

**Company Profile**

**Alcon** is an American global medical company specializing in eye care products and headquartered in Hünenberg, Switzerland. Alcon's American headquarters are located in Fort Worth, Texas. Alcon was founded in 1945<sup>[2]</sup> in Fort Worth, Texas. The company started as a small pharmacy in Fort Worth and was named for its founders, pharmacists Robert Alexander and William Conner. Conner and Alexander focused on sterile ophthalmic products.

**The Situation**

EtO Emmissions in the facility are higher than OSHA action levels. The majority of the EtO emissions are from custom-pack product that is brought into the warehouse, processed, and stored in isles, The pallets of custom packs received at the warehouse may have been transported by ventilated trailers, however EtO reduction is not fully achieved

**Target EtO Levels**

The OSHA permissible exposure limit is 1 ppm over an 8 hour average. The OSHA action level is 0.5 ppm over an 8 hour average. Alcon requires that the maximum concentration is no more than 0.35 ppm, with an action level of half that. Alcon's goal is 0.1 ppm to remain below action levels. Alcon stated that they may accept a goal of 0.2 ppm at this site since this is a leased facility that may not be occupied for the long term.

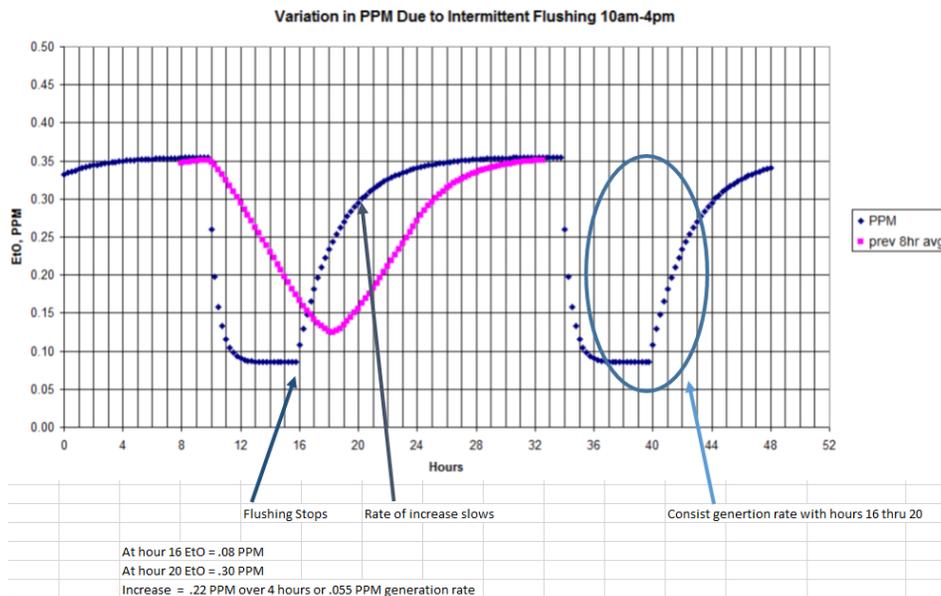
**Present EtO Levels**

Historical EtO concentration data was supplied by Alcon for various time periods. The data was collected by Alcon using dosimeter badges that were both worn by employees as they moved about and hung at fixed locations at breathing level. EtO levels are shown in the graph below.

**The Action**

The EtO is a result of off-gassing from products stored and assembled in the warehouse. PS&S Engineering conducted a site inspection, reviewed environmental test data supplied by Alcon, estimated the present ventilation air flow rates, developed concepts, and performed an economic analysis of the Solution Alternatives.

General Aire Systems, Inc. coordinated with Camfil and Jacobi Carbons to develop an impregnated carbon specific for EtO removal at the concentrations levels in the Alcon results.



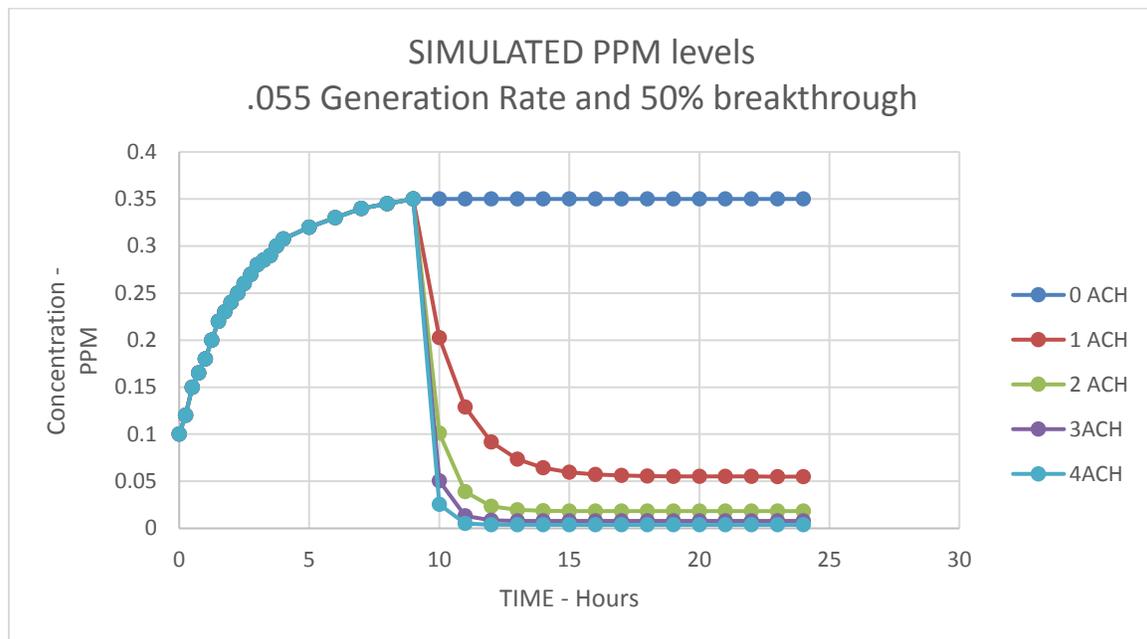


### **The Result**

Per the Camfil and Jacobi study on the removal of EtO dated 8/15/16 EtO breakthrough rates begin at 90% and reduce to XX% at an adsorptive capacity of lbs. of EtO. Below Graph correlates PPM levels vs. Air Changes per Hour with a specific breakthrough level of 50% and shows time to achieve steady state concentration levels. Start point of the CamCleaners are after 10 hours of zero ventilation air bringing EtO levels up the .35 PPM.

Assumptions include .055 generation rate and 50% breakthrough. No allowance has been made for natural or forced ventilation effects. The graph shows adequate EtO reduction can be achieved to meet the desired goal of a steady state level of .10 ppm when utilizing carbon specifically impregnated for removal of EtO.

If EtO level generation is greater than assumed, the tradeoff is more ACH and / or reduced carbon life expectancy.



General Aire proposed CamCleaners with the special carbon – The customer determined 12 were required and decided to roll the same concept out to the Alcon Plant in Fort Worth Texas. The Baltimore project resulted in a project worth \$130,892.00, the Fort Worth Tx, project resulted in a project worth \$176,210.00

### **The Proof**

Start up end of January