VOC Abatement for Semiconductor Fabrication

ST Microelectronics
Phoenix, AZ

In 2006, Munters Zeol provided air pollution abatement equipment to control solvent emissions from ST Microelectronics' semiconductor fabrication plant in Phoenix, Arizona. ST Micro is one of the world's largest semiconductor companies and is committed to environmental responsibility and excellence in Corporate Responsibility.

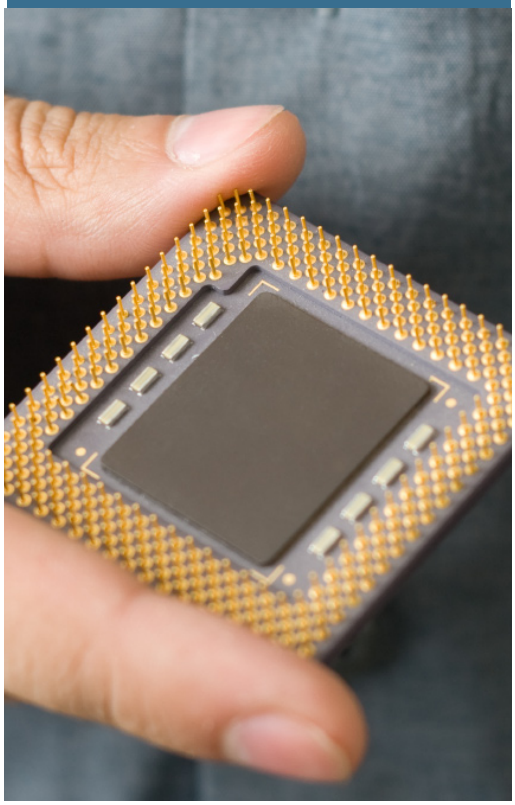
Semiconductor companies like ST Micro use organic solvents in the wafer manufacturing process. ST Micro wished to increase manufacturing capacity at their fab in Phoenix which would increase their solvent air exhaust flow, invoking requirements to control volatile organic compound (VOC) emissions. Preferred for its low capital cost, high reliability and low operating costs, the customer chose to install a Munters zeolite rotor concentrator abatement system. The rotor concentrator system concentrates the initial flow of 45,000 cfm (28,600 Nm3/hr) down to only 3,000 scfm (1,900 Nm3/hr) and destroys the VOC solvents in a small integrated thermal oxidizer. ST Micro's recent compliance test confirmed a system VOC destruction efficiency of greater than 95%.

For the semiconductor industry with 24/7 manufacturing schedules, the main benefits of using a rotor concentrator system are high reliability, steady flow exhaust with minimal pressure fluctuations and considerable operating cost savings. Munters' system concentrates a large exhaust volume containing a low concentration of VOCs into a small concentrated stream that can be efficiently and cost-effectively destroyed in an oxidizer. Pressure drop through the system is low which helps reduce exhaust fan electricity use.

> *"With the Munters Zeol System, ST Micro has significantly reduced its costs to achieve environmental compliance while conserving valuable energy resources." described Penelope Capriola, Project Manager at ST Microelectronics in Phoenix.*

ST Micro is saving $250,000 annually in fuel and electricity consumption using Munters' system as compared to the competing technology, a regenerative thermal oxidizer (RTO).

Cost Effective Solution for Semiconductor Industry



Benefits of Using Rotor Concentrator Technology over an RTO

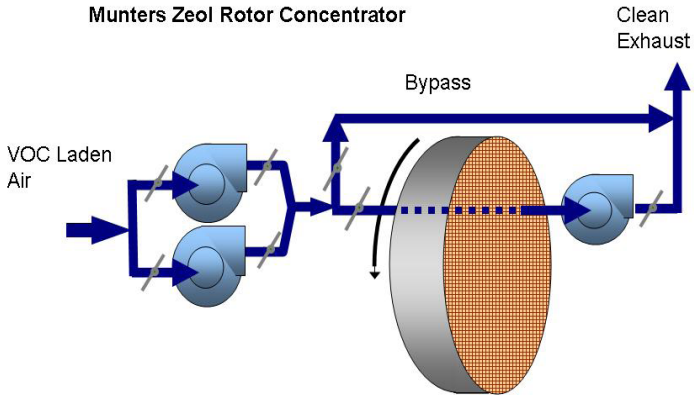
- High Reliability
- Steady Exhaust Pressure
- Energy Reduction
- Operating Cost Savings
- Smaller footprint
- Easy installation
- Low maintenance

Munters

Zeol Division

INNOVATION

Since semiconductor fabs need to operate within precise pressure tolerances, a steady exhaust pressure is critical. Munters' system and process fans are designed to operate with minimal pressure fluctuation. Redundant forced draft pre-process fans are used to overcome duct losses and an induced draft process fan is used to draw through the concentrator at steady pressure. All fans are equipped with variable frequency drives (VFDs). A pressure transmitter monitors upstream duct pressure and a controller controls the VFD speeds to minimize pressure fluctuations during startup, shutdown and normal operation. Pneumatically activated dampers are used to bypass exhaust air to the stack during maintenance activities while minimizing pressure fluctuations.



SPECIFICATIONS

Model No.	IZS-3546-TH
Flow Rate	45,000 scfm (28,600 Nm3/h)
Inlet temperature	92° F (33° C)
Rel. Humidity	40 %
Inlet Pressure	-12 in w.c. (3000 Pa.)
VOC Loading	38 lb/hr (17 kg/hr)
Zeolite Rotor	3546mm diameter 400 mm deep
Prefilter	30% paper
Thermal Oxidizer	3000 scfm (1900 Nm3/h)
CR	15:1
System Size	65' x 19' (20m x 5.8m)
System Weight	58,000 lb (26,400 kg)
Natural Gas	1.3 MM Btu/h
Electrical Usage	140 kW
DRE	> 95%

Munters Installation at ST Microelectronics, Phoenix, AZ

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