

PROJECT NAME: Industrial Ventilation Assessment

PROJECT DESCRIPTION:

The client operates a manufacturing facility for the production of urethane products. Processes conducted include the application of silicone release, flow molding of articles, heating and degassing of urethane resins, priming of parts with adhesives and solvent cleaning of parts and equipment. EIS was contracted to observe the operations conducted, measure the current ventilation system performance, calculate ventilation requirements and produce recommendations for modifications or improvements. Phase II of the project included working with a ventilation system fabrication contractor to produce prototype hoods and other ventilation system equipment. Chemicals of interest included MDI, TDI, DMF and other flammable solvents.

EIS personnel sketched the layout of the current system. The ratings of the current exhaust fans were determined. After gathering the information, we conducted calculations for determining the added exhaust needed the most economical changes to make and the specifications for a new system.

Our investigation using an air flow meter showed that no hood provided the minimum 100 fpm air flow recommended by OSHA. The placement of the make-up air ducting was needless, complicated, not according to good practice and included a gross number of bends in the duct work. There was on average at least four 90 degree bend equivalents in the ducting for each hood. These bends produced a system pressure (velocity) loss equal to an additional duct length of approximately 40 feet of straight duct per hood. This reduces the hood's effective volumetric air flow by approximately 160 %

The following were our recommendations for improving the ventilation system:

1. Replace all existing hoods and duct-work up to the blowers.
2. Install a U-shaped plenum that includes the three existing exhaust blowers.
3. Use branch ducts to service hoods.
4. Use appropriate sized four sided hoods for general work area.
5. Use specially designed slot hoods for specific equipment such as the ovens, and centrifuges.

It was beyond the scope of this study to design a complete system.