
SIGNIFICANT IMPROVEMENT OF EFFICIENCY BY AUTOMATIC GOB CONTROL

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For nearly two decades Gedvelop AB has been a leading specialist in monitoring and control of hot glass flow in the glass fibre industry and has shown the way to enhance gob measurement and control in the glass container industry. The control of gob shape, weight and temperature has become essential for today's glass container operations and can have a significant influence in helping to reduce production costs. This article will present the latest developments in the Gob Image Analyser concept.

1 - INTRODUCTION

Since the introduction, about 8 years ago, of the GIA concept – Gob Image Analyser – the Swedish company Gedvelop has today installations at most of the major glass container plants. The GIA camera concept is increasingly seen as an instrument to ensure a high level of accuracy and efficiency where traditional techniques no longer cope with the higher demands for automation.

The basic idea of the GIA was and still is one of a non-contact line-scanning camera technique. It allows that the system virtually does not require maintenance and, as such, at all times provides for a continuous performance because there is no wearing of any mechanical parts.

2 – THE LATEST DEVELOPMENT

As a new milestone, Gedvelop has introduced some months ago (the official launch was made at Glasstec 2002 in Düsseldorf) the new generation of the GIA concept. Over 120 installations all over the world running in several different production environments have given a lot of valuable feedback regarding the functionality of the GIA.

With an open ear to customers' requirements available technology

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has been used to implement these as far as possible. Technology and production advancements within the glass industry have now put focus on new issues, which made the new GIA generation a necessity. The massive advancements within software and hardware should be of benefit to the customers as well. By using the latest technology within these areas the glass container industry can be supported with a state-of-the-art concept. Already available software systems are more and more integrated and also the new GIA generation is made a part of that process.

2.1 - Multi-camera system

One main target was to develop a multiple camera configuration in-

stead of, as with the conventional system, a single camera unit. Apart from this upgrade, at the same time also other customer input was implemented as far as possible. All these valuable elements with today's latest standards on technology have been considered and incorporated in the latest GIA generation. Its main features are:

- One central unit to support up to four cameras, allowing a wide variety of different applications with multiple camera configuration for DG, TG and QG operations.
- Increased flexibility allows the user to configure the Gob Image Analyser to his own needs. Either it be two cameras on a single IS-machine, on two IS-machines, or two cameras each on two different IS-machines, the same one central unit is sufficient to support up to four cameras (Fig. 1).
- Camera can be installed at blank load position. Gob image comparison can be made immediately after shearing.
- To compete on space with other equipment the new camera dimensions have been reduced considerably (Fig. 2). Electronics of the central unit are assembled on a mounting panel giving the option to mount it in an existing cabinet.
- Higher image accuracy by using a 1024 pixel scan line array re-

sults in higher resolution. The higher sensitivity of the array is also essential when measuring for example small flint gobbs.

- Windows 2000 for communication and connection to external systems. The central unit can be connected to local net, the plant Intranet as well as Internet.
- Enhanced tool for image analysis – full 256 grey-scale level for analysis of true gob image (Fig. 3). It allows the operator to identify (intermittent) discrepancies in the gobbing process. For repeat production runs, the grey-scale image also facilitates the run of setting up the same conditions as for the previous operation.

2.2 - Gob temperature measurement

Another important function of the GIA "closed loop" idea has been to incorporate gob temperature measurement. By means of a two-colour pyrometer the temperature profile throughout the gob is highlighted. A two-colour pyrometer has a number of advantages over one-wavelength pyrometers. It features the insensitivity to variations in the glass' emissivity and minimises the influence of signal attenuation caused by dust and smoke, both closely associated with the gob forming process.

3 - ADVANTAGES OF THE GIA SYSTEM

Steadily growing demands for improved quality products have and will be a challenge for Gedevelop to ongoing developments of the Gob Image Analyser. Close access to glass container production processes ensures software updates and implementation of the latest technology to meet future customer demands for more accurate production of high quality glass containers at lower costs.

From the introduction days of the Gob Image Analyser, Gedevelop has documented significant im-

Fig. 1 - Up to four cameras with one central unit.

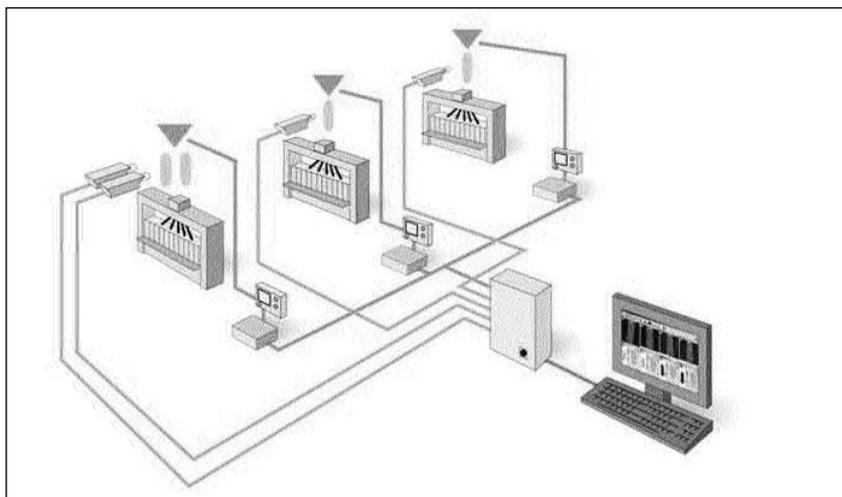
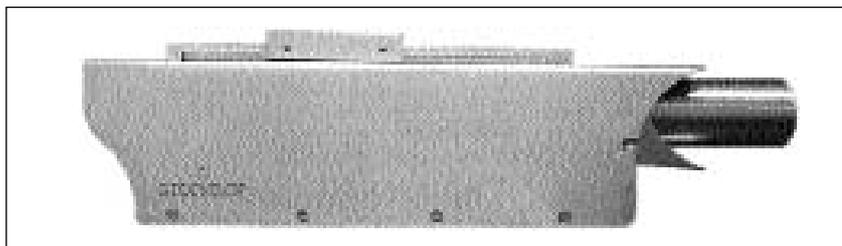


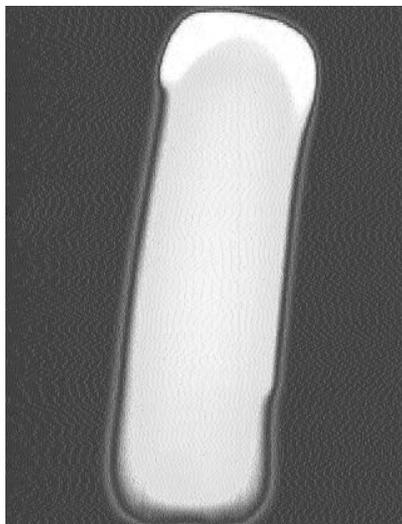
Fig. 2 - Smaller camera(s) for easy installation.



provements in gob weight tolerances over long time periods. Reduction of tolerances imply better conditions in the forehearth and allow glass makers to stay close to the set-point, thus enabling them to reduce overall weight and consequently cut production costs. With automatic gob weight control by using the GIA system, run-in

time is considerably reduced. Whether it be B&B, P&B or NNP&B process, to reach the correct weight of the product as soon as possible should be seen as a logical target. Achieving a reduction in the time from the start of the job change to reaching eventual standard pack efficiencies signifies increased total production output which, again, allows for better benefits.

Fig. 3 - The 256 grey-scale image of a gob.



4 - CONCLUSIONS

Competition and complexity within glass container forming has increased. Tougher competition inside the industry and from the introduction of alternative packaging materials has sharpened over the past years. Shorter runs and tighter weight limits, together with higher quality demands from end-users, requires better production tools to minimise production costs. The newly launched GIA concept responds to these new enhancements needed in the hollow glassware industry.