

ROBOTIZED ISLAND (CELL) FOR THE PRODUCTION OF PARTS FOR THE AUTOMOTIVE INDUSTRIES**Cooling circuit rubber/plastic caps**

The robotized island for the production of parts for the automotive industry integrates the different production phases from pressing to the finished product. It is used to draw, trim and fit up simultaneously and automatically 64 rubber caps on the corresponding plastic inserts.

The rubber caps are pressed by a rubber injection press, while the plastic pieces are automatically drawn from an accumulation store placed in proximity of the fitting area.

Through both electrical and pneumatic movements the island (cell) translates the bottom die rubber pieces holder outside the injection press. A vertical electrical axis approaches the taking group to the pieces to be drawn; then the taking group hooks the rubber pieces and simultaneously releases the burr pieces. At the end of the trimming process the electrical vertical axis pulls out and removes the burr from the pieces and from the bottom die with a complete ascending movement. At the end of the drawing, trimming and cleaning phase, the bottom die goes back into the press to start a new pressing operation and the central burr-taking pliers let the burr fall onto a butterfly-shaped chute, which rotates so as to turn the burr over into a special container and prepares itself for the fall of the fitted pieces into a separate container. At the end of the burr unloading the insert plate advances towards the inserts-presence control position and subsequently to the rubber pieces fitting position.

Before the insertion – though coordinated movements between the vertical axis and a second plate - the straightening and a new low-pressure taking of the rubber piece is carried out. Subsequently, the vertical axis descends and fits the rubber pieces into the plastic pieces, after which the vertical axis ascends, plate 1 goes back to the complete backward position under the accumulation store to wait for the loading of a new series of inserts. At the end of the re-entry of plate 1 the vertical axis descends and releases the assembled pieces into the special container, after which it ascends again, so consenting the repositioning of the butterfly-shaped chute in the burr fall position at the beginning of a new drawing cycle at the next press opening.

ADVANTAGES:

- **REDUCED THE TIME OF ITEMS REMOVE**, because it's made at the same time for all the items and not one by one as in a manual removing cycle.
- **REDUCED MANUAL LABOUR**: cycles are completely automated and therefore one operator can control several machines.
- **REDUCED OPEN MOULD TIME**, then smaller moulds cooling and smaller vulcanization time.
- **ELIMINATION OF UNDUE CYCLE STOPS** and their pertinent problems due to moulds cooling down, such as scraps due to insufficient heating, moulds cleaning and eventual removing of them, purges for cleaning the nozzle from prevulcanized material.
- **REDUCED MACHINE DOWN TIME**: it is no longer necessary to wait for the operator to remove moulded items.
- **IMPROVED QUALITY AND CONSISTENCY OF MOULDED ITEMS**: continuous extractor cycles eliminate hazardous open machine down time due to operator absence and/or extraction speed, thus preventing the mould from cooling off and/or the compound from curing in the injection pot and extruder, which may change the physicalchemical properties of the moulded item.
- **THEY PROVIDE A RAPID RETURN ON INVESTMENT.**
 - **IMPROVED PLANT OPERATING TIME**: simplifying the machine work load programming, it's really easier to programm, because of costant cycle times.

DESCRIPTION OF THE MACHINE AND TECHNICAL SPECIFICATIONS	I
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- **REDUCING LABOR FOR THE TRIMMING OF PIECES:** the use of a mechanical hand consents to automatically remove and separate the burr from the pieces that have been directly pressed during the drawing phase.
- **INCREASING THE NUMBER OF PRESSING OPERATIONS PRODUCED IN THE TIME UNIT:** it is possible to draw the pieces in masked time, that is with closed press during vulcanization, so increasing the number of pressing operations in the time unit.
- **CAREFULLY DRAWING THE COMPLEX AND DIFFICULT PIECES** like curved rubber sleeves for household appliances without affecting the global cycle time because the operation is carried out outside the press in masked time, that is during the vulcanization phase.
- **FINISHING (TRIMMING)** on the machine edge without affecting the global cycle time because the operation is carried out outside the press in masked time, that is during the vulcanization phase.
- **REDUCING THE COST** for drawing heads: the head is built with a minimum number of adequate takes to draw a single raw of pieces and is then used also to draw the pieces that are in the other draws placed on the same male holder bar and on the other bars of the same mould.
- **REDUCING TOOLING TIME** for production change: it is possible to place more than one drawing head inside the same island; their use can be selected by digiting the reference code in the man-machine dialogue terminal.
- **PERFORMING** checks of the external quality of the manufactured items inside the island, as well as seal checks and assembling rubber pieces with plastic or metal inserts.

The machine is composed of:

- A group for translating the bottom die outside
- A group for the silicon application to the upper die
- A vertical and electrical movement axis for moving the piece-taking and burr-taking pliers groups holder mobile table
- A group with four pneumatic units for the descent of the piece-taking group
- Four taking groups, each with 16 positions for taking pressed pieces and fitting the plastic insert
- Four burr-tearing groups
- Four burr-detaching groups
- A tray for inserts loading
- Four accumulation baskets for inserts loading
- A tray for laying down and taking up again the rubber pieces that have been drawn
- A group for the horizontal sliding of the inserts-holder tray
- A group for the silicon application to inserts on the tray
- A pit group for loading inserts from the loader to the tray
- Two photocells groups for controlling the presence of inserts in the special pits
- A butterfly-shaped group for the separate fall of burr from the pressed pieces
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- A control panel with PLC, selectors and switches
- A pneumatic system
- A front side gate
- A right front gate