

Building bigger and better extruders



Since the financial crisis of 2009, pipe producers generally tend to be more conservative in their planning. Besides keeping their inventory stocks low, they tend to produce smaller batches and prefer shorter change-around times. The optimum use of energy is a top priority and more producers are using bio-based materials.

In the face of changing customer demands, makers of extruders such as KraussMaffei Berstorff find themselves supplying different kinds of equipment. In recent years, the Munich-based machinery maker said that nearly two-thirds of their customers requested for integrated automation and/or complete production cells. There are also those who asked for multi-technology solutions, such as combining injection moulding with extrusion or with reaction processes.

"We recognise a strongly growing interest in pipe systems which need a combination of 2 or 3 plastics processing technologies for their production," said Daniel Lachhammer, product manager of pipe at KraussMaffei Technologies.

"For example, polyurethane (using foaming technology) insulated pipes (extrusion) for district heating or cooling applications and fittings (injection moulding), which KraussMaffei is able to handle as complete single-vendor solutions."

Another trend KraussMaffei Berstorff experienced is the demand for large-diameter pipe extrusion lines.

Lachhammer said: "We received a lot of

orders and inquiries within the last months for large diameter pipe extrusion lines, extrusion lines for special pipes (such as production of polypropylene pipes highly filled with barium sulphate via direct extrusion), extrusion lines for multilayer pipes and also turnkey solutions for pipe extrusion."

This trend followed an order KraussMaffei received from Middle-East pipe producer PES for an extrusion line to produce extra-large, smooth-walled HDPE pipes with diameters up to 2,400 mm, a record-breaking width in the industry. PES supplies pipes in many applications, including pipelines bringing seawater to desalination plants and cooling water to oil refineries.

The new pipe extrusion line for PES will be headed by a KME 150-36 B/R single-screw extruder and a KM-RKW 40-2400 pipehead. The longer 36 L/D processing unit, together with the barrier screw design, can achieve a very low but uniform melt temperature, which helps to minimise the problem of sagging. In the pipehead specially engineered for extra-large pipes, the melt is pre-distributed through multiple holes so as to produce an ideal circular cross-section, before it reaches the spiral channels.

Lachhammer added that KraussMaffei "recognise an extremely growing interest in our pipe extrusion lines from the Middle East and the Far East."

"Growth mainly takes place in the field of HDPE pressure pipes, and also PVC and PP pipes," he further said.

Vacuum energy saving system

Greiner Extrusion and Gruber Extrusion have developed a new innovation that helps cut energy costs for plastics profile extrusion by 50%. Developed together with their R&D arm Greiner Competence Centre (GCC), the technology Vacuum Energy Saving System uses speed controlled vacuum pumps to more efficiently manage drying rates at the calibration table and vacuum cooling tanks.

Under the new system, vacuum pumps are interconnected and individual units can be automatically connected and disconnected. On the other hand, side channel blowers controlled by frequency converters are used at the vacuum cooling tanks.

Leo Weiermayer, CTO of Greiner Tool.Tec claimed that although speed-controlled vacuum pumps are already in use, the combined use and special design of this system is novel.

Besides simplifying the operation of the calibration table, the new system also reduces the amount of heat given off to the cooling water. It is mostly compatible with tooling system on the market and may be retrofitted to existing downstream machinery.



From gray ashes to green frames



When a fire engulfed MCS Industries' plant in Mexico, the operation was burnt to the ground and slashed 30% of the company's overall production. The accident was a huge blow to MCS, which was also North America's largest picture frame manufacturer.

Thankfully, by the end of the year, a new MCS corporation, TFM was set up on a new facility that is larger and better. Occupying over 21,000 m², the new factory has the capacity to produce over 80,000 pictures frames each day, from start to finish, including co-extrusion, foiling and embossing.

Davis-Standard supplied TFM with over 30 extruders, a sheet line, and a reclaim line.

In a new development, all the profiles produced in the plant are made from recycled plastics. Collection points were set up where the material is either compressed or melted down then transported to the TFM facility. These are then mixed with additives and then extruded. Davis-Standard customised the equipment and provided proprietary feedscrew technology, resulting in an improvement in the overall amount of recycled materials by 50% and increase in throughput by over 10%.

MCS weighed in on the environmental impact of the factory. "We take materials that would ordinarily end up in a landfill and extrude them into a profile that can be laminated, embossed, and decorated," said Dallas Kohler, Director of Engineering for MCS.

Market demand for eco-friendly products laid the groundwork for the new plant. "This fits in well with the green initiatives practiced by our customers, which comprise 2,000 retailers throughout North America," Kohler added. TFM claims to recycle nearly 5 metric tonnes of polystyrene and Styrofoam each year.

The eco solution to water pipelines

The Tianjin Eco-city is a bilateral project between China and Singapore, involving both public and private investments and participation. Located in the Tianjin Binhai New Area, just 45 km from Tianjin and 150 km from Beijing, an area of 30 m² has been designated for the development of a self-sustaining community of clean technologies and industries, such as clean energy, green building, waste management and environment management.

One of the main challenges faced by the developers is to bring clean water supply to the eco-city as well as its projected population, which is targeted to reach 350,000 by the year 2020. A new 4.5 km water pipeline was thus commissioned, starting at a point 80 m to the west of Jingshan railway, following along the left bank of Yongding New River, passing under the Ji Canal and finally to the eco-city's pumping station.

The local developer, Tianjin TEDA, wished to install the pipeline with minimum disruption to on-going construction works on the ground level. In addition, the section under the Ji Canal had stones and other hard materials which might damage the pipe surface since the pipeline would be installed by directional drilling.

To address these concerns, pipe producer Cangzhou Mingzhu Plastics chose Borouge's



PE100 high stress crack resistant polyethylene to manufacture the pipes.

"By using pipe produced from our new high stress crack resistant PE100 grade, the local water company was confident to install the pipe under the canal using directional drilling, knowing that any surface damage would not reduce the life of the pipe," said Hu Wei, Borouge's VP for Business Pipe Unit.

"Our commitment to working with partners throughout the value chain ensured the

ideal materials were being used for the different sections of the pipelines."

Borouge's BorSafe HE3490-LS-H grade was specified for the section of pipeline under the canal as it is extremely tough and will resist the development of cracks and damage that may be caused during the directional drilling operation (as shown above).

The remainder of the pipeline was manufactured from the standard BorSafe HE3490-LS Black PE100 compound.