

► FULLY  
AUTOMATED  
ROTOMOULDING ◀

**MULTIPLE-LAYER  
ROTATIONALLY  
MOULDED PRODUCTS**

At the Plast'06 exhibition Persico will be introducing a new technology to manufacture a multiple-layer rotationally moulded products (hall 14, booth F15). This new capability utilizes Persico's Leonardo machine, a new fully automated rotational moulding system.

This new capability allows designers to produce products with layers of material each providing different properties and benefits. For example, the

wide variation in wall thickness. The new Leonardo technology can produce multi-layer products with extremely uniform wall thickness without any operator intervention. With Leonardo, the large oven in which many moulds rotate bi-axially has been replaced with oil heating and water cooling directly on the mould. Not only does this improve energy efficiency, the oil can be heated by either gas or electric depending upon which one is most readily available or cost effective. With oil heating, the mould can be either heated to a consistent temperature or different zones can have more or less heat applied, resulting into precise control of product wall thickness from highly uniform to highly varied. A product/mould can now be designed with double the wall thickness in particular area to provide structural strength, durability.

By designing products with reinforcing zones, required material and part weight can be greatly reduced. In addition, cut out areas can be designed to remain

cool throughout the cycle so that no material forms in that area. This also reduces scrap and resin consumption.

The precise control of mould temperature and cycle time provided by Leonardo allows also rotational moulders the opportunity to process materials other than the classic polyethylene. Persico is currently testing polyamide 6, polypropylene and polycarbonate.

Looking around the rotational moulding industry very few plants have automated the steps in the rotational moulding process.

The new Leonardo machine fully automates each step.

The machine provides automated material loading, part loading/unloading. Finished parts are unloaded in an established area. Mould changeover is quick and easy. A single operator can control 4 to 8 machines similar to injection moulding or extrusion processes. Maintenance costs are greatly reduced and part quality and consistency is standardized. Leonardo offers the capability of filling closed moulds which eliminates the

problem of having enough room in half the open mould to fill it with the high-volume, low-bulk density and powdery rotomoulding resin.

Persico can customize Leonardo by size, features, energy source, level of automation and integration into existing facility.

► RECYCLING ◀

**COMPACT EXTRUSION  
AND REGRANULATION  
LINE**

The new equipment Compak 51/A meets the requirements of many customers who were asking for a more versatile line. This machine, on show at PRT booth at Plast'06 (hall 15, booth B/C 18/17), joins the characteristics of the previous equipment Compak 50, being a compact extrusion and regranulation line for inline recycling of reels and edge-trims, with the possibility to reprocess loose film as well. This new equipment maintains all functions of Compak 50 adding a film grinder and a feeding system, in order to feed the extruder with regularity and obtain an output capacity of 50 kg/h.

The line consists of following components:

- granulator G 25 - 30 studied for high output suitable for recovery PE film. Grinding chamber made of thick welded carbon steel sheet, with subsequent spreading and machining of all parts where coupling with other complementary parts is needed. The rotor blades with inclination studied for an effective cutting and reduced applied power. It is composed by a forged steel shaft with blade holding sector welded and supported by oscillating bearings. The

upper hopper is entirely made of carbon steel sheet welded together. It is operated by an electric motor with transmission unit including guide drive pulley, "V" belts and protection case. Electric motor 7,5 kW.

- Feeding unit for plastic film flakes especially designed for application on Compak 51/A.

- Trims and rolls in feed system located on the extruder mouth, essentially made of two knurled rolls driven by a variable speed geared motor, a pneumatic cylinder to keep the rolls in pressure on the processing material and a special hopper. (Installed power 0,18 Kw; intake speed: 20 m/min).

- EX 50 single screw extruder with special feeding zone to permit the direct loading of the extruder itself. Supporting frame made of welded steel sheets properly machined. Parallel shaft driving gearbox complete with thrust bearing. a.c. variable speed drive electric motor connected directly to the gear-box by means of a joint, motor speed controlled by inverter. Extrusion barrel and screw made of special nitrided steel. Barrel heating by electric ceramic heating band enclosed in an stainless steel casing

with insulation and reflecting parabola. Feeding zone cooling by water circulation. Barrel cooling by air circulation. (Screw diameter: 50 mm; L/D ratio: 9:1; screw speed: 0 -144 rpm; heating power: 3 kW; drive motor power: 13,2 kW).

- Lever screen-changer CL 50/50; manual operating screen-changer with sealing system "torpedo-teflon ring", complete with electric heating bands, thermocouples, and electronic pressure-gauge with alarm bell and light. (Filtering area: 50 mm; heating zone: 1; heating power: 1,5 kW).

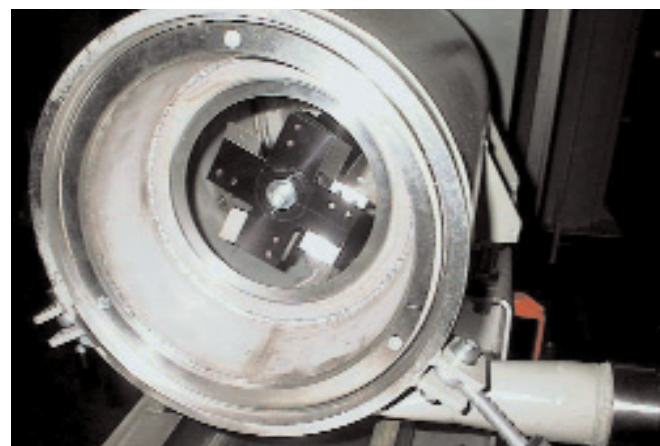
- DFC- 50/A air die face cutting unit. Hot melt granulation head with air-circulation cooling system is the rational and practical solution of the problem of hot granulation, studied for an easy and cheap running maintenance and cleaning in the operation of colour or material changes. The system allows hot granulation of LDPE-HDPE guaranteeing the perfect granulometry and complete cooling of granulated products.

Technical features: connecting stub screen changer - die face cutter head heated by electric resistance. Inside the head is fitted a special torpedo in order to distribute uniformly the



outer layer could provide a high level of UV and impact resistance, the centre layer might be insulating polyurethane foam finally. The new Leonardo machine fully automates the injection of additional resins and blowing agents during the moulding cycle.

The precise heating of the mould allows the moulder an unprecedented level of control of the wall thickness of each layer. A product can now be designed and manufactured with specific areas of increased wall thickness for additional strength, rigidity or insulation. Until now, the methods to produce multi-layer rotationally moulded products were limited. Most often, the mould is stopped during the heating cycle, opened and the operator pours in an inner layer of material, and then continues the cycle. Another method uses a bag which holds the second layer. The bag melts during the cycle to release the resin but never fully blends with the resin leaving an unsightly surface. One-step foams are also available but have an extremely



melted material to the die-head. Horizontal shape granulation chamber equipped with air-ring cooling system. The granulated material is sucked out from granulated chamber and blown to the cooling cyclone where it is finally cooled by an air-counter flow system. (Cutting power: 0,55 kW ; thermoregulation zone: 1; installed power: 6 kW).

- Electric control board for the complete line located side the extruder, containing all electric and electronic devices for the drive, control and thermoregulation.