

Relationships. Innovation. Teamwork.

Novel burner enables use of recycled copper and delivers savings and improved product quality to Encore Wire



Encore Wire Corporation is in a commodity business that serves the construction industry. While this might seem an unlikely place to find wide-open thinking, it is exactly the innovative culture you find at Encore Wire in McKinney, Texas. “We are always looking for a better, more efficient way,” states Gary Spence, Encore’s Vice President, Non-Ferrous Metals, and head of the company’s continuous cast rod facility. “And with Air Products, it is phenomenal what we’ve been able to achieve.”

Phenomenal indeed. As the largest publicly traded building wire manufacturer in the United States, Encore Wire was looking to increase the amount of recycled copper scrap used in its continuous rod mill, both because it is more environmentally friendly and to

continue to lower costs. However, the use of recycled copper scrap has historically been avoided by the industry because of the vertical design of the shaft furnace and belief that recycled scrap produces a lesser quality product.

“Most continuous rod manufacturers use almost exclusively cathode plates direct from copper mines,” explains Josh Gordon, Air Products’ Applications Engineer, continuing, “this is because smaller pieces of recycled copper scrap can move down the shaft furnace too quickly and are therefore not adequately preheated.” This can cause a severe blockage of the tap hole, an approximately 8 x 8 inch opening on the hearth of the furnace. Such blockages can quickly cascade to a catastrophic event where the copper freezes up in

the vertical shaft. Blockages can occur, even if recycled copper scrap is not being used, and require one to two weeks of downtime for recovery.

As blockages are more common when using recycled copper scrap, Encore Wire previously used burning lance bars to keep the tap hole clear. This manual operation was both expensive and time consuming and presented a challenging work environment for the furnace operators. “We knew we needed more fire power to keep the tap hole clear,” says Encore Wire’s Spence, “and Air Products has a talented team of engineering people within their burner combustion group who can do a lot of neat things.”

Traditionally there is no burner at the tap hole. Air Products’ team, including Josh Gordon and Shailesh Gangoli, Combustion Technologist, worked with Encore to develop a totally new oxy-fuel burner mounted near the exit to the tap hole. The ongoing development efforts led to a novel oxy-fuel burner design that can deliver the desired heat input and withstand the harsh environment. Comments Encore’s Spence, “Not only does Air Products sell gases, they create products for the use of their customers.”

“At Encore Wire, relationships mean a lot to us, and we want to do business with companies that fit our culture and with people we trust and respect. We are looking for the best value and, as is the case with Air Products, often that value comes from the people.”

Gary Spence, Encore Wire Corporation

As a result of this innovative new oxy-fuel tap hole burner, Encore Wire is now able to utilize more than 30% recycled copper scrap in its vertical shaft furnace, resulting in a significant improvement to its bottom line. Benefits include lower raw material costs, improved furnace performance and virtual elimination of the use of lance bars, which yielded huge safety benefits for the company.

Another improvement Encore realized is in the quality of their end product. While many in the industry are under the assumption that recycled copper scrap produces an inferior product, Encore Wire's evaluations found just the opposite. Cathode plate coming directly

from the mines contains trace impurities such as antimony, lead and sulfur—some of which are removed from the copper while it is in the furnace. Because recycled copper scrap has the opportunity to go through the furnace for a second time, Encore Wire's studies have shown the end product to have a higher copper purity content than that produced with just cathode plate.

The relationship between Encore Wire and Air Products is built on teamwork and innovation. To learn more about Air Products' unique tap hole burner or to develop solutions to your challenges, contact Air Products at the location closest to you.

tell me more

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