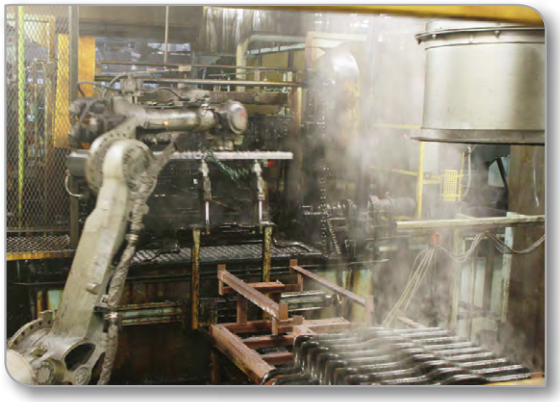
AEROVENT
INDUSTRIAL VENTILATION SYSTEMS

Oil-Quenching Cooling Systems



Project Snapshot

Industry
Automotive

Application
Exhaust for oil-quenching cooling systems

Customer
New Mather Metals

Aerovent Representative
Ogle Equipment Sales, Inc.

Location
Franklin, Kentucky

Challenge
Exhaust oily air

Solution
Aerovent's VTBD fans

Result
Oily air is being successfully captured and exhausted, improving air quality and overall work environment in the plant

Overview

New Mather Metals, a manufacturing plant that produces heat-treated metal products (including automotive components) commissioned Aerovent to provide unique solutions for their facility needs. Two separate projects were required for this particular application – both involved examining a process that used an oil-quenching cooling system to cool automotive suspension bars that were dipped in hot oil. The contractor on the project, Alex Buchner of Profab Metals, along with Ted Ogle of Ogle Equipment Sales worked together to assess and develop a plan with proposed solutions. In the end, the result of the two projects was a much-improved work environment with cleaner, fresher air for the employees.

Challenge

The oil-quenching cooling system at New Mather Metals was a significant challenge. The course of dipping the heated bars into the oil produced tremendously hot, oily vapor that dispersed into the air, coating the ceiling, walls and machines. Not only did it make an extremely dirty environment, but the vaporized oil created a blue haze around the lights and built up on surfaces within the plant. Project #1 involved finding a solution to containing and cleaning the air. This required developing a system to capture the large oil particles, isolate the remaining hot oily vapor and then exhaust the air out of the building.

Project #2 at the plant required forming a method to cool the heated suspension bars so that employees could efficiently handle them with thinner gloves. The process that was currently in place involved removing the suspension bars from the oil at 1,700 °F, where they became hard and brittle. To strengthen the bars and give them flexibility, they were put into another oven and heated again, to 1,000 °F. Afterward, the bars were sent through a cooling station which used outdoor air to cool the metal. Personnel then handed the bars using thick, cumbersome gloves. At the request of the engineer, cooling the bars further would allow the workers to wear thinner gloves resulting in increased efficiency from easier handling.

Solution

Project #1 involved a two step plan for resolving this problem. The first step was to capture the larger oil particles through an exhaust system, which would then extract the oil with an oil mist collector and then return the oil to a reservoir. The second step required enclosing the area to capture the remaining, smaller oil particles to keep them from infiltrating the plant.

A solution was devised to enclose the fifteen feet high, eighteen feet wide, and thirty-six feet long steel beam support structure. Twelve inch strip curtains with a three inch overlap were draped from the structure to isolate the area, which effectively blocked the cross drafts in the factory and helped to contain the dirty air. In two areas strip curtains could not be used because a robot and a transporting conveyor were in the way, so instead, air curtains were added to maintain the integrity of the enclosure.

Next, three (3) eight feet wide by twelve feet long canopy hoods were installed on the structure. The twenty-five inch diameter Aerovent Vaneaxial fans were mounted on each hood and their ducts extended out through the roof. Each fan exhausted 10,000 CFM of the dirty air, which totals about 100 FPM per hood, successfully ventilating the area.

The solution to Project #2 was straightforward. To meet the challenge, one VTBD exhaust fan and two VTBD supply fans were mounted on a platform with the purpose to blow plant air over the bars. This effectively cooled them an additional 100°F, which successfully allowed personnel to handle the bars with thinner gloves.

Benefits

Aerovent fans provided the ideal solution for this application. In addition to their ability to operate with oil buildup on the props, they were selected because they could provide the necessary velocity to pull the air through the enclosure. New Mather Metals wanted an enduring solution, and they knew they could depend on Aerovent fans to function reliably for the next 20 to 30 years.

Aerovent VTBD Vaneaxial belt-driven fans are characterized by their ability to handle airflow to 81,200 CFM and static pressure to 4.5" w.g. These fans are regularly used in applications such as in-duct space ventilation, roof mounted ventilation, industrial fume exhaust, and high temperature process ventilation. An A240 high temperature aluminum alloy propeller and high temperature lubrication are available to make this fan suitable for airstream temperatures up to 600°F. In addition, a belt-driven design makes the Aerovent VTBD particularly well-suited for applications where the motor needs to be kept out of the airstream because of dirt-laden, hot air. Its belts and sheave are enclosed in a metal tube to protect them from the airstream, and the motors are totally enclosed and drip-proof, allowing for continuous operation.

Summary

New Mather Materials wanted to provide a better work environment for their employees by cleaning up the oil-filled air in the plant. This challenge was met by the ingenuity of Profab Metals and Ogle Equipment – and solved using high-quality, durable Aerovent fans.

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Aerovent's advanced engineering and manufacturing capabilities, combined with our high quality industrial products, have made us the ideal solution for the world's most difficult and demanding ventilation challenges. Our impressive 85 year track record is a result of consistently applying our knowledge of fan technology to the individual needs of our customers. This expertise and dedication is what has made us a leading manufacturer of air moving equipment.