GARDEN WAY, INC.
TROY, NEW YORK

Elimination of Solvent Wastestreams in the Manufacturing of Power Equipment via Switch to Powder Paint Technology

Garden Way, Inc. is a manufacturer of outdoor power equipment and operates manufacturing facilities in Troy, New York; Lynn, Indiana; and Port Washington, Wisconsin. The Troy, New York plant manufactures Troy Bilt rototillers, Sickle Bar mowers, Tuff-Cut high wheel mowers, and chipper shredders. In August of 1990, an additional portion of the company's shredder operations was relocated to Troy, New York.

By switching to powdered paint technology in December of 1989, Garden Way has accomplished a 95% reduction in their hazardous wastestreams and has experienced treatment savings of approximately $25,000 per year. Below is a summary comparison of the old conventional solvent paint system versus the new system.

Solvent Paint Wastestreams Eliminated

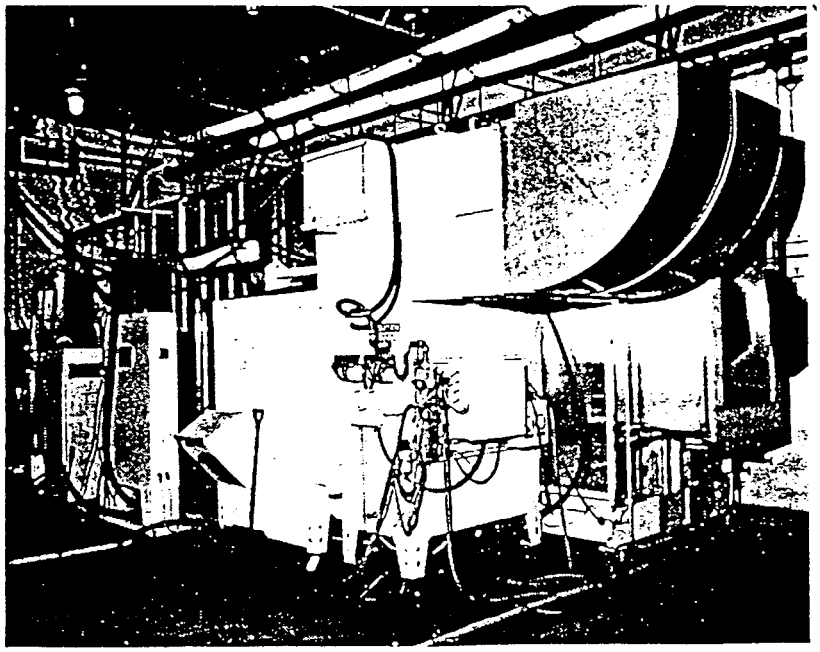
- Lead Paint Solid Residues (9600 lbs/yr)
- Paint Line VOCs (68,000 lbs/yr
- All Caustic Hydroxide & Wash Streams (4,000 lb/yr)

Wastestreams of New Powdered Paint System

- Non-Hazardous Wastewater (20,000 gal/yr)
- Tramp Oil (500 gal/yr)
- Waste Plastic Residues (200-500 lbs/yr)
- Non-hazardous Ash (200-250 lbs/yr)

Note: Quantities of wastestreams are estimated averages.

Because the Garden Way products must endure the rigors of outdoor use, the paints and finishes used for them must be very durable. For this reason, the company, as well as other manufacturers, used paints having lead contents exceeding 10,000 ppm (1%). Early efforts by the company reduced lead levels to as low as 11 ppm, but still above the regulatory limit of 5 ppm for leachate.



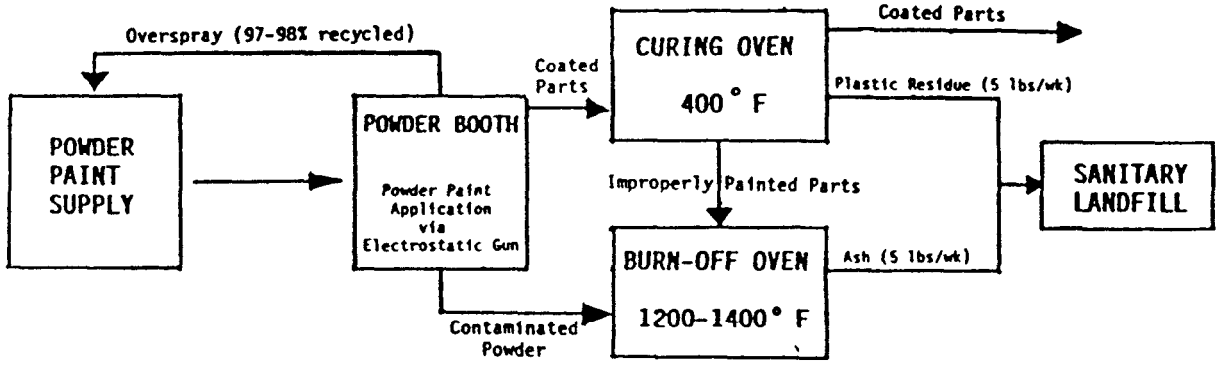
Garden Way made the major change in switching to powder paint technology in late 1989, because of improvements made in the durability of the pigment ranges that the company utilized. To implement the new technology a new paint line was constructed and involved the following:

- 14,000 square foot addition
- new conveyor system
- five-stage washer
- powder booth (see photo at left)
- future wet booth
- dry-off and curing ovens
- burn-off oven

Bringing the new paint line into production took Garden Way approximately 8 months (including construction time). The capital cost associated with the new system was approximately $1.25 million and the payback time was originally estimated at 10 years, but may actually be as soon as 5 *years.*

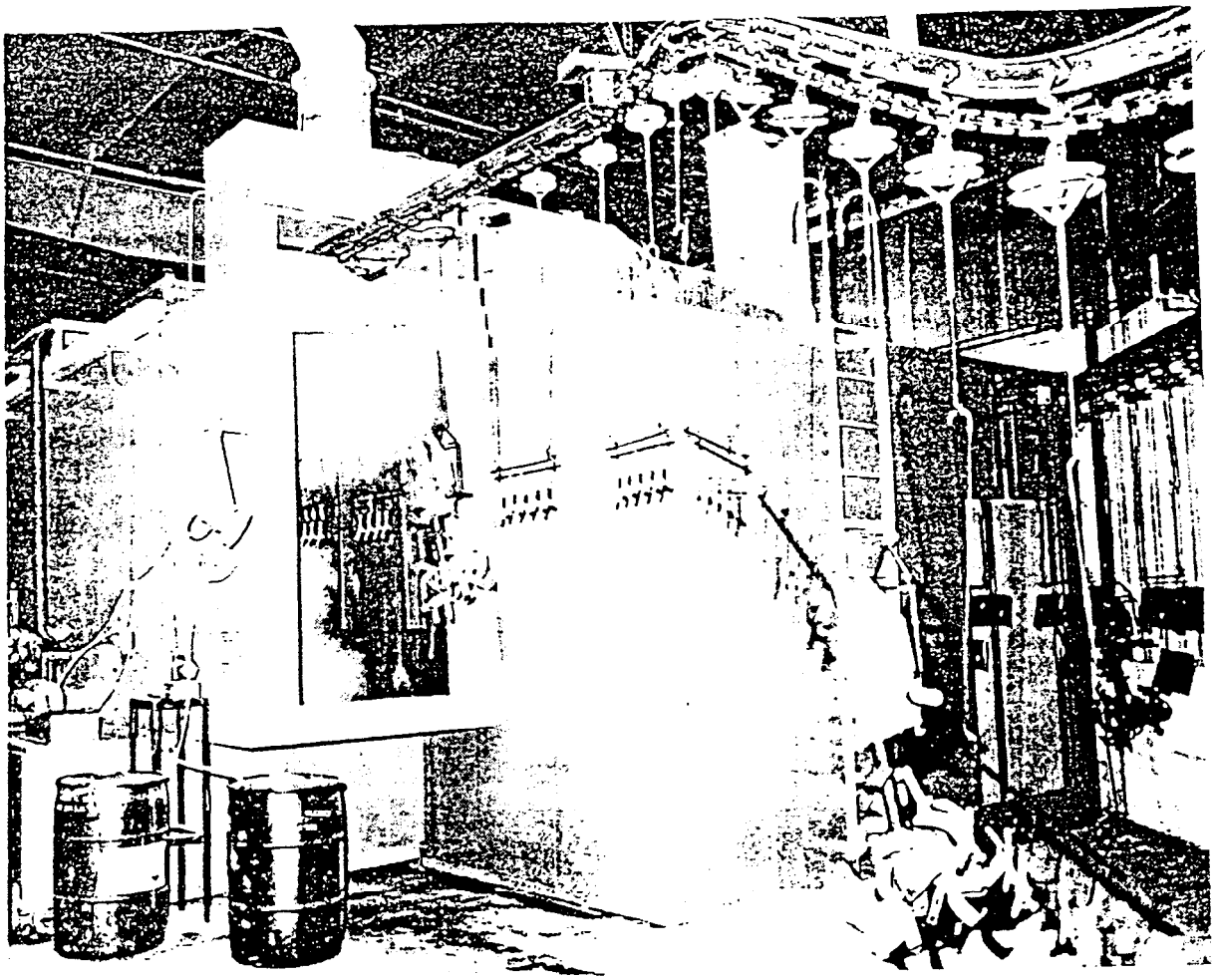
Initially the project was designed to obtain a higher quality product, improve flexibility and increase production capacity. The new system afforded Garden Way the improved ability to handle new stocks of galvanized material for new product lines. Reducing the company's hazardous wastestreams and permit costs were noted additional benefits. The new system layout consists of a low pH hydroxide wash; clean tap water rinse; iron phosphate stage; a second rinse; non-chrome sealer; drying off stage (250^0F); a powder booth; and curing oven (400" F). The new powder paint process used at Garden Way is shown diagrammatically below.

FLOW DIAGRAM OF POWDER PAINT SYSTEM



Powder paint, essentially a fine, semi-polymerized polyester dust (3-10 microns), is applied by automatic and manual electrostatic spray guns. The majority of the overspray (97-98%) is contained within the powder booth and recycled via an inherent pump system. The collected powder is returned to the fill hopper and reused. The 2-3% powder that becomes contaminated with dust from outside the spray booth is collected in a High Efficiency Particulate Air Filter (HEPA) vac and cured to form a non-hazardous disposable plastic. The powder coated part is baked so that the coating melts into a durable, high gloss plastic/polyester finish. Improperly painted parts are cleaned in a 1200^0 F oven equipped with a 1400^0 F afterburner, and the small quantity of non-hazardous ash is sent to a sanitary landfill.

The non-hazardous disposable residues go to a sanitary landfill, as does the ash (the Toxic Characteristic Leachate Procedure showed the ash to be non-hazardous). The tramp oils are paraffin- and petroleum-based oils that are present on the metal stocks when received in shipment (for protective purposes). The oils are collected as float during stock washing operations and are sent to a reprocessor for recovery and reuse, either as lube oil or for fuel blending.



The photograph above shows the unpainted parts entering the,Powder Paint Wash System (foreground) and finished powder-painted parts leaving the 400-degree F Caving Oven and Cooling Tunnel.

NOTES:

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