

# LIGHT METAL AGE

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The new 3,600 ton, 9 inch press installed at Bonnell's Newnan facility is dedicated to automotive production.

## On the Front End of the Curve – Bonnell Aluminum Shifts into Automotive

By Andrea Svendsen, Managing Editor

One of the first North American extruders to capitalize on the growing demand for extrusion for automotive applications, Bonnell Aluminum started up a new press line at its headquarters in Newnan, GA, in April. The \$17 million expansion project, first announced at the beginning of 2013, is a state-of-the-art extrusion line dedicated to the production of 6000 series aluminum extrusions for automotive components, including crash management systems and structural applications. These parts will be supplied to car manufacturers in the North American market, many of which have global platforms.

Bonnell is a subsidiary of Tredegar Corporation and has been in operation since 1953, producing custom extrusions primarily for the B&C market. The company manufactures mill finish, anodized, and painted aluminum extrusions, as well as thermal barrier assemblies. Bonnell is an extruder often noted for being ahead of the curve. In 2009, the company installed a 5,500 ton Prezezzi press at its Carthage, TN, plant, expanding its circle size capabilities to 16 inches, enabling it to produce wide extrusions previously unavailable on the construction market (*Light Metal Age*, April 2009, pp. 18-22). In 2012, the company broadened its market capabilities by acquiring AACOA Extrusions in Niles, MI, and AACOA Inc. in Elkhart, IN. The company now has a total of four manufacturing operations—Newnan, GA, Carthage, TN, Niles, MI, and Elkhart, IN. Twelve presses total at Bonnell facilities range in size from 1,550 to 5,500 tons. The Newnan and Carthage facilities have casthouses that produce 6000 series billets in 6-10 inch diameters. With over 1,300 employees, Bonnell Aluminum is among the largest aluminum extruders in the industry.

The new automotive line adds 17 million lbs of production annually, representing a significant shift in production and diversifying Bonnell's product mix. A recent conversation with Ira Endres, vice president of Sales and Marketing, Mike Jones, vice president of Operations and Strategic Planning, and Guy Charpentier, division marketing manager, helped to illuminate the reasoning behind this investment (Figure 1).



Figure 1. L-R: Ira Endres, vice president of Sales and Marketing; Guy Charpentier, division marketing manager; and Mike Jones, vice president of Operations and Strategic Planning.

### *A Strategic Move*

Bonnell choose to enter the automotive market for several reasons. “The first reason is to diversify our market participation and overall business, so we’re not overly concentrated in one area,” said Endres. “That is something we learned from the 2009 recession, when we had the majority of our capacity in non-residential construction with a little bit of residential construction. So, the downturn was pretty significant. Participating and diversifying in other markets will allow us to weather business cycles much better.”

Another reason for the choice is that the company has had prior experience producing extrusions for automotive. Prior to 2008, it had operations in Canada that produced automotive extrusions, which were eventually divested. This past experience provides the new expansion with an experienced management team familiar with the automotive industry's requirements. “We took our historical experience within our current management group and went back to some of our historical relationships,” said Endres.

Endres also cited the ongoing growth of aluminum use in the automotive market. He said, “Based on the re-

search we've conducted, internally and with external assistance, automotive will offer significant growth opportunities over the next decade and longer, as lightweighting becomes a key issue for OEMs and how they wrestle with meeting more stringent CAFE requirements going forward."

The new expansion represents a key strategic initiative for Bonnell. "Back in 2008 and 2009, we had maybe 80% of our capacity in nonresidential construction and in residential construction," said Endres, noting that while that market will continue to see organic growth, the percentage of construction capacity from Bonnell will reduce to around 50-55%. "So, automotive will grow significantly in the future as a percent of our overall mix. Depending on how the automotive programs specifically develop, we will continue to grow and dedicate more of our capacity, if it makes sense, to automotive production."

#### *A Dedicated Press Line*

The Newnan facility was selected as the site of the automotive expansion in part because the experienced management and skill base required were located there and in part because it is the company's largest site, situated on 60 acres of land with 12 acres of manufacturing under roof. Both of these reasons made Newnan the natural site for expansion. Furthermore, the company expects automotive demand in the Southeast U.S. to increase in the future, potentially making Newnan a strategic location as time goes on.

Built as a plant within a plant, the new automotive line is physically separated from Bonnell's traditional business and operates under separate management. Construction involved both the modifying of existing bays and adding new bays, with the work performed by Forcum Lannom Contractors.

The line was designed and engineered specifically to serve the automotive industry and to meet its tight technical and quality needs. "The automotive business is very different," said Jones. "They require very strict controls on all quality aspects of the part. Also, consistency is something that is required in automotive. So, the equipment was designed specifically for this product. We certainly have a different skill base, as well. Our employees on the new line are trained very differently, more in-depth than necessary for some of our other businesses. And we use a lot of internal auditing to assure that we are meeting all of these challenges."

New equipment installed includes a Presezzi Extrusion press, a complete handling system from Turla, die ovens from Novatec, and aging ovens from Gerref, as well as state-of-the-art control systems and POCs to help closely monitor the profiles to make sure they meet customer requirements. Dies for the facility are supplied by Thumb Tool & Engineering in Bad Axe, MI, and Exco Michigan in Chesterfield, MI, as well as other die suppliers.

The new press is the second press supplied by Presezzi to be installed at a Bonnell facility. "Presezzi is an Italian press maker and they have become very much the state-of-the-art in press design," said Jones. In 2009, the company supplied a 5,500 ton, 12/14 inch press at Bonnell's Carthage, TN, plant and the success of that installation is part of the reason why Presezzi was selected for the current expansion. In addition, the press maker was able to supply the press specifications needed for this market and to meet delivery requirements on a tight timeline, with the press manufactured and installed in nine months.

The new press is a 3,600, 9 inch press that can handle billet up to 53 inches in length (Figure 2). "The 9 inch size was selected, because our study on the demand for aluminum extrusions, indicated that the vast majority would fit into a less than a 9 inch CCD. That was the first thing we decided," said Jones. "We needed the tonnage because of the long billet and special alloys and even pressure to consistently produce the product that is needed for the automotive market." Other features of the press include Presezzi's patented PE ES hydraulic system that provides up to 35% in energy saving; a nitrogen die cooling system; a shear to cut the profile between the die ring and bolster, avoiding manual cutting of the profile; an isothermal system; and press mouth protection. With the press mouth protection, rather than physically looking into the press, the operator uses a monitor during the start of a new die. The process is recorded and the information is sent to the die shop in order to correct the entry of the profiles into the dies. The mouth protection also provides a thick plate of steel to contain any explosion should a die break, providing operators a safe environment.



Figure 2. Richard Beaman, lead operator second shift, at the operator press control station for the new press.

The press is fitted with a sophisticated handling system from Turla, including log heater, air and water quenching, a double runout system, cooling tables, stretcher, and finishing saw (*Light Metal Age*, August 2013, pp. 60-61). The Step<sup>5</sup> log heater provides high fuel efficiency, short throughput times, and minimized maintenance costs. The runout and cooling tables supply smooth and defect-free profile management and the finishing saw offers a precise and clean operation. "Turla is built a little more robust, a little heavier equipment than some of the other suppliers," said Jones, who also noted, "Their North American office is in the Atlanta area, so it is quite convenient for us if we need any kind of support from them."

Due to the automotive industry's specifications, which look for good mechanical properties that provide an optimal combination of strength and ductility for a vehicle's structure, quenching is an important aspect of the extrusion process. The QAH quenching system was designed by Turla specifically for extrusion companies active in the automotive industry to meet these needs (Figure 3). It is an adaptable system, able to provide either air or water quenching, depending on the alloy being produced. The new expansion will produce alloys in the 6000 series that are typically at the higher end of the range of mechanical properties. These alloys, from 6060 to 6082, are being specified by the OEMs. To optimize mechanical properties, air quenching is used with 6060 alloys and water quenching with 6082 alloys.

The six infrared die ovens supplied by Novatec were selected for their unique design to heat individual dies.

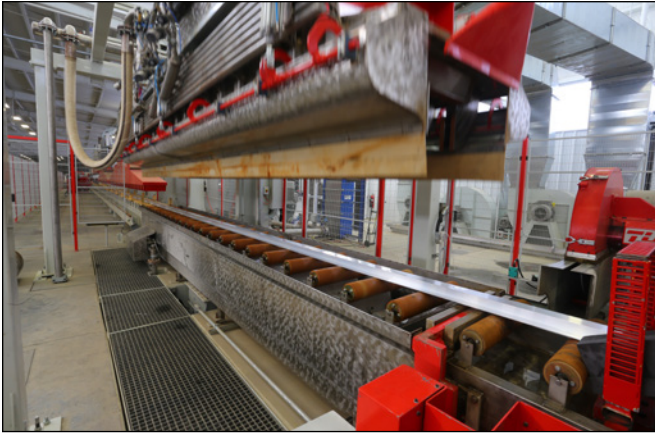


Figure 3. QAH air and water quenching system.

The G5 infrared ovens were designed to be energy efficient and provide heat up times that are 35% faster than many competitive ovens. In addition, the ovens are fitted with good control systems that allow dies to not only be heated quickly, but also uniformly and with lower energy consumption.

The new aging oven has vertical lift doors at both ends and allows for a maximum load width of 94 inches, a load height of 8 ft, 11 inches, and a load length of 52 inches. End-to-center airflow supplies heated air at both ends of the oven, which moves through the center and passes out each end to the two heat houses for reheating, providing continuous air flow during the load cycle. The ovens have an operating temperature of 395°F, with a maximum possible temperature of 500°F. This was the seventh aging oven that Gerref has supplied to various Bonnell locations over the past 16 years.

The automotive projects currently being produced are mostly mill finish and require no additional finishing, anodizing, or paint, however Bonnell does provide cut-to-length services, short cuts, and precision cutting. It will also do some CNC machining, and plans to do more machining in the future, at its Niles facility.

As part of this expansion, the company has achieved additional quality certifications and it received ISO TS-16949 in second quarter 2013. “That is the quality designation that is standard in the automotive world,” said Jones. “In addition, each of our customers have product or program specific specifications, where they might have different mechanical properties, different chemistry limits, different tolerances—and these are all handled on a one-off basis.”

Currently, over half of the production on the new press line is for Bonnell’s automotive programs in the North American market, with some medium strength product coming off the press for general market use. As the company grows its participation in automotive, however, the line will become totally dedicated to automotive production alone.

### *Conclusion*

A combination of experienced management and current technologies to provide efficient production performance, high quality extrusion products, and the required standards makes Bonnell a competitive player in automotive as the market continues to grow. “We believe that we are definitely on the front end of the growth curve, as far as the automotive industry is concerned,” said Jones. “Our research is currently showing us that there is not enough qualified automotive capacity in the industry to meet demand, so when you’re in that situation, you are definitely on the front end.”