The do-it-yourself vent

By doing away with the cumbersome need for vents built into moulds, time and money can be saved.

> Sand casting is a technology that has been around for millennia. But the needs for today's sand casting in foundries are anything but old. In cutting-edge foundries, much of the production of sand casting has become automated, protecting workers and improving productivity.

A key issue is dealing with ventilation of the mould so that air or gases generated by the process can be released efficiently and safely. Traditionally, this has been done by creating moulds with vents in them. The downside is that not only does this create extra work, but it means a break in the model contour caused by cutting from the back of the mould. The resulting piece can then require extra cleaning to remove material left by the break.

However, ABB has created a new cost-effective solution that removes the need for pre-vented moulds. With ABB's new FlexMouldVenter, it's easy to create vents regardless of the mould.

The system uses an IRB 6620 robot, with a special punching head integrated onto the arm of the robot. The robot, which is positioned next to or over the mould, punches vents into the mould from above (model side), or can even cut from any angular direction. The cycle time for creating the vent is approximately one second per hole. The vents are 5-10 millimeters in size, and the precision is better than 1 millimeter. In addition, there is force supervision and if the needle bends or breaks, the robot checks for this after the cycle by moving to a needle-check station. The robot saves the position data for the form so it is possible to apply exactly the same vents for another application. Each form type may have different numbers of and/or positions of the holes.

There are many possibilities for upgrading as well. And the benefits are many: Reduced complexity of the system saves money since application-specific cutting devices are not necessary, for example. Time can be saved due to the simple programming via the graphical interface. Online processing also means that production doesn't need to be interrupted for programming.

>FACTS

FlexMouldVenter up close

- **Mounting:** Floor, wall or ceiling mounting is possible
- **Mould size:** 1250 x 1000 mm, maximum 1600 x 1900 mm
- **Vent punching tool:** integrated into the robot (7th axis)
- **Vent size:** 5-10 mm available (up to 20 mm on special request)
- **Angular venting is possible:** normally +/-30° with X and Y axis, +/- 90 degrees with Z axis
- **Cycle time:** approximately 1 second per vent
- **Needle speed:** maximum 2.5 meters per second
- **Power:** Punching force of 500 N up to 1400 N
- **Precision:** better than 1 mm
- Position data can be saved and transferred from a PLC via Ethernet to the controller
- **Automatic control:** if the needle bends or breaks it will be detected automatically.
- A needle can be changed in less than two minutes
- **Upgrading:** Can be upgraded to with integrated measurement of a force of +/- 2000 N
- **Data:** Can also be upgraded to save all data regarding the vents