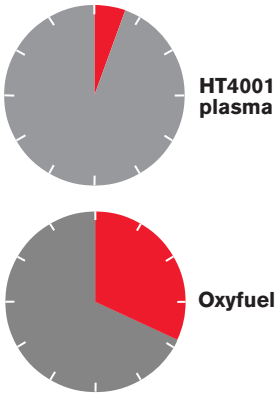
Applications for Plasma Cutting Technology

Industry: Manufacturing – Large Machinery
Equipment: HT4001® on Water Table

Water-Injection Plasma Gains Increase in Productivity; Improves Air Quality Problems

- **Automatic Feed Company cuts thin sheet metal to 6" plate.**
- **Existing oxyfuel cutting system was slow and created air quality problems.**
- **Installation of Hypertherm HT4001 water-injection plasma cutting system.**
- **Cut speed and quality improved significantly. Air quality improved 60 – 70%.**

Cutting time (hours)



The company and products

Automatic Feed Company, located in Napoleon, OH, builds metal coil processing machinery for the big three auto makers in addition to Toyota, Nissan and others in the industry. The company was using oxyfuel torches to cut metal ranging from thin sheet steel to 6-inch (150 mm) plate; 80% of it in the ½" (12 mm) to 1" (25 mm) range.

The problem

Automatic Feed was also looking for productivity improvements that would increase the speed of the cutting operations as their business increased. In addition, the oxyfuel torch cuts frequently required additional finishing steps to remove dross. The slag they produced landed on the floor, creating a mess and a potential accident hazard. The oxyfuel torches were also creating unacceptable amounts of smoke, seriously reducing air quality in the plant.

The solution

After considerable analysis, Automatic Feed purchased a Hypertherm HT4001 water-injection plasma cutting system and a water table in August of 1996. With 340-amp capability, the HT4001 system delivers virtually dross-free cuts on mild steel up to 1¼" (32 mm) thick. On ½" (12 mm) plate, cut speed is 110 inches per minute, much faster than the existing oxyfuel torches could manage. Because it actually cuts under water, the company felt the unit would significantly reduce smoke produced by cutting and therefore improve air quality.

Benefits

Installation of the HT4001 resulted in several benefits for Automatic Feed. Cutting speed improved dramatically. In one test cutting nested parts out of 1" (25 mm) steel, the oxyfuel torch took 3.6 hours and the HT4001 took 45 minutes. At ½" (12 mm), the HT4001 cuts five times faster than the older system. This throughput makes a significant difference in the department's productivity. Air quality improved 60 – 70%. The water table also reduced noise and glare from the cutting operations.

The HT4001 uses oxygen as the plasma gas for carbon steel cutting. This results in a cleaner cut with minimal finishing. Oxygen also virtually eliminates nitriding, a nitrogen-produced cut edge condition that requires a time consuming and expensive grinding operation to remove. Cut squareness is also improved, making welding easier.

Joe Butler, burn table operator, works with the new system constantly. "The HT4001 cuts considerably faster than our older oxyfuel torch – 5 times faster at ½" (12 mm). Cut quality is also greatly improved. Cuts with the new system need minimal finishing."

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