

AMERICAN LA FRANCE SPRAYS POWDER ON EXTINGUISHER SHELLS

American La France Fire Extinguisher Co., Elmira, N.Y., a division of Badger-Powhatan, Ranson, West Virginia, has switched to powder coating, and they are glad they did. One of the world's largest manufacturers of hand-held fire fighting equipment, the company reports their new electrostatic powder spray system has enabled them to double their production output of steel and aluminum fire extinguisher casings or shells in an eight-hour shift. What's more, they achieved a substantial improvement in the quality of the finish with a 25 per cent increase in the utilization of production manpower.

For years the company used a solvent base liquid paint spray to protect the shells, but it had many disadvantages. It required dipping in an iron phosphate bath to clean the surface and protect against corrosion. This left a residue that had to be removed by hand with a tack rag before the prime coat could be applied. The operation required three passes under the spray gun—one for the primer and two for paint—plus three 10-minute passes through a 350F drying oven. With all of this, they had problems with the finish. Parts with sags, fish eyes and orange peel were too expensive to salvage, so they had to be scrapped. Cleanup of equipment at the end of each shift involved considerably more time than with the new powder coating. With the advent of the Occupational Safety & Health Act and strong anti-pollution legislation, solvent base paints presented even



General Foreman Robert F. Barnes and Plant Manager Fred R. Cooklin, right, are pleased with their new powder spray finishing operation.

more problems. Indeed this was one of the primary considerations when La France converted to powder spray coatings.

HOW IT WORKS

Electrostatic powder spray coating is based on the attraction of positive and negative electrical charges. A high voltage, low amperage charge is applied to the powder particles as they move under air pressure through the spray gun. The part to be coated is grounded. The negative powder

adheres to the positive part until it is fused and cured in the post heat oven.

With electrostatic spray, no preheating is required, and thinner more uniform coatings from 1 to 5 mils can be obtained. Curing temperatures for spray coated objects are lower than those required for fluidized powder coating. However, electrostatic spraying generally requires a larger investment in guns and equipment.

FINISHING SIMPLIFIED

With the new powder coating, the finishing cycle has been greatly simplified. After being formed in drawing presses, the steel casings go into a water bath containing Formula "C" where they are simultaneously washed and hydrostatically tested to make sure they can withstand the pressure required by the Underwriters' Laboratories.

The shells are then brazed to burn off oil and grease, and sent to the loading station of the powder line. Shells are snapped onto carriers moving on an overhead conveyor to the drying side of a two-zone oven**, where any moisture is baked out.

From here the shells move directly into the spraying booth where

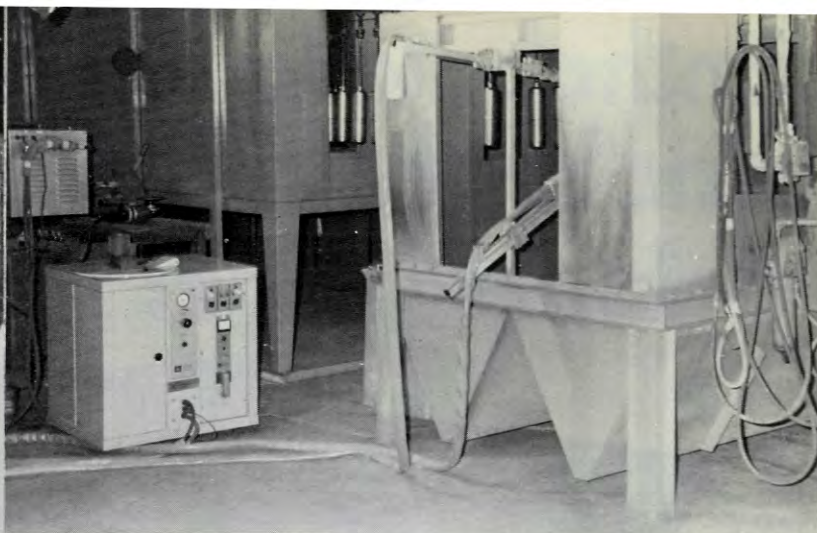
* Oakite Products, Inc., Berkeley Heights, N.J.

** Jensen, Inc., Farmington, Mich.

*** Interrad Corp., Riverside, Conn.

**** The Polymer Corp., Reading, Pa.

***** Vacu-Blast Corp., Belmont, Calif.



two, fixed, Gema Model 71 electrostatic spray guns*** apply 2 mils of Corvell**** epoxy powder coating. Now the conveyor takes the cylinders back into the curing side of the oven for a 5½-min fuse-out at 475F. This completes the finishing operation, and the bright red casings go back to the unloading station where they are taken off the carrier and piled in metal racks one atop the other. With the solvent paint shells had to be loaded into partitioned, corrugated cartons and held in storage 48 hours to allow the paint to harden so they would not be nicked or scratched during moving or final production. The epoxy coating can withstand a 160-inch-pound impact.

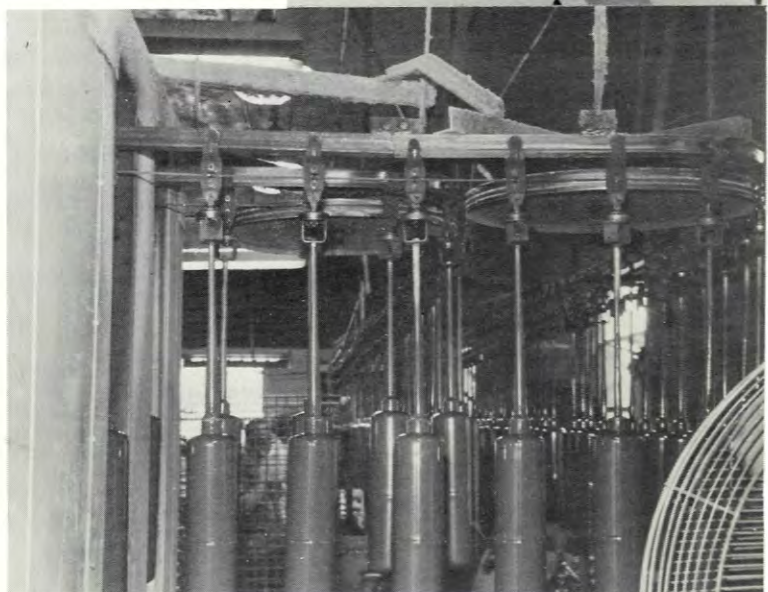
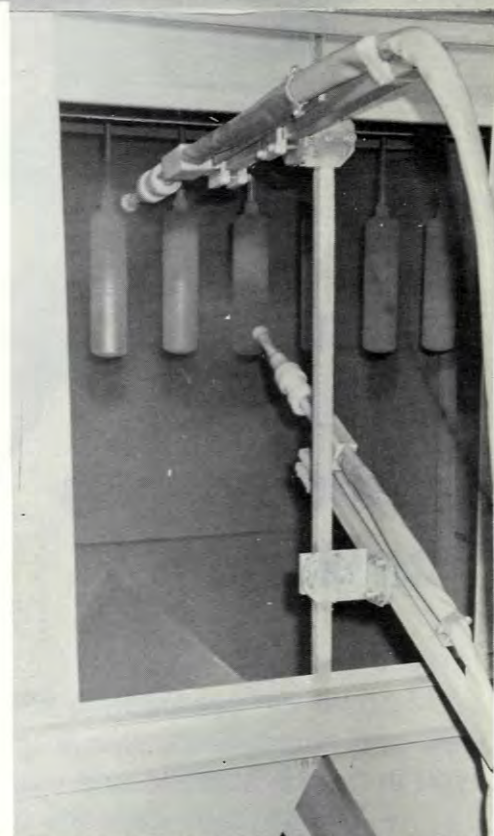
98 PER CENT EFFICIENT

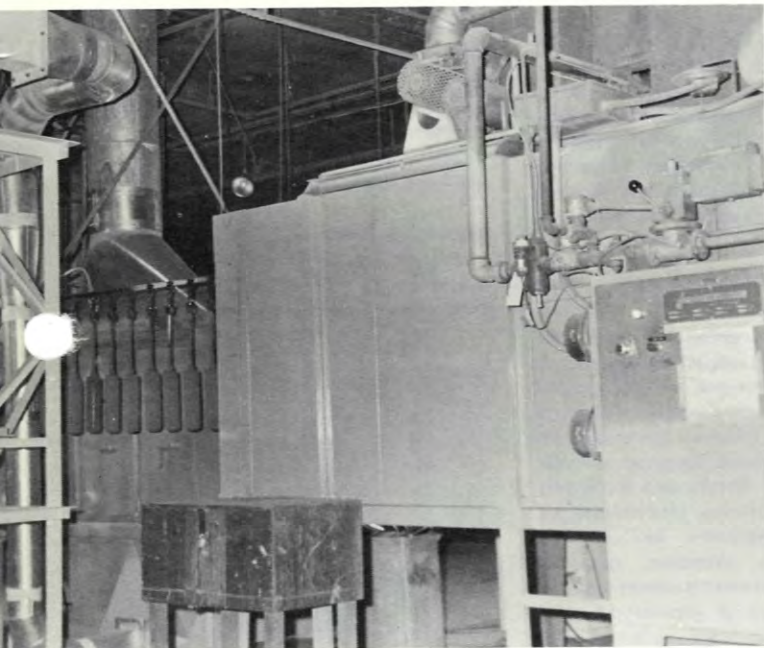
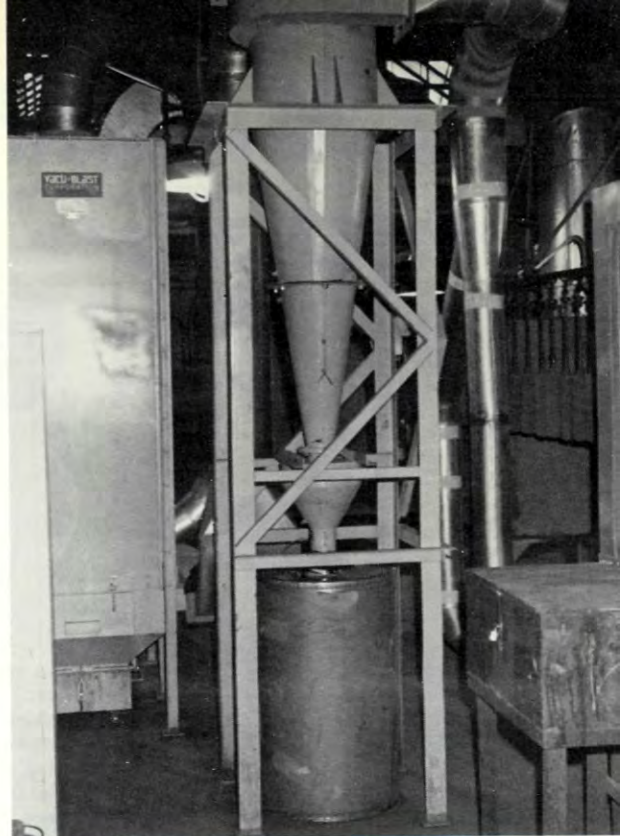
The new finishing operation is 96 to 98 per cent efficient. A vacuum cyclone***** sucks excess powder from the spray booth, centrifugally separates powder particles from any dust, and drops the powder into a drum for reuse. A bag filter***** behind the cyclone collects smaller powder particles and dust to keep the air clean. This accounts for the remaining 2 to 4 per cent of the powder lost in the operation.

Powder reclaimed in the cyclone is mixed about 50/50 with new powder because Badger-Powhatan finishing engineers believe this helps them keep mil coverage uniform—the same as 100 per cent new powder.

Plant Manager Fred R. Cooklin first began looking into powder coat-

Top left, finished shells at extreme left are ready for removal. Bare steel shells are snapped on carriers to start coating process at right. Top right, Shells emerge from drying oven to enter spray booth, center. Control module for electrostatic guns is in the left foreground. The smaller box, to the left, above control module, supplies dry air for spray guns. Right, closeup of spray gun nozzles. Bottom, closeup of shells on carriers. Teflon disc between carrier and shell prevents powder buildup at mouth of shell. Plant engineers are looking for disposable mask to shield carriers from powder spray so they can eliminate periodic cleaning of carriers.





Top left, side view of spray booth shows line of shells passing under the gun. Belt on conveyor twirls holders going through spray to ensure even application of powder. Top right, powder collecting cyclone, center, with bag filter to left. Left, coated shells move into curing zone of oven for fuse-out of epoxy powder.

ings when some of the painting equipment came due for replacement. He discovered he could get a new powder spray system for the same price as solvent equipment. With powder he could eliminate the need for a prime coat, shorten the conveyor line and get rid of the storage area required for drying solvent paint. There would be no odors or fumes and far less danger from fire or explosion with the powder. And, no one is more aware of the dangers of fire than Badger-Powhatan.

Experience has shown Fred's de-

cision was a wise one. The system paid for itself in seven months, and the resulting finish has demonstrated superior qualities. The epoxy can stand 300 hours in the salt spray chamber with no visible deterioration. Cleanup of powder spray air lines and hoppers has been cut to less than 30 minutes adding significantly to production time.

The decision was based on good engineering research. This operation is ideally suited to the use of electrostatic powder spray. Only one color—red—is being run and

only one part configuration—fire extinguisher shells—which standardizes time and temperature of fuse-out in the curing oven. These conditions are basic to achieving a highly efficient production operation.

Despite their success, La France engineers continue to search for even more improvements in the system. They would like to have a powder coating capable of an even faster curing time. And they presently are looking for a disposable sleeve to keep epoxy off the carriers so no periodic cleanup will be necessary.