

# VARIABLE FLOW EXHAUST VENTILATION CAPS FOR LOCAL EXHAUST SYSTEMS

Patent Pending

Technology Readiness Level: 7/8

*Actual technology completed and qualified through test and demonstration*

Local Exhaust Ventilations (LEV) are vital engineering control systems used to prevent exposure to harmful airborne contaminants in the workplace. When fumes are produced, LEV systems produce enough suction to remove them, however, Current LEV systems function at constant rates, providing the same amount of suction at all times. As a result, LEVs have a low rate of efficiency and a high rate of energy consumption. To address this problem, Sandia engineers developed the Variable Flow Exhaust Ventilation Cap (VFEVC) which allows users to plug the LEV when suction is not needed, and also allows them the ability to control the variable rate of suction.

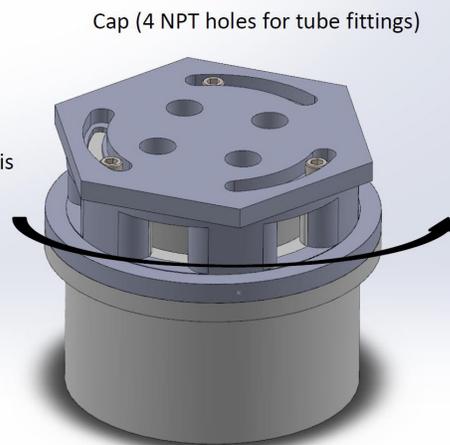
The VFEVC is designed with a cylindrical, variable-angle flow valve that allows the operator to vary the amount of suction that is exerted on the tubes connected to the VFEVC by simply rotating the cap. The flow valve is essential, because it allows small or large amounts of air to enter the LEV to prevent large amounts of suction on applications which cannot tolerate a vacuum of any kind (such as gloveboxes or dry-desiccant boxes). The cap incorporates four NPT holes for tube fittings of various sizes. Plugs are inserted into the tubes which are not needed during operation. Another version of this invention incorporates HEPA/ULPA filter for use with nanoparticles. This unique attachment can be easily installed inside of LEV tubes using a simple pipe clamp to hold it into place.

The VFEVC is a simple attachment that results in a more efficient LEV system by plugging the LEV when suction is not needed. By preventing wasted suction, the VFEVC reduces the amount of conditioned makeup air.

## TECHNICAL BENEFITS

- Increased efficiency
- Reduced costs
- Increased control with throttling flow rate
- Easy installation

Rotate Cap  
About central axis  
To change flow



Base (Insert into LEV)

## INDUSTRIES & APPLICATIONS

- Laboratory ventilation systems