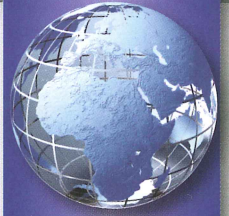


EXTRUSION

INTERNATIONAL MAGAZINE



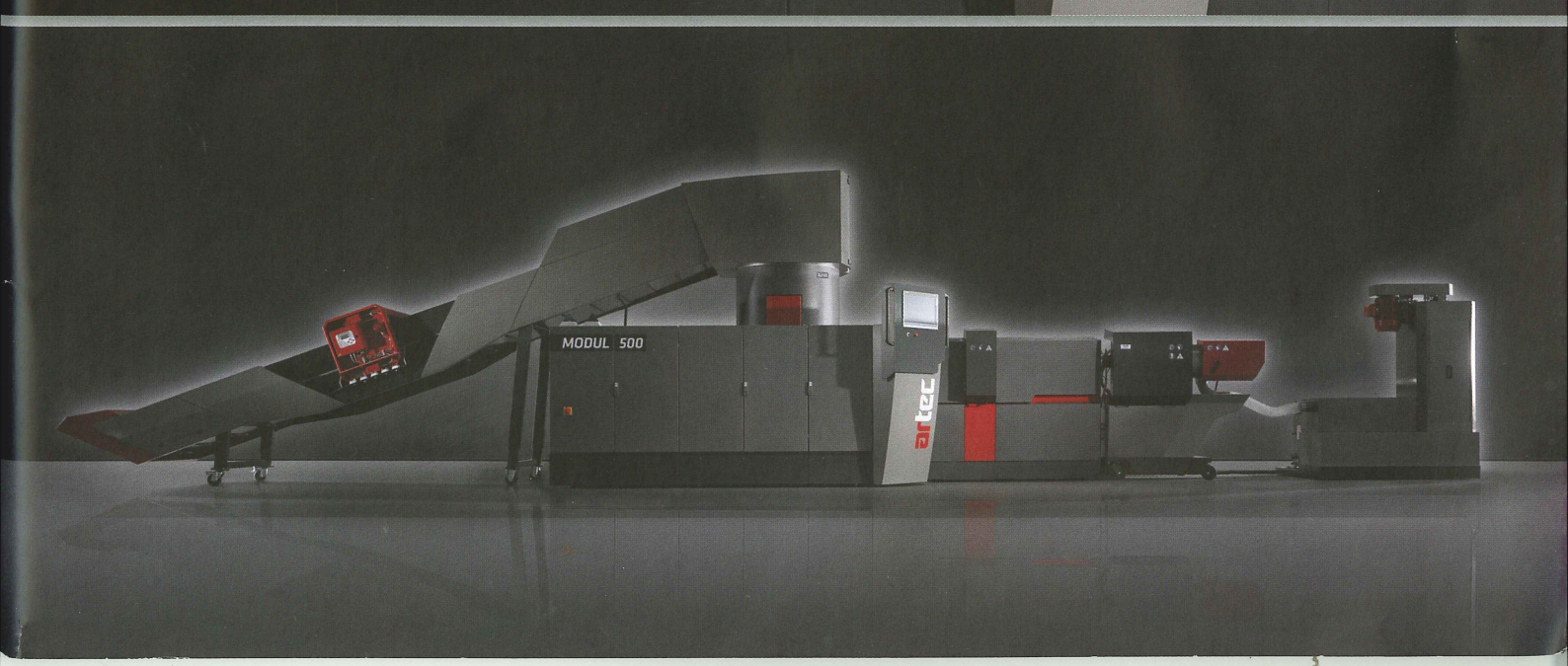
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S.24:
Neues und modulares Recyclingsystem
New and modular Recycling System



AUSTRIAN
RECYCLING
TECHNOLOGY



Flexible and Efficient Recycling of PET Edge Trims

The demand for higher production process efficiencies in the plastics industry has increased significantly in recent years. In addition to the time factor, the main focus has been the growing range of materials to be processed. This runs in parallel with the development of slitters and winders with much higher operating speeds in continuous operation and corresponding process flexibility.

One of these high-speed winders is the Conslit, manufactured by Kampf Schneid- und Wickeltechnik GmbH & Co. KG, which has been installed as part of a capacity increase of a plastics manufacturing company in Turkey. Together with KAMPF technology, Schuh Anlagentechnik GmbH made to measure extraction system guarantees reliable, round-the-clock PET edge trim extraction and recycling within the requirements of a flexible operation of the slitter and the trim removal system.

Production Requirements

The plants supplied by KAMPF and Schuh Anlagentechnik GmbH have been operating successfully in Turkey since December 2012. For more than 40 years, the Turkish company has been one of the leading suppliers of plastic packaging in Europe. Their products, manufactured with modern thermoforming machines, are supplied to well known brand manufacturers and vary in size from 50 to 3,000 cubic centimetres. The products range from food containers, cups, lids and trays. With its enormous variety of plastic packaging, the company covers a

broad range of requirements in the consumer goods industry. **(Picture 1)**

For the production of foil, the compact Conslit is an advanced version of the twin-spindle machines of the Conslit-family with working widths up to 2,250mm. KAMPF Conslit offers maximum flexibility for a wide range of applications. The continuing development of proven technologies enables the reliable and efficient processing of a variety of material combinations and the advantage of short set up times, especially when processing small batch sizes. It also handles paper, packaging films and laminates. Due to the overhead material guide as one possible machine configuration, it meets the highest hygiene standards in the final product, such as for the pharmaceutical and food industries.

The Turkish company's production process, a 1,750 mm Conslit slits the foil to the required size at an operating speed of 700 m/min, while the edge strips are transported direct or indirectly into the granulator. The edge trim has a material thickness ranging from 100 - 1200 microns and widths of 10 mm up to 50 mm. The special aspect of this project is the removal of edge trim material with a thickness over 800 microns, for which KAMPF and Schuh Anla-

Picture 2: Edge trim removal system during the pre-acceptance test (without sound hood)

Picture 1: View of the Suction line from the parent roll



genteknik GmbH were able to develop a suitable solution. (Picture 2)

Technology Characteristics

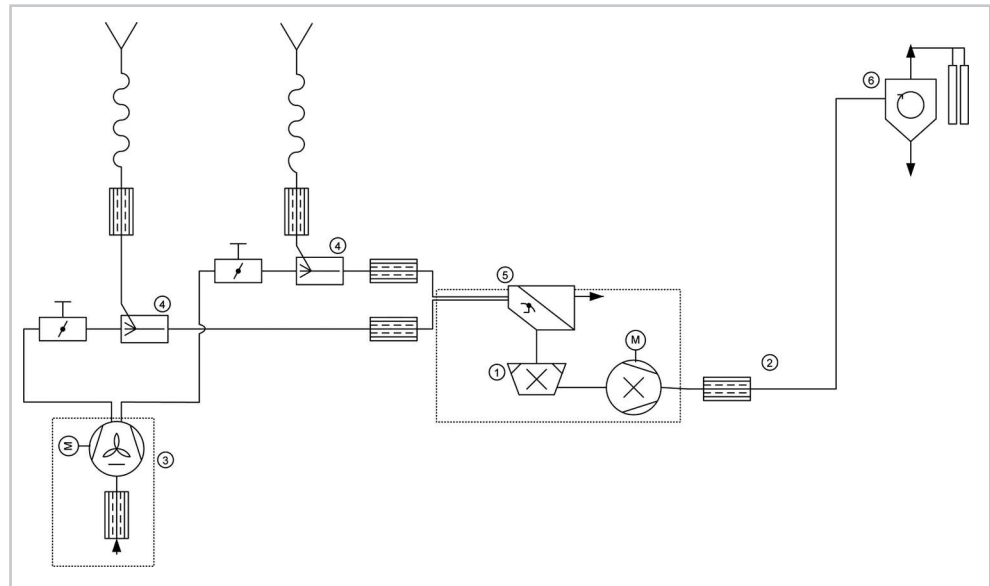
The Schuh Anlagentechnik extraction system acts as a material recycling system within the process: The extraction and transport system ensures reliable collection and transportation, as well as recycling of the PET edge trim from the packaging production. During the decision-making process to design the plant for processing the PET material, factors such as a high reliability and flexibility played an important role.

In the case of the Turkish packaging company, the engineers were confronted with an extra

challenge: The thickness of the edge trim led to a reduction of the material bending properties and therefore, restrictions to their automatic extraction. Together with the customer, different machine speeds were defined for the various material thicknesses, which also depended upon the economically achievable extraction power of the edge strip conveyor system. The maximum roll speed in this special configuration is possible up to a material thickness of 300 µm. For thicker materials, speed reduction is necessary down to 150 m/min for thicknesses of 800 µm.

The thicker materials of up to 1200 µm are transported to the separator by a reel feeder with a special roll guide system, whereby speeds of up to 50 m/min are still achieved. When operating the reel feeder system, the edge trim extraction system can be switched off, resulting in an energy saving of 22 kW. (Picture 3)

The edge trim is extracted directly at the Conslit. The solid material is then separated through an injector via a material separa-



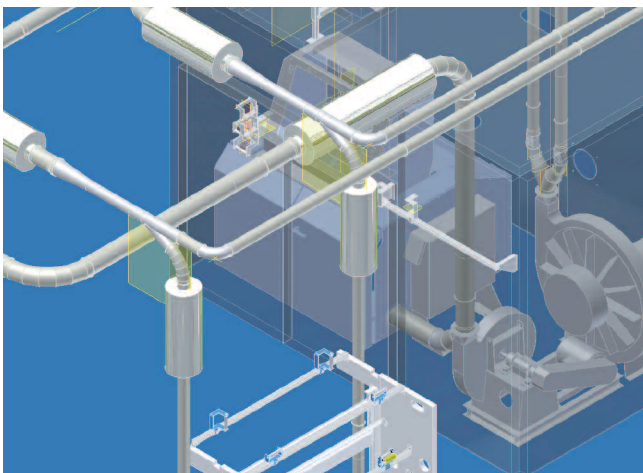
Picture 3: Edge Trim Removal Technology: The scope of supply of the edge trim removal system includes: granulator (1), conveyance (2) and ventilator (3), injector (venturi) (4), material separator (5) and cyclone(6)

rator. The required pressure and volume flow for the extraction of the edge trim is generated in the mixing duct of the injector by means of a jet orifice, which accelerates the air to the required high velocity. This air jet enters the mixing duct at atmospheric pressure, creating the venturi effect. A part of this energy is used to accelerate the solid material and for aspirating additional air volumes. The velocity of the airflow is further reduced at the diffuser. This principle can be applied to materials with a thickness of up to 800 µm.

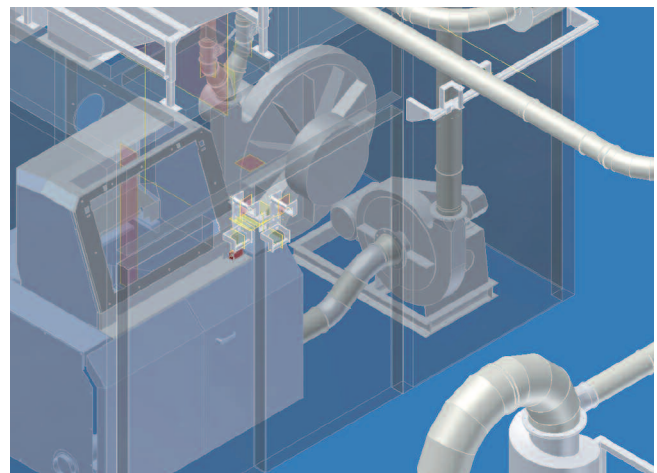
Additionally, the edge trim is transported to the granulator by means of a mechanical system. The extraction from the machine is achieved with the help of a speed controlled reel feeder. The SPS plant control regulates the tension to the production speed of the Conslit. Transportation from the machine to the granulator is guided by a pulley system. (Picture 4)

The PET edge trim is subsequently forwarded to the granulator, where the trims are granulated to the required size before it is transported to the cyclone by the transport ventilator. The

Picture 4: Suction and conveying duct on the Conslit



Picture 5: View of the components inside of the sound hood





Picture 6: Cyclone-Filter

pellets are then reused for the reproduction of new foil. (Picture 5)

The cyclone serves to extract the solids from the airflow. The cyclonic airflow is created in the tangentially arranged entry. The reduction of the cyclonic flow path and the corresponding centrifugal forces serve to separate the solid particles from the gas flow. These heavier solids drop out under atmospheric pressure. The pellets (fluff) are finally collected in Big Bag, which are stored for later use. (Picture 6)

All the main components of the plant are installed in a sound hood measuring 12 m² due to the space constraint. The extraction, conveying and recycling systems from Schuh Anlagentechnik are energy optimized and can accommodate the complete material spectrum from 100 to 1,200 µm. (Picture 7)



Picture 7: View of the sound hood and the material separator

Picture 8: Conslit and noise hood



Finally, the exhaust air is filtered through a simple filter system and returned to the production hall. This is able to save the additional costs for air after treatment.

Conclusion

During a period of only 12 weeks, the Schuh Anlagentechnik extraction and conveyer plant was manufactured and together with the Conslit, assembled and tested in the facilities of KAMPF in Dohr, Germany. Following the successful pre-acceptance test, the unit was dismantled, transported to site in Turkey and recommissioned.

Addition sound insulation measure are used to ensure that the noise levels generated by the plant. Since it's commissioning in the Turkish plastics production plant, the Schuh Anlagentechnik extraction, conveyer and recycling system and Kampf Conslit have operated with high reliability.

This type of unit has been seen to be highly suitable for all industrial air processes in which compact and space saving, as well as reliable, flexible and economic solutions are increasingly required. The edge strip extraction, conveying and recycling technology has now proven itself in numerous differing plastics, aluminium and paper industry applications worldwide. (Picture 8)

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