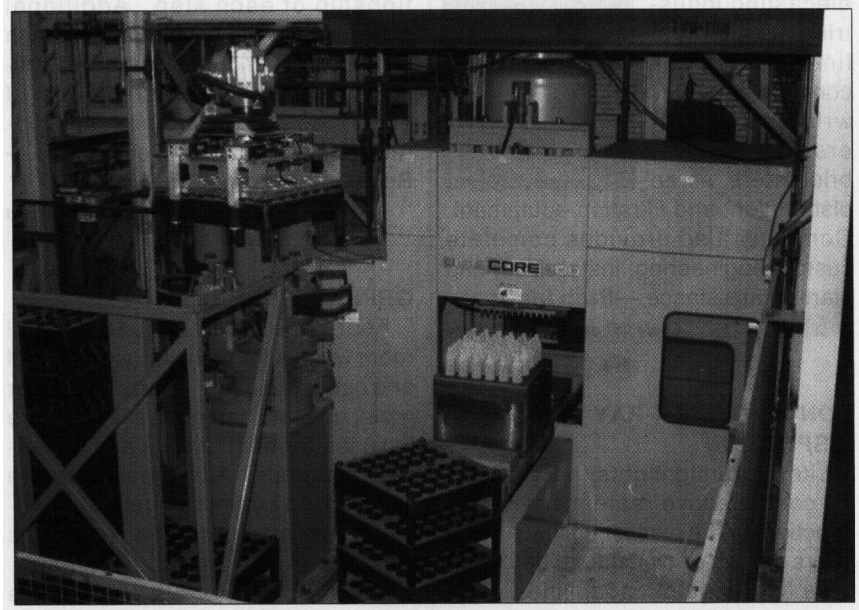
Older Foundry Finds New Cost Savings Through Addition of Core Machine

Hayes-Albion, a 113-year old foundry in Albion, MI, took a major innovative step in increasing production and reducing core costs through the installation of a DISA CORE 300 core machine. DISA, Holly, MI, also designed a unique core removal system that is used with an ABB robot for quick and precise core removal and handling.

Harvard Industries purchased the Hayes-Albion foundry in 1986 and since that time has continued to take steps to maintain an edge in the highly competitive automotive casting market. "We are a jor supplier of differential carriers to American Axle, Visteon, Dana and a wide variety of castings to other automotive suppliers," says Jim Paternoster, plant manager of Hayes-Albion. "We installed the DISA CORE 300 to improve our competitive situation in the market place. Our ability to produce cores at higher rates and better quality will give us the flexibility to branch out in other types of castings."

The CORE 300 uses a unique extruding process that creates a shock wave on top of the sand column to rapidly accelerate the sand into the core box. A minimum amount of air is introduced into the core box resulting in reduced core box wear. The result is a dense core with improved dimensional accuracy and good core box utilization. John Dickelman, project engineer at Hayes-Albion says of the X-trude process, "We're using a horizontally parted box to make a vertical core. We've increased production on an axle tube core for a differential carrier from 22 cores (11 sets) per cycle that had to be manually separated, to 36 individual cores made in almost half the cycle time."

The scope of supply to Hayes-Albion included the CORE 300 40-liter core machine using a special pick-off device, two sets of tested and debugged tooling, a 16-kW Lüber gassing generator, and installation and training. "We ordered the fork pick-off for core removal, but after we saw the machine being tested at the factory with the tooling supplied, we decided to change to robotic core removal," relates Steve Burns, project engineer. "We used the same concept developed by DISA for core removal and DISA and ABB worked together to supply the robot. This was the first robot installation in the foundry and it was real important that it started up smoothly. The core boxes plus completed tooling drawings were supplied by DISA," he adds, "enabling us to proceed with additional boxes right away, but the real story is about the cooperation between DISA, ABB and the Hayes-Albion people. Both companies simulated each other's functions and the interface worked out real good—it took only four days on site to integrate everything together. Technical support from DISA was real good during startup. Training, with an emphasis on safety, which is certainly important, was provided for the operator and all the skilled trades. We don't normally have the benefit of all that training and it will certainly help in the long run."



The Core 300 features a core removal system that is used with an ABB robot for quick and precise core removal and handling.

The machine uses technology well known on the high speed DISAMATIC vertical molding machine to reduce the cycle times. The result is a highly productive core machine with cycle times comparable to those of the fastest machines available. All movements influencing the cycle time are hydraulic. All critical movements have separate hydraulic proportional valves allowing overlapping movements, thus ensuring the low machine cycle times are maintained.

"The tremendous hydraulic clamping pressure on the core box halves results in an extremely dense core, and coupled with the tooling, reduces parting line fins," states Burns. "Environmentally, the machine is fully enclosed, but there is still more than enough access for maintenance. An additional benefit includes reduced time for tooling changes. It used to take us over an hour to change boxes. The Lüber gassing generator, sold with the machine, will result in a cost savings on the catalyst due to the precise dosing system controlled by an impulse metering device, instead of just gassing by time."

Paternoster concludes, "We stress continuous improvement to reduce our costs to remain competitive in the automotive market. The changes we're making to upgrade technology in the core room will reduce the piece price per core. We can also reduce our core inventory and change jobs quicker in response to customer demands. Increased production plus reduced inventory equals savings. All of these benefits go right to the bottom line."

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