

Saturn Volatile Organic Compound (VOC) Abatement Project

In January 1993, Saturn Corporation commissioned an air pollution control project for the abatement of solvent emissions (VOCs) from its Spring Hill, TN, automobile assembly plant. The chosen abatement process utilizes a large fixed-bed carbon adsorption system incorporating flue gas regeneration ("Cadre" Process) with a design capacity of 320,000 SCFM. The system is capable of handling 1,000,000 SCFM of paint booth exhaust with 75% of the total exhaust air being recycled. The abatement project encompassed eight major painting processes with exhaust stacks scattered over a wide area. These stacks required manifolding into common headers, with duct work routes being carefully selected to avoid interferences with existing stacks, air intakes, etc. An air mixing system was required to maintain uniform concentration of VOCs prior to entering the abatement equipment. Ductwork sizes ranged from 64 inch diameter to 144 inch diameter. Installation of new filter houses, air supply houses, and significant rework of existing equipment was required. The location of new equipment was restricted by the existing penthouse configuration. The ability to regenerate the carbon adsorbents with flue gas at low pressure, made roof mounting of the equipment an attractive alternative to an "at grade" installation. Reinforcing of existing building columns was minimal. Grillage steel was supported from new trusses that were shop fabricated and lifted to the roof by helicopter. All major equipment was lifted to the roof by helicopter over several weekends to avoid any impact on production.

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