



APPLICATION SPOTLIGHT

Flow Management and Reporting Solution Automates
EPA Compliance of VOC Emissions



Flow Management and Reporting Solution Automates EPA Compliance of VOC Emissions



APPLICATION:

A large industrial OEM manufacturer located in Ohio sought an automated solution to track and report VOC (volatile organic compound) emissions associated with their paint operations at three regional plants. Under the Clean Air Act, the U.S. Environmental Protection Agency (EPA) regulates VOC paint emissions to reduce the threat of ground-level ozone that violates national ambient quality standards. (The ozone mixes with dust and other particles to create smog that is unhealthy to the environment.) Instead of enforcing an umbrella federal ordinance, the EPA allows individual states to govern VOC emissions through approved Control Techniques Guidelines.

Ohio is a leader in EPA reporting initiatives to promote a safer and healthier environment by reducing pollutants that lead to unhealthy smog pollution. Ohio’s Division of Air Pollution Control ensures compliance with the Clean Air Act by issuing operating permits that specify emission limits and reporting requirements of air contaminants including VOCs.

To follow state EPA guidelines, the OEM manufacturer must report VOC levels emitted from 10 paint booths maintained at three plants to confirm totals adhere to daily permit limits. VOCs contained in the paints are released during the application and drying processes. Paint booths capture paint fumes, exhausting them into the ambient air through booth stacks. To accurately capture and report VOC data on a daily basis, the company wanted to implement an

automated process that tracked paint usage and calculated VOC emissions at all of its operations. In addition, the company sought a solution that would allow them to automatically populate EPA reports for electronic submission to the state.

PRODUCT SUPPLIED:

- TRICOR TCM 0650 Coriolis Mass Flow Meters
- AW-Lake teamed with controls partner Coritech Services (a certified OPTO-22 “Groove Box” integrator) to create a data acquisition system with dashboards for real-time monitoring of paint usage and VOC emissions
- Integrated EPA software automates VOC emission calculations and EPA report creation/ submission

CHALLENGES:

Tracking paint usage was a cumbersome process for the manufacturer as unskilled workers manually recorded information onto a clipboard after adding five gallons of paint to day tanks that supply the paint spray booths. Information was often inaccurately documented, undated, and sporadically entered into a computer database.

As data often became available a day or two after workers added paint, operators averaged paint usage by week and/or month, which did not reflect actual daily usage. With EPA permits





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issued on a per-day rate, estimated calculations sometimes resulted in inaccurate overages as the company appeared to exceed limits. Without visibility into daily operations, the company never knew if paint operations met or exceeded VOC emission limits.

The company also manually entered information into Excel sheets to calculate VOC totals according to EPA parameters, making report creation for ten different spray booths very time-consuming.

SOLUTION:

TCM 0650 TRICOR Coriolis Flow Meters integrated with customized logic controllers (made possible with the OPTO-22 Groove Box software solution), and custom EPA-reporting software offered a turnkey, automated management and reporting solution for accurately tracking, calculating, and reporting VOC emissions to meet EPA compliance. The TRICOR meters also provide value-added process control capabilities to monitor applicator flow rates, paint temperature, and paint-specific gravity, which is used to detect out-of-paint status.

Installed outside of paint booths, the TRICOR Mass Meters accurately measure paint flow and volume at 100 – 500 cubic centimeters per minute as it flows from paint drums through 24-foot lines to spray guns that dispense the paint. Paint sprayers monitor flow rates to accurately set up their spray guns and supervisors obtain paint usage by batch and total in gallons to calculate daily VOC emissions. For example, one gallon of paint with 40% solids, which when dry becomes the coating, has a 60% VOC content. One eight-pound gallon of paint has 4.8 lbs. of VOC emissions.

With the capability to monitor paint-specific gravity, or weight per volume, the flow meters can determine when paint booths run out of paint. In addition, the flow meters can track paint temperature for greater quality control. Flow rate information also enables supervisors to monitor the activity levels of personnel and the correct usage of spray guns for optimized performance and productivity.

NETWORKED SYSTEM

Flow meters are daisy chained by Ethernet cables to a factory Intranet. An on-site server consolidates data from all flow meters in a SQL database in a dedicated virtual space. Third-party software uses EPA formulas to calculate daily totals of VOC's by specific location and populates EPA forms for electronic submission. Reports are available to management via web servers, or can be emailed on a daily basis to monitor operations.

With information tied to the Intranet, supervisors monitor operations on dashboards that visually indicate the current operational status at all locations simultaneously. The wired system updates information every 1 to 2 seconds. For example, bar graphs show the current levels of VOC emission for the day by spray booths at each plant simultaneously. When VOC emissions reach yellow levels, supervisors receive a warning; a red level alerts management to a potential overage for the day.

The software also maintains a running total of EPA-defined limits by day, month, and year for historical analysis and trending. With this information, management can identify spikes in paint usage and move equipment in/out of booths to maintain proper VOC emission levels.

RESULTS

By implementing an integrated flow management and reporting system, the company automatically calculates VOC emissions daily per EPA permit requirements. Management and operators also gain full visibility into current emission levels at each of its ten spray booths maintained at three plant locations to ensure operations do not exceed EPA limits. With a complete view of total operations in one control system, supervisors can make better decisions on plant operations to stay within daily emission levels. Historical information helps identify heavy paint usage of paint at specific spray booths to plan future activities to avoid exceeding EPA limits while operating more efficiently.