

The NIS machine and the container forming process

Emhart's latest technological advances offer much to the glassmaker, says James Geren.*

The development of the Emhart Glass NIS machine has opened many doors to improve the container forming process. The man-machine interface and the cost of operation have already been positively impacted and the industry can confidently expect that all aspects of the forming process will see improvement.

Because Emhart's NIS is fully servo-controlled it is possible to determine exactly where mechanisms are in relation to each other. The NIS has a built in capability to incorporate a sophisticated collision avoidance system. With this feature the system would warn of the impending danger if an operator were to try to move a mechanism to the point of causing a collision. On a pneumatic machine with electronic timing, the best that can be done is to command a mechanism to move with an "on angle" and to control its motion with a speed control adjustment. Setting up a standard IS machine requires constant adjustment over the machine's life, and longer setup time at job changes.

Another way forming can be improved with NIS comes from the operator's ability to view the process from the standpoint of thermal times rather than mechanism "on and off angles." The operator can adjust thermal times (eg maximising mould contact time) and have the job automatically

reset itself to attempt to support the desired change. This option, the Cycle Time Optimizer, can help to greatly improve the throughput of the NIS in a very short period of time. The Cycle Time Optimizer is imbedded in the man-machine interface as an easy-to-use extension of the standard timing graph display.

The NIS also helps improve the cost of line operation. Mould equipment is one of the largest investments for container forming. The rough handling caused by the blank and blowside mould open and close (MOC) mechanisms can easily damage moulds. Damage can also occur with collisions and poor mechanism alignment. In the NIS, the MOC mechanisms operate very smoothly. Closing forces are completely under the control of the operator. Collision avoidance prevents inadvertent commanded changes that could damage the mould equipment and NIS is designed so the actual mechanism alignment is superior to that in a pneumatic IS machine. Emhart Glass researchers estimate that mould maintenance cost could be cut by up to 20% over pneumatically driven devices.

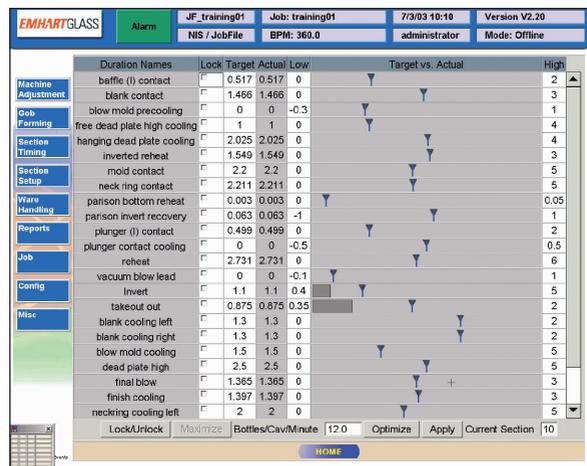
Electrical energy costs can also be greatly reduced since it is relatively inefficient to compress air for mechanism

movements compared to using a motor to move a mechanism. In a comparison of electrical energy consumption between a 10 Section AIS 4-1/4in TG machine and a 10 Section NIS 5in TG machine performed by Emhart RD&E during NIS' development, the NIS demonstrated less than 1/3 of the electricity consumption of the AIS machine. In addition the NIS created less negative impact on the work environment than the standard IS machine.

Noise in the plant was reduced from 103dB(A) to 97dB(A). It was estimated that central lubrication could be reduced by up to 70%, and hydraulic equipment for the cushioning of mechanisms could be eliminated. In addition, the risk of fire and other operator safety hazards were greatly reduced.



* James Geren, Emhart Glass, Connecticut, USA.
Website: www.emhartglass.com



▲ Cycle Time Optimizer.