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Press Release

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Extrafill: a new monobloc unit integrated with a futuristic gripper that moves just like a human hand

Presentation

Extrafill is a filling and stoppering machine for syringes in nests, developed to meet the growing demands of packaging disposable pre-filled syringes. **Extrafill** is compact and flexible and designed to accommodate from two to five stoppering stations and to make it easier to manage the work areas.

During the last edition of **Achema**, the machine was showcased with a new integrated weight control system; this time, the **Extrafill** will be exhibited as a **futuristic monobloc unit designed to combine the two tub opening and syringe filling/stoppering phases under just one isolator.**

The outcome is a machine capable of delivering 12 thousand pieces per hour, guaranteeing incredibly precise batching operations, thanks to systems that centre the syringes and completely protect them during the filling phases, to avoid contamination and to ensure a **perfectly sterile process.**

Technical features

The machine on display at **Achema 2015** will have the tub opening (by means of a robotic peeler) and syringe filling/stoppering phases integrated all in one monobloc unit.

Once loaded on the machine, the tub passes under the warm-up system that heats the edges. The tub filled with syringes then passes under the opening station where a **robotic arm peels off the Tyvek® protective film and pushes it onto**



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the loading belt of the machine to continue towards the filling and stoppering stations.

Just one isolator protects both zones, but still separates them with vertical laminar air curtains and controlled pressure flows of air, to guarantee sterile processes in the individual sections.

The isolator and the machine are sterilised by vaporised hydrogen peroxide (VHP). The VHP technique minimises process sterilisation times and also aeration times when the residual concentration requested is just a few PPB.

The new monobloc is equipped with peristaltic filling pumps and innovative statistic batched weight controllers in order to offer customers **not only economic benefits but also technical ones**, compared with traditional solutions, thanks to the fact that the individual management systems are simpler and the machine footprint is much smaller.

The heart of the machine: a new high-tech arm that moves just like a human being

The robot that has been integrated in the new syringe filling unit is the outcome of research activities carried out by the Marchesini Group to innovate the automatic machinery industry. Both the mechanics and software of the peeler have indeed been developed entirely by the R&D team with the aim of devising a specific **robotised system capable of handling the product with outstanding efficiency in sterile conditions.**

Since it has been purpose-designed for this function, the robot has been given a **futuristic gripper that moves just like a human hand.** The software is also incredibly effective in moving it and performing the various consecutive operations:



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Phase 1 - Handling: The robot gets hold of the tub and puts it into position;

Phase 2 - Look for peel-off corner: This phase has been studied to mimic human hand movements. The robot looks for the corner of the film to be lifted, also, or especially if the corner is folded, and grasps it to remove it delicately;

Phase 3 - Peeling: The robot peels off the protective film and throws it into the dedicated bin;

Phase 4 - Remove second cover from tub: The robot uses its suckers to get hold of the second cover of the tub, removes it and throws it into the rejects bin;

Phase 5 - Handling: The robot gets hold of the tub again and carries it to the outlet.

Flexibility

The machine is **easily integrated in various possible layouts and material flows** thanks to the special design of the work areas. Special attention has been paid to designing the moving components, preferring the use of rotary drive shafts or linear drive shafts with open wheel, which are indispensable techniques to ensure machine cleanliness and to integrate RABS or isolators.

Precision and reliability

Optimization of the working phases for the various products dispensed – phases that can be saved on the operator's interface and pulled-up later for the format involved – is guaranteed by servomotors that drive the main movements of the machine. **Several filling systems are available** – such as volumetric steel or ceramic pumps, peristaltic pumps – as well as the circuits for fixed dispensing units with CIP/SIP or with disposable systems.



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In addition to dispensing precision, the machine also guarantees **maximum protection of the syringes**, which must not be damaged in any way during filling. In fact, the *Extrafill* machine avails of exclusive systems during syringe handling, filling and stoppering phases, which optimise centring, thus safeguarding the syringe tubes against the risk of breakage or damage.

Integrated weight control system

The machine has been enriched with the integrated weight control system (IPC). The sampling and control system of the weight of the product batched in the syringes (IPC) makes it possible to verify the tare weight (unfilled syringe) and the gross weight (filled syringe without stopper) using just one load cell, for each filling station. Sampling can be performed once on the single nest and at a rate of the nests that can be chosen via the control system.



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