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Even the toughest of projects appear to be no match for this equipment.

Think beer, bratwurst and cheese and Milwaukee, Wisconsin might come to mind. In 1977, Ed Michalski had a hunger to start his own business, so he set his sights on the industries that made Milwaukee famous and founded Pro Engineering and Manufacturing, Inc. ("Pro"). Today, Michalski's company is considered a leader in custom fabrication, manufacturing and engineering for the food and beverage industries.

In fact, to support its growth, Pro recently moved to a new 33,000-sq. ft. manufacturing facility complete with 30' high ceilings, 16'x 20' dock doors, 5- and 10- ton overhead cranes and state-of-the-art welding equipment. According to the company, whether they are here or at an off-site project, its fabricators rely on the flexibility of the XMT, 350 CC/CV multi-process inverter with Auto-Line™ from Miller Electric Mfg. Co. to deliver quality, custom fabrication solutions to customers. A situation at the 150-year-old Milwaukee-based Miller Brewing Company is a good example.

Brew kettle maintenance and repair

When Miller Brewing needed assistance with its extensive brew kettle repair project, it tapped Pro Engineering experts for advice. This difficult welding project involved repairing damaged copper and stainless steel joints within six massive brew kettles. Over time, mechanical, chemical and electrolytic erosion had degraded the copper and stainless steel interface where the brew kettles' sidewalls and domes meet. In certain areas, the original copper weld used to bond the stainless steel dome to the copper kettle had begun to show serious signs of wear (Fig. 1).

To repair the damaged interface, Pro engineers designed and fabricated a 6"wide copper band to bridge the original stainless steel/copper weld seam. Taking advantage of the Miller Electric XMT 350's multi-process capabilities, the Pro fabricators used a combination of MIG and TIG welding to bond the copper band to each of the base metals.

Fig. 1. Evidence of the various mechanical, chemical and electrolytic erosion that had degraded the copper sidewall and stainless steel dome joint located inside one of the brew kettles.

Using the XMT 350 and Miller Electric's S22A wire feeder operating at 325 amps and 25V, the fabricators MIG-welded the bottom portion of the copper ring to the 3/8" thick brew kettle copper sidewall using .035"-diameter copper solid wire. They also used Smith Equipment gas regulators to deliver 100% helium shielding gas.

To weld the upper portion of the copper band to the 1/4" stainless steel dome, fabricators first TIG-welded a root pass using a Weldcraft torch with 3/32"-diameter tungsten and .035-inch diameter silica bronze (AWS-A5.7/ER Cu Si) filler rod. Because TIG welding produces lower deposition rates, fabricators MIG-welded the remaining fillet welds using silica bronze solid wire operating at 275 amps and 25V. Due to copper's excellent heat transfer, the fabricators used a secondary heat source to achieve and maintain the weld pool (Fig. 2). "We manually used Mapp torches to heat the area either directly below or on the opposite side of the work piece," explains Michalski.

Although Pro Engineering fabricators rely greatly on the XMT 350s multi-process capabilities, they also value the machine's primary power flexibility, especially when they are working at off-site projects. The XMT 350's Auto-Line Power Management Technology, exclusive to Miller Electric, gives operators the ultimate power flexibility.Auto-Line allows the XMT 350 to produce a rock-steady arc-even through primary power fluctuations-within a 190 to 630V range, and it accepts any type of primary power supply (190 to 630V, single- or three-phase, 50 or 60 Hz).

The XMT 350's Auto-Line circuit internally boosts primary power to a high voltage. Once it's regulated, the power becomes the source for the actual inverter section of the XMT.Auto-Line ensures that the inverter has sufficient power as long as the primary power remains within +37/-59% of the nominal 460V power.

Fig. 2. Pro Engineering fabricators MIG- and TIG-welded a 6" wide copper band to bridge the original copper and stainless steel joint.

This technology proved particularly useful during the brew kettle maintenance repair project where the brew house was running 230V service. "In the past, we've lost machines because of voltage problems," says Michalski. "I like my XMT 350's flexibility because I can move it from place to place without having to worry about the primary power supply."

Ease of use leads to better quality control

According to Michalski, the XMT 350 also is very easy to use. "It allows us to control the quality of its products," he notes–which should be important to any company. In the case of an industry leader like Pro Engineering, though, it's key. That's because crafting meticulous custom products is how it earns the business and confidence of industry-leading clients such as Miller Brewing Company.

For more information on Miller Electric and the products and services referenced in this article, visit www.millerwelds.com