Pressing issues

New ranges of seaming machines are being launched, but the demands of processing thinner gauges at higher speeds remain the same. Daniel Searle reports

The metal can industry has celebrated a number of anniversaries recently, with 2013 marking the bicentenary of the first commercial food cans, while it is 50 years ago this year that the first D&I beverage cans were produced commercially.

Last year another key development in canning celebrated its 125th birthday: the emergence of the airtight double-seam on food cans that was developed by Charles Ams, son of American canmaking pioneer Max Ams.

Today, this feat of engineering still provide cans with a solder-free, hermetic seal, but at increasingly high speeds that would have been undreamt of in the 1880s.

This continuing need to raise productivity in modern seaming machines raises the same issues: hygiene, the processing of lighter-gauge materials, and faster changeovers.

The launch of completely new ranges of seaming machines is a rare event, so the debut of the Angelus V-Series from PneumaticScaleAngelus (PSA) in the next few weeks is a big deal.

The range comprises eight models, equipped with between three and 18 seaming heads, and running at speeds ranging from 75 up to 2,500 cans a minute. The machines operate on both food and beverage cans – although the higher speeds are reserved for beverage can seaming applications – and are designed to address the most pressing issues currently facing canmakers and fillers, says the company:

"Lightweighting of the cans and ends along with new can and end sizes are the biggest trends that we see," says Jeff Bernstein, director of seaming engineering at PSA. "We are constantly upgrading our traditional equipment as well as designing new seaming equipment, such as the V-Series, to handle these ever-changing trends.

"Hygienic stainless steel construction is one of the most important considerations due to stronger cleaning solutions that are required to make sure a seamer is clean today. Quick changeover designs are also highly desired along with improved serviceability. Improved guarding systems incorporating the latest safety devices are also a requirement.

"Our new seamer models have all of these options incorporated into them, and we also offer aftermarket upgrades to our traditional seamers to retrofit these popular options."

The V-Series will be on display first at the Craft Brewer Show in Denver in April, with the 6V model on show. PSA will then showcase the 12V at Interpack in Germany in May.

MCG's F-113 seamer with automatic height support columns, and the company's trademark full stainless steel finish

At Spanish seaming machine manufacturer MCG, its range for food cans is constructed from stainless steel, as the alternatives lead to hygiene problems, explains MCG's Jose Luis Ruíz.

"Due to the cleaning products used, painted coatings and nickel-based surface treatments will start to flake off after a few months of repeated washing," says Ruíz.

Every part counts

A secure pipeline of aftermarket replacement parts is vital for canners to keep their lines running, says Richard Estrada

American Holt Corp is a Boston-based shop that since the mid-1990s has built its reputation by providing replacement parts for US food processors and canmakers. The company makes aftermarket parts for an array of machines that are crucial to the canning, bottling and packaging industries.

One of American Holt's growing relationships is with Mexican-based food processor Productos Carey, which has an expansive cannery in the state of Jalisco. It processes peppers, vegetables, sauces, beans and hominy – much of its production going into cans.

"For products we pack, our machines require very intensive maintenance to complete every packing season," says Carlos Cuestas, an engineer with Productos Carey. "The need for reliable suppliers to furnish parts, at the best quality, is something we've been looking for since our inception (in 2004)."

The two companies have been working hand-in-hand for two years. The key to the relationship is American Holt's ability to improve delivery times on parts for Angelus seamers. Previous suppliers were unable to keep pace, which meant idle seamers.

"We expect our business (with American Holt) to continue for a long time," says Cuestas, citing the US company's ability to beat competitors' prices and quality as additional reasons for their bond. "They [American Holt] maintain parts in stock [and] that allows them to deliver immediately."

Many Mexican manufacturers use time-served machines compared with more up-to-date production lines in the US and Europe, and that bolsters American Holt's success. Hundreds of Angelus seamers are the lynchpins to processing facilities, creating constant demand for replacement parts.

Providing aftermarket replacement parts on a large scale was one of the carrots that helped land the Productos Carey contract. Its Jalisco cannery processes 30,000 tons of vegetables a year.

"There are a lot of great OEMs [original equipment manufacturers] but one of the issues is the huge inventory of parts required to service their equipment," American Holt president Jon Levy explains. "It's difficult for a manufacturer to keep every one of those parts in stock. They might make a few spare parts

MCG's F640 irregular can seamer has recently been further improved by the redesign of the piston clinching station to further reduce spillage. By stepping down from 12 pistons to nine, and re-engineering the station to use a cam and eliminating the use of springs, spillage is reduced to a minimum and less maintenance is required.

The lower-speed irregular can seamers in MCG's range – the F425 and F113 – have also been adapted to reduce the ▸

at a time, but we make 50, 100 or 500 and might hold inventory for a few years.

"It's a different business model. That's where our cost savings come in, making a large run of spare parts before changing over. I'd say 99 percent of parts for these machines, we have them in stock. That allows us to get parts out the door the day they're ordered."

"Every manufacturer needs that local machine shop it can turn to for work, but we have X-ray fluoroscopy and spark spectroscopy, as well as our own metallurgy lab," Levy assures with pride. "We have the depth of engineering experience, and the proper equipment, to reverse engineer a part."

American Holt Corp, 203 Carnegie Row, Norwood, Massachusetts 02062, USA. Tel: 1 781 440 9993. Fax: 1 781 440 9994. Website: www.americanholt.com

forces responsible for spillage by between 50 and 70 percent, compared to alternative seamers, says Ruíz.

The need for height changeovers, which are becoming an increasing part of the operations of canmakers and fillers as production runs decrease, led to MCG offering automatic height adjustment on all of its irregular and round can seamers. The system enables height change adjustments to an accuracy of within 0.1mm to be made in a few minutes, says Ruíz, compared to the two or three hours required by alternative seamers.

MCG has also designed its irregular can seamers to offer flexibility, enabling the machines to handle changes such as to thinner and harder tinplate. A seaming turret allows both of the second operation rollers to be adjusted independently, which in turn enables operators work with lower-gauge and harder can bodies and ends without reducing operating speeds.

At Swiss-based Ferrum, the latest seamer is the F9 and, in keeping with demand, focuses on hygiene and swift height changeovers.

With nine stations and operating at up to 1,125cpm, the F9 is part of Ferrum's complete redesign of its range of can seamers, which was undertaken with the aim of developing modular can seamers for the canmaking, food canning and beverage canning industries.

Compatible with cans between 50mm and 99mm in diameter, the new machine has a servo-powered height-adjustment mechanism and quick-changeover system, says Ferrum.

Meanwhile, the hygienic design incorporates an integrated washing device and undercover steam injection.

From a manufacturing perspective, the F9 also offers an infeed screw with a can body brake, an infeed system for ends, and integration into the complete canning line.

Going with the grain

A key consideration in the seaming industry is the materials used to produce seaming rolls, says James Wilkinson, seaming business manager at CMB Engineering

"In terms of seamer tooling developments the advancements all revolve around the next generation of seaming roll materials – the driver here being finding a material with the finest grain structure possible. This fine grain structure has two distinct advantages, namely an increase in service longevity and a stronger molecular bond between the base substrate and the CVD (Chemical Vapor Deposition) coating, which aids adhesion.

"CMB Engineering currently has seaming rolls of this advanced material on trial in various seaming environments and results are regarded as extremely positive.

"This development is primarily aimed at the food fillers due to the ongoing downgauging process within the food canning industry and the move away from SR (Single Reduced) to DR (Double Reduced) materials, affecting both the steel end/cover and the steel can body. These harder DR materials have increased the rate of wear within the seaming roll profile – primarily the profile lower angle/exit radius, also known as the 'kick angle'."

Another aim for seamers is to maintain production for as long as possible without downtime, says Wilkinson:

"Increased seamer up time is only achieved through regular assessment of the seamer, ensuring the mechanicals are always at the optimum in terms of clearances, floats and backlash.

"In addition, the fitting of seamer tooling, once set, maintains that condition for as long as possible and this is only achieved through the design of a maintenance-free seaming roller using advanced materials, bearings and coatings fit for purpose. These are all core principles used by CMB Engineering in the design of our seamer tooling and the optimum set-up of the seamer."

CarnaudMetalbox Engineering Ltd, Dockfield Road, Shipley, West Yorks BD17 7AY, UK. Tel: 44 1274 846200. Fax: 44 1274 846201.
Website: www.carnaudmetalboxengineering.com

Mexican food processor Productos Carey uses Angelus seamers and parts from American Holt; and right, MCG's R645 round can seamer

Applying the theory

While the double seam may now be well into its second century, operating the latest seaming machines – and older, existing machines on today's lower-gauge materials – still requires experience and knowledge.

Danish food and general line canmaker Glud & Marstrand has been running its 'Seaming School' course since 1950, sharing its knowledge of maintaining a problem-free seaming operation on round and irregular food cans.

Originally established as a seminar primarily for managers, the Seaming School as it is today began in 1987 to assist Danish canned meat fillers to meet demands from the US Department of Agriculture's Food Safety and Inspection Service.

Held at the canmaker's headquarters at Odense, the two-day course is held between four to eight times a year and focuses on three-piece and two-piece food cans, covering food sectors such as meat, milk powder, fish and vegetables, and both atmospheric and vacuum seaming operations.

Topics such as seam theory, seam control, visual inspection and winkle evaluation are all covered.

The challenge of lightweighting is also examined in the course: "We are working with cans made of steel and aluminium from 0.25mm down to 0.13mm in thickness," says Glud & Marstrand. "This is a challenge when working with a seamer built back in the 1960s."

More information from:

Ferrum, Bahnstrasse 18, Rupperswil 5102, Switzerland. Tel: 41 62 889 1311. Fax: 41 62 889 1255.
Website: www.ferrum.ch

Glud & Marstrand, Hedenstedvej 14, 8723 Løsning, Denmark. Telephone: 45 6312 4200. Fax: 45 7589 0683.
Website: www.glud-marstrand.com

MCG, Polígono Industrial Rebullón, Nave 10, PO Box 1092, Mos-Vigo, Pontevedra 36416, Spain. Tel: 34 986 266 146. Fax: 34 986 487 135.
Website: www.mcg.com.es

PneumaticScaleAngelus, 10 Ascot Parkway, Cuyahoga Falls, Ohio 44223, USA. Tel: 1 330 923 0491. Fax: 1 330 923 5570.
Website: www.pneumaticscale.com