

Macchi S.p.A., Italy

Increased performance with lower energy consumption

The new five-layer co-extrusion machine by Italy's Macchi S.p.A. is designed for cost- and energy-efficient production of high-quality thin films at a high output.

With a product line that extends from single-layer machines to multilayer lines, Italian manufacturer Macchi, headquartered in Venegono Inferiore, Lombardy, delivers extrusion plants around the world. The product line ranges from single-layer plants with a film width of 800 mm to multilayer plants for three-, five-, seven-, and nine-layer structures to agrifilm plants with large widths. The move to co-extruded structures makes it possible to produce films with a significantly improved surface quality and higher mechanical strength, while maintaining optimum performance. Lower material thicknesses are possible, as excellent holding forces ensure stiffness and film strength.

The latest Macchi plant, the COEX5 POD, works as a five-layer co-extrusion machine on the POD (polyolefin dispersion) principle and is designed for high throughput and efficient production of thin, high-quality polyolefin films. The production line is equipped for a 1-2-4-2-1 structure with a 500-mm blown-film die head, which achieves a yield of approximately 900 to 1,100 kg/h, depending on the formulation.

Maximization of plant potential

Simotics M-1PH8 motors ensure smooth operation of the co-extrusion blown-film die head and precise control of the speed, pressure, and melt flow. The revamped induction motors with vector control offer all the advantages of asynchronous motors. The liquid-cooled motors are highly efficient, create little noise in operation, and are compact in size, requiring much less space than asynchronous motors. The plants in question are newly developed and not simply modified machines for the production of barrier films. From screw design to die-head geometry, existing solutions are designed to process polyolefin,

meaning a significant reduction in flexibility. The main advantage of the new system with five extruders is that it is possible to design a new film structure without the existing restrictions, allowing, for example, the use of polymers with high melt viscosity in the outer layers.

The new machine, which fits seamlessly into the Italian manufacturer's product line, aims to achieve high output, quality, and cost-efficiency. The extensive control achieved with its production control system enables the machine to meet its full operational potential. The EasyControl 4 Profinet user interface allows the operator to continuously monitor all parameters and intervene where necessary to regulate production. The resulting minimized downtimes and increased production capacities lead to substantially higher yields.

Successful energy management

Energy efficiency is becoming an increasingly important success factor for manufacturers of extrusion lines. When it comes to energy management, drive technology deserves special attention. It accounts for a considerable share of the plant's energy requirements and is thus an area with huge savings potential. Systematic logging of energy consumption throughout the whole production process offers plant owners the opportunity to implement successful long-term energy management measures.

Macchi employs specifically customized drive technology to ensure maximum productivity and reliability. The machine manufacturer relies not only on Simotics M-1PH8 main motors for the new lines, but also on the corresponding drive system. Thanks to their versatility, the modular Sinamics S120 drives are suitable for a wide variety of applications, from extruders to complex multi-axis applications such as Bo



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The five-layer co-extrusion machine COEX5 POD with a 500-mm blown-film die head can achieve a yield of up to 1,100 kg/h – precisely controlled by Simotics M-1PH8 main motors from Siemens

Drive system and Simotics M-1PH8 main motors interact perfectly for maximum productivity



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Plus winders. The Sinamics drives are fitted with a common control supply module specifically for this application. It is linked to various power modules – a solution that effectively saves space in the control cabinet.

All systems are networked via Profinet, thus ensuring fast and constant data exchange between CNCs and drives. Macchi uses the specialized WinAC Servo Light software for the entire line; this software was specially programmed by the Competence Center in Milan for controlling stretching units and winders. The software also offers a remote maintenance function, providing technicians with immediate access to all the units in the network in the event of a failure. This tool considerably simplifies and accelerates fault diagnosis. According to the Italian machine manufacturer, partnering with Siemens means being perfectly equipped to successfully meet the challenges of the extrusion plant market, both now and in the future. ■

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