

Fabrication flexibility

At work in Brazil's "no-till" zone

Semeato is a market-leading manufacturer of "no-till" agricultural machinery and replacement parts. Located in Brazil's southern state of Rio Grande do Sul, Semeato traces its roots back to the mid-1960s. Originally created to supply parts and small machinery, the company grew in the 1970s by introducing one of the first lines of agricultural implements manufactured in Brazil.

Today, Semeato comprises six separate units that function as one entity. As a vertically-integrated company, Semeato has developed differentiated manufacturing and logistic processes—including raw material, foundry, plastics, etc.—that assure the high quality of its products and services.

To satisfy a broad range of farming operations, Semeato has developed a distinct line of no-till planters and drills that combine accuracy and efficiency when seeding and fertilizing. In order to satisfy its customers' special needs according to particular regions, soils, cultures, and climates, Semeato has developed a new concept in no-till seeding—the Personalized Drill. With over 500 assembly combinations, the Personalized Drill is a flexible planter/drill designed to find customized solutions to specific agricultural problems.

As a result of the multiple configurations of these customized machines, flexibility is a critical element of Semeato's manufacturing philosophy. To manufacture these products, Semeato has a wide variety of metal-working equipment, including stamping presses, milling machines, shears, press brakes, a coil cut-to-length line, a turret punch press, and lasers.

In September 2003, the Finn-Power Laser Work Center went into production at one of Semeato's Passo Fundo locations. According to Amilton F. R. Loss, production manager, Finn-Power's technology was the reason for choosing the Finn-Power laser over competitors' models. "We chose the



Semeato's distinct line of no-till planters are manufactured using Finn-Power's high-speed laser work center.

Finn-Power laser for its high-speed and load/unload capabilities," explains Loss.

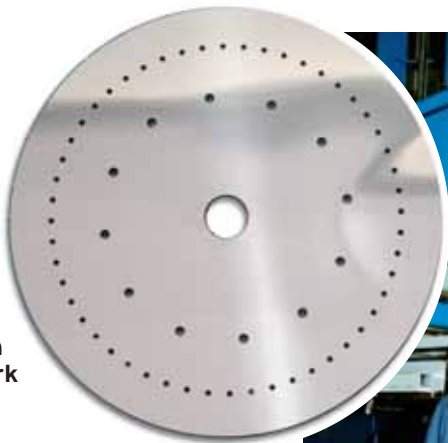
Linear drive driven

The Finn-Power laser is a breakthrough in sophisticated high-speed laser cutting for sheet metal fabrication, creating enhanced production with superior speed, accuracy, and part quality. It uses linear drive motor technology to allow maximum speeds, even in small

notches or narrow contours, achieving a new level of high-speed performance with regard to machining dynamics, contour accuracy, and process safety.

The Finn-Power laser is a flying optics system with a working area of 3,000 mm (120") X axis; 1,500 mm (60") Y axis; and 100 mm (4") Z axis. Maximum positioning speed of XY axes simultaneously is up to 300 m/minute (11,811"/min). Loss also explains that Finn-Power's unique "Ping

One of 2,000 different parts processed on the Laser Work Center.



Pong" repositioning movement allows smooth and efficient transitions for increased productivity. In conventional repositioning, the head moves in straight lines, taking extra time just to position the cutting head.

Semeato processes mild steel up to 6 mm (1/4") thick and stainless and aluminum up to 3 mm. "On thin material, we have experienced a 70 percent increase in productivity over our other laser," says Loss. "On the thicker material, we still experience a 30 percent increase in productivity."

To demonstrate the speed of the Finn-Power laser, Loss presents a production time comparison on a 9 mm stainless steel seed distribution disc. "On our old laser, making 52 of these parts on a sheet 3 meters x 1 1/2 meters would take three hours," says Loss. "We do it in 20 minutes on the Finn-Power."

Automatic loading and unloading are accomplished with the use of load/unload gripper that is equipped with suction cups. The gripper picks up the sheet from the loading table and then places the sheet onto the Finn-Power laser's cutting table.

After the laser cutting has been completed and the laser shuttle tables have exchanged positions, the fork assembly, which is mounted on the load/unload gripper, removes the cut parts, including the skeleton, and places it on the unloading table.

Semeato currently produces approximately 2,000 different parts on the Finn-Power laser. In the past, Semeato utilized a job shop to meet its laser parts requirements. Today, Semeato does all its fabrication internally and also supplies the other divisions of the company with parts. "By allowing us to fabricate all our parts internally, we not only experience lower production costs but also reduced lead times. In addition, when we need to make a



Amilton F. R. Loss, Semeato's production manager, likes the Finn-Power laser's high speed production and load/unload capabilities.

design change, it is much easier to make prototypes on the Finn-Power," Loss explains.

Semeato operates the Finn-Power laser three shifts per day, seven days per week in order to ensure the best performance. Maintenance is something that Semeato takes very seriously. The company rigorously follows daily, weekly, and monthly maintenance procedures to keep the laser running in top condition.

Adds press brake

Recently, Semeato purchased a Finn-Power 160-ton, 4-axis hydraulic press brake to process precision parts with tight tolerances. When doing small or large batch work, the Finn-Power press brake provides cycle time enabling short strokes and quick rapid advance/return speeds to benefit production needs. The forming speed is programmable to avoid part whip-up and provide the operator with ease of operation.

Ram movement is extremely accurate. The piston is fastened to the top beam through spherical surfaces,

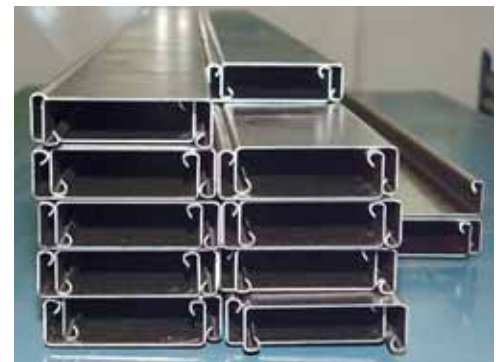
which eliminates the effect of horizontal loads during the working stroke and also makes tilted settings possible. Off-center loading is possible on the Finn-Power press brake because the measuring arrangement has been designed specifically to eliminate any effect on accuracy of the bending force used.

All axes of the press brake, including crowning, are calculated by the control and automatically positioned. The hydraulic clamping circuit for the bed, or ram, has a separate hydraulic hose for direct control.

When the operation parameters of tool pair, sheet properties, and the product dimensions are specified in the control system, it automatically calculates optimal ram movement, back gage position and retraction, bending force, lower dead point, and automatic return stroke.

During ram movement, linear encoders constantly measure the actual ram position, which is then compared with the command values for stroke depth, speed, change point, and return limit.

Any deviation from preset values triggers a feedback signal that, in turn, activates servo valves to direct oil flow to the top, or bottom, of each piston for the correct ram movement required. Measurements are automatically cal-



Typical shapes bent on the Finn-Power press brake.

culated by program information for programmed depth to reach the desired angle.

Finn-Power's precision press brakes are accurate. Regardless of oil temperature, repeatability of lower dead point positions is ± 0.01 mm (0.0004") with Finn-Power's dual linear scales controlling movement throughout the work day. **Finn-Power**