First class safety in IS machine operation

According to Wilfried Seidensticker and Mark Ziegler, high productivity in glass container production requires maximum safety. Based on a presentation delivered at the 12th ESG Conference in Parma, the following article discusses a series of equipment innovations to protect employees and equipment.

In line with a global trend to improve safety conditions throughout glass container factories, Heye International is convinced that safety-related investments result in higher productivity. Consequently, as 'glass people', the company's engineers have developed the Heye multi-level safety concept. This facilitates the achievement of enhanced safety via the use of intelligent processes and controls, the clean and clear design of equipment, the employment of useful tools and working instruments and the introduction of additional protection devices coupled with sophisticated workflows.

In addition to providing the correct equipment, the Heye multi-level safety approach emphasises the need for perfect engineering throughout the plant, in addition to a well trained and educated workforce.

HOT END ENGINEERING CONCEPT

The Heye hot end equipment layout calls for a clear and clean structure. Not only does cleanliness look better but it is an important factor when considering safety.

There should be no possibility of slippery surfaces where under foot accidents can occur and the risk of dirt and particles entering containers should be minimised, thereby leading to a safe product. By the same token, a clear structure means the avoidance of production disruptions as a consequence of incorrect operation. It is important that operators know precisely which control elements relate to each function.

TRAINING FOCUS

Well trained and confident personnel are also important, requiring employees to be properly trained and provide their managers with essential alerts about existing and potential problems. Essentially, a properly trained workforce contributes significantly to the attainment of productivity and safety.

Experienced Heye International production specialists can provide customers with a series of job-specific training courses, delivered either at the company's Obernkirchen training centre or at the customer's premises.

CORRECT EQUIPMENT SELECTION

When considering safe equipment options for gob forming, IS machines and ware handling duties, selection parameters are influenced by past and present experiences, as well as existing and potential legislative requirements, including those introduced by such organisations as GOST (Gosudarstvenny Standard) in Russia, OSHA (Occupational Safety and Health Administration) in the USA, CCC (China Compulsory Certification) in Asia and the EU's European standards.

Bottlers are especially keen to encourage safety-related improvements at glass plants, in part to protect their own reputations. Higher safety standards are just as important to glassmakers and their employees, however, because potentially, every accident can lead to injuries, equipment damage and downtime.

TOTAL FORMING CONTROL

An important recent process control development from Heye International involves the monitoring of blank side loading positions, where the correct position of plunger positioners during gob loading is monitored, as well as the timely exit of the plunger immediately before opening the blanks and transferring the parison. Should the plunger positioner fail to reach its working position or leave it late, the section is stopped immediately and parison transfer does not take place.

Either of these situations may result in a damaged container finish, which needs to be detected before it reaches the customer. In addition, a poorly developed finish could produce an insecure hold during transfer from blank to blow side, with the danger of causing accidental damage. Both risks are limited by the loading position monitoring system (figure 1), which operates in real-time and stops the section immediately.

Turning to the blow side, the dead plate position for each cavity is monitored by an infrared sensor underneath the dead plate over the entire cycle of a section. If the >
heat radiation is abnormal or does not exist at a certain time, a glass handling failure or demoulding has occurred. As soon as this situation has been identified, subsequent gobs for this section will be rejected, thereby minimising downtime and avoiding wasteful maintenance.

**ERGONOMIC AND CLEAN DESIGN**

Heye International’s latest generation oil distributors (injectors) are compactly arranged in the operator’s field of vision. Additionally, rapid interchangeability and precise preadjusted capacity that matches the lubrication point size are assured.

Together with the company’s six cycle central lubrication system, this development ensures that optimum oil levels are used at the different lubrication points. Not only does this approach save money but it also provides enhanced safety, with minimised dangers of slip hazards and fire risks.

Other equipment innovations include a machine bed that features integrated cable channels for blank and blow sides. Not only does this arrangement protect the cables but it avoids the danger of them being burnt by hot glass and other hazards. Importantly, it also avoids unnecessary repairs in the production area.

Final blow manifolds are now located under hoods, where cables and valves are protected against heat and dirt. As well as providing greater durability, they are easier to clean and are more secure.

Specially designed covers have been widely adopted to protect the installed equipment and cables etc. As a result, maintenance personnel are assured a clean and uncluttered environment to perform necessary settings and inspection tasks. This results in time savings and increased productivity.

Another useful tool is an electrically-operated blank side lifting device, which provides improved ergonomics for personnel conducting necessary maintenance work, while also protecting them against physical overload situations.

Heat protection is provided for the operator at the blow side by a device that is easy to fix on the different sections. This equipment makes it simple to reach hot and higher parts of the IS machine.

**SAFETY SNAP VALVES**

Below these covers and for numerous other IS process functions are the latest Heye safety snap valves. This valve block principle ensures that locking and unlocking functions are distinguished by an optically clear and intentional action, thereby providing a high level of additional security for operators.

Used for blank and blow mould open and close, baffle down, funnel down and blowhead down duties, Heye safety snap valves ensure that there is no unintended equipment motion during section maintenance or repair procedures. The valves control the pipeline between the pilot air and air-operated cartridge and can be operated either by an electrical pulse or by actuating overrides caused by inadvertent movement of the mechanisms.

**BLANK SIDE PROTECTION**

Completing Heye International’s latest portfolio of safety-related equipment innovations is a blank side protection grid, an automatic safety device that provides an important link with the IS machine’s control system. In order to perform the lubrication programme of the preforms, the operator actuates the corresponding button, after which the station is moved to the rest position, the grating is lowered and access to the lubrication process is provided. The operator confirms the completion of lubrication using the corresponding button, the guard is raised and the station returns to operation.

Experienced machine operators can use a key switch that lowers the grid during production to optimise gob loading, check cooling systems etc.

**SAFETY AND CLEAN DESIGNS**

Safety and clean designs are key factors that complement one another because both employees and equipment can be protected as a result of their implementation. Machine downtimes and staff losses can be reduced, while the quality of products and profitability will be increased as a result.

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