

Clifford-Jacobs Sees Saw Advantages

Application Note

By utilizing a new design of billet-cutting saw, one forging company is realizing faster throughput on its billet blank preparation with a high degree of accuracy and an anticipated 20-year service life, without major rebuilding.

Clifford-Jacobs is a leading forging company in the Midwest and has become a major supplier to aerospace, off-road construction, mining, forestry, truck, military, rail transit and the oil/gas equipment markets worldwide since its founding in 1919 by Cass Clifford and David Jacobs. The origins of the company include a great story of tenacity and determination to succeed. Following a fire that nearly destroyed the business and the onset of the Great Depression, Jacobs and the company's one employee cut, forged and trimmed an order of 300 service hubs for Chevrolet at fifty cents apiece. To save additional shipping cost, the men loaded the product into wheelbarrows and hauled them to the local rail station in Champaign, Illinois.

Today, the company's Total Quality program mandates continuous improvement in management tasking, production reporting and especially equipment upgrades to maintain the highest level of quality and consistency possible.

While the company centers on the forging process with 1,500-25,000 lb. steam hammers, the billet blanking saw department is where the process begins. Here, a billet-cutting saw, built by a man named Willy Goellner in 1971 and still functioning today, prepares stock up to 12" diameter into the blanks for the forging process. Goellner's company, Advanced Machine & Engineering Co. (AME) has since designed a new generation of saw called Amsaw® for today's cutting needs, based on state-of-the-art machine technology. AME still supplies Clifford-Jacobs its billet-cutting saws and has recently installed one of its latest developments, the AMSAW S300, for use on 3"-12" billets,



The Clifford-Jacobs facility in Champaign, Illinois.

though the customer here primarily uses it for 6"-9" stock, according to VP of manufacturing, Mike Snell.

"We process a very wide variety of materials here at Clifford-Jacobs, and we use the AMSAW for all but some aerospace and stainless grades. That covers carbon, alloy and bearing steels, calcium-treated, VIM-VAR and customer-supplied proprietary grades from such leading companies as Caterpillar, Westinghouse, GE and Boeing Aerospace." In the sawing department, Snell explains, long bar stock is offloaded by overhead crane and fed directly onto the saw tables. On the new AMSAW S300, a PLC maintains the precise feed settings and monitors the loading system. According to AME, this particular style of carbide billet-cutting saw outperforms a band saw by a factor of eight at less cost per square inch of material cut. Mike Snell says that, while Clifford-Jacobs has not studied that particular comparative aspect of the saw's performance, he



Typical parts forged at Clifford-Jacobs weigh 3-800 lbs. and include gears, axles, valve bodies, hubs, rings and clevises. Short runs and production contracts to 15,000 pieces annually are executed.



This saw was installed in 1971 and has recently been rebuilt by Advance Machine and Engineering.

is certain the AMSAW makes a discernable difference in the overall output of the sawing department at his company.

The same grind is used on all saw blades and though Clifford-Jacobs uses a local source for resharpening and new blades, all machine service and the rebuild/upgrading work on the AME saws are all purchased through the manufacturer, as part of a scheduled predictive maintenance procedure in place at Clifford-Jacobs. As Mike Snell, a 21-year employee of Clifford-Jacobs, explains, "Our contact at AME, Steve Swanson, has been with Willy (Goellner) at the company, almost since the beginning. We can call on him and know our work is being handled by someone who is familiar with us, our needs and the particulars of our process."

Beyond this personal closeness in the working relationship, the performance of the AMSAW is what most appeals to Snell, who says they can hold +/- 0.010" or better tolerances routinely on the material blanks, including the hardest materials processed at Clifford-Jacobs. He credits the design of the AMSAW machine, using pivot point rather than older way technologies, to maintain this consistent cutting action.

The AMSAW S300 at Clifford-Jacobs was one of the first such machines installed and Snell admits there were some difficulties at the outset. "The initial problems took awhile to solve, but AME and C-J stuck with it and, in the end, we got exactly what we wanted from the machine. That's a credit to both AME and us, but when you've relied on a supplier for so long, it's worth having them as a cooperative partner. We'd like to think our customers have the same attitude towards us."

The smaller saws in the department have been rebuilt approximately every eight years, according to Mike Snell, who predicts the AMSAW S300 might go 20 years before requiring a rebuild. "We use the machines constantly about 50 hours each week, with only a routine maintenance shutdown, every July." Snell also commented that the training received from AME for his three operators in the Clifford-Jacobs sawing department was thorough and allowed nearly immediate production to occur.

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