

High potential for better forming

Glassmakers producing wine and beer containers have much to gain by using NIS technology, says **Leo Diehm***.

With the introduction of the New Individual Section machine (NIS) by Emhart Glass, a new age in producing glass containers started. The fully servo electro driven NIS machine guarantees exceptional mechanism repeatability and performance. The well known unmanageable kinematics variations caused by pneumatics are a thing of the past. On the NIS machine, the optimised servo electric mechanism motion profiles are stored at the job file. As a consequence, all critical forming times and mechanism motions are maintained.

The NIS has the capability of centre distance changes. The 5" triple gob configuration can be converted to 95mm quadruple gob or to 6 1/4" double gob. This unique flexibility allows the cost-effective production of 0.3 litre beer containers in quadruple gob or 0.7 litre wine containers in triple gob.

Meanwhile the NIS machine is recognised by the industry as one of the top machines on the market, outperforming conventional pneumatic IS machines on beer and wine container production. The servo electric NIS is the way to improve productivity, flexibility and quality, and at the same time to reduce operating costs.

The Emhart Glass IS machine portfolio started in 1927 with the first single gob Individual Section (IS) machine and covers today the NIS 12 section quadruple gob machines, able to produce more than 1 million glass containers per day.

Why is NIS one of the best beer and wine bottle forming machines? In today's rapidly changing marketplace, IS machine performance, quality, and most important, flexibility play more important roles than ever before.



◀▲ NIS 5" triple gob 0.7 litre wine container 450g (InVertiFlow blank).

The NIS machine is the only machine allowing wine container production in triple gob and narrow neck press-blow (NNPB) and beer bottle production in quadruple gob.

For example, NNPB beer bottles are still produced on 5" double gob. Let's assume a 12 section IS machine with 14 cycles produces 336 beer bottles/minute, whereas an NIS 95mm quadruple gob 12 section machine is able to produce twice as much (672 beer bottles/min). Wine containers can be produced on 5" triple gob while conventional pneumatic IS machines compete on 5" 6 1/4" double gob. As a result the productivity benchmark, and hence the total production cost, is dramatically in favour of the NIS.

The advanced servo technology allows the storage of the mechanism kinematics profile at the job file. This reduces the start up time after job change and the workout time. All the troublesome pneumatic fine

adjustments required on pneumatic machines to reach the pack to melt target value are eliminated.

Technical features

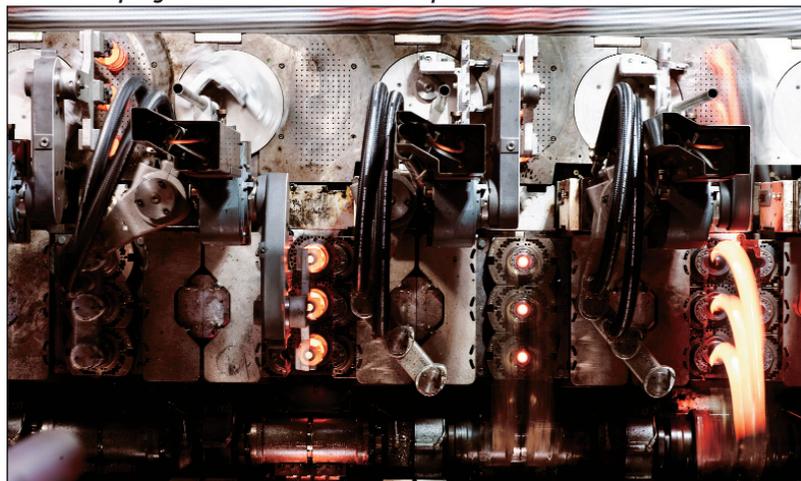
The advanced servo technology assures controlled mechanism motions and excellent repeatability and permits additional features:

- Reduced cost of operation by a significant energy saving.
- Substantial noise reduction. One NIS is equal to four IS machines.
- Extended mould and accessories life and less downtime as maintenance cost by a perfect mechanism cushioning.
- The servo electric baffle mechanism together with the Emhart patented V-Baffle does not require funnel operation in the blow and blow process. During baffle down the servo baffle stops about 5mm before the blank

▼ NIS 12 Section 5" triple gob with 340 Forehearth installed in 2006.



▼ NIS 5" triple gob 10 Section: servo mould open and close and servo FlexIS Pusher.



mould. Through the V-baffle the settle blow is applied. Then the servo baffle moves down to match the mould.

■ The blow mould can be opened in two steps:

The so-called mould cracking prevents a container shifting during blow mould opening. The container maintains the centre position and matches with the take out tong position.

■ The blow head lifting is able to improve the internal container cooling: After final blow the servo blow head mechanism is precisely lifted to increase the internal container cooling.

■ Fully servo driven dual axis FlexPusher for optimised consistent ware handling.

■ Diagnostics tools able to stop sections automatically at glass jams between the moulds or in case the invert can not reach the programmed position.

The NIS uses the well proven parallel mould open and closing concept on the blank and blow sides. Established and demonstrated on the AIS machine, the proper mould equipment alignment is ensured by the design. Mould and insert wear does not influence the cavity positions unlike using conventional accurate mould hangers. Therefore the blank and blow mould datum does not move as a function of wear. The NIS without hinge pins is not exposed to the critical mould holder arm and insert heat elongations. The well known plunger alignment difficulties on conventional IS machines, caused by wear and heat elongation are solved by design on the NIS. A key advantage of the NIS is the thermal condition on parison reheat. All reheat relations on all cavities are identical between mould and parison.

Type	Name	# Gob	Center	Market Introduction	# of Sections				Machine powerd mainly by	Mold open & close
					6	8	10	12		
NIS	QG	95mm	2005						servo electric	parallel
	TG	5"	2000							
	DG	6 1/4	2000							
	SG									
6 1/4	TG	4 1/4	1976						pneumatic servo options	parallel
	DG	6 1/4	1976							
	SG									
5 1/2	DG	5 1/2	1967						pneumatic servo options	arcuate
	SG		1967							
6 1/4	TG	4 1/4	1969						pneumatic servo options	arcuate
	DG	6 1/4	1969							
	SG		1969							
5"	TG	85mm	1997						pneumatic servo options	arcuate
	DG	5"	1985							
	SG	85mm	1985							
4 1/4	TG	3"	1977						pneumatic servo options	arcuate
	DG	4 1/4	1950							
	SG		1927							

▲ The actual Emhart IS machine portfolio.

Summary

All these features and benefits make the NIS one of the most advanced IS machines on the market. Especially in wine and beer bottle production, this machine is the superior option to conventional pneumatic IS machines. Producing NNPB beer bottles in quadruple gob and wine bottles on triple gob is a unique feature, based on the capability to change the centre distance easily and quickly.

However, such a state of the art servo IS machine requires different skills from machine operators and maintenance personnel. The transition requires a learning

time until the full potential on productivity, flexibility and quality are realised. The feed back from NIS users re-ordering this advanced machine is an unquestionable confirmation that the described benefits, combined with the overall production cost reductions, are being realised.

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