MACPLAS INTERNATIONAL

MP

THE MAGAZINE FOR THE PLASTICS AND RUBBER INDUSTRY

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TRUSTING IN EXPORTS | THE EFFECTS OF PLA IN PET RECYCLING SYSTEMS | MACHINERY AND ANCILLARY EQUIPMENT AT K 2013 | PLASTIC MATERIALS FOR THE PACKAGING SECTOR

CHEM-TREND

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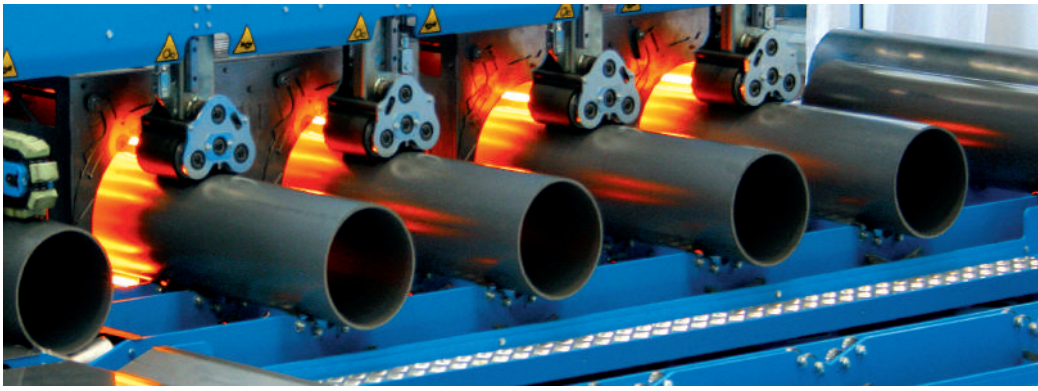

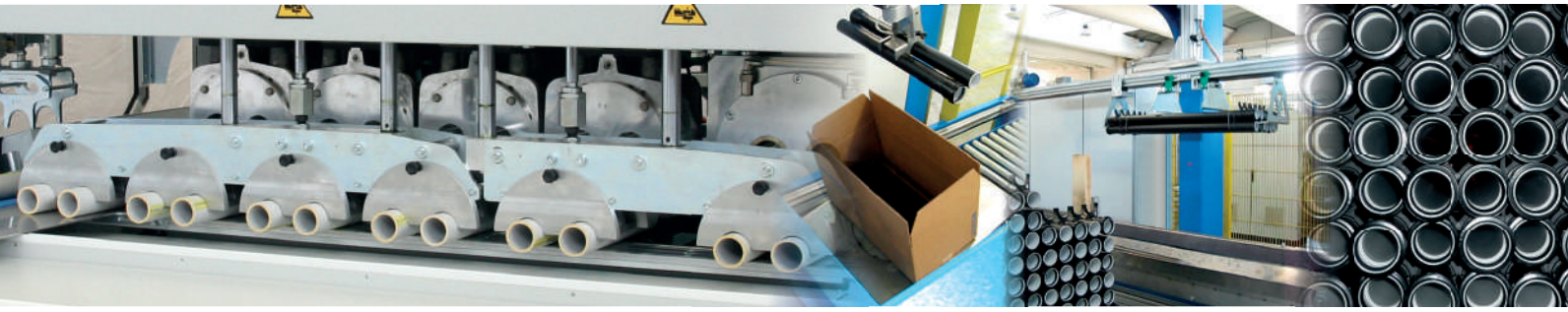

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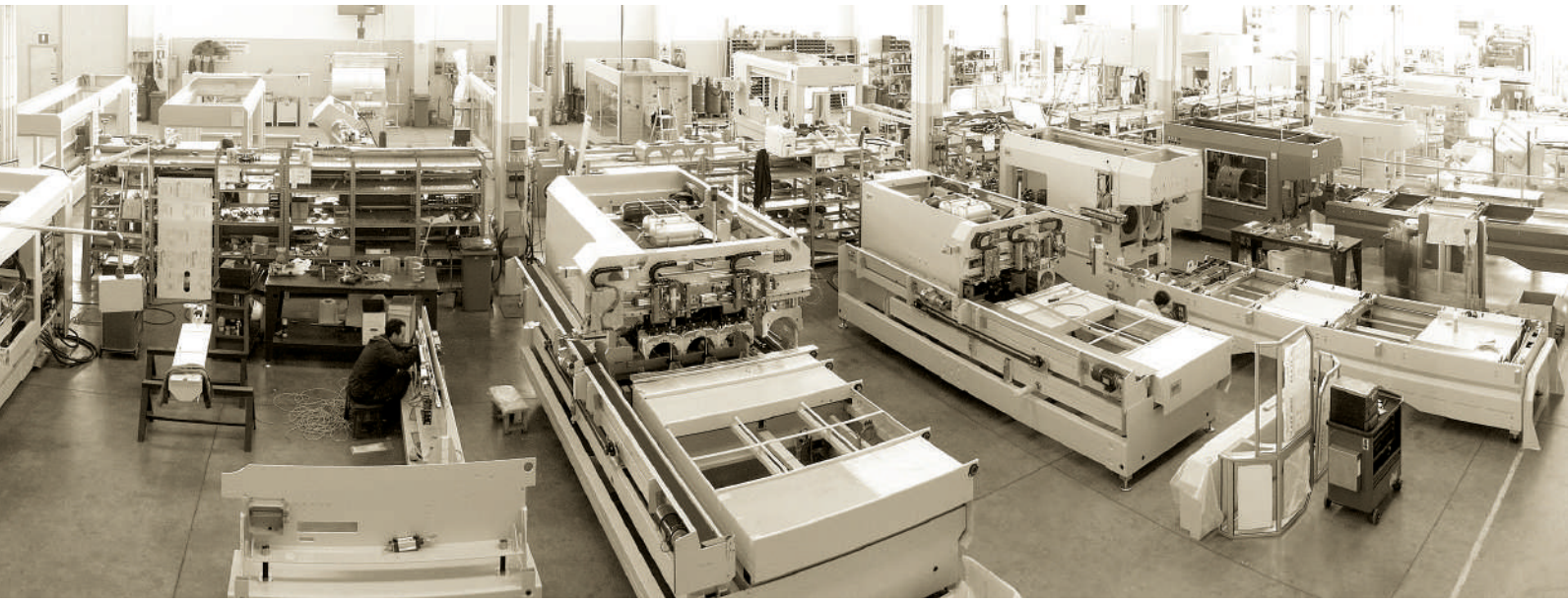

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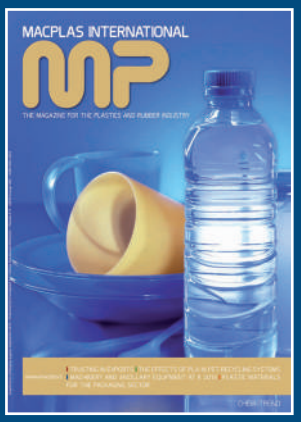

COVER STORY

Small, efficient aids

Process efficiency is a key factor in the manufacturing process of thermoplastic products, especially in a growth sector such as the packaging industry. Numerous factors can reduce productivity during the manufacturing process. The most common anomalies include surface defects such as scratches, schlieren and stress cracking, as well as colour and or material impurity. These problems can be mitigated through the use of suitable external processing materials, which, unlike their in-house counterparts, comprise all products that help to optimise the manufacturing process and are not incorporated into the end product. Under dedicated brands, Chem-Trend (hall 7.2, stand E09 at K 2013) offers a portfolio of reciprocally compatible products that ramp up productivity for manufacturers in the thermoplastic industry.
Release agents not only prevent form adhesion of the material to the mould, but also help to improve surface quality and avoid stress cracking. The latest generation of release agents form a film on preform and film surfaces during the moulding process, thus minimising scratching during the downstream processes. It is important to use an injection moulding tool lubricant that provides long lasting lubrication and soft running and that thus obviates the need for time-consuming tool re-lubrication. The lubricant should also not become encrusted or form any hard residues.
Colour changes always pose a problem, since all residues must be removed from the injection moulding machine plasticiser screw; otherwise such residues may cause schlieren. Such "ghost colours" sometimes manifest themselves a number of hours after completion of the production process. Cleaning granulates developed specially for this process allow for efficient machine component cleaning that reduces reject rates and downtime. Mould cleaners are used to remove residues and decomposition products from the mould. Targeted use of cleaners that remove degasifiers and oligomers leave the form in an extremely clean state, thus enhancing the quality of surface characteristics. The advantage of solvent-free mould cleaners is that they reduce downtime since they can be injected directly into the heated mould. Regular application of a long-lasting anti-corrosion agent helps keep machine components as well as moulds in good condition.

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RICCARDO AMPOLLINI

MACPLAS INTERNATIONAL IS BACK!

Well known in the world of plastics, macplas international was published in several languages, from Russian to Polish (under the name Tworzywa), Chinese, and Farsi, until 2010. Back again at K 2013 (Düsseldorf, 16-23 October 2013), the biggest international trade fair for plastics and rubber industry, macplas international makes an entrance showing off its brand new layout.

Published to coincide with major international trade fairs for the plastics industry, it is going back to its original name, macplas international, to enhance the macplas brand, after the short experience of Made in Italy and Machines Italia special issues. As with B2C products, often subject to fashion trends which nearly impose a new look with each season, also publishing products, although not as often, undergo a restyling process to keep up with changing times and adapt to new ways of reading, which are now quicker and more immediate. A trend that many magazines, not only specialized publications but also widely distributed consumer magazines, try to follow in different ways. Macplas has therefore decided to adopt a revamped look, starting from the August-September issue of the Italian magazine and the first issue of the year of macplas international, dedicated to K 2013 in Düsseldorf. The restyling can be noticed straightaway, starting from the cover, where the new MP logo stands out, specially designed to be associated with the reputation the magazine has earned and consolidated throughout 38 years of publishing. So many years of history are summarized in just two letters, bringing back the idea which was originally behind the publication. That idea was to offer a product that would speak firstly about machinery for plastics (from which the name macplas and the MP logo), still the core of the publication, opening up to deal, in detail and in a modern way, with all issues related to the world of plastic materials (MP, again -standing for "Materie Plastiche" in Italian), from the environment to the endless applications which can now be realized by using polymers and composites. Finally, the "minimal" logo allows to focus on the photo on the magazine cover, as it happened back in 1981, when the first restyling took place.

PROMAPLAST

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ITALIAN MACHINERY AND EQUIPMENT MANUFACTURERS

TRUSTING IN EXPORTS

SOME CONSIDERATIONS AND DATA REGARDING MEMBERS OF ASSOCOMAPLAST, THE ITALIAN ASSOCIATION CONSISTING OF APPROXIMATELY 160 MANUFACTURERS OF PLASTICS AND RUBBER MACHINERY, EQUIPMENT AND MOULDS, MOST OF WHOM ARE PARTICIPATING AT K 2013 IN DÜSSELDORF

At the last annual assembly of Assocomaplast members, held on June 6 at the Cesap centre in Verdellino-Zingonia (Bergamo, Italy), the president of Assocomaplast, Giorgio Colombo, underlined how Italian manufacturers operating in the plastic and rubber industry are increasingly being called upon to make great innovations and constant improvements to confirm their ability to deliver high-tech solutions, destined above all for major international markets that are investing heavily on advanced machinery and energy efficiency. Referring to the most important indicators that shaped the performance of the sector in 2012 - production value at 4 billion euro, almost the same as 2011, exports rising by 5.9%, to almost 2.6 billion - Colombo highlighted how it was foreign sales (representing approximately 65% of sales) that were sustaining the industry.

To support Italian manufacturers, Assocomaplast has scheduled a series of promotional activities - participation at fairs, workshops and B2B events, technological seminars, buyer missions etc. - aimed at promoting, consolidating and improving knowledge of the Italian industry on many world markets. The main appointment this year is, obviously, the K fair in Düsseldorf, Germany (October 16-23, 2013), where Italy traditionally takes part en masse, with a presence second only to German companies, confirming the predominant position Italian manufacturers hold on the world stage. The Assocomaplast's stand at the fair is A56 in hall 16.

A NUANCED SEMESTER

The analysis by Assocomaplast of the latest ISTAT (Italian National Institute of Statistics) figures for Italian foreign trade shows that, in the first half of 2013, imports in the sector were somewhat weak compared to the same period in 2012 whereas exports held relatively firm, as summarized in **table 1**. The downturn in imports is a symptom of

Giorgio Colombo (left) and Mario Maggiani, respectively president and director of Assocomaplast, during the last annual assembly of Assocomaplast members

TOWARDS PLAST 2015

On June 27 the first meeting between the Plast fair secretariat (the next edition being scheduled in May 5-9, 2015, in Milan) and the Fiera Milano executives working on Expo 2015 (that will also be held in Milan, from May 1 to October 31, 2015) was held to identify possible synergies between the two events. A possible cooperation agreement will involve joint marketing initiatives and concrete benefits for international operators in the plastic and rubber industry, with the aim of exploiting all extraordinary incentives available from 129 countries attending Expo 2015 in order to arrange delegation visits to Milan. It should be remembered that 1,514 exhibitors took part at Plast 2012 (828 Italians and 686 from 58 countries), on a net surface area of 56,832 square metres (78% machines - 20% raw materials and products - 2% services) with a total number of 50,593 visitors, 18,162 from abroad (representing 121 countries). Considering the negative economic context surrounding the fair, this figures exceeded the expectations of the majority of exhibitors and confirmed the importance of Plast as a triennial appointment for industry operators. More than 3,500 machines and auxiliaries were exhibited in operation in the fairgrounds, which also hosted a satellite hall dedicated to the rubber industry: Rubber 2012, the success of which was an excellent prelude, operators hope, for a second appointment as part of Plast 2015. The broad-ranging exhibition showcase was completed by plenty innovations in the field of materials, finished products, semi-finished goods and services, in addition to a number of international conferences and seminars on the main topical issues in the plastic industry.

www.plastonline.org

TABLE 1 - ITALIAN IMPORTS-EXPORTS OF PLASTICS AND RUBBER MACHINERY, EQUIPMENT AND MOULDS *(January-June, 000 euros)*

	IMPORTS			EXPORTS		
	2012	2013	Δ% 2013/ 2012	2012	2013	Δ% 2013/ 2012
Flexographic printers	6,041	9,165	51.7	51,534	53,899	4.6
Injection moulding machines	34,881	30,572	-12.4	46,174	57,183	23.8
Extruders and extrusion lines	15,982	8,930	-44.1	159,818	151,972	-4.9
Blow moulding machines	4,626	2,843	-38.5	65,757	60,895	-7.4
Thermoforming machines	3,429	1,339	-61.0	26,938	22,686	-15.8
Various presses	4,696	6,734	43.4	51,104	49,744	-2.7
Other machines	30,785	33,235	8.0	319,735	307,278	-3.9
Parts and components	70,137	66,479	-5.2	167,948	165,794	-1.3
Moulds	127,530	120,391	-5.6	345,887	344,885	-0.3
Totale	**298,107**	**279,688**	**-6.2**	**1,234,895**	**1,214,336**	**-1.7**

Source: Assocomaplast

a domestic market that still struggles to recover. However, a potentially promising sign, on this front, is the forecast issued by Confindustria (the Italian employers' federation, to which also belongs Assocomaplast), which predicts that Italy's GDP will stabilize in the third quarter of the year and even grow slightly (+0.3%) in the final quarter. What is more, an Assocomaplast business survey conducted at the start of September on a sample of plastics and rubber processing companies reveals a certain degree of optimism, with processors' order books up compared to the preceding month and, most importantly, favourable 3-4 month projections.

TABLE 2 - TOP TEN DESTINATION COUNTRIES OF THE ITALIAN PLASTICS AND RUBBER MACHINERY, EQUIPMENT AND MOULDS EXPORTS

(January-June, % out of total)

	2012	2013
Germany	14.7 (1°)	14.9
United States	5.5 (3°)	6.0
France	6.3 (2°)	6.0
Russia	5.5 (4°)	5.6
Poland	4.6 (6°)	5.2
China	5.1 (5°)	4.0
Spain	3.7 (8°)	3.9
United Kingdom	3.1 (10°)	3.7
Brazil	3.6 (9°)	3.4
Turkey	3.7 (7°)	3.0

Source: Assocomaplast

The drop in exports, meanwhile, can be considered minor (-1.7%), especially given their overall ups and downs. Foreign sales in fact followed an intermittent trend over the first six months of 2013: after a decidedly strong start to the year - entrained by the positive close to 2012 - export flows lost some momentum, though without any of the steep declines suffered by other Italian mechanical engineering sectors. It has to be said that, aside from the general economic situation, Italy's domestic political problems pose a further obstacle to recovery. In light of this fact, maintaining exports at essentially the same level as in the preceding year can be regarded as an achievement. The attitude of Italian machinery manufacturers is moderately optimistic. In fact, the latest survey conducted by Assocomaplast among its members shows that companies expect to see an improvement in turnover over the second half of the year, also in view of the upswing in orders in July of this year, compared to both June 2013 and July 2012. This, at least, so far as exports are concerned, since the domestic market still doesn't show any encouraging signs.

For a more detailed analysis, we can look at the ranking of the top ten destination countries of Italian exports in the first semester of 2013 (**table 2**), in comparison with the same period of 2012. At K 2013 Assocomaplast is operating an information stand (A56, hall 16) to support and showcase Italy's participation with promotional materials and a small gallery of design objects and films tracing the evolution of plastics over the past few decades.

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ACMA SERVICE	16 / B70
AD COMPOUND	7.0 / B16
ADLER	**11 / B23**
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ALESSIOTECH	13 / D78
ALFATECH	16 / E68
ALIPLAST	5 / E21
AMOTEK SALES & SERVICE	3 / C46
AMUT	**16 / D43**
AMUTEC	**3 / C71**
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AREA	13 / C12
ARGOMM (AR GROUP)	8A / B21
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BATTAGLIO LUCIANO & C.	11 / C08
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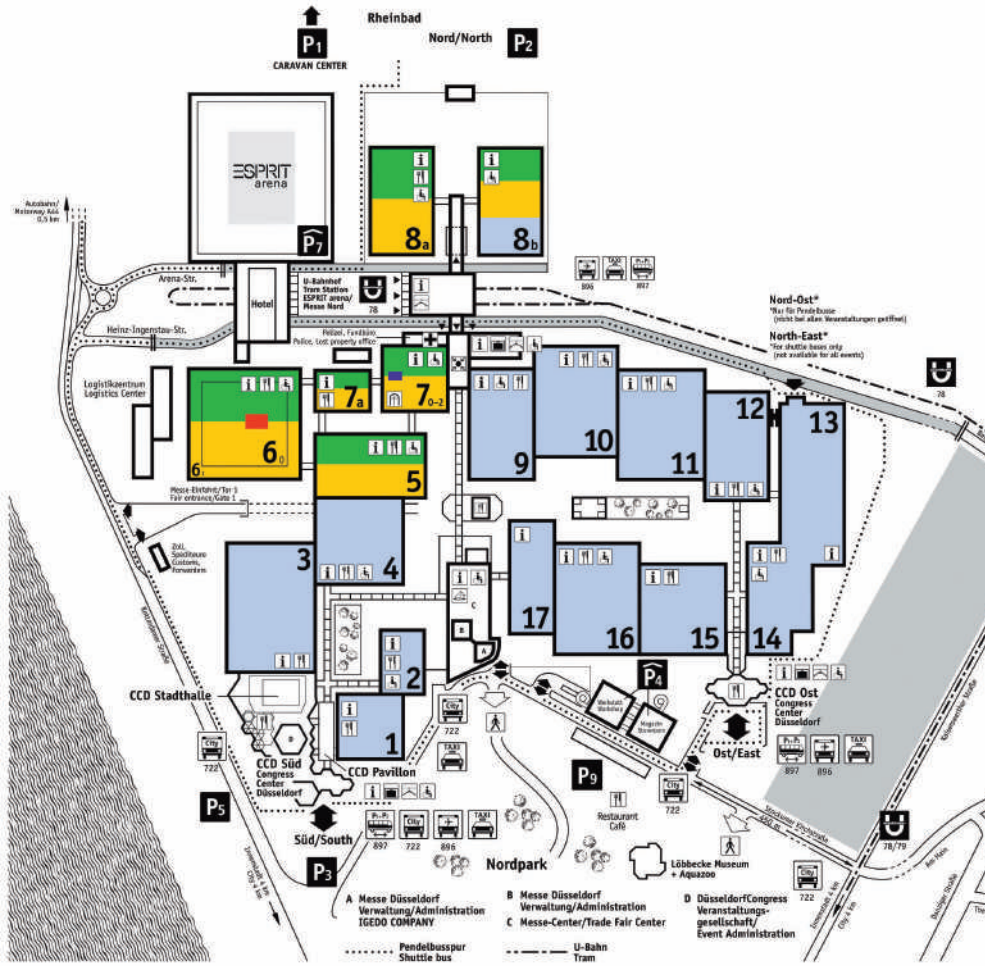

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GREEN BOX	**10 / H03**
GRIP SERVICE	12 / B34
GRUNIVERPAL TRANCHERO	11 / B74
GUARNIFLON	7.0 / B29
GUIDOLIN GIROTTO	3 / C12
GUSBI OFF. MECC.	13 / A26
GUZZINI ENGINEERING (DIVISIONE ACRILUX)	1 / C29
HELIOS, ELIO CAVAGNA	3 / F71
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HITEMA	10 / B76
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INTERCAR DI GAITO PASQUALE & C.	8B / E25
IPM	**16 / D58**
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IST (ITALIA SISTEMI TECNOLOGICI)	4 / B01
ISVE	10 / J16
ITALCOM	8B / E25
ITALCOPPIE SENSORI	11 / A53
ITALIAN GASKET	7A / C12
ITALMATCH CHEMICALS	8B / F46
ITALMEC - G3	3 / E36
ITALWORK ROLLS	3 / F34
ITIB MACHINERY INTERNATIONAL	**15 / D37**
ITS (ITAL TRADE SERVICES)	11 / A71
ITW-INSTRON	**10 / J18**
JCOPLASTIC	8B / E25
K-TECH-ITALIA	1 / F16
KROMABATCH	7.2 / C18
LAEM SYSTEM	4 / A04
LAMBERTI	8A / D41
LAMFI EQUIPMENT	1 / A20
LAWER	13 / A61
LINEA 3	2 / A23
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MAGIC MP	**14 / C33**
MAGMA DI PAOLO GUAGLIO E C.	13 / A86
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MAIN TECH	11 / H22
MAKLAUS	3 / B36
MANIFATTURA CATTANEO	8A / D37
MARANGON DANILO & C.	1 / C07
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MOBERT	**3 / E16**
MONDIALSTAMPI	1 / D05
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MORETTO	**11 / H57**
MOSS	**4 / B52**
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MVV	11 / F32
NEGRI BOSSI	**15 / B22**
NEW OMAP	9 / B74
NEXA	7.0 / B29
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NORDMECCANICA	4 / B39
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NOVOTEX ITALIANA	5 / C19
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PASQUATO DI PASQUATO LORENZO E BAZZA PAOLO	3 / A53
PATI	7.1 / A22
PEBO	8B / D56
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PLAS MEC	**9 / A60**
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PLASTICA ALTO SELE	8B / E25
PMS DI MENCARELLI LUCA E R.	1 / F01-2
POLIVINIL ROTOMACHINERY	**9 / C22**
POVELATO	11 / D11
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PREVIERO N.	**9 / D41**
PRIMPEX	8A / G42
PRODICON INTERNATIONAL	9 / E29
PROFILE DIES	**16 / E72**
PROMASS	13 / C37
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QS GROUP	**3 / C51**
RADICI PLASTICS	6 / B10
RAMBALDI & CO. IT (INTERNATIONAL TRADING)	13 / A44
RE CONTROLLI INDUSTRIALI	4 / D35
RE.MA. PLAST	8B / E25
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REG-MAC	**9 / D52**
REGIONE MARCHE	2 / A23
REGLASS HT	4 / B40
REPI	6 / B24
RG CHEM	8A / B02
RIPRESS	**15 / A03**
RITMO	11 / E40
RIVI	**15 / A06**
ROBOR	11 / E59
RODOLFO COMERIO	**16 / B54**
ROMAGNANI STAMPI	1 / D06
ROSSI STAMP	2 / B14
ROSSINI	4 / E21
ROTFIL	1 / D29
ROTO MOULDS	13 / D63
ROTOMAC	3 / R 3F52
RP INJECTION	13 / C76
SABO	6 / C79
SACMI IMOLA	**15 / B06 - 13 /A63**
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SARA	3 / E35
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SCAE EUROPE	**3 / B55**
SCS (SOCIETÀ COSTRUZIONE STAMPI)	1 / R 1F01-6 - 1 / A05
SEI LASER	4 / C25
SELECTRA	4 / B49
SER	8A / H10
SETTIMA MECCANICA GEAR PUMPS	7.2 / B13
SICA	**16 / A22**
SILIKONEUROPE	8B / C51
SIMA	**12 / B50**
SIMATEC	11 / F40
SIMEC GROUP	4 / E19
SIMEX	2 / A23
SIMO	**2 / A23**
SIMPLAS	**2 / D04**
SIPA	**13 / B11**
SIRE	7.2 / E25
SIRMAX	8B / F63
SLIDER PACK	3 / F63
SOFTER	6 / A58
SO-MEC	1 / E15
SOCIETA CHIMICA LARDERELLO	7.2 / C12
SONIC ITALIA	11 / C72
SOREMA DIVISION OF PREVIERO N.	**9 / D55**
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T2	**3 / E80**
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ULTRA SYSTEM	**13 / D89**
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UNION OFFICINE MECCANICHE	**16 / B60**
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UTECO CONVERTING	4 / A36
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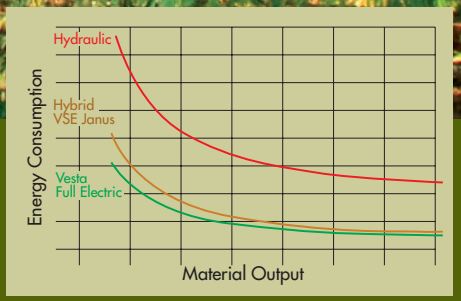

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THE SOUTHEAST ASIAN MARKETS

A UTOPIA FOR GROWTH

WHEN THE GLOBAL ECONOMY DIPPED IN 2008 AND 2010, OPPORTUNITIES FOR GROWTH IN SOUTHEAST ASIA REMAINED UNPERTURBED. THE CONVERGENCE OF ASEAN INTO A SINGLE MARKET (AEC) BY 2015 PRESENTS FURTHER OPPORTUNITIES FOR COMPANIES IN THE PLASTICS AND RUBBER SECTORS

The Association of Southeast Asian Nations (ASEAN) has a 600 million consumer base, with a GDP of 1.5 billion euro, spread over a geographical area of 4.4 million sq km. Showing strength in numbers, the ten-member league, comprising Brunei, Burma (Myanmar), Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam, is treading towards an optimistic growth trend, making it indeed a beacon for multi-national and international companies. Basically anchored to the US and Europe for their export revenues, the Asean countries' shift to catering to regional consumption, which has since increased, has buffered the group against the global crisis. The Asean's plastics industry has shown a reliable 9% average annual growth, braving the nemesis of declining demand, volatile prices, capacity constraints and labour shortages.

Firming up trade initiatives, such as the Asean Free Trade Agreement (AFTA) in 2010, which has cut importation tariffs from zero to 5%, as well as the Asean-Korea Free Trade Area (AKFTA); the trade pact with China (ACFTA), and the Expanded Economic Engagement (3E) initiative are expected to bolster investments opportunities for the Asean. As for the Asean Economic Community (AEC), it aims for a single market and production base characterised by free flow of goods, services, investments, capital and skilled labour. Trade barriers will be dropped starting from 2015. Increasing wages and business incentives biased in favour of local manufacturers are beginning to dull China's edge, with production costs to increase twice or thrice by 2020, according to the Boston Consulting Group. These and other factors should bode well for Asean countries, with production being rerouted from China to countries like Vietnam and Indonesia, in view of the disparity in production costs.

SINGAPORE: HUB FOR PRINTED ELECTRONICS

Printed or organic electronics as well as green electronics, bioelectronics and security devices are emerging growth areas for Singapore's electronics sector, according to the Economic Development Board (EDB). Printed electronics already accounts for 10% of the country's total electronics output and by 2020 will grow by 30%, against the global market that is expected to grow to more than 9.4 billion euro in 2016, according to BCC Research. Applications include disposable electronics, retail se-

curity sensor tags, flexible display devices and smart packaging, which detects food expiration. In fact, Singapore's Institute of Materials Research and Engineering (IMRE) pioneered a breakthrough polymeric material for use in electronic and thin-film solar cells through nanotechnology, to lower the cost and speed up the production process for semi-conductors.

THAILAND AND INDONESIA: KEY PLAYER IN BIOPLASTICS AND PACKAGING

The biorenewable materials market, which according to Frost & Sullivan is expected to grow at a rate of over 19% until 2018, is the target of Thailand's government-initiated strategy to turn the country into a bioplastics hub by 2021. This is likely to succeed since the world's third largest bioplastics producer (after Japan and China) has the agricultural resources, infrastructure and government platforms it requires.

It also hinges on the Thailand's biobased polylactic acid (PLA) capacity, which will rise from 182,000 t/year in 2011 to 721,000 in 2020, according to the National Innovation Agency (NIA) of Thailand and nova-Institute (Germany). This is against the Asian capacity for PLA, which is expected to reach more than 350,000 tons. But most of the capacity will be exported as domestic demand still remains weak. A forerunner in the packaging sector is Indonesia. According to a recent report by the McKinsey Global Institute, it could add 90 million new consumers by 2030 to become the world's seventh largest economy. It is for this reason that the country finds its niche in the packaging industry, with a revenue climbing 11% to 3.27 billion euro in 2012, compared to the previous year. By 2016, the revenue from the packaging sector is expected to double at an annual growth rate of more than 10%. Indonesia's plastics consumption in 2011 was 2.8 million tons and went up to 3 million in 2012. Almost 70% of the total plastics use was accounted for by the food and beverage packaging sectors.

PHILIPPINES AND VIETNAM: WORKING TO COUNTER THE CHALLENGES

While Vietnam's plastics sector grew by 15-20% in 2011 and is anticipated to grow to 17.5% by 2020, it may not be competitive because the country still relies heavily on imported raw materials and machinery for the sector.

Meanwhile, the mélange of performances of some Asean members in the automotive segment show that demand and other variables, including government support, upgraded facilities and location, factor in the growth. For example, the Philippines's low domestic demand for vehicles could prompt some of the existing


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car manufacturing plants based to shut down. Likewise, the comparably small industry could hit the consumption of engineering plastics and rubber, although PVC will benefit from the 6% growth in the construction sector.

MALAYSIA: FORERUNNER IN MEDICAL DEVICES

A Frost & Sullivan report on medical devices in Asia cited that the sector is worth 46.7 billion euro, accounting for 26% of the global market. The medical device industry in Malaysia is amongst the most successful in Asia, with an estimated value of 0.84 billion euro in 2011 and is forecast to reach 1.27 billion in 2015.

Comprised of 190 medical device firms producing gloves, catheters, cannula needles, lenses, orthopedic products and other high value devices, the country's industry has been meted as a priority sector under the National Key Economic Area (NKEA). It is geared to serve the flourishing regional demand, fuelled by an ageing population, increased access to healthcare, lifestyle modifications and shifting trend towards medical tourism, according to the Malaysian Investment Development Authority (MIDA).

MEGATRENDS IN THE AUTOMOTIVE INDUSTRY

Revenues earned from the engineering plastics market in 2011 amounted to more than 1.6 billion euro and could even peak at 3.2 billion by 2018, with the robust sales in electrical appliances and vehicles in the region.

As early as 2009, lightweight vehicles have made inroads, and concepts for materials to ease the weight in vehicles are becoming competitive. The years 2011 to 2012 have pushed this trend to a higher level, recognising the dire need for more fuel efficient vehicles (not to mention compliance to CO_2 emissions regulations). The market for engineering plastics is, thus, assessed to grow at least 10-15% from 2012 to 2018. This growth will also be driven by the boom in the construction and infrastructure sectors.

The industry is expected to spiral upwards as the Asean bloc peaks in trade and economic homogeneity by 2015 with the AEC. Global consultancy firm Ernst & Young's recent market report on Light Vehicles forecasts a 10.6% CAGR over an eight-year period from 2011, culminating at 4.1 million units sold by 2019, with more than 40% to come from Indonesia and 33% from Thailand.

Location-strategic Thailand still remains as Asia's Detroit, with its automotive sector growing at around 8.1% of GDP, with local capacity forecast to reach 2.3 million units by 2014. The automotive sector can also help pull up rubber prices especially for the top Asian rubber producers, Thailand, Indonesia and Malaysia, which account for 67% of global output. Demand for rubber, mostly for tyres, is increasing, which has contracted the rubber surplus by 61% in 2011, as the three countries continue to stockpile rubber, cut down trees and reduce exports to boost prices.

WOOD-PLASTIC COMPOSITES: A GROWTH DRIVER

Another sector that is benefiting from the rising production costs in China is the PVC-based wood-plastic composite (WPC) industry. The fledgling WPC industry in Southeast Asia is expected to grow 10% a year by 2015, reaching 55,000 tons of production, says Austria-based Asta Eder Composites Consulting.

Compared to China's 1 million-ton capacity, the Southeast Asian capacity is relatively small, nonetheless, it is more export oriented than China. From 2008-2011, Southeast Asian WPC production grew to 34,000 tonnes and hence further opportunities for growth are anticipated.

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COMPOSITES EUROPE

A RETURN TO WEAK GROWTH IS EXPECTED FOR THE EUROPEAN MARKET OF GRP. THE TREND LINE FOR THIS SPECIALIST SEGMENT MORE OR LESS MIRRORS THE CURRENT STATE OF THE ECONOMY AND THE GENERAL TREND FOR THE PLASTICS PROCESSING MARKET

BY **AVK (GERMAN FEDERATION OF REINFORCED PLASTICS)**

THE EUROPEAN MARKET OF GLASS FIBRE REINFORCED PLASTICS IN 2013

A SLIGHTLY POSITIVE TREND FOR GRP

After a slight year-on-year decline in the volume of glass fibre reinforced plastics (GRP) produced in 2012, the sector returned to growth, albeit weak, in 2013. The overall market in Europe is expected to grow by 1% to an estimated 1.02 million tons (see **table 1**). The GRP industry is dominated by small and medium-sized companies and is therefore extremely diverse not only in terms of the spectrum of manufacturing processes and level of automation but also in regional differences, country-specific conditions and the raw materials used. Let's have a look at the trends in the development of procedures/components.

SMC/BMC

SMC (sheet moulding compound) and BMC (bulk moulding compound) components, mostly series manufactured, still account for one quarter of the total quantity of GRP produced. The largest market here is vehicle production, which is experiencing its most difficult year for some time in 2013. Consequently, SMC production has contracted by over 2%. As was the case last year, production of BMC components grew slightly by 1.4%, which can be attributed primarily to applications in the electro/electronics industry.

OPEN MOULD

The least automated "open processes" (hand lay-up, spray-up) continue to be in decline. While the volume of components manufactured using the spray-up process is stagnating, the market for hand lay-up parts is shrinking by over 2%.

RTM

Growth in the production of RTM (resin transfer moulding) components, at around 5%, has been stronger than average in 2013. Due to the wide

FIG. 1 – GRP PRODUCTION IN EUROPE FOR DIFFERENT APPLICATION INDUSTRIES (YEAR: 2013)

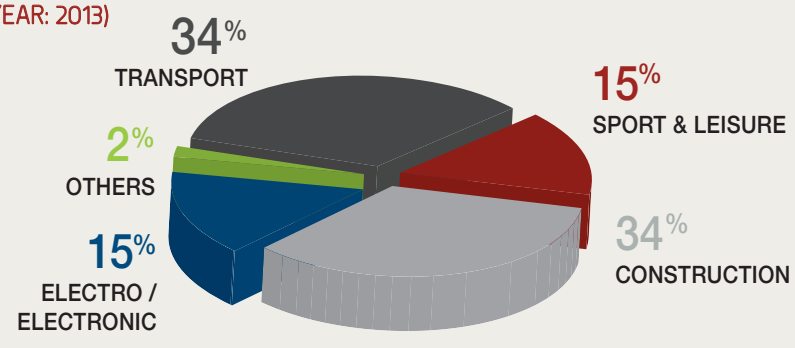

TABLE 1 - GRP PRODUCTION VOLUMES IN EUROPE ITEMISED BY PROCEDURES/COMPONENTS

	2013* Kt	2012 Kt	2011 Kt	2010 Kt	2009 Kt
SMC	184	188	198	198	160
BMC	71	70	69	69	56
Sum: SMC + BMC	**255**	**258**	**267**	**267**	**216**
Hand lay-up	142	145	160	160	123
Spray-up	90	90	98	92	74
Sum: open mould	**232**	**235**	**258**	**252**	**197**
RTM	**126**	**120**	**120**	**113**	**94**
Sheets	84	78	77	72	56
Pultrusion	47	47	51	47	39
Sum: continuous processing	**131**	**125**	**128**	**119**	**95**
Filament winding	78	80	86	82	69
Centrifugal casting	66	67	69	66	55
Sum: pipes and tanks	**144**	**147**	**155**	**148**	**124**
GMT/LFT	**114**	**108**	**105**	**100**	**75**
Others	**18**	**17**	**16**	**16**	**14**
Total	**1,020**	**1,010**	**1,049**	**1,015**	**815**

Source: AVK

kT = kilotons
2013 = estimate*

TABLE 2 - GRP PRODUCTION VOLUMES IN EUROPE - AND TURKEY - BROKEN DOWN BY COUNTRY / GROUP OF COUNTRIES

	2013* Kt	2012 Kt	2011 Kt	2010 Kt	2009 Kt
UK / Ireland	140	134	126	130	106
Belgium / Netherlands / Luxembourg	42	43	42	40	31
Finland / Norway / Sweden / Denmark	44	44	52	50	52
Spain / Portugal	152	160	200	217	188
Italy	146	152	165	154	122
France	112	117	122	116	87
Germany	192	182	172	161	118
Austria / Switzerland	17	17	17	16	13
Eastern Europe**	175	161	153	131	98
Total	**1,020**	**1,010**	**1,049**	**1,015**	**815**
Turkey***	214	195	180		

Source: AVK

kT = kilotons
2013 = estimated*
*Eastern Europe** = Poland, Czech Republic, Hungary, Romania, Serbia, Croatia, Macedonia, Latvia, Lithuania, Slovakia and Slovenia*
*Turkey*** = Source: TCMA*

range of production possibilities and the broad scope for changing its process parameters, RTM processes are currently among those receiving the greatest attention with regard to the development of large series production processes in the composites sector.

CONTINUOUS PROCESSING

With annualised growth of nearly 8%, continuous processes for manufacturing GRP panels and webs have been among the fastest-growing in the sector. As well as applications in the transport sector, suppliers are also opening up an ever-growing number of new uses in the sport/leisure and construction sectors (e.g. for facades).
After its contraction last year, the market for GRP pultrusion profiles has stabilised in 2013 and is no longer in decline in Europe.

PIPES AND TANKS

Western European countries again recorded a slight fall of 2% in the production of pipes and tanks, which are manufactured using the centrifugal casting and filament winding processes. However, the production figures for Europe do not reflect country-specific differences or major drinking water projects in the countries of Central and South-Eastern Europe as well as North Africa.

GMT/LFT

As was the case last year, the market trend for glass mat reinforced thermoplastics (GMT) and long fibre reinforced thermoplastics (LFT) was significantly more positive than the average. The main area of application for these products is the automobile industry. Here, manufacturers of thermoplastics have, above all, repeatedly found success in replacing other materials and opening up new areas outside this industry.

SHORT FIBRE REINFORCED THERMOPLASTICS

The quantities of short fibre reinforced thermoplastics produced are difficult to assess and record and as a result they are not included in the GRP study presented by AVK on September 17, 2013, in the occasion of the exhibition Composites Europe. However, this area is growing fast compared to the GRP market as a whole. It is estimated that the total quantity manufactured in Europe is more than 20% greater than the production figure for GRP stated here. Approximately half the volume produced is used in applications in the transport sector, one quarter in the electro/electronics sector and somewhat more than 15% in the area of sport & leisure.

APPLICATION INDUSTRIES AT A GLANCE

Once again, this survey has detected virtually no shift in the proportions of GRP components used in the individual application industries in 2013. The transport and construction sectors each consume one third of total production volume. Other sales markets include the electro/electronics sector (E&E) and the sport & leisure segment.

GRP PRODUCTION IN 2013: ITEMISED BY COUNTRY

Table 2 shows clear differences in the development of the market in the various European nations. These correspond very closely to the growth or contraction in the respective economies and the major applications for GRP components in these countries. Only a few countries are experiencing any growth at all. As was the case last year, these include Germany, the UK/Ireland and Eastern European countries. In the case of Germany, this is due to the generally good growth in its economy. In Eastern Europe, growth is primarily being driven by major infrastructure projects. GRP production is still declining most significantly in the countries of Southern Europe, whose economies continue to be in recession - although this negative trend is less pronounced than in 2012. Volumes in the Benelux countries are also shrinking while the markets in Austria and Switzerland are stagnating. According to figures provided by the Turkish Composites Association (TCMA), the country is again expecting above average growth - compared to the rest of Europe - of nearly 10% in 2013. The slow growth of the European GRP market in 2013 closely mirrors the general development of the European economy. Nor is any other region of the global economy growing as strongly as last year. Although continued growth is expected in the BRIC countries (Brazil, Russia, India, China) in 2013, this is significantly weaker than in recent years.

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NEWS

Global markets

Demand for TPEs to reach 5.8 million tons in 2017

Global demand for thermoplastic elastomers (TPEs) is forecast to rise 5.5 percent per year to 5.8 million tons in 2017, valued at more than 20 billion dollars. Advances will be driven by ongoing product innovation on the part of TPE manufacturers, allowing these materials to continue to displace traditional elastomers and thermoplastics in a variety of applications. Furthermore, TPE demand will benefit from the ongoing push to reduce motor vehicle weight. Healthy growth will also be fuelled by an improved economic outlook in North America and Western Europe, while advances in emerging countries will benefit from increased adoption of TPEs in place of competing materials. These and other trends are presented in World Thermoplastic Elastomers, a new study from The Freedonia Group, a Cleveland-based industry market research firm.

Styrenic block copolymers (SBCs) will remain the leading TPE product type through 2017. However, SBC demand will rise at a below average pace compared to TPEs overall, limited by a high degree of market saturation in many large volume applications. The fastest growth is expected for polyolefin elastomers (POEs), a relatively new TPE product class which is gaining rapid acceptance as a performance additive for plastics and packaging adhesives. Motor vehicles account for the largest portion of the world TPE market, with one-third of total demand in 2012. Advances will be bolstered by improvements in the TPE-intensive North American and West European automotive industries through 2017, as well as increased TPE use in emerging markets, although demand will be limited by continued declines in Japanese vehicle production.

The Asia/Pacific region will remain the largest market for TPEs through 2017, rising at an above average pace to account for nearly half of world demand. China, the world's largest consumer of TPEs in volume terms, will continue to see more than eight percent annual growth in demand. Regional gains will also benefit from robust expansion in India and Southeast Asia, whereas growth in the Japanese market will remain sluggish. Other regions that will enjoy above average advances in demand through 2017 include the Africa/Mideast region, which currently has the world's lowest TPE consumption levels per capita. TPE demand growth in North America and Western Europe will see substantial improvement compared to the recession-plagued 2007-2012 performance.

www.freedoniagroup.com

WORLD THERMOPLASTIC ELASTOMER DEMAND (thousand tons)

	% Annual Growth				
Item	**2007**	**2012**	**2017**	**2007-2012**	**2007-2012**
North America	1112.0	1198.0	1510.0	1.5	4.7
Western Europe	869.5	839.0	1000.0	-0.7	3.6
Asia/Pacific	1411.5	1970.0	2700.0	6.9	6.5
Other Regions	367.0	455.0	620.0	4.4	6.4
Thermoplastic Elastomer Demand	***3760.0***	***4462.0***	***5830.0***	***3.5***	***5.5***

Source: The Freedonia Group

Plastic Caps and Closures

A growing market thanks to cosmetics and pharma

Plastics are not only an important material in the manufacturing of packaging, but also become ever more important in the production of caps and closures. Market researchers at Ceresana forecast global demand for plastics caps and closures to rise to more than 1.1 trillion (1,100,000,000,000) units in 2020! Their worldwide most comprehensive market report regarding plastic caps and closures also offers a detailed analysis of individual application areas. In 2012, about 62% of all caps and closures were processed in the sector beverages (lemonades, water, fruit juices etc.). The remaining closures are utilized for applications such as food containers, cosmetics, personal care products, perfumes, pharmaceuticals, and household detergents. "The sector cosmetics and pharma in particular will experience a highly dynamic development during the next couple of years. Demand for plastic caps and closures is likely to increase by 4.9% p.a. until 2020", says Oliver Kutsch, CEO of Ceresana.

The market for plastic caps and closures is profiting substantially from an increasing use of packaging made of plastics, of PET-based disposable bottles in particular. Rising demand for bottled water and smaller packaging sizes as well as dispensing systems will provide important stimuli to growth in the future. The quality of plastic caps and closures is improving continuously. Thus, they gain access to segments that traditionally used other materials. Examples for this trend are the sub-categories wine, beer, or liquid foodstuffs such as sauces.

More restrictive packaging standards in countries of strong economic development and increasing requirements of consumers on packaging all around the world are likely to result in a rising consumption of advanced closures, such as temper-evidence caps and dispensers. Reduction of costs and weight remains a declared goal of manufacturers. On the other hand, lighter closures still have to meet the high requirements. Additional growth impulses are provided by an increase of world population, rising standards of life in emerging countries, and the spread of a westernized way of consuming. As a consequence, Ceresana forecasts a considerable increase of demand to occur in Asia in particular. This region is expected to increase world market share from 34% to approx. 42% during the next eight years.

www.ceresana.com

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NEWS

Chinese market for medical polymers

A steady growth over the next five years

In a new report from BCC Research the Chinese market for medical polymers was valued at 1.7 billion dollars in 2011 and at $1.9 billion in 2012. The report forecasts total market value to surpass 4 billion dollars in 2017, after increasing at a five-year compound annual growth rate (CAGR) of 16.1%. The Chinese medical polymer market is growing quickly due to its close relationship with the pharmaceutical and medical device industries in China. It has grown steadily over the last twenty years and BCC Research predicts that this growth will continue over the next five years. The Chinese medical polymer market is expected to be influenced by several factors such as the fast growth of the medical products market, establishment of pharmaceutical and medical device manufacturers in China, shifts by polymer manufacturers towards medical applications, production efficiency improvement, low emission standards and solutions for environmental constraints. According to the report, the cardiovascular market is the fastest growing market in terms of consumption of medical polymers, although it is currently one of the smallest markets. The research and development efforts for nontoxic polymers are increasing because of the high safety standards in the medical industry. The industry will also be significantly impacted by the increased environmental regulations in China. The medical polymers market and production centres are concentrated in five major regions in China, including the Yangtze River Delta, the Pearl River Delta, and Northern China. This report identifies the Yangtze River Delta as both the largest and fastest growing region for medical polymers in China.

www.bccresearch.com

New prospects for Indian films

The performance statistics of the plastic film industry in India were disclosed during a conference on flexible packaging organised by Elite Plus Business Services on August 29-30 in Mumbai, India. According to the statistics data, an increased demand for flexible packaging is expected, whose growth rate should be higher than stiff packaging, whose current demand accounts for nearly one million tons. In detail, in 2012 BOPP film consumption reached 280 kt, while production was up to 325 kt. For the next few years the Indian Film Manufacturers Association expects a 15% increase. As for BOPET films, consumption reached 285 kt and production 350 kt, with an expected growth of about 12%. Consumption of CPP films was 24 kt; in this case too, a 15% growth is foreseen. The main application area of plastics in India is represented by packaging which accounts for about 35% of the consumption of raw materials. Currently, the Indian demand for polymers is about 10 million tons but it could double by 2015 and then reach 40 million tons by 2021.

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NEWS

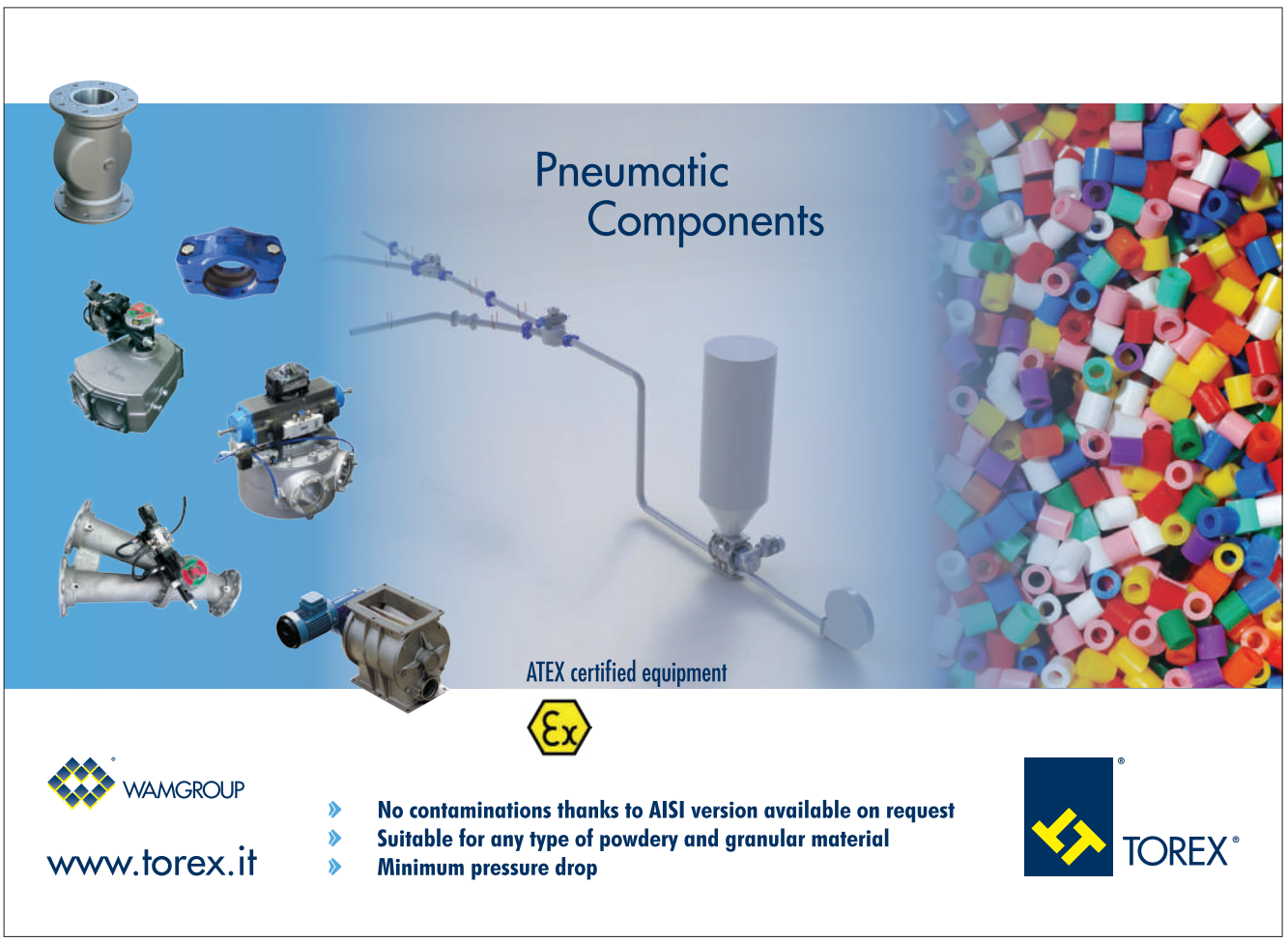
BOPP film

Demand returns to the West

Representing almost 50% of total European PP film demand, the West European bi-oriented polypropylene (BOPP) film industry has struggled to gain any upward momentum over recent years due to factors including the region's economic weakness, changes in production strategy by multinational food packers and the maturity of the market. Growth in European markets at 1% per annum, and offsetting declines in West European BOPP film demand, has come from the greater use of cast polypropylene (CPP) film in Western Europe and strong PP film market growth in Eastern Europe. Author of PCI's latest findings, Steve Hillam commenting on the market situation said: "Demand in the European PP film market has undoubtedly been hindered by the weakness in the BOPP film sector in Western Europe. However, with demand returning, plus continued economic recovery, strong GDP growth driving East European flexible packaging consumption, and a continued switch from rigid to flexible packaging formats, I believe the future looks very positive for European polypropylene films".

Responding to this growth will be more PP film being made available in the coming years with new film extrusion capacity coming on stream and existing suppliers improving their capacity utilisation rates. While a majority of the new capacity is expected to be for BOPP film and will be installed in Eastern Europe, predominantly Russia, a new line is also being planned for Portugal. This new capacity is expected to increase competition in the European PP film market by targeting imported volume but is also expected to be directed at export markets. PCI Films Consulting's latest report, "European Polypropylene Film Market Trends to 2017", outlines the factors currently affecting capacity, production and demand in the European PP films market.

www.pcifilms.com



North American thin wall packaging industry

Tackling the ever squeezing margins

An authoritative report from industry consultants Applied Market Information, published in August 2013, defines and analyses thin wall packaging market trends in North America. Thin Wall Packaging (TWP) is a market with a still unclear definition in North America. So the consulting company perceives it from the perspective of the end-use market and packaging formats. The TWP industry encompasses thermoformed and injection moulded plastic tubs, pots, trays and cups. The 3.5 million tons industry can be split into foodservice and retail packaging. The proportion of foodservice and retail TWP in North America is skewed towards foodservice, which accounts for 56% of the market by volume. This translates to the demand of nearly 2 million tons in 2012. The remaining 44% of TWP volume was used in retail packaging applications, with volume demand equivalent to 1.5 million tons in 2012.

Retail TWP applications include for example chilled dairy cups, meat/fish/poultry tray, fruit punnets, margarine tubs and long-life food containers. The intense retail environment is increasing retailer focus on ways to differentiate from the competition, efficiency gains to lower margin pressure, rationalisation of SKUs, and inventory reduction. Price competition drives efforts to streamline supply chain and improve vertical coordination. It has become imperative for the North American thin wall packaging industry to review operations in search for cost savings and efficiency optimisation to counteract the ever squeezing margins and offer more competitive prices for customers addressing consumer spending constraints.

Italian manufacturer SELLS

models, along with working drawings and technical assistance, for the production of star and switch valves integrated into pneumatic conveying plants.

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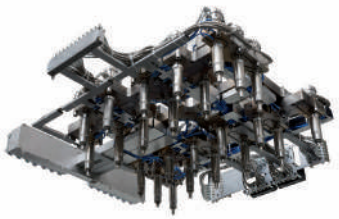

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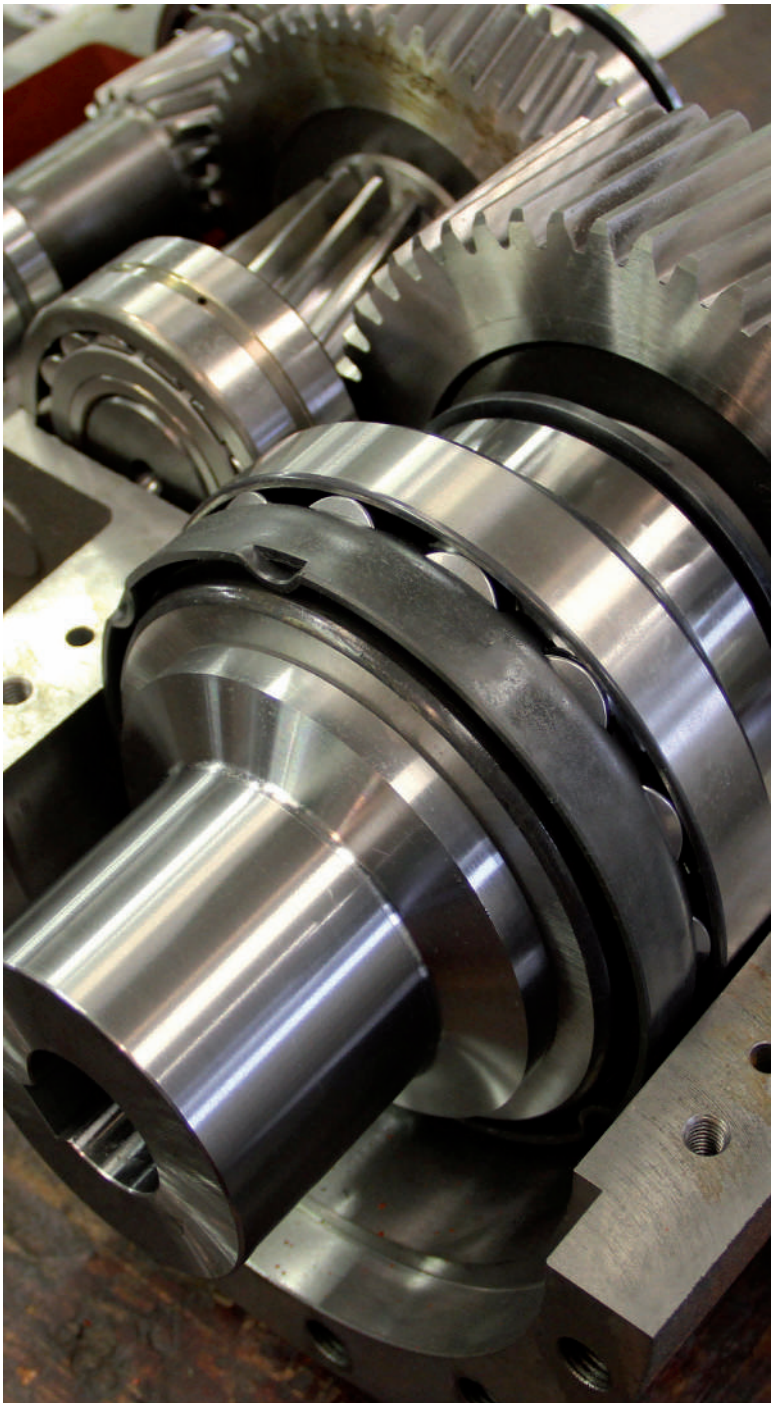

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UNTIL A FEW YEARS AGO, THE MOST COMMON IMPURITIES IN POST-CONSUMER PET WERE PAPER AND ALUMINIUM. LATELY, HOWEVER, THE MARKET HAS SEEN THE INTRODUCTION OF CONTAINERS, PARTICULARLY BOTTLES, MADE FROM A BIODEGRADABLE POLYMER KNOWN BY THE ACRONYM OF PLA (POLYLACTIC ACID)

BY **F.P. LA MANTIA, L. BOTTA, R. SCAFFARO*** AND **M. MORREALE****

EXPERIMENTAL INVESTIGATION

THE EFFECTS OF PLA IN PET RECYCLING SYSTEMS

The use of PET in the food packaging industry for the production of bottles, trays etc., is a well known and widespread practice. As a result, for some years now, different strategies have been adopted to recycle post-consumer PET from separate collection. Recycled materials are used, for example, in the production of textile fibres or in the construction industry. One of the biggest problems is the presence of water (which can react badly to the hydrolytic scission of the macromolecular chains of PET) and impurities in post-consumer materials which are destined for reuse.

The accidental presence of small quantities of PLA in the PET plastic waste collected for recycling, could cause problems during the recycling process and compromise the effectiveness of the recycled end product. This article aims to show the main results of an experimental investigation which concentrates on the main variations in the properties of some recycled PET that contain small amounts of PLA.

PREPARATION AND CHARACTERISATION OF SAMPLES

The PET and PLA samples used in the experiment were selected from post-consumer bottles, washed, pelletized and dried before processing. The original PET material and its mixtures with PLA (0.5-1-2% in weight) were then prepared in a Brabender discontinuous mixer at 270°C and 60 rpm cam speed.

The rheological characteristics were identified by elongational non-isothermal flow analysis to determine the MS (Melt Strength) and BSR (Breaking Stretching Ratio), using a Ceast-In-

TABLE 1 - MECHANICAL TENSILE PROPERTIES

Material	Modulus of elasticity [MPa]	Stress at break [MPa]	Elongation at break [%]
PET	1288 ± 64	34.6 ± 1.7	450 ± 23
PET-PLA (99.5-0,5%)	1241 ± 62	34.9 ± 1.8	390 ± 21
PET-PLA (99-1%)	1395 ± 71	34.3 ± 2.1	430 ± 26
PET-PLA (98-2%)	1349 ± 69	33.7 ± 2.2	400 ± 24
PET-PLA (98-2%) (not pre-dried)	1400 ± 98	28.8 ± 2.1	20 ± 2
PLA	1710 ± 103	42.5 ± 2.6	3.4 ± 0.3

stron Rheological 1000 capillary rheometer, and in shear flow conditions with a Rheometric Scientific SR5 rotational parallel-plate rheometer.

The mechanical characterisation, carried out on test subjects obtained using compression moulding and later conditioned at 25°C and rH 60% in a climate controlled chamber, is based on tensile tests performed using a universal Instron 3365 tester.

The thermal stability of the systems was verified using thermo-gravimetric analysis which was carried out via a Perkin Elmer TGA4000 system in the temperature range from 30°C to 700°C.

The crystallisation level was established by calorimetric analysis (DSC) using a Perking Elmer DSC7 system. The optical transparency qualities of the materials obtained were proven using a high resolution digital camera.

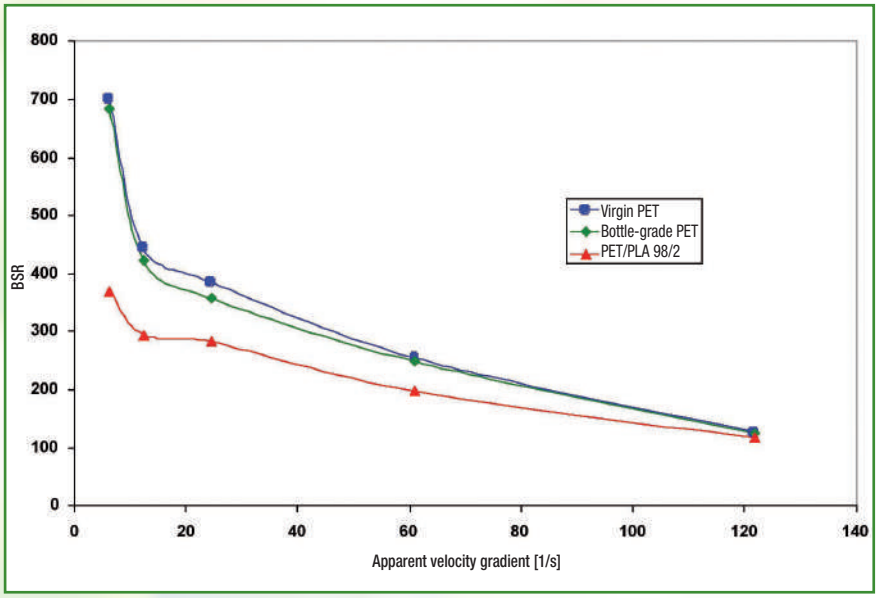

Fig. 2 - BSR (Breaking Stretching Ratio) vs apparent velocity gradient

PROPERTIES AND RESULTS

The rheological tests in shear flow conditions showed a drop in viscosity which corresponded to an increase in the percentage of PLA and in general, an incompatibility between the two components of the mixture. Furthermore rheological tests carried out on a PET/PLA (98%-2%) mixture whose components had not been pre-dried in preparation for processing, showed significant effects linked to the presence of moisture, which caused viscosity values to become significantly lower than those of a 98%-2% pre-dried sample.

Even more important were the conclusion that could be drawn from rheological tests in elongational non-isothermal flow conditions. PET is well known for its industrial applications in processes such as blow-moulding and spinning where the material is processes right in these flow conditions. Therefore it is very important to determine rheological parameters such as MS and BSR, which offer an indication of both the resistance and the strain of the melt.

Figures 1 and 2 respectively show the MS and BSR values in relation to the apparent velocity gradient. The first result apparent is the sudden drop in these two parameters when small quantities of PLA are present, consequently the resistance and strain of the melt during processes such as blow-moulding and spinning will be significantly lower, while a similar, yet lesser effect can be observed when we compare PLA free post-consumer PET with virgin PET. The values of the main mechanical tensile properties are listed in **table 1**.

As long as the percentage of PLA does not exceed 0.5%, the difference in terms of elasticity modulus and stress at break compared to post-consumer PET is negligible. But as soon as the PLA percentage starts to rise, the elasticity increases slightly (which could be explained by a slight increase in crystallisation as detected by the differential scan calorimeter), while the stress and elongation at break fall progressively, although not dramatically. A sudden drop (regarding the elongation at break) can be observed, however, in the sample prepared using materials that had not been pre-dried. The hydrolytic scission during processing represents a plausible explanation for this result.

Thermo-gravimetric tests were also carried out to establish the thermal stability of PET when PLA content increases. The test consisted of bringing the sample to a very high temperature (700°C) in an inert atmosphere at a constant heating rate while monitoring the reduction in weight caused by thermal degradation. We discovered that the presence of up to 2% PLA (in weight) caused no significant variation in PET weight loss, but the effects became more serious starting from a temperature of 400-450°C, although the biggest weight loss in the mixture compared to virgin PET, when treated at the same temperature, amounted to just a few percentage points.

One very interesting comparison between PET for recycling and samples of PLA-contaminated PET is the degree of transparency. PET is well known for its high transparency and indeed this is one of the reasons why it is used

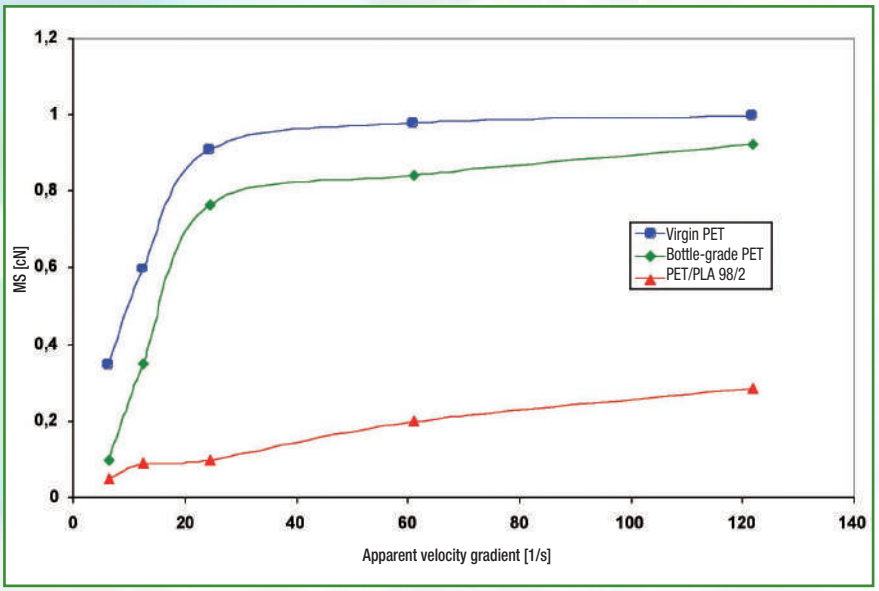

Fig. 1 - MS (Melt Strength) vs apparent velocity gradient

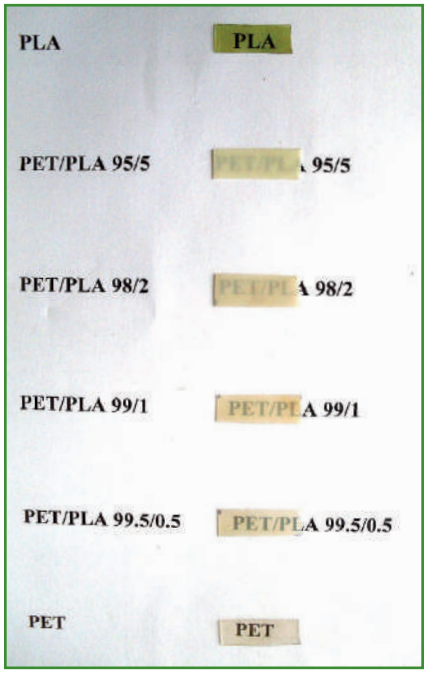

Fig. 3 - Comparison between the degrees of transparency of the various material samples used

so widely. Therefore a significant alteration due to the presence of even just a small amount of impurities during recycling can make a big difference to how it will be reused.

The comparison was carried out using film made from pure PET and PLA and a mixture of up to 5% which was put directly into contact with a sheet of paper on which the name of the sample material in question had been written. The degree of transparency and its quality was therefore established by how easy (or difficult) it was to read the printed words through the sample film. In **figure 3** we can clearly see how, compared to the high degree of transparency detected in the unadulterated samples, a mixture sample containing just 1% PLA has a decidedly inferior degree of transparency. The result if even more noticeable in the 2% PLA sample. This shows that even small quantities of PLA in recycled PET will compromise its high transparency and limit its post-consumer recycling applications.

CONCLUSIONS

This article illustrates the results of an experiment to determine the main consequences, in terms of rheological and mechanical properties, thermal stability and degree of transparency, resulting from the presence of small quantities (up to 2% in weight) of PLA impurities.

As far as tensile properties are concerned we noted not significant difference between post-consumer PET destined for recycling and the sample containing up to 2% PLA; similar considerations can be made in terms of thermal stability. However very significant reductions in mechanical properties (above all elongation at break) were observed in the 2% PLA mixture that had not undergone drying prior to processing. We can state, therefore, that the presence of moisture in material undergoing the recycling process can have drastic effects on the properties of the recycled material.

The rheological properties in elongational non-isothermal flow such as MS and BSR are significantly worsened by the presence of small quantities of PLA, and we may inevitably expect this to have a significant effect on the behaviour of material destined for recycling when subjected to processes that require this type of flow (for example blow-moulding, foaming and spinning). Another drastic effect was observed concerning the reduction in transparency attributed to the presence of small quantities of PLA.

www.dicpm.unipa.it

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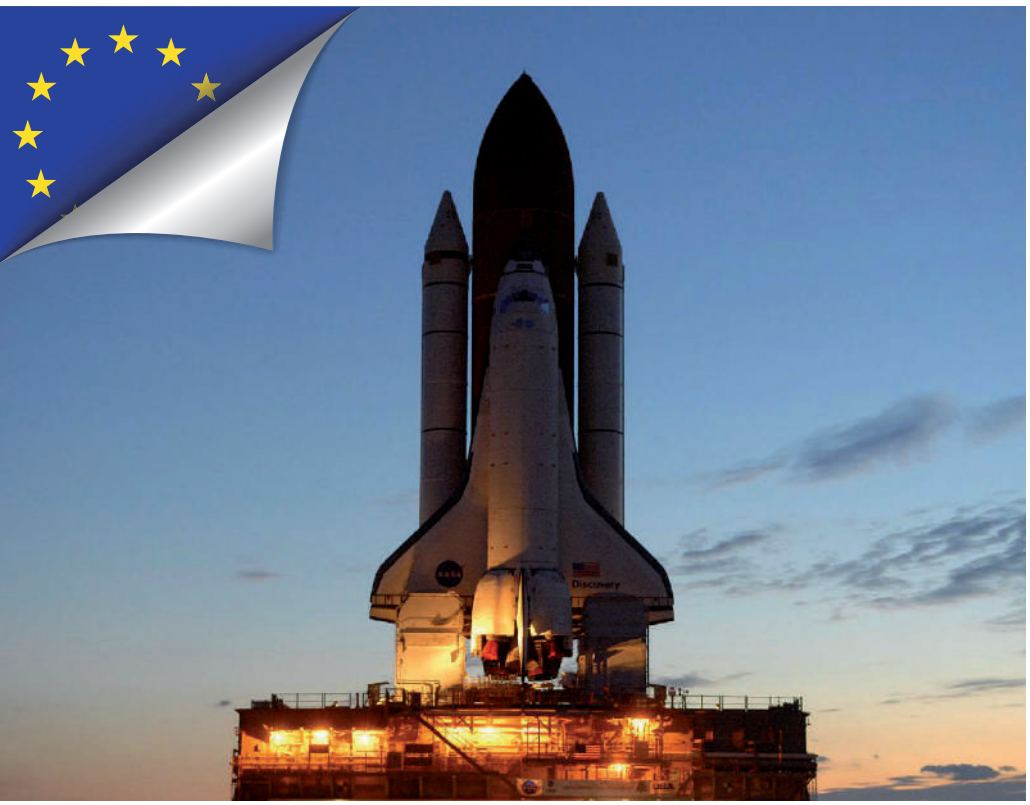


FUNDED BY THE EUROPEAN COMMISSION UNDER ITS EUROPEAN UNION SEVENTH FRAMEWORK PROGRAMME, RESEARCH ACTIVITIES ARE CONTINUING IN THE PLASTICS AND RUBBER FIELD, INVOLVING RESEARCH CENTRES, TRADE ASSOCIATIONS AND SMEs

BY **GIROLAMO DAGOSTINO**

TDM-SEALS, INNOREX AND SUPERCLEANQ

EUROPEAN PROJECTS: WORK IN PROGRESS

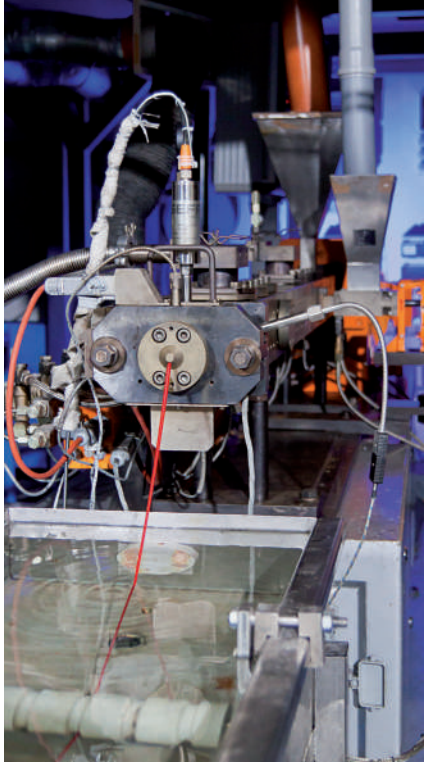
"SEALING" THE DEAL WITH TDM-SEALS

Do you remember the Space Shuttle Challenger disaster? It is the most famous failure of an o-ring. The o-ring installed in one of the rocket boosters failed due to repeated over-compression during installation. The low temperatures, in the morning of January 28, 1986, affected the mechanical properties of the seal and produced an outflow of hot pressurized gas… and the space shuttle burst into pieces. In pressure cookers, washing machines, fridges, watering or milking systems, oxygen conduction systems in hospitals, taps, watches… around us there are many more elastomeric seals than we can imagine. Whenever we want to ensure the closure of a chamber, reservoir or circuit, to avoid leakages of fluid or gas, pressure losses or a contaminated inflow, there they are. Assocomaplast is participating, as part of a consortium of 10 partners from all over Europe, in a project called TDM-Seals, which has received funding from the EU's FP7 mechanism. The working group, led by the Spanish research organisation Instituto Tecnológico De Aragón, will develop cost-effective, low friction seals by "Texturing During Moulding" technology. This 3-year project will run until mid-2015.

The new process will be integrated in the moulding for the surface texturing of elastomeric "dynamic seals". These seals are required to prevent leakage past parts which are in relative motion. They are present in all types of pneumatic and hydraulic cylinders, such as those used in automatic doors, construction machinery, reach stackers, brake cylinders or landing gears. Dynamic seals, subjected to higher friction force, wear faster than static seals. For this reason, and especially in pneumatic and hydraulic cylinders, high performance seals are installed in order to provide high resistance to friction and maximum durability.

How to reduce friction? It has been demonstrated that friction between two surfaces can be reduced by texturing one of them. This technique consists in making microdimples on the surface. That microtexture is able to dramatically reduce the friction coefficient without affecting the sealing properties. The problem is that such treatments must be applied, usually by laser, through a post-production process, which hinders its implementation on an industrial-scale production.

That's why the TDM-Seals project aims to develop an optimised fabrication process of low friction seals, by integrating surface texturing in the moulding process, to achieve a reduction in the seal dynamic friction of more than 20%. Furthermore, one of the most important tasks consists in characterising the functional properties of texturized seals by FE (Finished Elements) simulation and quantifying the improvement achieved in the demoulding process by means of new coatings. This should reduce production costs related to the demoulding process, by developing ceramic coatings that reduce (>30%) the adherence elastomer-mould. New treatments and textures for moulds improving the process and the final making of the seal will be tested by the TDM-Seals Consortium partners: Instituto Tecnológico De



An example of extruder like the one subjected to development for the InnoREX project

Aragón (coordinator); amongst trade associations: The British Plastics Federation, present at the K show in Düsseldorf (stand D35, hall 12), Plastipolis (stand E91-6, hall 3 at the K show), Assocomaplast (stand A56, hall 16) and Swedish Plastics Industry Association; amongst SME participants: DMX, Miju, Barbieri A. & C.; amongst research centres: Tecnologias Avanzadas Inspiralia, Leibniz Universität Hannover (Institute of Dynamics and Vibration Research).
www.tdm-seals.eu

INNOREX: PLA WITHOUT METALLIC CATALYSTS

The European project InnoREX - funded by the European Commission under its Seventh Framework Programme - Grant Agreement number 309802 - enables the production of bioplastics without metallic catalysts thanks to the broad collective competence of the consortium involved in the project. These bioplastics are then destined to applications in the monolayer packaging segment. The ambitious InnoREX project seeks to develop a new technology for the production of PLA (polylactic acid or polylactide) that will, among other benefits, improve the homogeneity of production and exclude the use of metallic catalysts. Up to now, metal-containing catalysts (typically: tin (II) 2-ethylhexanoate) have been used to improve the polymerization rate of lactones, posing, however, a potential hazard to health and environment. InnoREX will develop a novel reactor concept using alternative energy sources and replacing metal-containing catalysts by organic ones, thus making both process and product safer for consumers and for the environment.

A new reactor concept

To ensure short market entry times for the InnoREX technology, commercially well-established co-rotating twin-screw extruders will be used as reaction vessels. However, the use of an extruder as a reaction vessel to produce bioplastics made from polylactic acid is only one of the innovations in InnoREX. An online viscometer and spectral analytics using NIR technology will be applied to the production line.

Alternative energy sources in extrusion for dynamic control

Beside the reactive extruder technology, alternative energy sources will be utilized to enhance the reaction kinetics, namely laser, microwave and ultrasound technology.

The low-intensity but highly-targeted input of alternative energy in the reaction volume will increase catalyst activity and ensure a high molecular weight polymerization within the limited residence time in the co-rotating twin-screw extruder. This adjustable input of alternative energy, in contrast to the static energy input by means of an extruder, will allow the precise, dynamic control of the polymerization and the resulting material properties.

InnoREX at K 2013

For more information on the project, and to meet the consortium members in person, it is possible to visit Fraunhofer-ICT (stand B05, hall 7), Aimplas (stand C32-3I, hall 8a) and Assocomaplast (stand A56, hall 16) at K exhibition (Düsseldorf, Germany, October 16-23, 2013). Fraunhofer will also present the topic at the Bioplastics Business Breakfast, on October 18.
www.Innorex.eu

TOWARDS GOALS AND OBJECTIVES

The SuperCleanQ project (also funded by the European Commission under its Seventh Framework Program – Grant Agreement number 285889) is developing quality assurance tools and procedures for plastics recycling processes targeted at food contact applications. The tools will be applied to a new process for the recycling of coloured and layered PET into food contact applications that cannot be processed by current PET recycling facilities. Spectroscopic methods have been used in order to identify coloured and barrier-modified material in the waste stream of PET. Methods examined include infrared, near infrared, ultraviolet, laser induced fluorescence (LIF) and Raman spectroscopy. An online system to detect undesirable levels of contamination in injection moulded parts at the earliest possible stage of the injection moulding process has been developed. The final results comprise both the hardware and the chemometric models necessary to perform the mentioned task. A range of marker compounds, representative of recycled PET, has been selected to be used during SupercleanQ "marker test". The purpose of the SuperCleanQ "marker test" is to provide producers of recycled PET, and products made from recycled PET, with a relatively cheap, efficient and accurate test for seeing if PET contains a low level of contaminants - the SuperClean Q "Marker" compounds. The SuperClean Q "Marker" compounds are not ones that are added artificially to waste PET during the so called "challenge test", but are compounds that are normally found (at low levels) in any recycled PET because they originate from the PET itself. The standard analytical method being developed for the identification and quantification of marker compounds in recycled, food grade PET will be proposed as a potential standard. The availability of such a standard for recycled, food grade PET will provide governing bodies, regulators and analysis laboratories with the capability to determine the purity of such products in a cost-effective and accurate manner. For more information on the project, it is possible to meet the consortium members in person at K 2013: Fraunhofer-ICT (stand B05, hall 7), British Plastics Federation (stand D35, hall 12), Assocomaplast (stand A56, hall 16), Aliplast (stand E21, hall 5) and Extricom (stand A36, hall 5).
www.supercleanq.eu

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EXAMPLES OF ITALIAN EXCELLENCE

DIESEL FUEL FROM PLASTIC WASTE

AN INNOVATIVE TECHNOLOGY DEVELOPED IN ITALY BY GREEN ENERGY TECHNOLOGY, CURRENTLY INSTALLED AT THE RA.DI. RECOVERING CENTRE IN PALMI, REGGIO CALABRIA, IS GIVING THE OPPORTUNITY TO TURN PLASTIC WASTE DESTINED FOR LANDFILLS INTO LIQUID FUEL

BY **RICCARDO AMPOLLINI**

Materials that are considered unusable today because we have no viable application for them are usually sent to landfill sites or incinerators to be burnt, a process that merely adds to their negative reputation. This kind of waste comes from the recycling of domestic plastics collected in recycling bins all over our cities - commonly known by the name "plasmix" - consists mainly of assorted polyolefins. Generally speaking the reuse and mechanical recycling of this material use up more energy than the recovered material is worth. So it literally is not worth recycling if we use traditional methods. However the system that has been perfected by Green Energy Technology, working in partnership with Ra.Di., gives us an end product of significant value. Fuel for diesel engines is a very interesting proposition at a time when petrol and diesel prices are going through the roof.

"As a businessman", explains Carmelo Ciccone, managing director of Ra.Di., "I immediately grasped the opportunity represented by the industrial application suggested by engineer Filippo Randazzo – a technology that can transform into a new product the kind of plastic waste that is treated on a daily basis at my plant – putting into action the philosophy of Corepla (Italy's national consortium for the collection and recycling of plastic packages), which advocates putting as much recycled material as possible back into use".

More than 60% of the plastic packaging waste collected and recycled by Corepla is recycled mechanically, but a significant, although lower, proportion which has no commercial use in the recycled materials market, must rely on other methods which are in any case preferable to landfill, an option that hopefully is destined to disappear. Amongst these methods there is first and foremost energy recovery (preferably substituting non-renewable fossil fuels in cement works and heating systems or in high energy efficient incinerators) and innovative technologies like those Ra.Di. has been working on. Something that until now has been seen as an expensive issue for our society in economic and above all environmental terms, becomes a resource thanks to the new technology. Therefore it:

- has been adopted as part of a completely automated industrial plant
- has been installed and made operational at a waste treatment and separation centre that is well established locally and as part of a nationwide network for recycling materials
- complies to international and Italian regulations
- has been authorised for operation.

FUEL FROM PLASTICS

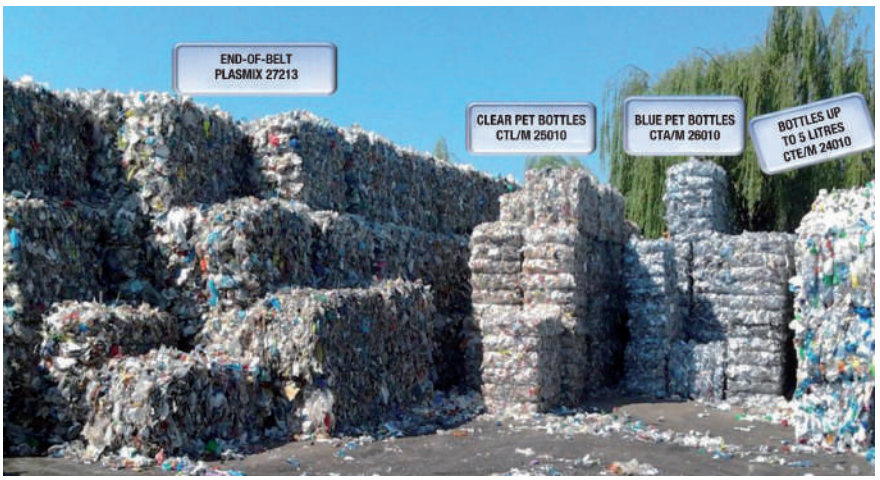
The "Fuel from plastics" technology allows us to treat post-consumer plastic materials for the production of liquid fuel. As Filippo Randazzo (director of the technical department at Green Energy Technology) explains: "The idea of recovering plastic materials via chemical recycling (i.e. feedstock recycling) which is to say a process that reverses the state of the materials and returns it to the raw material of origin, has been widely studied

around the world and there are similar plants in Japan, China, Korea and India, usually based on very large machines that convert plastics into diesel fuel. The main problem with the chemical recycling technology that has been perfected in recent years is that a part of the waste (80% of which is made up of plastic) is characterised by the presence of a wide number of substances and the composition of the materials in the plasmix cannot be predicted in advance. It is therefore, difficult to handle the wide range of polymers present to ensure a final product that is a homogeneous as possible with the right kind of characteristics to fuel a traditional diesel engine without having to redesign the engines on an ad hoc basis.

To avoid this a process based on catalytic pyrolysis has been developed, which thanks to specific catalysers, takes place at lower temperatures than traditional pyrolysis – allowing us to break the polymer chains at a precisely calculated length similar to the range of hydrocarbons that make up commercial diesel. For this reason the end product is reasonably homogeneous.

Pyrolysis is followed by a distillation process that further refines the substance and is carried out in a completely closed circuit system where the mixture is evaporated and the vapours condensed. Then – in a process similar to that used in the production of alcoholic beverages – the "head" is returned to the system and the process repeated, while the "tail" (consisting of a mixture of light and non-condensable gases) is used by a generator in the vicinity that powers the plant itself. As you can see nothing gets thrown away and, thanks to the closed circuit system, the line operating costs are kept low. Return on investment, therefore, is soon achieved". In this process the "heart" is, of course, the fuel obtained at the end, which can be used as it is without needing further processing or treatment. It is compatible with commercial diesel and, thanks to the origins of its components "purer" than the unrefined oil it originally came from, being sulphur and particulate free. Therefore, although it closely resemble diesel it is far better for the environment. As a substitute for commercial diesel it can be used with traditional and affordable technologies: easy to store and transport because it is a liquid, this fuel can be used for electrical energy co-generators in a time frame and at power levels that are suitable for real life use, maximising co-generation efficiency with no need for the, frequently inefficient, continuous running that often afflicts incinerators.

The fuel obtained with this method is compatible with commercial diesel and, because it is "purer" than the original raw material used to produce it, contains no sulphur or particulates



The process begins with the separation of the plasmix and the removal of metals, glass and other inert substances. What remains is stored and then fed into the Ra.Di. system

THE PRESENT AND THE FUTURE IN ITALY

The Ra.Di. system is fed with the scrap originating from the nearby CSS waste separation plant, part of the national Corepla organisation. On average today about 65% of plastic collected for recovery and recycling is used for producing material of the same type, while the smaller size and high concentration of dirt make the remaining part something that can truly be defined as waste, called "mix". This waste produced in Italy today (about 240,000 tons) is mostly disposed of in landfills or burnt as refuse-derived fuel (RDF). The Ra.Di technology, however, makes it possible to reuse up to 90% of the plastic collected. The transformation processes used by the system allow Ra.Di. to recycle waste in the best possible way. Over 85% of the initial polymer content is transformed into liquid fuel. The size of the system and the fact that it is entirely automated means it can be installed directly in refuse treatment centres across the country, thereby eliminating waste transportation costs.

Filippo Randazzo has this to say: "About 50% of the refuse taken to recycling centres and landfills is made up of plastic, a product which is made from the purest part of petroleum and therefore with enormous energy producing potential. Transforming it into a product that can be released directly back into the consumer market is highly efficient and represents an excellent solution for waste management. Both the EU and the USA are setting out guidelines that take us in this direction: mechanical recycling where possible and recovering energy via incineration or via processes similar to the one described here. However, while incinerator efficiency is around 15%, the process developed by Green Energy Technology in partnership with Ra.Di. reaches between 80 and 85%".

Corepla's immediate future holds not just plastic waste and the plasmix, but other types of waste that represent added costs for society, but which could become a resource. Tyres, paper pulp, fluff from scrapped vehicles, exhausted mineral and vegetable oils and byproducts from the industrial use of polymer-based materials are all examples.

In closing Carmelo Ciccone says: "In Italy we work with a variety of private companies and public organisations, such as Conai and Corepla. We are trying to send the message that waste collection for recycling and plastics in particular can give rise to other, different products. In some municipalities, for example, we collect plastic waste and give back energy so the local authorities can heat or provide lighting for gyms, schools and other public buildings". As illustrated in the "Life Cycle and Market Impact Assessment of Waste Conversion Technologies - Executive Summary", published by the California State Integrated Waste Management Board in 2004, catalytic cracking is recognised as one of the most important short term solutions to the issue of how best to recycle and reuse plastic waste.

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NEWS

Bio-based polymers in Europe

More production facilities by 2015

Europe's current position in producing bio-based polymers is limited to a few polymers, as shown in the last market study published by the nova-Institute and based on its continuously updated "Bio-based Polymers Producer Database". Europe has so far established a solid position mainly in the field of starch blends (blends of polymers with native starch or thermoplastic starch) and it is expected to remain strong in this sector for the next few years (see **figure 1**). Nevertheless, new developments and investments are foreseen in Europe: some years after the installation of industrial scale PLA capacities in North America and Asia, the first European industrial-scale PLA plant is scheduled to become operational in 2014.

PET production is growing worldwide, largely due to the Plant PET Technology Collaborative (PTC) initiative, whose global value chain development will lead to the introduction of future production facilities in Europe by 2015.

One noteworthy finding of other studies is that Europe shows the strongest demand for biobased polymers, while production tends to take place elsewhere, namely in Asia and South America. The bio-based polymer production facilities for PLA and PHA located in Europe are currently rather small, and although there are next to no production capacity figures for the latter, several pilot plants are already operating. On the other hand, bio-based PUR and PA production has gradually taken off in Europe and is likely to remain stable in order to supply the growing markets on the building and construction and automotive sectors.

Europe does host industrial production facilities for PBAT. Although still fully fossil based, PBAT is expected to be increasingly bio-based reaching shares of 50% by 2020, to judge by industry announcements and the capacity development of its bio-based precursors.

Also for PBT (see **table 1**) recent developments in the production of bio-based 1.4 butanediol (BDO) have proven that the bio-based route to the polymer is commercially feasible and its production is planned to have started by 2020 (date not disclosed yet). With leading chemical corporations, Europe has a particular strength and great potential in the fields of high-value fine chemicals and building blocks for the production of PA, PUR and thermosets among others. However, only few specific, large-scale plans for bio-based building blocks with concrete plans for the production of bio-based polymers have been announced to date.

The European Union's relatively weak position in the production of bio-based polymers is largely the consequence of an unfavourable political framework. In contrast to biofuels, there is no European policy framework to support bio-based polymers, whereas biofuels receive strong and ongoing support during commercial production (quotas, tax incentives, green electricity regulations and market introduction programmes etc.). Without comparable support, bio-based chemicals and polymers will suffer further from underinvestment by the private sector. It is currently much more attractive and safe to invest in bio-based polymers in Asia, South America and North America. ■

www.nova-institut.eu

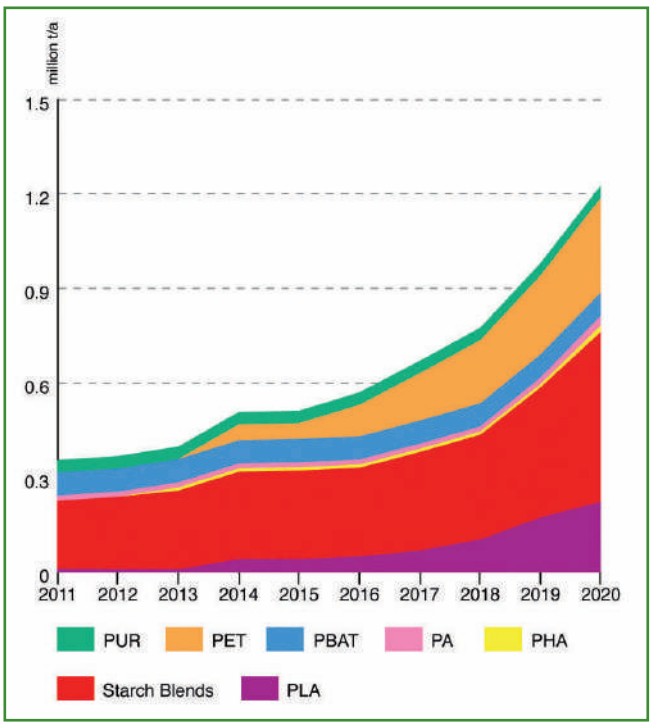


Fig. 1 - Bio-based polymers - Evolution of production capacities in Europe from 2011 to 2020 (without cellulose acetate and thermosets), million t/a

TABLE 1 – BIO-BASED POLYMERS, PRODUCING COMPANIES IN EUROPE AND PRODUCTION CAPACITIES (T/A)

BIO-BASED POLYMERS	PRODUCING COMPANIES IN 2013**	PRODUCTION CAPACITIES IN 2011* (t/a)	PRODUCTION CAPACITIES IN 2013** (t/a)	PRODUCTION CAPACITIES IN 2020** (t/a)
PLA	7	8220	8230	226730
Starch Blends	7	217000	279000	539000
PHA	7	50	10050	10090
PA	7	16000	16000	31000
PBAT	1	74000	74000	74000
Polyolefins: PE, PP, PVC, EPDM	0	0	0	n. a.
PET	0	0	0	300000
PBT	1	0	< 50	80000
PUR	3	39450	39450	39450
Total		354720	426780	1300270

* *Source: Report Market Study on Bio-based Polymers in the World, 2013-3*

** *Source: Bio-based Polymers Producer Database, 2013-07*

Industrial processing

Water purification in plastics recycling

With over 40 years of experience in the treatment of industrial waste water from several sectors, the Italian company Depur Padana Acque has been in the plastics recycling field since 1993, designing, developing and patenting specific technologies to address and resolve all different problems related to waste water in plastic processing.

Several are now the waste water treatment plants in relation to post-consumer recycling of PET bottles and HDPE bottles and jars in Italy and abroad, and the same goes for the agricultural/industrial LDPE film industry and for other alternative types of plastics (PP, PVC, Sele film, plast mix and so on). Problems with water vary, so do the technical solutions developed, more or less articulated, depending on the type of material being processed and the results required in terms of purification. Specific technologies for the treatment of degassing water from extruders and for the purification and recycling of hot soda washing baths for PET flakes have also been developed, in collaboration with some of the company's most prestigious clients. The significant amount of water used in the phases of the process has determined the need to find and put in place optimized solutions, which allow to work, in most cases, reusing treated water, with hardly any discharge, thus achieving important results in terms of quality and cost saving for customers.

Water treatment/recycling system with 60-70 m³/h capacity, ancillary to polypropylene big-bags and LDPE film recycling line 1000–1200 kg/h

Depur Padana Acque designs and builds "tailor made" purification plants, completely and specifically manufactured on the basis of the actual needs and requirements of the customer, starting from simple mechanical filtration and sand removal systems, through to clarification treatments by chemical/physical technologies, up to purification, even at dissolved contamination (organic) level, by biological purification plants. The treatment of waste mud produced in the purification process plays a fundamental role in the optimization of water treatment management and related costs. Depur Padana Acque has therefore identified a number of specific, optimal, diversified, technical solutions for all related problems.

www.depurpadana.it

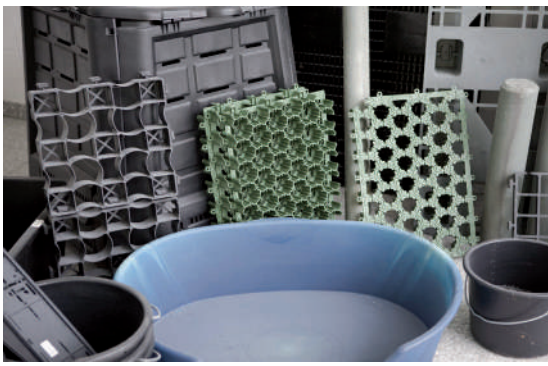
NEWS

Profitable and versatile

Recycling rates of 35 per cent are realistic

The resounding market success of plastics has been associated with growth in the quantity of plastics waste. That's why many countries in Europe have addressed the issue and developed highly successful strategies for collection and recovery. According to surveys by PlasticsEurope, about 47 million tons of plastics were consumed in the 27 countries of the EU plus Switzerland and Norway in 2011, 40% for non-durable and 60% for durable applications. In the same year, some 25 million tons of waste plastics were collected, 40% going to landfill and 60% being recovered. The waste from collection systems for used packages accounted for over 60% of this, followed by products from the construction, automotive and electronics sectors. Exemplary collections systems are in place in nine European countries: Switzerland, Germany, Austria, Belgium, Sweden, Denmark, Norway, The Netherlands and Luxembourg (listed in descending order), with collection rates ranging from 99 to 92%. At the same time, six of these countries have the highest recycling rates in Europe. Norway, Sweden, Germany, the Netherlands, Belgium and Austria with rates of 35 to 26% head the field by a clear margin. The remaining collected wastes are recovered to generate energy by incineration. Gratifyingly, not only has the quantity of collected wastes risen in the last five years, but also the recycling rate – with a corresponding reduction in the quantity going to landfill. Nevertheless, plastics recycling still has huge growth potential, particularly in countries where current recovery rates are still low.

Like regranulated materials, agglomerates produced from residuals can be put to good use in the injection moulding process (photo: Herbold Meckesheim)



Many different products can be produced easily from regranulated polyolefins, mostly by injection moulding (photo: mtm plastics)

Experts are also critical of the classification of "waste to energy" incineration as a sensible form of recovery for plastics. In Germany, 95% of all waste incinerators are classed as "recovery plants" and are thus licensed to

generate energy. Another problem facing the recycling sector is the export of plastics wastes – mainly to the Far East. This reduces the quantities available in Europe for sensible recycling, increases the competitive pressure and pushes up costs.

PLASTICS RECYCLING IN GERMANY

Detailed information on recycling activities in Germany is supplied by the Consultic study published every two years on behalf of BKV (a member of GKV: German association of the plastics manufacturing industry), PlasticsEurope Deutschland, bvse (the Federal association for secondary raw materials and waste management), VDMA Plastics and Rubber Machinery and IK (German association for plastics packagings and films). According to this, about 5 million tons of plastics wastes were generated in Germany in 2011, with the lion's share, or 82%, coming from post-consumer applications. For the remaining 18%, consisting of production wastes, a materials recycling rate of 90% is achieved. For pure-grade sorted production wastes, direct in-house recycling has become established at most processing plants. For post-consumer wastes, the recycling rate is only 30 to 35%, although here, too, workable solutions have been found and are in place for sorted single-grade waste fractions, e.g. for PVC and PET. In short, PET recycling, achieving a market volume of 1 million t/y in Europe, does indeed work. The situation is similar for pure-grade materials streams of PE and PP and for materials streams that can be readily realised with suitable separation processes. In Germany alone, there are about ten large and many small processors specialising in producing injection-mouldable regranulated materials from commercial and household polyolefin wastes. These can be used for a wide range of products such as pallets, troughs, buckets and pipes.

www.plasticseurope.org - http://kug.vdma.org

Corbion Purac at K 2013

PLA partnerships for new bioplastic applications

At the K trade fair in Düsseldorf (stand 5B22, hall 5) Corbion Purac bioplastics is exhibiting under the theme "partnering for bioplastics growth". To highlight the most recent developments in PLA (Poly Lactic Acid), the company exhibits a number of biobased applications resulting from numerous strategic partnerships. In fact, Corbion Purac has teamed up with esteemed partners in a number of industries, including packaging, automotive, home interiors and sporting goods, and is showcasing the resulting applications.

Combining high biocontent with a low carbon footprint, PLA is a great replacement for PS, PP and ABS. This offers brandowners a unique opportunity to be a sustainability frontrunner in their field, whether it be in terms of product packaging or primary product materials.

Application of PLA in drink packaging

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IN EUROPE, ALL-ELECTRIC TECHNOLOGY IMMEDIATELY MADE AN IMPACTFUL CASE: LOW ENERGY REQUIREMENT, PRECISION, SILENT AND CLEAN OPERATION, BUT MORE RECENTLY THERE HAS BEEN A MORE CONSCIOUS USE OF ELECTRIC DRIVES THAT HAS LED TO THE DEVELOPMENT OF SO-CALLED HYBRID MACHINES

BY **RAFFAELE BODINI**

HYDRAULIC, ELECTRIC OR HYBRID

HOW TO CHOOSE

Today, one thing is certain - the idea of a clear division between hydraulic and electric machines is now a thing of the past. This idea has been replaced by machine that can be fitted with the most appropriate technology according to the type of moulding process. Today, processors have another important choice to make when configuring their machines: electric or hydraulic axes, because the extent of the advantages and disadvantages of the two technologies varies in importance depending on the type of application and the driven axis.

GENERAL FACTS

Both types of axes have clearly recognisable characteristics. Hydraulic axes can achieve different levels of precision depending on the components used (directional valves, proportional valves or servo-valves), and the cost corresponds to performance. Therefore, low cost means low performance and higher performance features require higher costs. An electric axis, on the other hand, does not offer a broad range of degrees of precision, delivering always and only the highest level. An electric axis is always more precise than a hydraulic one for a number of strictly technical reasons, not addressed here. For simplicity's sake, the first feature of note is the absence of oil, an element which always affects precision. In addition, different levels of precision can be seen on the same hydraulic machine from axis to axis, depending on the importance it is attributed, while an electric machine offers the same and higher precision on all axes in their basic configuration. An electric axis always consumes less energy than a hydraulic one, also when variable speed pumps are fitted, because overall performance is better. It should also be noted that modern drives use power supplies that recover the energy generated by motors while braking, thereby further reducing consumption.

MOULD AXIS

Its function is to open and close the mould, gener-

ate the clamping force and check the force during the mould protection mode. The speed and force the two types of axes can develop are equal, depending solely on how much power is applied. An accumulator is used to achieve very high speeds, but long-pitch ballscrews mean comparable performance is achievable. A basic hydraulic axis does not have the same characteristics but can achieve similar performance to the electric one only when fitted with highly dynamic proportional valves, but at a similar cost. The potential to recover energy during braking – a unique characteristic of the electric axis that has no parallel in hydraulic axes – assumes a particularly important role for the mould axis, in virtue of the notable mass handled, such as the mould and floating platen, contributing to further reducing energy consumption.

EJECTOR AXIS

Function: eject the moulded pieces from the mould. This is quite a simple movement where the hydraulic axis almost always meets the process requirements. The electric axis in addition offers the option of verifying the force required for the movement at every cycle, thereby assessing whether the moulded pieces have consistent characteristics, and whether any gripping phenomena occur in the mould. Considering the simplicity of this part of the machine, the highest cost of an electric axis is justified in few cases, essentially only where the mould and parts are very delicate.

PLASTICISER AXIS

Its function is to turn the plasticising screws to prepare the quantity of material for injection. It is the simplest axis to switch from hydraulic to electric. Only the hydraulic drive and the related hydraulic control valves needs to be changed, replacing them with an electric motor and with suitable drive. The electric motor can be asynchronous, its performance is adapted to the simplicity of the movement, or synchronous, connected to the screw both directly as well as through a gearbox or a transmission belt. An electric axis, though costly, delivers clear and considerably advantages in terms of consumption in this phase of the cycle, which is energy-wise the most expensive. Savings are here higher than with other machine axes both because of the reasons already cited as well as because the performance of a hydraulic plasticising axis is in itself particularly low, due to the hydraulic drive, thereby it requires more energy for the same amount of torque on the screw.

CARRIAGE AXIS

Function: move the entire injection unit and generate the contact force between the nozzle and the mould. It is an extremely simple movement, which does not justify the use of an electric axis unless the machine is installed in an environment where staying clean is fundamental, a feature that it easily achieved because it does not require oil, for example when moulding medical articles.

INJECTION AXIS

Its function is to permit injection of the plastic melt in the mould cavity. This is the axis that has the most differences both in construction and in terms of cost between hydraulic and electric axes. In the case of traditional moulding, with injection speeds of up to 200 mm/s, an electric axis offers better performance than a hydraulic one, thanks to greater precision both during injection, permitting accurate control over the flow of material in the cavity of the mould, as well as during the metering step. It should also be remembered that the electric injection axis is used to actively regulate backpressure, guaranteeing greater precision in terms of uniformity and quantity of material prepared for the injection. Higher precision in terms of injection speed is particularly evident at low speed, a typical processing condition for more delicate engineering polymers, in virtue of the intrinsic characteristics of the electric axis control strategy in position. In the case of high-speed injection moulding processes, in particular of thin-wall parts, the electric axis can only match the performance of a hydraulic axis in the range up to Euromap 2000, which corresponds to an injection unit with the following features: screw diameter 65 mm; injection pressure 2400 bar; shot capacity approx. 850 g. In fact, below Euromap 2000, the speed of an electric axis is slightly inferior to a hydraulic axis, however, as the electric axis can ensure higher and more controllable accelerations, it is able to complete the injection cycle in the same time as a hydraulic axis, hence the same performance level.

HYBRID TECHNOLOGY

The combination of electric and hydraulic axes offers additional advantages. An example is the possibility of overlapping movements without complicating the hydraulic system with the addition of pumps or accumulators, which would significantly increase costs. Adoption of the electric mould axis opens the possibility of ejecting the piece during mould opening. With electric plasticising axis, metering can take place when the mould opens and closes, without incurring additional costs. In a number of cases, for applications requiring this mode of operation, the use of electric axes has not made the machine more costly than hydraulic axis solutions incorporating a multi-load system.

CONCLUSIONS

Market evolution has now led to the most convenient configurations being developed based on the type of mould (see **table 1**). An all-electric injection press is the mandatory choice for operators needing a machine that guarantees maximum precision on all axes indiscriminately.

As a brief summary therefore, it can be said that electric drives are always preferred for mould and plasticising axes; for injection it is required for process precision; for the ejector it is useful only for very delicate parts or moulds; and finally for the carriage it is only used on medical applications. ■

www.macplas.it

Table 1 - Possible configurations of a modern injection moulding machine

	mould	ejector	injection	plasticising	carriage
total precision and moulding of medical items	M	M	M	M	M
precision moulding	M	▲	M	M	▲
moulding of thin-walled items	M	▲	▯	M	▲
traditional moulding	M	▲	▲	M	▲
low cost machine	▲	▲	▲	▲	▲

M electric axis ▯ hydraulic axis with accumulator ▲ hydraulic axis with pump

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IN MID-JULY AT ITS OWN FACILITIES, IMG EXHIBITED, IN OPERATION, VARIOUS MACHINES BELONGING TO ITS REM AND GUM SERIES. SALES MANAGER DAVIDE BONFADINI TOLD US ALL ABOUT IT

BY **LUCA MEI**

DOORS OPEN FOR THREE DAYS

ELECTRIC AND HYDRAULIC MACHINES FOR RUBBER MOULDING

On the 11th, 12th and 13th of July, IMG opened the doors of its facilities in Capriano del Colle (near Brescia) in order to present its range of elastomer processing machines. The star of the show, with its purple body, was a fully electric machine from the REM range (REM being an acronym for Rubber Electric Machine). First unveiled at Plast 2012, the REM range is currently under production testing at the facilities of two processors who are using 300-ton models like the one on display at the open-house event. "Purple is quite an unusual colour for this kind of machine and it was chosen for the launch phase of the range and also for its exhibition at last year's Milan show, but it actually went down well with the customers at whose plants we have installed the first two machines. Therefore, for the time being, we have decided to keep it", explained Davide Bonfadini, sales manager at IMG. But, of course, there is a lot more to the machine besides its colour. The first thing to mention is the fully electric drive, which, although now an established technical feature of plastic processing machines, is still a novelty for rubber processing ones. The most immediate advantage of this solution is the reduced energy consumption which, according to the Brescia-based machine manufacturer, can even reach levels as low as 60% of those recorded by hydraulic presses.

The REM range is currently available with clamping forces of 200, 300 and 400 tons. Its main features are: clamping unit with five-point toggle joint; magnetic platens with the floating one, detached from the tiebar, running on ballscrew guides; no bushings (a measure designed to prevent flashes and contaminants from depositing on the tiebars); a reciprocating screw. The machine exhibited at the company's facilities had a special screw profile; this is a feature that is specifically developed for the application required once a machine is in operation at the processor's facilities, and a new PLC Moog with touchscreen.

VERTICAL HYDRAULIC MACHINES

The event also featured a machine from the GUM series ofhydraulic machines, which has a clamping force of 300 tons, a vertical configuration, and a FIFO-type (First In First Out) injection unit. An inverter installed on the servo gear pump and coupled directly with the motor allows the machine to run at a lower speed, reducing its energy consumption but without affecting its performance. The incorporation of new, more efficient control units has made it possible to

150-ton vertical press featuring rotary table with two temperature-controlled platens for the overmoulding of inserts

Examples of horizontal injection moulding machines exhibited during the three-day open house

reduce the amount of oil circulating in the machine, and therefore to reduce the size of the tanks and, as a consequence, the overall dimensions of the machine, as well as to improve certain other aspects, such as the response times in the machine start-up stage. Also on display was another GUM machine with a clamping force of 150 tons, again featuring a vertical configuration and FIFO injection unit and equipped with a rotary table with two temperature-controlled platens for the overmoulding of inserts. To eliminate the sprue, and thus avoid wasting material, the material was injected directly into the mould. This was possible thanks to the development, in collaboration with the customer, of special nozzles.

This was clearly a rather special machine, designed to be equipped with an anthropomorphic robot for loading inserts ready for overmoulding and for unloading the finished pieces.

TAILOR-MADE SOLUTIONS

The ability to create tailor-made solutions featuring high levels of customisation is, in fact, one of the strengths of IMG, whose rubber processing machines are sold for the most part (80%) on the Italian market. “We are a small company with a staff of around 50 people and this gives us the flexibility that is needed in order to respond effectively to crises and to adapt to market changes. It also allows us to come up with tailor-made solutions designed to meet the specific needs of processors, and these are all things that large manufacturers are not always able to do”, added Bonfadini.

Most rubber processing activity is concentrated in northern Italy, particularly in in some areas of Piedmont and Veneto and in the Lake Iseo area, and this currently guarantees us a market that is more stable than the plastics one and also characterised by increasingly unique features. Familiarity with the domestic market, flexibility, and product quality therefore allow this company to compete with the leading European manufacturers. In 2012, this Brescia-based operator delivered around a hundred of its own presses, recording a turnover of around 12 million euros. ■

www.imgmacchine.it

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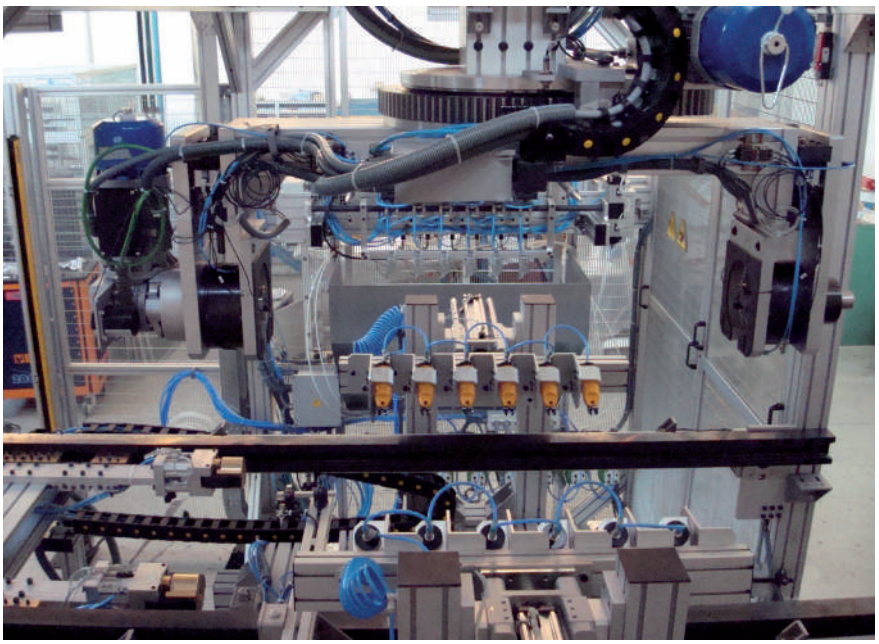

THE ITALIAN MACHINERY MANUFACTURER DELIA HAS DEVELOPED A SOLUTION WHICH INTEGRATES THE VARIOUS PRODUCTION PHASES, FROM PRESSING TO THE FINISHED PRODUCT

The cell developed for the production of rubber bellows

ROBOTIZED CELL

BELLOWS FOR THE AUTOMOTIVE

The robotized cell developed by Delia for the production of parts for the automotive industry integrates the various production phases from pressing to the finished product. It is used for automatically drawing, trimming and fitting the injection peduncles.

Bellows are pressed by a rubber injection press equipped with a Delia 12-injection nozzle thermoregulated block, which allows material saving, a 12-opening mould with a series of double males to carry out the removal and finishing in masked time, reducing the cycle time remarkably.

The cell translates the male holder bars alternately outside the injection press by both electrical and pneumatic movements. While the injection press is pressing a new series of parts outside, a 12-position cutting group cuts the small injection peduncles from the bellow collar. In the meantime, a trimming head removes the residual burr from the perimeter of the piece. At the end of the cutting and trimming operations, the male holder bar with the pressed pieces is drawn by electrically controlled axes and placed in the drawing head area, and six-piece rows are simultaneously removed by means of special taking groups.

After drawing the pieces, the male holder bar is turned and placed again on the electrical translation device from and to the press. The whole cycle time is defined by the press according to injection, vulcanization and frame exchange time.

Various are the advantages deriving from this system. The time to remove pieces is reduced as they are not removed one at a time as it happens in manual cycles. Manual labour is also cut down to a minimum: working cycles are completely automated, therefore one operator can control several machines. The open mould time is reduced, which means shorter mould cooling and vulcanization time. There is no need to eliminate undue cycles and face related problems with regard to mould cooling, scraps due to insufficient heating, mould cleaning and possible removal, cleaning the nozzle by removing prevulcanized material. The machine down time is reduced: it is no longer necessary to wait for the operator to remove moulded items. Both quality and consistency of moulded items are improved: continuous extractor cycles eliminate hazardous open machine down time in the absence of the operator and/or due to extraction speed, thus preventing the mould from cooling off and/or the compound from curing in the injection pot and extruder, which may change the physical-chemical properties of the moulded item. These advantages provide a rapid return on investments and the system is more flexible. Further advantages are listed below. The labour for piece trimming is reduced: the use of a mechanical hand allows to automatically remove and separate the burr from the pieces that have been pressed directly during the drawing phase. The number of pressing operations in the time unit is increased: it is possible to draw the pieces in masked time, that is, in the closed position of the press during vulcanization, thus increasing the number of pressing operations in the time unit. Complex and difficult pieces, like curved rubber sleeves for household appliances, can be carefully drawn without affecting the total cycle time because the operation is carried out outside the press in masked time. The finishing (trimming) on the machine edge does not affect the total cycle time because, even in this case, the operation is carried out outside the press in masked time. The cost for the drawing head is reduced: the head is built with a minimum number of adequate takes to draw a single row of pieces and is then used also to draw the pieces that are in the other rows placed on the same male holder bar and on the other bars of the same mould. The tooling time for production change is lowered: it is possible to place more than one drawing head inside the same cell; their use can be selected by digiting the reference code.

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INJECTION PRESSES AS GOOD AS NEW

GLOBAL RECONDITIONING

Established in 2006, SA Tech includes the reconditioning of injection machines and vertical presses for thermoplastics, rubber and thermosets, offering guaranteed machines comparable to new ones but at much lower cost. Starting from sturdy metal structures, the implementation of state-of-the-art hydraulic and electric technology based on an innovative proprietary concept makes it possible to obtain a reconditioned product featuring precise movements, low energy requirement, user friendliness and long-term reliability. The hydraulic system is the analogue type and features a proportional valve for controlling pressure and speed. All processing parameters are set through the electronic control panel, while the cycle precision and repeatability are ensured by a closed loop control board connected to the pressure transducer and to the injection position transducer. The wiring system is redesigned completely, in order to enable the installation of inverters ensuring - besides an actual energy saving - real-time automatic energy consumption adjustment, thus allowing the system to operate continuously without wasting energy, preventing oil from overheating, reducing stress on pumps and cutting the consumption of cooling water. The new touchscreen control panel is based on Windows 7 operative system, and the Ethernet and USB interfaces enable the connection to external peripherals as well as to the corporate network, making remote assistance direct and intuitive. Many injection presses of any kind have been reconditioned both in Italy and abroad, developing special and customised applications: some of these have been carried out in the context of moving in production plants, activity in which the company is now specialized, thus allowing the processor to optimize the times and the costs of operations. SA Tech also designs and manufactures control units for calibrating the temperature of hot runners (up to 256 zones) and control units for monitoring sequential gate pins, and proposes a range of non-commercial applications also including: a moulding machine safety gate control system, complying with the current machinery safety standards; lifts with a telescopic walkable platform, allowing the operator to have access to the mould area on large injection moulding machines; a mechanical, hydraulic and electrical device for the application of BMC loading hoppers on injection moulding machines for thermosets. What is new in the growth of SA Tech is the manufacturing of new vertical machines for thermosets, LFT, GMT and composite materials.

www.satechsrl.eu

A 400-ton RMP injection moulding machine after SA Tech's global reconditioning

NEWS

Injection moulding

Renewed mini electric machine

Presmall SC 6 is the name of the new version of the all-electric mini-moulding machine that Presma will unveil at the K 2013 exhibition (booth C57, hall 15). This new machine distinguishes itself from the previous model mainly for the 6-ton tiebarless clamping unit and the multi-axis control system driving up to 16 axes (5 of which are standard axes dedicated to the injection and clamping operations.) The use of a high-speed fiber optic network and of a high-resolution encoder allows the machine controller to promptly verify and adjust the position of each actuator every 0.44 milliseconds, thus ensuring a positioning accuracy in the order of a tenth of micron. Its absolute encoders integrate a backup battery which eliminates the need for the zero calibration that usually has to be carried out when starting up electric machines. A touch-screen colour panel with a simple and user-friendly graphic interface enables the user to set the processing parameters, carry out an alarm diagnosis and acquire and store all the essential production data.

The new Presmall SC 6 distinguishes itself from the previous model mainly for the 6-ton tiebarless clamping unit and the multi-axis control system driving up to 16 axes

www.presma.it

Integrated solutions

Eight cells for injection moulding

High tech solutions, applications with fully renewed design capable of meeting every possible production requirement: this is how the Negri Bossi group aims at presenting its very latest innovations at K 2013 in Düsseldorf.
On an 800-sqm stand (hall 15, stand B22) entirely dedicated to injection, Negri Bossi showcases no less than 8 integrated production centres featuring machines with 2-platen and toggle-clamp injection technology, all equipped with Smart Energy devices to contain consumption.

To start things off, there is a 650-ton version of the evergreen Vector series with integrated robot, set up with a mould for polycarbonate headlight reflector dishes. Another icon of the Negri Bossi range is also showcased: a Canbio 210 equipped with a mould for automotive heat shield caps in PA66 filled with 25% of glassfibre; this unit, like the former, also features an integrated Sytrama robot. All the machines in the 160-500-ton range are equipped with the new Smart Flex clamping units with optimised structural rigidity and V-rails to guide the mobile platen, creating an oil-free moulding zone.

Moreover, the full electric version of the Vesta 300 is also on show: in addition to the Smart Flex clamping unit, it also features the new actuator with ultra-rapid ball bearing screw to meet the specific needs of the packaging and medical industries, which require a short cycle time. Another solution designed for the medical sector is the electric version of the Eleos 65, an extremely compact 2-platen machine that moulds a polypropylene syringe component; besides, an EOS 120 hydraulic version with inverter on the variable-capacity pump is exhibited in the LSR version. In addition, the base of the injection machine "pyramid" is represented by the excellent Sintesi Global machine, belonging to the BM Biraghi brand, the Negri Bossi group's entry level solution for technical moulding. To demonstrate Negri Bossi's technical capacity to provide turnkey solutions, the range on show at K 2013 is completed by an integrated PET test tube moulding centre, based on the Janus hybrid series and equipped with a 32-cavity Gefit mould and a Piovan pellet treatment system. The Negri Bossi stand showcases Sytrama's new Cartesian S-series manipulators. Extremely fast and precise, these are suitable for even the most difficult applications (e.g. IML).

Vector injection moulding machine in the version with 800-ton clamping force

And, last but not least, the new Bi-Power VH 1000 is on show, the smallest in the 2-platen range which has allowed Sacmi, over the years, to become a key partner in the international automotive, environmental, large-scale packaging and construction industries.

These machines combine power, performance and energy saving and are able to mould "one step" articles of wide dimensions and complex design with reduced cycle time.

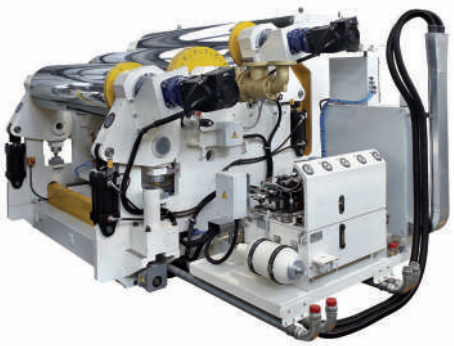
www.negribossi.com

AT THE FAIR IN DÜSSELDORF THE ITALIAN COMPANY BANDERA EXHIBITS AN INNOVATIVE COEXTRUSION LINE FOR 5-LAYER BLOWN FILM

INNOVATIVE PET RIGID FILM EXTRUSION LINE

A LIVE CONNECTION BETWEEN THE K AND THE FACILITY

Taking part in the K 2013 with a wide exhibition area, Bandera (stand C06, hall 17) is introducing an innovative coextrusion line for 5-layer blown film. It consists in a modern line suitable for the extrusion of white and black film with symmetrical structure, with PA or EVOH barrier in the middle layer, and also for lamination and flexible packaging. In addition, an innovative coextrusion line for PET/PP rigid foil is being tested from October 7 to November 8 at the new R&D department of the company in Busto Arsizio, near Varese (Italy). During the K exhibition, there is a video connection between the company's R&D area and the booth at the show, allowing visitors to watch live the line while working.



The innovative extrusion line developed by Bandera for PET/PP rigid film is equipped with a cooling and polishing calender in horizontal configuration

The line ensures a thickness range from 150 to 1,000 micron for PET foil and from 280 to 1,800 micron for PP/PS foil, a 1,540 mm (770 mm x 2) net width of the foil and a total output of 1,500 kg/h (PET), 1,100 kg/h (PS) and 1,000 kg/h (PP). In detail, the line is equipped with a gravimetric "loss in weight" dosing system, with the possibility to work up to 6 components fed by a suitable handling conveying system. A corotating twin screw extruder, type HVTSE 2C105mm 52D, allows the direct extrusion of post-consumer regrind PET flakes without dehumidification and crystallization, induced by an efficient degassing system. It is set up for the installation of side feeders for external mineral fillers. A 2C55mm 52D corotating twin screw extruder permits the extrusion of virgin/regrind PET for the external layers of the foil. A backflush superfiltration screenchanger has been installed to ensure continuous self-cleaning. A melt pump provides constant pressure and volume of the melt to the extrusion die, reducing scraps and improving the management of the whole process. The width of the foil and the relative feed block and selector plug can be easily and quickly reduced thanks to a single manifold flat die with manual internal deckling systems.

Cooling and polishing roll stack calender with horizontal configuration, drilled rolls and cross-axis system installed on the first calender nip allow to obtain the perfect foil profile even with very low foil thicknesses. A cleaning system efficiently cleans the middle roll of the calender through a contact sliding (motorized) trolley installed on a transversal rail. A rubber contact roll laminates the barrier film directly in the calender, and a control system monitors the thickness and width of the foil.

A haul off system and a longitudinal cutting system by motorized blade and counter-blade have been adopted for the edge trims of the foil and to obtain multi-reels on the same shaft. The fully automatic winding system features double stations. The winder is equipped with an automatic transversal foil cutting device and an automatic foil threading system for carton cores. A semi-automatic trolley carries out the reel discharge by load cell. The system is equipped with accumulator double rack to slow down line speed during the changeover of the reels. Wiring is noticeably reduced, making the electric and electronic maintenance easier.

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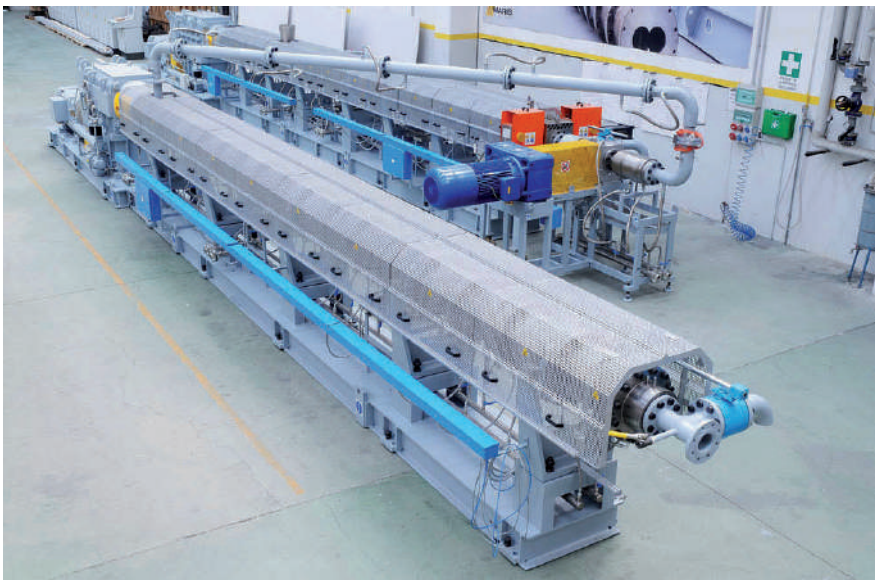

THE COROTATING TWIN-SCREW EXTRUDER, AS AN ALTERNATIVE TO THE BATCH SYSTEM, IS EXTREMELY ADVANTAGEOUS FROM AN ENGINEERING PERSPECTIVE

CONTINUOUS PRODUCTION OF SOLVENT BASED ADHESIVES

ONE STEP AND TWO STEPS

Since its foundation in 1962, Maris (stand B59, hall 16), manufacturer of corotating twin-screw extruders, has always been a leading innovator in the research of new, state-of-the-art applications for its products. With the aim of providing the customer with the widest range of choices, every mechanical component of the extruder is entirely manufactured in-house. Maris is indeed, in the world, one of the companies that is capable of customizing its co-rotating twin-screw extruders according to specific customer requirements, even in the production of adhesives such as solvent based adhesives.

The corotating twin-screw extruder, as an alternative to the batch system, is extremely advantageous from an engineering perspective. As a dynamic mixer characterized by intermeshing and self-cleaning screws, the extruder is fed in a continuous way with free-flowing material, by means of gravimetric feeders. This ensures not only process stability and reproducibility, but also flexibility in the changes to the formulations.

The experience gained by the company with hot-melt and total solid applications has been transferred to solvent based adhesives. This particular category of adhesive is commonly produced in dissolvers, with the use of a noteworthy quantity of solvent. Once spread, the solvent is vaporized, an operation that limits the speed of the entire production phase.

The corotating twin-screw extruders, on the contrary, allow to significantly decrease the amount of solvent in the adhesive. This permits to limit the environmental impact of the whole process: a 500 kg/h production is estimated to reduce the emission of solvent in the atmosphere by about 30.000 l/year.

Maris technology, which is continuous and complies with Atex norms, helps limit the plant costs: a smaller percentage of solvent means quicker evaporation times and, simultaneously, higher production speeds. The volume of solvent saving positively affects both process phase and storage, thus ensuring production safety and security.

The flexibility of the extruder and its quick response to the variation of the process parameters ensure a direct on-line control of the material viscosity. It is therefore possible to use different types of natural rubber, including lower qualities. It is also possible to color the material, with the addition of a further, smaller extruder.

TABLE 1

Comparative table: One Step vs Two Steps	One Step	Two Steps
Costs	Lower	Higher
Line complexity	Simpler only one extruder no gear pump less space needed	More complex two extruders gear pump more space needed
Flexibility	Lower	Higher
Production rate	Lower	Higher
Specific energy	Lower	Higher

This operation, due to the self-cleaning characteristic of the two co-rotating screws, is simple and allows to minimize cleaning times.

The company technology for the continuous production of solvent based adhesive is based on two solutions. The first is ideal when the primary target is an economical and simple system. The second enables higher production rates and greater plant flexibility.

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NEWS

Extrusion technology

Complete lines and equipment

In the market of plastics, Teknomast proposes itself as a dynamic company able to listen and develop technology which can fully respond to the customer's needs, providing what is considered to be the best solution. The company produces complete extrusion lines and equipment. The RSZ 90/30 HD extruder is a machine that, thanks to a direct drive torque motor with water cooling, is able to process 600 kg of PP or 800 kg of PE. The heating of the cylinder, divided into four areas, is carried out by a system of ceramic resistors. The cooling of the feeder zone is obtained by a cavity where the circulating water is managed by a flow meter while the cooling of the cylinder is ensured by a system of electric fans.

The production of the spiral pipe and/or pipe with steel wire takes place in different ways, with single or double spindle system, depending on need and production capacity. The company provides complete lines, but also equipment to be adapted to extrusion systems already at the customer's premises, to produce pipes with a diameter ranging from half to 6 inches. In addition to the spindles and the spindle support in different sizes, the main features are the extrusion heads with dies, the form-spring system (in the case of pipe with steel wire), the cooling system with stainless steel tanks, and the electrical panel, which is the heart of the equipment and interfaces with the management system of the extruders perfectly since it must synchronize the mechanisms of the extruders, the spindles and, possibly, the form-spring system.

Over the last few years a line of three-cylinder calenders has also been developed to be used as laboratory equipment for pilot productions, and in line with machines used to produce PVC, PET, PS and PP sheets. Today the company has a very diverse range of calenders, with a table from 400 to 2,500 mm and a diameter from 200 to 600 mm; the cylinders can be positioned on an axis perpendicular to the support plane or at 45° to the same plane. All cylinders of the calenders are made of hardened steel, with hard metal insert and hard chrome plating on chrome-plated surfaces. In order to ensure perfect circulation of the cooling or heating fluid, a cavity is realized on the cylinders and they are then hot lined so as to prevent any leakage. ■

www.teknomast.it

Teknomast has a very diverse range of calenders, with a table from 400 to 2,500 mm and a diameter from 200 to 600 mm

Reduction in energy costs

Pace with a change

The market needs a change and Bausano (hall 16, stand B70 at the K 2013), thanks to its consolidated experience in more than 65 years of activity, continues to support its customers with the constant development and improvement of its extrusion lines. The reduction of energy costs is not only imperative to be competitive in the global market, but also responds to a specific international effort to limit the footprint of industrial production in terms of CO_2 emissions.

In particular, the growing attention to high performances in terms of quality and production capacity finds a further thrust in the need to reduce specific and global energy consumptions, which have a significant incidence on the total cost of the product.

With the aim of meeting customers' requirements, Bausano proposes a range of innovations that redefine the philosophy of energy-saving with the adoption of elements and construction details, such as: high-efficiency motors; closed-loop system with high capacity heat exchanger in the calibration benches for profiles and calibration tanks for pipes; electronic control of vacuum pumps by inverter; fully automated, electronic grade vacuum system. The results obtained follow the path taken by Bausano with the launch of the new Multi Drive MD75 Plus and MD130 Plus extruders, which, with the same power of their predecessors, allow to increase production capacity by up to 30%. ■

www.bausano.it

The new models of the MD (Multi Drive) extruders allow to increase production capacity by up to 30%

Thermoforming, recycling, extrusion

Equipment for three fields of application

At its stand (D43, hall 16), Amut presents to customers and visitors the following equipment, which is part of, and therefore represents, the production range of the company's three departments: extrusion, thermoforming and recycling.

The thermoforming machine model AMP850S-GP, tilting type, is proposed for 240-cc PP cup production with an output of over 90,000 pcs/hour. The complete set of production includes: automatic stacker, packaging unit, chiller & thermoregulation unit, grinder. Daily working demonstrations to be timed during the exhibition.

The delabeler unit has been developed for post-consumer PET bottle washing plants. Also on show, special equipment to totally remove the "full body" or "shrink" plastic labels from PET bottles. This system is patent pending.

The EA75/52D-HT-HS single-screw extruder belongs to the new series High torque-High speed, and has a diameter of 75 mm and an L/D ratio of 52. It also features a capacity up to 600-700 kg/h for polyolefin-based materials and a high revolution speed. The BA92/AR40 twin screw extruder, counter-rotating type, WPC series, is destined to the production of wood-plastic composite profiles. It is able to extrude plastic resin (PVC or PP) filled with up to 80% of wood or vegetal fibres directly in powder (without compounding). The horizontal roll-stack AKO1800 can extrude foil having a maximum width of 1,600 mm. It ensures a capacity up to 1,800 kg/h and features rolls with a horizontal geometry, specifically designed for PET foil production. Last but not least is the extrusion T-die for foil or sheet production. It has a nominal width of 1,200 mm, it is fitted with a choke bar for melt flow pre-adjusting and is complete with relevant supporting trolley.

www.amut.it

The new unit for removing shrink labels from post-consumer PET bottles in washing and recycling plants

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Delia srl specializes in the design and construction of special automated machines, equipment for rubber moulding processes and robotized island (cell)

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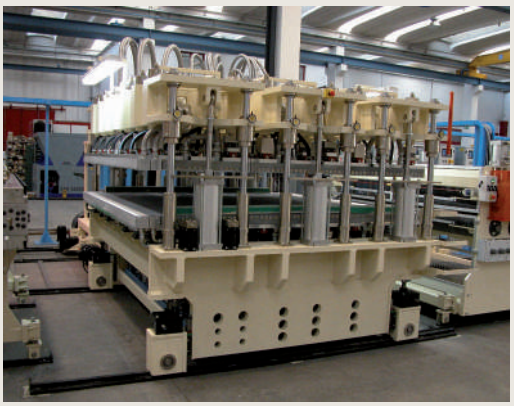
EQUIPMENT FOR SHEET PRODUCTION

CALIBRATION UNIT AND VERTICAL CALENDER

As in the past editions, at this K show, BG Plast Impianti (hall 16, stand B22) showcases some innovative machines. The most innovative of them is a "hybrid" hollow sheet calibration unit. This system has been designed to produce both PC and PP hollow corrugated sheets. Usually, it is considered impossible to produce these two completely different materials on the same extrusion line: thanks to BG Plast direct past experience, this is now possible.



The calibration unit developed by BG Plast Impianti is intended for processing both PC and PP hollow corrugated sheets

It is worth mentioning that the throughput of the line has not been affected at all: for both materials the extrusion line ensures the maximum possible capacity as if it were specifically made to process just one of the two materials. The calibration unit on show is part of the 6 lines sold to the Russian company Kronos Trade, one of the biggest producers of PC hollow sheets in the entire Eastern European region. The other machine is a vertical 3-rolls calender, 1,500 mm wide with a diameter of 500 mm. This unit is designed for the production of HDPE T-grip sheets. These sheets are destined to be used as concrete pipes inner liner. There is a high demand for this liner in the Middle East and this new machine will be installed in the Amiantit factory in Dammam, Saudi Arabia, to whom the Italian company already supplied similar lining 6 years ago.

www.bgplast.it

NEWS

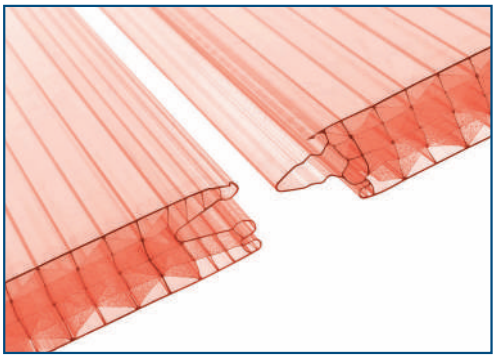
An important anniversary

Half a century

This year Omipa (hall 17, stand A42) celebrates the 50th anniversary of its foundation. The company is characterized by a production policy based on in-house manufacture of all different components of the extrusion line.

With regard to the automotive industry, the company can provide complete coextrusion lines for the production of coextruded sheets (ABS, PC and other thermoplastic materials). These materials have been used successfully for years in body parts of small and large vehicles. As far as the building industry is concerned, the company can be an important partner thanks to a large range of lines for PC hollow profiles with different tailor-made profile geometries, useful for big coverings and infrastructures.

Furthermore, Omipa has developed a new range of machines for the production of innovative profiles such as roofing panels, wall panels, clip profiles, cogging profiles, corrugated hollow profiles and "wing" panels. Additionally, in the agricultural field, the PC hollow profiles made by its machines are widely utilized in the production of greenhouses. In order to produce coverings with high insulating capability, the company provides lines for the production of PC corrugated sheets with numerous design shapes, as well as several industrial profiles.



Omipa extrusion lines can manufacture a wide range of profiles with different geometries for large coverings and infrastructures

The company also supplies a wide range of lines for PP hollow profiles for the production of packaging for the transport of agricultural products and mail, as well as heavy packaging and packaging for hospital and sanitary applications.

www.omipa.it

Film extrusion

Expanded PE

The extrusion lines recently developed and built by FAP (hall 12, stand C07) have brought significant innovation to the production of expanded PE film in the last years. The lines recently developed by the company can process materials of higher quality and better density.

FAP can currently design and build machines which output ranges from 50 up to 1,500 kg/h, obtaining very low density, such as under 16 kg/m^3. Despite facing continuous challenges by the low-cost machine builders from Eastern Europe on the international market, FAP has never stopped focusing on high technology, efficiency and best quality for its machines. The company has successfully optimized density and homogeneity of various materials and is now offers excellent quality at a competitive price. The improvement of the mixing process of PE with gas and the use of economical and efficient lines have led to a saving of up to 20% of the costs and to impressive figures with regards to the power/weight (kW/kg) ratio.

FAP can now design and build machines which output ranges from 50 up to 1,500 kg/h, obtaining very low density, such as under 16 kg/m^3

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Viplas Produces new and reconditioned screws, twin-screws and plasticization barrels for injection, extrusion and blow molding machines from dm. 40 up to 500; made of special steels: bi-metal, nitrided, tempered and powder steel. The expertise and help of state-of-the-art machines, in addition special material and treatments, contribute to the resolution of problems due to abrasion and corrosion. Viplas thus makes a high-quality product that is closely monitored by specialized personnel available to you.

VIPLAS

PLASTICIZING SCREWS AND BARRELS

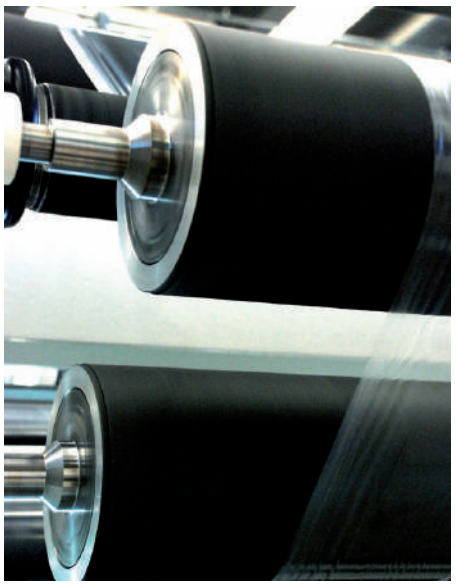
NEWS

Evolution in extrusion

New generation for stretch film

At K 2013, Colines (hall 16, stand A39) introduces the new ALLrollEX 1500 line for the production of stretch film, to be considered as the evolution of a major success, HANDrollEX 1000 mm, pioneered by the company in 2006.
The in-line direct production of manual reels became a reality thanks to the very quick and impressive diffusion of this model, with tens of lines sold all over the world.
The same salient features (flexibility and user-friendly characteristics, very high relative productivity, limited initial investment, low energy consumption, reduced space requirement) were given a further boost in the new generation of ALLrollEX 1500, expressly engineered for the production of thin films on high standard manual, automatic and jumbo reels, without any tails or sacrifice in the performance.
Particular emphasis was put on the capacity to wind very thin films (up to 6 micron) on reels without stressing - and consequently damaging - the film thanks to a tension control system specifically designed for such low thicknesses; the same attention was given to the study of the winding axis, equipped with a pressure control system to avoid any air absorption in the reel.
Not just the new winder but the whole line has actually been designed to ensure energy saving and flexibility of use. It features: torque motors for extruders and chill-roll, allowing over 10% saving in energy consumption compared to the traditional motor + gearbox solution; infrared heaters for extruders, with an actual energy saving of more than 20% compared to the traditional ceramic solution; melt pipe insulation, minimizing thermic energy waste and environmental impact; infrared reflection thickness gauge system, allowing the film gauging directly in contrast on the chill-roll, dramatically decreasing the response time of the system and significantly reducing production waste for the line start-up until the system reaches full operational speed; extruders with a high L/D ratio and high speed, to guarantee the perfect blending of raw materials even when they are not "perfectly compatible" for blending, and ensuring a high productivity at the same time.
Since the last edition of the K show, beside the stretch film lines evolution, Colines has been developing and innovating many other lines. Among the most important achievements the following innovations are noteworthy: the DiaperBlown line for the production of hygienic film with in-line embossing; the new series of CPP high performance lines; the continuous development of the Bubble Guard Board technology (worldwide patent the company is taking steps to protect, fighting different infringement attempts); the further push to the air bubble film technology, now up to 14 layers.

www.colines.it



The new ALLrollEX 1500 is the evolution of the HANDrollEX 1000 mm, pioneered by Colines in 2006

Equipment for stretch film

Multi-wind winder

At the K show, Dolci Extrusion (hall 16, stand A05/A17) displays the new stretch film winder for the production of either hand rolls on 2-inch cores, or machine rolls and jumbo rolls (up to 420 mm diameter) on 3-inch cores. The stretch film market is becoming increasingly demanding for the production of very low gauge films having very good mechanical properties and good optical appeal. For this reason the winders must run smoothly at higher speeds in order to reach a reasonable output of the cast line.

The new stretch film winder for the production of either hand rolls, or machine rolls and jumbo rolls, shown by Dolci Extrusion at the K Show

As a matter of fact the new Dolci winder has been designed to achieve a speed of 800 m/minute. In the design phase, the company has considered the customer's need to follow the "changing" market trends, and the outcome is a versatile machine that can produce the 50 kg jumbo rolls, or the machine rolls (15/20 kg), or even the hand and cling rolls winded on "thin cores" for film length of less than 200 metres.

At the show, this new winder works in-line with a 5-layer 2-metre cast line, having an output of up to 1,350 kg/h, and is the evolution of the well tested Rotowind winder, that was designed for hand and machine rolls.

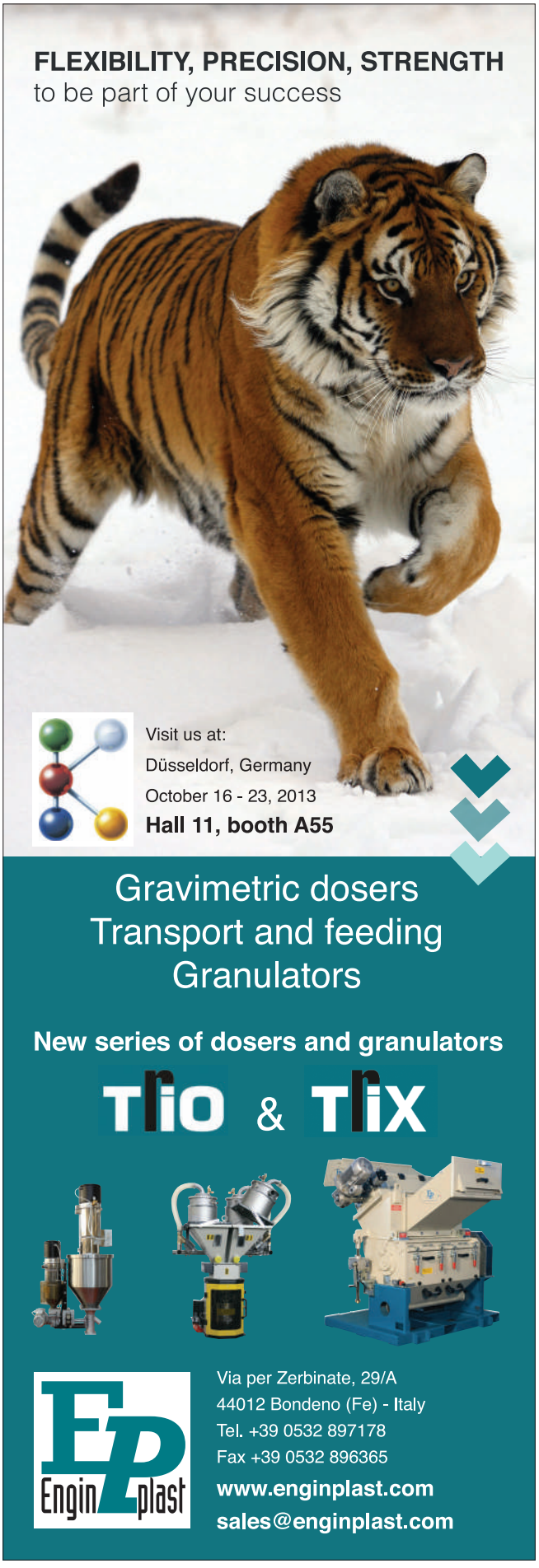
The new Multiwind is designed for a contact/axial winding system with 4 spindles and a roll change cycle of 17 seconds.

Particularly interesting and totally innovative is the cores loading system and the cores storage of 100 cores (2 inches) or 75 cores (3 inches). This system can be easily expanded upon customer request.

This winder has been specially designed for thin film production - 8/10 micron - at high speed. For this reason, it features some cylinders driven by vector motors.

At the K Dolci will also show its most updated blown film line for quality films, designed for an output of 750 kg/hour.

www.dolciextrusion.it



NEWS

PVC processing

Thirteen bin activators

Thirteen bin activators have been recently supplied by WAM to a PVC plant in China. Reliable, functional, flexible, easy to use: these are the main features of Wamgroup products, which are aimed at fully satisfying the needs of the plastics processing industry.

Thirteen bin activators from WAM have been installed in a Chinese PVC compounding plant of a global chemicals supplier

An excellent example is the application of Wamgroup's bin activators in a PVC compounding plant of a global chemicals supplier located in China. A long-term collaboration between WAM Italia, the Italian trading subsidiary of Wamgroup, and the Italian division of a global engineering company specialising in storage and processing plants for reinforced polymers, gave WAM Italia the opportunity to provide ten stainless steel Atex bin activators for large capacity silos for PVC, $CaCO_3$, dry blend, TiO_2 storage, and three bin activators suitable for daily buffers hoppers, which normally operate under negative pressure conditions. Moreover, three vibrating bin aerators were supplied by OLI, an associated company of Wamgroup specialising in vibration and flow aid technology.

As a leader in the supply of equipment for bulk solids handling and processing, Wamgroup has developed and specialised a product range for plastics processing plants. Among other products, this range includes slide valves, diverter valves, rotary valves, dust collectors, bin activators, screw feeders and loading spouts.

Oriented to the market needs, Wamgroup takes great interest in constant product innovation with the aim to provide the industry with affordable industrialised solutions, tailored for the specific needs of the application.

www.wamgroup.com

Solutions for irrigation

Extrusion line for hoses

In the plastics extrusion sector for more than 20 years, Profile Dies (hall 16, stand E72) is specialized in the design and production of special equipment and complete systems for drip irrigation pipes, films, flat sheets, hollow profiles and sheets, and equipment tailored to customers' specific requirements. The company also manufactures extrusion lines for the production of furniture trim (PVC, PP or ABS) with thickness from 0.4 to 3 mm, PE/PP/PC/PMMA hollow sheets and profiles with thickness from 2 to 60 mm (up to 9 layers), and extrusion lines for the production of flat sheets with thickness from 0.2 to 15 mm.

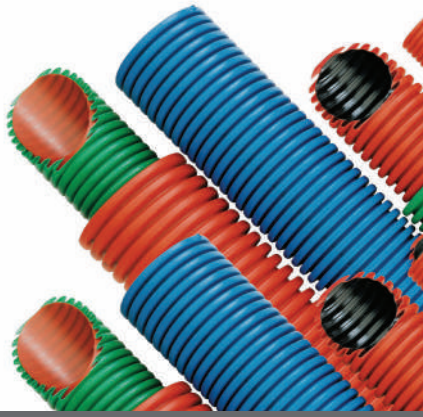
Profile Dies has developed an extrusion line able to insert up to 800 flat drippers into irrigation pipes

The company has recently developed new automated extrusion lines for the production of drip irrigation pipes with flat drippers, which reach a maximum output speed of 150 m per minute and can insert up to 800 drippers per minute, and extrusion lines for the production of round drip irrigation pipes, with a production speed between 80 and 100 m per minute and an inserting capacity of up to 400 drippers per minute, to produce pipes with a 16 to 20 mm diameter.

Still with a view to develop solutions for the irrigation field, at K 2013, Profile Dies presents to the market a new extrusion line for the production of hoses with variable water output. This irrigation system is extremely cheap and is suitable for both crops in open fields and gardens. It is easy to install and to remove after use, thanks to the low thickness of the pipes. The new line technical specifications are: maximum output speed up to 200 m per minute; spacing (distance between holes) between 10 and 15 cm; minimum wall thickness 5-6 mm.

www.profiledies.com

ITIB Machinery International with his experience of more than 50 years can supply extrusion lines for the production of single and double wall corrugated pipes in PE, PP, PVC, PA, EVA and other thermoplastic materials starting from 4,5 mm I.D. up to 1200 mm O.D..



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SYSTEMS FOR RUBBER CALENDERS

POSITION AND FORCE UNDER CONTROL

The Hydrogap system has been patented by Comerio Ercole (hall 16, stand F21) for controlling the position and gap distance of the rolls in its rubber processing calenders and mixers. Each portable roll is actuated by two hydraulic pistons, which in turn are driven by oil fed by a pump and regulated via special servo-valves. The reference signal representing the set position of the portable roll is continuously compared with the feedback signal coming from the high precision electronic transducers installed on the machine. The closed loop control system corrects in real time any deviations from the value caused by lamination stresses between the calender cylinders or imperceptible changes in environmental conditions (humidity, temperature etc.). It can also be interfaced with a thickness gauging system to ensure quick regulation without hunting. The position repeatability achieved by the system is equal to ±2 micron with a position accuracy for each bearing block in the range of ±5 micron. The rolls are adjusted at a speed of 1 mm/s, which can be increased to 10 mm/s for emergency opening.

The system offers the following advantages: no wear of mechanical parts; no mechanical clearance of moving parts; reduced start-up times; reduced handling costs; easier maintenance; quick roll positioning at recipe changes; high speed emergency opening; excellent position repeatability; protection of roll integrity in case of accidental passage of hard materials between the rolls.

The Hydronip system, on the other hand, controls the pressure exerted by the rolls, optimizing the rubber coupling process. Load cells under the calender bearing supports are therefore unnecessary and the lamination force is always readable and controllable, allowing the operator to select the optimum conditions for each product type.

In short, the Hydrogap system ensures a precise and repeatable positioning of movable rolls, one of the most important parameters in ensuring the quality of the calendered product, while Hydronip ensures optimum material coupling.

www.comercole.it

Hydrogap and Hydronip systems have been developed by Comerio Ercole for controlling the position and the force of the cylinders respectively

NEWS

A network of excellence

The Brush District

One year after its official opening the "Brush District" is ready to present itself to the international market: TechnoPlastic and Borghi (hall 12, stand A24) at the K fair in Düsseldorf. The Brush District is the Made in Italy technological pole for the manufacturing of machinery for the production of brooms and brushes. A highly skilled cluster of national excellence, located in Castelfranco Emilia (near Modena, Italy), reflecting the experience of the industry leaders. An efficient and flexible business network that gives a competitive advantage to the three members: Borghi, a worldwide leader in the production of machinery for the broom and brush industry for over sixty-five years; TechnoPlastic, a specialist in the production of equipment for extrusion lines dedicated both to strapping bands for packaging and plastic monofilament, mainly for broom and brush applications; Unimac, a forefront reality in the design and manufacturing of machines for the production of power brushes and lines for fixed and telescopic handles. Borghi and TechnoPlastic participate in the K Trade Fair sharing a booth where they bring their contribution in terms of technological innovations. Borghi exhibits the filling machine model STAR-R32 for the production of all types of brooms and brushes. It is a double tool rotating machine with 3 stations (blocks loading/unloading, drilling and filling unit) operating simultaneously and able to work on two pieces at a time. The carriages are moved by 5 axis driven by servomotors and controlled electronically via PC. The highly flexible machine can fill articles with parallel, radial and parallel/radial tufts. Techno Plastic exhibits the fully electronic winder, suitable for PET strap from 4 up to 32 mm. It is a state-of-the-art machine dedicated to the winding process on band strap spools for packaging. It marks a real turning point, a leap forward for the whole field thanks to its forefront technology. Borghi provides solutions for the production of machinery for the brooms and brushes industry, offering its customers over 65 years of experience, state-of-the-art technology and the utmost professionalism in its services. Flexibility and versatility, combined with product quality and reliability are the factors that determine growth and success. Techno Plastic provides all inclusive customer-oriented services (raw materials research, design, testing, after-sales service) for extrusion lines dedicated to the production of strapping for packaging and plastic monofilament, with a focus on technological research and environment. The core business is advanced projects for the use of recycled plastic.

The STAR-R32 double tool filling machine with 3 stations for the production of all types of brooms and brushes can work on two pieces at a time

www.borghi.it

Recycling equipment

Cold and hot wash

The plants supplied by Reg-Mac for the recycling of post-consumer plastic are based on cold or hot wash and available in four models, with a capacity ranging from 600 to 2,500 kg/h.

With over 27 years of experience in the field of post-consumer plastic recycling equipment, Reg-Mac (hall 09, stand D52), headquartered in Olgiate Olona (Varese, Italy), is proposing technological solutions based on a modular concept that allows the best plant layout according to specific processors requirements. The main production of the company is represented by washing lines built with 2 different technologies: Cold-Wash series, suitable for rigid and flexible flakes made of LDPE, HDPE, PP, PS, PVC, and other materials; Hot-Wash series, suitable for PET/HDPE flakes. Among the recent innovative developments, the Hot-Wash treatment is the most significant. Such a process is carried out by two independent units where flakes are automatically loaded and alternately treated in both chambers, thus resulting in a continuous working process with two separate feedings. This Hot-Wash unit features significant improvements, which include further control instruments integrating the standard ones.

Chemicals are automatically dosed on the basis of working parameters established time by time according to incoming PET quality. After chemical treatment, liquids are extracted by a specific filtration system and PET flakes are then fed into an intensive rinsing system. Process controls have also been improved, becoming more functional by means of a touchscreen instrument, which allows the operator to follow and modify parameters as needed. The whole process is customized according to the final application of the PET clean flakes: bottles, sheets, fibres, strapping bands, etc. Cold-Wash and Hot-Wash lines are available in 4 models, offering a treatment capacity from 600 to 2,500 kg/h. Reg-Mac production also includes R series densifiers/agglomerators, available in 3 models with 8 motor power, suitable to convert voluminous films and fibres into heavier chips, which allows: final dry materials, better homogenization of colors and specific weight, higher bulk density, easy mixing, transport, storage etc.

www.regmac.com

NEWS

From preforms to caps and large one-step articles

Planet plastic

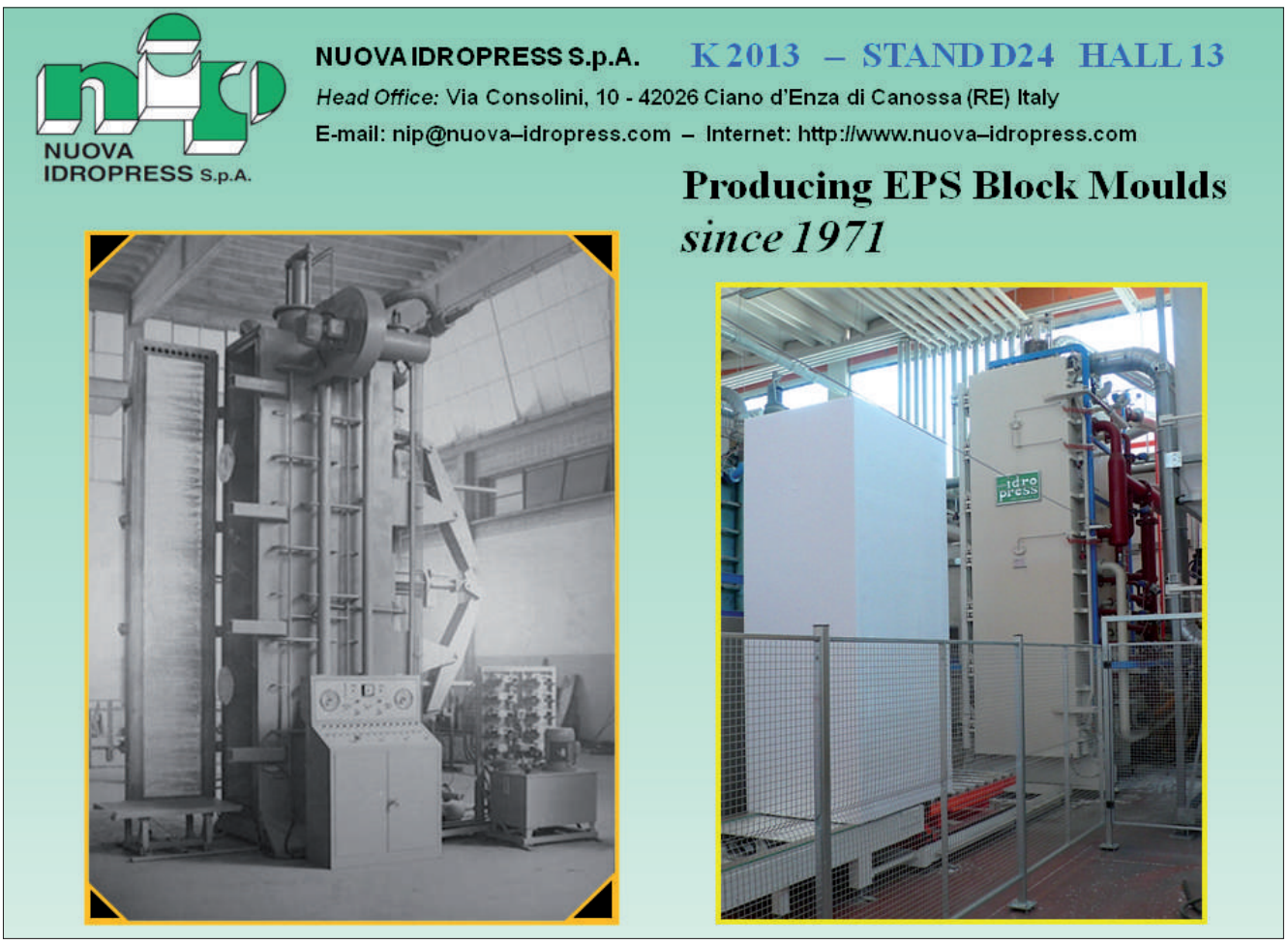
At the Sacmi stand (hall 13, stand A63), a pivotal role is played by the IPS 220 B, a new-concept injection preform press that stems from Sacmi's decades of experience in the industry and from innovations developed on the stretch-blowing front. An innovative control system allowing real-time control of process parameters means exceptional size changeover flexibility and outstanding user-friendliness. Moreover, this press ensures the very best cycle time and the highest energy efficiency within the industry, thanks to innovative technical solutions, such as the kinetic energy recovery system (kers). Easily incorporated in a line via the innovative PVS 2B system, the IPS press stands out on account of extremely short cycle times and excellent output flexibility, allowing the manufacture of preforms up to 190 mm.

At the Sacmi stand a pivotal role is played by the IPS 220 B, a new-concept injection preform press

With regard to plastic caps, at the K stand, the company exhibits an upgraded version of the CCM 48 S, optimised for the innovative Cool+ mould. In fact, the version on show at the fair features this new mould and produces 2,000 caps per minute: the cycle time, a mere 1.5 seconds, is an industry first. Moreover, as from this year the CCM can be fully integrated with the bottling line via a highly automated dynamic buffer (CPB Link); also in this case, further advantages stem from the integration with the Sacmi CVS quality control system. And it is here, on the vision systems and quality control front, that the group is now launching the "total inspection" concept with the CHS Lean solution. In addition to a marked increase in inspection rates - up to 150,000 caps per hour - CHS Lean also allows all-round "360°" cap control, from the side wall to the tamper band slit profile.

One of the many distinctive characteristics of the CBF is the transfer of all the advantages of compression technology to an entirely new sector, plastic containers made of different resins commercially available at present (HDPE, PS, PET and PP). The advantages of this solution include continuous extrusion of plastic while, inside the mould, the preform is thermo-regulated to a temperature that allows for it to be stretch-blown to form the container which, in turn, is fed in an orderly manner to the line while the smoothly integrated Sacmi BVS system certifies quality.

www.sacmi.it



Multilayer barrier film

Double bubble line with annealing

The extrusion and biaxial orientation lines, manufactured and sold by GAP (hall 17, stand A76), are mostly designed for the production of multilayer heat-shrinkable film by the technique which is generally known as double bubble process or simultaneous bubble orientation.

Double bubble technology is a typical coextrusion process where the polymer, after leaving the die, is water quenched to form a primary tube

An important contribution in this area is represented by the new pilot multilayer double bubble and annealing process that GAP carries out at its factory. This high tech line will be a pilot plant in the development of new multilayer oriented barrier film structure for the production of barrier bags, barrier shrink film and lid film. The new high tech center attracts the attention of many producers of barrier materials and provides significant improvement to the process and technology. Double bubble technology is a typical coextrusion process (using extruders and die) where the polymer, after leaving the die, is immediately water quenched to form a primary tube which is then conveyed up to the top of the orientation tower to then descend through a series of infrared heated ovens that raise the temperature of the primary tube until its temperature reaches the orientation level. The primary tube is stretched simultaneously in both directions under the combined effect of internal air pressure and differential speed between the upper and lower stretch nip. The company has also experience in extrusion coating and in multistage extrusion coating and laminating for the production of multilayered material used in liquids packaging. GAP can offer, under one roof, both extrusion and web converting capabilities, which make it a reliable partner for coating or lamination projects. Lamination through extrusion requires high technological features due to the need to preserve the product with its best organoleptic properties, causing no damage or alteration.The materials used for these packages are obtained by combining webs of different materials through an extrusion or coextrusion/laminating process. Among many different applications, a typical example of application of the extrusion/laminating process is the production of laminates for long shelf life preservation of liquid foods. This product typically consists of different layers, which are combined together. It is produced by a multi-station coating machine. GAP carries out extensive research and development on new machine design and dedicated technology with the constant support of a team of specialists.

www.gapitaly.com

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ALL ELECTRIC BLOW MOULDING MACHINE

ZERO ENERGY

A large portfolio of blow moulding system technologies are offered by Uniloy Milacron (hall 14, stand B03), whose aim is to match the ideal machine system solutions with different applications. This has meant innovative blow moulding solutions for plastics processors worldwide for over five decades. The company is taking another step forward in terms of performance with its injection blow moulding machine series, one of the widest on the market today. Uniloy presents the new Umib 100 EnergiaZero: "the state of the art" among all electric injection blow moulding machines for the manufacture of precision bottles for medical, pharmaceutical and cosmetic products. Thanks to a new concept motion mechanism, Uniloy has been able to simplify axis translation components and utilize low numbers of brushless motors for a faster dry cycle time. This means an extended trigger bar length for a larger number of cavities, an easier mould change and free access machine maintenance. Other important advantages of Umib 100 EnergiaZero, such as adjustable closing force, up to 100 tons, and settable opening stroke, allow to optimize production with the right force and the shortest cycle time for each container. New technologies have been introduced to reduce motion energy consumption and recover energy in the motion deceleration phase, in order to cut down to a minimum the use of energy. The absence of hydraulic circuits eliminates the risk of contamination from lubricants and the noise pollution, making this system the perfect solution for clean-room productions. Moreover, the absence of hydraulic oil and filters to replace result in lower maintenance costs.

Laminar flow and nickel coating of the moulding area grant high cleanliness levels. Sophisticated air filter systems inside the moulding area, where there is a constant air flow and positive pressure, prevent any possible contamination including bottle contamination deriving from paint particles. The nickel coating in the moulding area permits steam sterilization, while the self-lubricating bushings avoid the use of lubricants in the container formation area. The precision of all electric injection units can be configured with a wide variety of screw designs and L/D ratios to process all types of resins with virtually no variation in the final part weight, even when utilizing regrind. Capable of producing containers from two millilitres up to one liter with precise neck finish, wall thickness, weight and no scrap or pinch-off scar, the new design of Umib 100 EnergiaZero has a number of features that make it ideal for use in sterile applications, such as clean-rooms.

www.uniloy.it

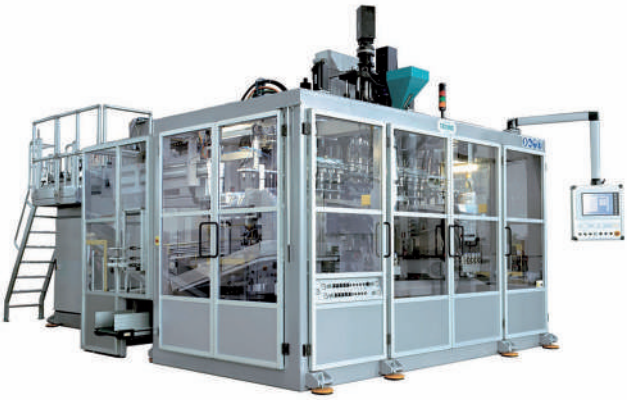
The new all electric Umib 100 EnergiaZero blow moulding machine is mainly proposed for the manufacture of bottles for medical, pharmaceutical and cosmetic products

NEWS

Extrusion and blow moulding technology

Double shuttle for drinkable yogurt

With more than one hundred plants all over the world, 20 billion bottles produced every year and an average turnover of 3 billion US dollars, Graham Packaging Corporation is known worldwide as one of the biggest converters of plastic packaging for liquids. The acquisition of Techne (hall 14, stand A02), a machines manufacturer, in 2011 joined experience, technical know-how and excellence of two of the major companies in the market with fruitful results. The technological innovation which has always characterized the company has strongly contributed to the commercial success since the acquisition and has consolidated Techne brand. After the success of high technology machines as Rotax and Advance, the range has been further completed with a new full electric machine, dedicated to customers with medium production capacity. The company has been one of the first companies to develop full electric technology in extrusion and blow moulding and the current range is one of the most complete available on the market with solutions for almost any application for a wide range of product categories. The ADVT machine was introduced into the market a year ago, proving to have strong appeal and raising great interest. Actually, it is the best seller among Techne range of machines with a high number of units already delivered for motor oil, personal care and food applications with excellent results in terms of performance, consumption, maintenance, efficiency and an unexpected quality/price ratio. Compact, highly flexible, full-electric, it follows the long-lasting Techne tradition and comes with the reliable full electric technology of ADV first series, transferred onto a medium/high production capacity scale thanks to its single or double shuttle configuration.



The double shuttle machine exhibited by Techne is dedicated to the -production of 200-ml round bottles for drinkable yogurt, neck to neck, 40 cavities, for a total production capacity of 12,000 bottles per hour

The machine, exhibited at the K show, is dedicated to the production of 200 ml round bottles for drinkable yogurt, neck to neck, 40 cavities, for a total production capacity of 12000 bottles per hour, on a double shuttle configuration. It includes a specific patented take-out system, which allows the transfer of the log onto the outlet conveyor in the horizontal position. With this new series, the low electric consumption further decreased and reached 0,27 kWh/kg of extruded plastic with a significant money saving for the final user.

www.technespa.com

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NEWS

"Out of the box" blow moulding solutions

Starting from the end

For Automa (hall 14, stand B58) "to think out of the box" means to start from the final product. To do so, the company presents several solutions whose aim is to achieve a high level of product liability, flexibility, modularity and expandability. In order to reach this goal, a brand new I-Lab has been created, a laboratory where customers' ideas can be converted into reality through innovative engineering instruments for bottle production. This is why, at K 2013, Automa presents two new arrivals. The first running machine is the EBM Pro, with its unique technology in terms of flexibility and modular concept. Through personalized configuration and number of shuttles, Automa can fine-tune the machine focusing on the client's competitive edge. This is why EBM stands out: to give clients the solution that better fits their needs but, at the same time, look at the future considering business growth. The increase of production capacity can easily be achieved simply by adding shuttles. The other technology is the ISBM (single stage) for the production of PET containers. The company has continued to develop technology for this sector, achieving features that make it unique in terms of productivity, consumption and footprint.

www.automaspa.com

Complete cycle plants

Blow, fill, seal

Specialized in the manufacturing of primary packaging machines for aseptic packaging of liquid pharmaceutical formulations, Brevetti Angela proposes the Syfpac, Secureject, Cynopac and Liquidpac ranges for blowing, filling and sealing aseptic packaging. They just take 12 to 20 seconds from formation to the filled and sealed container. A special low temperature filling attachment can reduce the temperature of blow moulded containers so that the filling product (vaccines, biological products and other heat labile formulations) is not adversely affected.

The Secureject machine allows the production of prefilled syringes in 18 seconds at a cost of 12 euro cents starting from the polymer

The latest innovation is Secureject for producing prefilled syringes in 18 seconds at a cost of 12 euro cents starting from the polymer. Syfpac SVP and LVP machines are versatile and reliable machines designed for blowing, filling and sealing containers for injectable solutions, ophthalmologic preparations, ear drops, preparations for aerosol therapy, respules, disinfectants, diluents, antibiotics and solutions for reconstitution, intravenous solutions, solutions for irrigation, and solutions for continuous ambulatory peritoneal dialysis. These machines process all kinds of medical grade polymers (PP, PE, HDPE) without any change in hardware, only by changing configuration.

Cynopac is a special machine developed for high speed packaging of cyanoacrylate and octyl cyanoacrylate adhesives for medical and non-medical applications. Handling cyanoacrylate adhesive

Continuous and two-step all electric blow moulding

Two new series

Two machines are presented by Meccanoplastica (hall 14, stand B18) at the K show. The first one is the HL 450/S continuous all electric extrusion blow moulding machine, in single station configuration. The new HL range is high performing, in terms of speed and movement accuracy, and noiseless. The HL450 machine ensures energy efficiency, maintenance savings and highly productive, yet environmentally sustainable, performances. The machine can produce containers with a capacity up to 5 litres and features: 12-ton clamping force; horizontal mould carriage stroke (mm) 450/500; up and down extruder platform (bobbing) thanks to an electric brushless motor. During the K fair, the machine runs equipped with a dual parison extrusion head (210-mm centre distance) and a 2-cavity mould to produce HDPE 5-litre containers for lubricating oil. The two-step MIPET-1G all electric stretch blow moulding machine (SBM), in single cavity configuration, is designed to process both standard and special PET preforms, to produce PET bottles with a capacity up to 10 litres. It is characterized by air tight force (at 10 bar) of 450 kg and a clamping unit with a 210-mm opening stroke. The MIPET-1G is the latest innovation from Meccanoplastica and is manufactured at the company's new Spanish factory in Barcelona. During the exhibition it is equipped with a single cavity mould to produce 2-litre PET bottles with "blind handle" for the detergent market, starting from Bericap 83-g PET preforms with a 48-mm neck.

www.meccanoplastica.com

The MIPET-1G is the latest innovation from Meccanoplastica and is manufactured at the company's new Spanish factory in Barcelona

is not easy because under adverse conditions and in case of contact with undesired material, polymerisation occurs quickly. To keep the adhesive in the liquid form it is necessary to avoid adverse atmosphere as well as any contact with undesired material. This machine allows the fully automatic packaging of cyanoacrylate adhesive at a speed of up to 18,000 units per hour in a fully automatic equipment, from the polymer to filling and sealing the container, through the blowing and the printing of different information on it, with reliability exceeding 99.5%.

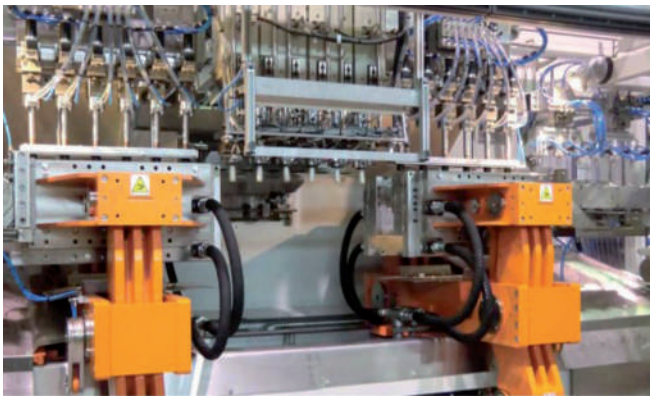
Liquidpac has been developed to address the packaging needs of the food and beverage industry. It permits the design of very creative and ergonomic bottles, such as those with strap off seal for fruit juices or milk or those provided with a straw for fruit juices.

www.brevettiangela.com

Electric sustainable blow moulding machines

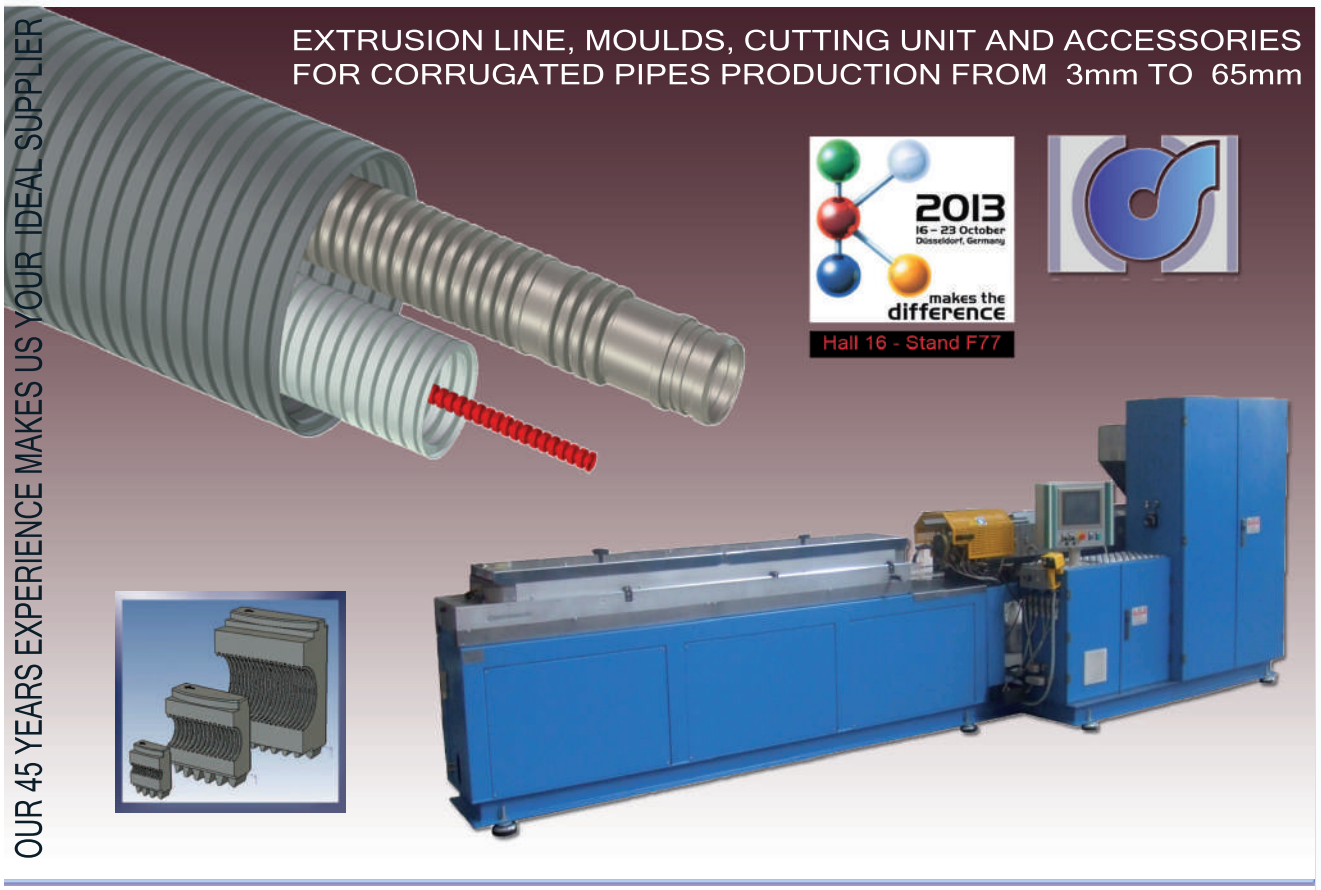
Cosmetic style bottles

Once again Plastiblow (hall 14, stand B56), producing machines from 0.5 to 30 litres, is exhibiting at the K show in Düsseldorf. The company exhibits a full electric blow moulding machine for the production of cosmetic style bottles. The PB10E/DXL - a double station, servo driven class A machine with mould holder stroke 800 mm, 100 mm diameter. extruder, hourly output 300 kg, clamping force 24 tons - produces bottles by 6 cavities per side with 120 mm centre distance. The extrusion head has been designed to ensure greater control of the extruded parison, also allowing quicker color changes - even less than half an hour - using multi cavity heads. A servo driven 3 axis robot picks up the bottles after deflashing and places them on a linear conveyor belt. The PB10E/DXL is equipped with an in-line quality control device for the bottles, giving the possibility to check and discard any defective pieces. The device checks for micro holes, deformation and obstruction of the neck, and detects sprues.



The extrusion head of the PB10E/DXL blow moulding machine has been designed to allow a greater control of the extruded parison and permits color changes in less than half an hour

www.plastiblow.it



CAPUZZI SYSTEM SRL

Via Tito Baresani, 5 - Loc. Folzano - 25124 BRESCIA - ITALY
Phone: +39.0302161101 - e-mail: contact@capuzzi.com - www.capuzzi.com

ROTOMACHINERY GROUP R&D DEPARTMENTS HAVE DEVELOPED BREAKTHROUGH INNOVATION TO IMPROVE ENERGY EFFICIENCY OF ROTOMOULDING TECHNOLOGIES, GENERALLY POOR AT PRESENT

ROTATIONAL MOULDING

ENERGY EFFICIENCY

Energy efficiency of rotomoulding machines is generally poor. R&D departments at Rotomachinery Group (hall 09, stand C22) have come up with breakthrough innovations as a result of the active collaboration between Italian and North-American engineers and the customer, using the company machines in 5 continents. Before the introduction onto the market, the improvements are tested in the new research centre, which has recently been opened near the Italian facility.

Regen (Regeneration of energy) is a special bi-directional power supply serving all the machine motors controlled by inverters. Inverters convert DC in AC and return the energy generated by the motor during the deceleration phase or stop when the motor acts as a generator.

With rotational moulding machines, it happens quite often that the electric motors decelerate or reverse rotations, e.g. deceleration of the oven doors; deceleration of the carts in positioning; deceleration/reversal of primary/secondary rotation; deceleration of the oven and cooling fans. Regen takes regenerative energy and uses it for the other motors. When this "recycled" energy exceeds the machine needs, the surplus goes into the general circuit to feed other utilities (the lights in the building, for example). A digital counter shows the actual energy consumption and the amount of energy regenerated by the system.

Ecomode is a working modality of the oven where the basic principle is that the burner stops when the oven is empty or the temperature falls below the set value. Best results are achieved when the machine is equipped with a full digitally controlled burner, new-designed cooking fans, well-insulated oven panel, and automated management of the cycle. At the end of the cooking cycle, Ecomode stops the fans when the doors open. The new-designed cooking fans (turbines), managed by inverters, need only 5 seconds to stop, not 1 minute as it usually happens with one big fan. This reduces the hot air pushed out of the oven, with a minimum loss of temperature, and also creates a significant amount of regenerative energy. The turning off and restarting of the burner increase the time needed to reset the temperature but, thanks to the good insulation of Rotomachinery Group machines and using the reliable automated machine management, energy saving is higher than the disadvantages of increased cooking time. The succession of the process steps is determined by the temperature given by the thermocouples placed inside the moulds. Big savings are achieved in case of unbalanced cycle time when the oven is empty for a long time; the first morning cycle can run without preheating and, as to the last cycle, the burner turns off automatically. The exhaust fan ejects the hot air and the combustion fumes: this continuous loss of energy has been substantially reduced by the active management. With Ecomode, all the time the burner is off, the exhaust fan works at its minimum setting. In addition, a new special device designed to recirculate the hot air in the oven has been installed. It takes part of the hot air returning in the combustion chamber and conveys the heat onto the mould again, but in another position, creating a new heating point so as to optimize the entire cooking process and allow the achievement of additional moulding benefits. The operator activates the Ecomode function, simply tapping the icon on the panel touchscreen. The customer who, for any reason, should not want to increase the cooking time, can turn off Ecomode by tapping on the screen, yet maintaining all the advantages deriving from the regenerative unit. New type fans have been installed, allowing noise reduction and energy saving. Efficiency is higher too. With the same energy absorption, the cooling power of a medium size machine increases from 28,000 to 40,000 cubic metre/hour. ■

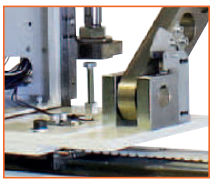
www.rotomachinerygroup.com

Ecomode is a working modality: the burner stops when the oven is empty or the temperature falls below a set value

large families are an art

STAR AUTOMATION EUROPE THOUGHTFULLY MAKES ITS FAMILY LARGER

SWA-3K-R5 welcome our newborn



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NEWS

Eco-friendly rotomoulding solutions

Meeting the needs of laboratories

Always sensitive to the particular needs of research centres and analysis laboratories working in the thermoplastic polymers field, Caccia Engineering (hall 11, stand B26) has recently supplied a machine model Rotaut type RT1051B, with an offset arm, a digital burner for LPG, and an Omron PLC, to a big multinational company based in Belgium. In particular, producers of polymers used in rotational moulding or laboratories and research centres need machines to enable the study of the chemical-physical processes of the raw materials. This allows the research centres to produce samples that give actual real time documentation on how the material has reacted to the process.

In fact, the large number of tests carried out on rotomoulded items are based on the scientific method, which is the collection of empirical and measurable data through observation and instrumental experimentation (melt flow index, density, resistance to traction and impact, reticulation, dispersion, softening point etc.), allowing the formulation of hypothesis and theories that should be, and need to be, tested through experimentation.

Caccia Engineering laboratory machines completely reflect these restrictive characteristics and much more. They offer flexibility, by means of a wide spectrum of machine parameters, which grants the possibility to produce any item from the simplest to the most complex or technical using any type of material available on the market at present. The company machines offer researchers a built-in system for measuring the internal temperature of the moulds, which allows an in-depth analysis of how the material is reacting during the machine cycle. This program is integrated in the machine control unit.

A Rotaut RT1051B machine, with an offset arm, a digital burner for LPG, and an Omron PLC, has been recently supplied by Caccia Engineering to a big Belgian multinational company

Caccia Engineering, as a company, has always been particularly sensitive to environmental issues and this is reflected in the design and manufacturing of their machines by low energy consumption combined with high efficiency throughout the range, granting a high added value in terms of productivity and ecological sustainability. The equipment is also marked with the Eco-Friendly logo. A philosophy used in the laboratory machines, too.

Thanks to the use of sensorless vector inverters complete with energy-saving functions, specific software, digital burners and advanced devices (patent pending), Caccia Engineering can confirm an approximate energy saving of up to 38% compared to traditional machines. Special attention has been given to the thermal bridges in the laboratory rotational machines, in order to further reduce the dispersion of heat and fumes into the environment during the machines process. Caccia Engineering can offer different ways to heat their lab machine ovens (LPG, natural gas and electricity), offering a maximum spherical diameter of 1,050 mm and the options of straight or offset arms.

www.cacciaeng.com

Machines for EPS processing

Block moulders and pre-expanders

Taking advantage of its consolidated experience in the design and production of industrial automation, Tecnodinamica (hall 13, stand C13) designs and manufactures machines and plants for EPS processing. The company can offer a wide variety of machines as well as customized solutions, such as 3 and 5 axis contour cutters, slicing machines, down cutters, fully automatic cutting lines, milling machines, recycling plants and turnkey plants for the production of EPS blocks. The range of machines has become more complete, in order to satisfy even the most challenging requirements and needs of the market. Focusing on research and development, the company can offer innovative hi-tech solutions.

Beside the already well-known cutting technology, since 1993 Tecnodinamica has been focusing on the production of block moulders and, recently, on pre-expanders (continuous and batch), too. The block moulders, fixed or with single/double (height/depth) size adjustment, are built in various sizes: dimensions range from 2,000 up to 6,000 mm height, from 500 up to 1,200 mm width and up to 1,800 mm depth. Thanks to continuous investments in advanced technologies and to the constant commitment to a sustainable environment, the company has developed and realized a new high efficiency waterless vacuum system. This solution applies high efficiency pumps to the depression tank with no need for any liquid to be recirculated through the refrigeration system. The result is a simpler, efficient and low maintenance cost plant. The company is constantly committed to restyling its machines and making them more functional. Compact dimensions and new technical solutions enable EPS processors to work on various size blocks and solve any difficulties encountered when cutting new additive materials, both with minerals and dyes.

www.tecnodinamica.it

Block moulder with new waterless vacuum system

Advantageous fourty-year old technology

Vertical block moulding machines

The vertical block moulding machines produced by Nuova Idropress (hall 13, stand D24) are the result of continuous technological research and development and of many years of experience acquired through the manufacture of more than 600 machines of this type.

Benefits of a vertical mould are density uniformity, due to the narrow filling section that prevents the material from separating, and the low degree of residual humidity present in the blocks. The possibility to compress the material during vaporization allows to mould even blocks containing high percentages of recycled EPS (up to 100%). Other innovative features of the block moulding machines made by Nuova Idropress are: low steam consumption (at any rate, the block mould with vacuum does not use more than 7-8 kg of steam/ m^3), ensuring a more rational energy balance whilst minimum density variation inside the block allows to save raw material; density automatic control, allowing to obtain series of blocks with the required dimension and density; during every cycle the density of the material input is corrected before moulding the block by compression and the multiple continuous adjustments of the mould (1 or even 2 dimensions - without steps) allow to minimize production scrap. The dry vacuum, last of the innovations presented by the company, allows the block mould to work with a vacuum system that does not use up water. The system keeps on using the liquid ring standard pumps, for which the heated water is cooled in a closed circuit with an air heat exchanger that does not need any restored water; but, most important of all, the system foresees the replacement of the conventional water condenser by a dry condenser in which hot gases are cooled and condensed by means of forced ventilation. All this allows the plant to function without any cooling tower and without having to integrate fresh water into the circuit. The advantages resulting from all this are quite considerable: the simplification of the plant, practically ready-made for the customer; the cost saving in terms of evaporated water and chemical solvents necessary for maintaining the water circuit clean; the possibility of obtaining very "pushed" vacuums in the block mould - up to -0,80 bar - without having to "oversize" all the cooling plant; the possibility to benefit of hot air produced by the exchangers in order to heat the work area or the silos area. Zero emissions into the atmosphere, with consequent noise and pollution reduction, as well as the recovery of the residual calories generated by the sintering process of the block by means of heat exchangers placed in various positions of the vacuum system increases the already excellent performances. ■

Benefits of a vertical mould are density uniformity and a low degree of residual humidity present in the blocks

www.nuova-idropress.com

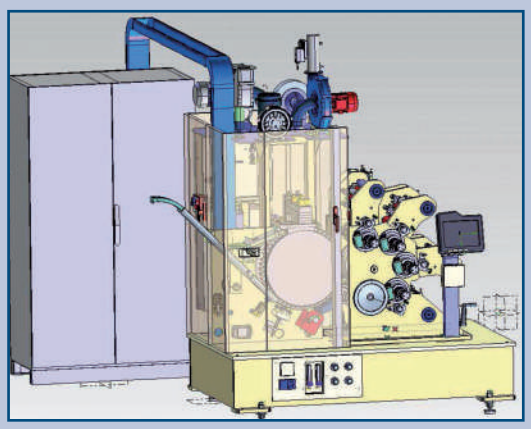
DRY OFFSET PRINTING MACHINE

ENTRY LEVEL FOR CAPS

At the K 2013 show, Moss (hall 4, stand B52) introduces the new dry offset printing machine model MO 3062/4 for the decoration of plastic caps for water and soft drink plastic bottles. This new model, which completes the range of printing machines specially manufactured by the company for printing the top flat side of plastic caps, can print up to 1250 pieces per minute (75,000 pph) and it has to be considered as an "entry level" printing machine, in comparison to the superior models from the Italian manufacturer, which can reach production capacity of 2,500 and 5,000 pieces per minute.

In the processing cycle, each cap is subjected to the following operations: orienting and channeling towards the automatic loading device; loading on the piece holder wheel with continuous spinning (no indexing); removal of dust and static electricity and flame treatment; 4-color printing plus UV drying; unloading and quality control by means of a camera which inspects each piece; passage in the piece counter to fill the boxes with the exact pre-set number of closures.

www.moss.it



The new MO 3062/4 model can print up to 1250 pieces per minute (75,000 pph)

NEWS

Solutions for flexible packaging

Printing machines, devices and automations

The most up-to-date technical and technological solutions are presented by Uteco Group (hall 4, stand A36) in terms of both machinery - and devices or automations applied to the machines. All solutions are designed to achieve maximum productivity and manufactured to meet customers' needs with the best return on investment, in a constantly changing market. Visitors can discover the latest innovations in a stand full of important messages to the market, as part of a strategy aiming to brand consolidation. The new Crystal flexo printing machine is introduced, with its great, authentic "made in Italy" design, in perfect harmony with technical applications and automations that make this model unique. After the fair, the new Crystal will be presented with live demos at the company headquarters in Verona (Italy). The new generation of Mira & Izar solventless laminators, compact and easy-to-use solutions, are the result of ecofriendly technology. The new Vpress 300 rotogravure is a modular solution, perfect for medium/short runs, representing the high quality result of a strengthened partnership with the Indian company Kohli Industries. Uteco mission is to consolidate its position as a leading supplier of machinery for the flexible packaging market, and more than that. This goal is achieved by focusing on four different areas: research and product development; flexibility in design and engineering; production capability and organization; service to support products and technologies.

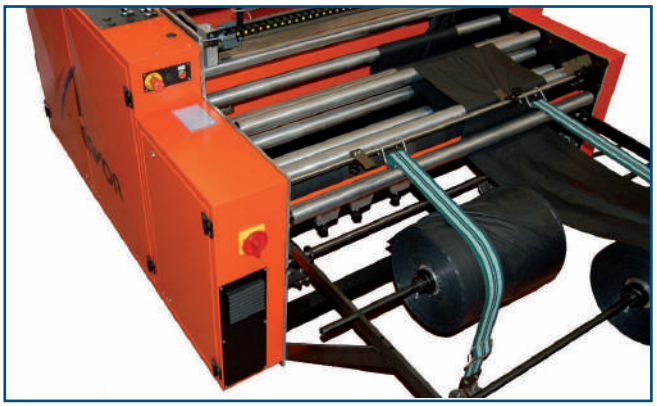
www.uteco.com

The new look of the new Crystal 808 GL flexo printing machine model 130

Bagmaking machine

Orange still in action

For over 45 years, the Arvor brand has been synonymous with machines for the production of sacks and bags made of polyethylene. The company started its activity in 1968 with the first 868 GL "orange" machine, representing a complete innovation in the production of bottom weld machinery. The machine was designed by the then owner, George Lagain, and over the following years the company sold more than 9000 machines, well known for being user-friendly, robust and simple, worldwide. As many other companies with an over 45- year- long history, the company has had many ups and downs, especially in recent years, also because of the international crisis, which almost led to the



The Arvor range includes seven models of machines, from the economic Easy to the high speed Gamma

Arvor brand extinction.
In 2012, Icom took over the Arvor brand, becoming the sole owner, with the aim to bring this brand back to its past splendour. Believing in the project from the start, the team at Icom have renewed the Arvor brand by equipping the machines with the latest electronic and mechanical innovations developed by its research department. Arvor offers an after-sales service, technical support, all original spare parts from 1968 to present. The company refurbishes the old machines in its own factory, updating them on current standards, in order to improve their performances. Today, it has seven models with various cam control designs, ranging from the economic Easy to the high speed Gamma, with widths from 400 to 2,000 mm (wider upon request). All models feature servo motor drive, PLC and colour touch screen.

www.arvor-machine.com

Industrial welding

Certified heavy duty sacks

The BF-106 HS 800 automatic bagmaking machine that BFM (hall 17, stand C05) will be exhibiting at K 2013 is specifically designed for the production of "heavy duty sacks", which are widely used for packaging bulk products, including polymers and additives in granules. The new machine is intended to meet the requirements of thick industrial sacks with bottom sealing and side gusseting, ensuring high quality welds and complying with ISO 7965-2 standards, with particular attention to the "drop test", which certifies the perfect sealing of the product through vertical drop and ground impact.
The machine includes a motorized unwinder unit for reels with a diameter up to 1,500 mm, an automatic edge guide, an innovative cutting system driven by brushless motors, a nickel-chromium sealing device with electronic control of the sealing parameters, and an automatic stacker for collecting the bunches of sacks.

The BF-106 HS 800 automatic bagmaking machine is equipped with a motorized unwinder unit for reels with a diameter up to 1,500 mm

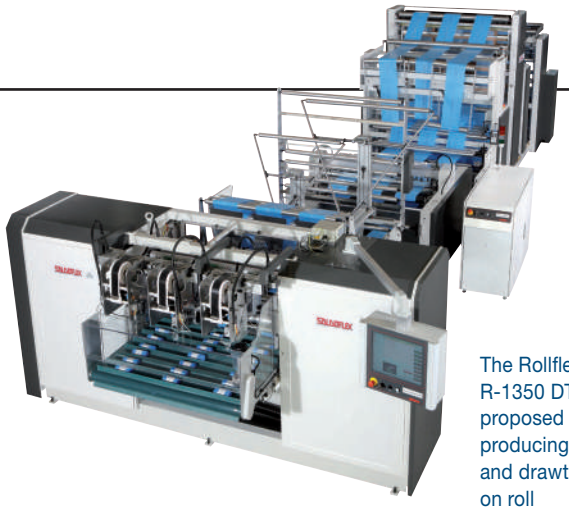
www.bfm.it

NEWS

Automatic bagmaking machines

One, two, three lanes

The Italian manufacturer Saldoflex, headquartered in Solbiate Olona (Varese, Italy) and present in the market of bagmaking machines and flexo-printing presses since 1961, sees K 2013 exhibition (hall 3, stand F54) as the opportunity to showcase the latest developments of its Rollflex series of bags-on-roll sealing machines. The following servo driven bag-making machines are shown while running: Rollflex 3 Lanes, for bottom-seal, no-drop or star-seal precut bags on roll, on 3 lanes; Rollflex Drawtape, for no-drop garbage bags on roll on 2 lanes, or draw-tape garbage bags on roll on single lane. The Rollflex 3 Lanes is equipped with the latest version of the 4-shaft rewinder with an improved system for discharging the rolls, aimed to eliminate the risk of telescoping the roll when extracting the winding shaft from its core, also processing critical materials. On the Rollflex Drawtape, a great innovation is represented by the automatic drawtape splicing system: there is no need to stop the machine when the drawtape roll ends as the new drawtape, coming from a roll previously placed on a second unwinding unit, is automatically spliced to the old one. On both machines, the latest advances in kinematics are applied to the rewinders for the axial extraction of the winding spindles from the rolls. The new system is based on brushless servo-motors: this allows the winding process to become faster and more precise, while reducing the noise and cutting maintenance costs. At the end of the line, the taping devices are also updated with enhanced performance. Thanks to the great care devoted to the design concept and manufacturing methods, Saldoflex's bags-on-rolls machines are becoming increasingly popular among converters, as they offer a number of features:



The Rollflex R-1350 DT1 is proposed for producing no-drop and drawtape bags on roll

- total flexibility: 1-2-3 lanes, bottom-seal or double-seal with possibility to shift from one to the other without stopping production;
- micrometrical servodriven precut: while the machine is producing, and without any need for manual intervention other than via touch-screen, the operator can micrometrically adjust the precut depth, store its value in the recipe and/or recall it from another job;
- quick PTFE tape change-out: less than two minutes are needed, thanks to the special design of the sealing station;
- no-stop, automatic turret rewinder: the 4 revolving winding shafts allow to perform the four different phases (winding, tearing at precut, taping with gummed paper, discharging) simultaneously, thus shortening the overall cycle time. This is crucial when producing rolls with low bags count;
- wide range of possibilities: gusseted bags, star-sealed bags, "C"-fold, double-fold, no-drop seal, draw-tape bags;
- excellent ergonomics, thanks to the adjustable-position operator panel with colour touch-screen.

www.saldoflex.com

Toner based digital decoration

From the file to the object

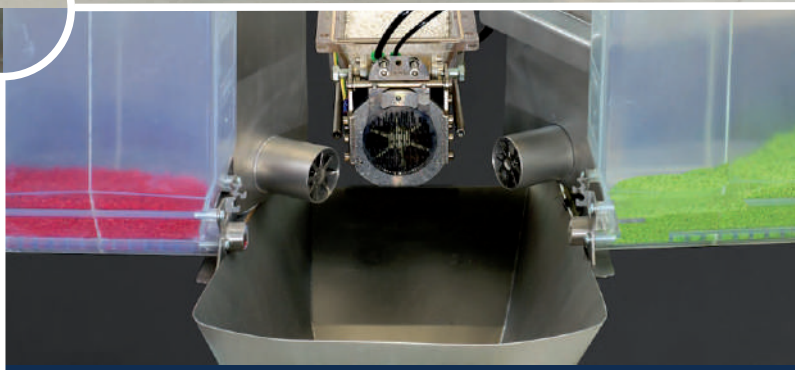
DHDT is the newest innovative decorative system developed by GMC for printing 3D plastic objects directly, starting from a file, without manipulation. The system includes an electrographic printer motor of the latest generation - model GMC6540 - synchronized either mechanically or electronically with the decorating unit. The result is a user-friendly system, ensuring cost efficiency, with a consequent positive impact on profitability. The ever growing use of toner based digital technology has been consolidated into plastic materials (PP, PE, HDPE, LDPE, PA, and PS), used for chemical and food packaging, rigid and flexible tubes and sealant cartridges. The decorative unit for containers - no mandrel - allows the decoration of cylindrical, truncated cone shape objects from 1 litre up to 25 litres, with round, square or elliptical base, with or without bucket handle fitting. This unit has no tooling, the change of format takes approx 15 minutes, and the mechanical speed ranges from 500 to 850 cycles per hour. It can be equipped with ancillary equipment such as de-stacker, re-stacker and automatic handle fitting machine for metal and plastic handles. The decorative multi mandrel unit for rigid/flexible tubes is available with 8-16-28 stations, quick format changeover (approx 15 minutes), mechanical speed from 2,400 to 12,000 cycles per hour, for a diameter from 5 to 60 mm. This unit can be equipped with further systems, such as a lacquering unit with UV/flas drying to make the object glossy or an orienting system before feeding and at the exit of the packing unit. Only one operator can manage the whole system by a few, easy operations, such as launching the printing file from the computer or adjusting working parameters through the touch operator interface.

The DHDT system from GMC permits to directly print chemical and food packaging, flexible tubes and sealant cartridges starting from a file

The system is equipped with a professional color controller and software tooling to control printing quality, to manage colors, to allow personalized adjustments, and the printing queue, to plan more artwork at the same time.

www.gmcprinting.it

AUTOMATIC WEIGHING SYSTEMS - BLENDS, COMPOUNDS, MASTER-BATCHES



Dispensing, especially

A well-established Italian company since 1970, a world wide excellence in industrial dispensing systems, providing state-of-the-art technology in automatic dispensing systems of powder and liquid products as pigments, colors, additives, loads, chemicals etc., single and multiple weighing systems, preparation plants for compounds, blends, master-batches, automatic units for handling and packaging.

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THE CEO OF FRIGOSYSTEM AND VICE PRESIDENT OF ASSOCOMAPLAST, ALESSANDRO GRASSI, ILLUSTRATES THE NEW RANGE OF HC MACHINES AND THE IMPROVEMENTS MADE TO THE RACA PLUS ENERGY CHILLERS

BY **LUCA MEI**
AND **RICCARDO AMPOLLINI**

NEW WATER CHILLERS FOR INDUSTRIAL APPLICATIONS

HOT AND COLD TOGETHER

The new range of water chillers to be unveiled by Frigosystem at K 2013 (10 A74-3) is called HC Heating & Cooling. As the name suggests, these are compact solutions that integrate, in a packaged unit, both heating and cooling of industrial processes. These are two functions that, combined in the same machine, allow precise fluid temperature control, in the range -10°C to +90°C, guarantee the end user constant fluid pressure, and allow increased productivity, energy savings and lower maintenance costs, all in a solution featuring compact overall dimensions.

The cooling phase occurs through a refrigeration system that uses biogas and long-lasting sealed compressors. Water condensation is efficient even in the most demanding working conditions and the energy savings can be maximised by the free-cooling function, which allows the compressors to be turned off in situations in which it is possible to exploit ambient temperatures. The cold water tank, the plate exchangers and the cooling circuit tubes are made of stainless steel, while the centrifugal pumps are equipped with bypass valves. In the packaged unit it is possible to have up to 4 independent temperature-controlled loads each of which can be extensively customised to suit the particular needs and conditions of use. Basically, it is possible to have different operating pressures, water capacities and heating capacities. The temperature is controlled by means of three-way proportional valves with an accuracy of ±0.5°C.

The HC units can be used in many ways in different fields of application. For example, they can be used for the initial heating and subsequent cooling and temperature control of the mould in injection moulding, blowing and thermoforming (even of the fixed and floating platens separately), of the barrel in extrusion, and of the rollers in laminating and converting. “The electronic systems mounted on the units belonging to the HC series stand out for their high external connectivity (capacity to connect and communicate with other systems in order to exchange information) and for their programmability, which makes them able to offer simple answers to the most diverse

Raca Plus Energy chiller pumping units

application needs, at the same time guaranteeing complete control, both local and remote. It is precisely for this purpose that we developed the Frigosystem iWeb monitoring and control system that can be used to control the units from various portable devices (PCs, tablets and smartphones), connected via wifi, in order to set or correct operating parameters or connect with the manufacturer's technical support centre", explains CEO, Alessandro Grassi.

AN IMPROVED RANGE

The company has also recently extended its Raca Plus Energy range of industrial chillers running on R140 ecological refrigerant gas, taking it from the previous 200-700 kW range to the broader range of 50-1000 kW. This move, which has concerned both the smaller and the larger models, has increased the flexibility of application of these machines. The R410 refrigerant allows energy savings of up to 38%, even though these tend to be, on average, somewhere between 33 and 35% compared with the use of R407 and R134. The technical improvements made also include the introduction of 100% aluminium microduct heat exchangers, in place of the more traditional condensers featuring copper pipes and aluminum fins. This change was inspired by the radiators used in the automotive sector and uses the same technology, which makes it possible to obtain a high heat exchange capacity even in the presence of extremely small surfaces. Surface reduction, and thus a reduction of the weight of these components, is accompanied by an improvement of their performance, but not an increase in the price of the single refrigeration unit.

The microduct heat exchangers stand out for the improved efficiency they allow: indeed, they make it possible to use up to 35% less refrigerant gas, which has positive repercussions in terms of operating costs and machine maintenance. Furthermore, they are lighter, helping to reduce the overall weight of the chillers.

"Another factor contributing to the increased application flexibility is the fact that all the models have been standardised to work in ambient temperatures of up to 46°C, thus eliminating the previous distinction between models that could be used in temperatures of up to 37-38°C, as opposed to 40-42°C or even 45-46°C. Basically, all the versions are now designed to work in any type of climate and this represents the basis for the development of special ones able to operate in extreme conditions, characterised by temperatures of over 50°C", concludes Alessandro Grassi. The chillers belonging to the Raca Plus Energy range are available in 7 versions: FT, with no tank and no pump; FT-1P, with a pump but no tank; FT-2P with two pumps and no tank; 1P, with a tank and a pump; 2P, with a tank and two pumps; FC, with free-cooling; and finally a version with recovery of heat for winter heating.

Alessandro Grassi, CEO of Frigosystem, pictured with the new HC Heating & Cooling water chillers

NEWS

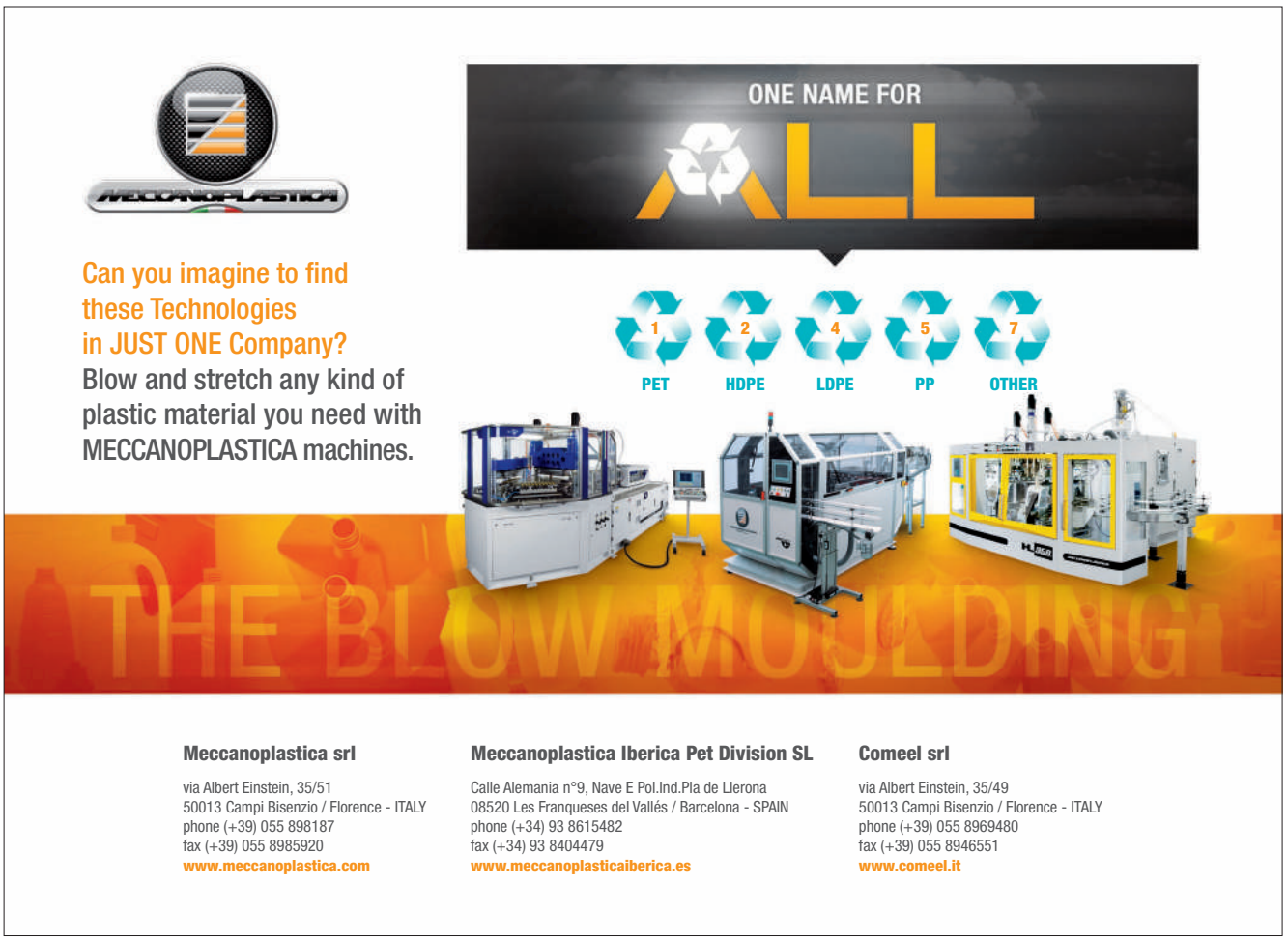
High-efficient low-consumption cooling systems

Two machines in one

With over 20 years' experience, Green Box (hall 10, stand H03) is a worldwide player in the design, manufacture and distribution of cooling systems for industrial applications. Since the beginning, the company has been making constant efforts in the field of technological innovation. For this reason, the new MR-H/FC series of chillers has been developed with inverter and integrated fluid cooler. This system allows to adjust and better control cooling capacity automatically, increase energy saving by the entire system and cut the final customer's installation costs. The choice to use inverter technology also permits the maximum adaptability to working conditions and greater part load efficiency, allowing a quick return on investment, also thanks to the efficiency of the brushless motors, which are 30% more efficient than standard motors. Energy saving is also facilitated by the integration of the fluid cooler with separate circuit from condensation with dedicated fans, producing high energy savings when the ambient temperature is more favorable. A considerable advantage, apart from having two machines in one, is greatly simplified installation and maintenance. Finally, the use of microchannel heat exchangers, with higher heat exchange and greater compactness, allows the reduction of the refrigerant charge and the realization of a compact machine. Green Box's mission has always been the design of high-efficient low-consumption cooling systems, and the company has been pushing for the integration of traditional industrial chillers with fluid coolers since the early '90s. This allows to exploit ambient temperature as much as possible for the purpose of cooling industrial processes. Fluid coolers could be widely used in almost all industrial cooling systems, either in brand new systems or as integration to existing ones: they could be used as chiller boosters, as cooling tower replacements or as dedicated cooling systems for mid-high temperature applications (up to 35°C). An absolute innovation in the range of Green Box thermo-chillers is the new Picobox series, with two different models. Its main feature is an extremely compact design (only 62 cm high, wheels included), which allows its installation under the machine. These systems combine a water condensed chiller, with ecological refrigerant R410A, and one pressurized temperature control unit (operating temperature between 5°C and 140°C). Main advantages are: compactness, operating temperature up to 140°C, low consumption, easy installation and use.

The new MR-H/FC range of chillers features inverter and integrated fluid cooler

www.greenbox.it



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Joint venture in refrigeration

The conquest of Algeria

The new company will deal with the construction and marketing of some small refrigerators (from 50 to 120 kw), especially aimed at Algerian small businesses

The Algerian market has always represented a very important part of the turnover of Nova Frigo Engineering (hall 10, stand B50), to such a point that the company decided to invest some capital directly there, thus creating a production plant for certain products in the country. Algeria is now becoming an even more important market, not only for exports, but also for production, as raw material and processing costs are very competitive if compared to the Italian market. Therefore, Nova Frigo Engineering Algérie was established, an Italian-Algerian joint venture where shares are held by Nova Frigo Engineering Italia and by a group of Algerian small businessmen, operating in the industrial refrigeration and plastic material processing sectors. As provided by Algerian law, 51% of the shares are held by the group of local businessmen, who have been well-known and integrated in the local industrial area for a long time, while the Italian company holds the remaining 49% of the shares. The new company will deal with the construction and marketing of some small refrigerators (from 50 to 120 kW), specially aimed at Algerian small businesses whose number is increasing exponentially in different sectors due to the growth of the Algerian market. The headquarters of the new company are located in Algiers, where new models of refrigerators are built with constant support by the on-site technical team, who can intervene promptly in case of need. The new company is aiming at developments in the plastic material sector, in which Nova Frigo Italia moved its first steps, and the agri-food sector, after the positive feedback following the company's participation in the renowned Djazagro Fair for two consecutive years. Nova Frigo Engineering Algérie also wants to specialize in the industrial and civil air-conditioning sector, taking advantage of Nova Frigo Italia experience, thanks to which the company was in charge of providing various installations, for different applications, to Algerian industrial plants. ■

www.novafrigo.it

Vacuum corrugator unit

Modular solution

Since 1960, Olmas (hall 15, stand A56) has been manufacturing corrugator machines and downstream equipment for producing a wide range of corrugated pipes used in several fields of application. The company has now developed a new vacuum corrugator unit, capable of reaching a production speed of 50 m/min with pipe diameters ranging from 6 up to 32 mm. In particular, this machine has been designed to optimize the production of automotive and thermo-conditioning pipes, and allows to coat PE and multilayer Alupex (aluminum + XPE) pipes directly in line. This modular corrugator features from 70 up to 120 mould blocks to manufacture high quality PA, PP and HDPE corrugated pipes, in order to minimize the production scraps and to obtain pipes in the requested lengths. It can easily produce single and multilayer pipes, too. This machine is provided with vacuum system technology that can change the wall thickness and the geometry of the profiles, with irregular shape and integrated cuff sections. The main performance of this corrugator is surely the opening and the closing mould raceways. This also permits to produce pipes by very short tooling, in order to reduce the backpressure into the extrusion die head, which has always been a weak point for corrugated pipes manufacturers. ■

www.olmas.com

A detail of the new modular corrugators developed by Olmas

WITH 60 YEARS OF ACTIVITY, BARUFFALDI PLASTIC TECHNOLOGY PROPOSES A COMPLETE RANGE OF DOWNSTREAM MACHINES FOR THE EXTRUSION OF PLASTICS PIPES AND PROFILES

EXTRUSION SOLUTIONS

TAILOR-MADE DOWNSTREAM

Proud of its 60 years' activity, Baruffaldi Plastic Technology (hall 17, stand C71) participates in K 2013 with one of the most complete range of downstream machines for the extrusion of plastics pipes and profiles. Machines for pipes come from Primac, a company with a strong tradition, yet dynamic, flexible and at the forefront in providing satisfactory solutions to processors, whatever their requirements, a capability not even giant multinationals can always compete with. In particular, Baruffaldi-Primac can boast excellence in four manufacturing areas: high-speed and high-productivity extrusion tooling; machines for making holes, slots and joints for corrugated pipes; machines for assembling PVC roller shutters; turnkey plants for the production of cable ducts.

The company has also recently perfected its hot blade technology - for which it holds a number of patents - in the TG series guillotines as well as in the TPV-110 planetary guillotine for cuttings pipes, both of which get rid of burrs and dust, helping processors to manufacture top class end products. With specific reference to profiles, advances have been made in both hot blade and cold blade guillotines, now fitted with a wide range of accessories so that they can cut a large variety of profiles. The greatest advance consists in the hot blade guillotines where a special blade movement has been introduced, allowing either profiles or pipes to be cut without being deformed or becoming oval.

The TPV-110 guillotine with its planetary blade, cutting the pipe and creating a chamfer on it, is particularly suitable for electrical conduits and PP/ PPR water pipes. Nevertheless, it is also an extremely versatile, safe and reliable machine which offers many advantages: it makes a clean cut with no material removal, which means absence of swarf; it is silent and accurate within ±0.2 mm over length; the result is energy saving and the elimination of swarf removal costs. The machine can mount several different tools, according to the pipe material. It has a completely new type of frame with respect to the former models and is up to 25% faster than traditional guillotines.

The company is also keen to remind processors of the patented technology on its Primac welding machine for PE and PP pipes with diameter from 200 to 1,200 mm. This machine brings considerable benefits in the welding of pipes to injection or rotomoulded couplings by using added weld material. The system gives maximum pipe strength with no ovality, no slow-down on the extrusion line, and no wasted pipes.

At the K show, the Italian company showcases an offline Povi 5000 machine (an inline version is also available). This system is part of the latest generation punching machines for cable ducts. The Povi 5000 allows processors to realize top class products with lower capital investment. The high quality of the cable ducts produced derives from a long-standing tradition and knowledge in punching tools which ensure perfect and accurate punching, combined with a specific software which manages the cable duct feeding and punching accuracy, and the patented coining system which eliminates all traces of burrs and dust.

www.baruffaldi.eu

The Povi 5000 allows processors to realize top class products with lower capital investment

www.giuseppegalliano.com

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IPM FOCUSES ON ITS INNOVATIVE RANGE OF INJ AUTOMATIC INJECTION SOCKETING MACHINES TO BE INSTALLED IN LINE WITH THE EXTRUDERS OF DOUBLE WALL CORRUGATED PIPES

INJECTION SOCKETING MACHINES

MEMORY EFFECT ELIMINATED

At K 2013, IPM focuses on its innovative range of INJ completely automatic socketing machines, working in the extrusion line for socket formation by injection directly on double wall corrugated pipes. An outstanding feature of these machines is versatility, as they are able to socket polyethylene or polypropylene indifferently, using the same socketing tool.

All this is part of an ambitious project which, after years of research and thanks to the collaboration with the University of Bologna (Italy), has allowed the development of new technology and relevant patents. The technology developed is able to cope with the fastest extrusion lines for corrugated pipes now available on the market, reaching output rates of 90 sockets/hour for outer diameter 110 mm and 25 sockets/hour for outer diameter 500 mm. But, above all, it is able to drastically reduce defects and waste, increasing the quality of the socket to the highest levels, and ensuring an absolute geometrical and dimensional stability over time. Currently, IPM produces 4 different models of such equipment - for pipes having large diameters and maximum length of 6,000 mm (or 12,000 mm on request) - which are: BA 500 INJ for OD (Outer Diameter) 110-500 mm, BA 680 INJ for OD 160-680 mm, BA 900 INJ for OD 160-900 mm and BA 1200 INJ for OD 200-1,200 mm. The socket is manufactured using the same raw material, polyethylene or polypropylene, the pipe is made of. As a consequence, shrinkages and any other problem related to the so called "memory effect" are definitively eliminated. With this new process, it is possible to guarantee reliability, the absolute dimensional stability of the socket over time and, above all, the repetitiveness of the cycle, independently from the characteristics of the raw materials being used and from the different formulations.

Further advantages to be underlined are the lack of any influence on the socket and pipe ovalization, and the possibility to thicken the socket wall and customize its shape as desired, also by adding the customer's logo.

Tests and analysis carried out by means of electronic microscopes (and certified by the University of Bologna) show that injected sockets are even more resistant than pipes themselves. They are perfectly welded, mechanically solid and aesthetically nice with homogenous, smooth and regular surfaces. Besides socket formation in the extrusion line, these machines also allow double socket fittings with various lengths.

IPM produces machines and automatic customized plants for the extrusion of plastics pipes.

An IPM plant for packaging and palletizing pipes

In more than 25 years of activity, many have been the innovations brought to this field by IPM, from plants for the automatic bending of pipes, to wrapping, packaging and palletizing plants in extrusion lines, to the wide range of double extrusion machines; and again, from the RS Rieber System socketing machines for socketing and simultaneously inserting rubber gaskets, to the modern Multisocket, particularly suitable for very high output of pipes with lengths from 0,5 to 3-6 meters (for example, for 110 mm dia. pipes with 3 mm wall thickness, the output reaches 440 sockets per hour, using collapsible mandrels).

www.ipm-italy.it

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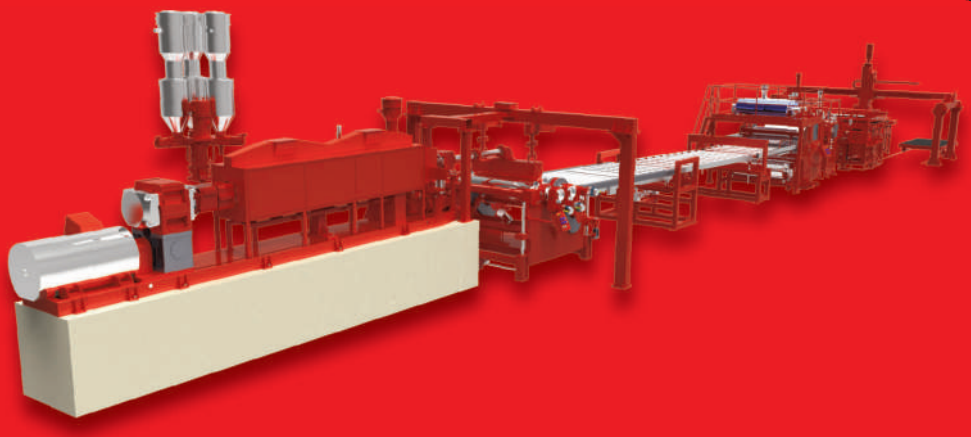

omipa
EXTRUSION MACHINERY

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Ph +39 0332 461400

omipa.it

NEWS

Equipment for plastics processing

Simplicity as the fruit of perfection

New products, new commercial documentation and a new website. This is the new formula with which Engine Plast intends to present itself at K 2013 (hall 11, stand A55).
Research and continuous development of innovative solutions have been the engine giving power to the company since its foundation in 1975. An Italian company which has become international, powered by strategic marketing oriented to the search for opportunities making it possible to capitalize on experience in order to obtain tangible and lasting solutions. Engin Plast is now a reference in the design, manufacture, marketing and installation of dosing systems, and in the transport of polymers (granules, minced and powders) together with robust granulators, having low environmental impact. Aiming to propose technologically advanced solutions with low energy consumption, the company is on the market, today, with two new product lines: Trio, which includes dosing systems, and Trix, which includes granulators. Trio dosing systems consists of single and/or multiple units based on volumetric and gravimetric technologies (sum of weight, loss of weight, combined). Modularity is an outstanding feature of these units and allows to meet even the most articulated requirements in terms of raw material and energy efficiency. Trix granulators cover a range of machines suitable for the recycling of plastic materials, with capacities from 50 to 3000 kg/h. But the most important novelty this year are the gravimetric dosers (loss in weight) for master: their name is Micro. Their main characteristics are the high accuracy level, constancy of performance over time, and user-friendliness. They offer innovative mechanical solutions combined with high resolution load cells and latest-generation microprocessors. The management in milliseconds of weighing algorithms makes them immune to vibration. In addition to this, touch screen and software icons allow to program the machine in an easy and intuitive manner. The X130.460.5 granulator is another novelty this year, designed for the direct recovery of PS, PE, and PET sheets, to be thermoformed. Benefits are high production yields with low energy consumption in complete safety, thanks to the innovative cutting profile of the blades, the large passage surface of the reversible grids, the accurate soundproofing and the latest-generation mechanical/electronic safety devices. Engin Plast, always aiming to strengthen its presence on the market, also this year wants to maintain its commitment to product innovation, distinguishing itself at the K 2013 exhibition for product quality, safety and durability. ■

www.enginplast.com

Trio dosying systems are made by single and/or multiple units based on volumetric and gravimetric technologies (sum of weight, loss of weight, combined)

Auxiliary equipment

Ten years and lots of innovations

K 2013 offers Main Tech (hall 11, stand H22) the occasion for celebrating 10 years in the business exhibiting a variety of innovations. To begin with, an automatic depalletiser for 25 kg bags, featuring integrated bag cutting and emptying units. This machine can pick up the bags directly from the pallet, cutting and emptying them into a conveyor system for silos loading. The depalletiser is available as a stand-alone unit with manual pallet handling by means of a truck, or equipped with an automated magazine for pallet loading and unloading. The output of the machine in terms of unloaded material ranges from 12 to 25 tons per hour. Another Main Tech highlight is the CSA automatic material distributor-separator for centralised conveyor systems. It is a solution for automatically linking the loading points with the pick-up points, available in a vast range of models with pipe sizes from DN40 to DN100. The production monitoring system for recycling and re-granulation lines represents a solution for keeping the plant output under continuous control. This system can be interfaced with a supervision software system including a production management database to be installed on a PC for data exchange. In the field of hygroscopic material treatment, Main Tech is exhibiting the new range of Dess System dryers, designed for optimising energy consumption; they are also able to recognize the type of material and detect consumption rates so as to adjust the air flow automatically. Other new products on show are the GRN160-300 granulator-shredder and the GRS180 and GRS250 granulators. The new LDE precision volumetric feeder is offered as a compact solution for injection moulding machines. ■

www.maintechworld.it

Rendering of a bag depalletising, cutting and emptying system exhibited by Main Tech at K 2013

Dispensing systems

Automatic weighing of powder

A well-established all-Italian company, Lawer represents a landmark in advanced and flexible systems, suitable for successful applications in various industrial sectors, such as textiles, tanning, cosmetics, paint and inks, ceramics, as well as the food industry. Over 40 years of experience in the field have enabled the company to offer its dispensing systems to the rubber and plastic trade. These business areas must likewise pursue the following key objectives: productivity optimization, thus respecting the environment; quality improvement; productive efficiency; reduction of waste; energy efficiency. In order to obtain these results, the following points are therefore essential: carefully control production processes; rationalize and automate each step; eliminate human errors; guarantee hygiene and safety in the departments; prevent any pollution in the production.

Showcased at the K fair is the new Supersincro system, for the automatic weighing of powder products for the preparation of mixes, blends, compounds and masterbatches. EVA bags can be obtained in the required sizes, starting from a roller of tubular film cut and heat-sealed at one end. Printing identifies the bag content and each bag is placed in a stainless steel container to allow filling with the dispensed product.

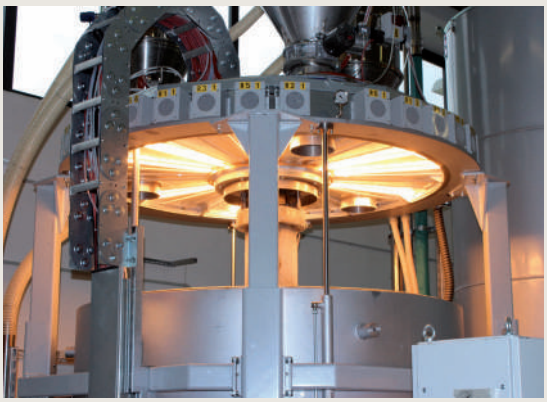
The new Supersincro system has been developed for the automatic weighing of powder products used for preparing mixes, blends, compounds and masterbatches

The system is modular and can be equipped with 10 to 50 stocking silos, one for each product to be dispensed automatically. Each silo can be loaded by gravity or pneumatic force, and is provided with safety, filtering, or bar-code reading devices. A pneumatic system for transporting the material to the chosen silos is also available for largely utilized products delivered in big bags. Each silo is equipped with an anti packing and dispensing device, high/low level probes and humidity sensors. Underneath each silo there is the corresponding weighing system. The plant is equipped with devices controlling the automatization of container handling: fitting and extraction, air-tightening and heat-sealing of the bags. It can be personalized and completed with optional accessories.

www.lawer.com

PLANTS FOR SOLID STATE POLYCONDENSATION OF PET

INFRARED RADIATIONS AND VACUUM



The Moby reactor with open lid and lamps in operation

The Moby system is proposed by SB Plastics Machinery as a true change in the paradigm for the treatment of plastic materials, in particular of polyester (PET). It is based on the simultaneous action of infrared radiations and an ambient under vacuum which, compared to technologies currently available for processes of drying and dehumidification, but also crystallization, decontamination (the so-called "Super-clean") and SSP (Solid State Polycondensation) of PET, brings important benefits from various points of view, from energy efficiency to the final quality of the treated material. All bodies absorb or reflect a specific wavelength of infrared radiation and, given that even water and plastics have their own range of absorption/reflection, it is possible to focus the radiation only on water (maximum dehumidification), or on the material (crystallization or SSP), or on both, optimizing the use of the energy delivered. The material is heated by infrared radiation in a direct, uniform and controlled way so that, at the end of the treatment, the same conditions of temperature and humidity are found in the material, allowing the immediate start of the processing cycle and reducing to zero the waste resulting from dehumidification. Vacuum also represents the most efficient "means" for the extraction of liquids, inducing the migration from the material not only of water but also of any other contaminants (for example, acetaldehyde, chloroform, benzophenone etc.). This is the reason why the Moby system can be employed effectively not only for dehumidification, but also for the super-clean processes of PET in the so-called "bottle-to-bottle" process or, in general, for the recovery of recycled PET to be used in contact with food. An important advantage is the extreme versatility of the system, able to work not only granules, but also flakes, powders and regrind with an irregular particle size, with great results in terms of energy and time efficiency. In the case of PET, for example, an hour and a half of treatment allows to descend from a humidity of 4,000 ppm to less than 30 ppm (and eventually crystallize). The average power consumption is 72 W/kg, but time and consumption are reduced in the case of small particle size (dust) while they increase in the SSP (Solid State Polycondensation) processes. The production rate can be up to 3,000 Kg with modular configurations of the reactor.

www.sbplastics.it

NEWS

Customised systems meeting any requirements

Everything counts

Designing and developing customised systems that can meet any manufacturing and processing requirement has always been the force that has driven the growth of Plas Mec (hall 9, stand A60). The Italian company, world-renowned for its plastic processing equipment, has been making headway in terms of innovation since 1967. All this, thanks to the team's professional talent, the ultra-dynamic and state-of- the-art Research and Development department, and also to the accurate market analysis, based on close collaboration with processors. Direct interactions with processors have allowed fine-tuning the systems. This is why the company is world-renowned not only for the sturdiness and performance of its systems, but also for the way it meets any manufacturing and processing requirement.

One example of this vision based on perfectioning and increased versatility is the new TRR range, which has been technologically redesigned to achieve greater performance from internal components and compounding equipment, as well as make the operating system easier and more user-friendly, thanks to the simplified human-machine interface, and the system itself easier to clean. Even the PVC mixers (dry blending) have been redesigned: new compounding equipment, such as high frequency motors and state-of- the-art frequency converters for energy savings have been added.

For Plas Mec, no factor is more important than others. Sturdiness, energy savings, control system, cooling system, down to the last bolt: every part contributes equally to an optimal production volume. Moreover, in an increasingly competitive market, it is crucial to be able to ensure continuous and widespread customer service. Even in this regard, the company stands out for its worldwide presence and for the way it manages every stage in its systems' lifespan, from their installation to their final production cycle, directly, without intermediaries.

Over the past two years, inspections have trebled and the systems are increasingly adaptable, thereby meeting any processing requirement, whether with reference to dry blend PVC or transparent, non-transparent, soft, semi-soft, or rigid PVC. Tailor-made compounding is much more than just a mission for Plas Mec. It is an imperative to keep raising the bar on Italian quality in the world and continue these 46 years of growth that have made it the world leader in the plastics compounding market.

For Plas Mec no factor is more important than others; sturdiness, energy savings, control system, cooling system, down to the last bolt: every part contributes equally to an optimal production volume

www.plasmec.it

Systems for coilers

Automation at the end of the line

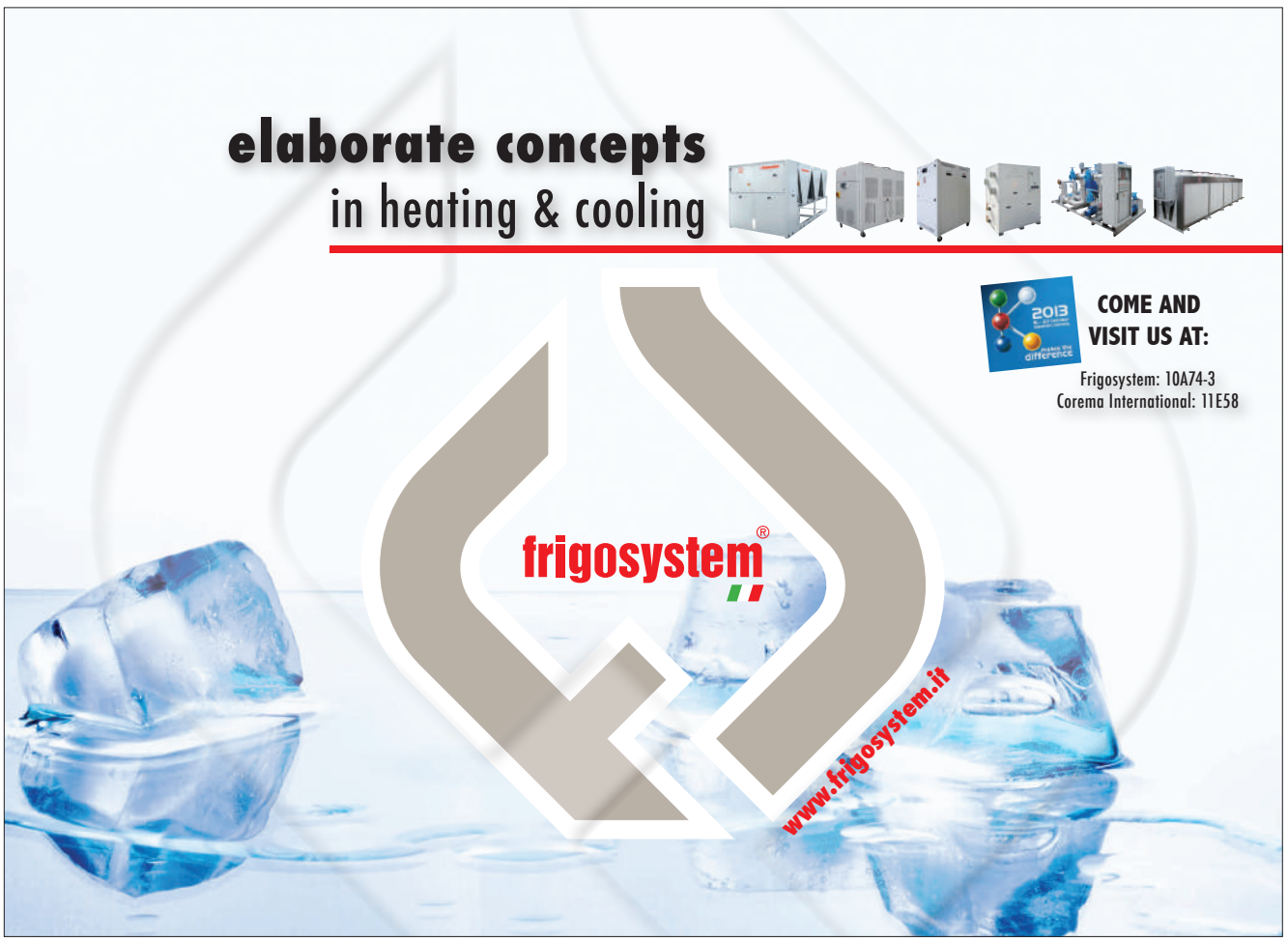
For a few years, FB Balzanelli (hall 16, stand A66) has been manufacturing, along with its well known series of automatic coilers, fully automated systems to handle the coils themselves.

The company R&D, oriented towards innovation, consolidated a high level of coilers reliability by integrating them into the pipe extrusion lines, as a standard application, to ensure the general efficiency of the plant. Thanks to the use of FB Balzanelli coilers, which ensures the quality of packaging, bringing to a perfect final product presentation, processors can now focus on manufacturing high quality pipes.

TR1400PE for handling PE pipes

Adapting to market demands, coilers can be programmed to pack a certain quantity of pipes by just applying preset recipes, with no need for an operator's assistance to do so. This feature ensures consistency in packing without stopping production, thus maximizing the extrusion line output. To complete the packaging phase, FB Balzanelli has introduced various systems to collect coils. The basic models are conveyor systems, to be installed behind several production lines and managed by a dedicated software, whilst the most advanced model is a coil offloading system, integrated with coils stacking onto pallets. This particular system, completing the range, has attracted great attention from pipe manufacturers. With more traditional systems, the operator had to take care of the collection of the coils coming from the coiler to be then moved towards the storage area, but today these operations can finally be fully automated. The systems manufactured can be adapted to customers' needs and grow according to them. A simple pick and place arm for coils can be easily integrated with pallet dispensers, stretch wrap station and roller conveyors for handling. In this way, the end- of- line efficiency is increased by completing the packaging process of the pipe without the intervention of the operator. In many countries, where labour costs have a significant impact on the finished product cost, it becomes mandatory to integrate systems for handling and stacking coils. FB Balzanelli provides its expertise to find the system that best fits the processors' needs.

www.fb-balzanelli.it



A HUNDRED SYSTEMS INSTALLED ALL OVER THE WORLD: THIS IS THE BASE ON WHICH FIMIC IS BUILDING ITS RANGE OF NEW MODELS - CURRENTLY FOUR - AND FUNCTIONALITIES

SCRAPING AND BACKFLUSH SCREEN CHANGERS

TWO TECHNOLOGIES IN A SINGLE SYSTEM

Starting from 100 systems installed all over the world, Fimic (which will be present at K 2013 in hall 10, booth D13) is expanding its range of products by increasing the capacity of its automatic, self-cleaning, scraping and backflush screen changers. These systems operate by scraping a micro-perforated sheet placed inside the screen body. Pulled by the extruder, the contaminated plastic mass enters the screen changer, passes through the perforated sheet (selected on the basis of individual filtering needs) and is then conveyed towards the next plant section. As dirt clogs the screen, the inlet pressure rises up to a maximum threshold set in the control unit; when this value is reached, the control unit activates a hollow scraper holder housing two interchangeable steel scrapers. The scraper holder removes the dirt from the perforated sheet, collecting it until a drain valve is opened, enabling impurities to be evacuated with a waste rate of about 1-2%.

"In these difficult times, the demand for more production amazed and - above all - excited us. We always take on our customers' challenges, especially when they trust us and ask us to design new systems improving their production cycle. This is why we decided to extend the active surface of our screen changer, introducing the 700 model", said Fimic owner Antonio Canaia.

SIMPLE AND EFFICIENT

The company currently manufactures 4 types of screen changers in different diameters and, therefore, filtering surface and hourly outputs. The smallest system of the range, the 325 model, is usually employed for outputs between 500-800 kg/h, while the largest one, the 600 model, reaches up to 5000 kg/h.

"By increasing the diameter, we also boost the filtering surface, the hourly output of the extrusion line and, of course, the customer's profits,

The new Fimic 700 model

but most importantly, we reduce the operating pressure and therefore the energy consumption", added Canaia. The main feature of Fimic

screen changers is their double action: while the scraping system makes it possible to separate particles down to 300 microns with very high rates of iron, wood, paper, copper and non-melted plastic materials, the backflush system allows the screen fineness to be reduced by using the same metal screens generally employed in conventional manual piston screen changers. The strength of these systems lies in their operating costs. The scraping system is based on two economical elements: screen and scraper. The spare screens are obtained from a punched sheet conveniently reinforced by using two hardening processes at a relatively low cost. So, both scraping and backflush screens are very easy to find, and this enables users to always have in their warehouse all the components they may need to meet the production requirements. Based on the material, the contamination level and the method used, the screen can be changed one to three times a week, and the simple and quick changing operation takes about 20-25 minutes, thanks to the pneumatic gun which makes screen change an easy and safe operation. In the new 700 model, the cover opening is assisted by a small air piston, and a 1.5 mm-thick, 100 and 200 micron filter is currently being tested.

"While the punched sheet ins based on the 'same hole/same thickness' principle, this new technology will enable us to increase the thickness and reduce the screen fineness achieved until now through scraping, therefore ensuring a longer life. The customer will be able to choose between the backflush and the scraping technology for fineness values under 300 microns, with further savings on operating costs", concluded Antonio Canaia. The next step is represented by two tandem screen changers, where the second filter is activated when the first one is replaced, thus avoiding the need to stop the production process.

www.fimic.it

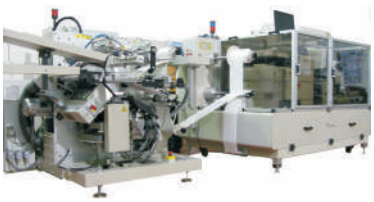
Three functions for any need

1) **Cleaning by scraping and discharging of the dirt collected, controlled by a pressure sensor. This is the most common method: contaminants gradually pile up at the screen, resulting in a continuous pressure increase. When the pre-set threshold is reached, the system automatically activates the scraping step with the subsequent evacuation of the dirt through the drain valve.**
2) **Continuous cleaning by scraping and dirt discharging based on a timer. The self-cleaning system can operate continuously, too: in this case, the scraper holder keeps on rotating, cleaning the screen without interruption. This method turns out to be useful when the concentration of contaminants in the material is very high, or when the material or the processing technology require a constant operating pressure.**
3) **Cleaning by choked backflush through any metal screen without limitations (filtering fineness down to 80 microns). It is especially recommended for low-contaminated materials or for possible secondary filtration, when particularly refined filtration is required.**

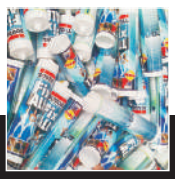
Digital Decoration by Toner directly to the objects

www.gmcprinting.com

Method and device patented by GMC



Printer Unit mod. GMC MOD. 6540
"From file to the object without manipulation"



DHDT
Digital Decoration Directly to pails, buckets, rigid/flexible tubes and cartridges

HDT
Digital Decoration onto barrels of felt pens and graphic markers

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MACHINERY GROUP GMC INTERNATIONAL

NEWS

For extrusion and injection moulding

Gearboxes for all

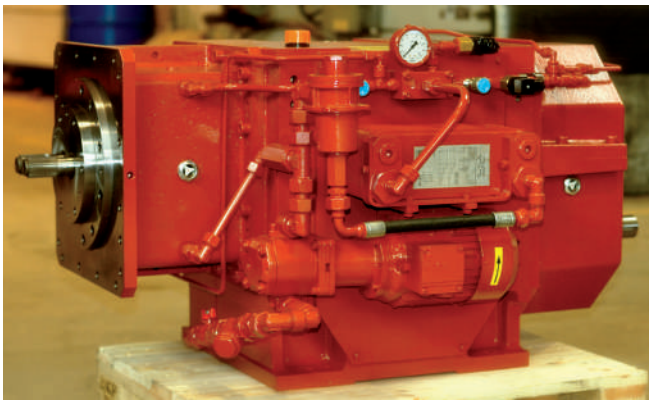
Company operating worldwide and specializing in the design and manufacture of gearboxes for extruders, Zambello group is more and more focused on offering a full range of products to cover all applications, from the single screw, to the parallel twin-screws (both corotating and counter-rotating) and the conical twin-screws. The gearboxes for injection moulding machines (hybrid or full electric) complete the range of products entirely designed and manufactured by Zambello.

Founded in 1957 by Zevio Zambello - the father of Elio and Alessandro, today's managing directors and owners of the company group - the company has been involved, since the beginning, in the design and manufacture of reduction gearboxes of the highest technology. In the last decades, the range has gained a prominent position in the field of machinery for plastic materials and for extrusion in general. The company's industrial policy, inspired by quality criteria, has led it to make important investments over the years and to pursue significant industrial and commercial developments, which have determined a considerable increase in its international activities, making the company well-known all over the world. The list of processors now include the most important companies in the extrusion field worldwide. Since the very beginning, the company has manufactured exclusively in Italy.

The headquarter of the group is located in Magnago, near Milan, and covers a surface of 16,000 sqm, 3,500 of which are covered. The Magnago factory produces gearboxes for single-screw and twin-screw extruders of large dimensions (i.e. for extruders having a screw diameter from 120 mm on) and gearboxes for injection presses of large dimensions. The main manufacturing site of the company is located in Lendinara, near Rovigo (still in Italy), and covers a surface of 110,000 sqm, 8,000 of which are covered. This factory produces gearboxes in series for single-screw and double-screw extruders of small and medium size (up to screw diameter 120 mm) and also gearboxes for injection presses of similar dimensions.

The company is now investing again to enlarge both the production facilities in Italy. By the first half of 2014 the production capacity will be increased by 60% in order to meet the increasing demand of high quality gearboxes for extruders. On one side, the production plant in Magnago, will be doubled. On the other side, the covered surface of the production plant in Lendinara, will be increased by 5,000 sqm. As a consequence, new CNC machinery will be placed in production in order to enhance not only production capacity but also productivity. Moreover, its worldwide sales network is getting global with two new offices in Istanbul (Zambello Turkey) and Ahmedabad (Zamindia). ■

www.zambello.it



Zambello is specialized in the design and manufacture of gearboxes for extruders and injection moulding machines

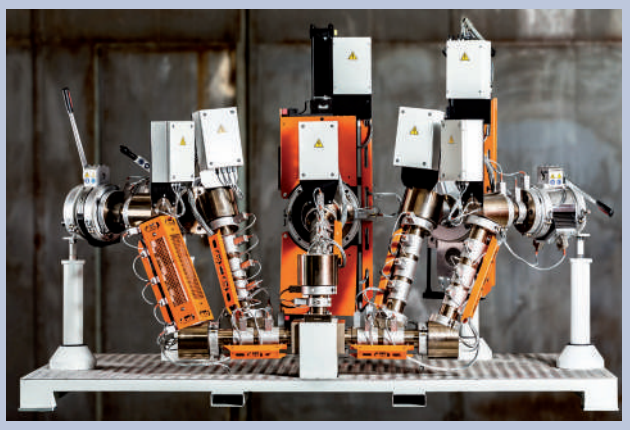
Filtering technology

Strategic supplier

At the K 2013 exhibition, BD Plast (hall 09, stand D74) confirms its ability as a strategic supplier of filtering systems, adapters, melt pipes and fittings, static mixers and accessories. In particular, at the German trade fair the company unveils a set of melt pipes and fittings pre-assembled on a dedicated base, each equipped with a different type of single-plate screenchanger, destined for a 5-layer cast extrusion system. In addition to the traditional single-plate screen changers with wide filtering mass, the latest model of the BDOx2 continuous flow system is displayed in a version with fully interchangeable seals, allowing quick intervention times even on the part of end-users, and featuring a new streamlined layout.

The company's recent activity has been focused on the continual improvement of screen changers, rationalising many components so as to make them more ergonomic and simplify their maintenance. At the same time, the production of melt pipes has been consolidated while the range of complete units with screen changers, melt pipes and pumps has been widened. These units are delivered preassembled on dedicated bases in the form of real installation modules, ready to be easily integrated into more complex coextrusion lines according to the specific needs of processors. ■

www.bdplast.com



For a 5-layer cast extrusion line BD Plast has developed a group of fittings and elbows preinstalled on a dedicated platform and each equipped with a different single-plate screenchanger

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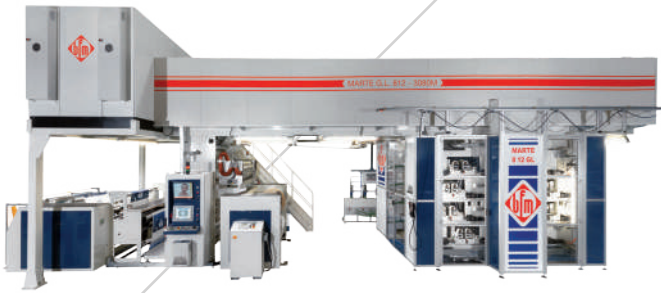

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PARTNER OF
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EXTRUSION INTELLIGENCE

NEWS

Extrusion auxiliaries

"Armoured" screws and barrels

Established in 1967 by Marino Arioli and kept healthy over the years by his sons Carlo and Marco, Mast provides the appropriate solution for the manufacture of screws and barrels destined for various types of product fabricated on extruders and injection moulding machines, as well as for systems manufacturers. The company offers different solutions in terms of materials and coatings, without particular limitations regarding the maximum diameter and length of the screws which, respectively, now can reach a diameter of 400 mm and maximum length of 7,000 mm.

In detail, single-screw extruder systems require the production of screws of different profiles, as well as coatings of different materials. Moreover, Mast is able to provide chambers made of bimetallic materials. Instead, counter-rotating twin-screw extruders involve the production of two screws with thread areas of a different pitch, including a variable-pitch thread area.

Mast also specialises in the production of taper screws. In this case, a version featuring threads with coated crests is also available. As far as the co-rotating twin-screw extruders are concerned, it is important to emphasize that the screw sections can be assembled using several methods. The screw profile is always kept intact in order to ensure an optimal self-cleaning effect while the machine is running. Finally, the barrel may incorporate modular sections with internal circulation of the coolant as well as hardened or bimetallic interchangeable bushings. "Considering the complexity of the typical thermal and mechanical cycles in plastics extrusion processes, the use of high-performance materials plays a very important role in the production department", says the director of Mast, Carlo Arioli. "For example, we use bimetallic barrels in case of high wear which is usually caused by filled or reinforced plastic materials.

These barrels have an inner wall made of sintered material, or powder coated. In this case, hole boring is carried out by one of our partners exploiting the combined action of centrifuge, pressure and temperature, benefiting from the fact that the barrel inner surface will be considerably more compact - and the microhardness of the individual grains higher - in order to increase resistance to wear and corrosion. We use bimetallic barrels combined with screws coated with Stellite - which is a cobalt alloy characterised by excellent resistance to wear and corrosion or, more often, with Colmonoy, a nickel-based alloy which improves resistance to wear and corrosion, thus obtaining a really armoured". ■

info@mastsrl.it

Machine tools and industrial equipment

Mechanical strength

In recent years, applied research in the automotive field and the activity of some laboratories developed new high-strength engineering polymers, called "Super-technopolymer", which can also be used instead of metal. Thanks to these materials with very high glass fibre reinforcement and particular characteristics of the polyamide base, Elesa (stand C29, hall 08a, at K 2013) has launched on the market components ensuring, among other features, exceptional mechanical strength, similar to that of metal components. In fact, in some resistance tests, the new engineering polymers performances reach resistance values close to or even twice as high as the ones achieved by conventional polymers used so far. For this reason, the Elesa mechanical components made of these new polymers integrate the specific advantages of plastic materials with the typical strengths of steels, in particular, stainless steel. In addition to the exceptional mechanical strength, the main advantages of the new components in "Super-technopolymers" can be summarized as follows: resistance to corrosion, therefore suitable for use in wet environments, outdoors, and in applications that require frequent washing; low weight, making them more economical for transport, storage and handling; low coefficient of friction, with consequent advantages in improving the slip and in the reduction of noise during motion; absence of maintenance: the low coefficient of friction of polymers eliminates any periodic lubrication of the component; nonmagnetic, making the plastic components unaffected by magnetic fields; electrical insulation, which prevents the passage of energy through the body of the component; addition of colour in the moulded material.

Amongst the new components made from these new materials there are:

- **CFM. hinges, with performances comparable to metal hinges of the same size and thickness;**
- **CFSQ. and CFSW. hinges with single or multiple integrated security switch;**
- **CFV. detent position hinges with stop positions, which have a particularly high resistant torque, suitable for holding the door in defined positions;**
- **CFMY. hinges for removable doors;**
- **PMT. plungers, with threaded body and nut made of new engineering polymers;**
- **LAC-R adjustable cam levers;**
- **HCZ-P column level indicators, with protection in "Super-technopolymer" on the plate that rests directly on the reservoir wall.** ■

The Elesa mechanical components made of the new engineering polymers integrate the specific advantages of plastic materials with the typical strengths of steels

www.elesa.com

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SPEED AND ACCURACY, QUALITY AND REDUCED COST: THE NEW ROBOTS FOR INJECTION MOULDING FROM STAR AUTOMATION EUROPE ARE BASED ON THESE CHARACTERISTICS

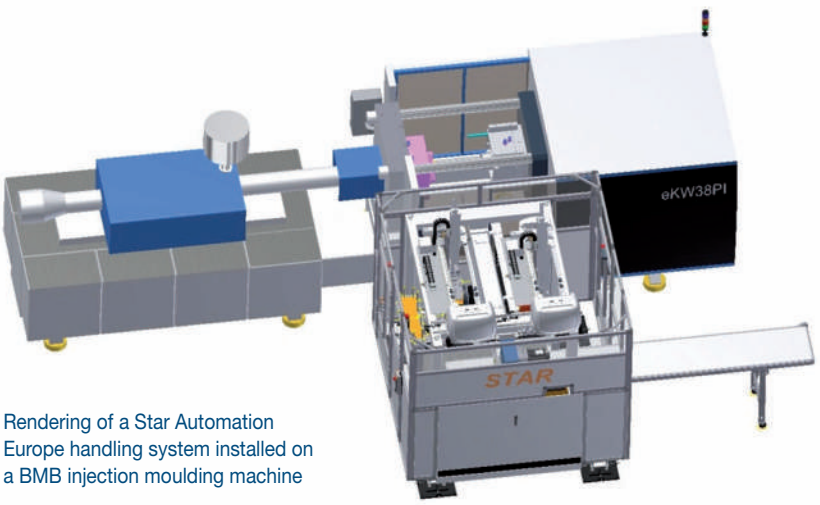
CARTESIAN ROBOTS

SO MUCH FOR SO LITTLE!

Robots may all look the same, but in fact they are not. Convinced of this, Star Automation Europe at the K 2013 (hall 11, stand G74) introduces some products able to change the way to automate the manufacturing processes, focusing on quality and reduction in the investments.

For this purpose, two robots in the SWA range are exhibited: the servo assisted SWA-150S model, for the picking of sprues, and the SWA-3K-R5 model with 3-kg useful load, for the extraction of moulded components. The main feature of both models, currently supplied for injection moulding machines with clamping force up to 200 tons, is to be very rapid and accurate in the open mould.

A productive cell based on an eWW10Pi from BMB, equipped with a mould for the manufacturing of two thin wall food containers, has been set up to show the potentials of the SWA-3K-R5 model.



Rendering of a Star Automation Europe handling system installed on a BMB injection moulding machine

TOP-ENTRY...

The new top-entry Y-3 robot goes in the same direction, with the aim of increasing the deposit area beside the injection moulding machine, to the advantage of higher productive flexibility and freedom in the mould area, to fa-

vour the maintenance and the replacement of the moulds themselves.
This robot, designed for injection moulding machines with clamping force between 100 and 350 tons, allows to override the traverse axis and release the product beside the clamping unit or the injection unit indifferently. This allows to vacate both areas of access to the mould, from the operator side and from the opposite side. The Y-3 model with "T" shaped traverse, in fact, allows a space up to 4 times wider to release the product or to serve ancillary equipment in comparison to a top-entry robot.

... AND SIDE-ENTRY ROBOTS

Moreover, at the BMB stand the high speed side-entry S7 Flex IML robot is running on an eKW35Pi injection moulding machine producing a 5-litre bucket in a short cycle time.
This robot is characterized by the very fast production changeover from the IML on truncated-conical articles to the IML on lids and rectangular containers, still ensuring high performances (minimal cycle times from 3 to 5 s).
Instead, at the Toyo Europe stand, the S7 Flex IML System is installed on a SI-450IV injection moulding machine manufacturing a 10-litre truncated-conical container. The aim is to offer, also in this case, a demonstration of the high flexibility in the production changeover regardless of the article to be moulded. This is possible thanks to the flexibility and the modularity of the S7 range, configurable according to the different productive requirements.

FAST FASTENINGS

At the fair, the company also introduces the products from its Eins Division, which can count on a catalogue of over 3,000 articles developing from the simplest to the most complex end of arm tooling.
In the spot light of the German fair the new quick-touch chunk change for anthropomorphic and Cartesian robots, the new suckers for gripping holed articles and the device to detect the presence of the article in the micro injection moulding.

www.star-europe.com

The new SWA-3K-R5 model with 3-kg useful load, for the extraction of moulded components

ROBOTS FOR ANY REQUIREMENTS

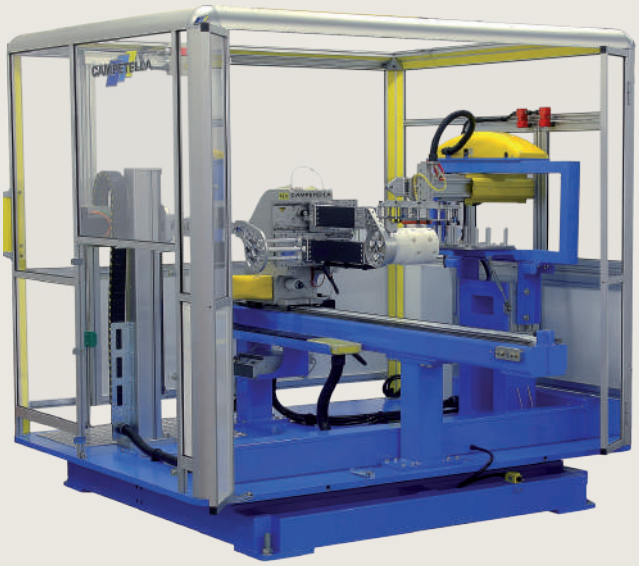
FIVE SYSTEMS

At the K 2013, Campetella Robotic Center (hall 12, stand C16) attends with 5 systems, in addition to the new X-SeriesEVO Cartesian robots, to confirm the important development undertaken. The company presents the new rotary SP3 sprue pickers, the Skill mini robots and the CL2 model, which complete the range of 3-axis machines.

An IML system is displayed by the company at its stand: a 250-mm high pail is injection moulded with an intervention time into the press of 0.9 seconds and a total cycle time of less than 5 seconds. Such a system, based on Modula automation, is proposed as a benchmark for this kind of applications and counts on technological partners as BMB for the injection moulding machine, TGM for the mould and Verstraete for the labels.

At the Engel stand an automation for the extraction of 16 moulded boxes produced by a stack-mould (manufactured by Stack-tech) is in operation. Here as well, the company took up the challenge of the intervention time in the injection moulding machine with a simple and versatile solution: the SM3 robot with double fast axis.

In cooperation with Netstal, the company exhibits, at the Swiss company stand, a system for the extraction, palletizing and packaging of plastic glasses.



The high performance IML system proposed by Campetella is based on Modula automation

The automation consists in a SM2 side-entry robot, an articulated ABB robot and a Lafer Packaging machine.

Moreover, at the Tederic stand an entry level plant is displayed for the IML on a pail produced by a single-cavity mould, equipped with a top entry robot, whilst at the Acrilux booth a vertical injection moulding machine is equipped with an SP3 sprue picker for handling silicon moulded parts.

www.campetella.it

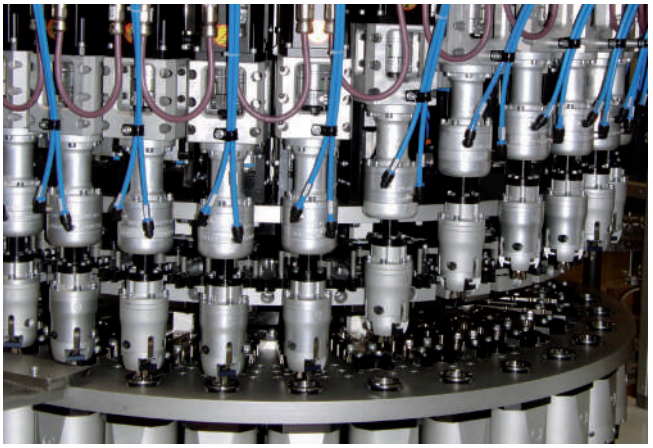
NEWS

New impetus to hybrid machines

Continuous assembly

Technological innovations. Experimental applications. Study of new solutions, designed to provide immediate and effective responses even when faced with the most complex needs of the market. A company can be set up but that does not necessarily mean it will become a global partner. What makes the difference is the constant desire to grow, without ever ceasing to look to the future and without losing sight of the right attitude to work. Through these values, Gefit (hall 13, stand A64), a worldwide player in the manufacturing of moulds for thermoplastics and high-speed assembly systems, has given new impetus to the study and design of the "hybrid machines". The goal is as simple as it is important: to cross new frontiers, moving from traditional mechanical solutions to modern and efficient electric motors, with obvious multiple benefits. A Gefit hybrid machine can carry out the continuous assembly of components, which, previously, had to be assembled by using different systems (index or step-by-step). The traditional closures applied on food cartons, for example, are now realized by using the hybrid technology.

Another key issue, addressing this topic, regards the possibility to realize the screwing operation of the product only after performing a particular angular search, so as to overcome the critical points of traditional fastening, such as the annoying crash on threads. Moreover, a sort of "gentle screwing" is now possible, with a substantial reduction in the amount of dust produced by friction between the elements.



A hybrid Gefit machine can realize the continuous assembly of components which, previously, had to be assembled by using different systems (index or step-by-step)

Furthermore, the hybrid machine is able to perform linear pressfits controlling the coupling force between the elements in several points, with obvious benefits in terms of waste. An additional check beyond the traditional visual inspection.

Not to mention that the use of brushless motors on these machines also allows to obtain a firm grip on the workpiece with the upper spindle completely stopped: a very important detail, which reduces, almost to zero, the risk of damaging the component. In brief, starting from a single angular position, orientation and pressfit can be performed, combining linear and rotary motion. And what's more, in continuous.

www.gefit.com

Granulators and shredders

Energy saving package

A new energy saving package is offered by CMG on all its granulators and shredders

Various are the novelties that CMG (hall 9, stand E22) has recently brought to its size reduction machines. However, at the K 2013, three of such novelties are under the spotlight, namely: energy saving solutions for granulators and shredders; granulator family for bulky parts; dedicated single shaft shredders for the plastic industry.

As for the first, CMG can now offer, on all granulators, efficient solutions achieving up to 20-30% energy saving, compared to other similar granulators. Optimizing the cutting chamber design, in addition to the efficient blades profile, and using a driving system mechanically and electrically developed with the aim of improving energy efficiency, it is possible to achieve savings not reachable only few years ago. This "energy saving package" shows its greatest performance with irregular feeding/use at maximum allowed feeding level as it optimizes energy consumption, according to the real needs of the granulator. Using it 24 hours a day, 6 days out of 7, the average payback time for this energy saving package is between 12 and 18 months, considering the average cost of electricity in Europe and normal work changeover times. Similar performances are also possible with all CMG's single shaft shredders, even if the payback time is usually 3-6 months longer compared to granulators.

As for the granulator family for bulky parts, CMG has developed three models, 900-, 600- and 450-mm wide, that allow size reduction of parts previously processable by bigger and more expensive granulators only. Also, the new granulator family for bulky parts can be equipped with CMG's energy saving package as well as different discharge systems for regrind.

Finally, thanks to the patented cutting system and accurate machining, all CMG's single shaft shredders can process very different rejects.

With the possibility to custom-design every model to processors' needs, also CMG shredders can be equipped with the energy saving package. Unique is CMG's small purge recycling system that, combining a little single shaft shredder and a little granulator, is capable of reaching an output up to 200-250 kg/h, without operator, also removing any metal contamination.

www.cmg.it

NEWS

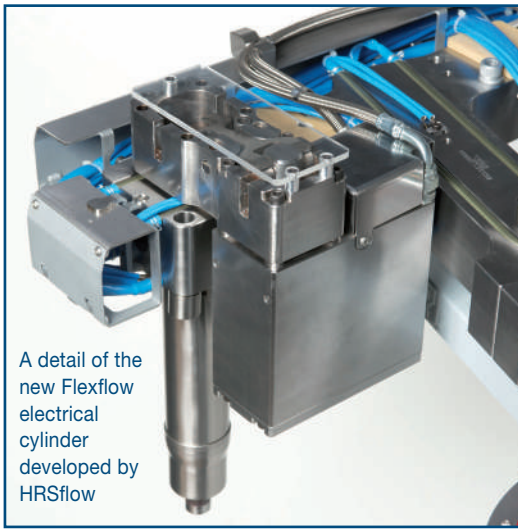
Solutions for the injection moulding of large parts

Electrical cylinder

At the K 2013, HRSflow (hall 01, stand B08) presents the new Flexflow electrically driven system to accurately adjust valve pins in large surface applications, such as bumpers, instrument panels, door panels, and in general any big part that requires sequential cascade moulding, as well as quality optical parts whatever the size. It guarantees a completely independent management of each pin during the opening and closing stages by precisely controlling position, acceleration, speed, and stroke of each valve pin. The result is an optimal control of both the filling and packing time with a direct benefit on the part warpage, too. The new electrical cylinder meets the requirements for high aesthetic quality, removing major defects, such as flow marks, weld lines and flash on injection points.

Multicavity moulds call for the benefits provided by the new Flexflow cylinder. It represents the ideal solution for the fine tuning of weld line position and when a complex filling pattern balance is required, even involving glassfibre materials where structural problems could arise. Moreover, it meets the requirements of moulding applications within a narrow process window and engineered material. The total absence of oil makes it suitable for clean rooms.

The new electrical cylinder has several benefits compared to conventional air/oil cylinders. It can bring a lot of advantages for finished parts and the whole injection moulding process: class "A" aesthetic quality of the part; improved part-to-part consistency; optimized balancing, reducing over-packing and clamping force; hydraulic connections are eliminated; maximum flexibility in multicavity/family tool design; reduced energy consumption; accurate process control; easy use and maintenance.



A detail of the new Flexflow electrical cylinder developed by HRSflow

The new HRSflow electrical cylinder is available in the M, G and A series (5, 7, 10 mm pin diameter) and it can work up to a maximum pressure of 2,500 bar. The nozzle is placed on the side of the nozzle axis, reducing the height over the hot runner system package. The electrical cylinder can be easily fitted and replaced with a hydraulic cylinder considering Flexflow has the same size of a hydraulic cylinder with side layout. Moreover, it has three possible positions, allowing the customer full freedom in mould design. The total control of the pin provides processors with the ability to adjust the filling pressure to reduce the pressure jump phenomenon. It is possible to eliminate the pressure jump by controlling the opening pin speed profile. This reduces the risk of flow marks on the part.

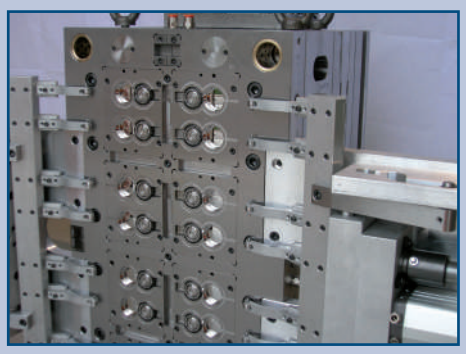
The new Flexflow is adjusted, controlled and monitored by the Flexflow advanced controller that can set the valve pin position within an accuracy up to 0.01 mm. The control unit is available in the 8, 12, and 16 zone configuration. Two HRSflow hot runner systems will be mounted on George Kaufmann moulds and running on an Arburg injection moulding machine (hall 13, stand A13) and on an Engel one (hall 15, stand B42/C58).

www.hrsflow.com

Moulds for caps and closures

Expanding market presence

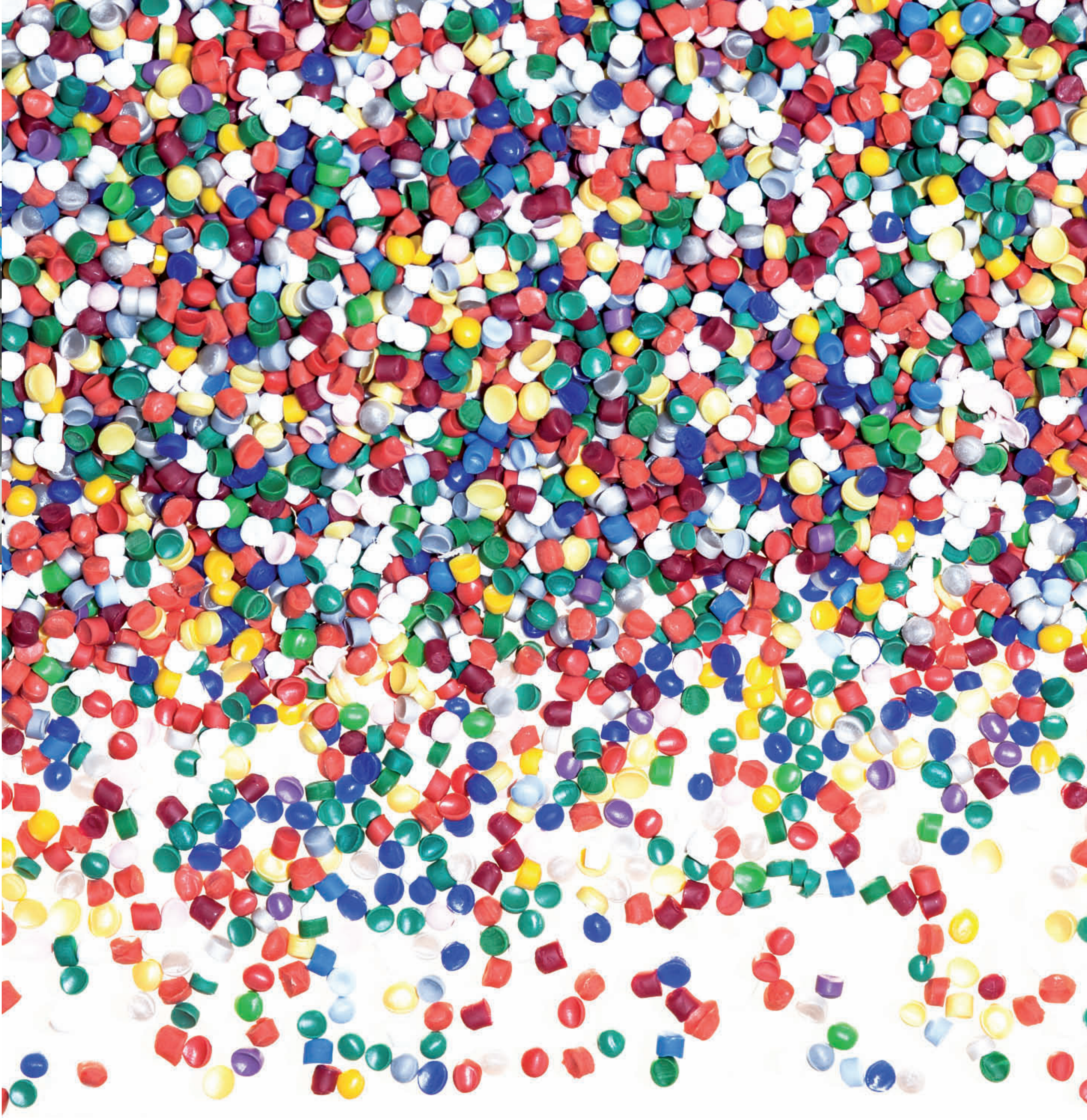
Sure about the significance of the K worldwide, Giurgola Stampi (hall 01, stand F01-2) participates in this edition of the German trade fair like it has been doing since 1998. In order to keep up with the times and anticipate market needs, the company has continually worked to provide processors with innovation, expertise, flexibility, service and, of course, high quality moulds. Primary emphasis has been placed on the moulders' production requirements. Although it remains a mouldmaker, the company feels it is necessary to expand its competence from the co-design of the processor product to the complete quality control of the moulded part, through the whole testing phase and pre-production, with the aim to provide processors with an answer to any need and a solution to any problem. The company takes part in the fair with a stand representing 6 Italian companies, with the aim of strengthening its presence in the European and international market, from both productive and commercial points of view. It shows the latest technologies applied to moulds for closures, destined to sectors such as food and beverage, personal care, body care, pharmaceutical and medical, all of great interest to the company. Caps are displayed with all their possible combinations, with unscrewing thread, pull thread, seals, flip top with and without closing of the lid in the moulding machine, mono, bi and three colour, realized using rotating and tilting technologies in the mould, completely designed and manufactured by the company to meet the needs that emerged from a particularly demanding processor.



A multi-cavity mould from Giurgola Stampi

Equipment constantly updated and managed by qualified and dynamic people allows the company to expand its commercial presence in Europe and around the world, looking for continuous growth opportunities in a changing socio-economic reality. The company is trying to move the boundaries in mechanics using inventiveness and imagination to create solutions and pass on to processors its capability of being a reliable partner.

www.giurgolastampi.com



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Fainplast, a leader company in the field of plastics, has been producing **compounds for special applications** for over 20 years. Thanks to a strong technical know-how and large investments in the field of R&D, today the company boasts a wide range of ever more performing and competitive products developed in order to meet all customers' specific needs. **Tailor-made production, high productivity and flexibility are the keys to success of Fainplast.**

Fainplast compounds

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NEWS

Measuring and testing systems

Material and component properties

At K 2013, Instron (hall 10, stand J18) showcases highly sophisticated measuring and testing systems for efficient and precise determination of the rheological properties of plastics and evaluation of the behavior of materials and components under static and dynamic loads. Amongst the exhibits is the melt flow testers Ceast MF50 and the new Ceast MF30 with manual mass selector, a Ceast 9050 pendulum impact tester, and a Ceast 9350 drop weight tester.

Instron is also presenting automated testing systems, accessories, and software that will help the plastics industry improve the efficiency, repeatability, and accuracy of measurements both in the laboratory and on the shop floor. The exhibits include the new AutoX750 Automatic Contacting Extensometer, the TrendTracker software package, and an automated carousel system for tensile testing that features a high-precision measuring system for determining specimen thickness.

The Ceast MF30 and MF50 are part of Instron's new Melt Flow Tester Series. The Ceast MF30 is a single-weight system, designed to determine melt mass-flow rate (MFR) and melt volume rate (MVR) in accordance with ISO 1133-1 and -2 Procedures A, B, C, and Astm D1238. Its unique and versatile features include a high-resolution digital encoder and an N/C-controlled weight lifter. The lifter is equipped with an integrated load cell for controlled compacting and purging operations, a significant improvement for repeatability and time savings. The Manual Mass Selector - a new integrated option - simplifies configuration and testing, and ensures outstanding operator safety. With minimal physical effort, there is no heavy mass handling required and the configuration of the machine always remains the same.

Instron showcases high-performance measuring systems for determining the flow properties of thermoplastics, testing systems enabling the evaluation of their mechanical properties and of the behavior of components, under static and dynamic loads

The Ceast MF50 is the premiere Melt Flow Tester for single-weight and multi-weight tests. With outstanding technical features and a higher level of automation, safety, and user-friendliness, it is compliant with the latest international standard requirements for temperature accuracy and stability. During multi-weight tests, the system automatically applies up to five of the eight pre-installed test masses, ranging from 0.325 to 21.6 kg, in any desired sequence. During the measurement, the temperature profile in the barrel is extremely stable and accurate according to ISO 1133-2. The Ceast VisualMelt Software controls all functions of the tester during both single-weight and multi-weight tests.

The Ceast 9350 is a floor-standing impact system designed to deliver high impact energies from 0.59 -750 J. As the high-end model in the Ceast 9300 line, it includes many time-saving features and supports a large variety of options - from environmental chambers to extra energy. The versatile testing system can be used to test a variety of specimens and is suitable for a range of impact applications including tensile impact tests, puncture tests, or tests to Izod and Charpy. The new AutoX750 is a high-resolution automatic contacting extensometer which meets the requirements of ISO 9513, Astm E83, and ISO 527-1 (2011). AutoX750 can enhance the productivity of testing laboratories with features including automatic gauge length positioning, adjustable contact force with a reference label, and multiple knife-edge options to accommodate different materials.

TrendTracker, a new software package for Bluehill Software, accelerates the data analysis workflow of a lab by allowing the user to rapidly search and analyze test

results across multiple samples tested over time and on various test frames. The results are automatically exported to a robust and scalable database.
Instron's automatic carousel feeding system may significantly reduce the time and effort required for performing standardized tests on tabletop tensile testers from the Instron 5960 Series. An optional digital measuring system is now available to capture the thickness of all specimens at several points over the length of the specimen with an accuracy of 1 micron. It then transmits the values through an RS 232 interface to the Bluehill 3 Materials Testing Software.
www.instron.com

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The pCO5+ programmable controller is suitable for multiple industrial applications

Versions are available with both "Host" and "Device" USB ports for connecting a standard USB pen drive and connecting directly to a PC without needing serial converters. The integration of these functions brings various benefits to manufacturers and designers of many kinds of systems, including more powerful and distributed control thanks to the five serial lines, allowing management of smart actuators, such as drivers for compressors with DC inverter technology, brushless fans (EC Fans), centrifugal compressors, variable flow-rate pumps, serial sensors, wireless probes etc.
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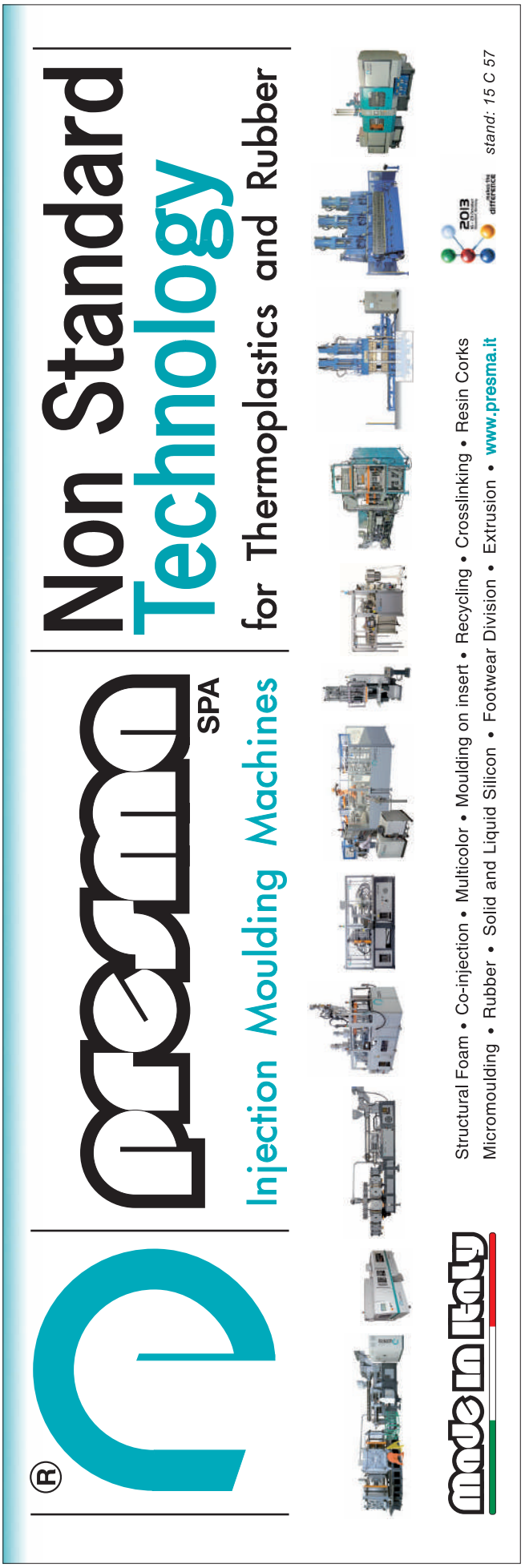

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The Dutch paralympic cycling team is using new, strong and very light chains incorporating white rollers made from the Stanyl PA46 by DSM

KNOWING PLASTICS

ALIPHATIC POLYAMIDES

WAYS OF PRODUCTION, KEY FEATURES AND TYPICAL APPLICATIONS OF THE MAIN ALIPHATIC POLYAMIDES

BY **ANGIOLINO PANAROTTO** AND **DAMIANO PIACENTINI (CESAP)**

It is said that when, during the Second World War, Japan stopped the United States from importing silk from China, a leading U.S. chemicals manufacturer - DuPont - created a replacement material for the production of military parachutes, calling it NYLON, an acronym for "Now You've Lost, Old Nippon!"
Although this is perhaps a legend, the fact remains that nylon, technically classified as a polyamide, has been an almost irreplaceable material in many, specific applications in the plastics industry for decades now, and is set to remain so for a long time to come. In this article we take a brief look at the key features and typical applications of the main aliphatic polyamides.

PA66

Production

Polyamides are obtained by polycondensation of an aminocarboxylic acid, or of a diamine and a dicarboxylic acid. The polymerisation process takes place in an autoclave, into which is fed concentrated salt derived from the reaction between the acid and the amine. It lasts 5-12 hours and occurs at 250-300°C and 2-15 bar. Elimination of the water then leaves a molten mass that, cooled on cylinders, is reduced to flakes or extruded as pellets.

Advantages

PA66 is the aliphatic polyamide offering top mechanical resistance properties (modulus and load), second only to PA46. It also boasts high impact and abrasion resistance and has a low friction coefficient. What is more, it has excellent sliding and wear properties, is not susceptible to contamination, and is highly resistant chemically. Its impact resistance at low temperatures is better than those of acetal resins, PBT and PA6.
Its properties can be modified through the addition of glass fibre reinforcements or of specific fillers depending on the intended use. PA66, like all polyamides, can be reinforced with very high percentages of glass fibres (even up to 50%), which is more than is possible for other types of polymer.
This is thanks to its considerable fluidity and, therefore, its capacity to incorporate and dis-

perse the fibres homogeneously within the polymer matrix.

Disadvantages

Compared with the other polyamides, PA66 is more difficult to mould, partly due to its low viscosity (which makes it necessary to use nozzles fitted with valves). Its melting temperature is approximately 257°C. Absorption of water and differentiated post-moulding shrinkage can result in significant deformation of moulded parts. As with PA6, an item moulded from PA66, if it is mechanically stressed before it has absorbed the correct amount of water necessary to maintain its natural equilibrium, will be prone to brittle fracturing.

Applications

PA66 is used in the production of films, fibres and extruded sheets and, in engineering, in place of metal parts. In the mechanical field, it is used in the production of: gears, bushings, brackets, locks, fans, cogwheels, sprockets, cages, roller bearings, and so on. Recently, glass fibre-reinforced PA66 was developed for use in the construction of gearbox sumps for certain top-of-the range cars, successfully passing the stringent and specific impact tests. The recent introduction, on the market, of reinforced polyamides for thermoforming could, in the future, prove advantageous in the automotive sector for the production of parts under the bonnet such as housings, soundproofing components and panels.

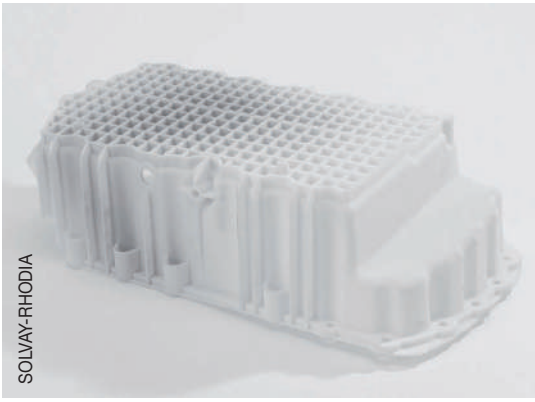
There is also a place in the automotive sector for semi-finished products made from PA66, such as protection bars. The advantage of this new generation of semi-finished products is the enormous scope for using them in applications that, at present, are still the preserve of metals. The particular strengths of PA66 are its lightness and its capacity to be used continuously at temperatures of up to 140°C (and for short periods of time at temperatures reaching 170°C), without any loss of its stiffness or resistance to mechanical stress. It is also resistant to many chemical substances.

Processing technologies

Polyamide 66 can be used with all processing technologies except for thermoforming, which for the time being has been developed only for reinforced PA6, giving good results. Nearly all the processing technologies require predrying of the pellets. Melted PA, which is partially crystalline, becomes highly fluid (indeed, for injection moulding, needle valve nozzles have to be used), and it has very specific melting and solidifying temperatures. Extrusion and blow moulding demand certain precautionary measures, or the use of special materials. Films are produced using the chill-roll system. Parts can also be produced by means of rotational moulding. Sintering technology can be used, as can reaction injection moulding (RIM) and reinforced reaction injection moulding (RRIM). The tooling of semi-finished products does not present any particular problems; the material can be bonded using adhesives or solvents, hot-welded, metallised, and ink printed.

In the case of injection moulding, drying temperatures vary, depending on the PA66 grade.

A moulded oil sump in DuPont Zytel polyamide resin is one of the innovative technical solutions incorporated by Scania in its new Euro 6 engines. This solution has made it possible to reduce the weight of this component by over 50%, i.e. by 6 kg, compared with the aluminium version used in the past, resulting in improved fuel economy and lower emissions



They range from 75°C to 95°C, while drying times range from 2 to 4 hours, depending on the moisture content of the pellets. The maximum moisture content should, in theory, be around 0.2%. The processing temperature can also vary, within the range of 260°C to 320°C (this latter value applies to aromatic polyamides), while mould temperatures range from 40°C to 100°C.

PA6

Production

In this case, the polymerisation is performed using caprolactam (obtained from phenol or cyclohexane) as the starting monomer. The process occurs through the reaction of an intermediate obtained through the addition of water, which opens the caprolactam ring, forming an acid reagent. It takes place in an autoclave at a temperature of 250-270°C into which water is introduced together with PA66 or aminocaproic acid salt as the initiator. Mono-functional monomers are also added to control the molecular weight and the industrial reaction occurs in continuous mode or in batch processes.

Advantages

Laboratory experiments comparing PA6 and PA66, both 30% glass fibre-reinforced and using the same heat stabiliser, have highlighted several aspects that, until a few years ago, were controversial.

These experiments showed that, after weathering at 150°C and 170°C, PA6 showed, in some mechanical trials (such as impact resistance), a better decrease in value relative to ambient temperature.

At 190°C, after 3000 hours of weathering, the value of the impact resistance is no longer measurable. The high temperature elasticity modulus, at 3000 hours and at different temperatures (150, 170 and 190°C), increased by as much as 350 MPa. In the case of PA66, the value at 190°C was no longer measurable.

This means that the optimal conditions for the use of PA66 are long-term working temperatures of up to 140°C, with brief 200°C spikes. Other advantages of PA6 over PA66 are its considerably lower cost and greater mouldability.
Furthermore, this material shows less shrinkage, is more isotropic, corrodes the metal of the plasticising screws less, lends itself better to vibration welding, and offers a broader processing range, while still guaranteeing better impact resistance.

Disadvantages
Compared with PA66, PA6 absorbs more moisture, is more sensitive to hydrolysis and is slightly softer in the conditioned state; furthermore, at temperatures of over 70°C, it tends to depolymerise, whereas PA66 in water withstands temperatures of up to 130°C. Furthermore, its crystallisation speed is lower than that of PA66 which therefore means slower moulding cycles.

Applications
The applications of PA6 are exactly the same as those already listed for PA66.

Processing technologies
It can be used with all processing technologies, including (albeit only for reinforced PA6) sheet thermoforming for semi-finished products. The remarks on processing technologies made in relation to PA66 also apply to PA6.

The TechnylStar polyamides by Rhodia Engineering Plastics, now part of the Solvay group, have made it possible to design and launch the very first transpallet truck made of thermoplastic resin, which is named I-ton and produced by the Italian manufacturer Lifter

ARKEMA PA12 RILSAN

PA6+ABS ALLOY

Production
PA6/ABS is an example of an alloy, deriving from an amorphous polymer (ABS) and a semi-crystalline polymer (PA6), which offers the advantages of both materials. Since ABS and PA6 cannot be blended, the polymer that is formed is, basically, a compound obtained mechanically (or, more accurately, through grafting with reactive extrusion), a process that allows combination of the strengths and weaknesses of the two materials. For better adhesion, the proportion, in weight, of PA6 is usually 60%; furthermore, compatibilisers like maleic anhydride (SMA) are used during the reactive extrusion phase. What is obtained is a copolymer with a higher melting point and better chemical resistance, thanks to the PA6, and less water absorption, thanks to the ABS.

Advantages
This alloy is cream-coloured and non-transparent. It is characterised by particularly high surface opacity and good acoustic damping behaviour. It has a density of approximately 1.07 g/cm^3; furthermore, due to the presence of PA6 it shows slight deformation below the glass transition temperature (Tg) of 110°C. It shows good resistance to petrol, oils, alcohol, solvents and bases. Dry, it has a Young modulus of 2 GPa; conditioned, this falls to 1.6 GPa. It shows very high impact resistance, even at low temperatures.

Disadvantages
PA6/ABS features low resistance to acids.

Processing technologies
It is particularly suitable for the production of injection-moulded parts, which do not necessarily need to be treated prior to any subsequent coating.

Applications
In the car and motorcycle sector, it is used for the production of: dashboards airbag covers, instruments covers, storage compartments and various components.

PA46

Production
In this case, the starting monomers for the polymerisation are 1.4-diaminobutane and adipic acid. The production process involves the preparation of different grades to which substances are added in order to meet different specific needs.
Accordingly, it is possible to produce blends containing polytetrafluoroethylene (PTFE) to reduce friction, modified with elastomers to improve impact resistance, and reinforced with glass fibres, or grades containing a flame retardant.
Some grades have been developed for the production of pipes and profiles, or semi-finished articles.
A niche application for PA46 has been found in the market of synthetic fibres for tyres. Its cost makes it unsuitable for large-scale applications where, for now, PA66 is cheaper and easier to process.

Advantages

Dry, it has a distortion temperature under load of 160°C and a significantly higher continuous use temperature than that of PA66, largely thanks to its greater degree of crystallinity, which also explains its excellent chemical resistance, especially to acidic salts. It also shows better creep resistance and shorter moulding cycles. The grades for films and fibres that have been marketed in recent times are characterised by mechanical properties which are superior to those of PA6 and PA66, while they cost less than some of the super-polymers such as PPS and PEEK, aramid resins and fluorinated resins.

Disadvantages

PA46 has higher processing temperatures compared with PA6 and PA66, since it has a melting point of around 290°C. Its moisture uptake is a little higher than that of PA66, compared with which it is also more expensive.

Applications

It is possible to find, on the market, grades of PA46 which can be up to 60% glass fibre-reinforced so as to be able to guarantee performances on a par with those of some metals. These are destined for applications in the automotive sector (underhood components in particular), as well as, in other sectors, for the production of electronic and electrotechnical parts.
Applications in the fibre sector include: staple fibre for industrial felt products and yarns, abrasion resistant clothing and protective composite coatings. Filaments have many possible applications, such as: professional hairbrushes, rubber reinforcements for V-belts, car ducts and roller strips etc.
In the mechanical field, the main applications are: gaskets, bearings, bushings, and gears; in the electronics sector they are: dielectric sheets. Injection moulding can be used to produce parts with very thin walls, even as thin as 0.1 mm.

Processing technologies

The processability of PA46 is conditioned by its high melting point; suitable additives are needed to prevent degradation of the polymer. For injection moulding, the melt will typically have a temperature between 305°C and 320°C, while the mould temperature can range from 60°C to 120°C, depending on the desired thickness and final characteristics. Drying will be necessary in situations in which the material is exposed to moist air. Dehumidifiers with a dew point of -30°C should be used for 2-4 hours at 80°C, always bearing in mind the initial moisture value of the pellets and the threshold required for correct processing.

PA11 AND PA12

Production

Polyamide 11 (PA11), recognised as a biopolymer by the Japan Organics Recycling Association, is a polymer produced from renewable sources. The process of synthesising this polymer starts with the castor oil plant, whose seeds are used to obtain an oil that, when correctly processed, generates glycerol, ethyl alcohol, heptane acid, and also the monomer used to produce the polyamide.
Polyamide 12 (PA12), on the other hand, is a homopolymer that is derived from petroleum in a manner reminiscent of what is seen with PA6. Indeed, it is obtained from lauryllactam by ring breaking caused by the hydrolytic polycondensation of lauryllactam at 300-330°C in the presence of phosphoric acid. The system used by some producers to obtain 1.12-dodecanedioic acid (the basic reagent for the production of PA12) is hydrogenation of cyclododecatriene (CDT) to cyclododecane, which is then oxidised at a high temperature.

The seeds of the castor oil plant can be used to obtain an oil that, when correctly processed, generates glycerol, ethyl alcohol, heptane acid and also the monomer used for the production of some polyamides derived from renewable sources, such as the Radilon D 610 polyamide grades produced by the RadiciGroup

Giant flexible pipes made from the polyamide 12 Vestamid NRG by Evonik

Advantages

Compared with the performances of the traditional polyamides PA6 and PA66, PA11 and PA12 show very low moisture absorption: 1.9%, and 1.6% respectively. Their melting temperature is lower too: around 175°C for PA12, and around 185°C for PA11. Given their low density (1.02 g/cm^3), PA11 and PA12 may, in some applications, be considered as replacements for PC (1.20 g/cm^3) and PES (1.37 g/cm^3).

Disadvantages

Compared with PA6 and PA66, PA11 and PA12 show lower heat resistance and load at break. This is due to a reduction of the distance between the amide groups, which are the ones that most influence these properties (the number of carbon atoms present in the starting monomer is increased). PA11 and PA12 are also more expensive than PA6 and PA66.

A vital component of the lightweight, aerodynamic velomobile Velox 2 was the drive-train incorporating DSM's Stanyl, a high-performance polyamide 46 which helped give the Human Power Team of Dutch cyclists the edge they needed to win World Human Powered Speed Challenge in 2012

Applications

Both PA11 and PA12 are specifically and extensively used in the production of pipes for air systems installed in environments where the temperature can fall to several degrees below zero. In the automotive sector, PA12 is used for the pipes supplying direct-injection diesel engines, while in the food industry it is used for the transportation of beverages (beer). It is also used in some applications in the electrical/electronics sector, such as the production of electrically conductive magnets, which are produced by incorporating 80% barium and ferrite powder into the PA12 matrix.

In the medical sector, these polyamides, on account of their good mechanical properties, are used in the production of catheters. In the sports sector, some special grades of PA11 or PA12 film are used to decorate snowboards, tennis racquets, football boots and ski boots. Recently, new grades, offering a transparency superior to that of glass, have been developed for the production of eyewear: their transmittance is 91.5% (in compliance with ISO 13468, thickness: 2 mm, wavelength: 560 nm), which is an improvement on the values recorded for glass (90%) and polycarbonate (88%).

Processing technologies

Depending on the grade, PA11 can be extruded to produce films, sheets, foils, pipes and profiles; it can also be blown and injection-moulded or rotationally moulded. The processing temperatures are: 200-230°C for blow moulding grades, with a mould temperature of 70°C; 230-290°C for extrusion grades; and 210-250°C for grades used in injection moulding, where mould temperatures range from 40 to 80°C. PA12 for RIM is processed using a mould in which the monomer (having a low viscosity) is transferred and allowed to polymerise.

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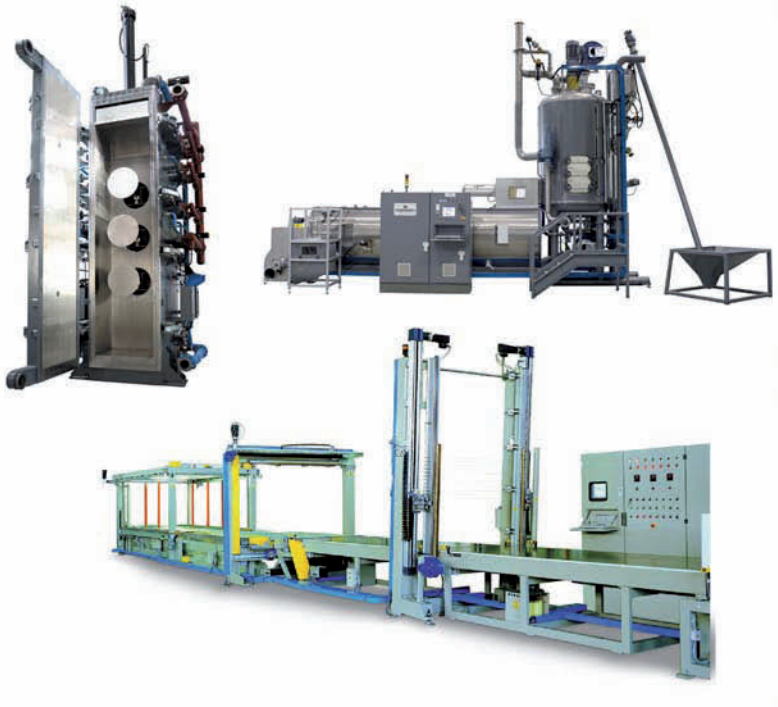

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Technical questions

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POLYAMIDE CONDITIONING

How long should a 4-mm-thick part in PA 6 be immersed in water at 20°C in order to condition it adequately, in other words so that it becomes ductile and not prone to brittle fracturing during assembly?

Polyamides need to have absorbed a certain quantity of moisture to ensure adequate flexibility, sufficient to avoid the risk of breakages due to excessive distortion during the assembly stage. It should be borne in mind that the moisture content in a polymer increases over time until the correct equilibrium is reached, which for PA 6 in standard conditions (23°C and 50% relative humidity: RH) is approximately 2.6% (ratio of water mass to total mass). However, reasonable flexibility can also be obtained with even lower values, which depend on the thickness of the material and on the assembly conditions. In very general terms it is considered that a mean value of around 1.6-2% through the cross-section is usually acceptable.

Since this question, sent by a moulder, refers to the time needed to reach the equilibrium during the conditioning of the piece in water, it should be noted that the immersion time depends on the thickness of the piece and the temperature of the water according to the equation:

$$t = \frac{\pi * 2b^2}{16D} * \left(\frac{M_t}{M_s}\right)$$

where:

2b is the thickness of the piece [in cm]

D is the thermal diffusivity, considering a mean value in the required range of absorption and for the relative immersion temperature

Mt is the percentage of moisture at time t, while Ms is the percentage of water at the point of equilibrium (and is therefore approximately 2.6%).

Since it is very simple to obtain measurements, over time, of the amount of moisture absorbed, we were able to derive, with sufficient accuracy, the value of D in this moulder's working conditions and thus to work out the time necessary to obtain a certain humidity level.

Having established experimentally the value of D, the three variables: time, thickness and amount of moisture were plotted in pairs, fixing the third. In particular, we obtained graphs of time-thickness for a fixed absorption level and time-moisture percentage for a fixed thickness (**figures 1 and 2**).

This experiment allowed us to estimate a mean diffusivity value to be used in the desired range of absorption (typically from 1 to 3%) and to verify the parabolic curve of the time needed to obtain conditioning, which increases in a non-linear fashion with increasing thickness. We were also able to calculate the reduction of this time that is possible when immersing the piece in water at 40°C.

In the case in question, what figure 2 shows is that for the indicated thickness of 3.2 mm, we obtain a time of around 20 hours when the piece is immersed in water a 40°C; this time increases to around 30 hours if the temperature of the water is 20°C. It is shown, finally, that the water absorption is a slow process and that the temperature of the water is an important parameter; to reduce the immersion time by 4-5 hours, the temperature of the water must be increased to 75-80°C, using temperature-controlled tanks. ■

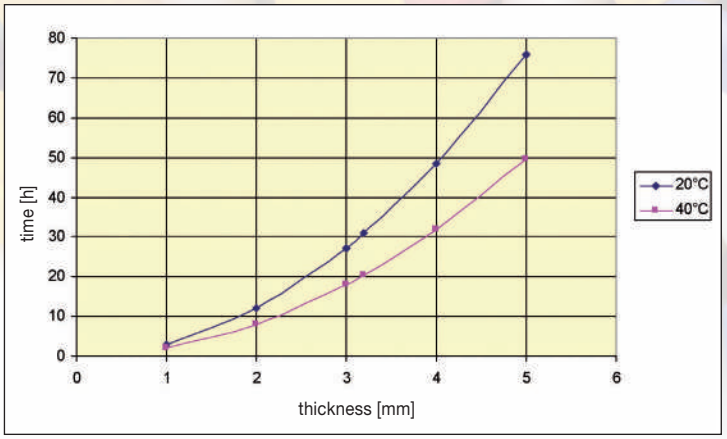

Fig. 2 - 2% absorption in water at 20°C and 40°C

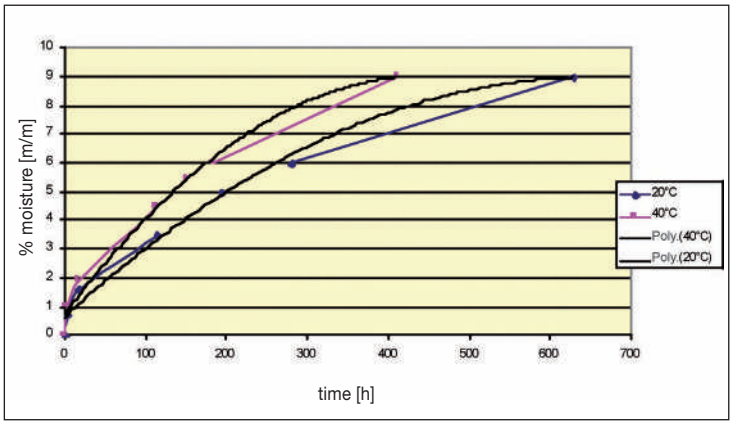

Fig. 1 - Moisture absorption in water at 20°C and 40°C as a function of immersion time: experimental values

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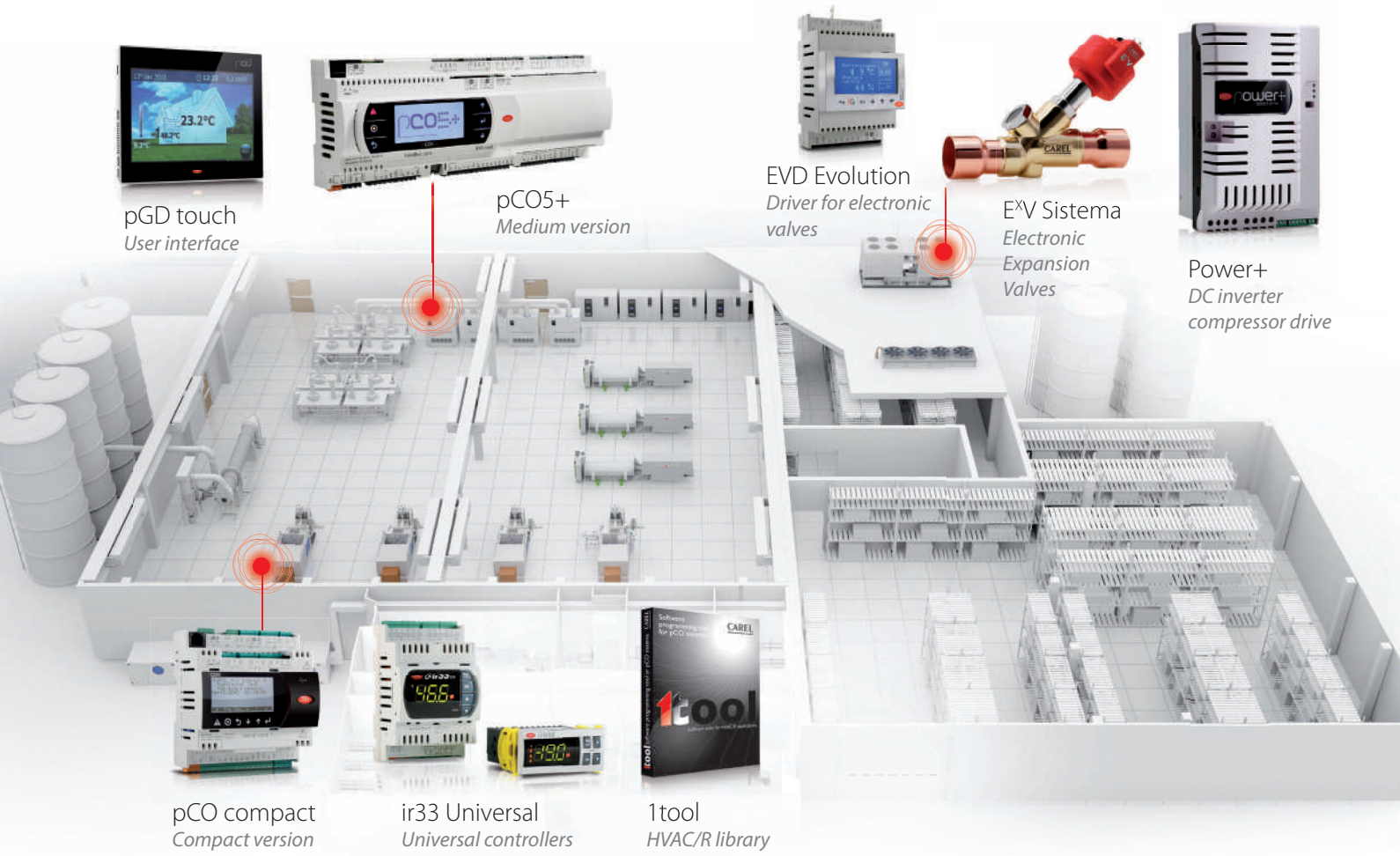

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PLASTIC MATERIALS FOR THE PACKAGING SECTOR

YOUNG... BUT FULL OF POTENTIAL

PLASTIC MATERIALS, WHICH WERE NOT MASS PRODUCED UNTIL AFTER THE SECOND WORLD WAR, ARE AMONGST THE "YOUNGEST" RAW MATERIALS TO APPEAR IN THE PACKAGING SECTOR. WHAT DIFFERENTIATES THEM FROM OTHER RAW MATERIALS IS BASICALLY THE FACT THAT THEY ARE STUDIED TAKING INTO ACCOUNT THE PERFORMANCE OF THE FINISHED ARTICLES

BY **ORESTE PASQUARELLI**

In the early years following the introduction of plastic materials, they were used to make objects whose shape and appearance closely resembled those of ones produced using other materials, such as wood, glass and metals. Therefore, plastic materials were initially regarded as substitutes rather than innovative raw materials needing to be specifically designed according to the performance characteristics required of the finished articles. Subsequently, alongside new materials, processing technologies were developed and refined that allowed the creation of a wide range of products and semi-finished goods, ranging from rigid objects, lightweight and resilient, to transparent films with high dimensional stability and mechanical strength.

The application sector that, at both Italian and European level, absorbs the greatest quantity of plastic materials is that of packaging, which accounts for around 40% of total consumption.

In Italy, consumption of plastics in the packaging sector in 2012 totalled 2500 kt, with rigid polylaminated (TetraPak type) containers accounting for 140 kt and flexible packaging made from laminated film (including laminates containing paper and aluminium foil) for 180 kt. Still in terms of consumption, in Italy, plastics are the third most important packaging material, on a par with wood (disposable and re-usable boxes and pallets).

First in the classification, we find cellulose materials with 4350 kt (paper, flat cardboard for boxes and corrugated cardboard for transport packaging); then comes glass (bottles, jars, demijohns) with 3600 kt. Steel is in fifth place with 530 kt, while at the bottom of the classification we find aluminium, with 72 kt (in the packaging sector, metals are used mainly in the production of cans for long-life foodstuffs and aerosol cans).

In the packaging sector, plastic materials are used to produce both rigid re-usable containers and rigid and flexible disposable containers. They are destined mainly for the primary packaging sector (where the material is in direct contact with the product itself), followed by the secondary packaging for handling and tertiary transport sectors.

PRIMARY PACKAGING FOR BEVERAGES AND LIQUID FOODS

Plastic materials provided the solution to the problem of the need for lightweight, unbreakable containers. Consumers want containers of this kind because they are practical and lighter to carry, while supermarkets prefer them for reasons of efficiency and because they allow better use of the available display space. The first step, in this regard, was the development of alternative types of packaging for "non-carbonated" liquid food products. It was precisely as a result of studies undertaken, beginning in 1943, to develop a milk a container that used a "minimum of material" yet protected the product, keeping it hygienic, that, in 1951, the company TetraPak (Akerlund & Rausing group) was established.

The following year TetraPak installed its first plant at a dairy in Lund (Sweden).

More recently TetraPak developed containers featuring high gas impermeability and a sterile filling system, for the packaging of long-life milk that can be stored at room temperature. The laminate structure is the following: LDPE/card/LDPE/aluminium/LDPE. Nowadays, this solution is used not only for milk but also for fruit juices, vegetable purées and sauces and wines. In addition to this type of packaging, three-layer HDPE bottles for sterile milk are also present on the market. The middle layer is black, to protect the milk from the light.

But the market also needed rigid, transparent bottles for packaging mineral water, soft drinks and different types of oil. The 1970s therefore saw the start of the development of PVC bottles, first of all in France where they were used for water, seed oils, and - to a very limited extent - vintage wines. Italy followed suit, albeit only for mineral water, instead introducing cans for seed oils.

One limitation of these first plastic bottles was that they could not be used to contain carbonated drinks and, in this same period, US carbonated drink manufacturers called upon the polymer industry to develop a plastic material suitable for producing light, unbreakable bottles, able to resist internal pressure without becoming distorted and featuring an excellent barrier to CO_2. The first market tests were run in 1971 on polyacrylonitrile (PAN) bottles with a capacity of 33 cl. The results were encouraging, prompting some companies to start producing this polymer; these included: Vistron, with its polymer Barex, E.I. DuPont of Nemours which produced Vicobar, and Monsanto which produced Lopac.

In the period 1972-1973, leading manufacturers of carbonated drinks (PepsiCola, CocaCola and Seven-Up) carried out various industrial tests on the new bottles and in 1974 DuPont decided to stop producing Vicobar, instead launching - in collaboration with Pepsi Cola - the first PET bottles. Until 1976, PAN and PET were both available on the market, together recording consumption levels of around 1000 tons/year. In 1977, PAN was withdrawn following a decision by the FDA (Food and Drug Administration) to limit the content of acrylonitrile monomer to a maximum of 50 ppm.

In the USA, PET consumption soared, rising from 16000 tons in 1977 to 140000 in 1979. PET bottles reached Europe (Great Britain) in 1979. The following year they appeared in Italy (where they were used for San Benedetto soft drinks).Today, consumption of PET bottle grades in Italy amounts to 400 thousand tons/year and they are used to contain: mineral water, soft drinks, sports drinks, fruit juices, fresh pasteurised milk, vegetable and fruit purées, edible oils and medicinal syrups. It is estimated that 80% of the 10 billion litres of mineral water consumed each year is packaged in 2-, 1.5-, 1-, 0.75-, and 0.5-litre PET bottles. The 18-litre containers used for water coolers are also made from PET, while 5-litre family size containers for different types of oil are also becoming more widespread.

TOTAL

PRIMARY PACKAGING FOR SOLID FOODSTUFFS

The plastic materials sector "invented" new types of packaging for solid foodstuffs, especially more perishable ones. The first products to appear were pouches for cold meats and high waterproof bags for cooked whole hams. The pouches are made from high gas barrier films (PA6, PET), coupled with LDPE to obtain a safe seal and provide an excellent water barrier. Shrink bags are generally produced using copolymers of PVDC. The historic leader

in this sector is Sealed Air, with its Cryovac brand.

One very widespread type of packaging for cooked, ready-to-use foodstuffs is a sterilisable pouch that has the following structure: BOPET/aluminium/BOPET/PP. The two biaxially-oriented PET (BOPET) films protect the aluminium foil avoiding possible crazing, while the polypropylene (PP) film allows welding of the pouch and also makes it possible to heat the product inside without opening the pouch. This type of packaging is widely used for precooked meats, roasts and other delicatessen products.

Since the 1990s, there have also existed rigid transparent and high-barrier containers consisting of thermoformed trays (bottom part) sealed with laminated film (top). They are made, respectively, from thermoformable amorphous PET sheet coupled with coextruded LDPE/EVOH/LDPE, and from biaxially-oriented film (BOPET or BOPP) coupled with coextruded LDPE/EVOH/LDPE. At the time of packaging the product, gases (generally N_2 and CO_2) are injected into these containers to create a modified atmosphere that protects the packaged food (sliced meats, filled fresh pasta, egg tagliatelle, meat-based products and so on) against oxidation.

In the case of whole cuts or sliced products such as hard cheeses (or frankfurters, cold cuts of ham, speck, mature cheeses), vacuum packing is preferred. Trays in PP or thermoformed from PET sheet are used for ricotta, soft cheeses and delicatessen products. Flexible pouches made from LDPE are very popular for the packaging of mozzarella in its whey and for the packaging of fresh, ready-to-eat salads (fresh-cut products). In the latter case, it is necessary to use anti-fog film to prevent fogging of the inside the packaging, which would obviously prevent the consumer from seeing the contents perfectly. Finally, let us not forget the trays and bubble wrap in PP or thermoformed from PET sheet used for the packaging of fresh fruit and vegetables, which can also be wrapped with plasticised PVC or polyolefin stretch film.


UNILOY

In the confectionery industry, biscuits are often packed in trays thermoformed from HIPS, PP, or PET sheet and then placed in paper or cardboard packaging. Cakes, like Italian panettone and pandoro, are instead packaged in a re-sealable PP film bag, which guarantees that all the fragrance and softness of the product is conserved.

SYNBRA

Containers made from sintered expanded polystyrene (EPS), offering a high insulating capacity, are used for transporting and storing fresh fish, ice cream and frozen products. Consumption of this polymer in Italy is estimated to stand at 150 thousand tons/year, with packaging absorbing 50%, and the building sector the other 50%.

PRIMARY PACKAGING FOR NON-FOOD PRODUCTS

Liquid products (detergents, bleaches, waxes, household products and products for personal hygiene) are packaged in flacons or bottles made from LDPE, HDPE, PVC and PET. Deformable tubes made from laminates (PET film/aluminium/LDPE) are widely used for toothpaste, creams and sun protection products. Injection-moulded polypropylene containers have replaced metal tins for packaging water-based paints, although tins are still widely used for solvent-based paints. Disposable crates in HIPS, HDPE or PP are used for the consumer market distribution of fruit and vegetables. Specially shaped thermoformed fruit packaging trays in PP or PET are often placed inside these crates.

TRANSPORT PACKAGING

The development of this sector, linked to the production of crates for returnable glass mineral water bottles, dates back to the end of the 1960s and, indeed, the need for rigid, sturdy and easily stackable containers ensured its success. Produced by injection moulding with HDPE and copolymers of PP, these crates replaced the wooden variety (used for mineral water and soft drinks) and wire ones (used for wine). The advent of disposable bottles, initially made from PVC and subsequently PET, led to a drastic reduction in the production of crates of this kind. However, the experience gained in the design of reliable multifunction containers was put to good use in the development of

crates for gathering fruit and vegetables and containers for the storage and handling of different products. The basic sizes of these containers are submultiples of standard pallets (800x1200 and 1000x1200 mm). The basic sizes of the traditional crate (600x400 mm) allow the entire surface area of both types of pallets to be exploited.

The need to reduce empty crate collection and transport costs led to the introduction, especially in the fruit and vegetable sector, of crates with collapsible sides, thereby reducing by 20% the space taken up by empty crates. Since the end of the 1990s, crate-pallets made from HDPE and copolymers of PP, widely used for the storage of fruit in refrigerated warehouses and for transporting it to packaging centres, have also become more widespread.

Then, of course, there are HDPE cans (with a capacity of 20 litres), which are produced by extrusion blow moulding and used for the transport and storage of kerosene for domestic use. These initially accompanied and have now replaced traditional metal cans.

In this sector, LDPE shrink film has provided a solution to numerous problems linked to the need to protect and package products together for transportation. One may think, for example of its use in the packaging, for shipment, of printed material (newspapers, magazines); in the preparation of six-packs of PET mineral water bottles; and in the wrapping and securing of palletised load units (empty glass bottles, bricks).

Another important sector is that of disposable flexible packaging materials used for packing and transportation purposes, which can be subdivided into the following categories:


OCTAL

- 25-kg bags in LDPE, HDPE and plasticised PVC and woven PP raffia "big bags" used for the packaging of various industrial products
- plastic shopping bags (shoppers), now produced using biodegradable and compostable polymers
- rubbish sacks for municipal solid waste (MSW) made from recycled LDPE.

Finally, plastic materials also feature among the materials that are used as padding for delicate and fragile products (e.g. ceramics, furniture, household electrical appliances, electronic equipment, cameras). The materials most widely used in this sector are: EPS in the form of boxes, cushioning elements, expanded sheets; sheets in LDPE and PP foam; and LDPE bubble wrap for protecting fragile objects, items of furniture and so on.

THE ROLE OF LARGE RETAILERS IN THE EVOLUTION OF PACKAGING

The growth of large retail chains has led to considerable changes in packaging, especially in the food sector. Unlike traditional shops – where many products are sold loose and packaged as required – self-service supermarkets do not have sales assistants serving the customer, therefore the product packaging takes on the role of "silent vendor": today's packaging is designed to present products attractively and to ensure that they remain adequately protected throughout the transportation and storage phases.

Another problem faced by large retailers is that of finding a safe way to supply customers with perishable goods that have a short shelf life. In this regard, modified atmosphere packaging offers two important benefits: reliable protection of the product and a longer shelf life. Plastics are in fact the materials that have made it possible to develop packaging that guarantees "lasting freshness", which is undoubtedly advantageous both for the retail chain and for the

TABLE 1 – SOME DATA RELATING TO THE LARGE RETAIL SECTOR IN ITALY

YEARS	2005	2008	2011
Numer of supermarkets < 4500 m^2	8171	9048	10000 (estimate)
Numer of hypermarkets > 8000 m^2	334	401	975 (estimate)

Source: Largo Consumo - Federdistribuzione

W&H

consumer. In the beverages sector, PET bottles have solved the problem of fragility and made for lighter packaging.
The reason for the rapid development of this type of packaging is closely linked to the demands of large retailers. As shown in **table 1**, self-service stores are still growing in number in Italy. What emerges in particular is the growing share of the market held by hypermarkets, due to the fact that these can offer a greater variety of products, and may also incorporate retail sales counters. The number of traditional shops and market stalls has fallen slightly since 2005, and this trend looks set to increase, partly as a result of the rise of cut-price "hard-discount" stores.

WHAT DOES THE FUTURE HOLD FOR PACKAGING?

The market is bound to see an increase in the presence of so-called active or smart packaging, in other words, packaging able to interact with the packaged product in such a way as to improve its conservation and, therefore, extend its shelf life. This type of packaging is becoming more widespread mainly in Japan and the United States. In The European Union, it is governed by Commission Regulation (EC) No. 450/2009 of 29 May 2009 on active and intelligent materials and articles intended to come into contact with food.Another very interesting sector is that of PET beer bottles, which feature an improved oxygen barrier. Tests are currently under way on bottles that have been rendered more impermeable thanks to the use of different technologies: multilayer walls, sealing with an external coating, internal coating or plasma external coating. This is a particularly interesting sector, given that consumption of beer in Europe exceeds 10 billion gallons per year.

www.macplas.it

BRUSH DISTRICT

Excellence through Networking

A year after its official opening the Brush District is ready to present itself on the international stage. From the 16th to 23rd of October, **Techno Plastic** and **Borghi** will be at the **K Fair in Düsseldorf**.

WHAT IS THE BRUSH DISTRICT?

The Brush District is a "Made in Italy" technology zone for the manufacturing of machinery for the production of brooms and brushes. A highly skilled cluster of national excellence, located in Castelfranco Emilia (Modena) Italy, which reflects the experience of these Industry leaders. An efficient and flexible business network that gives a high level of international competitiveness to its three members: **Borghi, Techno Plastic** and **Unimac**.

WHAT THEY WILL DISPLAY?

Borghi and Techno Plastic will participate at the K Fair with a shared booth.

Borghi will exhibit their brush drilling/filling machine model **STAR-R32** for the production of all types of brooms and brushes. It is a double head, turret-machine with 3 stations (block loading / unloading station, drilling station and filling station) operating simultaneously and able to work on two brushes or brooms at a time. The carriages are moved by 5 axes of motion driven by servomotors and controlled electronically via a PC. The highly flexible machine can drill/fill products with parallel, radial and combination parallel/radial tufts of fiber allowing for a versatile range of broom/brush products to be manufactured on the STAR-R32.

Techno Plastic will exhibit their Fully Electronic Winder suitable for plastic (PET) strap, from 4 mm up to 32 mm wide. It is a lastest generation machine dedicated to the winding process of band strap spools for packaging. It marks a real turning point, a leap forward for the whole field thanks to its innovative technology.

We look forward to seeing you at the K Fair!

PLEASE VISIT US AT OUR
STAND A24, HALL 12

Techno Plastic
extrusion lines

Borghi


Sarlon Tech Sparkling

VINYL FLOORING USING PLASTICISED FLEXIBLE PVC HAS EVOLVED A GREAT DEAL SINCE ITS FIRST COMMERCIAL PRODUCTION IN THE 1930s. IT SOON FOUND APPEAL AS AN AFFORDABLE, DURABLE MATERIAL THAT WAS EASY TO INSTALL AND MAINTAIN. 80 YEARS ON, PVC FLOORING IS STILL CONSIDERED ONE OF THE BEST AND MOST PRACTICAL FLOORING SOLUTIONS

BY **MAGGIE SAYKALI***

PVC FLOORING

A TRIED AND TESTED VETERAN STILL AHEAD OF THE GAME

Walk down any hospital corridor and you will very likely be stepping on a plasticised PVC floor: a soft sensation underfoot, footsteps muffled and a smooth and scuff-free surface. Designers and contractors of buildings that endure high visitor traffic often choose this kind of flooring as its combination of affordability and toughness (the material can last for up to 20 years) is hard to beat. In terms of design, vinyl flooring has come a long way since its early days. Modern production techniques have boosted its aesthetic possibilities and today, the appearance of wood, stone and ceramic can be realistically mimicked as well as anything from cartoon characters to three-dimensional patterns, all with minimal discolouration and deterioration from UV light. In fact, the latest generation of woven vinyl flooring, which offers the feel of textiles, is being selected by style leaders like architects Renzo Piano and Jean Nouvel, and renowned luxury brands for their clothing, luggage and accessories lines.

KEEPING BACTERIA UNDER CONTROL

Thanks to its flexibility, vinyl flooring can be welded and seamlessly shaped, to the extent that it can even "bend up" walls. The absence of joints makes for a smooth continuous surface without the gaps where harmful bacteria, fungi or other pathogens could thrive. This is a life-saving property in high-risk buildings such as hospitals and clinics where patients are exposed to potential infections which could lead to added treatment costs. Vinyl floors are also easily cleaned and able to resist powerful antibacterial agents; important where the sanitising of floor surfaces is critical to prevent the spread of illnesses, not only in hospitals but also in schools and sports centres. This in turn can help making a more efficient use of disinfectants and reducing the amount of tangible waste.

ECONOMICAL AND DURABLE

A recent study conducted by the Italian strategic business consultancy Althesys clearly shows that quality PVC is one of the best available solutions for floors. This conclusion was apparent after comparing rubber, linoleum and three varying qualities of vinyl flooring in the German and Italian markets. The report looked at the total cost of ownership which includes the purchasing, operating and replacement of a flooring product.

The results show that high quality vinyl is the most price-competitive solution in the long run by a margin of 20% or more when factors such as the price of purchase, installation, cleaning, maintenance, removal and disposal are taken into account. This is particularly relevant in public buildings subject to heavy footfall. The study also showed that maintenance will account for as much as 92% of total ownership cost of non-PVC rubber floors. Similar conclusions have been reached by the independently commissioned full Life-Cycle Environmental Product Declarations (EPD), developed by the European Resilient Flooring Manufacturer's Institute

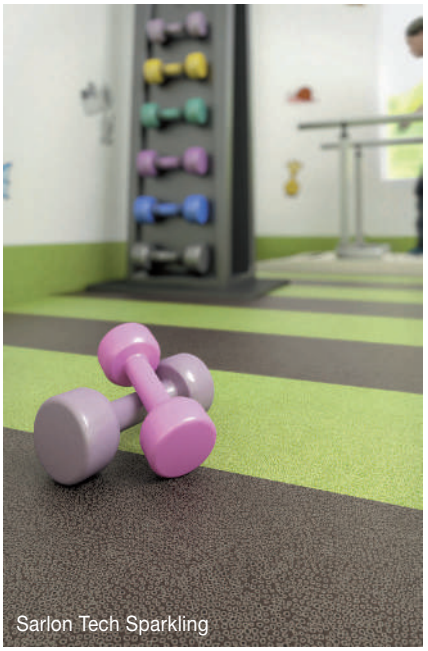
(ERFMI). Its research shows that the frequency at which floors are changed, and their methods of maintenance, have a far greater effect on the overall environmental impact than the choice of material. Vinyl's comparatively lower maintenance requirements and its proven durability, compared to other types of flooring, are therefore strong factors that can also contribute to creating more sustainable buildings.

SUSTAINABLE AND RECYCLABLE

In addition to its long life-span and low maintenance costs, PVC's inherent recyclability is a favourable quality when it comes to sustainability. Since the year 2000, the European PVC industry has established and rolled out a voluntary programme aimed at improving the sustainable production and use of PVC. VinylPlus – previously known as Vinyl 2010 – is an initiative that has taken PVC recycling beyond the seven compulsory EU directives covering the recycling of plastics. In 2011, EPFloor, a group which represents the European PVC flooring industry, exceeded its yearly target and recycled a total of 2,788 tons of post-consumer PVC flooring. The industry would be the first to admit that there is still a long way to go to collect and recycle all end-of-life flooring in a similar fashion, but efforts are being made in the right direction.

FLEXIBLE AND SAFE

Vinyl flooring is manufactured by superimposing a number of layers of "plastisol", a liquid paste composed of PVC powder and plasticisers. The most commonly used plasticisers are known as "phthalates", a large family of chemicals employed to make flexible PVC, not only in flooring but also in other important industrial applications such as cables, wall coverings and roofing membranes. Phthalates are divided into high and low according to their molecular weight, In the case of low phthalates (known under acronyms such as DEHP, DBP, DIBP, BBP) they are classified as Substances of Very High Concern (SVHC) under REACH and, consequently, will be banned in the EU as of 2015. However, concerns related to phthalates have mistakenly been extended to the entire family, mostly due to oversimplifications and misunderstandings when, actually, high phthalates can be safely used in all current applications. Extensive risk assessments performed by independent sources and the EU authorities have shown that, unlike low phthalates, high molecular weight phthalates (DINP, DIDP, DPHP) pose no risk to human health and hence do not require any classification nor are they on the candidate list for authorisation. The swift market and industry transition away from low phthalates in favour of high

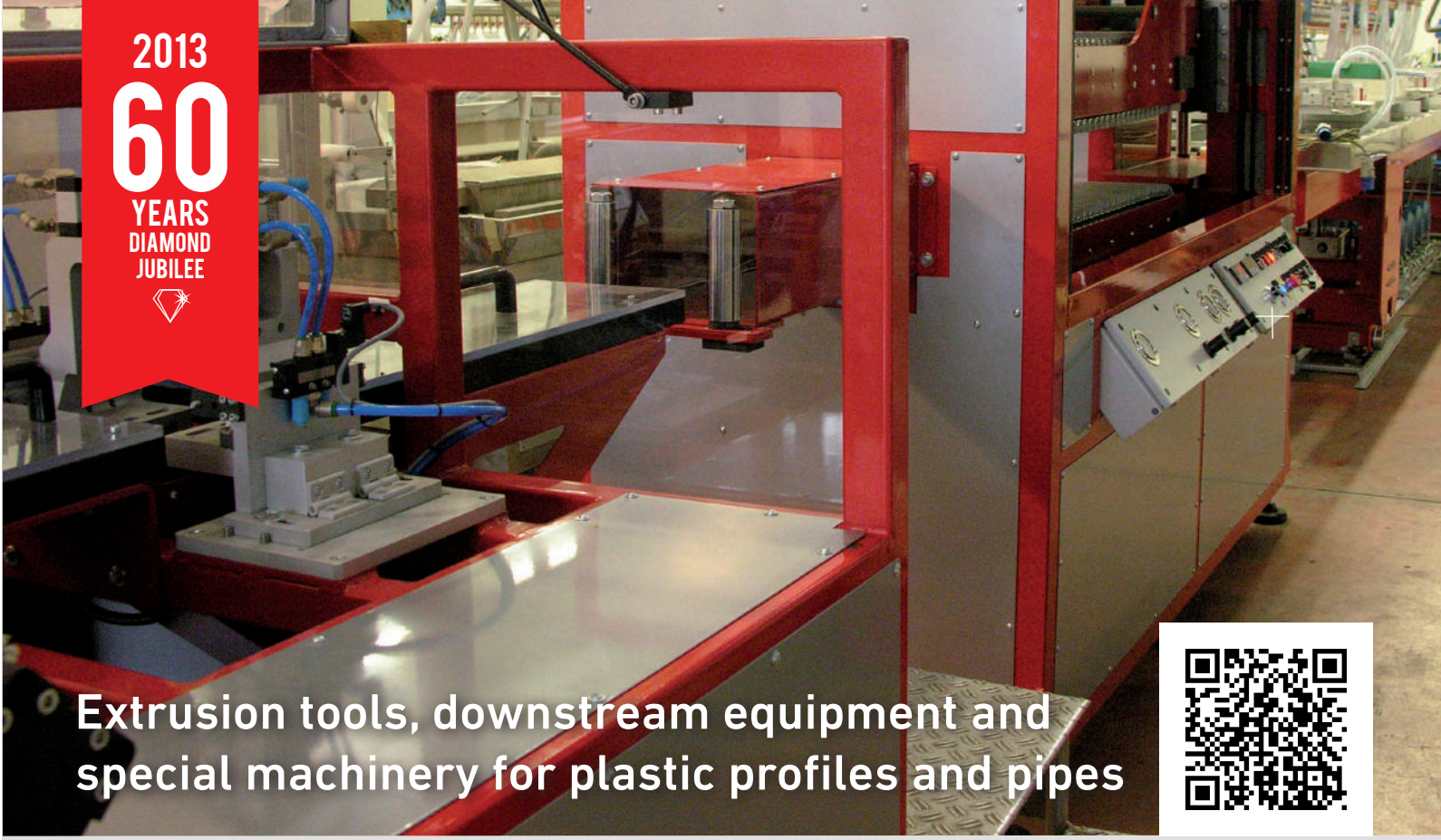


Sarlon Tech Sparkling

ones, which today represent around 85% of the European phthalate market, PVC's strong sustainability credentials, the industry's initiatives to demonstrate its social responsibility, and, of course, continuing investment in attractive and practical new applications and designs, are all good signs that vinyl flooring is still a developing product with a bright future ahead of it.

www.plasticisers.org

**Manager of ECPI (The European Council for Plasticisers and Intermediates), Bruxelles*



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NEWS FROM BASF PLASTICS AT K 2013: A SUMMARY

LIFESTYLE WITH PLASTICS AND FOAMS

AT THE K SHOW BASF PRESENTS A MULTITUDE OF NEWS FROM ALL PLASTIC SEGMENTS

NEW CONCEPTS FOR THE AUTOMOTIVE INDUSTRY

On the occasion of K 2013 (stand C21/D21, hall 5), Basf is expanding its activities in the field of engineering plastics for automotive construction to include a completely new approach. For example, Ultracom is a package of three components: continuous fibre reinforced semi-finished products, adapted overmoulding compounds and the complementing engineering support. The key innovations in this new approach are laminates based on woven fabrics that are fully impregnated with the polyamide (PA) Ultramid or the PBT Ultradur. The overmoulding materials have been developed individually for use with these laminates. The third component covers the extensive engineering support provided by the Basf application engineering group.

As part of the Ultracom package, the company has installed a high-capacity composite production pilot plant in Ludwigshafen. Since March 2013, this equipment is being used to produce multifunctional composite test specimens by means of the for in-mould forming/overmoulding process. Central element of the cell is a six-axis robot with specific gripper arm. Moreover, the company has developed its own multi-functional test part: the so-called CIFO part (derived from combination of in-mould forming and overmoulding) makes it possible to investigate continuous-fibre reinforced composite parts for volume production in the manufacturing cell. The simulation instrument Ultrasim is another part of the package.

Furthermore, one of the most heat-resistant polyamides is now also available as a blow-moulding grade: Ultramid Endure BM, with the same stabilization technology as the injection-moulding type. It also shows the same temperature resistance of 220°C in continuous use and peak temperature loads of 240°C. With this grade, Basf is closing a gap in the market: in the future, also pipes in the charge-air duct between the turbocharger and intercooler can be manufactured efficiently.

Another portfolio expansion covers the PA 610 product range. At the K 2013 the company will introduce two flexible grades of Ultramid Balance that are suitable for extrusion of pipe and tubing intended for use specifically in the automotive and machinery sectors as well as for oil and gas lines. In this way, Basf is reinforcing its position as a supplier of engineering plastics specialties for the extrusion field as well. Finally, the hydrolysis-resistant PBT Ultradur HR not only stands out in a positive way in customary static tests for damp-hot environments, but also passes the demanding climatic cycling tests of Uscar standard class 5. It could be shown that Ultradur HR is superior to competitor products and Basf now offers it with integrated flame retardant and laser transparency.

The material is thus suitable also for applications in electric vehicles. Examples are control housings or charging plugs, but also parts that have to be laser-welded from several components.

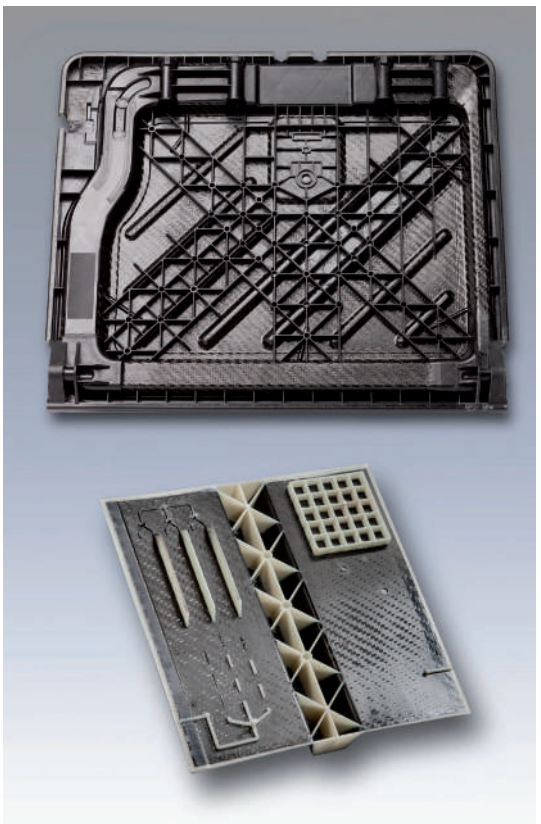
PLASTICS FOR FURNITURE, DATA TRANSMISSION AND WATER CURRENT

Plastics has also become a material of choice for furniture: Basf presents four new versions from its polyamide portfolio that are geared to the needs of the furniture sector. All four new Ultramid SI grades (SI: Surface Improved) combine high surface quality with the excellent mechanical and chemical properties of this class of materials - in a special case even joined with flame retardants. One of the first serially produced items made of the new Ultramid SI series is the MOVYis3 office swivel chair, which Basf developed in collaboration with the furniture manufacturer Interstuhl.

At the K exhibition the company also presents

Infinergy, the world's first expanded thermoplastic polyurethane (E-TPU). This closed-cell particle foam shows an excellent resilience and an especially high durability over a wide temperature range. The first product making use of this innovative material is the new Energy Boost running shoe from adidas, which the German sportswear manufacturer has developed in close partnership with Basf. The midsole consisting of the new E-TPU with its combination of softness and high elasticity is responsible for the outstanding running characteristics of the Energy Boost running shoes. Their rebound is the highest of all available running shoes and remains stable even at low temperatures of minus 20°C.

Another news: the compostable plastic ecovio has found its first production application in a system solution for packaging. The Swiss Coffee Company's coffee capsules beanarella consist of the new injection moulding grade ecovio IS1335; at the same time the multilayer composite system for the aroma-tight outer barrier packaging for the capsules is also ecovio-based. The capsules fulfil the demanding requirements for protecting the product and brewing coffee in high-pressure coffee machines, yet may still be composted; so does the barrier packaging. The system solution is predominantly based on renewable resources. The product which was jointly developed in only some 13 months, can contribute to sustainability while simultaneously addressing the latest trend in coffee drinking. A new grade of Ultradur has been specifically developed for thin fibre-optic jacketing. With Ultradur B6550 LNX, Basf is expanding its existing line of PBT plastics for extrusion of protective sheathing for optical fibres. With the new material, the loose tubes can have a thinner sheath at the same protection against crush and kinking than with standard PBT grades. Because of its fine crystalline morphology it exhibits even faster crystallization than all previous materials and has a very high melt viscosity, especially at low shear rates.



PBT Ultradur HR is suitable also for applications in electric vehicles. Examples are control housings (see photo) or charging plugs, but also parts that have to be laser-welded from several components

PBT Ultradur HR is suitable also for applications in electric vehicles. Examples are control housings (see photo) or charging plugs, but also parts that have to be laser-welded from several components

On the other hand, two newly introduced materials are suitable for replacing metals in areas of applications where plastics were hardly found until now: Ultramid D3EG10 FC Aqua and Ultramid D3EG12 HMG. Thanks to its good chemical and hydrolysis resistance, the Aqua grade is well-suited for components that come into contact with drinking water or food (FC stands for Food Contact) as in the case of housings for water meters.

The extraordinary mechanical properties of Ultramid D3EG12 HMG have led to the suffix HMG (High Modulus Grade). Moreover, the high surface quality opens up interesting application possibilities such as office chairs and ball shut-off valves.

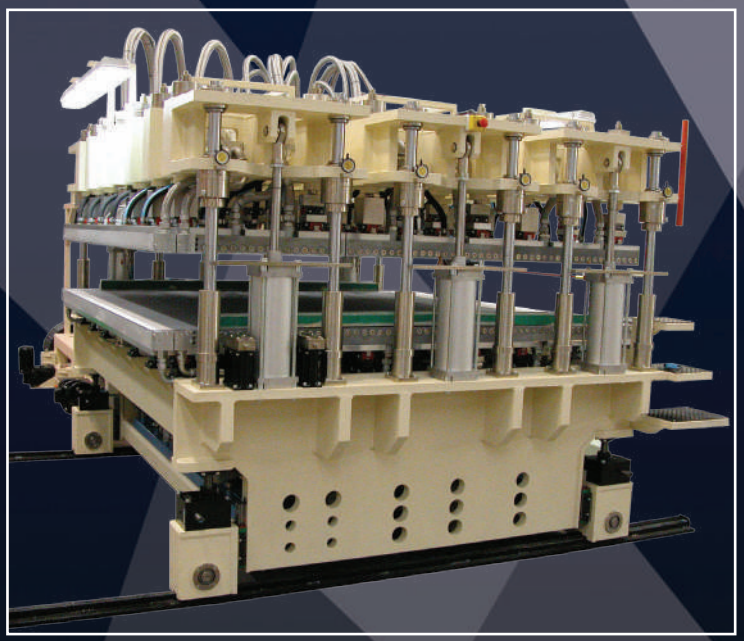
POLYURETHANES IN ALL FORMS

The Elastocoat polyurea-based coating system is constantly conquering new fields of application. It is sprayed on surfaces and this process yields a protective coating that reacts to form a continuous membrane devoid of seams and joints. In the construction sector, the Basf material is used for coating concrete surfaces as car park floors, petrol tank pits and waste water shafts. In industry, the electrostatic charging of plastics can cause severe damages. To address this problem, the company has developed an antistatic TPU granulate under the Elastostat brand name. Its exceptional properties are the permanent antistatic effect, mechanical properties and compatibility with non-polar polymers. The new TPU masterbatch opens up large fields of application, particularly for industrial packaging such as big bags and plastic drums or cans.

Last but not least, researchers of Basf have developed a unique high-performance insulation material that is scheduled for launch in just a few years. The product is a novel type of aerogel that will be offered as a mechanically strong panel. With a lambda value of below 16 milliwatts per meter and Kelvin (mW/m·K), it displays exceptional insulation performance, is extra-slim, light and will be produced as a ready-to-use polyurethane panel that is easy to process. The company sees future applications of the product above all in construction and refrigeration.

www.basf.com

EXTRUSION SPECIALISTS



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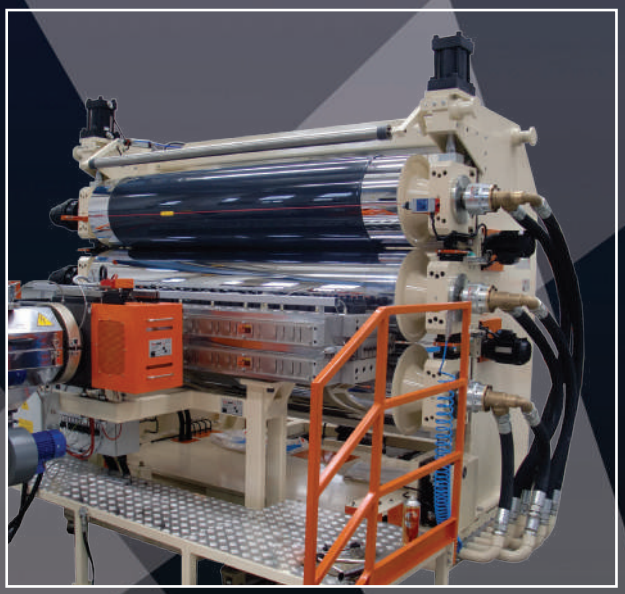

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The featured jounce bumper is part of a vehicle's shock-absorber system designed to absorb impact and dampen noise, vibration and harshness (NVH)

AT K 2013 (STAND C43, HALL 06) DUPONT PERFORMANCE POLYMERS REAFFIRMS ITS COMMITMENT TO CONSUMER SAFETY BY EXPANDING ITS INDUSTRY-LEADING PRODUCT PORTFOLIO TO MEET THE DEMANDING REQUIREMENTS OF THE ELECTRICAL/ ELECTRONICS, FOOD PROCESSING, AUTOMOTIVE AND HEALTHCARE INDUSTRIES

ENGINEERING POLYMERS

LIGHTER, STRONGER STRUCTURES

SUSTAINABILITY OPTIONS FOR E&E APPLICATIONS

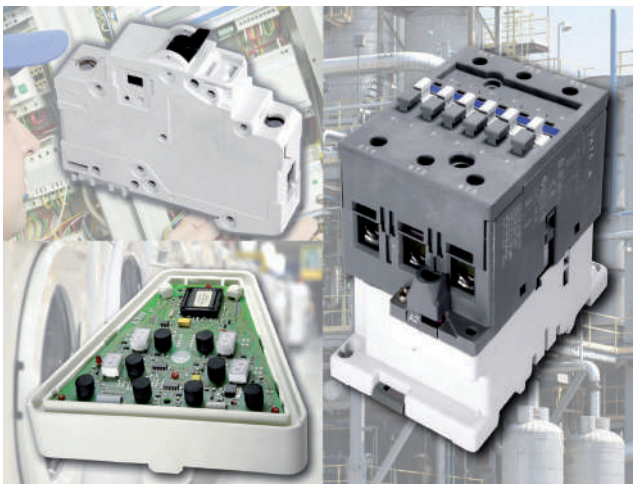
The electrical industry seeks alternatives to the use of halogens as flame retardants for health, safety, and recycling reasons. As part of its sustainability effort, DuPont is directly engaged in developing resins which allow replacing thermosets which are non-recyclable and developing bio-based materials which can lower CO_2 emissions and reduce dependence on fossil fuels. New product offerings must comply with numerous regulatory standards including the Waste, Electrical and Electronic Equipment (WEEE) directive, Restriction of Hazardous Substances (RoHS) Directive, and the Reach regulation on chemicals and their safe use. Most recently, the company has launched a new halogen-free, flame retardant nylon 66 with enhanced thermal aging. Zytel FR95G25V0NH retains 80% of its tensile strength when exposed to 200°C 1000 hours while the primary incumbent materials only retain approximately 50%. The new Zytel FR grade uses a patented combination of flame-retardant, polyamide base polymer and stabilizer to improve melt stability, flow, surface appearance, and reduce mould deposit. Available in 25% glass-reinforced version, it has a UL 94 V0 flammability rating down to 0.4 mm and a Comparative Tracking Index (CTI) rating of 600V+. Applications that take advantage of this performance level typically include insulating elements and housings for circuit breakers, contactors, transformers, and motors.

FOOD GRADE PRODUCTS MAKE STRONG GAINS

Similarly, DuPont Performance Polymers is building a strong position in food-contact applications with an expanded family of Food Contact Compliant (FG) polymers, which comply with relevant EU and FDA standards for use in a wide range of applications including: closures, dispensing valves, meat casings, small appliance and food processing components, valves, stock shapes for machined components, food service trays, and utensils. FG grades also provide a sustainable option by offering manufacturers the ability to replace metal, thus producing lighter, lower cost, and corrosion resistant components often with superior performance. This potential is clearly seen in the food processing industry where a food contact-approved, metal-detectable grade of Delrin acetal has found increasing use. Specifically, Delrin FG-400MTD acetal resin is made with a metal filler so it can be detected by most metal-sensing equipment used in the food processing industry. This food-contact compliant resin shares the established attributes of Delrin acetal including low wear and friction and a combination of mechanical properties that have led to a wide range of applications. Delrin FG400MTD has been successfully adopted in cutter and knife handles by France's Mure & Peyrot, a world leader in the development and supply of safety knives and industrial blades. The company cites Delrin's uniform filler dispersion and repeatability in applications for the dairy and confectionery industries.

INNOVATIVE SOLUTIONS FOR HEALTHCARE

Consumer safety issues are clearly represented in the healthcare segment. For technically demanding uses, DuPont delivers unique solutions from its range of standard products, or from its line of Food Contact Compliant (FG), Special Con-



Contactors, circuit breakers and housing moulded from non-halogenated Zytel PA66 and Zytel HTN meet demanding requirements for low environmental impact, high-temperature assembly and reliable service

trol (SC), and Premium Control (PC) grades which are differentiated by a greater degree of testing, manufacturing control, and regulatory support. The DuPont healthcare product offering provides food agency compliance and compliance to ISO 10993-5 and -11, as well as USP Class VI testing requirements. These materials offer benefits including excellent structural properties with lower material density and several grades with high flow to facilitate ease of moulding geometrically complicated parts. In addition, minimal or no finishing operations, rapid production cycles, and longer life with enhanced durability all contribute to cost savings. The ultra-low-friction grade of acetal resin Delrin SC699 is specified by Ypsomed, Burgdorf (Switzerland), for a key component of its UnoPen, a disposable, variable-dose injector pen for insulin and other therapies. A principal feature of the device is its ease-of-use based on a well-proven "dial and inject" handling concept, in which the dose dial sleeve - the component moulded of Delrin SC699 acetal - plays a key role. Its low-friction properties contribute significantly to the pen's ease–of-use. Further attributes of the new grade include its compatibility with laser marking, by use of an appropriate masterbatch, for indication of the dose settings.

FOCUS ON LIGHTWEIGHTING

Innovative technology and material solutions to automotive lightweighting are currently top of DuPont Performance Polymers R&D agenda. Latest examples include a truck oil pan of Zytel polyamide resin up to 6 kg (50%) lighter than the aluminium it replaces, and a developmental thermoplastic composite technology that combines metals-replacing lightness, strength and stiffness in structural, load bearing and crash-protection parts for body-in white, suspension or underhood applications. Work with PSA Peugeot Citroen on testing a side impact beam using Vizilon, a developmental thermoplastic composite technology, showed a 40% weight reduction compared to ultra-high strength (UHHS) steel, while absorbing more energy than metal and short glass-fibre polymer beams. As a result, Vizilon passed PSA Peugeot Citroën's crash test, making it well suited for crash components. This polymer also offers stiffness performance in temperatures from -40°C to +90°C, and outperforms polypropylene-based composites above 80°C.

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- Rubber recycling by devulcanizing process
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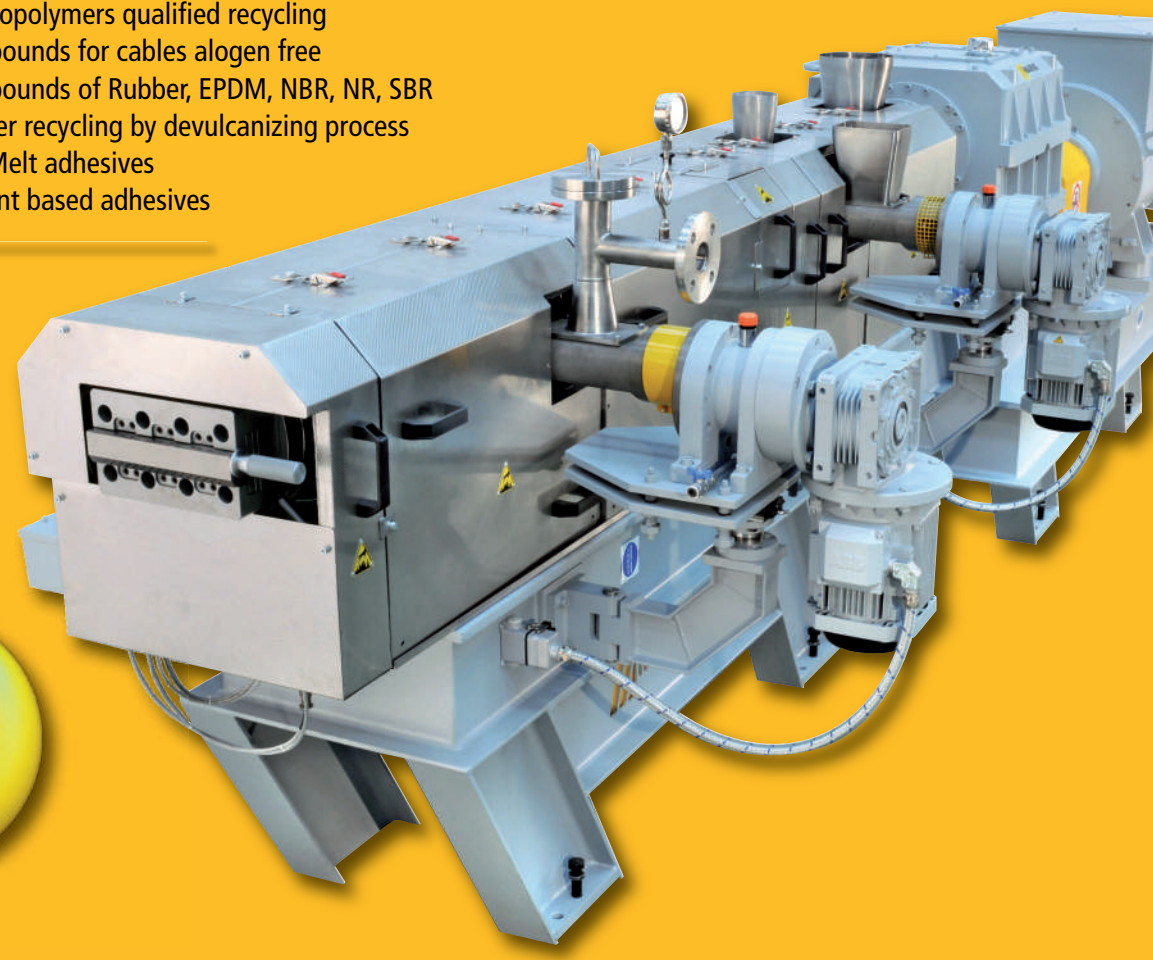

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CO_2 AS A RAW MATERIAL, AIRCRAFTS POWERED BY SOLAR ENERGY, APPLICATIONS OF EXOSKELETONS

TURNING DREAMS INTO REALITY

INNOVATIVE MATERIAL SOLUTIONS FOR FREEDOM, SAFETY AND HAPPINESS

"It is precisely the possibility of realizing a dream that makes life interesting". Bayer MaterialScience's appearance at K 2013 in Düsseldorf (stand A75, hall 6) is much in keeping with these words from Brazilian author Paulo Coelho. Under the motto "Sharing Dreams, Sharing Value - Be Part Of It", the company wants to talk with visitors about dreams - and make them come true with the help of innovative material solutions.

ACROSS THE USA ON SOLAR ENERGY ALONE

People have always dreamed of leaving the ground and flying around free as a bird. Leonardo da Vinci sketched a realistic model of a rotor on his drawing table centuries ago. Nowadays people dream of unlimited flight without fuel or noise pollution. Aviation pioneer Bertrand Piccard, for example, is fascinated with the idea of an aircraft powered entirely by solar energy. His Solar Impulse project has already made tremendous progress. The current prototype of the solar aircraft developed as part of this is presently on its longest flight to date. It spans the United Sates - from San Francisco to New York. The penultimate stage just concluded with a successful landing in Washington. The first solar-powered flight all the way around the world is scheduled for 2015 in an even lighter aircraft. Bayer MaterialScience is an official partner of the project and has been hard at work from the very beginning on solutions in collaboration with other partners.

One example is a microcellular, rigid polyurethane foam based on the Baytherm Microcell system. The ultra-lightweight material is used in the solar aircraft to very effectively insulate the cabin against the icy or hot environs. It comes as no surprise then that refrigeration equipment manufacturers are also very interested in the product.

A GREENHOUSE GAS AS A CHEMICAL RAW MATERIAL

It would also be a dream if the surplus carbon dioxide (CO_2), a greenhouse gas, in the atmosphere could be used for synthesis purposes, for example. It therefore comes as no surprise that a joint and well-advanced project of Bayer MaterialScience, the CAT Catalytic Center of RWTH Aachen University and the utility company RWE bears the name "Dream Production". A pilot plant in Leverkusen has been producing polyols, a component of flexible polyurethane foam, from CO_2 with the help of a special catalyst since early 2011. Production was recently switched from batch to continuous mode. Polyols manufactured from CO_2 are expected to hit the market in 2015 and will initially be used in mattress production. They could later also be used for the production of thermoplastic polyurethanes and then coatings and fibres.

ROBOTIC AIDS FOR RENEWED MOBILITY

Life expectancy is rising worldwide. In Japan, robotic technologies have been used for years to assist infirm people, enabling them to enjoy a happy life again. The HAL exoskeleton from Cyberdyne is already being used successfully in rehabilitation applications. It is also being used in Japan's damaged Fukushima nuclear power plant. Bayer collaborates with Cyberdyne in the development of high-tech materials. Many promising developments by various designers demonstrate that there may be opportunities for the technology in areas besides health and caregiving applications, such as sports and recreation and physical labor.

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AMONGST OTHER THINGS, LANXESS IS USING THE TRADE FAIR K 2013 (STAND C76-78 AND C54-58, HALL 6) TO FOCUS ON HIGH-PERFORMANCE RUBBER AND RUBBER CHEMICALS FOR GREEN TIRES WITH LOW ROLLING RESISTANCE, HIGH-TECH THERMOPLASTICS FOR LIGHTWEIGHT CONSTRUCTION AND RUBBER BASED ON SUSTAINABLE RAW MATERIALS

HIGH-PERFORMANCE ELASTOMERS

INNOVATIVE PRODUCTS FOR GREEN MOBILITY

"Worldwide there are more than one billion cars on our roads, and by 2050 this figure is expected to rise to 2.5 billion. Sustainable mobility is therefore becoming a global megatrend. With numerous products (like green tires) and technologies, Lanxess is already a pioneer in green mobility", said Werner Breuers, member of the Lanxess board of management, speaking to international journalists at a press conference in Düsseldorf ahead of K 2013. In 2012, Lanxess generated almost 20% of its group sales with products for green mobility. Last year, it invested 192 million euro - around 2.1 percent of its sales - in research and development, some 33% more than in the previous year.

EPDM – FOCUS ON ACE TECHNOLOGY

The company is looking to capture new market share worldwide in Keltan ethylene-propylene high-performance elastomers (EPDM) with advanced production technologies, investment in boom markets and a focused portfolio. Innovative ACE technology plays a key role in this, producing EPDM without the use of chlorine in a high-purity process and with a composition that can be controlled with a degree of detail that has hardly been possible in the past. Keltan Elastomers business unit investments include the world's largest EPDM plant at Changzhou in China.

TECHNICAL RUBBER GRADES

The High Performance Elastomers business unit is pursuing a four-prong strategy in nitrile-butadiene rubber (NBR). As well as cost-effective NBR grades and diversification of the portfolio through customer-specific materials, for example, the focus is also on innovative NBR grades and new Baymod powder NBR grades. An innovative compounding step in polychloroprene production extends the range of applications for this rubber. "This has helped us develop two new product families, Baypren HP and GF. The first includes products with properties that are not yet available on the market", said Jan Paul de Vries, head of High Performance Elastomers. Among the polyethylene-vinyl acetate (EVM) Levapren materials under development, a grade for impact resistance modification of polylactic acid is highly promising. The focal point of the business unit's investment activities is Asia.

HIGH-TECH THERMOPLASTICS

The High Performance Materials (HPM) business unit is looking to showcase its unique global position in lightweight automotive construction based on Durethan and Pocan high-tech polyamides and polyesters at K 2013. This was recently reinforced by the acquisition of Bond-Laminates, an outstanding manufacturer and supplier of continuous fibre-reinforced thermoplastic performance composites marketed under the Tepex brand. Among the examples of HPM lightweight construction expertise there are the first front end carriers consisting entirely of polyamide 6 and the first car brake pedal made of polyamide reinforced with continuous glass fibres and suitable for large-scale series production.

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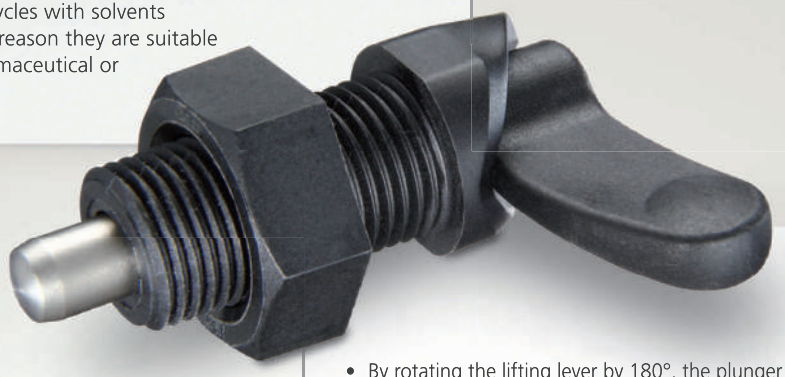

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PURGING COMPOUND

A SUSTAINABLE PRODUCTION

EASY TO ELIMINATE, PARTICULARLY EFFICIENT WITH "BLACK SPECKS", ULTRA PLAST PURGING COMPOUNDS BY ULTRA SYSTEM (STAND D89, HALL 13 AT K 2013) ARE BASED ON A HIGH FOAMING POWER, REACHING ALSO THE MOST DIFFICULT PARTS OF THE MACHINE

The chemical links of a polymer are very strong and stable in time, have a long life, are weather resistant and exceptionally strong. We can find them in our daily life under different forms. Unfortunately they are hardly biodegradable causing a great impact on the environment. Due to these facts it is extremely important that these "waste polymers" are either recycled and re-used again or limited to a minimum. It is also very important to change these natural polymers as few as possible into waste polymers, before they have fulfilled the functions for which they have been created. Anyway it is impossible to recycle a polymer endless. But if a production becomes "waste production" before entering the consumer market, these polymers must be recycled in a correct manner.

During a colour change, particularly from a dark to a clear colour, the first shots of processed pieces have the so-called "stripes", or other kinds of pollution originating from the previous production cycles. Of course these parts cannot be granulated and re-used for the production of clear pieces, but must be used for the production of black or dark parts. Not all manufacturers process huge quantities of dark parts, consequently it becomes important to recycle the waste production. There are three different manners to reduce production costs:

1. reduce waste production;
2. increase production duration;
3. improve regeneration process of the scraps.

The best way to reduce production costs is surely point 1 as it is not possible to act always on point 2 or 3. Thanks to modern purging compounds it is possible to reduce from 2 to 200 times the waste production during colour change. The higher is the efficiency of the purging compound the lower will be the consumption of material for the scraps.

HOW PURGING COMPOUNDS CAN REDUCE ENVIRONMENTAL IMPACT

Up to now we have spoken mainly of production costs decrease which is certainly the first step for a correct, efficient and competitive production. Let's analyze now the impact on the environment by using purging compound. A company producing per month different tons of waste parts can avoid up to 99% of this scrap production, if there is an efficient and correct use of a purging compound as well as an efficient recycling. The Ultra Plast purging compound, produced by the Italian company Ultra System, consists in a carrier material (a mixture of polymers) and a so-called "active part" containing only food and pharmaceutical components. The different grades are used with temperatures between 120 and 420°C and there is a chemical reaction. Due to the temperature the active part becomes foamy and all resin or masterbatch rests on the barrel wall or from the screw (some grades are also suitable for hotrunners) can be easily softened and removed. The ejected material can be considered a simple polymer with inorganic and inert minerals which can be either disposed or recycled as a polymer with minerals. Thus we can affirm that the ejected material is biodegradable, as the active part ejects the whole purging compound as a porous foam which can be easily attacked by bacteria, rain or snow. If the ejected purging compound should be granulated and re-used, its behaviour is like a normal polymer filled with 5% inert minerals. If it is mixed at 10% with a virgin resin and processed, it loses its biodegradability. This is important for the manufacturers who depose it as waste (low impact on the environment) and for those who re-use the ejected purging compound again in their production cycle.

A problem which may occur is the "milky shadow" (rests of the purging compound) which appears on the first produced pieces even after a deep "after purging" with natural material. So Ultra System has developed a new purging compound which guarantees a deep cleaning without leaving any traces on the following production parts: particularly with polycarbonate and similar resins which require a perfect transparence, the new Ultra Plast High-C is one of the few products on the market which during color/material change guarantees, after short time, brilliantly clear pieces in the production of helm shields, glasses, automotive lights etc.

www.ultra-system.it

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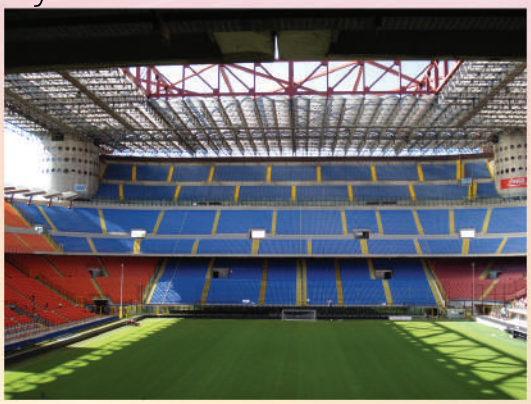

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NEWS

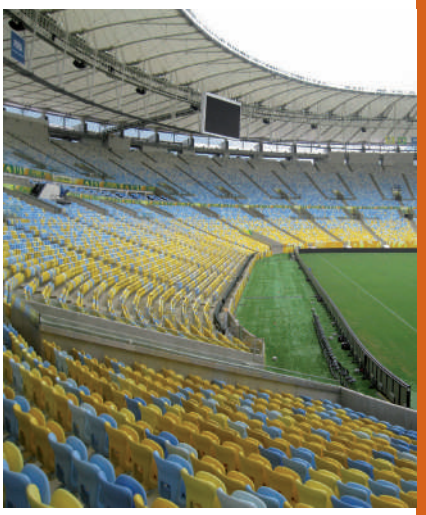
Engineering polymers and masterbatches

Certified for stadium seats

With its strong presence in the European market for supplying suitable materials to produce stadium seats, Te.Ma. is building a strong position in the same field in Brazil, supplying its innovative engineering polymer Temalen FR HF. The Italian company has recently gained the business for producing the seats for the Maracanã and Belo Horizonte stadiums in view of the 2013 Confederation Cup and 2014 Fifa World Cup.

Temalen FR HF has been developed to comply with "Norma Brasilera NBR 15925", in terms of mechanical properties, fire behaviour and UV stability. This engineering polymer has been supplied in the two requested grades, suitable for injection and extrusion-blow moulding technologies.

www.te-ma-srl.it



Maracanã stadium seats manufactured using Te.Ma. certified materials

TABLE 1 - TE.MA. MAIN PRODUCTS FOR STADIUM SEATS AND "FIRE AND LIGHT BEHAVIOUR"

Technical compounds	Polymer matrix	Fire behaviour		Light stability (*)	
		Standards	Classification	Standards	Grey scale colour variation
Temalen FR HF UV	PP	UL 94 (USA)	V0	ISO EN 13200 (total energy 8,3 GJ/m² for wavelength range from 295 nm to 3000 nm)	4/5
Temalen FR HF UV	PP	VKF/AEAI (CH)	5(200°C).3		4/5
Temalen FR HF UV	PP	NDR 15925 (BR)	V0		4/5
Temalen AE PPW V2	PP	UL 94 (USA)	V2		5
Temamid AE PA HF UV	PA 6	UNI 9174 (I)	C1		5
Temamid AE PA HF UV	PA 6	DIN 4102 (D)	B1		5
Masterbatches					
MA AE PPW UV (dosing rate: 10%)	PP	DIN 4102 (D)	B1	ISO EN 13200 (total energy 8,3 GJ/m² for wavelength range from 295 nm to 3000 nm)	5
	PP	AFNOR (F)	M2-M3-M4		5
	PP	UNI 9174 (I)	C1		5
	PP	UL 94 (USA)	V2		5
	PP	BS 5852 (UK)	CRIB 5		5
MA AE PA HF UV (dosing rate: 15-20%)	PA6	UNI 9174 (I)	C1		5
	PA6	DIN 4102 (D)	B1		5

(*) = The results shown in this table are certified by qualified laboratories. Weathering test results with total energy greater than 8,3 GJ/m² are also available, but obtained through internal testing

Polyamides

Strong and heat resistant

At K 2013 (stand B10, hall 06) RadiciGroup is going to showcase its polyamide engineering plastics range, with a special focus on some of its latest innovations. First, the company is presenting its new Radilon polyamide range with enhanced heat resistance for hot-air applications at temperatures up to 230°C. The base polymer is the result of an innovative technology that was developed, tested and scaled up to industrial production at the polymerization plants of RadiciGroup Chemicals. These new products complement the traditional Radilon HHR (High Heat Resistance) portfolio, which currently covers applications at temperatures up to 210°C.

Then, the new Radistrong glass fibre reinforced PA6 and PA66 are ideal for use as metal replacements in critical applications that traditional engineering plastics cannot withstand. Compared to conventional plastics, these long fibre specialities offer a series of important advantages: greater impact strength, higher creep and fatigue resistance, and greater mechanical resistance and stiffness at high temperatures. Manufactured by pultrusion, the new products are already available with 20% to 60% glass-fibre reinforcement. Among the potential applications: pump housings, engine mounts, intercooler trays, under-the-bonnet structural reinforcement parts and structural parts.

At the K show RadiciGroup is also introducing a new family of PA612 long-chain polymers. These materials have exceptional chemical resistance even to salts such as zinc chloride and calcium chloride. Amongst the countless potential applications are fuel lines, for which suitable extrusion grades, in both monolayer and multi-layer versions, are scheduled for immediate production. PA612 Radilon products will join the range of the company's PA610 long-chain polymers made from 64% renewable source materials and sold under the Radilon D brand name. And what are RadiciGroup's main goals on the sustainability front? Firstly, to measure the environmental impact of its entire production chain from upstream to downstream in a systemic and rigorous manner. The main benefit of this approach for RadiciGroup Plastics is the ability to develop Ecodesign analysis and, more specifically, to make objective comparisons among different materials with the same technical performance: plastics vs. plastics and plastics vs. metals.

www.radicigroup.com

NEWS

Elastomer compounds

A continuous supply of tailor-made compounds

Founded in Castel Guelfo (Bologna, Italy) in April 2009, by a group of experts, each with over ten years' experience in the field of rubber compounds, Elastomers Union offers technologically advanced solutions in the production of special fluoroelastomer compounds. The company specializes in the production of bisphenolic and peroxide FKM/FPM rubber compounds, using its own formulas or the formulas of its customers. It offers experience and expertise to meet processor expectations, providing technically advanced elastomers and special compounds designed to meet stringent specifications and quality standards, always offering an interesting cost/quality ratio in what is a highly competitive market. The company recently decided to make investments on three fronts. The first is the completion of its product range by introducing formulas based on FKM rubber with peroxide crosslinking. The second is the upgrading of the R&D laboratory dedicated to the development of new materials and quality control. Finally, the realization of a second production line ensures the continuous supply of compounds even during maintenance periods. Both lines are equipped with extruders to offer the filtering of the whole range of compounds, removing compound impurities down to a diameter of 0.11 mm for quantities up to 1000 kg/hour. Filtered compounds ensure a higher level of purity, reduce the wear of moulds and machinery, and reduce the need of operator control during the selection process. Elastomers Union has an articulated quality system. All lots produced are tested in terms of vulcanization, hardness and density. More specific controls can also be conducted in accordance with customers' requirements, such as the analysis of physical and mechanical properties, thermal and chemical ageing resistance, and more.

www.elastomersunion.it

The new compounds by Elastomers Union are developed in direct collaboration with the processors; this ensures that the tailor-made compounds produced are ideal in terms of performance and fine-tuned to the final production cycle

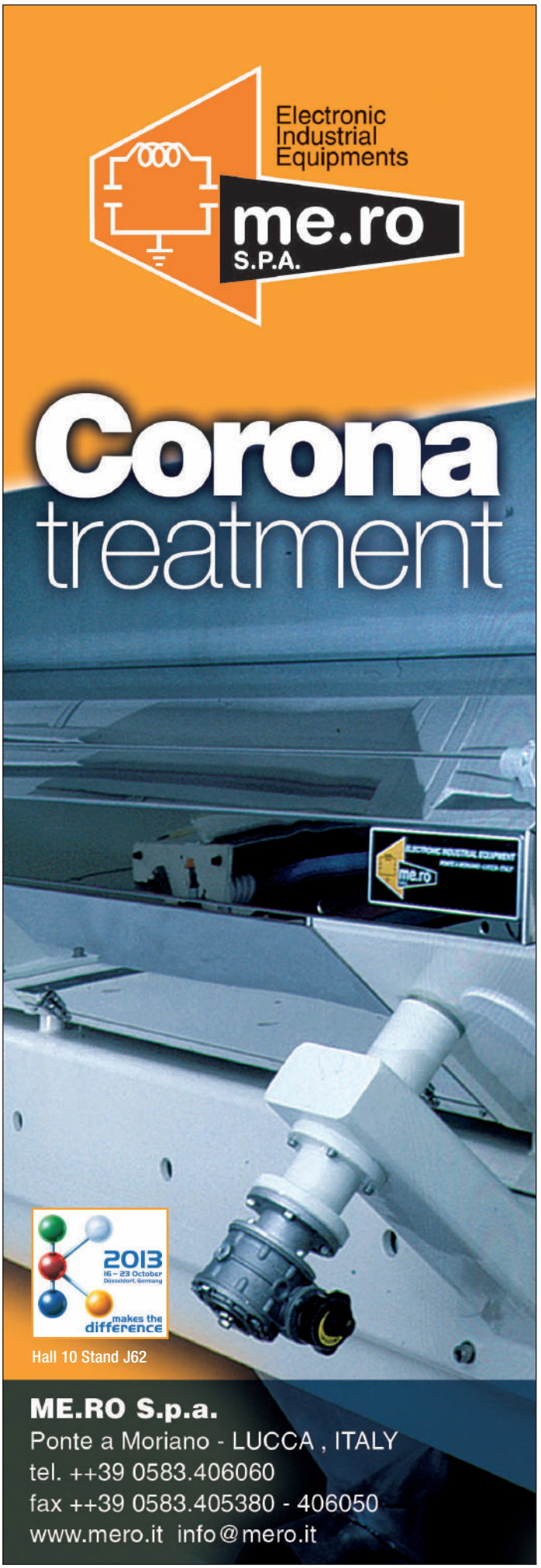
Polyolefins and vinyl polymers

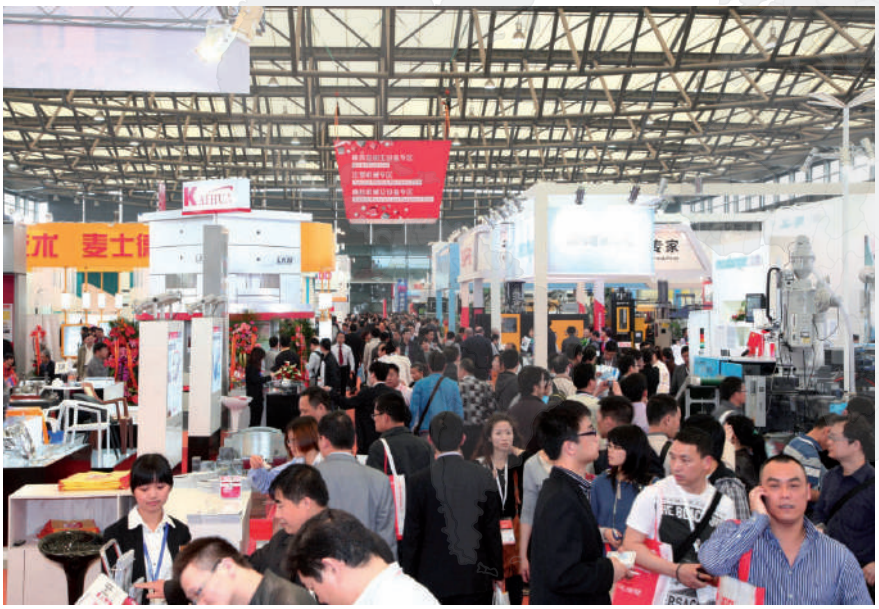
Research and innovation: right keys to success

Based in Ascoli Piceno, Italy, Fainplast (stand E28, hall 6 at K 2013) has always believed in constant innovation as the key to its business success. That is why the company has recently inaugurated a new Research & Development laboratory, outfitted with advanced machinery and equipment, which also includes the new department dedicated to quality control of polyolefin products – a total investment amounting to three hundred thousand euros on a 200-m^2 area. About twelve skilled technicians are employed within the R&D department. This new investment confirms the highly innovative vocation of the Italian company, which constantly invests in new technologies in order to improve product standards and remain competitive at an international level. Besides this new laboratory area, in June, Fainplast tested and implemented a new system that has increased plant automation of the halogen-free department. This system is based on a depalletizer robot that, in the initial phase of production, allows to speed up procedures, enhancing and increasing the dosage of the products. Two new large and six smaller silos were installed for the storage of raw materials. The total investment for this new automation system amounted to 1 million euros. The company is also investing on a new warehouse for the storage of finished products, which is currently being completed - a covered area of 1,850 m^2 on a total area of 37,00 m^2. Research, innovation and new technologies have been the pillars of Fainplast, which has been operating in the plastics market for over twenty years. The company is a leading producer of PVC compounds and boasts the production of an extensive range of compounds, focusing on new products dedicated to special applications. EVATech is one of the latest fruits of this important work. It is a next generation material, based on EVA (ethylene-vinyl acetate), with very good physical and mechanical properties, extremely low weight and gummy to the touch, abrasion resistant and with a good grip. It is suitable for the production of crosslinked foamed products, using injection technology. EVATech has been designed for the footwear segment (outsoles, insoles, slippers and many other products).
Fainplast pushes the accelerator also on halogen-free crosslinkable compounds (XLPO - HFFR), particularly suitable for the production of cables with high thermal and mechanical properties. These compounds guarantee very low smoke emissions in case of fire, high flame resistance and very long lasting performances at high temperatures. These compounds are designed for applications on ships and railways, airports and solar plants.

www.fainplast.com

EVATech has been designed for the footwear segment: outsoles, insoles, slippers and many other products





THE 28TH CHINESE INTERNATIONAL EXHIBITION ON PLASTICS & RUBBER INDUSTRIES, CHINAPLAS 2014, WILL BE HELD NEXT YEAR FROM APRIL 23 TO 26, AT THE SHANGHAI NEW INTERNATIONAL EXPO CENTRE. THE EXHIBITION AREA IS EXPECTED TO EXCEED 220,000 SQUARE METRES, WITH MORE THAN 2,900 EXHIBITORS AND 120,000 VISITORS COMING FROM 130 COUNTRIES AND REGIONS

CHINAPLAS 2014

A STILL GROWING MARKET

In the 1st quarter of 2013, China exported 2.696 million tons of plastic products, which worth US 10.2 billion, representing a 6.6% growth in quantity and 31.2% growth in product value compared with the 1st quarter in 2012. The figures indicate that China is steadily replacing older industrial models with higher value offerings. Actually, the country is now undergoing industrialization, urbanization, market-orientation and internationalization. At this critical moment, the 12th Five-Year Plan of the government has pointed out the direction for the plastics and rubber industries, including low pollution, low energy consumption, high value-adding and high technology.

The plastics and rubber machinery and raw materials are closely related to China's strategic emerging industries (SEIs). Hence the derived demand for cutting-edge plastics and rubber technology is strong. With the efforts invested in exploring new markets and the enormous local market demand, a steady increase in demand for quality plastic and rubber solutions are expected in China. Eastern China is one of the leading regions of economic and industrial development, as well as production and development centre of chemical raw materials. In 2012, around 25 million tons of plastic products were manufactured in this region, accounting for 44% of the country's production capacity. With well-equipped infrastructure and strong industrial cluster effect, Eastern China has become an appealing market for renowned multinational corporations.

The Chinese government will invest 400 billion yuan annually to improve the water infrastructure during the 12th Five Year Plan. Besides, China's urbanization is likely to create robust domestic demand for plastic tubes and building materials. Extrusion machinery, injection machinery and moulds related to the production of plastic construction materials will also benefit from the policy.

In the meantime, the prevailing trends of energy-saving, low emission technology and replacing steel with plastics have paved the way for new energy vehicles and optimization of plastic parts. The sales volume of automotive is estimated to have 13% increases in 2013, while the annual growth rate will go further to achieve 20% in the golden years of 2014 and 2015. Moreover, the 12th Five Year Plan has raised the strategic importance of renewable energy, while solar technology becomes increasingly popular. Actually, the environmentally-friendly policy has also accelerated the development of rubber recycling industry. In addition, the Chinese government also encourages the involvement of high-end technology in medical industry. The policy sets the target of developing 50-80 medical devices in sanitation, diagnosis, treatment, rehabilitation and first-aid sectors, with the focus on basic equipment and medical materials which are huge in demand, widely applied and highly dependent on import of foremost equipment and pharmaceutical materials. The policy sets the wheels for medical plastic technology to reach a new era.

... AND THE SHOW WILL BECOME HIGH-TECH-ORIENTED

Chinaplas 2014 is going to exhibit one of the most ground-breaking plastics and rubber technologies and a wide array of raw materials to be in line with the government policies and the latest trend. Accompanied by 14 country and region pavilions, including Austria, Canada, China, France, Germany, Italy, Japan, Korea, Singapore, Switzerland, Taiwan, Turkey, United Kingdom and the United States, Chinaplas will continue to be Asia's number 1 platform for plastics and rubber industry to connect with potential buyers and exchange market news. There will be 11 theme zones in the show next year, namely: Extrusion Machinery, Injection Moulding Machinery, Chemicals & Raw Materials, Auxiliary & Testing Equipment, Die & Mould, Film Technology, Plastic Packaging & Blow Moulding Machinery, Rubber Machinery & Equipment, Chinese Export Machinery & Materials, Bioplastics and Semi-finished Products Zones.

EXHIBITIONS & TRADE FAIRS

2013

November 6-8 - Plastex Siberia (Novosibirsk, Russia)
November 6-9 - Ecomondo (Rimini, Italy)
November 6-9 - Isfahan Plast (Isfahan, Iran)
November 13-15 - Rubbertech (Shanghai, People's Republic of China)
November 14-16 - Plast World (Almaty, Kazakhstan)
November 15-18 - Myanmar International Machinery Industrial Fair (Yangon, Myanmar)
November 19-22 - Yiwu International Exhibition on Packaging, Printing & Plastics (Yiwu, People's Republic of China)
November 20-23 - Plastics & Rubber Indonesia (Jakarta, Indonesia)
November 23-26 - Expoplast (Algiers, Algeria)
November 25-27 - High Performance Film Expo (Shenzen, People's Republic of China)
December 3-5 - Plastprintpack West Africa (Accra, Ghana)
December 3-6 - Euromold (Frankfurt, Germany)
December 5-8 - Plast Eurasia (Istanbul, Turkey)
December 12-16 - Plastivision India / Indiamold (Mumbai, India)
December 13-15 - Plastic, Packaging, Paper & Print Asia (Karachi, Pakistan)

2014

January 21-23 - Swiss Plastics (Lucerne, Switzerland)
January 28-31 - Interplastica (Moscow, Russia)
January 29 - February 1 - Samuplast (Pordenone, Italy)
February 5-7 - Compotec (Marina di Carrara, Italy)
February 11-13 - Oman Plast (Muscat, Oman)
February 17-20 - Saudi Plastics & Petrochem (Riyadh, Saudi Arabia)
February 20-23 - IPF - Dhaka Plas Print Pack Fair (Dhaka, Bangladesh)
February 25-27 - Composite Expo (Moscow, Russia)
March 4-6 - Plastics & Rubber Vietnam (Ho Chi Minh City, Vietnam)
March 5-7 - Plast Bulgaria (Sofia, Bulgaria)
March 6-8 - India Plast (Chennai, India)
March 12-14 - Rubber Technology Expo (Bangkok, Thailand)
March 12-15 - Rubber Products World Expo (Bangkok, Thailand)
March 18-20 - 3P-Plas, Print, Pack (Karachi, Pakistan)
March 31-April 2 - Plast Alger (Algiers, Algeria)
April 7-10 - Plastivision Arabia (Sharja, Saudi Arabia)
April 16-18 - Plastic Japan (Tokyo, Japan)
April 23-26 - Chinaplas (Shanghai, People's Republic of China)
May 7-10 - Expoplast (Lima, Peru)
May 13-16 - Ausplas (Sydney, Australia)

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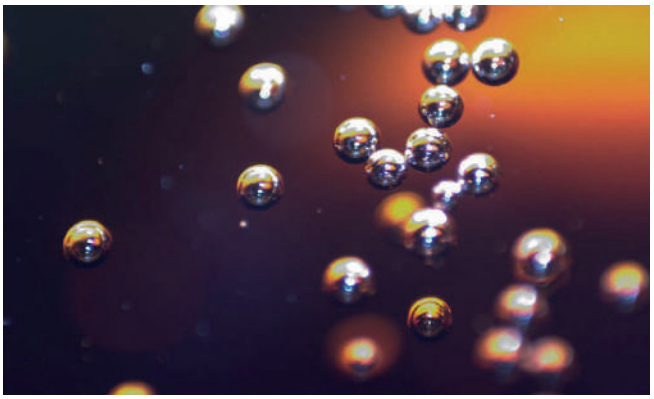
NEWS

Second conference on CO_2

Carbon dioxide as feedstock for chemistry and polymers

On October 7-9, 2013, at Haus der Technik in Essen (Germany), nova-Institut organized the second conference on carbon dioxide as feedstock for chemistry and polymers. For the second consecutive year, experts discussed about CO_2 as the feedstock of the future. The conference was under the patronage of Svenja Schulze, Minister of Innovation, Science and Research of the German State of North Rhine-Westphalia.

Life on this planet has thrived successfully for more than 3 billion years and has always relied only on CO_2 as single feedstock, in combination with water and solar energy. In a similar manner, over the last few years the vision of a "CO_2 economy" has emerged, based on different technologies developed for the capture of CO_2 and its conversion into all the different chemicals, plastics or fuels that our modern day society needs. Carbon dioxide utilization means recycling CO_2 as an everlasting raw material and carbon source in a circular economy. Instead of CCS (Carbon Capture and Storage), these new technologies are called CCU (Carbon Capture and Utilization).



First investments in energy storages (power-to-gas) and polymers (polyurethane from CO_2) are realized in Europe this year. Carbon dioxide as feedstock for chemistry can be used in many different manners and technologies involved can be clustered into several families: renewable energy storage, chemicals and polymers, CO_2 mineralization, carbon source for biotechnology for algae and bacteria and the artificial photosynthesis via chemical processes.

During the first day of the conference, the vision and the framework for a modern CO_2 economy was shown by representatives from European and German political bodies, the International Energy Agency (Paris) and the European Chemical Industry represented by Cefic (Brussels). Additionally, the Virgin Earth Challenge (London) presented its vision for CO_2 utilisation's role in combating climate change. The second day focused on the feedstock preparation and utilization in the innovative inorganic and organic chemistry and also in the production on "solar fuels". Following some overviews, several international speakers from the industry and academia presented their most recent projects. Internationally well-known experts such as Sang-Eon Park from the Seoul National University (South Korea), Gabriele Centi from the University of Messina (Italy) and Matthias Beller from the Leibniz Institute for Catalysis in Rostock (Germany) joined in with representatives from companies such as Evonik, Climeworks, Tecnalia and Carbon Recycling International. During the third day, the conference highlighted polymers and building blocks made from CO_2 via chemical and biotechnological routes. Participants could listen to presentations of companies such as Bayer, Basf, Lanzatech, Cardia Bioplastics and Oakbio together with those of scientists from different universities. A technical exhibition of products, technologies and development ideas ran in parallel to the conference, as well as a poster session on uses of CO_2.

www.nova-institut.de

EPSE Awards ceremony

Polycarbonate competition at the K show

Since 2007 EPSE (European Polycarbonate Sheet Extruders) organizes the Awards Competition to recognize the most innovative, most sustainable and the best design projects which were made out of polycarbonate. This year the ceremony takes place on October 17, 2013 at the K Fair in Düsseldorf. The aim of this event is to promote the material's unique properties and this 6th edition attracted 16 projects. Among the submitted projects there are stadiums, public buildings, innovative polycarbonate systems and artistic installations. All the nominees are a perfect illustration of the wide variety of areas in which polycarbonate may be applied. It is not only used in construction and architecture (such as roof glazings, claddings, canopies, skylights, façades) but thanks to its lightweight, high transparency and excellent processability, polycarbonate is often used in creation of artworks (sculptures and installations). The projects are assessed by a panel of experts with backgrounds in architecture, engineering, art, and journalism. The panel of jurors consists of J.M. Jaspers (architect at Jaspers), Eyers (president of the jury), D. Dall'Osso (artist), H. W. Franken (Kunststoffprüfstelle Franken), E. Kuryłowicz (architect and vice president at Kuryłowicz & Associates), V. Leoz-Argüelles (the former head of the construction unit at the DG Enterprise & Industry) and U. Mau (editor in chief at Plastics Information Europe).

www.epse.org

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MEETINGS & CONGRESSES

Austria

November 18-20, 2013 - Vienna: Multilayer Packaging Films - AMI, Applied Market Information (www.amiplastics-na.com)

Belgium

November 14, 2013 - Mons: Biobased Materials, What's Next? The Role of Nanotechnologies - Materia Nova (www.materianova.be)

France

November 6-7, 2013 - Nantes: Composites Meetings - ABE (www.advbe.com)
November 28-29, 2013 - Paris: IdentiPlast - PlasticsEurope (www.plasticseurope.com)
December 4-5, 2013 - Lyon: World Elastomer Summit - ACI, Active Communications International (www.wplgroup.com)

Germany

November 12-14, 2013 - Cologne: Fire Resistance in Plastics - AMI (www.amiplastics-na.com)
November 19-21, 2013 - Hamburg: Polymer Foam - AMI (www.amiplastics-na.com)
December 3-5, 2013 - Cologne: Thin Wall Packaging - AMI (www.amiplastics-na.com)
December 10, 2013 - Düsseldorf: Waterproof Membranes - AMI (www.amiplastics-na.com)
December 10-11, 2013 - Cologne: 5th German WPC Conference - Nova Institut (www.nova-institut.de)

Turkey

November 14-16, 2013 - Istanbul: Eurasian Composites Show – Artkim Group (www.eurasiancomposites.com)
December 4, 2013 - Istanbul: Plastic Applications for Food Industry - Pagev (www.pagev.org.tr)

United Arab Emirates

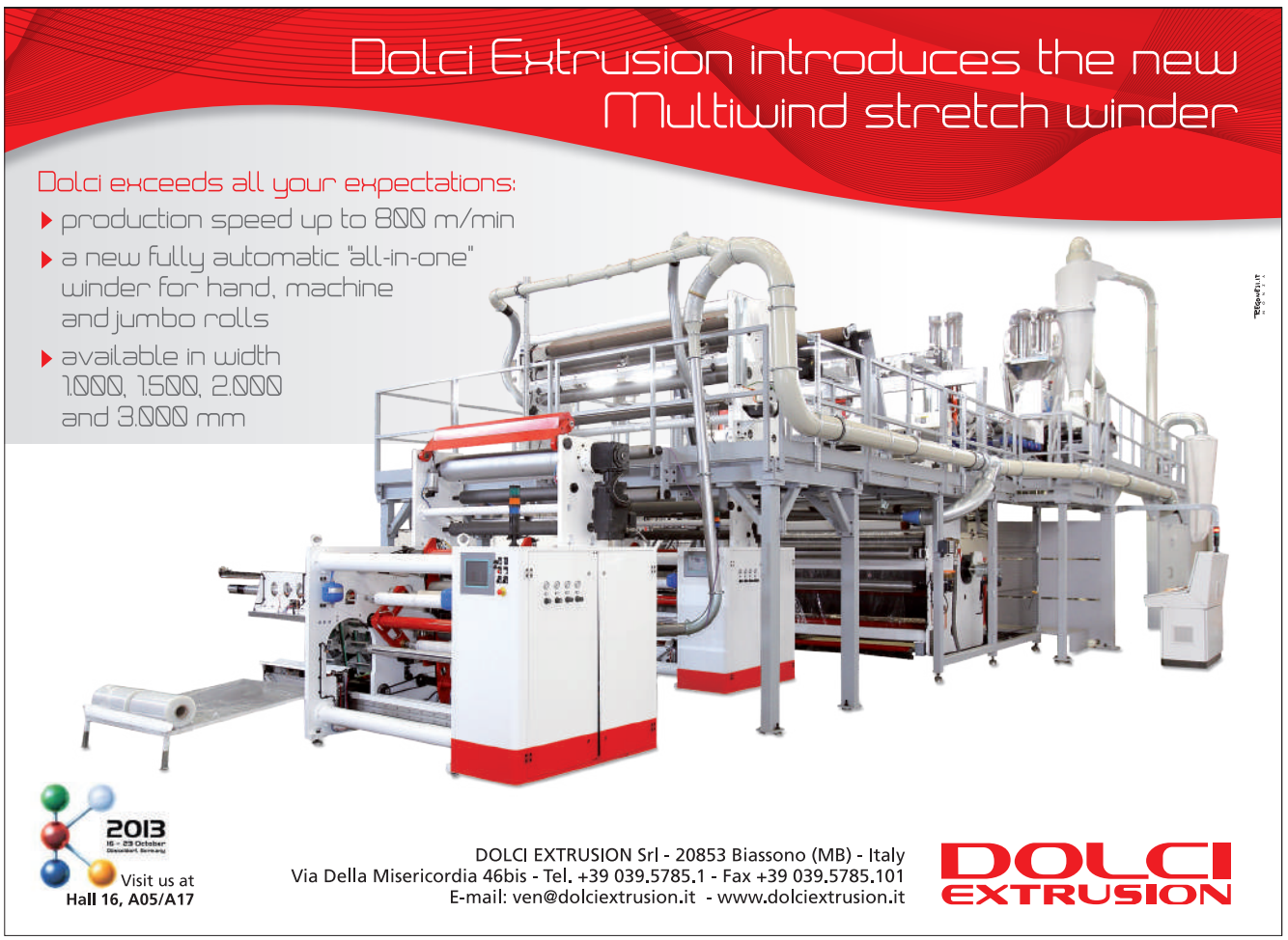
November 27, 2013 - Dubai: The GPPA Conference - Gulf Plastics Pipes Academy (www.gulfplasticspipe.org)
December 9-11, 2013 - Abu Dhabi: Flexible Packaging Middle East - AMI (www.amiplastics-na.com)

United Kingdom

November 12-13, 2013 - London: Pira Packaging Summit - Smithers Rapra (www.pack-summit.com)

United States

November 4-6, 2013 - Chicago: Global Plastics Summit - IHS (www.ihs.com)
November 6, 2013 - Livonia: 43rd Annual SPE Automotive Innovation Awards Gala – (www.4spe.org)
December 3-5, 2013 - Philadelphia: Stretch & Shrink Films USA - AMI (www.amiplastics-na.com)
December 10-11, 2013 - Philadelphia: Compounding World Forum - Compounding World Magazine (www.compoundingworld.com) and AMI (www.amiplastics-na.com)



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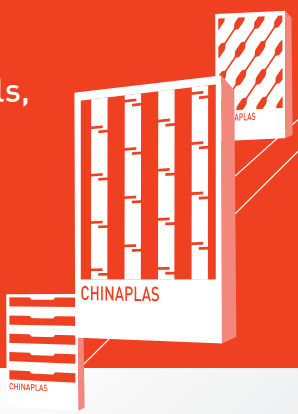

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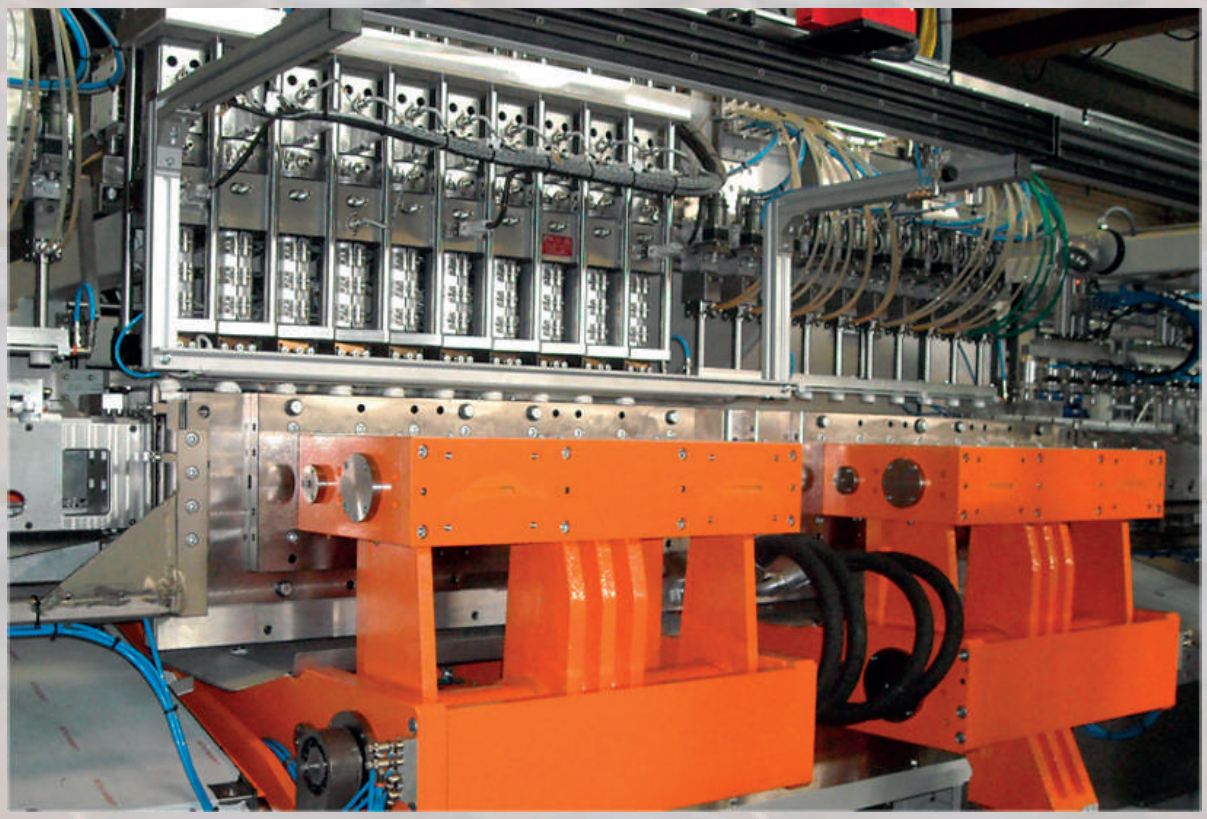

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