

Appliance Production Highlights

GE Saves with Powder Coating

An APPLIANCE Staff Feature

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Powder coating refrigerator liners at General Electric's Refrigerator Products plant in Cicero, IL, has been a big success, according to Steve Krc, manager of process engineering and major products.

"The whole operation is so trouble-free it's been almost amazing," he remarks. "We applied about 400,000 pounds of powder on two shifts the first year." The line has been on stream from January 1976.

Krc says that savings for the first year over the previous coating system, including energy savings, were substantial. Most of the savings were accomplished with steel, since an extra-low carbon steel used for liners in the previous finishing operation was no longer required. Other savings were noted in labor and energy, which had included use of electricity, gas and steam.

Refrigerator liners are coated with a DuPont white epoxy powder to an average thickness of 2.2 mils. Liner exteriors get about a 1 mil coating from the wrap effect of the powder spray and one stationary gun that sprays the liner backs. Top dividers for fresh food compartments are also coated on the line.

The applied finish, in white, has a slight orange peel effect. Touch up, if required, is done at the liner inspection station with a liquid epoxy paint and touch-up brush. Krc reports that the coating quality has been improved by the switch to powder. Final assembly problems have been reduced.

About 7 to 9 percent of the liners have to be re-run due to defects such as blue spots where coverage is too thin. No stripping is required. The liners are simply re-hung downstream of the powder booth and

coated again. Reject rate of the prior system was 10 to 20 percent.

The System

"Ours was the first filter belt recovery system in the country," Krc says. "We were in effect an industrial proving ground for the system."

The powder line employs Interrad's Twin Air Belt Booth, with powder recovery by means of a continuous belt loop at the bottom of the booth. Material utilization is around 99 percent, according to GE.

Powder overspray falling onto the belt is conveyed to the end of the booth where a belt-wide vacuum head sucks it up and routes it into the powder reclaim path.

This consists of a small cyclone which separates the powder from the air stream, mounted over the powder supply hopper. Cyclone exhaust is returned to the booth, closing the recovery loop.

As a safety measure, an explosion suppressor was installed in the small cyclone. It is a positive pressure-sensitive-activated unit. The device releases a fluorocarbon to suppress an explosive potential in milliseconds.

Air movement within the powder coating booth is created by a blower system pulling air down through the filter belt into a plenum. As the belt stops most of the powder, the air stream continues through the plenum and is ducted through final filters located in the powder coating room. The filtered air is released into the room.

No air makeup is required in the traditional finishing booth sense. Ten percent new air is brought into the powder coating room via ducting and mixed with ambient room air.

This shows the spray action by reciprocating and fixed guns. Since overspray is collected for reuse, guns do not have to stop spraying between hung ware and a memory chain system is not required.

A small cyclone returns recovered powder overspray from the booth to the hopper, and returns air to the booth.

Two powder booth reciprocators have four guns each operated at 100,000 VDC for applying epoxy powder spray to the refrigerator liners.

