



21CR Project 610-40040

## **Investigation of Building Exhaust Air Re-Entrainment into Outdoor Air Intakes of Packaged Outdoor HVAC Equipment — Phase I**

Updated 8 June 2005

### **Objective:**

To investigate various configurations and velocity profiles that exist in the fresh air intakes and exhaust air locations of a packaged piece of equipment. This investigation should identify the relationships that exist between percent re-entrainment of exhaust air, separation distances, direction of airflow and air velocities.

### **Information/items expected to result from this project:**

The output of this research will allow ARTI to determine if packaged products being manufactured by its member companies are designed to deliver an acceptable quality of fresh air into the occupied space. At the end of this research, the following information should be available:

1. What are the design factors that affect the amount of air that is re-entrained in a packaged product?
2. How to calculate the percent exhaust air that is re-entrained in a typical packaged product?
3. Based on a random sample, what percent of exhaust air that is being re-entrained in a typical packaged product?
4. Recommendation of guidance or acceptable design criteria that can be incorporated into industry standards.

### **How are the results likely to be applied:**

Manufacturers of packaged equipment and building design engineers will be provided with an understanding of the magnitude of problem of exhaust air re-entrainment and recommendations for possible solutions. ASHRAE SSPC-62.1 will be provided technical data upon which to develop standards or guidelines concerning installation of packaged equipment with respect to re-entrainment of exhaust air. Building owners and occupants will be provided better IAQ.

### **Research subcontractor:**

Battelle Memorial Institute, Columbus, OH (Principal Investigator: George H. Strickford)

### **Status:**

Project is completed. The final Report is available for downloading at no cost from the ARTI website.

**Responsible 21CR Subcommittee:** Indoor Environmental Quality