Abatement System Study

Prepared for
New Venture Holdings, LLC
Grand Blanc, Michigan

Phase One
System Design and Balance
Scope of Work

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System Ovens

Oven Fresh Air and Exhaust
Modifications to the fresh air and exhaust are required to bring the ovens up to code and reduce solvent laden air in and around the ovens.

- Gather paint loading information from New Venture Holdings (part dimensions, part centers, and conveyor speed) and calculate the fresh air requirements for all zones to meet NFPA and IRI specifications (both current and maximum loading conditions.)
- Measure current fresh air input in each oven zone and determine what modifications are required to raise or lower the flow of fresh air into the ovens.
- Work with New Venture Holdings maintenance staff to repair underperforming exhaust fans and fresh air inlets.
- Adjust fresh air and exhaust per zone to balance the system per current operating conditions.
- Prepare a detailed report indicating current and future fresh air requirements along with exhaust fan flow rates.

Oven Zone Recirculation and Heat Loads
In this phase we will attempt to reduce operating costs associated with overcapacity recirculation fans and burners.

- Calculate oven heat loads based on current and future production rates.
- Calculate oven turnover rates based on industry standard specifications and required heat loading.
- Prepare a detailed report comparing the current oven operating conditions to calculated heat loading and recirculation rates. Also, provide recommendations to reduce operating costs associated with oversized fans and burners.

Oven Balance
A proper balance insures solvent loading will remain below the Lower Explosive Limit in each zone.

- Provide a complete Oven Balance for Line A, B and D. Balance will include adjusting existing supply dampers and return gates to achieve a zone dedicated balanced system (minimize cross draft).
- Provide a detailed report indicating the current flow rates by zone, damper positions, and other data pertaining to a balanced oven.

System Booths and Tunnels

Booth Scrubbers, Tanks, and Exhaust Plenums

Booth scrubber modifications are necessary to achieve the static pressure required to provide efficient paint removal. Inadequate scrubbing allows an excessive amount of paint to enter the filter houses and overload the abatement system; correcting this will lower maintenance costs and reduce emissions to the abatement system.

- Identify exhaust plenums and ductwork whose structural integrity must be modified prior to increasing the static pressure across the scrubber. After a preliminary review, there will only be a few modifications necessary.
- Identify booth tanks that must be cleaned prior to adjusting and modifying the scrubber and flood sheets.
- Identify existing ad-hoc scrubber modifications that are impeding the performance of the scrubbers.
- Provide sketches, drawings, and documentation necessary for plant personal to proceed with plenum and ductwork reinforcements, booth tank cleaning, and scrubber performance modifications.
- Work with New Venture Holdings Maintenance department to adjust scrubbers and flood sheets to achieve better paint removal efficiency.
- Provide a detailed report indicating corrective actions taken and current operating conditions.

Booth Supply and Heat Loads

In this phase we will review the downdraft velocity and volumetric flow rates in each booth zone and attempt to reduce operating costs associated with overcapacity supply fans and heaters. The overcapacity, if any, is the result of converting the booths from manual to robotic zones.

- Calculate the required flow rates in each booth zone based on the booth size and required downdraft velocity.
- Adjust system dampers and perforated plates to achieve the required downdraft velocities in each booth zone.
- Provide a detailed report indicating flow rates, downdraft velocities, and system damper positions.

System Booths and Tunnels (continued)

Booth and Tunnel Supply and Exhaust Fans

- Work with New Venture Holdings maintenance staff to identify and repair underperforming supply and exhaust fans.
- Provide a detailed report indicating what corrections are necessary to achieve the correct supply and exhaust rates.

Balance the Booths

A proper booth balance will increase transfer efficiencies, eliminate zone cross draft and updraft, and lower defect rate due to dirt entering the system.

- Balance all supply and exhaust per booth zone to achieve the new design flow rates.
- Provide a detailed report indicating flow rates, downdraft velocities, system damper positions, and exhaust fan capacities.

Abatement System Analysis

Calculate New Abatement System Load

One of the goals of the booth and oven analysis is to reduce the amount of air that requires abatement. Once we determine a new exhaust volume, we will redesign the abatement system with the goal of reducing the operating costs. This engineering package will include reports, drawings, scopes, and recommendations to achieve this goal.

- Recalculate the volume of air which is to be sent to abatement.
- Redesign the abatement system to accommodate the new exhaust volume including: new set-point flow rates and temperatures for all heat exchangers, indicate the number of carbon wheels to be used, provide new flow capacities through all equipment, and provide new capacities for desorb and concentrator supply fans.
- Provide drawings, schematics, and reports to complete the abatement system modifications; including options to add and remove a single booth/oven line from the system without effecting the remainder of the systems.
- Work closely with New Venture Holdings personal to review maintenance schedules and inspect the current abatement system to insure future compliance testing with the Environmental Protection Agency.