

ROUNDTABLE ON EXTRUSION EQUIPMENT

Q: What's new with your company? Did you release anything new or notable at Drupa?

Keller: We have introduced an expansion to our successful dsX flex-pack product. It is being expanded to include shaft-less unwinds and rewinds, and line speeds to 450 MPM. A full range of widths is now available for 1,200-, 1,350- and 1,550-mm widths.

Shankar: We have recently introduced 1200-mm (48-inch) width 3-layer blown film lines with output range of 300-400 lbs/hr. These lines will replace monolayer lines while providing great savings on polymers and energy, giving very good ROI. We have also introduced similar width barrier film lines with 5 and 7 layers. Output range is 350-550 lbs/hr.

Campbell: There is always something new at Hosokawa Alpine, as we continually make advances on all facets of the blown film process, including improved efficiencies in cooling, die enhancements, optimized web handling and intuitive controls. We do not participate in Drupa, as it is traditionally a printing show, but we will be introducing new technology at this year's "K" show in Düsseldorf, Germany. That information will remain under wraps for a few more months.

Huennefeld: Drupa and K in the same year creates quite a challenge for W&H, being a major player on both shows. We'll keep our highlights on the extrusion side of the business close to the vest until the K-show. New press developments will be mind-blowing though...

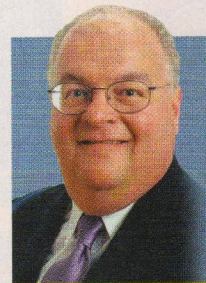
Q: It seems that changeovers and purging times are still some of the big things that contribute to waste when it comes to extrusion equipment. What's being done to help minimize waste?

Huennefeld: That is absolutely correct. The by far biggest impact in this field was presented during our in-house expo in June 2015, when we introduced TURBOCLEAN, our fully-automated resin purging system that reduces changeover time drastically. In some cases, from 30 minutes down to 2 minutes.

Shankar: As per our understanding, blown film has four main wastages: startup waste, changeover waste, trim waste and purging/shutdown waste. In most cases, trim wastage is the highest contributor as it is a continuous wastage. It is followed by startup and purging wastages. Changeover wastage is subject of the type of changeover which can be of the following types: color change from master batch to natural, overall recipe change (specialized resin to standard resin) and film width and thickness change.

Changeover from master batch to natural is subject of die design. In our case, we have die design with metal-to-metal contact taper-lock spiral mandrels with streamlined entry ports. This ensures very quick changeover or flushing within 10 minutes.

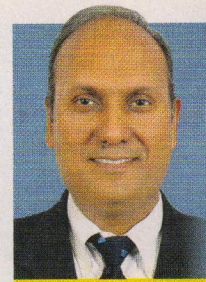
In order to reduce and control trim wastage, recycle units should be adopted in the plant ancillaries which feed trim wastages back to the extruder hopper for further processing. Of course, this has worked well in manner when natural film or single color film/similar group of raw material is in processing.



RICK KELLER
VP of Extrusion & Solution Coating

Davis-Standard, LLC

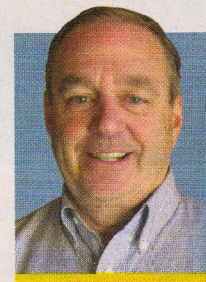
35 years with the company
(860) 599-1010
www.davis-standard.com



VIJAY SHANKAR
VP

Mamata Extrusion Systems Pvt. Ltd.

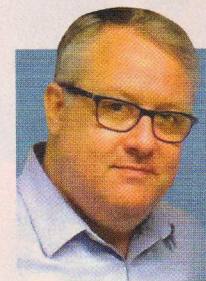
18 years with the company
(91) 9979864273
www.mamataextrusion.com



JIM CAMPBELL
VP of Sales

Hosokawa Alpine American, Inc.

20 years with the company
(508) 655-1123
www.halpine.com



LAURENT CROS
President

Pearl Technologies Inc.

4 years with the company
(315) 365-3742
www.pearltechinc.com

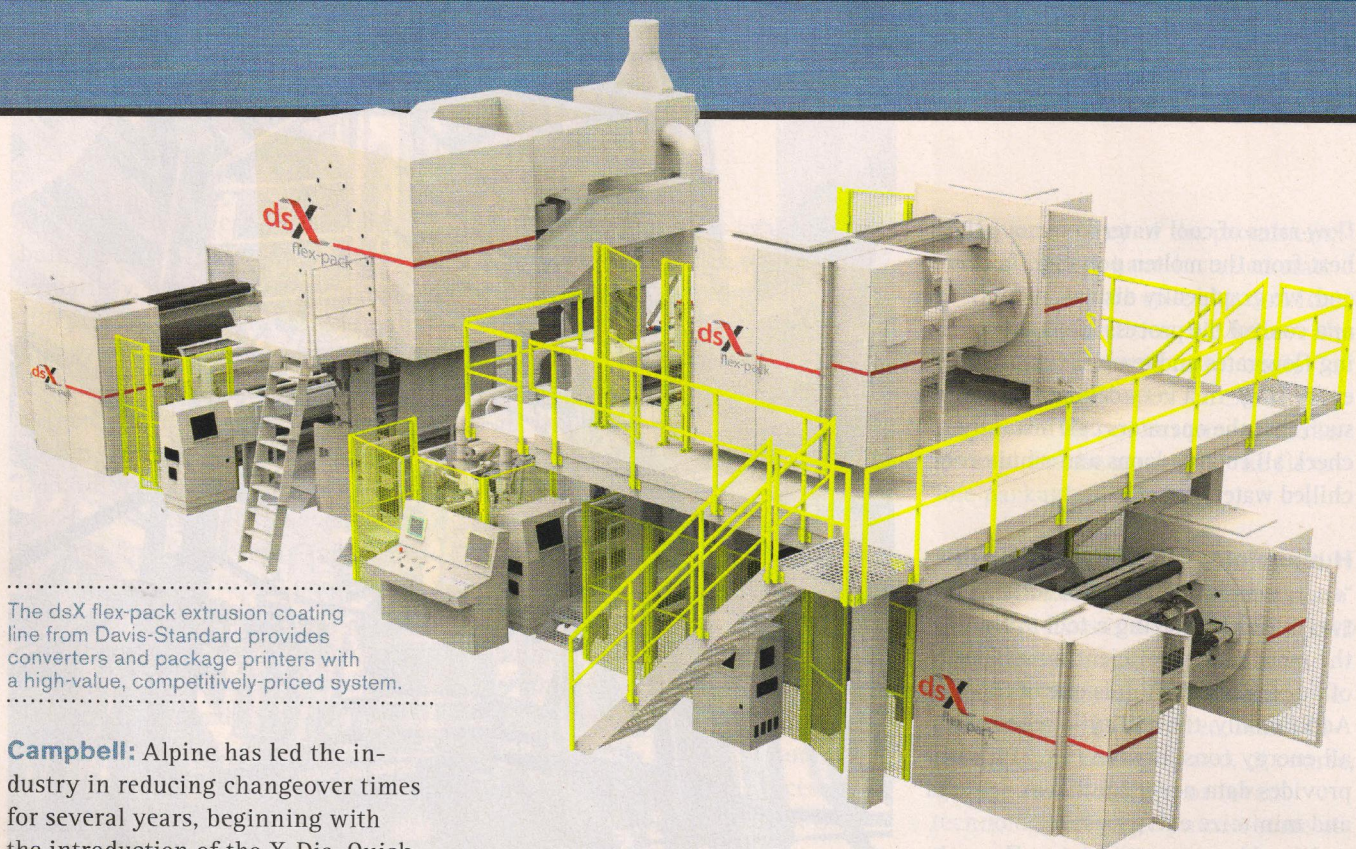


SEBASTIAN HUENNEFELD
Technical Sales Manager, Extrusion Equipment

Windmoeller & Hoelscher

5 years with the company
(401) 334-9502
www.whcorp.com/us

In terms of overall waste, our customers are able to maintain it below 1 percent due to our unique system of trim-less manufacturing of film. This is achieved with a combination of auto width control and special slitting systems.



The dsX flex-pack extrusion coating line from Davis-Standard provides converters and package printers with a high-value, competitively-priced system.

Campbell: Alpine has led the industry in reducing changeover times for several years, beginning with the introduction of the X-Die. Quick purging is one of the key features of the patented X-Die. The design provides the lowest die profile in the industry, resulting in the shortest residence times, and consequently the quickest purge times. We have customers that have published articles that confirm that with the X-Die and grooved feed extruders, they are achieving difficult color changes in less than 10 minutes. Alpine's quick changeover capability is not just the X-Die, we have also incorporated the quick change concept into our U.S.-designed and manufactured ExVis control system. ExVis also features the recipe driven "one touch" job change feature, significantly reducing time and scrap when transitioning from one job to the next.

Cros: Pearl Technologies' products are always designed to increase ease of use and quick changeovers. On the extrusion side of our business, Pearl continues to innovate in process enhancements that offer extruders flexibility in bubble management while minimizing waste. For example, innovations allowing quick transitions from a gusseted application to a non-gusseted product, without having to stop production for an extended period of time, creates flexibility and

versatility that allow film producers to increase the range of use and the output of their lines.

Pearl is the uncontested leader of gusset boards and collapsing frames. Our gusset boards, with removable or even automated retractable tips, coupled with our new actuators, make changeovers in a matter of minutes, not hours, while also enhancing safety. Other upgrades include our low coefficient of friction engineered materials in bubble cages, or in web management after the nips. Teflon rollers and idler rollers eventually wear or stop turning and without constant maintenance lead to marking, pinching and tearing of the film. Pearl's fixed idlers create uniform tension between primary and secondary nips for better quality rolls.

Keller: For coating and laminating, the dsX flex-pack product minimizes waste by using splice tracking software to minimize changeover scrap from one web to another. Additionally, the winders make transfers at full line speed with no waste, and the unwinds splice roll-to-roll with a small amount of web left on the core. Extruder and material controls anticipate the product change and minimize the material used during the process.

Q: There are lots of components that go into an extruder and a lot of utilities that help make it tick (i.e. compressed air). In what ways, if any, does your equipment monitor such to ensure that machinery is working properly and most efficiently?

Campbell: Present day extrusion equipment incorporates many improvements for productivity and efficiency. Modern AC drives and motors have increased performance with less waste. New improved temperature controls keep zones at setpoint without costly overshooting and new software delays heating of fast zones until all zones are ready to further save energy, while preventing material degradation. Overall supervisory controls with full integration allow the system to report failures quickly and allow for quick troubleshooting and repair. This integration also allows for faster job changes with less scrap and less downtime.

Keller: For our flexible packaging lines, the largest consumed energy section is in the water process loops. All flat die systems use large diameter chill and cooling rolls that require high

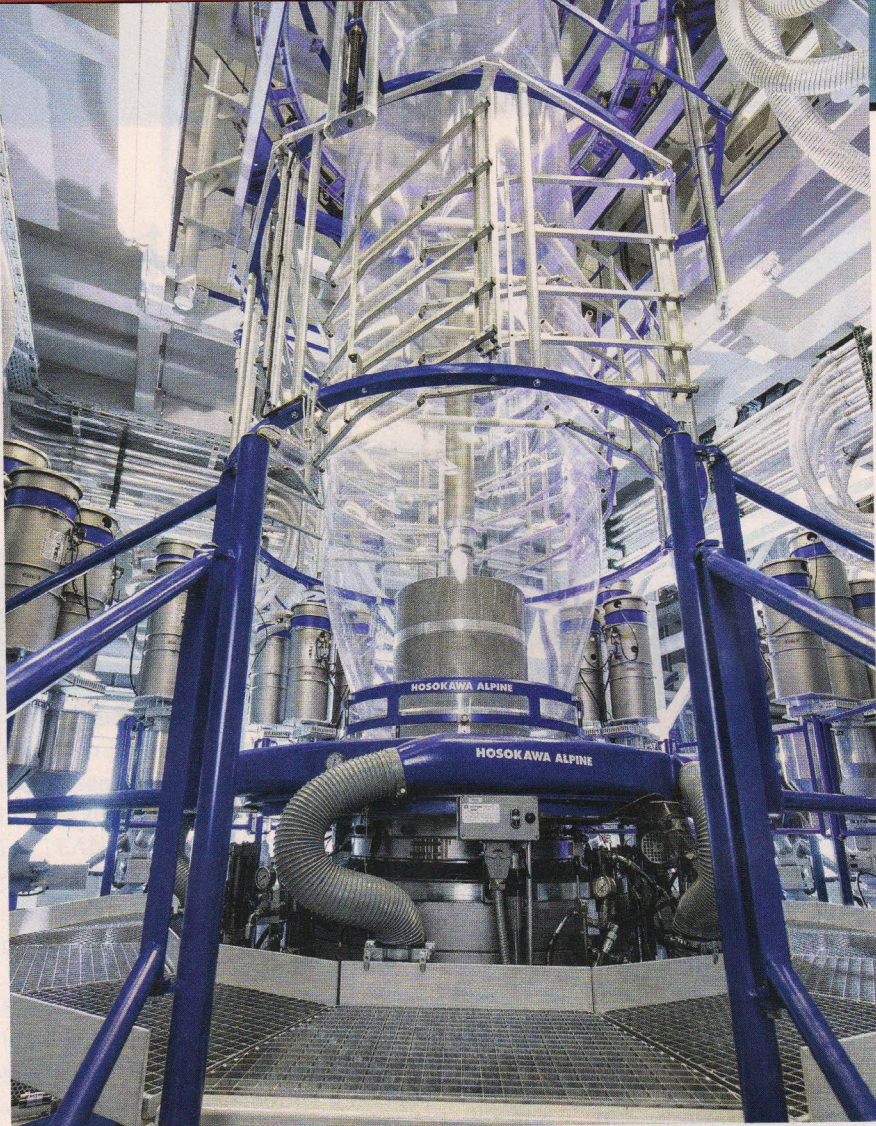
flow rates of cool water to remove the heat from the molten polymer. To this end, we graphically display, monitor and control the process loops showing flow rates and temperatures at every stage in a very detailed fashion such that the operators can instantly check all cooling loops and monitor the chilled water source.

Huennefeld: We offer what we call “energy monitoring” for exactly those two reasons. Offering a tool to find the most energy efficient sweet spot of a production setup is one of them. Additionally, the ability to monitor all energy consumption in real time provides data needed to tweak settings and minimize energy usage.

We add sensors to measure flow rate and temperatures of all water connections, compressed and process air and also the entire electrical consumption is considered. Now imagine you have a broken valve for compressed air. You could waste a lot of money not noticing this for a few days. With energy monitoring you would see a spike on the compressed air diagram right away and maintenance could look for and remedy the problem.

Shankar: There are many inputs (electricity, water and air, etc.) in general to the blown film and specific to the extruders in the form of utilities, which impacts performance of the plant and final quality of product. We offer very customized solutions with closed-loop monitoring system for such utilities.

Just to share, one of the practical approaches where we were to ensure that inner layer of 3-layer lamination film should not be less than 3.6 μ for proper sealing and the outer layer not less than 4.5 μ for better bonding. It was challenging to control individual layer thickness just from most popular automations like gravimetric control and auto gauge control systems, hence we had incorporated temperature control unit (TCU) for supply of water to feed throat zones of extrud-



Alpine's 11-Layer X-Die & VX Triple Lip Air Ring Blown Film Line

ers to ensure uniform melt temperature at the end of the extruder.

Our equipment is equipped with monitoring gauges/meters to measure and control the blown line operating parameters. The monitoring and control is done through closed loop systems with either alarm and/or auto shut down. We offer all the standard monitoring systems at various system elements of the blown film line as usual.

Q: With films and resins changing so regularly, how does your company best stay up with the latest industry trends?

Cros: Pearl Technologies invested in a technology and application lab. We work closely with our customers to test their films and applications with

our innovative products. We have the ability to measure friction and drag on different films, at different temperatures, allowing us to qualify the best cover material for our slats, arms, rollers, etc. This prompted us to develop our new SM-28 wear-surface this year, the most slippery and durable in our history. Our worldwide distribution network is also a great tool, allowing us to identify industry trends through new requests from our customers. Not a day goes by without Pearl being asked for a new application!

Shankar: Resin and film versatility in film extrusion depends on hot packages and cooling systems. We address the issue as under both. For hot packages, pertaining to extruders, we offer smooth bore extruders which are the most versatile extruder in the market handling fractional

MFI to 10 MFI. It can also handle bulky/fluffy trims directly. Due to versatility, one can process up to 100 percent LLDPE/m-LLDPE in all the layers, 100 percent LDPE up to 7 MFI in all 3 layers and PP-homo/copolymer in various blends in any or all the layers. We also offer customized die with layer ratio from 1-1-1 to 1-8-1. The individual layer can be handled for 50 percent of individual layer capacity up to 100 percent.

For cooling systems, the air cooling ring has unique capacity to lock film bubble with following outlets of air. Primary and secondary lip gaps are adjustable. Three set of collars exponentially adjustable with each row from 0 to 100 percent bring in versatility to lock bubble for BUR as low as 1.5 to as high as 4.0. The features are over and above the versatility of changing blower speed and air temperature to control the frost line as usual.

IBC System : It has again 4+1 (i.e. 5) pancakes with each one independently settable to operate at say 40 percent, 25 percent, 50 percent, 75 percent and 100 percent opening respectively from bottom to top. This helps to do quick pre-cooling at entry and progressive cooling of bubble with the rest of the pancakes to get desired output without disturbing gauge.

Keller: Davis-Standard has extensive laboratory facilities serving each of the major product lines in Pawcatuck, Connecticut, Fulton, New York and Suzhou, China. At these laboratories we develop machines to process new materials in conjunction with the polymer producers.

Campbell: Alpine has always maintained a close relationship with resin suppliers – and we continue to do

so. In fact, many of the prominent resin suppliers have installed state-of-the-art Alpine co-extrusion lines in their lab facilities. We believe the continuum between resin, equipment and applications are critically important for our customers and in general for the growth of the flexible packaging industry.

Huenefeld: We currently have 6 full size extrusion lines in our lab in Germany. This is where our own R&D department tests a lot of the new materials themselves. We want to be able to make the right recommendations to our customers and, of course, we also need to adjust or invent technology to better process some of these materials. **FP**

To read more of the Roundtable, visit www.FlexPackMag.com.

WikoffColor
CORPORATION

Come and see us at **Hall 3 Booth #E31**
May 31 - June 10, 2016 Düsseldorf | Germany



We specialize in being

flexible

INK&COATING
Customer Focused & Technically Driven

www.wikoff.com

CREATING SOLUTIONS
for a challenging market

