Since 1997 OSU's Applications Engineering Program has provided expert advice to hundreds of Oklahoma manufacturers resulting in a much-needed boost to Oklahoma's rural economy. By placing a staff of experienced engineers across the state, the program provides manufacturers direct access to the latest in technology. These engineers are an integral part of Oklahoma Cooperative Extension Service and also have access to the resources of OSU's nationally-recognized engineering faculty. This knowledge and experience represents a valuable resource for Oklahoma's manufacturers. Companies are surveyed by an independent organization after completion of a project. The opinions expressed on the survey help shape the direction of the program in the future.

For more information contact
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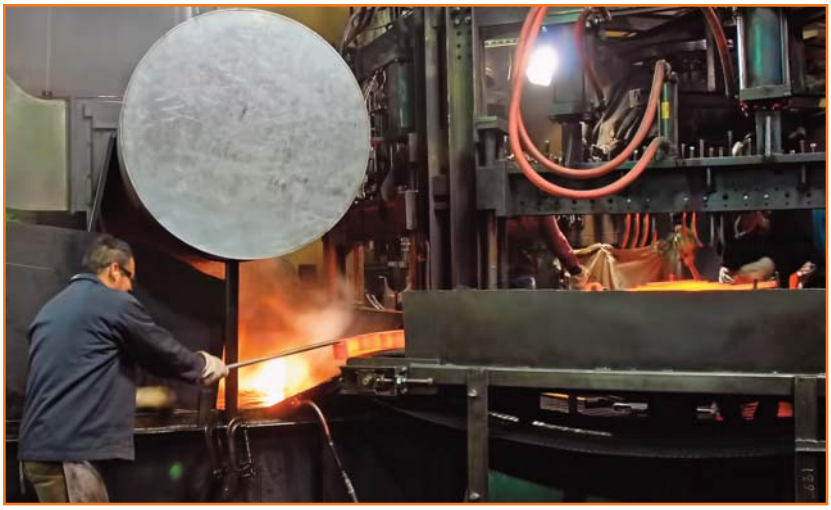
In Cooperation With

OKLAHOMA MANUFACTURING ALLIANCE



Applications Engineering Program

EMCO Industries in Claremore

One tough manufacturing job is more efficient and a lot less hazardous thanks to the work of Oklahoma State University's Applications Engineers.

"When we walked in the door after purchasing the company in 2010, we knew we had to make significant changes," says Randy Smay, director of manufacturing and engineering at EMCO Industries. "Customers looked at our production and couldn't believe we made springs that way."

Based in Claremore, EMCO produces a complete line of parabolic leaf springs and manufactured products for the specialty vehicle, RV, boat, agricultural, utility, and trailer industries.

Specifically, Smay needed assistance to improve the "quench after heat treat" process. EMCO's process at the time involved manually removing leaf springs from a forming press and using tongs to carry the intensely hot (1,700º F) pieces to an overhead conveyor. The heavy metal springs were then lifted onto hooks and sent through an "oil quench bath" before being manually removed from the conveyor and placed on a second conveyor where they were sent through another heat treat operation. It was very labor intensive. In fact, five men worked short 15-minute shifts, alternating off and on throughout the day.

Smay had a great working relationship with Bill Shortridge, a Manufacturing Extension Agent for the Oklahoma Manufacturing Alliance. They had worked on previous projects, including improvements in the area of Lean Manufacturing. *(Shortridge has since retired and David Wheeler is now working with EMCO.)* For help with this project, Shortridge called on Win Adams. He is one of five OSU Applications Engineers located throughout the State. The group assists small and medium-sized manufacturers on short-term engineering projects.

Importantly, EMCO wanted to reduce the possibility of injuries and fatigue while improving production times. Smay had an idea for a large, wide conveyor that would be located inside the quench tank where springs would be automatically "kicked" off the forming presses directly into the tank. He hoped they would fall onto the flat inclined conveyor and progress at a pre-determined speed where they would cool enough to be handled by workers wearing only protective gloves, as opposed to the awkward tongs.

After reviewing the specifications and requirements, Adams asked Shea Pilgreen, another Appli-

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> *We had ideas in our head. But it was a matter of taking those ideas and making them work in the real world.*
>
> *Randy Smay*

cations Engineer, to join the project. The basic design required a system able to process one spring every three seconds with a production rate of 20,000 pounds per hour. The quench tank dwell time needed to be automated at seven minutes. The complicated process required extensive engineering research and design, as well as the creation of bid and fabrication drawings.

The design team—made up of Adams, Pilgreen and EMCO leaders—completed the project in time for successful implementation during a holiday break when the plant was scheduled for a shutdown.

"We had ideas in our head," Smay says. "But it was a matter of taking those ideas and making them work in the real world … and making the changes and designing new machinery that fits into the overall process. It becomes very complicated."

The new process increased production by 25 percent and reduced downtime from two hours a day to 45 minutes a week. It also removed three people from the process, freeing them up for other tasks.

Wheeler adds, "Because of its smaller size, EMCO didn't have the in-house engineering expertise to handle this transition with all the correct specifications and design materials. The Applications Engineers can help companies like this on a temporary basis. The efforts are keeping viable Oklahoma manufacturers in business and technologically competitive."

Smay looks to build on the momentum. "In the next couple of years, you will see a completely new-looking factory. The OSU Applications Engineers are helping make that happen."

Inspecting a spring at EMCO Industries are from left, David Wheeler, Manufacturing Extension Agent for the Oklahoma Manufacturing Alliance; Win Adams, OSU Applications Engineer; Randy Smay, Director of Manufacturing and Engineering at EMCO; and Doug Enns, OSU Applications Engineer.