injection molding

Gum
Small and efficient

Two new injection molding machines for elastomers and silicones, ideal for the production of technical parts, even in small batches

by **Gianandrea Mazzola**

Precise, compact and flexible, the new Gum 50 Hydroblok and Gum 100 Hydroblock integrate lower tonnage inject machines for elastomers in the Gum series by **Industrie Meccaniche Generali** (IMG) a manufacturer based in Brescia (Italy). «Integration that opens up interesting possibilities in sectors for diverse application, thanks in part to our ability to develop servo systems and automation, and thereby build custom, totally independent work stations», Davide Bonfadini, Sales Director for IMG, says. They are both horizontal machines, with clamping force of between 50 and 100 tons, designed for the production of small series or appropriately sized technical details, that match the performance and efficiency of larger sizes from which they have inherited technology and technical innovation.

Cycle rapidity and energy efficiency

Fitted with Hydrob lock clamping with four jacks and high pressure cylinder (available also with toggle clamping unit), the new Gums have a free floating platen, guided on a base with re-circulating ways and automatic greasing. With reaction head and cylinder-cutter

Gum 100 Hydroblock

Weight: 4 tons
Average absorbed power: 11 kW/h

CLAMPING UNIT
Mold clamping force: 100 tons
Floating platen stroke: 400 mm
Maximum mold thickness: 600 mm
Mold thickness: 0-200 mm
Platen external dimensions: 610 x 610 mm
Tiebar span: 410 x 410 mm
Tiebar diameter: 65 mm
Central pneumatic extractor stroke: 50 mm
Heating platen dimensions: 475 x 475 mm
Heating platen power: 8 kW

INJECTION UNIT
Screw diameter: 38 mm
Screw stroke: 120 mm
Theoretical injection capacity: 85 cm^3
Specific injection pressure: 2,300 bar
Injectable volume: 40 cm^3

CONTROL
Moog or B&R

supports (also guided on re-circulating ways), these machines have self-lubricating bushes on the reaction platen and clamping jack, in addition to the "free" tiebars of the floating platen. To best meet the most diverse market needs, IMG designers have created a "turnkey" package for these machines, which already meet the technical requirements necessary for the applications they are dedicated for.

«The machines are fitted with a direct current motor with gear pump, drive control system with servo inverters and adjustment system with unidirectional valves, which permit individual sequential movements», Bonfadini points out. Features and technological choices that translate into faster cycle times, significant energy saving, as well as effective closed-loop control.

The presence of a brush for cleaning the molds (available in single or double, blow or non-blow version), along with heating platens (square with bevel and relative insulating platens) in the standard or magnetic versions complete the range of accessories.

Rubber, solid and liquid silicone

The injection unit selected for these machines by the manufacturer based in Brescia is reciprocating, with a configuration that makes it applicable for processing most compounds. «Not just different types of elastomers but also silicone, because the injection unit can be set up for use with a hopper for processing silicone paste or adapted for molding liquid silicone», Bonfadini says.

High precision, vital for technical parts, is guaranteed by the presence of a small diameter screw (30 mm), which delivers high production capacity for small batches. «In user facilities, it is increasingly frequent to see the presence of this type of machine not in single installations, but in sets», Bonfadini adds. «A solution that proves to be a winning choice, especially in the production of small batches of pieces that are highly diverse, and that offer interesting benefits from the standpoint of flexible operation, energy and production facility, but also the considerable advantage of reducing mold changing times».

Shorter times and lower costs

The new models are therefore a precise response to the needs of producing technical articles where the numbers do not justify the under usage of more powerful presses, with the relative higher cost of molds and consumption.

«Or where the times between sample and production are greatly dilated», Bonfadini continues. «Like the automobile industry, where the decision to start production is taken 12 or 18 months after the first samples are made. Having a machine with the characteristics mentioned above thereby can minimize investment and optimize resources, achieving the desired technical results».

But this is not all. The new machines offer interesting advantages also in the pharmaceutical sector, where technical blends weighed in micro grams are sometimes used. «In these cases, it is vital to have a machine that permits mold change and faster set up», Bonfadini concludes.. ■

Molding embraces sustainability

The newly designed GUM and GUM FIFO series of injection molding machines developed by IMG for the processing of elastomers are equipped with the innovative HST (Hybrid Servo Technology) and ECO (Energy Saving Process) systems. The main advantages of these new technologies are that they allow a reduction in the total quantity of oil used for machine movement, and also reduce oil wear and overheating, all of which translates into considerable energy savings. Furthermore, they ensure greater accuracy of movements, which are managed directly or indirectly by servo motor PID controllers optimised to allow the best performance. The philosophy behind the new HST system is, indeed, to leave the master movements under hydraulic control, while all the accessory movements (those superimposed on the master ones) remain electrically controlled. The hydraulic control unit is operated by a servo pump, which allows the dimensions of the motor compartment to be minimised and reduces the amount of oil needed, which also lasts longer.

GUM FIFO injection molding machine

These features add up to high precision in the production cycle, greater repeatability thanks to the use of drives in speed loop, and a more than 40 percent reduction in electricity consumption. Energy savings are also favoured by the ECO system, a mode of operation that allows the machine to work at low power consumption levels, moving without wasting energy, thanks also to levelling of the power peaks. By introducing these systems, IMG is embracing an all-round concept of sustainability that includes, in addition to electricity savings, a 50 percent reduction in the amount of oil used, lower consumption of water for oil cooling, and significantly reduced noise levels. The objective, for the future, is to provide the machines with a regeneration system that will make it possible to feed the energy dissipated from the machines back into the company's power network. The machine electronics feature a VNC server, which, on entering a password, can be interfaced with any client, on any platform (PC, tablet, smartphone), remotely or locally, in order to obtain continuous monitoring of the process data.

"The small machines in the Gum series are the ideal choice for producing small batches"
Davide Bonfadini