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TO BOLDLY GO

This unique supplier partnership enhances production and quality procedures with a bold approach to lean manufacturing.

Stephen English of Heil (left) and Jeff Kramer of Harco stand in front of a ready-to-ship Heil unit.

Jeff Kramer of Harco and Stephen English of Heil (bending down) examine a hydraulic tube installation on a production unit.

Example of tubes stocked by Harco on Heil production line.

Traci Kramer (right) and Josh Hairell of Harco use a Wauseon end forming machine to produce tube flaring and other tube end forms.

Traci Kramer (left) and Josh Hairell of Harco use a Romer CimCore laser tube inspection system to inspect tube geometry.

Heil Environmental Industries, Ltd. (Chattanooga, TN) and Heil Parts Central (Fort Payne, AL) have been valued customers of – and partners with – **Harco Metal Products, Inc.** (Tempe, AZ) for over 15 years. Approximately seven years ago, Heil closed the Arizona facility that Harco Arizona was serving and consolidated their operations in Fort Payne. Rather than accepting this as a customer loss due to circumstances beyond control, Harco saw an entirely different business opportunity.

Management felt there were two choices: allow this trusted customer to disappear, or take a much bolder approach. Investing in what was fundamentally a leap of faith, Harco Metal Products boldly established an additional facility in Alabama to locally service the Heil operation, with no firm commitment that the business would be theirs, but believing that their high levels of service and quality could not be ignored. The decision paid off.

Harco now fabricates more than half of the steel hydraulic lines for Heil's production facility. Partly due to the close proximity of the plants, they provide additional services no other tube supplier offers, such as a vendor managed inventory (VMI) program, JIT delivery, design assistance, short-turn lead times on parts not regularly managed, and constant availability and accessibility that ensures no line shut down due to tube shortages. Harco also supplies the world-wide parts distribution center of Heil Parts Central with all hydraulic tube assemblies, and has begun building a substantial and growing new customer base in the Southwest.

Recognizing the importance of a healthy supply chain in maintaining its status as a builder of refuse collection bodies with the lowest Total Cost of Ownership (TCO) in the market, Heil created a Sourcing and Supplier Development department in 2007 with the mandate to ensure the company aligns itself with the best suppliers in the industry. To fulfill this mission, the department first took stock of its current suppliers, establishing and periodically reviewing key supplier metrics such as Plant PPM, OTD, Warranty, Finances, and Warranty PPM.

Through this process, Heil was able to chart suppliers and prioritize resources to begin supply chain development a few suppliers at a time. After a supplier was identified, a comprehensive audit of that supplier's quality system and manufacturing practices was performed. The goal was to assist suppliers by assessing the overall effectiveness of their quality systems and determining how well these systems would continue to meet Heil's specific needs.

After performing this quality system and manufacturing best-practice audit, Heil provided a detailed analysis of findings to each supplier and created an action list detailing areas in need of improvement. In the spirit of true partnership, a Supplier Development engineer was assigned to guide and help each supplier through this comprehensive and intensive supply chain improvement process.

While some suppliers might have viewed this evaluation request as potentially intrusive and rejected the process, Harco welcomed the opportunity to tap a vast knowledge base not typically accessible to a smaller-sized company. They recognized the opportunity to further develop an already strong relationship with their largest customer while expanding and refining processes that, ultimately, would provide a high return on investment for both parties.

The first task was to identify how Harco products affected the safety, customer satisfaction, and environmental impact of Heil's end product. This pointed directly to the flare end form of tubes supplied to Heil, along with the fit of those tubes within Heil's production process. Harco fabricates fluid conducting lines that carry hydraulic fluid throughout the systems within Heil units. Any leaks or failures within that system during the unit's operation could produce safety hazards, as well as negative environmental impacts. Overall system performance can also be negatively impacted by connection leaks.

Together, both companies evaluated all of the current Harco processes that contributed to a quality end connection and fit. While several procedures were already in place to address these issues, they determined that improvements could be made to further assure the non-occurrence of failures.

Harco invested heavily in new equipment with greater technological capabilities and in employee training to immediately upgrade all internal processes and procedures. Tube preparation was improved through a more stringent method of evaluating cut quality and tube end preparation. Investments were made in new chamfering machines that produced a higher quality finished end for flaring.

Inspection of tube geometry was upgraded to include a Romer CimCore laser tube inspection device that provides extremely accurate data needed to make certain that parts are made to customer specifications. A new CNC tube bender was also purchased to improve the quality and repeatability of the fabrication process, and to ensure finite tube measurement to produce repeatable tube geometries.

An end-forming machine and associated tooling was purchased to provide a consistent and repeatable flare end on the connecting end of tube assemblies. Current capability studies on all flares performed with this new machine exceed 1.33 Cpk values, indicating an extremely repeatable and reliable process that creates leak-free end forms.

Additionally, a CNC tube stop system was purchased to make length changes more quickly and to improve repeatability of tube cut lengths, and an induction brazing unit was acquired to produce a more consistent and clean heating process for tubes that require brazed end connections.

Harco underwent an intensive employee training program at each relevant workstation to develop a complete understanding of the new machine operations and the results that were expected from each sequence of events. Updated work instructions, pictures and required boundary samples were introduced at each workstation to provide a tangible frame of reference for its assigned quality standards. Critical operations were laid out to further assist operators in understanding the end result necessary at each particular point in fabrication.

These investments in equipment, along with the accompanying investment in training and process control procedures, ultimately enabled Harco to produce an even higher quality part for Heil while systematically improving internal productivity and greatly reducing internal fallout rates.

The company is now an ISO-registered company that is certified at their Arizona facility, with the Alabama plant close behind (although the requirements of the ISO standard apply to both Harco facilities). As the ISO standard focuses on customer satisfaction and continuous improvement, the management team utilizes ISO certification as a method to strengthen and improve relationships with existing customers, and as a vehicle to develop relationships with new customers.

To ensure consistency between organizations, corporate management developed quality templates and requires all policies to meet ISO standards at both facilities. As operations and methods are unique to individual facilities, each Harco location chooses how to document and implement these policies in a manner that best suits their individual needs.

Personnel training for initial ISO certification details a plan ensuring that all employees understand the basic requirements of the standard and how Harco implements these requirements. Harco's Quality Organization team holds training sessions with employees where the basic requirements of the ISO standard are discussed and Harco's specific implementation processes are detailed.

One requirement of the ISO standard is to produce quantified, continuously monitored objectives for discussion by senior management at review meetings. Objectives for scrap reduction, manufacturing cycle time reduction, and on-time delivery to customers are established. By identifying and monitoring these specific objectives and taking actions to achieve goals, Harco realizes immediate benefits from the upgrades made to the quality system. For example, returns thus far include a 50 percent reduction in scrap and manufacturing cycle time, and an on-time delivery improvement of over 100 percent.

Throughout the evaluation, reporting, and restructuring process, Harco continually seeks assistance and input from Heil, and Heil routinely seeks Harco's input. Because of this direct interaction, Heil now has a much better understanding of the tube fabrication process and some of its inherent restrictions. This has led to a more open line of communication with respect to new tube design, existing tube design issues, and tolerance expectations. Heil now openly seeks Harco's advice, as Harco does theirs, in an operation is a never-ending process.

In a partnership that shares employee training, expectations and benefits, the relationship between this supplier and customer is stronger than ever – another testament to the pillar of lean manufacturing.

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