

Client Expands Customer Base With New 120-ton Recycling Baler

The practice of recycling materials continues to grow, and the demand for larger balers grows with it. GPI, a division of Harmony Enterprises, Inc., was limited in its ability to meet this demand—the largest recycling baler in its product line was a 30-ton machine. If it wanted to expand its customer base to include recycling centers and large department and grocery stores, it would need a larger baler.

That is when the Harmony, Minnesota company turned to RFA. The 120-ton conveyor-fed, vertical-stroke baler designed by RFA “really enhanced” the company’s product line, said Steve Cremer, Harmony’s President. “We’re now able to compete with firms making the larger, horizontal (stroke) balers.”

Harmony, a 75-employee company, became acquainted with RFA through a third party. RFA was selected in part because both firms had AutoCAD capabilities. Also, Harmony was impressed that RFA had done design work on heavy equipment that was hydraulically- and electrically-operated.

“When we walked into RFA for the first time, it looked like we were walking into our place,” said Cremer. “Their personalities and

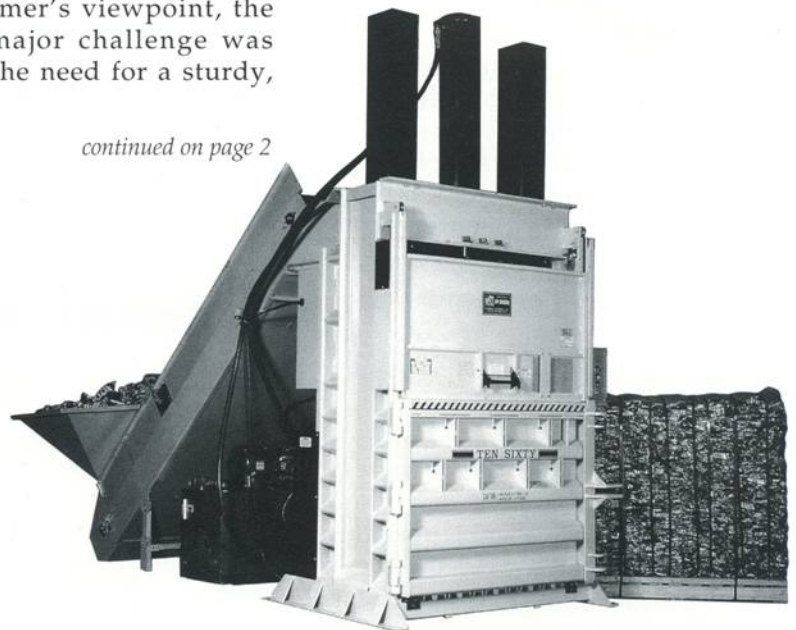
their offices made it seem like they weren’t a downtown Minneapolis engineering firm. Yet they seemed large enough to work with both a large organization and a small one, such as ours.”

The project demonstrated RFA’s ability to adapt itself to any size project, including smaller ones. “Because Harmony is a smaller company, there were some unique cost constraints associated with this project,” said Tom Teller, RFA Project Engineer. “We tried to fit the documentation and drawing package to the client’s requirements.”

From Cremer’s viewpoint, the project’s major challenge was balancing the need for a sturdy,

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continued on page 2



Harmony Enterprises, Inc. 120-ton, conveyor-fed, vertical-stroke recycling baler.

Expanded customer base

continued from page 1

rugged structure while ensuring that it was not over-designed to the point where it would have been cost prohibitive to build.

Unlike some recycling balers, RFA designed a cost-effective structure by utilizing a sequenced welding process that resulted in the use of less steel while increasing strength. "Other recycling balers we observed used a lot more steel, such as channels and tubing, and did a lot more welding to gain structural strength," Teller said. "We used more I-beams and a sequenced welding process, which gave us more effective use of the structural steel. For the same weight, we got more load-carrying capacity."

RFA's design of side channels on the exterior of the recycling chamber was also important. Comprised of heavy, 15-inch wide structural steel, the channels prevent the chamber from "bowing out" when the platen compresses material.

A key to the recycling baler's effectiveness was designing a strong enough joint connection between the platen and the platen cylinder allowing the platen to evenly compress material.

Eventually, twin torque tubes, which guide the platen on its downstroke, were selected.

Another way RFA pared costs was by designing a power pack consisting of a 20 horsepower electric motor used in conjunction with a two-stage hydraulic pump which powers the platen within the recycling chamber. Other recycling balers are often operated by larger, more costly motors.

"You can't afford to have a 50 or 100 horsepower motor on it," Teller said. "So we designed a combination 20 horsepower motor, two-stage hydraulic pump power unit that has full displacement at 700 psi. When the pressure in the circuit is above that, a special valve senses this and "kicks" the circuit so you then have 3000 psi available to squeeze the last 25 percent in the downstroke (within the recycling chamber)."

Unlike some recycling balers whose hydraulic systems are difficult to operate and maintain, RFA designed an easy-maintenance, standalone system for Harmony. "The standalone system can be assembled and tested independent of the baler," Teller said. "It's also easier to maintain because you can work on components where you can easily access them."

In large part, Cremer credited the success of the project to Teller's knowledge and experience. "He has a lot of experience in agricultural equipment and, although that doesn't necessarily relate to recycling balers, that gave him a lot of credibility in the eyes of our staff; if he could make a tractor work, he could probably design this equipment," said Cremer. "Once he was working on the project, our people were very comfortable interfacing with him," Cremer added. "They were confident of his ability and knowledge."

Meanwhile, Teller noted Harmony is an example of a smaller company with whom RFA works well. "They stepped up and took ownership in the project,

continued on page 4

"It is selling really well at this time...and we expect the market to be good for balers through the rest of this century because of the emphasis on recycling."

...Anniversary...

As our readers may be able to deduce, 1994 minus 1943 equals 50 years that RFA/Minnesota Engineering has been in business. We gave some thought to throwing a party and inviting our clients to come, but we decided our clients work with us because of the quality of work we do--and while we do know how to do engineering, we don't know how to throw a party. Sorry.

Nevertheless, we would like to here express our gratitude to approximately 170 current and past clients who have partnered with RFA and Minnesota Engineering. Each of their successes is vital to our success, and we seek to earn that loyalty, project by project, year by year. Most of what we do cannot be written about, but herein are two nice products that had pretty immediate payoffs.

While '94 looks like a busy year for us, we like to hear the phone ring and start the process of earning your respect once again. For some of our clients, it's just a continuing process without interruption. Being able to serve all you, in truth, makes us better able to serve each of you.

Ben Barnard
President

Caterpillar Landfill Compactor Upscaled To Meet Increasing Demands

Responding to customers' requests, Caterpillar saw the need and made plans for a new model sanitary landfill compactor; it was to be the largest model in their 800 Series of compactors. The Aurora, Illinois company realized the need for additional staffing to supplement their permanent staff which could be dedicated to the project. They contacted RFA to do much of the conversion work and design upgrades.

"We didn't contact any other firm," said John Bloom, Caterpillar's project leader for the 800 Series. "We've done a lot of work with RFA over the years. They know our machinery and what we want and need."

The size of landfills is ever increasing; therefore, the demand for larger compactors with their increased compaction ability and better durability is rising. This demand made this project very schedule sensitive. The project was completed over a span of nine months: from the Fall of 1991 until the Summer of 1992.

"We did an awful lot of work in a short period of time," says Bloom, adding that the project resulted in approximately 260 new drawings being created. "In the end, it worked out great."

As always, the key to a successful project is communication between the client and RFA. This facilitates the transfer of ownership to the client. "They look for leadership from us," says Bloom. "RFA is thorough, fast and accurate, but the secret to working with them is good communication with their employees."

Caterpillar's 836 combines the rear frame of the company's



**Caterpillar's Model 836 sanitary landfill compactor,
the largest in their 800 Series of compactors.**

Model 988 Wheel Loader, and with some modifications, the front frame and blade linkage of their Model 834 Wheel Dozer. RFA was asked to work on the design of the Model 836, keeping in mind the demanding environment in which it would be working.

RFA commenced the project by observing and video taping the existing compactor, the Model 826C, in action at a landfill. Analyzing the tape "gave us a feel generally for the machine's operation and, specifically, how different parts functioned," said Steve Ackermann, RFA Designer.

The work required a partial redesign of the Model 834 front frame including the addition of guarding to protect the underside of the vehicle from debris. Also, RFA modified the air intake system, the fuel tank, relocated the air conditioning condenser, plus added larger steel wheels and debris-removing cleaner bars.

One of the bigger design challenges was the addition of steel guarding to the underside of the machine. The guarding is necessary to protect drive train components plus axle, brake and hydraulic lines from landfill debris. After iterating the design, hinged guarding under the engine and the articulation hinge was selected to allow for easier maintenance. In addition, particular attention was paid to the design of form-fitting guarding to protect the wheel housing.

"If you don't protect the wheel housing, you could have trash such as the tape in a tape recorder wrapping around the axle between the machine and rim," said Dave Roesler, RFA Manager of Engineering. "It can work its way into the seals cutting them like a knife. Suddenly, you might lose all oil in the axle and burn out axle components."

continued on page 4

Caterpillar

continued from page 3

To prevent trash from interfering with the operation of the radiator and engine components, RFA designed modifications to the vehicle's air intake system. Previously, the radiator fan would "suck in" airborne debris through side openings in the engine hood, trapping debris in the radiator and causing the engine to overheat.

The new design resulted in air entering from the top via a three-sided scoop mounted in front of the engine. "Our intent with the scoop was to obtain air from as high a point as possible, making it less likely debris would get sucked into the radiator," said Ackermann.

As an additional precaution, air flowing through the scoop must pass through a removable screen installed in front of the radiator; the screen shields the radiator from debris. A radiator fan on the back side of the radiator then blows the air through the side openings in the engine hood.

The fuel tank which is located beneath and is attached to the top step was increased in capacity from 180 to 230 gallons. The wall thickness of the fuel tank was increased to make it more resistant to being damaged by debris.

The air conditioning condenser was relocated from the radiator to the top of the cab to shield it from airborne debris and to lower the

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John Bloom
Caterpillar Project Leader

cooling load on the engine radiator, said RFA Designer, Rick Nelson.

Cleaner bars, which remove debris clinging to the steel wheels, were also designed by RFA. The front frame was modified to allow mounting of the cleaner bars which extend out from the underside of the 836, Nelson said. The bars are located on the back side of both the front and rear wheels and the front side of the rear wheels.

Six RFA employees worked on the design and detailing of this project. "All of the RFA employees were very thorough and committed to quality," said Bloom. The

first shipment of the Model 836 to large landfill operators occurred during the first quarter of 1993. Sales, according to Bloom, "are ahead of target."

Said Roesler, "This project was a terrific example of how great a project should occur. John Bloom understands how RFA works and knows what he wants and expects. He's also very good at conveying that information to us."

Expanded customer base

continued from page 2

which we think is the key to making any project a success."

Proof of the larger baler's success is borne out in Harmony's sales since the product was released. "It is selling really well at this time," Cremer said, "and we expect the market to be good for balers through the rest of this century because of the emphasis on recycling."

With the possible need for an even larger recycling baler in Harmony's future, Cremer said, he would not hesitate to hire RFA again. "Without question, we would certainly go back to them."



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RFA/Minnesota Engineering

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