Plasma Delivers High Quality Aluminum Parts at Lower Price

This article was contributed by the experts at Messer.

In the metal cutting industry, fabricators and service centers have long struggled with producing high-quality aluminum parts for a reasonable price. While CNC plasma machines have consistently been the go-to technology for generating carbon and stainless steel parts, the technology could not produce the same quality with aluminum. The industry was left with a few options, such as waterjet and other technologies, that are very expensive in terms of capital costs and cost of operation.

In recent years, plasma technology has progressed and now includes processes for cutting aluminum with superb quality. These new techniques, coupled with the accuracy of Messer Cutting Systems' arc voltage sampling and height-control, use nitrogen as a plasma gas and water as a shield gas for less angularity and squarer cut edges. In addition, the adherence of dross and slag has been reduced or eliminated in many cases.

These increases in aluminum cut quality did not usher in higher process costs. The part pictured was cut out of 3/16-inch steel using a 60-amp plasma process on a Messer MetalMaster 2.0 cutting machine. The process cost, including gasses, water, consumables and other wear parts was approximately two cents while the same part would cost 16 cents with waterjet; eight times more expensive. Cutting these parts over the course of an eight-hour workday would cost approximately $65 using waterjet and $8 using plasma, with over 20 percent more parts cut. As material thickness increases, the speed difference becomes even more conspicuous. At a thickness of one inch, plasma is nearly seven times faster than waterjet.

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While waterjet is a very expensive cutting process, it does bring many benefits to the table. Waterjet cut parts have no heat-affected zone, fantastic edge quality, and part tolerances as low as 0.005 inches. Plasma part tolerances can be as low as 0.020 inches. The question that fabricators need to ask is, are these extreme tolerances necessary and are they worth the cost?

Producing parts to a tighter tolerance than what is necessary can be wasteful in the form of over-processing. A recent Messer customer that fabricates stairs and railings found that a majority of his parts do not require the extremely tight tolerances available with waterjet and purchased a Messer Evolution plasma cutting machine. He was able to offload a majority of his work onto the plasma and only use the existing waterjet in those cases where extreme tolerances are necessary, reducing costs and boosting productivity. Can plasma cutting your aluminum parts do the same for you? ■

***Messer Cutting Systems**, Menomonee Falls, Wis., is a manufacturer of cutting systems for industrial consumers. For more information, call 262-255-5520 or visit www.messer-cs.com/us.*