



Paint Booth Fan Control

Application Note

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General Description

A superb paint finish depends heavily on the air quality within the spray booth. Precise control of the exhaust/makeup air is as vital as air cleanliness. Successful air quantity and quality depend on the proper operation of approximately forty-five fans found in a typical paint booth. These fans range from 20-40 horsepower.

Automotive paint booths consume 65%-70% of the total energy consumed in a Ford Assembly Plant. To meet internal energy reduction guidelines, Assembly Plants must focus on reducing total energy usage in the paint booths. Simple changes in operating procedures can significantly reduce energy costs while maintaining a high-quality vehicle finish.



Problem

In order to reduce energy consumption, Ford recommends that paint booths be shutdown during weekends and holidays. When the fans are restarted, the sudden torque often throw fan belts; a situation that's aggravated when reverse stack drafts cause the fan to spin backwards prior to the restart. Before vehicle assembly can resume, all the fans have to be repaired; a task that requires 1-2 people 30 minutes for each fan. To allow enough repair time, paint booths are often started Sunday evening; a wasteful practice Ford is committed to eliminate.

Solution

Cutler-Hammer has two solutions for this problem. The first, selected by Ford Chicago Assembly, replaced 65 A-B across-the-line starters with Cutler-Hammer IT soft starters. Ford preferred the IT starters because their reduced-voltage start feature eliminates fan belt jolt, and, their small size allowed installation into the existing control cabinets.

Another alternative is to replace the fan drives with SV9000 variable frequency drives. The SV9000 also provides soft start capabilities but also feature variable fan speed control. With the SV9000, paint booth fan speed can be optimized to match production requirements, further reducing energy costs.

Contact

For additional details and a Ford reference contact: Tim Laughery, GSF Chicago