



TECHNOLOGY report

SML

LENZING | AUSTRIA edition no. 13 1/09



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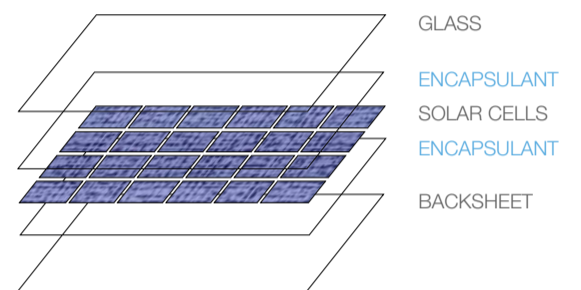


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Photovoltaic: A Challenge for the Polymer Film Industry



Today photovoltaic is perceived to be a growth industry in which established companies as well as numerous newcomers are placing both their hopes and innovative strength. The idea to gain energy from the sun in various forms for our own purposes is not new and even the possibility to convert radiant energy directly into electrical energy was discovered by Alexandre Becquerel in the 19th Century.

However, it was not until the energy crisis in the 70ies and later the trend towards renewable energies which really started the ball rolling with the development of solar cells – not least due to enormous grants from the state in many different countries. Thus in Germany alone, an additional capacity was installed in the year 2007 of 1150 MWp to now almost 4000 MWp which in total represents just 0.56 % of overall energy consumption.

Modern solar modules are comprised of several functional and carrier materials depending on in what way the solar cell itself is designed as a producer of energy. At present silicium is the main material used for the cells themselves but in thin-film technology in particular other materials such as cadmium or tellurium are used. These solar cells are combined with glass panels, various films and frame structures and processed to solar modules.

In our capacity as suppliers of machinery to the film industry, the encapsulant film and backsheet film are of interest to us. In most cases the encapsulant based on EVA is brought to curing in module production in a vacuum laminator. The highest possible transparency following curing, UV and temperature stability and good shrinking properties for processing constitute the requirements made of this film. The backsheet (on the basis of PET, PA, Tedlar and other materials) serves as a moisture guard and must reflect the light to increase the efficiency of the module. After all, a certain energy yield has to be guaranteed for solar modules for more than twenty years.

EDITORIAL



Karl STÖGER, Managing Director

Dear Reader,

This edition, no. 13, of the Technology Report comes at a turbulent time. The global economic downturn has not spared the plastics industry. The industry is confronted with a general downward trend and restraint with regard to new orders, although the effect of this is felt quite differently across the various branches of the business. As in every crisis, new opportunities arise and it is up to us to recognize these opportunities and emerge stronger and better when the dust settles.

A group of far-sighted investors with great courage has reason to rejoice these days. Octal, our largest single customer, has successfully commissioned the world's first "DTS" (direct to sheet) PET plant in Salalah, Oman. This marks the realization of an unprecedented capacity, highest product quality and cost-efficiency. Being involved in this outstanding project and having pushed the limits to new heights, fills us with pride.

Another field of activities which we are proud of being involved in is the photo-

voltaic industry. The very first panels with EVA encapsulant film extruded on SML equipment have successfully passed stringent quality testing. When the commercial production of EVA encapsulant film on an SML extrusion line will be commenced later this year, another meaningful development project promises to be successful.

Stretching units for mono-axial orienting of film have a long history in our company and so do extrusion lines for stretch film. These are two very different products, of course. But then, why not stretch (mono-axial orient) stretch film? We did and developed an orientation unit for pre-stretching of stretch film. Read more on the features of this brand new device inside this Technology Report.

As you can realize from the above said, developing new technologies never stops, not even during a recession. There is always a way forwards if you have good ideas. So let's make the most of the current situation and keep our chins up!

Yours sincerely



For some time SML has specialised in the production of various films for the photovoltaic industry and can, there-

fore, make use of the new and flexible pilot plant in an ideal manner when working on new developments together with customers. The module manufacturers expect improvements in efficiency above all in a reduction in the curing time of EVA films since by means of this more modules can then be produced in the shortest possible time. The amounts of films produced cannot yet be compared with the commodities from the packaging industry. Innovat-

Martin KALTENECKER
Head of Sales Department

Innovative Monoaxially Oriented Products

SML has many years of experience in the field of the monoaxial orientation of plastics films. More than 160 stretching or orientation units have been installed world-wide. The short gap process is the principle of the SML monoaxial orientation unit. The orientation rollers are mounted very close to each other to prevent the excessive necking of the film. In the machine direction, oriented films have a tenacity of up to 300 N/mm². This tenacity is similar to that of steel.

This explains why MOPP films for example lend themselves to tear tapes, strapping adhesive tapes and self adhesive carry handles, which facilitate the carrying of six packs. Foamed MOPP is used for decorative ribbons and insulating films for cable wrapping. For label films it is laminated with thermal paper or produced in a coextruded version (foamed/compact) with an even smoother print surface to convey the relevant product and manufacturer information. Oriented PE film is

used for flower wrappings film and candy twist film. Polystyrene is used for the production of banderole film to be shrunk on bottles. Also coextrusion films with ethylene alcohol (EVOH) and cyclic olefin copolymers (COC), polyamide films and technical films from PVDF are oriented.

The latest development from SML is a special monoaxial orientation unit for the production of prestretched stretch film. This application allows a production speed of up to 750 m/min. The product is an oriented LLDPE stretch film with a thickness down to 7 microns. It is primarily used as a temporary transport wrapping for goods which are transported within the limits of a factory. An orientation ratio in the range of 2 to 4 is applied, to reduce the elongation of the film. Thus the operator saves a lot of effort when manually wrapping around the goods and fixing them with a few turns.

Robert PREUNER,
Head of R&D Department



SML monoaxial orientation unit

TYPE OF LINE: CC/150,90,75/3200/350

We need space and are thus selling off a very well equipped, slightly-used laboratory cast film line for CPP film (CPET film optional). The machine is currently installed in our technical centre and can be inspected upon appointment.

PRODUCTS:

CPP film 15 – 100 µm
max. end film width 2700 mm
Cast-PET-film 12 – 70 µm (optional)

GROSS EXTRUDER OUTPUT:

1400 kg/h PP
900 kg/h-A-PET (optional)

PRICE:

35 % off the regular list price

TECHNICAL DATA:

extruder A 150/33, extruder B 90/33
extruder C 75/33, 3 layer feedblock
3100 mm automatic die
thickness measuring unit Kr 85 or IR
reversible corona treatment unit 40 kW
turret winder 1200, max. winding diameter 1300 mm
8" shaftless and 6" shafts or shaftless
edge trim refeeding with vertical scraptruder

SPECIAL OFFER:

CAST FILM LINE FOR CPP-FILM LAB LINE

Features of Winders for Stretch Film

WINDER SERIES 2000

Utmost flexibility to serve your requirements:

On this horizontal sliding winder, the individual roll width can be varied both quickly and easily from 250 mm to 750 mm. The maximum roll diameter is 450 mm on 3 inch shafts and 600 mm on 6 inch shafts. The film thickness ranges from 7 to 90 µm. Cling layers can be wound to the inner or outer side of the roll. Thus niche products can be finished very efficiently.

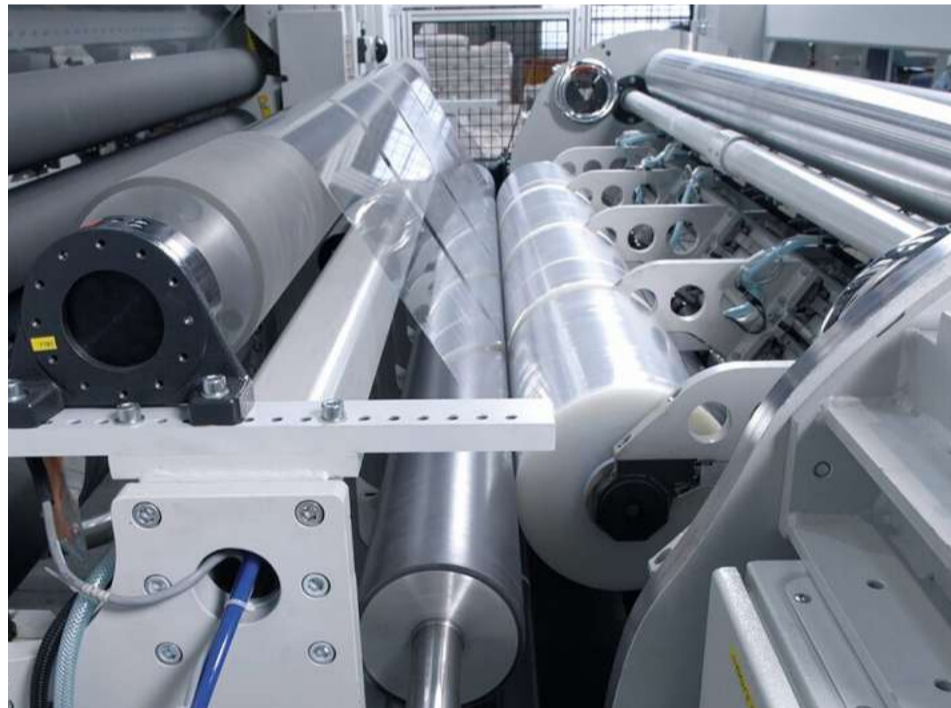
Vibration-absorbing side walls for a high speed:

The winding stations of the horizontal sliding winder move directly above the sidewalls, which are filled with vibra-

tion-absorbent polymer concrete. This is a major advantage in comparison to a turret winder, where the rotating masses are far away from the supporting center axis. This boosts the winding speed up to 700 m/min.

Optimising the roll quality:

An online pivoted satellite roller optimizes the film entrance angle into the roll nip and avoids the entrainment of air. Winder oscillation avoids gauge banding. At roll change the start-up winding station and the finishing station move so closely to each other that there is no free web length and the roll is in good shape up to the last layer.



WINDER SERIES 3000

Core diameter 2 inch and 3 inch shaft-less production:

Machine and hand rolls are produced shaft-less at a production speed of 600 m/min. There are no problems with critical shaft vibrations. This concept of individually clamped paper cores is equally suitable for 4-up, 5-up, 6-up, and 8-up winders.

Version for a super-fast cycle time below 20 seconds now available:

This turret winder with 4 winding stations makes it possible to produce hand rolls with a length of 200 m at full speed. The 90 degrees indexing is extremely

short and quick. An auxiliary contact roll will follow the station with the finished roll.

Bleed trim-less operation:

After the start up of the line, part bobbins are separated by means of automatic spreading frames. No bleed trims are necessary, which can provoke a film break and a consecutive line stop. Moreover the reduced amount of fed back trim material helps to save energy.

New core-less rolls:

An option for the core-less production of 2 inch stretch film rolls is available. No paper cores are needed.

WINDER SERIES 4000

Electronic suppression of 3 inch critical shaft speed for 8-up super-wide winders:

The critical rotational shaft speed is calculated electronically. The carbon fiber shafts are switched automatically from a hyper-critical to an under-critical state by making the shaft longer or shorter. This results in an unbelievably smooth operation at production speeds beyond 800 m/min.

8-up winder with an unmatched high output!

This winder can do machine rolls at a net output of up to 3000 kg/h. The winder is also perfectly suited to the pro-

duction of jumbo rolls for rewinding up to a diameter of 420 mm.

Online support by SML service center

The winder PLC can connect you via modem or internet to the specialists of the SML service center. Online trouble shooting is state of the art. Program changes may be up and downloaded. Even individual drives may be tele-checked via their individual IP addresses. It goes without saying that these features are available for all of the SML stretch film winders.

Robert PREUNER,
Head of R&D Department



OCTAL – Up and Running

Almost 4 years have now passed since the first contact between Octal's investors and SML as a machine supplier started. Back in those days SML was confronted with a determined entrepreneur and his ambitious idea to change the worldwide PET market, a vision which was sometimes hard to follow for a down-to-earth machine builder.

The plan was to implement a large-scale proprietary production method to reduce cost and increase the quality of PET resin and sheet. Operations were structured for world-wide service, and it was chosen to organize sales through strategic locations in the USA, Europe and Asia – but to locate production itself in a more advantageous location, which was found in Salalah/Sultanate of Oman. This promised reliable and abundant supply of raw materials, but also fast and reliable distribution of products to all parts of the world, due to the ideal location along the East-West Trading route.

For SML a job in the PET sheet business is usually defined at around 5.000 to 10.000 production tons per year. The difference here was the project scale – which was asking for a sheet capacity of 150.000 tons per year. In close co-operation with the investor and all project partners involved – SML completely reviewed and redeveloped a suitable machine program, with a fo-

cus on high capacity and automatic sheet handling - while not compromising the reputation for highest quality, the reason why SML was chosen as machinery supplier for the sheet lines.

Octal has just recently announced full commissioning and start-up of the first integrated complex that will now provide 330.000 tons of PET resin and sheet per year to the industry. SML is proud to be a partner in this undertaking and we wish Octal all the best for a bright future.

Gregory K. EBNER,
Area Sales Manager



NEW: Coreless Stretch Film Production Now Available

On SML winders, series 3000 stretch film rolls can be produced alternatively as a coreless final product. To achieve this goal, SML offers special winding shafts, which are inserted in an expanded state into the core feeding system of the winder like normal paper cores. When unloading the individual finished roll, the expansion of the shaft is released. Thus the shafts can be easily removed from the centre of the finished roll.

Robert PREUNER, Head of R&D Manager



SML Goes High Speed with 1000 m/min.

In the summer of 2009, SML will introduce a cast film line for LLDPE stretch wrap film with a production speed of up to 1000m/min. This latest development will shift productivity of a 4-up line to the level of 6-up lines.

NEWS

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EVENTS 2009

EVENT	LOCATION	DATE
CHINAPLAS	Guangzhou, CHINA	May 18 - 21, 2009
ITM	Istanbul, TURKEY	June 06 - 10, 2009
TECHTEXTIL	Frankfurt, GERMANY	June 16 - 18, 2009
NPE	Chicago, USA	June 22 - 26, 2009
ICE	Munich, GERMANY	November 24 - 26, 2009

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