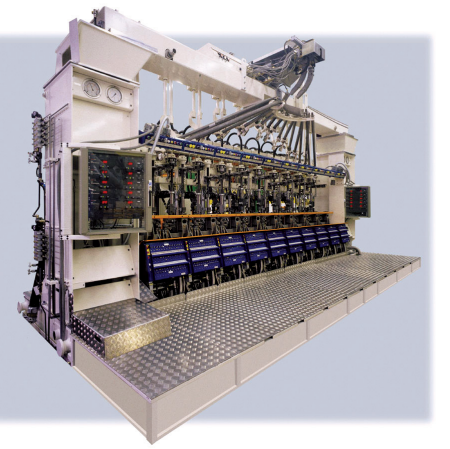
More gobs versus more sections

Alan Fenton* argues that using a double gob IS machine with more sections, rather than machines with more gobs, is a false economy.



An Emhart IS machine.

The manufacture of glass containers requires the most efficient use of glass plant resources to produce a container that is priced competitively. The container forming machine (IS, AIS or NIS) can be argued to have the greatest effect on the total productivity of a glass container plant.

Since the size of the machine and the number of moulds are directly related to the daily output of containers, contracts requiring large daily outputs can lead to requirements for a machine that has 32 or even 40 moulds. The glass plant can either run a double gob machine of multiple (16 or 20) sections, or use a triple or quad gob machine with fewer sections but each section handling more gobs. Both types of machines are available, but which type is the most efficient and cost effective? In this article we will examine a glass plant where production requires a machine of approximately 32 moulds that can use either a double gob 16 section machine, a triple gob 10/12 section machine (this being the closest triple gob machine), or an 8 section quad gob machine.

When choosing a machine and its configuration the factors to be considered are the cost of equipment, site preparation, the compatibility of the machine within the plant and the running costs including job changes, maintenance and staffing.

Cost of equipment

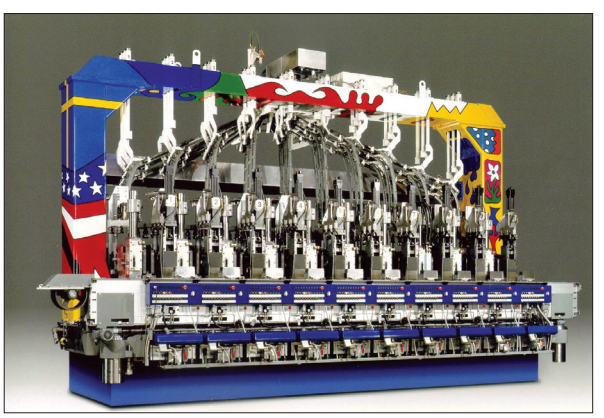
For the 32 mould example a double gob machine will require 16 sections - at least four sections more than the triple gob, and eight more than the quad gob alternative. The double gob machine will need two forehearths, two feeders, two shears and two gob distributors to handle the throughput. A triple gob or quad gob machine with the same throughput would require only one of each. Therefore the initial cost of equipment will be higher using the double gob configuration than triple gob or quad gob.

Site preparation

A plant that is seeking to augment its production capacity should consider triple or quad gob machine configurations, since either occupies less space than the double gob machine and is therefore more easily assimilated into the plant. If the situation requires the removal of existing equipment (eg two lines), the site preparation of a triple or quad gob machine should be less than for the double gob machine since the footprint of either one is less than that of the double gob. The double gob configuration does have one advantage: the metal line height for the double gob machine will be less than that required for either a triple or quad gob.

Compatibility of the machine within the plant

The IS machine configuration options have evolved from single gob to include double (with varying centre distances), triple and finally quad gob. Many glass plants continue to use double gob IS machines, thus avoiding introducing triple or quad gob operation - even if it becomes necessary for the machine to be a 16 or 20 section machine to satisfy production requirements. Reasons could include a workforce that is familiar with double gob operation, and equipment, spares and accessories that are compatible with the rest of the plant.



The NIS machine from Emhart Glass.

However there are many machines around the world operating triple gob and quad gob. The perceived problem for those who traditionally run double gob is the manipulation of the extra gobs within the IS section, but the same mechanisms that handle two gobs are now capable of handling three or four. One major glass container manufacturer recently transitioned from double gob to triple gob successfully, doing it while integrating narrow neck press and blow via the servo IS machine technology offered by the NIS.

The basic operation of either configuration is the same as long as the gobs arrive at the blank moulds at the same time, and this is a function of gob shape, weight, and the delivery system. With modern forehearth technology, servo feeders, spout bowl design, servo parallel shearing, servo gob distribution and suspended delivery, it is more possible to ensure accurate and repeatable gob shaping and consistent gob loading of the blank mould.

Introducing a triple gob machine into a plant with double gob machines means the glass plant has to invest in a different set of accessories. However because the triple gob and quad gob machine configurations require fewer sections to achieve the desired output, the investment needed would not be as large.

Job changes

With more sections to change in the double gob configuration, job change time will be longer than for multi-gob machines unless personnel are increased. This is because, although the number of mould equipment pieces are the same, the number of mechanism adjustments is increased in the double gob configuration because of the extra sections, and also because of the requirement to adjust the two forehearths and feeders. Comparing staff-hours required per job change to production losses might make a case for using more personnel. However, the same resources applied to a smaller job will tend to be equally efficient, so fewer sections to change will always result in fewer staff-hours and less production time lost.

Maintenance

The greater number of pieces of equipment used in the double gob configuration (ie forehearth, feeders, shears, gob distributor, IS sections, conveyor, etc) versus those required by multi-gob configurations means increased downtime for maintenance, and more frequent and/or lengthier scheduled repairs.

Staffing

Even though the number of moulds requiring swabbing or changing is approximately the same, a double gob 16 section machine, because of its size and complexity, will require more manpower than a 10 section triple gob machine or 8 section quad gob machine. For example, maintaining gob weight means adjusting the weight on two feeders not one, and there are 16 sections of mechanisms to adjust, 16 sections of mould tooling to adjust, etc.

Conclusion

Producing more containers with more gobs is more efficient and cost effective than using more sections. G

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