



TECHNOLOGY report

SML

LENZING | AUSTRIA edition no. 12 2/08



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Diverse Opportunities with Sleeve Touch Technology

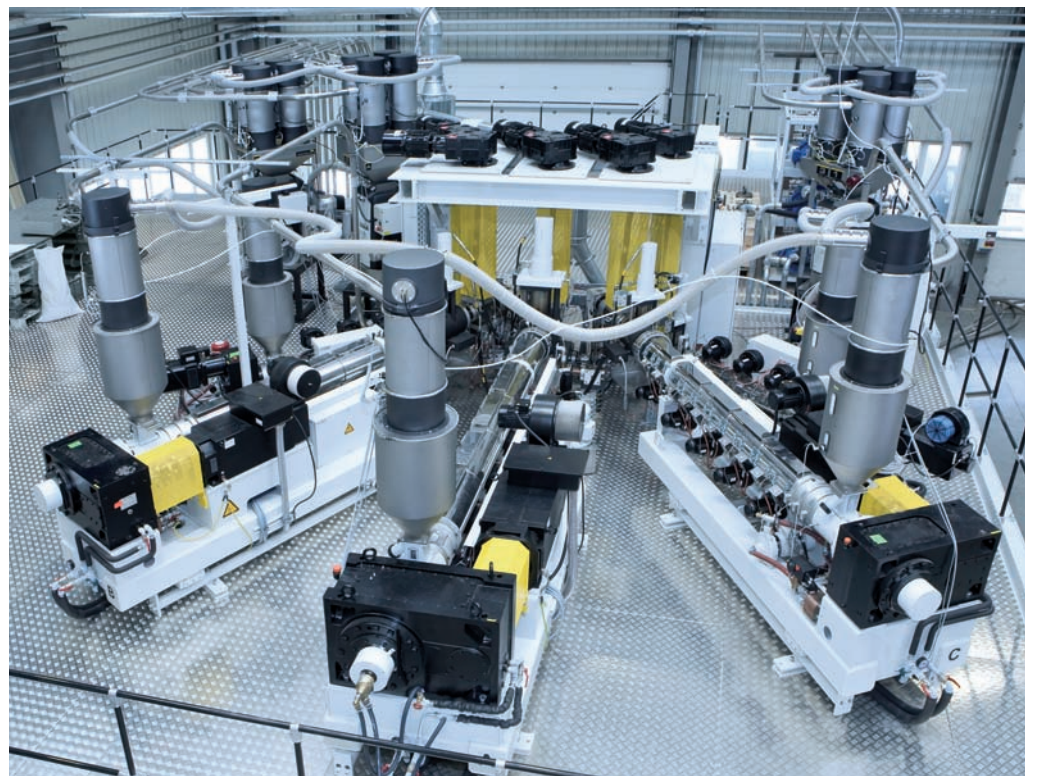
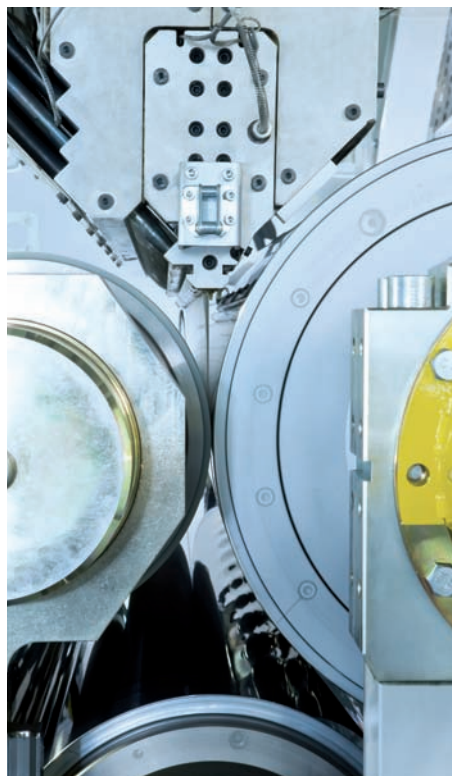
The sleeve touch line produces film in thicknesses from 60 to 450µm, closing the gap between cast lines and calendering lines. The technology is equally suitable for films of polyolefins, ethylene vinyl acetate, polystyrene, polyester, PMMA, polycarbonate as well as of barrier materials like COC, polyamide or EVOH in a compound structure. The use of this sleeve touch technology is recommended for those applications, where an additional benefit in comparison to cast or calendering processes is desired.

The production of optical films for flat screens (panels for TFT monitors) from polycarbonate in the range from 70µm to 100µm is one application where the sleeve touch system achieves qualities that are otherwise impossible. Another application are

protection films with a specific cling layer, which will be applied to the optical films for transport between the single

production steps of a flat screen. They are a high-end product with good margins. Since each enclosure would risk

scratching the surface of the optical sheet, it is necessary to produce a protection film with an absolutely smooth



EDITORIAL |



Karl STÖGER, Managing Director

Dear Reader,

We are excited to provide you with a new edition of the SML Technology Report. The main

focus in this issue is on speciality film and sheet for high-end optical or technical applications. The topics coincide with our "Speciality Film Convention" that will be held at the end of October at SML Austria. SML will demonstrate two sophisticated machines in operation. On a cast film line we will show a thin gauge PET cast film, and on a sleeve touch line an immaculate transparent barrier film will be produced. During the two-day event expert speakers will give lectures on raw materials,

equipment and technology. We look forward to welcoming you in Lenzing and kindly ask you to register your participation in advance.

The volatile markets for energy and raw materials bear certain risks, but they also generate new opportunities. With a certain foresight and quickness in making decisions everyone can make the best out of a changing situation. As a machine maker we too suffer from the rising cost of energy and raw materials, but on the other hand, we are encouraged by the volume of new business created by the rising cost. Sometimes it is just about making an extrusion line a bit more energy efficient, which we can. At other times it is about developing a new film to make photovoltaic panels more effective, which we did recently. Whatever your requirements

are for adapting to new market situations, check out SML's ability for special solutions in extrusion.

Putting so much emphasis on specialties does not mean we start to neglect commodities. In stretch film, for instance, we have further refined our machinery, introduced new technology, enlarged our delivery scope and set new standards in terms of achieved product quality as well as in terms of productivity.

I would like to wish all our customers, friends and readers of the Technology Report a positive outlook and many new ideas. And I hope you will find this copy of the Technology Report an interesting read.

Yours sincerely

surface down to 60µm thickness. Optimized extrusion will additionally use special leaf disc filters with 10µm mesh diameter. Thus finest particles are removed from the melt. An advantage of the sleeve technology over the cast technology is that gels which are less than 50% of the film thickness will be completely embedded in sleeved film.

Films produced by the sleeve touch technology are characterized by an excellent visual appearance. Gloss values even for PP outer layers are beyond 110%. That is why films for infusion bags and dialysis bags for medical purposes are produced by means of the sleeve touch technology. They are made of polyolefins and possibly contain COC or polyamide barrier layers. The process avoids die lines and the films exhibit perfect clarity.



According to data of the European Photovoltaic Industry Association sales in the photovoltaic industry are said to grow by 20% each year. If this trend continues as predicted until the year 2050, 25% of the electric energy consumption could be generated through solar power. Films from EVA or TPU enclose the silicon-based photovoltaic elements. They ensure electric insulation and protection from humidity. For easy handling prior to glueing together with the glass surface or the back side

carrier film those encapsulation films must have matted surfaces. The encapsulation film must provide protection against oxidation, feature high transparency and exhibit the same refractive index as the top outer layer. Here again sleeve touch technology is a tool for the cost-efficient production of photovoltaic encapsulation films. Matted sleeves with diverse roughnesses are available.

The list of possible applications may be

extended without limits. Whenever you use a credit card with a photo-sensitive intermediate layer, it might be produced by means of sleeve touch technology. Transparent folded boxes for cosmetics and blisters for drugs, too, are a possible product of the sleeve touch technology. So are formatted sheets for in-mould labelling and for offset printing. Compound structures with COC are used for shrink labels on high-end beverage bottles.

Rupert BECKER, Product Manager

PET Production by Means of Cast Film Technology

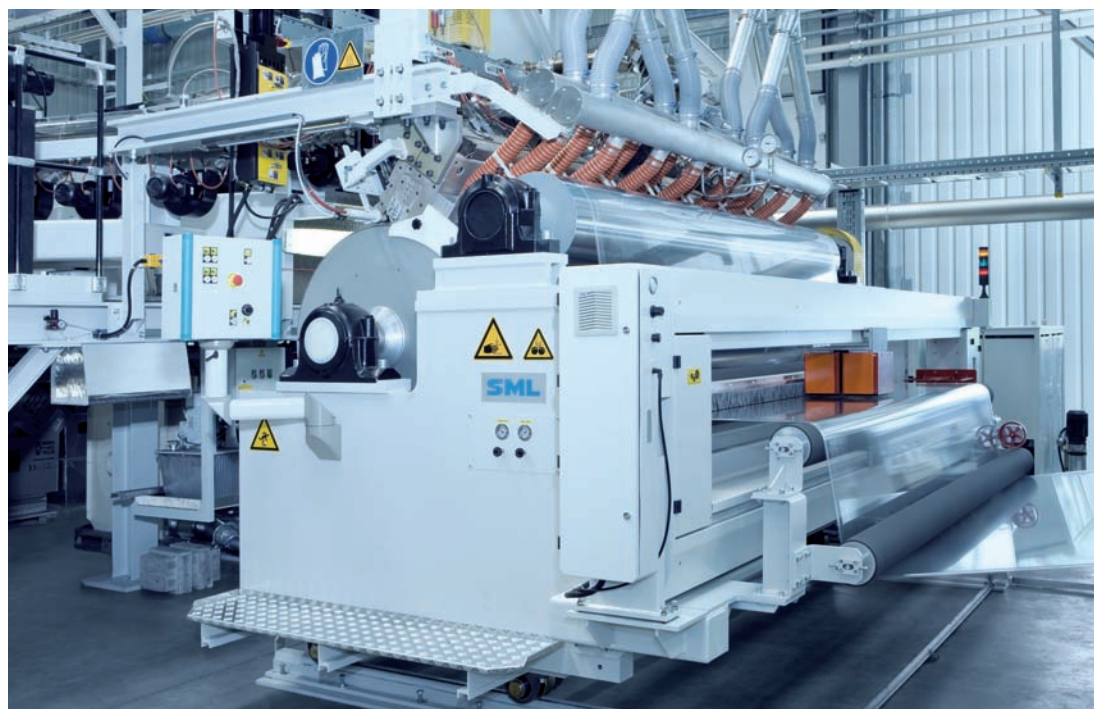
During SML's Speciality Film Convention on October 29th and 30th 2008 we will demonstrate the production of a thin polyester cast film which, for instance, is suitable for candy wrapping. The film made of standard APET resin with an IV of approximately 0.8 contains anti-block and anti-slip additives. The film cast onto a chill roll is made in a thickness of 25µm. Similar thicknesses of PET film are usually achieved only through biaxial orientation of the film (BOPET). With SML's process expensive equipment for biaxial orientation is not necessary and this cast film may even be produced as monolayer, making the formulation very cost-effective. Cast PET twistable film has the potential to become a serious competition to other twistable films like CPP twist film.

Cast PET film has been tested on a Theegarten Pactec line EK3 high-speed wrapping machine for hard candies in double twist wrap. Before the tests with the PET film the line had been running with PP film and there were no major

adjustments necessary for the test runs with PET film. The film width was 76mm, maximum production speed was 1600 candies per minute. This film allows easy cutting and produces 2 complete twists with almost zero untwist. The result is encouraging, since this film displays perfect visual appearance, features outstanding stiffness and is easily printable. The formulation is ready for commercial use, as the detailed know-how packages will be shared with customers purchasing the required production line from SML. The demonstration line is a 3-layer cast film line suitable for both cast PP and cast PET film. The extrusion unit comprises a Ø150mm main extruder and a Ø90mm and a Ø75mm co-extruder. The die width is 3100mm

comprising automatic profile control. The total extrusion output of the line is approximately 1400kg/h. The chill roll

biaxially oriented films. Thus certain applications of 12 to 20µm biaxially oriented PET film, especially those used



unit consists of a Ø1000mm main roll and a Ø400mm secondary roll. Thickness gauging is done via a radiometric source. A corona treatment unit is integrated. Winding is performed by a turret winder for rolls up to 1300mm in diameter on 6- or 8-inch cores. Recycling of PET edge trims is possible through a compacting process. The overall capability of the machine covers a thickness range from 15µm to 150µm. It is essential to understand that the cast PET technology without the step of biaxial orientation produces different mechanical properties in the film. Elongation, stiffness and shrinkage may deviate considerably from

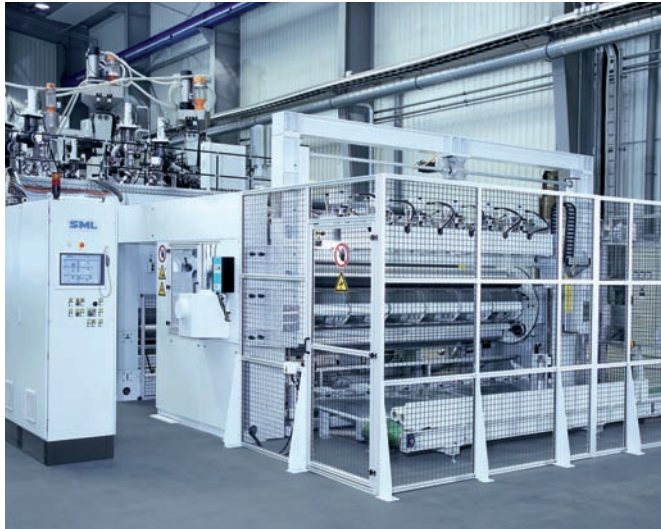
in automatic packaging machines, cannot be substituted by cast PET film due to its different properties. On the other hand, the distinct properties of cast PET film bear great potential for new applications in various other fields.

In the area of thermoforming applications, 3-layer cast PET film laminated with a PE sealing layer film increasingly aims at FFS packaging in the range from 100µm to 300µm. This is just one segment of the PET thermoforming business, which has recently been penetrated by PET cast films. Especially in the lower end of the thickness range high production speeds of up to 150m/min and wide net film widths are possible by means of the casting process. Cast PET film is suitable for aluminium vacuum metallizing, and in this form metallized film has become popular for blisters and trays.

Robert PREUNER, Head of R&D Management

Better Stretch Film at Lower Cost!

Competition is fierce in the stretch film business, and therefore production costs have to be kept as low as possible. With the SML winder series 3000, it is possible to use 10 to 15% lighter paper cores. For 2-inch hand rolls the



Winder 3000 Series

wall thickness of the cores can be reduced to just 3.5mm. A customer that recently installed a new SML line in-

stantly managed to cut 20% of his cost for paper cores.

Main extruders on stretch film lines have a typical capacity of about 1000kg/hour and screw diameters between 120mm and 150mm. With the new generation of high speed extruders, SML achieves the same output with a screw diameter of just 90mm rotating at approx 400rpm. The advantage, apart from less space requirement and less capital investment, is the reduced energy consumption. With energy cost averaging EUR 0.13 per kWh, the annual

saving on the electricity bill is EUR 23,000 per extruder. A typical 5-layer line with two high speed extruders

installed saves EUR 46,000 year after year.

Another way to achieve a substantial cost saving is to run narrow lines (4-up) at higher speed. SML is building a pilot plant for a speed of 1000m/min. This line has a theoretical capacity of 1650kg/hour at 15micron with a projected energy input of below 0.4kW per kg of film produced.



In-line produced hand rolls

Undoubtedly stretch film produced on SML lines is of the highest quality. And not less important is the fact that pro-

Susanne KOHLBERGER,
Marketing Management



Commencing on 1st of September 2008 I took over the position of Marketing Manager from Bettina Kreuzer.

Previously I was responsible for public relations, drafting and elaborating of leaflets as well as for facility management. My new field of activities includes the organisation of the booth at our most important exhibitions. Therefore it is necessary for me to collaborate with our R&D department, sales department as well as with our agents to be able to support them. Our next important event is the Speciality Film Convention in our facilities in Lenzing and also various exhibitions all over the world. I am really looking forward to welcoming you on one of these occasions.

duction costs are lower on the new generation of SML stretch lines than those on common equipment.

Thomas RAUSCHER, Product Manager



MARTIN KALTENECKER, Sales Coordinator

How to Benefit from Volatile Markets?

Day by day we are faced with varying forecasts regarding the future economic development. After a longer phase of strong and stable growth the economic situation is increasingly described by statements along the lines of "The party is over". Hardly ever before have important raw material prices and economic indicators changed as quickly as they do now. Exploding raw material prices as well as generally rising energy and food prices are sending up inflation to a level we've not seen in years. This aspect, in combination with the good profits made by most enterprises, is naturally tempting to employees to raise high wage claims, though, in parallel, economic growth is flattening. All these basic parameters make corporate planning more difficult, and enterprises are challenged to apply the right strategies in terms of investment planning, stocking or location planning.

It is no longer only manpower costs that drive production out of Western and Central Europe, the more so as raw material costs account for over

80% of the whole production costs in most fields of film extrusion. This leads to major investments in the commodity sector such as stretch film or PET thermoforming film in the regions of the Middle East, offering cost advantages for raw materials and energy. In spite of the extremely aggressive prices that make these suppliers attractive to customers around the world, it is still possible for specialized manufacturers in local markets to score with flexibility and customer proximity. Another special aspect affecting site selection these days are sometimes unpredictable political conditions such as investment incentive schemes for certain regions, or environmental regulations that might change quickly and that are far from harmonized.

An important factor that is highly difficult to assess is the development of raw

material prices. Though the general tendency is pointing upward, there are shorter declining phases time and again. Such turbulent markets demand price hedging, which might be achieved by an optimized purchasing policy with sufficient storage capacity on the one hand, or by so-called hedging in ad-



dition to the core business on the other hand. We know from our customers that they are frequently bound by long-term agreements including price maintenance they have concluded with the buyers of their products. By contrast, there are no such agreements with

the suppliers of raw material, who are able to easily push through their price increases because of their market power. While moderately increasing prices are favourable for the market, raw material prices on the decline would not necessarily stimulate the market, as they might involve caution and reluctance, nourishing hopes for still lower prices.

The factor concerning us most as a supplier of machinery and plants is the investment planning of our customers. Uncertainties on the market will always induce company managements to hesitate and will not encourage decisions. On the other hand, this opens up new chances for new products, which might seem profitable at once because of rising energy prices, entailing investments in production plants. The field of photovoltaics is as such an example.

All that we as SML can do in the years to come is respond to new products with a continuous advancement and optimization of our plants, and respond to the demands of our customers with flexibility. Our clear commitment to this approach is reflected by the developments presented in this Technology Report, which we'd like to show to our customers worldwide at the on-coming Speciality Films Convention.

SML Goes RUSSIA!

Over ten years have already passed since SML started its sales activities in the Russian Federation and in the CIS countries. Ten years in which the direction this would take was not always clear. In the year 2000 the first SML equipment was delivered to a company in Moscow, and until today the number of lines that are in operation all across the Russian Federation and CIS countries has consistently grown to a total of 18.

The hard work has paid off. Today we can proudly claim that SML has developed a reputation as a reliable and trustworthy partner for sophisticated extrusion lines for sheet, cast film, multifilament and coating applications. Against this background - the next step was not a hard decision. Proximity to our customers, quick service and consideration of special local circumstances needed improvement, and so the decision was made to establish our

Russian presence in Moscow. As of October 2008 we will now also be servicing our customers through:

Moscow Representative Office of SML Maschinengesellschaft mbH.
Ogorodnij proesd d.5
Building No. 2, 3rd floor
Room No. 312
127254 Moscow / RUSSIA

Our Regional Sales Manager, Mr. **Nikolay KHRISTICH**, is excited to be



part of this development and can be reached via phone: +7-926-4490-025 or email: kna@sml.at.

The Russian Federation and the CIS countries are important markets for SML and meanwhile account for a substantial share of our overall business.



"With this new office and local staff we are well prepared for the future and aim to service our valued customers better".

Christian HUBER – Director of SML Representative Office Moscow.

Stefanie MAIRINGER Export Management



I am very pleased to work in the Finance & Export Department. Our customers are not only aware of our highly sophisticated products but also of our long experience and wide knowledge in the field of exporting/importing the machinery all over the world.

Each project of SML is unique with regard to the product itself, the language and culture of the various countries, which makes my job very challenging and interesting.

We work and communicate closely with our customers, banks and forwarding agents to find the most suitable and efficient way of transport and to arrange all required steps for speedy customs clearance. Especially the documents for exporting and clearance of payments demand a lot of attention.

My scope of responsibilities begins with the preparation of offers and drafts for issues related to delivery, insurance, project financing and payment and ends with the physical exportation and handing over of the delivery to the customer. Furthermore, the close work with export credit agencies like the Austrian Kontrollbank (OeKB) represents another interesting part of my duty.



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EVENTS 2008/2009 |

EVENT	LOCATION	DATE
EXPOPLAST	Montreal, CANADA	October 20 - 21, 2008
PLASTICS & RUBBER	Ho Chi Minh City, VIETNAM	October 21 - 23, 2008
PLASTEX	Cairo, EGYPT	October 23 - 26, 2008
SML SPECIALITY FILM CONVENTION	Lenzing, AUSTRIA	October 29 - 30, 2008
IPF	Tokio, JAPAN	November 7 - 11, 2008
ARABPLAST	Dubai, UAE	January 10 - 13, 2009
INTERPLASTICA	Moscow, RUSSIA	January 27 - 30, 2009
PLASTINDIA	New Delhi, INDIA	February 4 - 9, 2009
PLAST 09	Milano, ITALY	March 24 - 28, 2009

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