IT TAKES A BIG MACHINE TO MAKE BIG MACHINES

By any measure, MacDonald Steel is one of North America’s largest fabricators - facility size, production capabilities, and the oversize structures and components produced for a wide range of customers and industries.

To further its “big” advantage, MacDonald has installed two long-bed CINCINNATI CL-707 laser cutting centers with dual 8 x 20 ft. (96” x 240”) pallets and 10,000 ipm linear motor drive at its 213,000 sq. ft. Cambridge, Ontario plant.

The 8 x 20 CL-707s are the world’s largest lasers with linear motor drive. MacDonald uses two of the massive, high-speed machines to achieve big output, big versatility and big part size capability. The machines bring super-fast processing to thinner material, create precision holes to eliminate drilling, cut hundreds of intricate parts without reloading, and produce extra-long profile shapes with ±0.001” per axis accuracy and super edge quality.

MacDonald puts that versatility to work 24/7 cutting profiles for a wide range of industries, as well as two “family members”:

- **MacDonald Environmental**, another division, makes industrial dust, fume and air control systems with massive duct work and capture/filter structures.

  “We already had five CINCINNATI lasers when we bought the first CL-707 in 2001, but they all had 72” x 144” (6 x 12 ft.) beds,” says Joe Barroso, vice president. “We purchased the 8 by 20 machine for the sheet size it could accommodate. It lets us do less handling of material, cut for a longer period of time, and run longer parts and profiles.”

While the 6 x 12 ft. lasers were the largest offered by CINCINNATI when MacDonald bought them, some large parts would exceed bed capacity, he notes. “Now we can make longer parts in one pass where we previously had to join two parts together,” says Barroso. “The longer bed let us eliminate the weld seams. We definitely take advantage of the bigger sheet size.”

Building on that advantage, MacDonald added a second 8 x 20 machine in mid-2004. The two machines are located side by side in a dedicated laser cutting bay along with material storage of long sheets. “Basically everything we run is 96” by 240” or 200”. We no longer run smaller sheets unless we need a grade of material that’s not available in large sheets,” he explains.

Founded in 1957 as a custom steel fabricator, MacDonald Steel built a reputation for efficient production of large, high-strength
components for demanding industries. Applications range from power distribution equipment and plastic injection molding machinery to large industrial shedders and stainless steel tanks for beer and wine plants.

MacDonald has long been a major supplier to heavy equipment and off-road vehicle manufacturers, producing machine chassis, booms, cabs and roll-over structures. That experience led MacDonald to develop Tigercat Industries, which has grown into a leader in the logging equipment field with a comprehensive line of massive machines for felling, bunching, loading and transporting logged trees.

The two long-bed lasers produce some large components for Tigercat, which has its own manufacturing facilities. In fact, Tigercat was assigned the smaller CINCINNATI lasers when the MacDonald plant installed the CL-707s. "Basically, the bigger bed capacity let us replace four machines with two," says Barroso.

The long-bed lasers also cut components for MacDonald Environmental, which shares the Cambridge facility. The lasers produce profiles used for filters and collectors, ducting, fan shrouds, bag houses - all the various elements needed for industrial environmental control systems. "Some structures are as big as a house, up to 30 ft. high," notes Barroso.

Between custom work and "family" jobs, the MacDonald plant keeps the CL-707s running 24/7. The large bed capacity can allow extended periods of unattended processing. "We can start plates at the end of second shift," he says. "When the day guys come in, the parts are cut."

Barroso was directly involved in the initial start-up, programming and part nesting when MacDonald bought its first CINCINNATI laser in 1990. At the time MacDonald used a plasma machine to cut profiles that could handle a maximum sheet of 48" by about 100" long, he says. "We'd shear plates, put them on the machine, plasma-cut the contours and holes, then grind off the slag. It was a three-step process to get a part cut out and the precision wasn't there. The reason we bought the laser was to eliminate those processes, and the precision was unbelievable."

Laser cutting technology keeps getting better and better, he says. "Power increases let us cut thicker materials and high-speed drives let us cut faster, with even greater precision," says Barroso.

Two interchangeable 8x20 ft. cutting tables give the CL-707 320 sq. ft. of cutting area, up to four times the processing capacity of other high-speed linear-motor-drive lasers. Massive work capacity allowed the two big-bed CL-707s to replace five former lasers (and reduce staffing), reduce downtime for material load/unload, produce outsize parts and profiles, and achieve long periods of unattended laser processing.