

Reduce Utility cost and improve product quality...HOW?

System Specifications

Product	Switch Gear Components	Conveyor Type	Overhead
Product Material	Steel	Line Speed	10' per minute
Coating	Powder	Hot Air Oven Time	20 minutes
Natural Gas	\$10/DekaTherm	Hot Air Oven Set Point	425°F
Electric	\$.055/kW-hr	Production Load	10,000 lbs/hr

Problem

- Some parts did not cure completely.
- Tall oven opening created convected air flow which draws cold in the bottom while large amounts of hot air escaped out the top of the entrance opening.
- Gas burner for the convection oven ran at full output.
- Natural gas costs have risen substantially over the past years.

Goals

1. Reduce utility costs.
2. Achieve complete cure on all parts.
3. Reduce hot air escaping from oven entrance.
4. Reduce oven gas demand.
5. No increase in labor cost or line length.



Solution Process

- ITW BGK proposed a high intensity electric infrared booster oven.
- ITW BGK installed a 12' section of opposing heaters in the existing oven vestibule.
- The parts were conveyed in, as before, at 10 FPM, providing 1 minute of IR exposure.
- The booster was fitted with a 3 position automatically adjustable heaters which moved the heater banks for varying products widths for added efficiency.
- System controlled by a PLC which automated the part recognition, zone control, moving heater banks and idle/run.

Benefits and Paybacks

The booster section yielded the following results:

- The powder was melted and flowed in the entrance section of the oven before reaching the convection section.
- Low air flow eliminated powder from becoming airborne in the oven, thus eliminating contamination.
- A 275°F rise in the product temperature reduced the convection oven gas usage.
- The convection oven set point was turned down to 360°F from 425°F.
- Hot air escaping the top entrance was eliminated.
- The booster provided completely cured parts and improved cure characteristics for all parts through increase time at temperature.
- No added floor space since the infrared booster was able to be installed inside the existing hot air oven
- Reduced Gas usage by 781 Dekatherm/month results in a \$7,810.00 per month gas savings.
- Net total savings per month = \$7,043.00 when factoring in Booster oven electric usage.
- Customer is producing a high quality product, more efficiently, with no additional manpower required.