

## Introduction

The benefits of closed-mould pick-up are well known in the industry. Longer mould times and higher production speeds make this “simple” change in pick-up method very attractive. Traditionally, glass container makers have found it difficult to overcome limitations in their equipment. The tight tolerances and accurate repeatability required to pick-up in the threads of a reclosable container have proven too much for many shops to achieve. Developments in take-out holder and insert designs have brought this goal within reach of more shops than ever before.

Allowing a glass container to cool while still in the mould results in a stronger and straighter bottle and can lead to higher machine speeds. An integral component in achieving these improvements, however, is the technique of bringing the takeout arm into position and grasping the bottle by its finish before the mould is opened and the container released. This technique, called “closed-mould pick-up” can offer the container manufacturer significant cycle time reductions as the take-out does not have to wait for the mould to open before engaging the bottle finish. Higher machine speeds and higher machine productivity are key as today’s container plants face global competition. Closed-mould pickup can offer significant improvement to both. Closed-mould pick-up is not a new concept. Container producers have long recognized the advantages. The old expression “if it was easy, everyone would be doing it” applies doubly in this case. The obstacles to achieving this pick-up technique are many. Some are within the control of mould and maintenance supervisors but many are not. A few of the obstacles have been machine related. Tolerances of the equipment and the degree of repeatability the equipment is able to achieve are two key considerations. Even if the equipment can be set up initially to pick-up with the mould closed, can this technique be maintained over the course of the job runs? Machine maintenance personnel have to work hard to maintain the precise setups imposed by this technique.

Alignments must be maintained to within 1.5 mm (.060”) on the vertical axis at all times. Any variation can result in deformed finish, high wearing of the insert or breakage. Take-out holders and inserts provide a vital link in the chain of events that must occur to achieve closed mould pick-up. Precision machined, rugged take-out holders like those offered by POCO®, are machined to tolerances of 0.75 mm (.003”) on most critical dimensions. Additional features such as the shoulder provide quick and easy set up and reliable repeatability. Alignment pins help ensure that the holder and insert are in the proper position as they close upon the bottle finish. Finally, the insert material itself must have sufficient strength and structure to hold the fine machined features necessary to duplicate a threaded finish and lift a bottle with a capacity of one litre or more. POCO’s GLASSMATE®, hot glass handling graphites, have been engineered to be highly machinable, strong, and above all, friendly to glass. Inserts machined from this material will resist wear longer than other graphites for fewer changeouts.

This method of closed-mould pick-up, referred to as “direct transfer”, offers tremendous benefits to the container manufacturer. For those shops able to maintain precise setups and repeatability, the improved container quality and machine productivity offered by closed-mould pick-up via the direct transfer method are considerable.

Not all equipment currently in use is capable of maintaining the precision location and repeatability necessary to achieve closed-mould pick-up using the direct transfer approach. Even on precision equipment, adjustments need to be made during long production runs. Methods have been developed to allow shops with less than optimum equipment to achieve the same productivity improvements. A more forgiving method which would work even if the highest levels of precision could not be maintained.

Such a method, called the “self adjusting” method was developed and has been in use since 1995. The principle of the self adjusting method of closed-mould pick-up is simple. The direct transfer method relies on the glass-making equipment and the machine maintenance personnel insuring precise

alignment of the equipment every time. The self adjusting method relies on a stationary reference, the mould top, to align the insert as it approaches the bottle finish.

Bottle makers have been trying for years to avoid contact between the take-out holder/insert and the top of the mould. That is because the result was usually a broken insert and a bent and useless holder. The self adjusting method allows the insert to ride along the top of the mould and actually uses a very precise reference, the distance between the mould top and the pick-up location, to align the insert perfectly every time. The job of alignment is performed by the mould top and the take-out insert, not the machinery itself. The specially designed insert is allowed to float, preventing holder/mould contact.

Here is how it works. Normally, an insert is held tightly within the take-out holder. This is done to help insure proper alignment. The self adjusting method allows the insert to "float" freely within the holder pocket, allowing as much as 1.5 mm (.060") movement up and down. Less "float" can be designed in, depending on the specific job and the desires of the container manufacturers. As the take-out holder/insert is brought into position to grasp the bottle, the insert rides along the top of the mould, seeking the correct level to contact the bottle finish. As long as the take-out holder is within 1.5 mm (.060") of the correct setting the insert, referencing off of the mould top, will be in the proper location. At set up, the height of the take-out tong head is adjusted so that the inserts, which have a bottom boss, material that extends below the pocket of the take-out holder itself, touches the top of the mould. As the inserts contact the mould top, the "float" allows the inserts to ride up within the holder. Regardless of how far up or down the inserts ride within the holder, the reference off of the mould top remains the same. As long as the height of the take-out tong head has been set up to within 1.5 mm (.060") of the true height of the bottle finish, the take-out insert will be properly aligned.

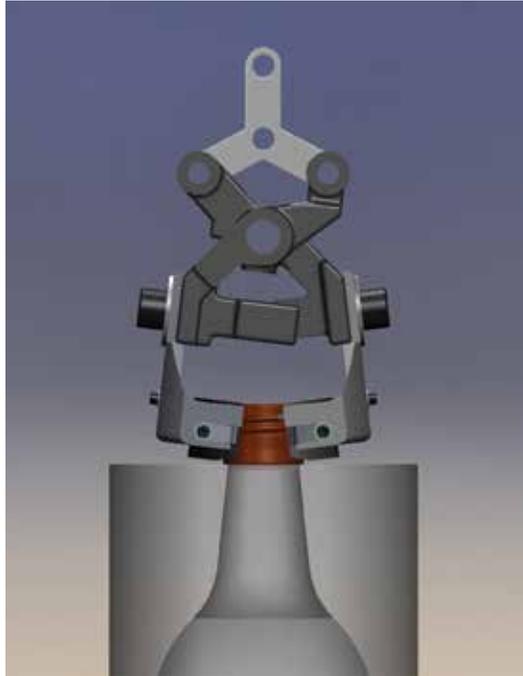
As the job runs, equipment settings can begin to change. Machine maintenance personnel must insure proper alignment of the equipment at all times. The self adjusting method, however, is much more forgiving in its alignment requirements than direct transfer. As long as the adjustment stays within the amount of float, proper alignment is assured.

Since the take-out holder and insert are a vital link in the direct transfer or the floating transfer, the design and manufacturer of these parts is critical. Precision take holders are important for correct positioning of the threaded insert to ensure that there is no damage to the finish of the container. Recent design improvements in this area give the container manufacturer the flexibility of fixed or floating inserts in the same holder. Prior to this innovation, a different style holder was required for each pickup method. In addition to the option of using the holder for direct transfer on some jobs and floating on others, this new design has the possibility of reducing tooling costs. The very nature of the design requires that tight tolerances be achieved so that the fixed insert fits the pocket snugly and the floating insert will float with ease for correct pick up.

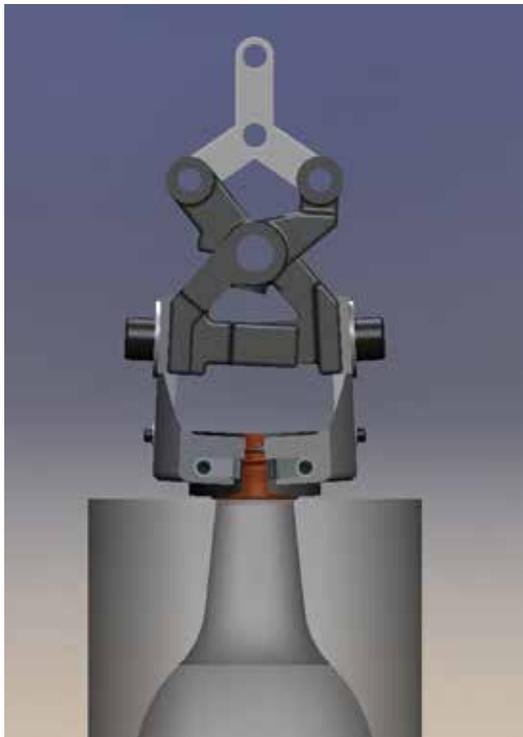
For the glass container manufacturer this means that equipment previously thought to be incapable of maintaining the accuracies necessary to pick-up with the mould closed may, in fact, be capable of achieving greater productivity. For those shops capable of maintaining the precision to run direct transfers, that method is still preferred. But for those shops who have been frustrated in their attempts to run closed-mould, the floating transfer may represent a fresh opportunity to improve their quality and productivity.



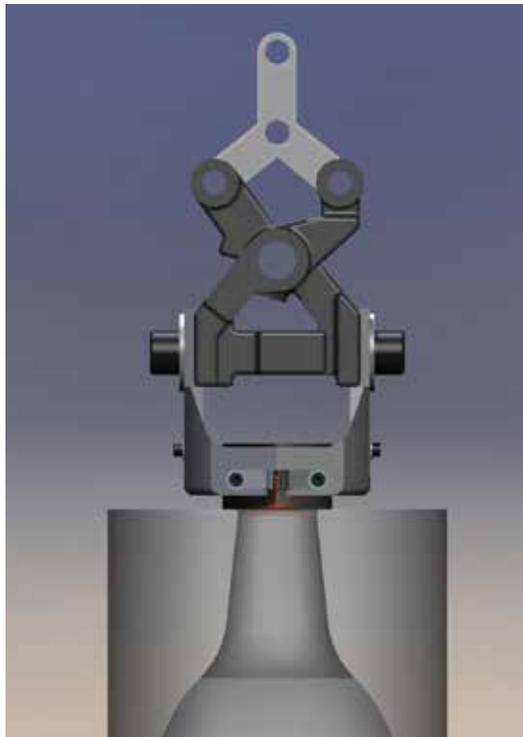
*Self adjusting POCO holder, with a thread pick-up GM insert, starts to close*



*Self adjusting assembly is engaging the finish*



*The insert starts to ride the top of the mold*



*The self adjusting POCO holder picks-up the thread finish perfectly*

## For More Information

Please call your Regional Customer Service Representative or Distributor today to learn what POCO's GLASSMATE products can do for you. Visit [www.poco.com](http://www.poco.com) and select the Contacts link for the location nearest you.

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