

New downstream equipment improves efficiency for Thames

EFFICIENCY has been improved at Thames Plastic Bottles in Maidenhead with the installation of a downstream support package from PCE Automation.

The company, now part of the Thames Packaging Group, has been supplying PE, PP, PVC and PET bottles for 20 years and has steadily expanded its range of moulding machines, but had come to realise that improvements in downstream equipment were needed to improve efficiencies, minimise costs, and guarantee product quality.

PCE has installed conveyors from the Rexroth VarioFlow range equipped with TPI-12 collation tables and in-line LL-2H leak testers for three Bekum EBM machines. Other EBM machines are having dedicated take-off conveyors fitted to



accept the re-locatable TPI-12 tables to facilitate flexibility of use. And a MK4 robot, VarioFlow conveyor

and in-line LL-1H leak tester were bought for the Aoki SBIII-250LL PET line.

The new single LL-1H and twin head LL-2H leak testers are based around a Siemens PLC combined with Pro-Face interfaces. This combination gives a higher data resolution to find smaller defects in a faster time. The Pro-Face HMI is a touch screen unit giving simpler set-ups; friendlier screens and is supplied with a USB port as standard to down-load test data for off-line analysis.

The MK4 PET take-out robot can be configured for bottles with easy-change tooling. It is built on a welded steel frame for rigidity and uses Festo electric drives for the main axes. The robot eliminates damage to bottle surfaces, and allows the out-feed conveyor to remain at a fixed height regardless of bottle height.

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"Out of focus" deflashing laser compensates for part variations

A DEFLASHING operation at Polypipe has been automated by ATM Automation using a combination of robotics and laser cutting.

Polypipe Civils makes surface water drainage, sewerage, cable protection and water management systems, and some of its Ridgigully surface water drainage products are blow moulded in HDPE. Significant flash is produced around the parting line which traditionally has been removed manually. The largest of these parts weighs up to 12 kg with some areas of flash being up to 12 mm thick, and as a manual process deflashing was both time consuming and arduous.

ATM was charged with devising a fully automated flash removal system based on a six axis robot and a laser. The combination of a laser with a six axis robot is not in itself new, and ATM already had experience of building systems of this type for automotive industry customers. Automotive laser cutting applications tend to be fine tolerance, and while this demands precise programming and robot path control, the fact that the components have clearly defined datum points means that the laser and robot together can easily meet the dimensional and profile tolerances required.

There are, however, a number of distinct differences between these automotive projects and the Polypipe application, not least the larger tolerance band of the blow moulded part and the material from which the part is produced.

With three product sizes to be laser cut (300, 750 and 900 mm) and a requirement to not only remove flash from the moulding, but also to cut two 360 degree paths, ATM decided that the optimum solution would be for the robot to hold the part and manipulate it under a fixed laser cutting head. A six axis robot system with a horizontal reach of 2,000 mm and a payload capacity of 50 kg was chosen to provide the working range and handling capacity required for these large components.

Because the flash is up to 12 mm thick in places it had to be cut into smaller pieces for recycling. This required intricate programming to achieve the balance between reducing the size of the waste material and maintaining the target cycle time.

A diffusion-cooled CO₂ slab laser from Rofin-Baasel UK with an output power of 2,500 W was selected for the project. Consideration had to be given to fume extraction and filtration for this project, as the parts being cut are

Deflashing cell installed at Polypipe Civils by ATM Automation has additional fume cleaning on the filtration to deal with contaminants in the regrind material being moulded.



Part size variations meant that a fine focus laser could not be used when deflashing this drainage component.

produced from 100 per cent regrind material which means that the blow mouldings can contain contaminants which could have a detrimental impact on the performance of any extraction and filtration system. Following a series of trials, a multi-stage dosing filter system was developed, with the air extracted from the cell being dosed with calcium carbonate before reaching the filtration system. To minimise the time associated with cleaning filters and removing debris from the filtration system, two sets of filters were incorporated. This enables one set of filters to perform a self-cleaning cycle, depositing any dust and debris in a bin, while the system continues to run using the second set of filters.

The work cell incorporates two component fixtures at the operator load and un-load station. This enables the robot to deposit a completed part and immediately pick up a new part. With an internal safety door closed to protect the operator, the finished part can be removed manually and another part loaded for processing by the robot. The robot gripper system and the component location fixtures incorporate quick change tooling features to enable the system to handle the three product sizes produced within the cell.

The major issue to be overcome in this application was the need to produce trimmed components with a minimum of excess material, on components which have potentially large part-to-part variations in size. The variation on each component meant that it was not possible to establish a consistent datum position, from which programme offsets could



be generated, and this led the ATM engineers to develop an unusual but effective solution.

In almost every laser application, the beam is focused to a fine spot, at a particular distance from the nozzle or optics, to generate a small spot size and enable precision processing of the part. Even with a powerful laser such as the Rofin DC025 a spot size of 1.0 mm is achievable at the appropriate focal distance.

This application, however, did not require such degrees of accuracy because of the variations in part tolerance, and ATM turned this to an advantage by programming the laser to operate "out of focus" and create a larger spot size. Using the laser outside of its focal point would require more laser power to cut the material, which was available from the 2,500 W laser.

The larger spot size together with the higher power settings on the laser enabled the system to not only achieve the cut profiles required during flash removal, but the high temperatures reached during trimming also partially melt the cut area providing a smooth aesthetic finish on the part.

www.atmautomation.com

Swiss stretch blow machines are back in Britain

SWISS stretch blow moulding machine manufacturer Magplastic is returning to the UK marketplace through Farrow Machinery Sales.

The company builds linear stretch blow machines for PET, PP and PLA and has sold more than 800 machines in more than 85 countries since the first SSB model was developed in June 1981.

Magplastic's range encompasses machines with output from 400 to 12,000 bottles an hour able to produce complex-shaped PET bottles/containers from 40 ml to 26.5 l.

There are three basic types of machine: the SSB series is designed for the low to medium output production of complex shaped and standard PET containers; the LBM machines with 5 to 10 cavities are for medium

output production up to 12 l; and since the end of 2006 Magplastic has been building the SLC range for the production of containers up to 26.5 l.

The SSB machines can produce PET bottles from 40 ml to 5 l and neck diameters up to 88 mm with minimal neck ring. Typical applications are for spirits, cosmetics, detergents, food and pharmaceutical.

As well as producing single serve and returnable PET bottles from 11.5 to 26.5 l the SLC is capable of producing water cooler bottles as lighter and less expensive alternatives to the traditional extrusion blow moulded polycarbonate bottles, bringing reduced transport costs and simplified logistics.

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Two-cavity Magplastic SSB-02 can produce PET bottles from 40 ml to 5 l.



Melt filter designed for blow moulders

THE difficulties of access on some extrusion blow moulding machines has led Industrial Plastics to develop a melt filter specifically for use on

blow moulders. It can be fitted to new or existing extruders, and can be manually or hydraulically operated.

As well removing accidental contaminants

from virgin materials, it enables some applications to run with reclaimed polymer mixed with the virgin polymer

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