

Air Filter Refurbishment Program Moves Forward

**GM Vehicle Operations, Flint Truck Assembly, Flint, Michigan:
Recipient of a 2002 WE CARE Award for Materials Conservation/Pollution Prevention**

Description of the Facility:

The General Motors (GM) Flint Truck Assembly plant is located in Flint, Michigan. The 3.2 million square foot facility is situated on 159 acres and employs over 3,100 people. Flint Truck produces the Chevrolet Silverado and GMC Sierra Crew Cab and the new 560 Medium duty truck.

Description of the Opportunity:

Air filtration systems that utilize cylindrical air filters are used extensively throughout GM Assembly, Metal Fabricating, and Powertrain Operations. These air filtration systems filter particulate matter from the air that is generated from plant production activities, such as welding. Therefore, these systems help keep plant indoor air clean. The system uses filters, which are changed on a regular basis when dirty as indicated by pressure differential. The filters are typically two feet in height, 15 to 20-inches in diameter, and weigh 12 to 15 pounds new. They consist of a mesh metal cylinder, metal end caps, neoprene seals, and a polyester-blend pleated media. In the past, used filters were placed in a 20 or 32-yard waste gondola. When the gondola was full, it was removed and the filters were placed in a landfill.

Description of the Improvement:

Flint Truck Assembly was the first GM plant to utilize a new development in air filter reuse and recycling. The process involves a GM supplier who built a mobile recycling unit, based on GM recommendations. This supplier worked with the Flint Truck plant and the Design for the Environment team by traveling to this facility to perform cylindrical air filter refurbishment on-site. The process involves a mobile cleaning unit that uses computerized sequences of compressed air, vacuum, vibration, and rotation to completely clean the used cylindrical air filter. The system does not use any chemicals or liquids in the cleaning process. A technician places the filter in the cleaning system; the automated cycle takes approximately five to six minutes per filter to clean as described above. The technician then removes the filter and tests it to ensure that it was cleaned properly and meets the pressure drop requirements. The filter is then visually inspected again for damage. It is then sent to final inspection where it is rotated above a 500-watt halogen light to look for any pinholes or torn pleats. Any filter not passing the inspections is rejected and disposed of. Those that pass, then go through a final wipe down and are put in bags before being boxed.



The mobile unit can clean approximately 100 filters per day. Each filter in this program is cleaned and reused from three to five times before final disposal. Any filter that is damaged or cannot be cleaned for any other reason is placed in a waste container, properly labeled, and left for GM to manage. Solid waste material that is generated from the cleaning process is collected in a 55-gallon drum, labeled, and left on-site for disposal by GM personnel. Before the mobile unit leaves the site it is thoroughly vacuumed, the dust containment unit filters are cleaned, and personal protective equipment is bagged for disposal by the plant.

Substance Addressed:

Solid waste from used filters

Reduction Obtained:

The Flint Truck Assembly facility provided the support for this important pilot project, committed to full implementation, and has generated over one year of data verifying positive results. The mobile unit has been going to the Flint Truck Assembly plant to perform the refurbishment on Body Shop filters for one and a half years. The filters are then placed back into the air systems for tracking purposes. Establishing that the machine effectively cleaned the filters was easy, but data was needed to prove that the filters would not prematurely load or fail when placed back into the rigors of production. Not only has the pressure drop curve been essentially identical to that of a new filter, the used filters have a higher efficiency rating upon initial equipment start-up. This is due to the fact that recycled filters perform as “seasoned” filters would.

As a result of this program, Flint Truck Assembly will purchase approximately 900 fewer filters per year. Landfilled waste is reduced by 30 tons and the plant saves \$40,000 annually. Additionally, instead of a pallet full of filters and waste debris leaving the site for recycling and disposal, the mobile unit comes on-site, refurbishes the filters, and leaves only a drum of waste material. Waste debris remains at the GM facility to assure proper disposal. Waste filter handling and transportation costs and risks are significantly reduced. Manifesting and tracking the filters is no longer necessary and filter disposal costs are reduced to non-reusable filters only.

Capital Investment:

\$0

Environmental Hierarchy:

Reduction, Recycling, and Reuse
