



Recovery position

Many processors are keen to recycle scrap material during processing, as a way of saving on materials and cutting waste. But there is also a growing trend – thanks to improved processing techniques – of making products largely from recycle.

One example was seen recently at K2010. **Rajoo Engineers** of Gujarat in India demonstrated a recycled PET (R-PET) extrusion line at the show, which featured crystallising, drying and material handling equipment from **Conair**.

The line made three-layer (A-B-A) clear PET sheet, intended for thermoforming of disposable containers. The 700mm (27.5in) wide sheet can be produced at up to 300kg (660lb) per hour.

Conair operates a joint-venture company, Nu-Vu Conair., in Ahmedabad in Gujarat, through which the contract with Rajoo Engineers was negotiated.

“This line showcases the advanced capabilities of Rajoo equipment, and demonstrates the global capabilities Conair can offer to PET processors,” said Jamie Jamison, global PET/packaging general manager for Conair.

The Rajoo Lamina RS1x 1490-50/900 rPET sheet line incorporates two extruders – a 90mm/30D /76kW unit processes the rPET flake (which makes up 90% of the finished sheet), while a 50mm/30D/22kW unit runs the virgin PET that forms the outer layers of the sheet. A grooved feed section and barrier screw ensure efficient melting and homogenous mixing of the flake feedstock. The line can run up to 35m (115ft) per minute.

Lou Reade reports on the latest in recycling machinery and granulators, including an extrusion line that makes sheet from recycled PET

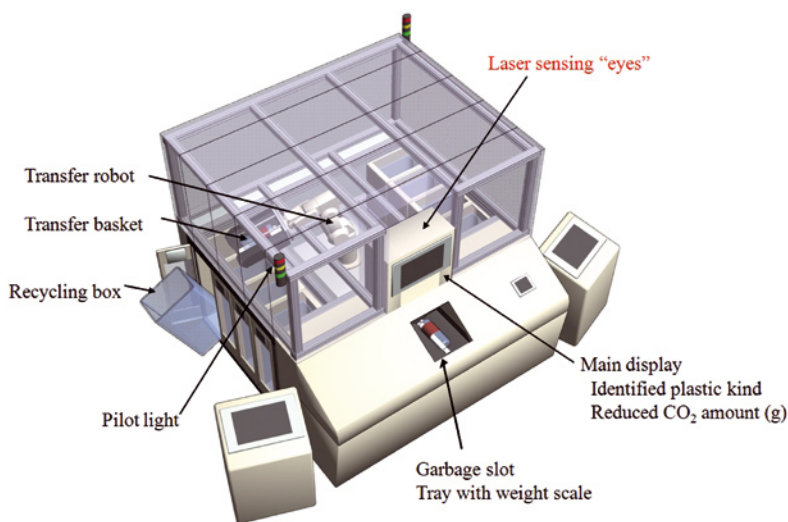
Some of the equipment supplied by Conair included: a CR42 crystalliser, which processes amorphous PET flake at temperatures up to 177°C (350°F) with continuous agitation to prevent agglomeration; and two Carousel Plus dryers – a W800 to process the rPET and a W200 for the virgin resin stream.

Conair has also designed a three-way hopper that improves the recycling of scrap thin-gauge film and sheet.

Its FSG series has an in-feed section that can handle edge and bleed trim, off-spec rolls or hand-fed materials. The granulator aims to boost productivity and profitability in mono-layer and co-extrusion applications in film, sheet and extrusion coating. Available in nine sizes, for maximum throughputs of 45-726 kg/hr (100-1600lb/hr), the units can stand alone or be used as part of an integrated Conair in-line film-scrap recycling system.

The cutting chamber features three or five knives on an open rotor. These are slanted relative to the two

Weima's single shaft shredder is suitable for rigid plastics, film, filaments and hollow objects



A plastic selection and recycling robot distinguishes between various kinds of plastics by using laser sensing technology

standard bed knives, achieving a scissors-like cutting action, ideal for uniform grinding of thin films. The rotor knives are adjustable to maintain a constant cutting circle and a constant gap between the moving knives, fixed bed knives and the screen – so screen clogging is almost eliminated and heat build-up is minimised.

This cutting chamber is also easy to clean and maintain. The screen cradle and granulate catch bin are mounted on the large swing-away front-panel door (in front of the rotor, rather than underneath) so they swing out of the way as the door is opened.

A fluff-conveying blower transfers regrind from the discharge bin to a hopper or surge bin.

Blowers are available in four different sizes to meet various rate and conveying distance requirements.

Spider shredder

Weima Maschinenbau presented its new Spider modular shredder system at K2010 – and even managed to sell a few models during the show.

Jörg Töpfer, Weima sales manager, said: “We were surprised by the high number of enquiries, especially from Germany. We received specific enquiries from across the world – a large number of visitors from India were noticeable.

The system consists of two modules. The cutting system comprises a rotor with various blade sizes and shapes. There are three different pressing system options, depending on the material to be shredded. Of these, a horizontal pusher is especially suited for rigid plastics, while a bow-shaped swing is particularly suited for films and filaments.

Conair’s FSG series has a three-way hopper that improves the recycling of scrap thin-gauge film and sheet

A slanted pusher is recommended for hollow objects.

“The range of applications for our shredders covers processing of production and post-consumer waste,” he said. “On account of such strong demand, we will further strengthen our sales team.”

The GM Tandem line from **Gamma Meccanica** can recycle materials that are printed, or which have over 10% humidity or heavy contamination. It consists of feeding system AFT Ecotronic Compac and two extruders arranged in tandem.

The efficiency of the system is guaranteed by a patented degassing system. At the end of the line is a TDA 4.0 pelletiser.

The degassing station is very efficient in the processing of printed materials. The TDA pelletiser significantly limits the interruptions of the production process, reducing the need for line maintenance.

The plant is suitable for regeneration of printed film with high humidity. By adding a lateral dosing system, it can also be used to regenerate heavy regrind.

Small wonder

A new small granulator from **Dynisco** handles a wide variety of parts and scrap, and is aimed at applications in plastic material testing laboratories.

“This is ideal for grinding production plastic parts for material testing and analysis,” said Matthew Caslow, global support manager at Dynisco. “It allows technicians to granulate lab scrap such as samples from melt-flow tests, rheometer tests, tensile tests and capillary rheometer tests and keep this material out of the waste stream.”

The granulator is powered by a 5hp electric motor, which drives an oversized flywheel to increase rotational momentum and decrease energy consumption. The slow-speed (200rpm) rotor has three rotating knives and two stationary bed knives counter-slanted to produce a scissors-like cut. These help to produce a consistent regrind with a minimum of dust and fines. Along with rotating sidewalls in the 6.5 x 8in cutting chamber, they also minimise heat generation to prevent the polymer from softening during granulation. Three different screen sizes are available.

The clamshell-design cutting chamber design and drop-down screen cradle allows easy access during cleaning and knife changes, says Dynisco.

At K2010, **Nuga** of Switzerland presented its range of CentriCut



granulators for grinding plastics and rubber. They are available as stand-alone or in-line systems. The series starts with type 33r for small- and medium-sized parts, with a maximum throughput of 500kg/h, through to type 44slr with a maximum throughput of 2,500 kg/h.

A major focus at Nuga is wear protection, and it has put its own wear-tester into operation. By applying the results of these tests to the production process, it has been able to raise the service life of typical wear parts substantially across its the entire range. Users benefit from low maintenance requirements, longer uptimes and reduced costs for recycling plastics and rubber.

Rapid has developed its largest 'open hearted' granulator to date, by adding a 1500mm wide model to its 600 series.

The series, which has a 600mm rotor, is already available in 900mm and 1200mm widths. It is designed for high volume granulation, and can handle throughputs up to 3500kg/h. There are 45 standard base configurations available, so it can be tailored to suit most large granulation applications.

Bengt Rimark, Rapid Group marketing director, said: "The 600-Series uses the same patented technology as the 300, 400 and 500 series granulators. The concept is completely modular and can be tailored to any application within the plastics processing and recycling industry."

The 600 series machines also come with Rapid's Mineral Composite Technology (MCT) base, which is a vibration-absorbing heavy platform. This makes it very heavy duty, and helps to reduce noise levels during operation.

The 'open-hearted' design means that, during a production change, the operator can gain access to the rotor and cutter at the heart of the machine in three steps – without needing any tools. This provides for a very rapid 'visibly clean' confirmation. The same quick access benefits maintenance work, says Rimark. It is designed for the high volume granulation, and can handle throughputs up to 3500kg/h.

Sensor sorting

Titech recently opened a 1,500m² sensor-based test facility for plastics sorting at its headquarters in Mülheim-Kärlich in Germany.

Set out in a loop which

prepares the waste by screening it and using a ballistic separator, the test facility uses all of Titech's sorting and recycling technologies. It has been designed to allow several different processes to run concurrently so that a customer's facility and operating environment can be accurately simulated.

During testing, changes can be made which ensure that the sorting systems are calibrated to deliver optimum levels of sorting and recycling for specific requirements.

Ralph Uepping, test facility manager, commented: "The facility allows us to work with customers to ensure that the systems will be deployed to their sites and immediately begin working as efficiently as possible."

A plastic selection and recycling robot that uses laser sensing technology as its 'eyes' has been manufactured in Osaka, Japan.

The technology distinguishes between various kinds of plastics by reflectivity. The photonics sensing technology was jointly developed by IDEC and the Photonics Advanced Research Center (PARC) in Japan.

This optical technology has been combined with robot technology from Mitsubishi Electric Engineering (MEE) to create the plastic selection/recycling robot.

Nowadays, only PET and PS are recycled in Japan, but their production rates are low – 5 and 7.6% of total plastics production, respectively. PE and PP have not been recycled as they are not distinguishable by eye, though they account for 23 and 22% of production, respectively.

The robot is expected to boost recycling levels of many kinds of plastics. The project is supported by the Ministry of Economy, Trade and Industry in Japan.



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