



# **Laboratory Fume Cupboards- parameter changes & cost savings**

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# GlaxoSmithKline

## Research & Development

- Project designed to support global strategy to reduce energy consumption and carbon footprint

# Stevenage Medicines Research Facility

- 700+ containment devices
- 200+ fume cupboards
- Used for the handling of solids and solvents
- Complex LEV systems



# Fume Cupboard Standards

- British European Standards (replacing BS7258:1994)
- BSEN 14175
  - Part 1 - Vocabulary
  - Part 2 - Safety and Performance requirements
  - **Part 3 - Type test methods**
  - **Part 4 - On-site test methods**
  - Part 5 - Recommendations for installation and maintenance \*
  - Part 6 - Variable air volume fume cupboards

\* In preparation

# GSK R&D Criteria

- Inner & Outer Plane Containment test
  - 0.005ppm SF<sub>6</sub> Average (Test Room)
  - 0.01ppm SF<sub>6</sub> Peak (Test Room)
  - 0.01ppm SF<sub>6</sub> Average (Commissioning)
  - 0.02ppm SF<sub>6</sub> Peak (Commissioning)
- Robustness test
  - Peak (SF<sub>6</sub>) must not exceed 1ppm or 0.2ppm average (and return to zero before next pass of board)

# Laboratory Fume Cupboard Design

- Flexible Laboratories
- VAV system (not face and by-pass)
- Face velocity
- Purge
- Diversity
- Sash height



Photo courtesy of [Mach Aire](#)

# Fume cupboard parameters

Parameter	Original Design setting	New setting
Face velocity	0.5m/sec	0.4m/sec
Purge	200L/sec	65L/sec
Diversity	60%	50%
Sash Height	500mm	500mm

# Conclusions

- Useful tests for determining containment of fume cupboards
- No significant difference between original setting and reduced settings (0.4m/s face velocity and 65L/sec purge)

# Cost savings

- Maximum configuration would requires 1,222,020m<sup>3</sup>/air/annum, which equates to £1000+ per annum running cost per fume cupboard.
- GSK setting at installation reduced the cost by approx 30% (Diversity/night settings)
- New setting give an additional 25% reduction in air usage and cost, mainly due to the reduced purge setting

- Thanks to
- GlaxoSmithKline for supporting this MSc project (University of Birmingham)
- Dr Jan Wren, GSK
- Chris Stirling, GSK
  
- Mach Aire Ltd