的终端去除，从而保护了后续的加工过程。METRO G 物料加料机能够针对每一种特定的需求配置其适合的输送系统。

METRO G 物料加料机既可以采用经济适用的方案操作，也可以选择创新的控制系统，直至采用当代最新技术的



METRO G – 世界级两强结合的产品
METRO G – combines the best of two worlds

Modular building block principle enables optimal conveying

motan engineers have combined the best technology from motan and colortronic with the METRO G and extended it with new features. METRO G's modular building block system allows users to configure and create the optimal material loader for any application. Different sizes of material inlets which can be matched exactly to material throughputs and conveying distances, are now offered in addition to the various different material loader volumes. Modules with a tangential material inlet that operate with a cyclone effect are still available for materials with difficult separation behaviour. Customers can also choose between different vacuum valves. Thus, a standard unit can be upgraded to a clean room version with a special membrane vacuum valve. A dedusting module enables fine dust removal at the end of the conveying process in order to protect the



MINIBLEND V – 来自摩丹和卡勒多尼，
久经考验，实用可靠

*MINIBLEND V - time-tested and
reliable engineering from motan and
colortronic*

控制系统。首先，客户可以从三种不同的加料机控制器中进行挑选。随后，可挑选不同的集中输送控制系统：SELVAC 2是一种简单并且经受了时间考验的系统，提供了价格实惠的解决方案。METRONet S被看成是作为Soft PLC控制的标准输送系统的一部分。METRONet A 旗舰版的网络兼容工具用于复杂的输送系统。不管是Soft PLC或西门子 S7 PLC，采用WEBpanel 或者是分散的CAN总线节点均可适用。所有METRONet控制系统完全结合在CONTROLnet平台上，可以经由以太网络联络其它控制器。

同步计量单元可精确地改进配方

正如METRO G 单元一样，历经考验而可靠的卡勒多尼机械与高质量摩丹控制相融合，使得MINIBLEND V 有了新的特性。容积式计量和混合单元MINIBLEND V 设计目标是用于自由流动和常规流动的物料，不管是生产透明的还是不透明的部件，都有很理想的效果。MINIBLEND作为添加剂计量单元，适合于注射模塑和挤出方面的应用。

作为同步计量单元，MINIBLEND V 提供了极为出色的配比精度和可重复性，任何时间都可以追溯配方。添加剂垂直喂入，依靠重力通过单元里的Y型混合器然后进入加工设备的喂料口。这可防止物料堆积和架桥效应。主物料和添加剂只有在进入加工设备的喂料口之前才结合。仅仅在这一个位置才共同流动并进行均匀的混合，不会有物料的离析。

圆盘计量特殊的好处在于计量的一致性。与螺杆式计量单元相比较，在产量为0.5 到 5 kg/h 这一计量范围内，盘式计量的一致性要高出一倍。计量圆盘可以有三种不同的类型（可选择耐磨型），计量范围从0.05 到 10.5 kg/h（容积密度0.6 kg/h）。当对非常小的产量进行计量时，单个颗粒就可以对混合精度产生巨大的影响。为避免出现这一问题，所有计量圆盘都安装了切粒装置。这样就可以将粒子切割为小片，以便对最小的产量进行一致的计量。

无刷电机可以非常方便地拆卸，不需要工具，配备有完善的电机管理方式，提供免维护和可靠的连续运行。通过CAN总线技术实现控制通讯。电机单元可以采用摩丹容积式VOLU MC 或VOLU net MC进行控制操作。VOLU MC 控制是一种经济实惠的容积式浓缩母料计量方案。而现代化的

following processing step when there is a particularly high demand for material quality. METRO G material loaders allow the configuration of a suitable conveying system for every individual requirement.

The METRO G material loaders can be operated either with a cost effective solution or right up to an innovative state-of-the-art controls system. To begin with, the customer can choose between three different loader controls. Furthermore, different centralized conveying controls are available: SELVAC 2 is a simple and time-tested electronic system which provides an economically priced solution. The METRONet S is considered part of the standard conveying systems as a soft PLC conveying control. The ultimate, network-compatible tool for complex conveying systems is the METRONet A, either with soft PLC or Siemens S7 PLC, with WEBpanel, and decentral CAN-bus nodes. All METRONet controls are completely integrated into the CONTROLnet platform and can be networked with other controls via Ethernet.

Synchronous dosing units improve recipe accuracy

Just like with the METRO G, time-tested and reliable colortronic mechanics have been combined with high-quality motan controls and have been extended with additional features for the MINIBLEND V. The volumetric dosing and mixing unit MINIBLEND V was designed for free and normal flowing materials and is ideal for translucent and opaque parts. As an additive dosing unit, the MINIBLEND is suitable for injection moulding and extrusion applications.

As a synchronous dosing unit the MINIBLEND V offers excellent recipe accuracy and reproducibility, which can be traced at any time. The additive is fed vertically and is gravity fed into the inlet of the processing machine through the Y-shaped mixing throat of the unit. This prevents material buildup and bridging effects. The main material and the additive combine just before the inlet of the processing machine. Only at this point do they flow together to create a homogenous mixture – without material segregation.

The particular benefit of disc dosing is the dosing consistency. Compared to screw dosing units, the dosing consistency at throughputs of 0.5 to 5 kg/h can be doubled. The dosing discs are available in three different versions (optional wear resistant versions) from 0.05 to 10.5 kg/h (bulk density 0.6 kg/h). When dosing very small throughputs, a single granule can have a huge effect on the mixture accuracy. In order to solve this problem, all dosing discs are fitted with a cutting device. This makes it possible to cut granules into smaller pieces in order to consistently dose the smallest throughputs.

The brushless motor can be removed very easily and without tools, and is fitted with integrated motor management, which provides maintenance-free and reliable continuous operation. The controls communication occurs via CAN-bus technology. The unit can be operated with the volumetric motan controls

VOLUnet MC微处理器控制带有计时器功能，其特点为采用以太网控制传输协议的网络连接，操作简单而直观。

采用直观的彩色显示触摸屏，可以进行添加剂自动校准，操作毫无难度，可储存多达50个配方。

此外，摩丹-卡勒多尼中国公司还将展出塑料加工应用全范围的解决方案。摩丹-卡勒多尼中国团队期待所展示的设备，呈现出“热备份-高实用性”的出色品质。

2016年中国国际橡塑展：展位号 E1 L41

Motan-Colortronic Plastics Machinery (Taicang) Co., Ltd
18 Xingye South Road, Taicang Economic Development Area,
aicang, Jiangsu Province, China 215413
www.motan-colortronic.com

VOLU MC or VOLUnet MC. The VOLU MC controls are an economically priced solution for volumetric dosing of concentrates and master batches. The modern VOLUnet MC microprocessor controls with timer function feature simple and intuitive operation for an Ethernet TCP network connection. Using the intuitive touch screen colour display, an unproblematic operation of the additive auto calibration is possible and up to 50 recipes can be saved.

Moreover, motan-colortronic China will exhibit the whole range of solutions for plastics processing applications. The team of motan-colortronic China looks forward to showing the units and presenting "Hot backup – High availability".

Chinaplas 2016: Booth E1 L41

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IC-RDM 70K 热成型生产线生产饮料杯

Chinaplas 2016: Thermoforming Line for Drinking Cups with IC-RDM 70K

在中国国际橡塑展期间, ILLIG将展出具有当今水准的全自动饮料杯生产线, 全套生产线的设备都是由ILLIG一家公司所制造的。在这一套热成型系统中, 配有IC-RDM70K自动卷轴进料成型机, 与生产线的各部分完全实现了最佳的同步运作。

At Chinaplas ILLIG will present a fully automated, state-of-the-art production line for drinking cups, completely from one source. In this thermoforming system where the individual machines are optimally synchronized the IC-RDM 70K automatic roll-fed machine serves as forming machine.



IC-RDM 70K自动卷轴进料成型系统与新型的伺服驱动SZA73c堆叠机结合, 在上海国际橡塑展期间, 这条生产线将采用APET原料, 配14-模穴的ILLIG热成型模具, 进行饮料杯生产示范, 同时生产线包括下游设备, 卷边机, 将饮料杯进行卷边。

Thermoforming system with IC-RDM 70K automatic roll-fed machine combined with new servo driven SZA 73c stacking machine. At Chinaplas drinking cups will be manufactured out of APET using a 14-up mold. The complete production line also includes a downstream rimming machine which finally forms the lip roll of the drinking cups automatically (Picture: ILLIG)

饮料杯的口径为89.5毫米, 采用APET原料, 14-模穴的模具成型面积为 680 mm X 300 mm。ILLIG在生产线上采用ILLIG崭新的智能机器操作概念“IC - ILLIG Intelligent Control Concept 智能控制技术”, 能让用户酣畅淋漓地享受伺服驱动的机器带来的高生产稳定性, 高质量, 和经久的耐用性, 简化操作人员的操作程序。本生产线亦配有崭新的伺服驱动堆叠机SZA 73c, 该机器是ILLIG的最新机型, 能装有不同的卸件装备, 满足不同客户的堆叠需求。生产线还装有卷边机, 将刚产出的饮料杯进行卷边。

RDM-K系列的热成型机的特征是有效地, 稳定地生产出各种形状, 尺寸, 特别设计的杯子, 该机型已成为与挤出机联线生产, 大量生产优良品质饮料杯的热成型机典范。ILLIG IC智能控制技术让所有动作经由伺服马达驱动, 确保高速度, 高精准确度, 和高能源效率, 其驱动系统卓越的定位精度和可重复性支持运作之间的繁琐重叠, 节省生产时间, 在套

Drinking cups, diameter 89.5 mm, are manufactured on this machine with a 14-up mold out of APET, forming area 680 mm x 300 mm. Current machines are equipped with the IC operating concept (ILLIG Intelligent Control Concept), so the high productivity of these servo driven thermoformers can be utilized easily, reliably and fast to the full extent. The trade fair machine is combined with the new, also servo driven SZA 73c stacking machine. Thanks to its modular design the stacking machine can be equipped with different discharge options. Automatic feed to downstream machines can also be realized with the new SZA 73c, here to a rimming machine to automatically form the lip roll of the drinking cups.

Machines of the RDM-K series are specifically designed for the economic production of cups out of thermoplastic materials in different shapes and sizes. Frequently the machines are also

用如此新的技术后，热成型机可以以更短的模次时间制造出更多的成型品，保证高产量，稳定生产，减低生产成本。

崭新的 SZA 73c 堆叠系统总结了三种旧款堆叠系统的特点而成功研发: SE 73, SZA 73 和 SZS 73, 新的堆叠系统一大特点是能配有不同的卸件装备, 以模块式的设计, 堆叠机分为堆叠模块与卸件模块, 客户可简易地更换卸件装备, 如使用一般的卸件槽, 或卸件台, 或更有效率的横向输送带系统等。用于以往SE 73, SZA 73 和 SZS 73的堆叠模具亦适用于这款新的堆叠机, 安装旧模具需使用适配零件。经由伺服马达的驱动, 提升SZA 73c 的堆叠速度和稳定性, 更能配合 RDM-K 热成型机的高产量生产速度, 解决了以往因堆叠机的操作速度跟不上成型速度而限制了产量的问题, 在钢板式堆叠系统里, SZA 73c 的堆叠速度能最高达到每分钟40 模次, 在毛刷式堆叠系统里SZA 73c 的堆叠速度能最高达到每分钟33 模次。

2016中国国际橡塑展：展台号 E1 A45

Chinaplas 2016: Booth E1 A45

ILLIG Maschinenbau GmbH & Co. KG
Robert-Bosch-Straße 10, 74081 Heilbronn, Germany
www.illig.de

used as inline systems with pre-linked extruders, e.g. for large-volume production of drinking cups in quantities of millions. The ILLIG IC operating concept also supports the aspects relevant for large-volume production very effectively. Besides modules used for general process optimization, e.g. the self adaptive start-up (sas-up) during material or mold change, mainly IC modules are employed which ensure high productivity and reliability of a production line and at the same time help to minimize operation costs.

The new SZA 73c stacking machine is suitable for all tasks which so far were performed by three stacking systems: SE 73, SZA 73 and SZS 73. For this purpose the SZA 73c can be equipped variably with different discharge options. When the application changes the discharge system can be easily adjusted thanks to the modular design. The following variants are available: Infinitely per cage or counted per cage, counted in layers or counted in stacks. Existing molds can still be used. Due to the fact that now a servo drive is employed as well, sequencing of forming station and stacking unit can be optimally synchronized. Thermoforming systems where in the past the performance was limited by the stacking units can now achieve higher productivity with existing molds as well. The SZA 73c performance exceeds the performance of previous versions with speeds of up to 40 cycles per minute achieved with latch stacking and 33 cycles per minute with brush stacking.

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Chinaplas 2016,
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一站式的测量、控制、检测、分析以及筛选技术

Chinaplas 2016: Clear the Stage for Measuring, Control, Inspection, Analysis and Sorting Technology

2016国际橡塑展将于4月25-28日在上海盛大开展。无论是在挤出技术，还是塑料加工或质量控制方面，CHINAPLAS展会都云集了最先进的技术。SIKORA公司在此次展会上也将推出一系列创新型的技术：包括应用于提高产品品质、优化操作流程及节省生产成本方面的测量、控制、检测、分析及材料筛选技术。

In Shanghai great importance is attached to the subject "plastics" from April 25-28, 2016. Whether extrusion technology, methods of the plastics processing or quality assurance, the Chinaplas centers pioneering technologies. SIKORAs exhibition appearance promises one thing above all: innovations for the areas measuring, control, inspection, analysis and sorting technology for an increase in quality, process optimization and cost saving.

SIKORA公司最新推出的2种新型测控仪器将在CHINAPLAS期间首次展出。CENTERWAVE 6000，专为外径范围120mm - 1000mm的超大管材设计，运用突破性的毫米波技术为管材提供外径、壁厚和偏心度的测量与控制。即使是复杂的多层管材，也可精确测得所有数据。CENTERWAVE不受耦合材料影响，可精准地对管材壁进行多点高精度测量。因而，该系统具有很好的操作重复性，为大直径的塑料管材的品质保障提供了一个前瞻性的重要技术保障。

SIKORA展出的另一款新产品为PURITY CONCEPT系统。该系统采用了创新技术，模块化的设计使得它可以适用于对颗粒、片状产品及带状产品进行在线或离线检测及分析。

展出产品中的另一亮点是塑料颗粒洁净度检测及分离系统PURITY SCANNER。该系统的使用可确保无杂质进入所生产的产品中。X射线技术和双轴光学检测系统完美的结合，使得PURITY SCANNER能够检测出颗粒内部或表面存在的大于50 μ m的杂质，并能可靠剔除含有杂质的颗粒。

SIKORA为管材产品的品质保障提供了各种不同的测控仪器。从功能强大的高端测控仪到满足用户使用要求的基础型测控仪，SIKORA为用户提供了测偏仪X-RAY 6000，外径



X-RAY 6000保证管材挤出的品质

The X-RAY 6000 assures quality of hoses and tubes during extrusion

At the Chinaplas, two devices celebrate their premiere. SIKORA presents the CENTERWAVE 6000, which is based on groundbreaking millimeter wave technology for measuring the diameter, ovality and wall thickness of large plastic tubes from 120mm to 1,000mm during the extrusion. Also the layer thicknesses of multi-layer tubes are measured with highest precision. The measurements are taken at several points of the tube circumference without the need for any coupling media and independent from the material and temperature of the measuring object. Calibration procedures are not necessary.



测量仪LASER 6000系列和外径测量仪LASER 2000系列等产品。通过对被测产品的内外径、多达三层的壁厚、偏心及椭圆度的精确测量，这些测量系统为制造商在挤出生产过程中生产出具有最佳品质的产品提供了可靠保障，并且同时能够兼顾到成本节省，起到提高效益的作用。在SIKORA的展台上，参观者还可以了解到具有可靠的双接收器检测技术的表面缺陷检测仪LUMP 2000系列产品。

Thus, the system allows for reproducibility of the processes and represents a key technology for future-oriented quality assurance at the production of large plastic tubes.

In addition, the SIKORA PURITY CONCEPT Systems make their first appearance at the Chinaplas. Thanks to the technological innovation the modular designed devices are available for on- and offline inspection and analysis of pellets, flakes and tapes/films. The systems are based on X-ray, Infrared or optical technologies and are suitable for any application.

Another highlight is the PURITY SCANNER for online inspection and sorting of plastic material. The system assures that only the purest material gets into the next production process. It combines X-ray technology with an optical measuring system and therefore allows the detection of contamination from 50 µm on the surface and inside of the plastic pellet. Contaminated pellets are automatically sorted out.

For quality assurance in the hose and tube industry, SIKORA offers a broad product range of devices for classic and high-end diameter measurement with the LASER Series 2000 and LASER Series 6000 as well as X-ray measuring systems of the X-RAY 6000. With their precise measurement of the inner and outer diameter, the wall thickness of up to 3 layers, the eccentricity as well as the ovality of the products, the systems enable manufacturers to produce highest quality while saving costs and increasing profitability during the extrusion. Visitors will also get to know the equally precise as reliable LUMP 2000 devices with double sensor technology for lump detection on the product surface.

Chinaplas 2016: Booth E1 D41

2016年中国国际橡塑展：展位号 E1 D41

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

继完成两次收购后，马格 (Maag) 在上海国际橡塑展上展出大幅扩充的产品组合

Chinaplas 2016: Greatly Expanded Product Portfolio presented

自去年秋季收购 Gala Industries 和 Reduction Engineering Scheer 两家公司后，马格在上海国际橡塑展上首次展出扩充后的产品组合。完成两次收购后，马格不仅赢得了区位优势，还进一步扩充了产品线。总部位于瑞士的马格借此巩固了其作为全球聚合物和混炼工业机械解决方案供应商的地位。

Following the integration of the two companies, Gala Industries and Reduction Engineering Scheer, in fall last year, Maag will be exhibiting the company's expanded product portfolio for the first time at the Chinaplas in Shanghai. Through the two integrations, aag has not only gained a broader geographic presence, but has also further expanded the product portfolio.

在国际橡塑展的展台上，全新切粒机 MAP6 是马格和 Gala 首款共同呈现的产品。该款切粒机在方便用户的结构设计方面极其出众：进刀通过手轮实现，这样便使操作人员能够直观地监控刀具磨损情况。新的聚合物换向阀在不到一秒的时间里实现起动和生产位置切换，确保稳定的起动和停车过程。选用 MAP6 切粒机的客户将获益于作为水下切粒机创导者的 Gala 多年来积累的丰富经验。全球有无数 Gala 制造的切粒机应用在各种不同的领域。

为了在水下切粒后使颗粒干燥，往往要采用离心干燥机。对此，展台上还展示了离心干燥机 CENTRO 150，设计通过量高达 22,000 kg/h。CENTRO 极其容易清洗，同时具有超强的能效表现。与其它干燥性能相似的干燥机相比，CENTRO 所节省的能源高达 40%。不仅是转子，转子筛也极易接近，这样便使清洁和更换更加容易。展台上，CENTRO 与过程水处理系统 PWS25 一同呈现。CENTRO 在德国设计，然后在中国现场制造，以提供优越的性价比。

反复经过实践证明的拉条切粒机 BAOLI 也以全新 200 S 款亮相。在中国已经成功拥有 300 多个示范客户的 BAOLI 适用于生产高品质圆柱形颗粒。先进的切削刀具确保高处理量，例如 PBT 或 PET 混合物的处理量高达 3,000 kg/h，同时还使得在运行成本较低的情况下，拉条切粒机的使用寿命更长。BAOLI 有三种规格可选，工作宽度分别为 100 mm, 200 mm 和 300 mm。BAOLI 的设计修改以与 BAOLI 客户紧密进行的经验交流为基础，在操作性和性价比方面都实现了优化。

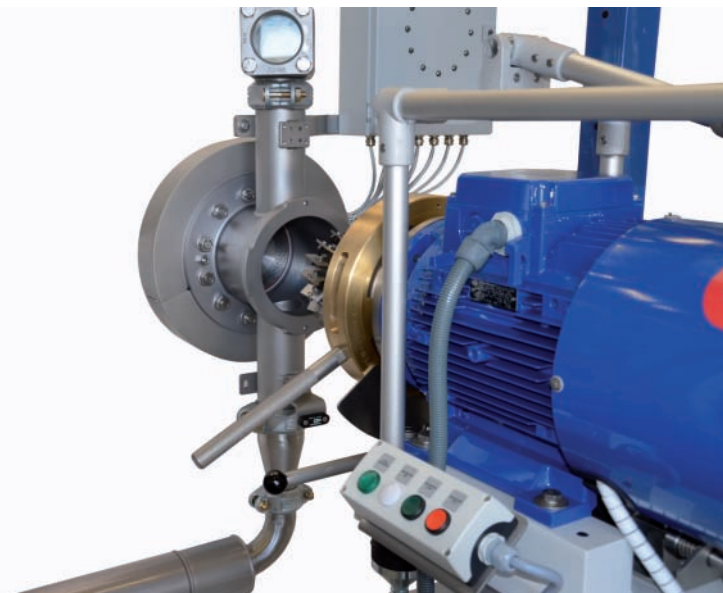
马格粉磨机 25AC 专供实验室使用，用于研发过程中试样的加工。粉磨机还可以冷却运行，适用于各种不同的领域：塑料、橡胶、胶粘剂、医药和食品。它的紧凑设计更节省了实验室的空间。除此之外，25AC 的操作和保养也十分简易。

全新第 6 代 extrex® 挤出泵是展台的一大亮点。与此前几代相比，新产品性能参数更佳，且尺寸更小。内部回流明显减少，从而使容积效率明显提高。与类似结构尺寸的产品相比，这款齿轮泵的通过量要高出 50% 之多。全新第 6 代 extrex® 也可以较低的转速运行，从而达到相同的通过量。这不仅使温度更低，泵的使用寿命更长，还使能耗降低了 10% 甚至更多。

2016中国国际橡塑展 展台号 E1 J21

Maags MAP6

Maags Manually Adjustable Pelletizer (MAP)



With the new Pelletizer MAP6, a product will be on show for the first time on the fair stand at the Chinaplas that Maag and Gala are presenting together. The pelletizer is characterized by a user-friendly design: The knives are adjusted by means of a handwheel so that the operator can monitor the knife wear visually. The new valve that diverts the polymer stream between starting and production position switches in less than one second and ensures stable start-up and shutdown processes. With the Pelletizer MAP6, customers benefit from Gala's many years of experience as pioneer in the field of underwater pelletization. A large number of the manufacturer's pelletizers are in operation in a very wide range of applications worldwide.

Centrifugal dryers are frequently used to dry the pellets after underwater pelletization. From this segment, the CENTRO 150 centrifugal dryer that is designed for a throughput of up to 22,000 kg/h will be on show. The CENTRO is particularly easy to clean and is characterized also by its high energy efficiency. By comparison with other dryers with similar drying capacity, it consumes up to 40% less energy. Both the rotor and the rotor screens are very easily accessible and are therefore easy to clean or replace. On the fair stand the CENTRO will be on show together with the PWS25 Process Water Treatment System. The CENTRO was designed in Germany, and thanks to the local production in China can be offered with a good price/performance ratio.

The BAOLI strand pelletizer will be presented in a new version, the 200 S. The BAOLI that is already successfully in operation with over 300 reference customers is suitable for the production of high-quality cylindrical pellets. Modern cutting tools guarantee high throughput rates – for example, up to 3,000 kg/h for PBT or PET compounds – and ensure a long availability of the strand pelletizer combined with low operating costs. The BAOLI is available in the three working widths 100 mm, 200 mm and 300 mm. The modifications in the design of BAOLI derive from a very close exchange of experience with BAOLI customers and offer improved handling and an optimized cost/benefit ratio.

Maag's pulverizer 25AC is designed for laboratory use in the preparation of samples in research & development. As an option, the pulverizer can also be operated chilled and is suitable for a wide range of different branches: Plastics, rubber, adhesives, pharmaceuticals and foodstuffs. Thanks to its compact design, it requires a minimum of space in the laboratory. The 25AC is also characterized by its ease of operation and maintenance.

One highlight of the fair stand will be the new Generation 6 of the extrex® extrusion pumps. Compared with the previous generation, they offer higher performance data despite their smaller dimensions. The internal return flow has been significantly reduced, leading to a considerably higher volumetric efficiency. The gear pumps thus achieve an up to 50% higher throughput with comparable pump size. Alternatively a new extrex® Generation 6 can be operated at lower speeds while achieving the same throughput. This leads not only to lower temperatures and a longer service life of the pump, but also reduces the energy consumption by 10% or more.

Chinaplas 2016: Booth E1 J21

Maag Pump Systems AG
Aspstr. 12, 8154 Oberglatt, Switzerland
www.maag.com

“世界之旅”将在2016年中国国际橡塑展期间启航

'WORLD TOUR' will be opened at Chinaplas 2016

下个月，Maguire有限公司将按计划发运第五万套 Maguire® 称重混合机，并将在2016年中国国际橡塑展（展台号E7K21）期间启动长达一年的庆祝活动，以纪念塑料行业的这一里程碑。

在Maguire的展台上，将展出一台独特的镀铜版MicroBlender™混合机，这是公司生产的非常流行的系列混合机中的最小型号。接下来的几个月，这台混合机将作为纪念品，在公司遍布世界各地的代理商及其客户所在地的庆祝活动中，作为销售里程碑的标志进行展示。

“Maguire混料机是世界使用最广泛的称重混料机，被用于每一种场合，包括模塑、挤出和混料加工，市场范围从汽车行业到电线电缆。” Maguire亚洲私人有限公司的董事总经理Hubert Nerlich说道，“1989年，Maguire的董事长和首席设计师Steve Maguire开发出第一台称重式批次混料机，彻底改变了原料经过计量添加到塑料加工机械的方式。”

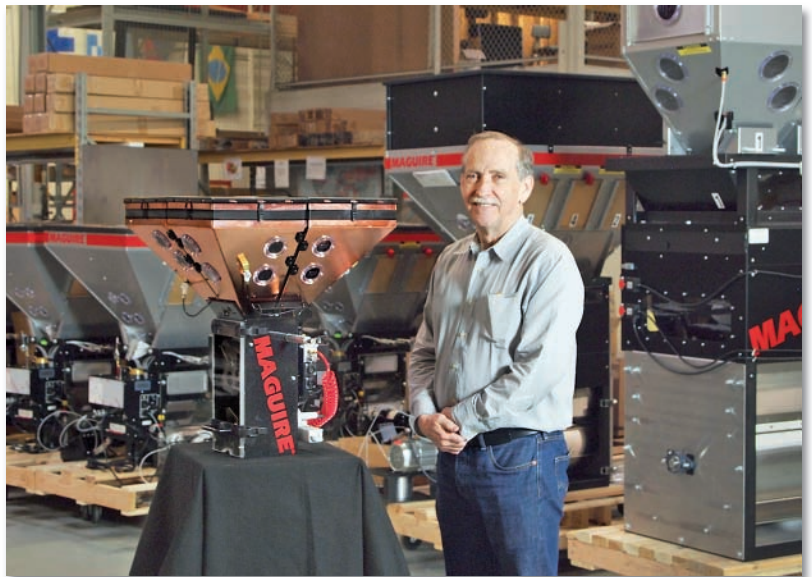
称重式批次混料机按照目标比例，将每一批次的原料依次分配到称重室，这样，通过监视每一个批次重量的增加，混料机控制下一批次作出调整，以保持精度和控制物料消耗量。Maguire销售有限公司副总裁Frank Kavanagh指出：系统的批次计量精度保持在 $\pm 0.1\%$ 以内，“要想在原料混合中对混合物的成分进行精密控制，Maguire公司的称重式批次混料机是第一台价格实惠而且易于操作的系统。这一创新对整个行业来说，节省了大量的物料成本，并且提高了产品的质量。混料机与控制系统以及Maguire公司所开发的软件结合起来，同样具备高级功能，方便地与各种处理器实现存取连接，包括每一个批次的可追溯性和文档化，挤出产量控制，以及工厂自动化。”

这种组合易于使用，功能强大，在Maguire公司引入的新的标识上，“智慧而朴素”这个口号是集体的体现。同样，在整个庆典年里，新的图标“50K”（意为：五万套）将出现在Maguire公司的媒介资料上。

Maguire Products, Inc. is on course to ship the 50,000th Maguire® gravimetric blender in coming months and will inaugurate a year-long celebration of this plastics-industry milestone at *Chinaplas 2016 (Booth E7K21)*.

On exhibit at the Maguire booth will be a unique copper-plated version of the company's widely used MicroBlender™, the smallest model in the Maguire blender range. In following months, this celebratory blender will be on display at local events around the world as the company's agents and their customers mark the milestone sale.

“The Maguire blender is the world's most widely used gravimetric blender, employed in every type of molding, extrusion, and compounding process and in markets ranging from automotive to wire and cable,” said Hubert Nerlich, managing director of Maguire Products Asia Pte Ltd. “When Maguire president and



Steve Maguire 及庆典纪念品 MicroBlender™
Steve Maguire with celebratory MicroBlender™

chief designer Steve Maguire developed the first gravimetric batch blender in 1989, he revolutionized the way raw materials are metered into the plastics processing machine.”

A gravimetric batch blender sequentially dispenses each batch ingredient in its target proportion into a weigh chamber; then, by monitoring each gain in weight of a batch, the blender control makes adjustments to subsequent batches to maintain accuracy and control raw material consumption. The Maguire system holds batch accuracy to within $\pm 0.1\%$, according to Frank Kavanagh, vice president of sales for Maguire Products, Inc.

“The Maguire gravimetric batch blender was the first affordable and easy to operate system for precisely controlling the composition of a raw material blend,” said Frank Kavanagh. “Throughout the industry it has generated substantial savings in material costs and increases in product quality. In combination with control systems and software developed by Maguire, the blender has also made advanced capabilities readily accessible to a wide range of processors, including lot-to-lot accountability and documentation, extrusion yield control, and factory automation.”

This combination of ease of use and powerful capabilities is reflected in a new logo tagline that Maguire is introducing: “Intelligent Simplicity.” Also new is a “50K” icon that will appear on Maguire communications throughout this celebratory year.

Maguire Products, Inc.,
Maguire Asia (China),
www.maguire.com, mpa@maguirechina.com

"超越分切和收卷"

Chinaplas 2016: "Beyond slitting and winding"

康甫作为一家领先的分切和收卷机制造商所具有的广泛知识和经验满足了客户对设备生产力和效率，以及产品的质量的要求。康甫在2016年中国国际橡塑展展现的主题是"超越分切和收卷"。

- 加工电池隔膜的新技术
- 应用于柔性薄膜, 软包装膜和光学级薄膜的分切和收卷技术
- 康甫终生服务: 新亮点: 康甫学院
- 未来的生产解决方案以至智能工厂

The comprehensive knowledge of the user about the productivity and efficiency of the machines and the quality of the finished products are challenges which have been met by KAMPF as a leading manufacturer of slitting and winding machines. KAMPF will present at Chinaplas 2016 topics "beyond slitting and winding":

- *New technologies for processing of battery films*
- *Slitting and winding technology for flexible films, flexible packaging and optical films*
- *New KAMPF life cycle service benefits: Highlight here: The KAMPF Academy*
- *Solutions for the future production as regards smart factory*

加工电池隔膜的新技术

康甫研发出面向未来应用于电池材料的解决方案, 电池隔膜对分切和收卷具有特殊的要求。康甫已经与薄膜生产厂、研究院和工厂设计专家进行了多年的深入交流。这种交流的网络让康甫的工程师得以深入地研究这些材料的特性。研究的成果奠定了全新客户订制机型的基础概念, 并且已经以此为欧洲, 中国和韩国的著名客户提供了成功的设备和稳定的生产。应用于电池领域的完善的产品组合包括:

- 不间断收卷机薄膜宽度可达4200mm并且可在线分切出多个成品卷
- 初次分切机薄膜宽度可达4200mm, 最小分切宽度至150mm, 可分切多个成品卷
- 二次分切机薄膜宽度可达2100mm, 最小分切宽度至20mm, 可分切多个成品卷
- 分切机也可应用于分切铝箔或阳极和阴极的铜箔



康甫11米分切机, Universal型

KAMPF 11 m slitter, type Universal

New technologies for processing battery films

KAMPF develops future-oriented solutions for materials used in battery applications. Slitting and winding of battery separator films has special requirements. KAMPF has already been in an intensive exchange with film producers, institutes and plant designers for several years. This network allows the KAMPF engineers a deep insight into the characteristics of these materials. These findings form the basis for new customized machine concepts which are already producing successfully at renowned customers in Europe, China and Korea. The comprehensive KAMPF portfolio for battery applications includes:

- Non-stop winder up to 4,200 mm film width and multiple finished rolls
- Primary slitter up to 4,200 mm film width and multiple finished rolls down to 150 mm width
- Secondary slitter up to 2,100 m film width and multiple finished rolls down to 20 mm width
- Slitter for aluminium or copper-based foils for anode and cathode materials

Slitting and winding technology for flexible films, flexible packaging and optical films

The KAMPF team will introduce the entire product range including winders, primary slitters and secondary slitters as well as automation systems – and last but not least - related lifecycle

应用于柔性薄膜、软包装膜和光学级薄膜的分切和收卷技术

康甫的团队将介绍整个产品系列包括收卷机，初次分切机和二次分切机以及自动化系统——还有同样重要的——终生维护保养服务例如定制服务组合，机器翻新改造和人员培训。

今年的主题是康甫 Universal型大分切机系列和新的 Imperial型不间断收卷机。这两种机器设计成工作宽达至11米，可以满足现在和将来高效率生产线的要求。

康甫终生服务的: 新亮点: 康甫学院

康甫公司的终生维护保养服务，在机器的整个生命周期内陪伴客户，为客户提供技术诀窍和最新的服务产品，康甫学院提供不同重点的综合性研讨课程。除了在培训日历上列出研讨班开班的日期之外，康甫团队也会按个别客户的要求编写所定制的培训课程，客户也可以和康甫学院的团队协商决定培训的内容，地点和日期。

未来生产的解决方案以至智能工厂

完善的分切和收卷机产品线，例如应用于薄膜生产的不间断收卷机，应用于初次和二次分切薄膜的分切机，使康甫在这个高要求的技术领域里成为领先者。康甫还可以按照客户的要求以为设备增加额外的处理系统，如检测系统和一些专用的组件。凭借着完整的产品线和长期的丰富经验，康甫得以提供超越您分切收卷要求的工艺和技术。随着康甫的“Converting 4.0”项目的发展，康甫进入了电脑自动对话和为未来的跨流程的解决方案的时代。

2016年中国国际橡塑展：拜雷尔展台 E1J61

康甫电池隔膜分切机

KAMPF Battery film slitter



康甫Imperial型不间断收卷机

KAMPF Imperial non-stop winder

services such as customized service packages, retrofit and training.

Main topics this year are the KAMPF Universal slitter series as well as the new Imperial non-stop winder. Both machines are designed to fulfill today's and future demands of high efficient production lines with a working width of up to 11m.

KAMPF life cycle service benefits: Highlight here: the KAMPF Academy

KAMPF Life Cycle Service accompanies its customers over the entire lifecycle of their machines with know-how and up-to-date service products. The KAMPF Academy offers a comprehensive seminar programme with different focal points. Beside the seminars shown in a training calendar, the KAMPF team will compose tailored training programmes for individual needs on request. Customers can determine content, location and date in consultation with KAMPF Academy Team.

Solutions for the future production as regards smart factory

The wide product portfolio of slitting and winding machines such as non-stop winders for the film manufacturing process, slitting machines for primary film and for the converting makes KAMPF the world leader for this demanding technology. Additional handling systems as well as inspection systems and dedicated components can be integrated in the concepts on request. Due to this entire portfolio and long term experiences, KAMPF is able to look on processes beyond slitting and winding. With the project „Converting 4.0“, KAMPF enters into a dialog on computerisation and cross-process solutions for future production.

Chinaplas 2016: Booth E1 G51

Kampf
Muehlener Str. 36-42,
51674 Wiehl, Germany
www.kampf.de

用可靠的方法按需要生产LFT组合料

Chinaplas 2016: Tailored LFT Compounds the Reliable Way

在今年的中国国际橡塑展上，ProTec高分子工艺有限公司将集中展示通过拉挤方法生产LFT（长纤维增强热塑性塑料）组合料的技术以及新一代ProTec翻转式反应器。固态后缩聚（SSP）反应器可以完美地应用于改善可流动塑料原料的性能。例如：经过造粒的聚酯（PET，PBT，PEN等）以及尼龙（如PA6和PA6.6）的后缩聚。这些改性后的物料可以加工成产品，例如瓶子、纤维、用于光导及轮胎帘子线和空气囊的工业用丝、复合纤维材料、过滤用织物或者无纺布。当进行注射模塑加工时，采用带有沿着粒子长度方向的纤维增强的LFT混合料，将能够使生产出的部件既具备高强度，又有重量轻的特点，并且部件的表面质量非常好。长度约12mm的LFT的纤维，对于进一步加工来说是理想的。

ProTec Polymer Processing's focus at this year's Chinaplas will be on the production of long-fibre-reinforced thermoplastics (LFT) by pultrusion and on the new generation of ProTec tumble reactors. These SSP (solid-state post-condensation) reactors are ideally suited to improving the properties of flowable plastics. Examples include the post-condensation of pelletised polyesters (PET, PBT, PEN etc.) and nylons such as PA6 and PA6.6. These "upgraded" materials are then for example converted into bottles, fibres and industrial yarns which are required for optical waveguides, tyre cords and for airbags, fibre-composite materials, filter fabrics or nonwovens. When injection moulded, LFT compounds with fibre reinforcement along the length of the pellets result in components which combine high strength and light weight with very good surface quality. LFTs with a fibre length of around 12 mm are ideal for further processing.



ProTec的LFT拉挤技术生产高等级长纤维增强粒子，作为基体的高分子材料范围广泛，可使用各种各样的增强纤维。这一技术同样能够可靠而灵活地调节基体材料的性能。

ProTec's LFT pultrusion technology produces high grade long-fibre-reinforced pellets with a wide range of polymer matrices and huge variety of reinforcing fibres. This technology also permits reliable and flexible adjustment of matrix properties (Photo: ProTec Polymer Processing)

Flexible, versatile LFT technology

ProTec's LFT technology is suitable for producing a wide range of materials with differing levels of fibre reinforcement and many different polymer matrix materials which may also be directly compounded during LFT manufacture. Even the difficult pairing of carbon fibres with PP can be reliably processed. ProTec's headquarters in Bensheim (Germany) has a versatile cutting edge pultrusion line for application-specific customer testing and basic process and materials development.

A keystone of the line is a high-performance compounding extruder equipped with a SOMOS® Gramix S gravimetric dosing system capable of accurately dosing and mixing up to nine

灵活而万能的LFT技术

ProTec的LFT技术适合于生产种类繁多的物料，可以选择各不相同的增强纤维以及各不相同的高分子基质物料，其中许多都可以在LFT制造过程中直接混合。即使难于处理的配对物料如碳纤维和PP也可以可靠地进行加工。ProTec的总部位于德国Bensheim，安装有一条技术领先的多功能拉挤生产线，能够满足特定客户的应用测试要求，进行基本的加工和原料开发。

生产线的主要配置，是装备了SOMOS® Gramix S 称重计量系统的高性能混合挤出机，计量系统可以精确称量和混合多达九种组份的原料。因此，高分子基体的独特配方可以用非常灵活的方式在工艺过程中直接生产出来，可变化的空间非常大。回收再生的物料和附加的填充料也同样包括在物料的配方中。

通过拉挤方法生产LFT组合料，包括将纤维带连续地拉伸并通过高分子材料融体，这样单独的纤维浸渍了高分子材料基材，一旦合成的纤维/高分子材料带冷却下来，就对其进行造粒。为了完成浸渍加工，第一道工序就是将纤维从特别设计的筒子架上引导向浸渍模头。在模头后方是下游设备，热的纤维/高分子材料带最终由压型系统定型，例如成为圆形条状或扁平带状。在采用适合于高分子材料的冷却单元将条带冷却后，还要通过拉伸机，拉伸机控制着条带连续地通过整条生产线。

ProTec提供一站式服务，可以按照特殊要求进行专门订制，设计和提供全套交钥匙生产线，包括物料开发和测试，以及在客户的生产现场调试运行和交付使用。生产线可以生产出纤维含量重量百分比高达60%的产品，产量高达1,200 kg/h。任何传统的热塑性塑料或甚至生物高分子材料如PLA（聚乳酸）都可以作为基体使用，玻璃纤维、钢纤维或碳纤维都可以作为增强纤维使用。

LFT生产线及所有模块的操作都通过中央生产线控制器完成。可设定不同的参数，包括生产线速度、挤出机的产量和粒子切粒长度。此外，根据不同的用途，上下游设备的参数也可以结合到控制系统中来。这些上下游设备包括进料组份的干燥、输送、调配和混合单元。

2016中国国际橡塑展：E1展馆，E43展台

components. As a result, a very wide range of individual formulations of the polymer matrix can be produced very flexibly directly in the process. Recycled material and additional fillers may likewise be included in the material formulation.

Producing LFT compounds by pultrusion involves continuously drawing fibre strands through a polymer melt, so impregnating the individual fibres with the polymer matrix and, once the resultant fibre/polymer strands have cooled, pelletising them. In order to be impregnated, in the first process step, the fibre strands are guided from the creels by a specially designed guide into the impregnation die. Downstream from the die, the hot fibre/polymer strands are then finally shaped, for example into round strands or flat tapes, in a profiling system. After cooling in a cooling unit adapted to the polymer, they additionally pass through a puller which controls the continuous passage of the strands through the line.

ProTec is a one-stop shop capable of designing and supplying complete turn-key lines tailored to specific requirements from materials development to testing and commissioning on the customer's premises. The lines are capable of handling fibre contents of up to 60 wt.% and throughputs of up to 1,200 kg/h. Any conventional thermoplastics or even biopolymers such as PLA (polylactic acid) can be used as the matrix, while glass, steel or carbon fibres can be used as the reinforcing fibres.

The LFT line and all its modules are operated from the central line controller. Variable parameters include line speed, extruder throughput and pellet chopping length. Additional functions, located upstream or downstream depending on application, may also be incorporated into the control system. These include drying, conveying, dispensing and mixing of the feed components.

Chinaplas 2016: Booth E1, E43

ProTec Polymer Processing GmbH

Bensheim Headquarters, Stubenwald-Allee 9, 64625 Bensheim, Germany
www.sp-protec.com

准备就绪，运往中国

Chinaplas 2016: Ready for Shipment to China

诺信公司 (Nordson) 将向位于中国江苏省的超大规模PET树脂工厂江阴澄高包装材料有限公司提供十六套商标为BKG® CrystallCut® 的已获得专利的造粒系统，该工厂计划本年度投产。这一大型项目表明亚洲市场对造粒系统的关注在加强，在2016年中国国际橡塑展诺信的展台上，这一点将被显而易见地得以呈现。(展台号 W2-J01)

与标准的PET聚合系统比起来，诺信的CrystallCut 工艺提供了实实在在的能源节省效果，这是由于将PET聚合系统熔融聚合物的热能应用到了随后的结晶化过程中去。在江阴

Nordson Corporation will supply sixteen of its process-patented BKG® brand CrystallCut® pelletizing systems for a mega-scale PET resin plant scheduled for startup this year by Jiangyin Chenggold Packaging Materials Co., Ltd. in Jiangsu Province, China. The big project reflects the intensified focus on pelletizing systems for the Asian marketplace that will be evident in Nordson's exhibit at **Chinaplas 2016 (Stand W2-J01)**.

Nordson's CrystallCut process provides substantial energy savings in comparison with standard PET polymerization systems



将要发运到中国的16套CrystallCut®系统已准备就绪
16 CrystallCut® Systems Ready for Shipment to China

澄高工厂的装置里，CrystallCut系统将生产的PET粒子输送到Eco-Sphere™ 固态缩聚（SSP）系统，这套SSP系统由位于瑞士Oberbüren的Polymetrix AG提供，合同规定使用CrystallCut单元。美国北卡罗来纳州威明顿市的Chemtex集团是这家制瓶级PET树脂工厂的总承包人。

CrystallCut系统集合了水下造粒、干燥、滤水和在180℃高温下直接结晶化的功能，结晶度高达40%。在这家新的PET工厂里，系统将为结晶化过程提供粒子温度调节，并将粒子输送到SSP设备，SSP设备将由Polymetrix提供。

诺信BKG同时还将提供16套冷凝系统，用于从工艺过程热空气中回收水。这将减少水的补充，预期将可以额外节省大量的用水。

Ralf Simon是诺信BKG的董事总经理，他指出：“在江阴澄高将要建成的新的超大规模工厂里，我们可以预料：由CrystallCut工艺带来的能源节省效果，与传统的PET聚合过程相比，将真正是令人叹服的。作为Polymetrix所设计的最新型系统的一部分，我们BKG的设备将帮助将新工厂的效率提升到史无前例的水平。”

by using the thermal energy of the molten polymer in PET pelletizing for subsequent crystallization. In the Jiangyin Chengold facility, the CrystallCut systems will deliver PET pellets to Eco-Sphere™ solid state polycondensation (SSP) systems built by Polymetrix AG, Oberbüren, Switzerland, which contracted for the use of the CrystallCut units. Chemtex Group, Wilmington, NC, U.S.A. is the prime contractor for the entire bottle-grade PET resin

plant.

The CrystallCut system integrates underwater pelletizing, drying, water filtration and direct crystallizing at temperatures of up to 180 °C and crystallinity up to 40%. In the new PET plant, the system will provide a pellet temperature adjusted to the process for crystallization and delivery to the SSP equipment, which will be supplied by Polymetrix.

Nordson BKG will also supply sixteen condensation systems for the water recovered from the hot air in the process, These are expected to provide substantial additional savings through reduction in water filling.

“In the new mega-scale plant to be operated by Jiangyin Chengold, we anticipate that the energy savings provided by the CrystallCut process in comparison with conventional PET polymerization will be truly dramatic,” said Ralf Simon, Nordson BKG managing director. “As part of the streamlined system engineered by Polymetrix, our BKG equipment will help the new plant to achieve unprecedented levels of efficiency.”

Nordson Polymer Processing Systems
www.nordson.com

资源节约型最大化效益的高性能挤出设备

Chinaplas 2016: Save Resources & Maximize Quality with Efficient, High-Performance Extrusion Equipment

佛山巴顿菲尔辛辛那提塑料设备有限公司（巴顿菲尔辛辛那提中国）自1996年成立以来，每年都参加国际橡塑展Chinaplas。藉此第20次参展之际，巴顿菲尔辛辛那提中国将推出其标准PO管材挤出生产线LeanEX，和来自twinEX系列的双螺杆挤出机，以及用于热成型片材生产的压光辊。这些为管材、型材和包装挤出而提供的解决方案将于展馆W1,展台Q21上展出。

Extrusion machinery manufacturer battenfeld-cincinnati (Foshan) Extrusion Systems Ltd (battenfeld-cincinnati China) was founded in 1996 and has been exhibiting at Chinaplas every year since then. At its 20th Chinaplas, battenfeld-cincinnati China will feature its LeanEX PO pipe extrusion lines as well as twin screw extruders from the twinEX series and a range of extruders and roll stacks for thermoforming sheet production. All these solutions for pipe, profile and packaging will be showcased in Hall W1, Booth Q21.



LeanEX高速聚烯烃管
材挤出生产线为标准管材挤出生产
提供全套交钥匙生产线。

The LeanEX high-speed polyolefin pipe extrusion line offers complete, turnkey extrusion systems for standard applications

(All pictures: battenfeld-cincinnati)

参展的亮点中LeanEX系列挤出机，是专为标准PO管材挤出而设计的，整线最大生产管径高达630mm。展台上将展出该系列的三款挤出机中挤出量最大的LeanEX 90挤出机。高效、优质的管材质量和成本效益，使得该机型自2009年推出市场后一直深受客户青睐。

LeanEX单螺杆挤出机由巴顿菲尔辛辛那提中国生产，采用欧洲技术，精选的欧洲部件和国产螺杆、机筒、电机。该机型有60、75和90mm三种规格，高性能、低能耗，产量范围为350–800公斤/小时（生产HDPE管材）和280–600公斤/小时（生产PP-R管材）。

展台上另一台展出的设备是twinEX 93-28D双螺杆挤出机，可用于管材、型材以及PVC片材挤出生产。近年来，塑料型材市场向着环保、节能的方向发展，对高效节能产品需求也日益上升。作为一家在型材专用挤出领域有着40多年丰富经验的设备制造企业，巴顿菲尔辛辛那提提供最节约成本最节省原料的双螺杆挤出机。尤其在当下原材料不断上涨的情况下，这是非常必要的。根据应用不同，挤出机产量范围从115公斤/小时到2,500公斤/小时。

热成型片材挤出的最佳解决方案

巴顿菲尔辛辛那提中国也提供热成型片材挤出设备以适应市场需求。届时将于展台上展出多重触控压光辊大型宣传海报。这是为追求高速和高品质片材生产的厂家而开发的一个优化的解决方案。得益于这项绝对创新的概念，在加工各种塑料材料过程中，如聚苯乙烯、聚酯或聚丙烯，以及乙烯-醋酸乙烯共聚物或覆膜制品时均可实现片材的高透明度、极佳平整度以及极均匀的厚度。

巴顿菲尔辛辛那提高速单螺杆挤出机，通过增加一个兼顾质量和数量高端应用的解决方案，填补了多重触控压光机的不足。



巴顿菲尔辛辛那提多重触控压光辊引领优质高产的片材生产。

The Multi-Touch roll stack from battenfeld-cincinnati yields excellent thermoforming sheet quality even at high line speeds



专为PVC型材、管材及片材的最高挤出量而设计的twinEX系列平行双螺杆挤出机。

The twinEX series of parallel twin screw extruders is designed for supreme productivity in PVC profile, pipe and sheet extrusion

The main feature of the exhibition is the LeanEX series, which was designed for standard PO pipe extrusion. Complete lines are available for diameters up to 630 mm. At the booth, the largest of three extruders, the LeanEX 90 will be presented. LeanEX has attracted a lot of attention from domestic pipe manufacturers since its launch in May 2009, due to its high efficiency, excellent pipe quality and cost-effectiveness.

LeanEX single screw extruders are built at battenfeld-cincinnati China using European technology, selected European components and locally sourced screws, barrels, motors. The three available extruder sizes 60, 75 and 90 mm provide high performance with low energy consumption. Outputs range from 350 to 800 kg/h for HDPE and from 280 to 600 kg/h for PP-R.

The second extruder exhibited at the booth is the twin screw extruder twinEX 93-28D, which was recently introduced in China. The machine can be used for profile, pipe as well as PVC sheet extrusion. In the past years, profile producers have become more and more environmentally conscious and are demanding highly energy-efficient products. Thanks to 40 years' experience in building twin screw extruders for profile extrusion, battenfeld-cincinnati's twinEX extruders offer substantial cost and material savings. Especially in times of rising raw material costs, this is very important. Depending on the application, the outputs range from 115 kg/h to 2,500 kg/h.

Optimal solutions for thermoforming sheet extrusion

battenfeld-cincinnati China also offers equipment for the demanding thermoforming sheet market. At Chinaplas, a large display will introduce the Multi-Touch roll stack, which is an optimal solution for producers who are not prepared to compromise on sheet quality even at high line speeds. Thanks to an absolutely innovative concept, a high degree of transparency, excellent flatness and an extremely even sheet thickness can now be achieved for a great variety of materials, such as PS, PET or PP, as well as EVA or laminated products.

High-speed single screw extruders complement the Multi-Touch roll stack, adding a solution for high-end applications in terms of both quantity and quality.

热成型边料回收的一体化解决方案

Chinaplas 2016: Package Solutions for Thermoforming

Getecha专注于粉碎和抽吸生产线,从粉碎机直到大袋包装站

设备制造商Getecha可提供高度自动化的一体化解决方案,针对热成型加工中的边料,实现高效粉碎和抽吸输送。强力喂料粉碎机可进行高效率粉碎,而量身打造的抽吸系统保证了粉碎物料的输送和排料填充到大袋。作为一家德国公司,Getecha是广为人知的,尤其是在生产食品包装产品的行业。在本年度中国国际橡塑展期间,你将在W4展馆的K25号展台(Gabler热成型公司)见到Getecha所生产的设备。

Getecha takes care of granulation and extraction lines from the grinder to the BigBag

The plant manufacturer Getecha realizes highly automated package solutions for the efficient granulation and extraction of material remnants from thermoforming processes. Powerful infeed granulators provide efficient granulation and custom-tailored extraction systems ensure the discharge of the ground material and filling of the BigBag. The German company is recognized especially in the production of food packaging products. At the Chinaplas this year, the Getecha plants can be found at stand K25 of the company Gabler Thermoform in hall W4.

Image 2: The model series RS 3000 with its three-blade rotors (cutting circle 300 mm), masters throughputs up to 1000 kg/h. The photo shows an RS 3009-E



图1: RS 4500系列大型造粒机,设计产量可高达1500 kg/h。
图片所示设备的型号为RS 4509
Image 1: The large granulators of the RS 4500 model series are designed for throughputs up to 1500 kg/h. The photo shows an RS 4509-E (Photos: Getecha)

当采用PP和PET片材大量生产食品包装材料时,热成型工艺是最为重要的加工方式之一。但是不可避免,大量的边角余料需要重新粉碎。设备制造商Getecha提供从边角物料的粉碎到粉碎料输送直到大袋包装这一整套高度自动化的一体化解决方案。

第一道工序是粉碎冲空的骨架或片材碎片。Getecha有四种旋转切割机型号系列,可提供17种不同的基本型号的横向喂料粉碎机,这样就确保了对于任何热成型应用都有着合适的粉碎机方案。紧凑系列RS2400粉碎机,适合的横向宽度为210到900mm,最高产量可达300 kg/h。相比之下,RS 3000和RS 3800型号系列粉碎机配备了三刀旋转切割器(切割圆直径300到380mm),主横向喂料宽度从390到1500mm,产量可达1300 kg/h。RS 4500系列粉碎机设计用于高达1500 kg/h的顶级产量,其横向喂料宽度范围从580到1480mm,切刀回转直径为450mm。

模块化的理念简化了联机过程

因为所有Getecha粉碎机都具有模块化的特性,每一种型号都可以最佳化地适应其用途。通过预先选择合适的横向喂料系统,粉碎机就可以最完美地用于完成各种各样的粉碎任务:例如用于厚膜、带有少许膜材的细瘦的冲空骨架、生产圆形模切零件后冲空的骨架、冲孔结构的膜材或非常薄的PET膜材边角料(< 0.20 mm)。如果横向喂料需要较大的动力

图2: RS 3000系列配备了三刀旋转切割器(切割圆直径300mm),吞吐量高达1000 kg/h,图片为RS 3009

(厚度大于8mm)，可采用带驱动装置的横向喂料带输送物料。如果采用强有力的双横向进料方式，生产中的边角料可以从两个方向喂入一台RS粉碎机！

Getecha产品的一大特色是采用了自动速度调节技术连续控制浮动辊筒，使其与粉碎机的横向进给速度相适应，而横向进给速度又是与热成型生产线的节拍相吻合的，因此膜材能保持张力状态，不再需要针对生产线速度对进行设定调节。通常的设备需要手动调节以适应生产线速度。这就简化了横向喂料粉碎机联机到生产线的过程，减少了生产的中断时间。除此以外，Getecha的横向喂料粉碎机的主电机配备了变频器或者节能控制器以控制电流峰值，在电机空载或部分负载时降低电机的功率，从而将无功电流降低到了最小值。

输送和装袋

与横向喂料粉碎机相协调，Getecha同时能提供有效的系统解决方案，输送粉碎的物料。尤其是那些采用热成型工艺制造食品包装的生产商将由此而获益，对他们而言，生产中的清洁技术是关键因素。因此，横向喂料粉碎机通常放置于靠近热成型生产线下游的位置，粉碎物料直接输送到挤出机或者位于远处的料仓或者大袋装袋设施。粉碎物料的输送可以通过正压或负压抽吸两种方式来完成，Getecha可提供这两种方式供客户选择。

如果采用正压方式，粉碎后的物料通过管线被风机叶轮从粉碎机输送到旋风分离器和大袋装袋站。如果采用负压抽吸方式，粉碎后的物料被中压风机通过管道系统“拉动”。这种方式有着若干好处：不需要用到易于磨损的风机叶轮（考虑到磨损物料这一事实），由于管道中形成真空，因此没有粉尘逸散到环境中。还有，因为负压抽吸输送的方案中，风机不是位于粉碎机的内部，而是在装袋设施所在处，这样就节省了热成型生产线所在处的空间，同时还降低了生产车间的噪声水平。

对于大袋装袋站，Getecha可提供不同的选择。高度调

图3：Getecha采用正压输送和负压抽吸输送两种方式实现粉碎物料的输送



Thermoforming is one of the most important processes in the mass production of foodstuff packaging from PP and PET film. Unavoidable, however, are the large amounts of residual material which must be reground. The plant manufacturer Getecha delivers package solutions with a high degree of automation ranging from granulating the material residues to transporting the granulated material until it is packed in BigBags. The first process step is the granulation of blanking skeletons or film fragments. Getecha has four rotary cutter model series with 17 different base models of infeed granulators available ensuring that the suitable granulation solution is ready for any thermoforming application. The Compact series RS 2400 manages infeed widths from 210 to 900 mm and achieves peak throughputs of 300 kg/h. By contrast, the RS 3000 and RS 3800 model series with their three-blade rotors (cutting circles of 300 and 380 mm) master infeed widths from 390 to 1500 mm and throughputs up to 1300 kg/h. The granulators of the RS 4500 model series are designed for top throughputs up to 1500 kg/h. Their infeed widths range from 580 to 1480 mm and their blades rotate at a diameter of 450 mm.

Modular concept simplifies process integration

Because all Getecha granulators feature a modular concept, each model can be optimally adapted to its application. Already by selecting the appropriate infeed system, the granulator can be optimized for very different granulating tasks: For thick films, lean blanking skeletons with little film portions, blanking skeletons of round molded parts, for film with unpunched structures or for very thin PET film residues (< 0.20 mm). If the infeed width requires greater dynamics (more than 8 mm), an infeed with belt drive can be employed. Utilizing powerful dual infeeds, production residues can be fed from two directions with a single RS granulator!

Thanks to the automatic speed feature from Getecha where a floating roller control continuously compares the infeed speed of the granulator with the cycle of the thermoforming line, the film web remains taught and the otherwise common – often manually performed – setpoint adjustment with the production plant is no longer required. This simplifies the process integration of the infeed granulator and reduces interruptions. Beyond this, Getecha equips their infeed granulators with a frequency converter on the main drive or an EnergySave controller which controls the current peaks, lowers the motor output during idling and partial loads and minimizes reactive current.

Transporting and bagging

Coordinated with its infeed granulators, Getecha also offers efficient system solutions for the transport of the granulated material. Especially manufacturers of foodstuff packaging utilizing thermoforming benefit from this fact since the technical cleanliness in production is a critical factor for them. The infeed granulator is therefore usually positioned closely after the thermoforming line and the granulated material is transported directly to the extruder or silo or a BigBag station at a remote facility.

Image 3: Getecha realizes extraction systems for the transport of granulated material both in pressurized and suction operation



图4：Getecha可提供大袋装袋站，支架的高度可调节，可悬挂一个或两个大袋，气动开关可手动或自动。

节架用于悬挂一只或两只大袋。用于两只大袋的调节架，可以是手动或气力开关自动，同时，填充料位控制带有报警信号。一旦第一个袋子装满时，气动开关会切换到装填第二个袋子。当变换物料之前，管道系统应抽吸干净，以避免不同的物料的混合。抽吸空气通过悬浮的过滤管或筒式过滤器进行清洁。筒式过滤器有很高的清洁效率，并能自动清洁。

Getecha的一体化解决方案，设备涵盖了从粉碎到抽料输送直到大袋装袋的全部过程。无论是成型的泡罩包装、糖果盒嵌件或者谷类杯盖都是由热成型工艺制造的，德国公司Getecha所提供的设备，能够保证无缝联接热成型设备，物料实现了经济的循环利用。

2016年中国国际橡塑展：W4 K25

Getecha GmbH

Am Gemeindegarten 13, 63741 Aschaffenburg, Germany
www.getecha.de

Image 4: Height-adjustable racks for the suspension of one or two BigBags are available from Getecha for BigBag filling. The racks for two BigBags feature a manual or automatic pneumatic switch

This can be done with pressurized or suction operation – Getecha offers both options.

With pressurized operation, the granulated material is transported from the granulator via a fan wheel through the pipeline and on to cyclone and BigBag. With the suction operation, the granulated material is "pulled" through the pipe system via a medium-pressure blower; this has several advantages: There is no blower wheel prone to wear (a factor with abrasive materials) and there is a vacuum in the piping; as a result no dust can escape into the environment. What's more, the suction conveyor solution saves space at the thermoforming line since the blower is not located inside the granulator but on the bagging rack. This also reduces the noise level in production.

Getecha offers various options for the BigBag accommodation. There are height-adjustable racks for the suspension of one or two BigBags. The racks for two BigBags feature a manual or automatic pneumatic switch as well as filling level control with alarm signal. The pneumatic switch switches to the second bag as soon as the first one is full. Before changing material the pipe system is extracted clean to avoid different materials from being mixed. The extracted air is cleaned through suspended filter hoses or cartridge filters. The latter have a greater cleaning efficiency and feature automatic cleaning.

The equipment of the Getecha package solutions covers the complete process from granulation and extraction via transport and bagging. Wherever folding blisters, inserts for praline boxes or lids for cereal cups are produced in thermoforming, the German company ensures a seamless and economic material circulation.

Chinaplas 2016: Booth W4 K25

格诺斯工业废弃物回收技术

Chinaplas 2016: Industrial Waste Recycling Technology

格诺斯提供废丝和废膜直接回收交钥匙技术

在今年展会上格诺斯会展出MRS挤出系统的模型，1个RSFgenius过滤系统并展示其工业废弃物回收技术。

在半成品产品比如废丝和废膜，重新回收使用引入整个生产链中。回收物的使用减少了原料的需求从而节省了生产成本。通过和世界级的专家合作，格诺斯公司提供包括尺寸减少，喂料和挤出在内的全套设备和解决方案。取决于回收原料的质量，撕碎机或磨碎机可以被用来确保外来物料的可加入性。这些轻质物料会通过喂料装置（喂料螺杆）被直接加入到MRS挤出机或更进一步的处理（在喂料前进行压缩）

Gneuss offers turnkey solutions for direct reuse of fiber and film waste:

At this year's Chinaplas Gneuss will exhibit a model of its MRS Extrusion System, a RSFgenius Rotary Filtration System and present its Industrial Waste Recycling Technology.

In the manufacture of semi-finished products such as fibers or films, waste that can be recycled and reused as a raw material is repeatedly produced along the entire production chain. Reclaiming waste reduces the need for raw material and thereby saves on production costs. In cooperation with worldwide specialists, Gneuss offers complete system solutions including size reduction, feeding and extrusion. Depending on the quality of



MRS挤出系统，含多螺杆挤出机，RSFgenius旋转过滤系统和VIS在线粘度测试仪

MRS extrusion system with Multi Rotation Extruder MRS, Rotary Filtration System RSFgenius, Online Viscometer VIS (Image: Gneuß)

。即使被纺丝油或其他污染物包裹的废丝和带有高含水量水平的都可以被直接添加到挤出机中而不需要任何预先的处理。原料在挤出机中被塑化，排气和去除污染杂质。挥发物如水或纺丝油被抽取出来，即使不同的含水量也可以保证出料的原始粘度是一致的。格诺斯工业回收技术的优点：

- 去除油，异味和其他挥发物
- 即使加工不同含水量的物料可得到稳定的IV
- 高透明性，低黄度
- 受控和稳定的粘度
- 高熔体纯度通过FDA 论证的食品级LNO许可，可使用100%消费前物料回收
- 巨大的能量节省

格诺斯工业回收技术的一个明显的元素就是单独元件的模块化设计，结合在创新的MRS 挤出机上。通过在多螺杆段巨大的交换面积而产生的非常高效的排气效果，MRS挤出机可加工回收料直接到最终制品而不会降低产品质量。目前，所有型号的诺斯多螺杆挤出机，从产量35公斤/小时的MRS35到2000公斤/小时的MRS200都在全世界范围内成功运转，主要应用领域是片材，纤维和造粒。格诺斯MRS多螺杆挤出机已成为了PET瓶片加工中一项关键技术，无需预干燥和预结晶。在传统的单螺杆技术的基础上结合了行星单螺杆，整个系统非常坚固尤其适合于回收加工系统。格诺斯将会在展会上展出最新一代创新MRS 多螺杆挤出系统。取决于加入物料和不同的要求，“粉碎”，“压缩”和“挤出”单元被引入并形成工业废料回收系统，并针对不同的客户进行了优化。模板化设计的优点是明显的：可对不同类型的废料选择最佳的喂料加工方式。MRS去除了水分，纺丝油或其他挥发物，并通过持续的过滤去除了其他硬质污染。在加工回收过程中，过滤是确保质量和经济性的非常关键的因素。格诺斯旋转过滤系统可以全自动化操作，压力和加工稳定，并可保证得到纯洁和高质量的熔体。在展会上格诺斯将会展出自清洗，压力和加工稳定的旋转过滤系统RSFgenius75。

the material to be recycled, either a shredder or a cutting mill can be used to guarantee good dosing properties of the output material. This very light material is then either directly fed to the MRS Extruder by means of feeding components (stuffing screw) or a further processing step takes place for compacting the material before it is fed to the extruder. Even fiber coated with spin finish oils and other contaminants and with a high residual moisture level can be fed directly into the extruder without any pre-treatment. The material is plasticized, devolatilized and decontaminated in the extruder. Volatiles such as water or spin finish oils are extracted. Even when different moistures

are employed the material's intrinsic viscosity (IV) is very consistent. The advantages of Gneuss industrial waste recycling:

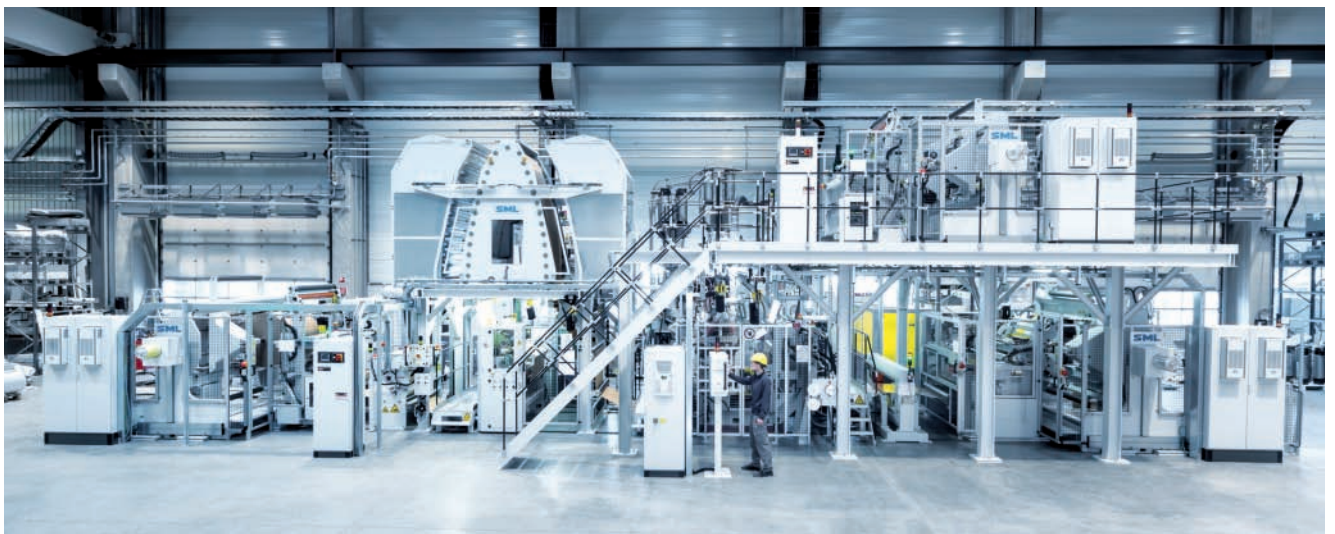
- Devolatilization of oils, odors and other volatiles;
- Stable IV even when processing materials with varying residual moisture levels;
- High transparency, low yellowness;
- Controlled, consistent viscosity;
- Highest melt purity;
- LNO for food contact use from the FDA for 100 % post-consumer recycled content;
- Major energy savings.

A significant element of Gneuss industrial waste recycling is the modular set-up of the individual components, combined with the innovative MRS extruder. With its very efficient devolatilisation performance thanks to the huge surface area renewal rate in the multi rotation section the MRS extruder processes recycled material to a final product without compromising quality. More than 50 MRS extruders of all sizes, from the MRS 35 for 35 kg/h to the MRS 200 for 2000 kg/h, are now successfully in operation world-wide, mainly in sheet, fiber and repelletizing applications. The MRS extrusion technology is now established as one of the key technologies for processing PET reclaim without pre-drying. Thanks to the patented combination of single screw extruder with a multiple screw section, the extruder is very sturdy and particularly well suited for recycling applications. Gneuss will show the latest generation of its innovative Multi Rotation System extrusion technology at Chinaplas.

Depending on the feed product and the requirements profile, the "shredding", "compacting" and "extruding" segments are brought together to form an industrial waste recycling system, and the respective most optimum system solution is achieved for the user. The advantages of the modular design are obvious: The optimum process for feeding into the extruder is selected for every type of waste produced. The MRS removes moisture, spinning oils or other adhering volatile components and solid contaminants are removed in the subsequent filtration, with the result that the melt produced comes close to having the properties of new product. When processing recyclates, filtration is an important element for ensuring quality and economy. The Gneuss rotary filtration systems work fully automatically, with constant pressures and processes, and guarantee a pure and high-quality melt. Gneuss will exhibit a self-cleaning, process-constant and pressure-constant Rotary Filtration System RSFgenius 75 at Chinaplas.

SML的三大亮点：挤出涂复生产线FlexPack、专业大型拉伸缠绕薄膜生产线MasterCast和小型拉伸缠绕薄膜生产线MiniCast

Chinaplas 2016: Three Highlights: FlexPack – MasterCast – MiniCast



SML的FlexPack® 挤出涂覆和复合生产线

FlexPack® – SML's extrusion coating and laminating line

最新一代的FlexPack®挤出涂复生产线在2016年中国国际橡塑展期间将成为SML三大亮点之一。FlexPack®是一种创新的模块化共挤涂覆和复合生产线，其特点是带有密闭室刮刀的基材站，并具有其它先进技术亮点。生产线适合于那些制造不同种类的商业包装材料的供应商，可生产包含高度复杂的复合结构的产品。而且，生产线结构设计紧凑，保证了极为出色的易维护性和操作的简便性。无轴放卷和复卷机允许在全速时进行分切，并且易于处理膜卷。尽管生产线采用高速设计，但仍能够保证生产中的极高产品转换灵活性，最大程度阻止废料产生，保证了生产的高效性。

此外，已申请专利的“DoubleCoat”工艺，与标准的FlexPack®涂复生产线相结合，可生产透气型产品。DoubleCoat同热融挤出涂覆复合相结合，有利于实现涂覆厚度最小化，并能增加产品的透气性能。采用这种新工艺，可生产防护服、医疗用布或一次性服装。

SML的第二个亮点是MasterCast®，功效最为强劲并且是世界最宽的专业拉伸缠绕薄膜生产线。从2015年7月开始，这条宽幅拉伸缠绕薄膜生产线开始生产有效膜宽6米（可达12卷）的薄膜，净产量为4500 kg/h。生产线的主要优点是可生产厚度非常薄的膜，这种膜能够满足亚洲市场上轻型产品趋势的要求。例如，可生产厚度为12微米的拉伸缠绕薄

The latest FlexPack® line generation will be one of three SML highlights at the Chinaplas 2016. FlexPack® is an innovative, modular coextrusion coating and laminating line, which features a primer station with a closed chamber doctor blade and other advanced technical highlights. The line facilitates the manufacture of a variety of commercial packaging materials including highly complex laminate structures. Moreover, its compact design guarantees excellent accessibility and simple operation, while shaftless unwinders and re-winders allow splicing at full speed and easy reel handling. In spite of the line's high-speed design, the utmost flexibility for product changeovers is guaranteed, which prevents waste and maintains productivity at the highest possible level.

In addition, the “DoubleCoat” process, for which a patent is pending, can be integrated into a standard FlexPack® coating line to create fresh production possibilities in the breathable product field. DoubleCoat combines extrusion coating with hot melt lamination and thus facilitates coating thickness minimisation, as well as product breathability enhancement. The new process can be used for the manufacture of products that include protective clothing, medical drapes or disposal overalls.



SML的MasterCast® 宽幅拉伸缠绕薄膜生产线

MasterCast® – SML's broadest stretch film line

SML's second focus will be on the MasterCast®, its most powerful stretch film line and the world's broadest. Launched in July 2015, this wide stretch film line offers a usable film of 6m (12-up) and a net output of 4,500 kg/h. The line's main advantage relates to very thin film, which meets the Asian trend towards slimmer products. For example, 12-micron net stretch film production provides 2,500 kg/h of saleable film on the winder. A further benefit of the line is its minimal power consumption, which in terms of net output can amount to a mere 0.36 kW/kg.

Last, but not least, SML is to present its updated MiniCast stretch film line at the Chinaplas. This is its smallest stretch film line design and is characterised by three part-bobbins, five layers and a combined maximum extrusion throughput of 1,050 kg/h. Furthermore, the line incorporates a casting station with a chill roll diameter of 1,200mm and an optical thickness measuring system.



SML的MiniCast: 最小的拉伸缠绕薄膜生产线

MiniCast: SML's smallest stretch film line concept

膜，净产量可达到2500 kg/h。生产线还有另一大优势就是：能耗最小，根据净产量计算，其能耗仅为0.36 kW/kg。

最后同样重要的是，在中国国际橡塑展上，SML将展出其现代化的MiniCast拉伸缠绕薄膜生产线。这是最小的拉伸缠绕薄膜生产线，其特点是在线生产，为三膜卷式、五层结构，最大挤出机产量为1050 kg/h。另外，生产线的流延站采用直径为1200mm的流延辊，并配备了光学厚度测量系统。

MiniCast生产线将著名的W4000收卷机与四个收卷站结合起来，保证了顶尖质量的在线分切收卷效果，可生产的产品包括2英寸芯轴的手用卷膜、3英寸芯轴的机用卷膜以及大直径卷筒膜。所有机械部件均都经过精心设计，可使生产线发挥最高效能，操作员也可直接地、灵活地进行操作。因此，MiniCast生产线对于刚开始涉足拉伸缠绕薄膜领域的公司，以及那些已经建立但需要另一条可以生产小批量且有利润空间的产品公司，确实是一种理想的选择。

In combination with the well-known W4000 winder and four winding stations, MiniCast guarantees the top quality inline production of hand rolls on 2-inch cores, as well as machine and jumbo rolls on 3-inch cores. All the machine components have been designed for straightforward, flexible operation and maximum performance. Therefore, the MiniCast represents the ideal concept for both start-ups in the stretch film business and established companies needing an additional line for the production of smaller lots and niche items.

Chinaplas 2016: Booth W1 B51

2016 中国国际橡塑展，W1 B51

SML Maschinengesellschaft mbH
Bundesstr. 1a, A-4860 Lenzing, Austria
www.sml.at

在中国连续运转了三年 高产量BUS混合机生产用于高压电缆的高 纯度过氧化物交联PE

Compounding – Three Years' Continuous Operation in China:

High Capacity BUSS Kneader produces High-Purity Peroxide-Crosslinked PE for HV Applications

三年多以前，BUS公司在中国安装了一条创新的混合机生产线。这条线的生产能力为年产两万五千吨，从那时起，这套设备在有严格要求的洁净条件下连续不断地运转，生产用于高压电缆的顶尖质量高纯度过氧化物交联聚乙烯。本文记述了这套设备的概念及实施情况。

瑞士布斯股份公司 (Buss AG) 向中国的一家主要混合料制造商及动力电缆生产商交付了一条最先进的生产线，生产过氧化物交联电缆聚乙烯 (XLPE-a, 以下本文称为XLPE)。这家客户所生产的混合料被用来作为中压(MV)和高压(HV)电力电缆的绝缘介质，这样就需要避免任何细小的污染，同时必须非常严格地控制微量的污染，防止这样的杂物形成电介质中的薄弱点，以及由此可能产生的绝缘击穿。客户要求单条生产线生产XLPE的产量达到每年两万五千吨左右。几年前，当布斯公司开始与客户讨论这一项目时，已经很快地就明白了，混合料的生产商寻求的是一站式服务，也就是具有单一供货源的交钥匙生产线，包括从初步规划到最终实施、安装调试、开机和验收的全部过程。

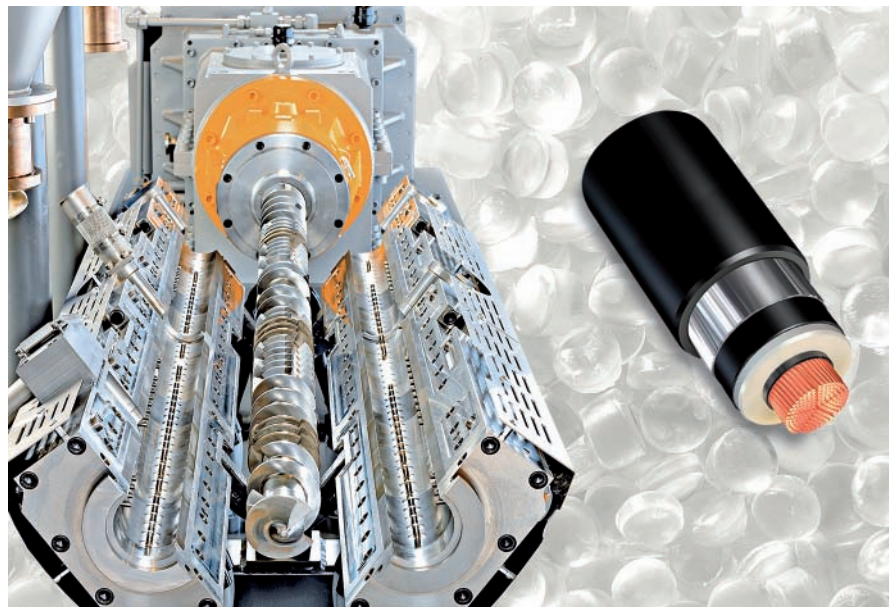
布斯公司的工程师和工艺专家们相应地制定出了整个设施及其组件的详细方案，生产线包括布斯公司的混合机，融体过滤器，水力输送系统和过氧化物吸收装置。对在洁净条件下生产的所有方面都给予了特殊的考虑。布斯公司与将要操作这台设备的人员密切合作，对生产线的工况和产品输送进行了优化。新的混料生产线 (图1) 包含两个加工阶段：

- 混合和过滤
- 过氧化物吸收

混合和过滤：

XLPE化合物的原料是保存在洁净室内的粒子形态的低密度聚乙烯 (LDPE) 以及高纯度的添加剂及稳定剂。

为了要对原料进行称重计量并输送到布斯混合机



Over three years ago, an innovative BUSS Kneader line with a capacity of 25,000 MT/year was installed in China. Since then, it has been continuously involved, under demanding cleanliness conditions, in the production of top quality, high-purity peroxide-crosslinked polyethylene for HV applications. This article describes the plant concept and its implementation.

Buss AG has installed a state of the art production plant for peroxide-crosslinkable polyethylene (XLPE) at a major compounder and power cable producer in China. The compound produced there is used for insulating medium (MV) and high voltage (HV) power cables. It thus needs to be free of small contaminants, whilst micro contaminants must be controlled very strictly, to prevent such inclusions from creating dielectric weaknesses and causing electrical breakdowns. The customer required a single-line production capacity of some 25,000 MT of XLPE compounds annually.

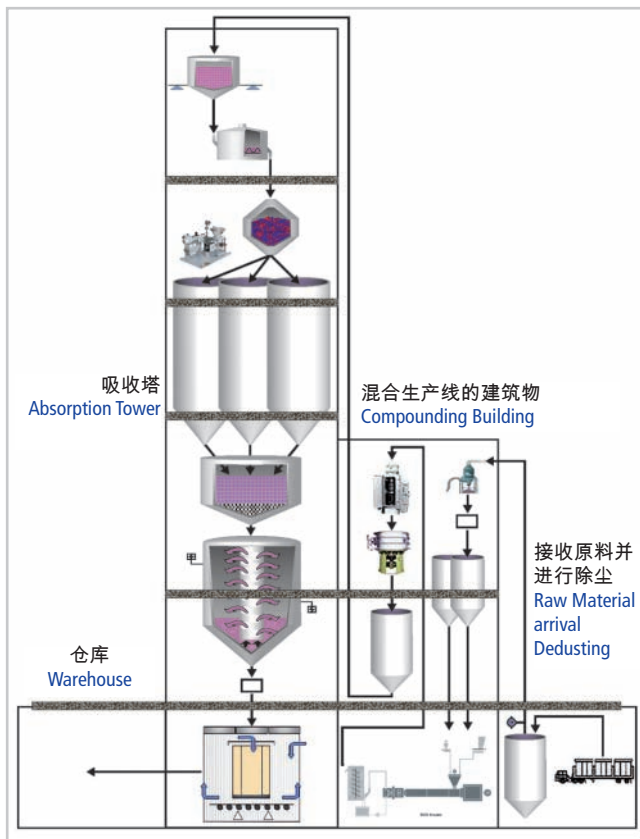


图1. 高纯度XLPE生产线概览
Figure 1: Overview of high-purity XLPE production

When BUSS initially discussed the project with the customer some years ago, it rapidly became clear that this producer was looking for a one-stop shop, providing a single-source turnkey line, from preliminary planning to final realization, commissioning, start-up and acceptance.

BUSS' engineers and process specialists accordingly developed a detailed concept for the entire plant and its components, including a BUSS Kneader, melt filtration, hydraulic conveying system and peroxide absorption modules. Special attention was paid to all aspects of production under cleanroom conditions. Work and product flow were optimized in close cooperation with the future plant operators. The new compounding line (figure 1) comprises two stages:

- Compounding and screening
- Peroxide absorption

Compounding and Screening

The feedstock for the XLPE compound is a low-density polyethylene (LDPE) in pellet form, stored in a cleanroom – together with high-purity additives and stabilizing agents – for subsequent gravimetric dosing to the BUSS Kneader (figure 2).

Using BUSS' well-proven compounding technology, the LDPE pellets and the additives (excluding the peroxide) are melted and dispersed in the BUSS Kneader, avoiding any de-gradation of the polymer chains. The required discharge pressure is generated via a melt pump flanged to the Kneader. This is followed by ultrafine melt filtration and underwater pelletizing of the resulting high-purity intermediate compound.

To meet high-purity requirements, the water used in the process is deionized and filtered to eliminate any possible contamination (figure 3). All mechanical components comply with the same high cleanliness requirements, some of them being specially designed. Only abrasion and corrosion resistant materials are used, and all surfaces in contact with the product are highly polished.

Peroxide absorption

Immediately after pelletizing, the intermediate compound is hydraulically conveyed to the upper level of the building, avoiding abrasion and fines generation. Here the second processing stage starts, using gravity for all further conveying and movement of the material.

In this stage, the purified intermediate compound is converted into ready-to-pack XLPE granules, used for producing power cable electrical insulation. The associated peroxide absorption and diffusion step takes place in what is known as the absorption tower (figure 4).

The peroxide absorption process has four main zones (figure 5):

- Dewatering the intermediate compound in a centrifuge and drying.
- Wetting with peroxide, using a high-precision pump dosing system. The product is lo-

(图2), 生产线采用了布斯公司极为成熟的原料混合技术。LDPE粒子和添加剂(不包括过氧化物)在混合机内被融化并且被非常温柔地混合,避免了任何高分子链的降解。融体泵通过法兰连接到混合机,所需要的送料压力由融体泵建立。融体泵的下游就是超细融体过滤器和生产出高纯度中间料的水下造粒机。

为了满足高纯度的要求,工艺用水经过了去离子化,并且进行过滤以剔除任何可能的污染物(图3)。所有机械部件都遵守同样高的洁净度要求,有些还进行了特殊的设计。仅仅使用抗磨损和耐腐蚀的材料,所有接触混合料产品的表面都进行了高等级的抛光处理。

过氧化物的吸收

造粒之后,中间料立即由水力输送到建筑物的上一层,避免了磨损和任何污染物。在这里,开始第二阶段的加工。

图2: 用于混合和过滤物料的布斯混合机

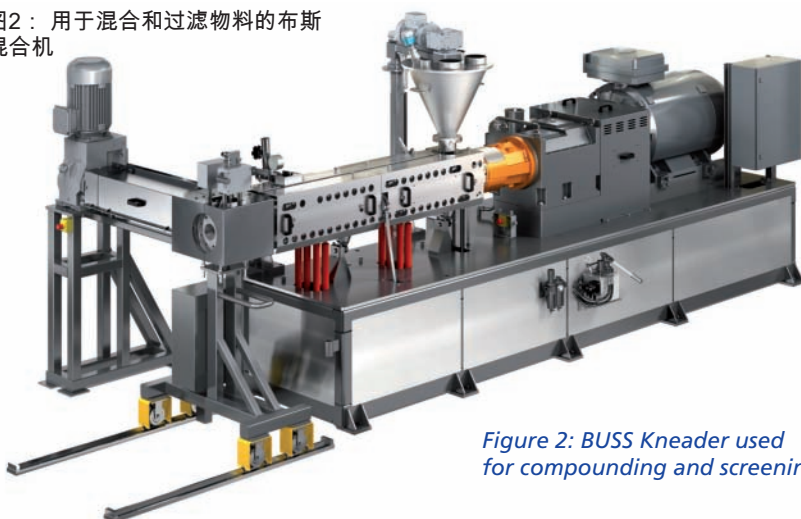
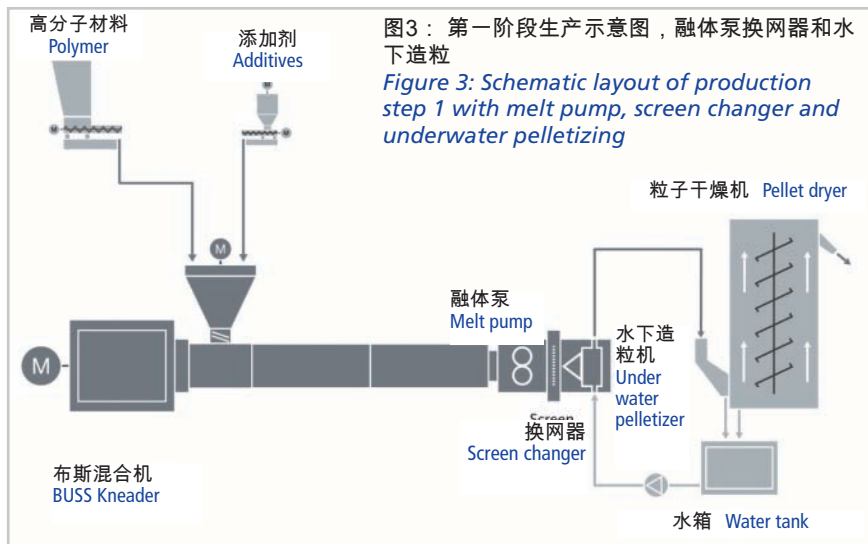


Figure 2: BUSS Kneader used for compounding and screening



ded into a specially designed slow moving, temperature-controlled mixer, which prevents relative movement of the metallic parts coming in contact with the product. Here, the liquefied and filtered peroxide is precisely injected over a defined time and uniformly mixed with the intermediate compound.

- Surface-coated with peroxide, the intermediate compound enters a heatable absorption tank, which is well insulated to minimize heat losses and maintain a constant temperature. Thanks to its special design and mode of operation, the material flows down with a narrow residence time distribution, whilst the peroxide diffuses uniformly into the pellets.

接下来，物料的所有输送和移动都采用重力方式完成。在这一阶段，精制的中间混合料将转换为等待包装的XLPE颗粒料，产品可用于生产电力电缆的绝缘层。原料的过氧化物吸收和扩散的综合过程在被称为吸收塔的装置中进行（图4）。

过氧化物的吸收过程包含四个主要的过程（图5）：

- 采用离心机对中间混合料进行脱水和干燥
- 使用高精度计量泵系统添加过氧化物，润湿中间混合料。产品装填到经过特别设计的慢速移动并带温度控制的混合器中，混合器避免了接触原料的金属部件的相关移动。在这里，液态的经过过滤的过氧化物在确定的时间精确地注入到中间混合料中，并与其均匀混合。
- 中间混合料的表面涂覆了过氧化物，然后进入到可加热的吸收罐，精心安装的吸收罐可以使热损失降到最低并保持恒

pellet temperature is reduced quickly to an atmospheric packaging temperature. The finished product then passes through a highly sensitive metal separator, being ready for packaging under cleanroom conditions to eliminate any potential risk of contamination during transport.

Special aspects of XLPE production purity

BUSS has used its know-how and experience to design the entire line as a self-enclosed system, providing the XLPE granules with the level of purity required for HV cable insulation and ensuring that every single production step takes place under the specified clean conditions. Since it is human factors which particularly complicate maintaining cleanroom conditions – people bringing in contaminants despite airlocks and protective clothing – BUSS has designed the entire line to be operated with minimum access by personnel. The process runs fully automatically with there being no need to access any part of the production line under normal operating conditions.

Apart from the production monitoring and control system, product quality is checked systematically using strict sampling and record-keeping procedures. Samples are taken from several plant locations to monitor quality trends. These samples are analysed simultaneously and systematically in the plant laboratory. Beyond operating under very clean conditions, this innovative XLPE granulate production line has further outstanding features:

- The plant is fully enclosed and uses state of the art air management systems.
 - Hydraulic transport and subsequent gravity feeding ensures minimal damage to pellets with little or no fines generation.
- When first commissioned, an XLPE production line has to be operated for two to four weeks before meeting the product purity level demanded for HV cable insulation. Despite all the precautions taken during manufacture with respect to components in contact with the product, and despite thorough pre-cleaning after assembly, it is only then that the residual conta-

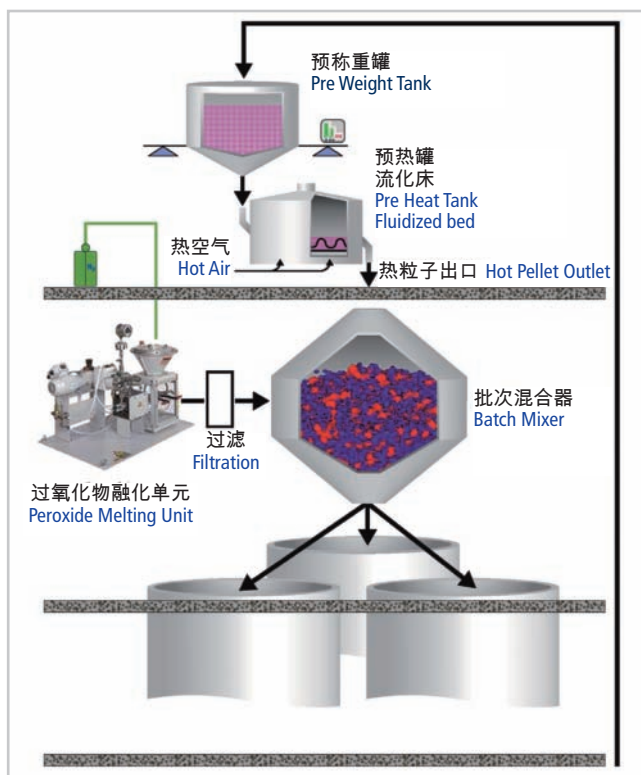


图4：第二阶段生产示意图，加入过氧化物
Figure 4: Schematic layout of production step 2, peroxide introduction

图5：第三阶段生产示意图，过氧化物平衡吸收
 Figure 5: Schematic layout of production step 3, peroxide absorption to equilibrium
 (All pictures source: Buss AG / P&M Cable Consulting LLC)

温。针对物料流动和操作方式进行了精心设计，分配有限的残留时间让物料向下流动，此时过氧化物均匀地扩散到粒子中。

· 离开吸收罐后，粒子的温度迅速地降低到了大气环境温度，即适合于包装的温度。完成加工过程后的产品通过高灵敏的金属分离器，然后准备就绪，将在洁净室条件下进行包装以排除任何运输过程中潜在的污染风险。

保证XLPE产品纯度的特殊措施

布斯公司已经利用其专有技术和经验，将整条生产线设计成为了一个自封闭的系统，生产出的XLPE粒子纯度等级满足高压电缆绝缘层的要求，并保证每一批产品的每一个单独的生产步骤都按照规定的洁净条件进行。由于人为的因素，特别是复杂的洁净室条件下的维护，尽管有气密室和防护服，人还是会带进污染物。布斯公司已经对整个生产线进行了特殊设计，能够在最少的人员进入的状况下运行。生产过程是全自动化的，所以在通常的生产条件下，生产线的任何一部分都是没有必要进入的。

除了有生产监视和控制系统外，还要按照严格的采样和纪录保持规程有系统地对产品质量进行检查，从设备不同的位置采样以监视质量动态。同时，对这些采样在工厂的实验室内进行系统的分析。

这一条创新的XLPE粒子生产线，除了在非常洁净的条件下运行以外，还有更多的突出特点：

- 设备全封闭，并采用了当代最先进的空气管理系统。
- 水力输送加上随后的重力喂料，保证了对粒子的损伤最小，没有或仅有非常少的粉尘产生。

当XLPE产品生产线第一次投料开机时，在生产出达到符合高压电缆绝缘所要求的产品洁净度之前，必须要运行两到四周。尽管在制造期间针对接触产品的部件已采取了所有的防范措施，并且安装完成后预先进行了彻底的清洁，但仍需要这样的开机过程才能够将残留的污染物完全清除出生产线系统。

在开机过程完成后，设备以“竞赛”的方式运行，非常快地生产出了中压电缆质量的产品而后又生产出高压电缆质量的产品。任何干扰（例如：不正确的采样方式）都将影响到产品的纯度，有时影响时间甚至长达数小时。

即使在制造生产线时考虑到这一状况而进行了一丝不苟的设计，就像这条生产线一样，也必须由受过良好训练的员工来进行准确而谨慎的操作，并且充分意识到潜在的污染问题。不言而喻，生产线所用到的所有原料以及辅料都必须最大程度满足洁净度的要求。

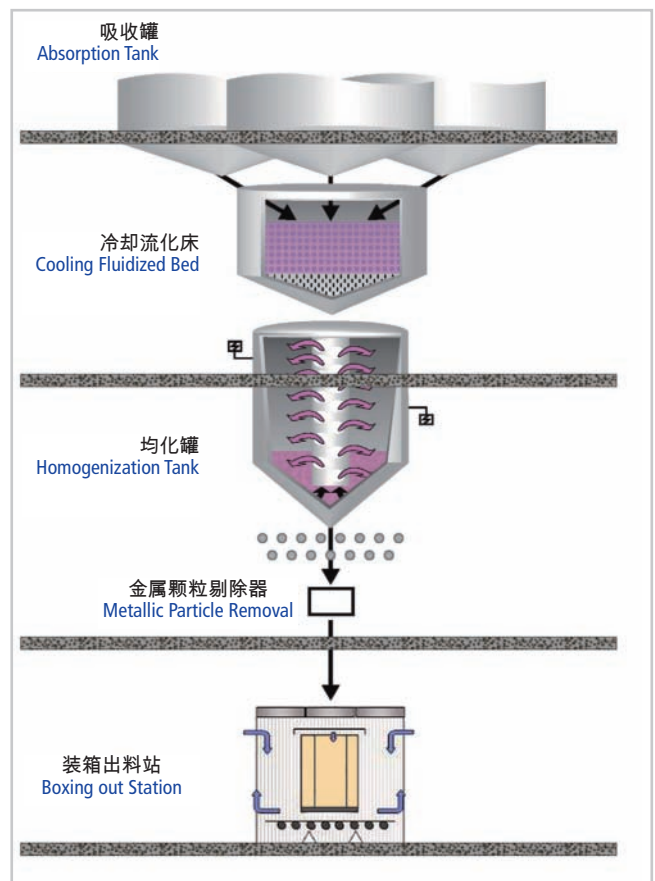
本文作者：

Juan D. Martinez博士：布斯公司全球市场部经理，有着二十多年的电缆行业经验。

Denis Labbé：顾问，日内瓦P&M电缆咨询有限公司的所有者，有着35年电线电缆行业的经验，着重于中压和高压以及超高压应用方面

Edgar von Gellhorn：工学博士，机械工程师和塑料专家，布斯公司工艺部门的主任

Andreas Niklaus：布斯公司高级工艺工程师，重点在电线电缆应用方面



minants are completely flushed out of the line.

The plant will subsequently operate in 'campaigns' during which, after start-up, the unit very quickly moves through medium to high voltage quality. Any interruption (including for example improper sampling) can affect product purity, sometimes for several hours.

Even a production line such as this, meticulously designed to take account of all these factors, must therefore be operated by well-trained staff, working extremely carefully and fully aware of potential contamination problems. It goes without saying that all the raw and auxiliary materials used in this line must meet these extreme purity requirements.

The authors of this article

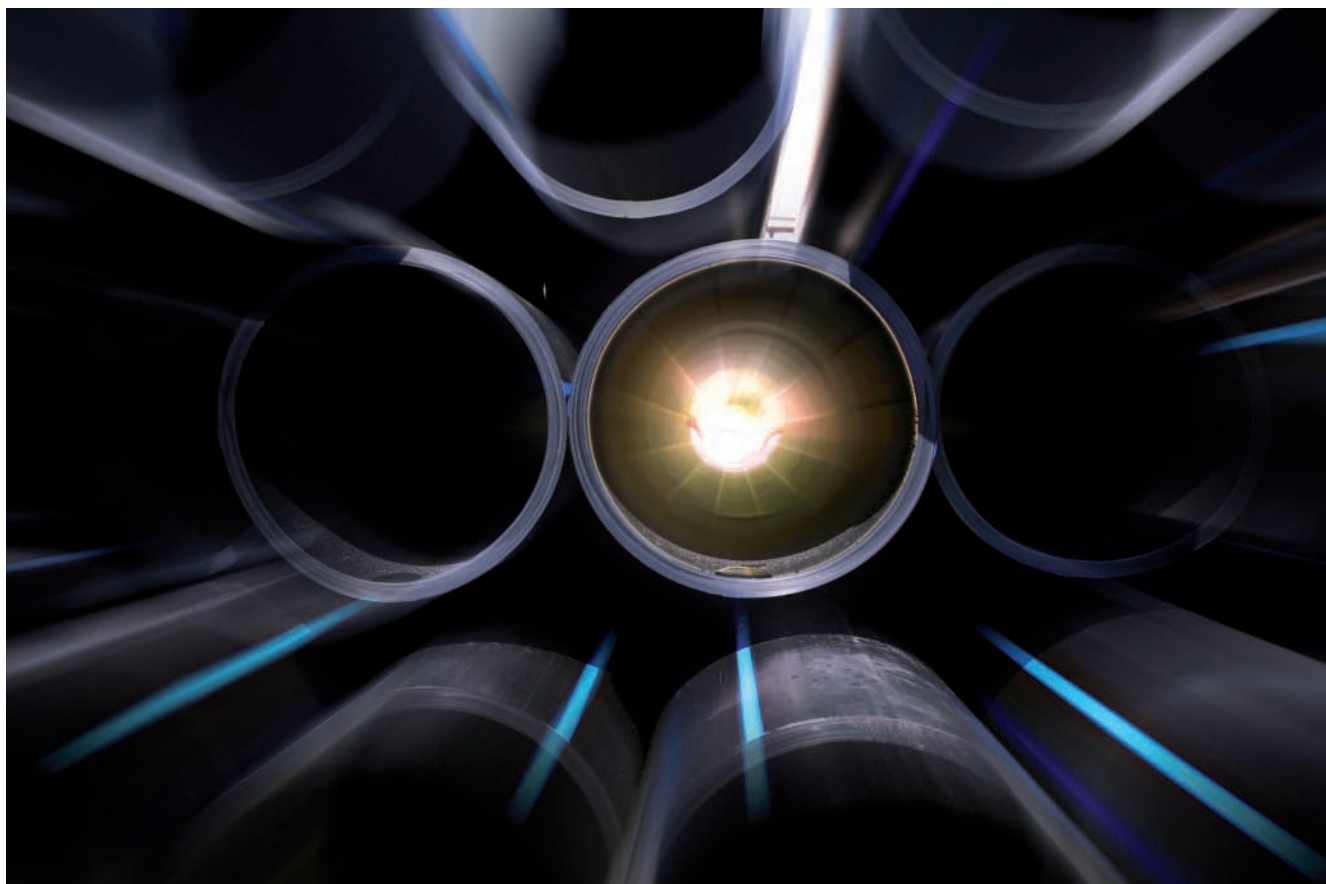
Dr. Juan D. Martinez is Global Market Manager Energy at Buss AG with over twenty years of experience in the cable industry.

Denis Labbé is consultant and owner of P&M Cable Consulting LLC, Geneva with more than 35 years of experience in the wire and cable industry, mainly MV-, HV- and EHV applications. **Dr.-Ing. Edgar von Gellhorn**, mechanical engineer and plastics specialist, is head of the process department at Buss AG.

Andreas Niklaus is a senior process engineer at Buss AG who focuses on cable and wire applications.

创新之作: CENTERWAVE 6000

Measurement Technology: *Innovation – CENTERWAVE 6000*



CENTERWAVE 6000: SIKORA研发的用于大型管材挤出品质控制的核心技术

CENTERWAVE 6000: Key technology for quality assurance during the extrusion of big tubes

SIKORA推出用于大型管材挤出品质控制的重要检测技术

“不景气”对于SIKORA全球的200余名员工来说似乎有些遥远。基于这样的公司运营背景，具有开创性的创新产品应运而生，这就是CENTERWAVE 6000。该产品的设计核心理念是：将若干个收发器沿管材的圆周排布，用以发送和接收调频连续毫米波，在大型管材挤出生产线上实现精确的在线非接触式外径、椭圆度和壁厚的测量，其精度可以达到微米级别。

SIKORA develops key technology for quality assurance during the extrusion of big tubes

Stagnation is a foreign word to the 200 SIKORA employees worldwide. Regarding this background, a new product of groundbreaking innovation was created, the CENTERWAVE 6000. The core: Several transceivers, arranged around the circumference of a tube, sending and receiving continuous frequency modulated millimeter waves for a non-contact and μm -precise online measurement of diameter, ovality and wall thickness for larger plastic tubes during the extrusion.

过去的几年中，对于毫米波段频率的计量学应用研究，使毫米波的应用在测量精度方面取得了巨大的突破。尽管如此，对圆柱状产品的涂层厚度测量还是难以达到理想水平。随着最具创新的CENTERWAVE 6000推出，SIKORA让可靠测量所有类型德标管材的尺寸、外径、椭圆度、壁厚成为可能。

最新毫米波技术的优势

即使没有挤出材料的性能和温度信息，CENTERWAVE 6000也可在圆周上通过多点测量外形与壁厚，其准确性为此前其它检测方法所无法企及。该技术也可应用于多层管的精确测量。

该测量系统通过在管材的圆周放置多个传感器（收发器），持续发送和接收调频的毫米波。管材的边界层，比如塑料的正反面会反射这些波，从而被相应的接收单元检测到并且解调。这些接收到的信号包含了不同材料边界层相邻距离的信息。各个传感器接收到信号后，通过一系列的计算，在极短的时间内所需要的测量数值就可以显示出来。这些测量数值可以用于挤出生产线上管材不同层面尺寸的控制。

取代传统技术

对于研发这样一个以CW-毫米波芯片为基础的测量技术，其决定性的目标在于为管材挤出生产线提供免维护且耐用的非接触式测量。由于不需要考虑材料的特性，CENTERWAVE 6000可以得到极精确的测量数值，无需针对不同的材料进行参数设置。

CENTERWAVE 6000的推出旨在提供生产线不同位置（即使是在热态）的高精度测量值，并且不需要耦合介质，不受温度影响，无需校准。

产品系列

目前开发的两种独立的测量头分别适用于外径范围120-400mm和250-1000mm的产品。搭配ECOCONTROL 6000显示处理系统，可提供数值显示和截面的图形显示，同时包含趋势图和统计图表等功能。另外，还可以通过虚拟测量头的功能计算挤出机位置的测量值，有效帮助生产线管理人员第一时间做出优化调整。即便挤出位置和测量位置的延迟时间较长，也能够保证有效并且快速地控制壁厚，减少过多的材料损耗。

During the last years, enormous successes regarding measuring accuracy were achieved by researching metrological applications with frequencies in the millimeter waves range. Nevertheless, the results could not yet be used for the coating thickness measurement of cylindrical products. With the novel, innovative measuring system, the CENTERWAVE 6000, SIKORA creates completely new preconditions for the reliable measurement of the nominal size as well as the outer diameter, ovality and wall thickness of all kinds of extruded DIN-tubes.

Advantages of the new millimeter waves technology

Even without any knowledge of the properties of the extruded materials and its temperatures, the CENTERWAVE 6000 measures the outer contour as well as the wall thicknesses simultaneously at several places of the circumference, providing a precision to a previously unknown degree. Layer thicknesses of multi-layer tubes can also be measured precisely.

Several sensors, so-called transceivers, arranged around the circumference of a tube, continuously send and receive frequency modulated millimeter waves. Boundary layers, as for example each front and back site of a plastic, reflect these waves, which are detected and demodulated by the receive unit of the regarding transceiver. These receive signals contain information regarding the distance between boundary layers of different materials. After an algorithmic processing of the receive signals of each sensor, the requested measuring values are ready for visualization within only a few milliseconds. The values can as well be used for the control of the different dimensions of a tube in the extrusion line.

Replacement of conventional technologies

For the development of the technology on the basis of a CW-millimeter wave chip, the goal of creating a non-contact measuring device at the extrusion of tubes that is maintenance-free and durable, was decisive. By independently identifying the characteristic values of the material, the CENTERWAVE 6000 generates the measuring values with highest precision, without the need for specifications regarding the material parameters.

The CENTERWAVE 6000 is going to provide highly precise measuring values at different positions of the production line (even in the hot area) as there are no coupling mediums needed, temperatures are not decisive and no calibrations are necessary

Product spectrum

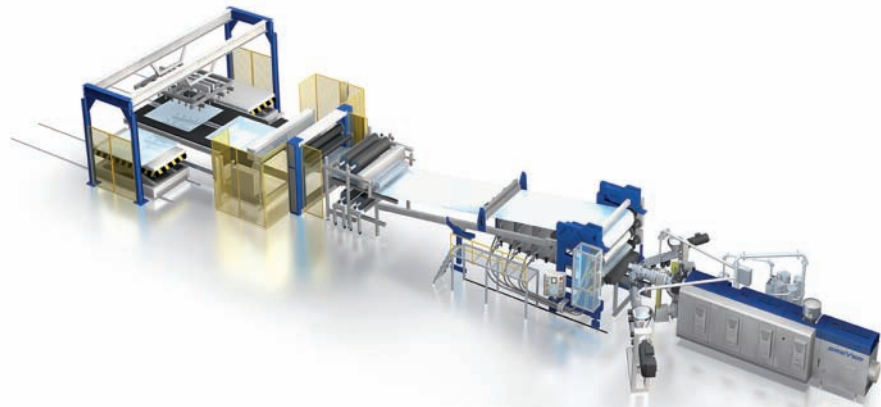
Two stand-alone gauge heads for different tube diameters from 120 to 400 mm and 250 to 1.000 mm were created. The industrial PC ECOCONTROL 6000 offers, besides a numeric presentation of the measuring values, also a graphic visualization as well as extensive trend and statistic data features. The calculation of virtual measuring values at the position of the extruder allows the line manager to react quickly to changes. Even with larger delay times between the position of extrusion and the measurement an effective and fast control of the wall thickness and especially the elimination of excessive consumed material is guaranteed.

SIKORA AG

Bruchweide 2, 28307 Bremen, Germany

www.sikora.net

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Fax : 852-25165024

Email : chinaplas.PR@adsale.com.hk



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