Rendezvous in Milan

A Home Game for the Italian Plastics Industry. Plast 2003 will be held in the Fiera Milano exhibition grounds from May 6th to 10th. Primarily because of the high numbers of visitors from abroad, it is the second most important plastics show in Europe after K in Düsseldorf. The Italian plastics industry is seizing the opportunity in Milan to demonstrate its innovative prowess to the experts.

German plastics manufacturers are still the most important target export group for the Italian plastics machinery industry: every year, German companies import plastic and rubber processing machines to the value of over EUR 300 million from Italy. The new developments to be unveiled by the Italian machinery sector at the Milan show are awaited with excitement. Numerous companies have already revealed to ***Kunststoffe* plast europe** what they intend to display – a summary of these is presented below.

Extrusion of Films and Panels

Dolci Extrusion, Milan, has developed a new three-layer coextrusion line with a maximum effective width of 2000 mm (Fig. 1). The line features three parallel extruders with compact drive systems that economise on required floor space. Blow head and nozzle have a multi-split design. The melt is divided into two streams in the blow head. This prevents overheating of the melt and ensures a uniform film gauge. The system is equipped with an efficient internal bubble-cooling system and a non-contact thickness gauge. The horizontal winder, which has a chromium-plated roller, produces rolls with a diameter of up to 1000 mm and winds the film up very evenly from the beginning. Featuring an extensive automation package, the extrusion line cuts down on work and levels of production scrap.

Friul Filieri, Buia, will be showcasing a 60-mm single-screw extruder with high output, high sound insulation and low energy consumption. The company has made great progress in equipment for producing very light foam panels and profiles (Fig. 2) and has reached densities of 0.4 to 0.05 kg/m^3 for PS, PP and PE.

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Brabor, Ubersetto di Fiorano, has developed a die head with two blown-film dies that can be attached to standard extrusion lines (Fig. 3). This allows full use of the extruder's production capacity, without excessive stress being placed on the material processed. Different items of downstream equipment can be hooked up in parallel, e. g. to cut one film bubble and to roll up another. Brabor sees its main application in medical engineering.

Euro Chiller, Castello D'Agogna, will be presenting its patented ABF/Twin System, a new cooling unit for blown-film extrusion, for the first time ever at Plast (Fig. 4). The machine can supply air to both the air ring and the internal cooling system. Different temperatures and air quantities can be set in the two cooling systems. The advantages of the method are greater productivity, better film quality as well as a stable production process.

In parallel to Plast, **Primplast**, Melzo, will be organising a company fair at which an up-and-running coextrusion line will be demonstrated. The machine has three extruders, whose screws are designed for processing PE-LD, PE-LLD, PE-MD and metallocenes (Fig. 5). Energy consumption is relatively low since alternating current motors are used for the screw drives, and infra-red lamps for the barrel heaters. Primplast will be operating a shuttle service from the exhibition grounds to its company show and back.

BG Plast, Marnate, will be displaying two new single-screw extruders, the inexpensive TM 50-25, and the THM 60-33, which is accessorised to meet the highest demands. An extrusion line for producing PET film from scrap PET bottles will be in operation in the Marnate plant during the show. This was a joint project with **OMC**, Saronno, a manufacturer of twin-screw extruders.

Pipe and Profile Extrusion

Gimac, Castronno, has developed a new, almost 3-metre-long micro-coextrusion line for the production of small tubes with an outer diameter between 0.4 and 4 mm (Fig. 6). It has an output of between 0.1 and 4.5 kg/h. The line consists of three extruders with a screw diameter of 12 mm combined with a screw length of 20 D, a three-layer die, a vacuum-calibration unit and a take-off unit with a maximum speed of 84 m/min. Gimac believes application areas lie primarily in the medical and pharmaceutical sectors, such as the production of small tubes with x-ray contrast strips.

Rossi Stamp, Bando, has announced a new concept called "Fibreplas" for extruding fibre-reinforced profiles. It can produce a profile reinforced in certain areas to fulfil specific mechanical requirements (Fig. 7). Rossi Stamp sees potential for increasing the flexural strength by up to 500 % relative to conventionally extruded profiles. Since there are no reinforcements made of metal, it is possible not only to reduce costs with this process but also to prevent unwanted thermal conduction and corrosion.

Blow Moulding and Thermoforming

Automa, Crespellano, will be showcasing its newly developed Plus AT 10D blow-moulding machine, which is designed for producing coextruded 6-layer plastic containers for foods such as ketchup, mayonnaise and fruit juices (Fig. 8). Five extruders are attached to a fourfold blown-film die. The machine produces up to 2000 food bottles per hour with a volume of 200 ml and a weight of 28 g.

Meico, Monza, will be presenting an all-electric automatic thermoforming machine (model: FCS 750E) that is notable

for its low energy consumption and rapid mould changing. The maximum mould size is 750 × 530 mm. Meico will also showcase its TA 500 XL blow moulder with a clamping force of 500 kN. The machine's accumulator head is fitted with a radial wall-thickness control system and has a volume of 2 litres.

Injection Moulding and Mould Technology

BM Biraghi, Monza, will be launching a new Sintesi series with clamping forces of between 750 and 2500 kN. This smallest injection moulding machine range (Fig. 9) has been completely overhauled to enhance reliability, accuracy and functionality. The toggle clamping unit satisfies high demands on accuracy and clamping force. The distance between tiebars and the dimensions of the clamping platens have been increased to allow moulds larger than the precursor models to be used. The compact injection unit generates pressures greater than 1700 bar. A high L/D ratio ensures top-quality plastication. A Sintesi 125/570 IML model will be in operation at the show, producing an ice-cream tub weighing 33 g.

MIR, Brescia, will be unveiling a new high-speed, toggle injection moulding machine that has a clamping force of 5400 kN. Production of a 20-litre bucket made from PP with a low melt flow index will be demonstrated on the stand. The cycle time is 14 s. Despite the long flow paths, the low wall thicknesses of about 1.8 mm and the relatively unfavourable flow properties of the material, the cavity can be filled completely. In addition, MIR will present a 1900-kN horizontal press for elastomer processing. This machine features a larger distance between tie bars and an injection capacity of 129 cm^3/s.

MIR and the mould manufacturer Cantoni Stampi, Abbadia Lariana, have founded a company called **Cantoni Injection MIR** which delivers the full range of equipment for PET preform manufacture. An all-electric injection moulding machine with a 2800 kN clamping force will be on display at Plast (Fig. 10). Cantoni has developed a corresponding mould that does not require robots for preform handling. A special cooling system for the cavities shortens the cooling time. The machine can produce 12 PET preforms for 1.5-litre mineral water bottles in a cycle time of 14 s. Short flow paths in the mould ensure that the acetaldehyde content in the preforms satisfies legal provisions on drinks packaging.

The Fail-Safe system from **HRSflow**, S. Polo di Piave, is an ancillary unit for hot-runner systems that contains additional heating elements and temperature probes for the nozzle and manifolds. This increases the reliability of the hot runner system and prevents costly interruptions to production.

Spotting presses allow moulds to be opened and closed any number of times during testing. Trial injections and shot strikes can be carried out at the touch of a button. **Milutensil**, Milan, will be introducing its new generation of BV spotting presses (Fig. 11). The presses have been fitted out with new side protection housings. Floor space requirement has been reduced, and the hydraulic system and electronic system area are more easily accessible in this new generation. The pressure is no longer set manually on the side pressure regulator, but electronically by means of a control panel.

Automation

Star Automation Europe, Caselle di Santa Maria di Sala, will be presenting two new ranges of linear robots. The high-speed Zx-800 robot with a payload of 3 kg features high-performance digital motors and is especially suitable for the production of packaging. With the model Gxe-2500 (Fig. 12), Star Automation wants to advance to the production of large parts. The payload of this robot is 35 kg.

Shredding, Recycling

Tria, Cologno Monzese, will be displaying all its seven granulator series. A new addition is the JM series, which has a cutting chamber of wear-resistant steel featuring a Vickers hardness of 750 (62 HRC). An improved drive arrangement ensures that the effective current consumption during operation is just between 400 and 600 W. Thanks to an improved cutting angle, maintenance intervals are longer. In its slow-running Scutter granulator, Tria offers a solution for in-line recycling of sprues, particularly during the manufacture of electronic components, cosmetics products, and for the processing of glass-fibre-reinforced plastics. The system consists of a granulator, equipped with milling cutter rotor, that is operated at a speed of 25 rpm without generating dust. The meshing width of the knives determines the particle size of the grinding stock. Tria will be launching the XT-BM series (Fig. 13) of four models for shredding extruded and blow-moulded parts. The compact granulators with a drive load between 7.5 and 22 kW are notable for low noise level.

Tecnova, Ollegio, will be demonstrating its new E160/54 D recycling machine with double degassing system that can process polyolefin films with a high content of printing ink or moisture. The machine can be equipped with a screen-changing device and a die-face pelletiser.

E-Trim is the name for the new unit from **Gamma Meccanica**, Bibbiano, that can return scrap back to the production line. The granules are of the same quality as granules of virgin material. The recycled material can therefore be processed in volumetric or gravimetric feed systems. Gamma Meccanica will also launch a granulating system that reduces the amount of scrap produced during start-up and product changes, along with a new mixing system that enables single-screw extruders to reach a level of material quality comparable to that yielded by twin-screw extruders.

Compounding, Metering

Techint Pomini, Castellanza, has developed a continuous compounding line that combines the advantages of a continuous mixer with those of a melt gear pump (Fig. 14). The equipment consists of a mixer with countermoving rotors, the gear pump at the mixer outlet, a continuous screen changer, a carbide-tipped nozzle and an underwater pelletizer system. A special mixing mechanism ensures good melt quality plus low energy consumption. The rotors mesh with each other in the feed section for high output. They are held at both ends to prevent contact with the mixing chamber at high speeds. Two valves installed on the mixer and the melt pump allow the mixing and melting process as well as the dwell time in the mixing chamber to be controlled.

Win Dosing System software from **Piovan**, Maria di Sala, offers fast and simple recipe formulation, recording of all data from installed feed systems, real time display and statistical analysis of consumption by various units. The system improves the interplay of gravimetric feed systems with the computer, thereby facilitating centralised control and monitoring of metering processes. It can immediately generate graphics for any formulation employed and summarise key operating parameters. Also part of the delivery scope are special programs for the use of recycled materials and the transfer of recipes from one mixing system to the

next, with automatic testing of compatibility. Alarm signals and the operating state of every mixing system are recorded and can be e-mailed to the Piovan after-sales service. The software can optionally be equipped with a module for production tracing that documents the start and end of production as well as the components and blender used for all batches. This allows users to perform detailed checks on costs and quality of each batch.

Machining

Cibra, Cernusco sul Naviglio, will be showcasing a fully automated production line for disposable gloves made from biodegradable film. These gloves made from Mater-bi (Fig. 15, manufacturer: Novamont, Novara) are antistatic and can be worn for longer intervals because the film is permeable to air. The line can produce the gloves in different sizes.

Belotti, Suisio, has rounded out its product line of numerically controlled work centres for the plastics industry. Different designs of work-tables are available. New to the range is the model BL 300, with six translation axes and innovative presentation graphics of the processing head. Materials and Testing Technology

Material and Proofing

A flame-resistant low-density PP homopolymer whose dimensional stability almost matches that of PP with mineral fillers has been developed by **Vamptech**, Busnago. The material with the trade name Vamplen 0024 V2 LBC fulfils the provisions of UL 94 V2, is halogen-free and can be used at a sustained temperature of 110°C. Application areas are primarily small electrical devices (Fig. 16) which are used in the household and are subject to directive IEC 60695-2-13. For applications with even higher requirements, Vamptech offers the PP grade Vamplen 0024 VO, which has a fire rating of UL 94 V0.

Ceast, Pianezza, has developed a capillary rheometer for performing several determinations simultaneously (Fig. 17). For this, the device is equipped with two or more capillary bores. The ratio of capillary length to diameter varies. If the same polymer is examined in capillaries of different length, the so-called Bagley correction factor can be calculated from the shear stresses. The correction factors can be determined very precisely because the determinations are carried out under exactly the same conditions. A further application of the Rheologic 5000 Twin is the simultaneous examination of different materials, e.g. for comparing different batches with each other. The time requirement is considerably reduced because the measurement is performed on several capillaries. ■

THE AUTHOR

HARALD SAMBALE, born in 1966, works as a freelance technical journalist in Munich.

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