

UNIVERSITY OF HOUSTON – DOWNTOWN

ENGR 4310 - INDUSTRIAL HYGIENE INSTRUMENTATION

**LECTURE NOTE OUTLINE – LOCAL EXHAUST VENTILATION
CHAPTER 19**

WEEK 13

- I. Types of Industrial Ventilation
 - A. Dilution
 - B. Local Exhaust Ventilation (LEV)

- II. Local Exhaust System Components
 - A. Hoods
 - 1. Capture
 - 2. Enclosure
 - 3. Receiving
 - 4. LEV - Slot and Canopy
 - B. Ducts
 - C. Fans
 - 1. Radial-blade fans
 - 2. Forward-curved blade fans
 - 3. Backward-inclined/backward-curved blade fans
 - D. Air Cleaners
 - 1. Particulates
 - a. Filters
 - b. Electrostatic precipitators
 - c. Cyclones
 - d. Wet scrubbers
 - 2. Gases and Vapors
 - a. Absorption
 - b. Adsorption
 - c. Oxidation or combustion
 - E. Make-Up Air

- III. Airflow and Pressure Principles
 - A. Airflow Principles
 - B. Pressure Concepts
 - 1. Static Pressure
 - 2. Velocity Pressure
 - 3. Hood Static Pressure/Entry Loss
 - 4. Pressure Loss in Ducts
 - 5. Fan Pressure

- IV. LEV Performance Evaluation and Improvement
 - A. Smoke Tube Tests
 - B. Velocity Measurements
 - C. Static Pressure Measurements

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**LECTURE NOTE OUTLINE – DILUTION VENTILATION OF
INDUSTRIAL WORKPLACES – CHAPTER 20**

WEEK 13

- I. Dilution Ventilation Systems
 - A. Natural Ventilation
 - B. Mechanical Ventilation

- II. Dilution System Design Considerations
 - A. Safety Factors
 - B. Layout

- III. Dilution Airflow Calculations
 - A. Health
 - B. Fire and Explosion Prevention

- IV. Fans for Dilution Ventilation

- V. Ventilation of Normally Unoccupied Enclosed Spaces

- VI. Measuring Dilution Performance

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**LECTURE NOTE OUTLINE – GENERAL VENTILATION OF
NONINDUSTRIAL OCCUPANCIES – CHAPTER 21**

WEEK 13

- I. General Ventilation
- II. Energy Conservation vs. IAQ
- III. Terms
- IV. Heating, Ventilation, and A/C Systems
 - A. Zones
 - B. Constant-Volume
 - C. Variable Air Volume
 - D. Unit Ventilators
 - E. Air Mixing
 - F. Dampers
 - G. Terminal Devices
 - H. Return Air Systems
- V. HVAC Sources and Causes of IAQ Problems/Standards
 - A. Issues
 - B. Consensus Standards
 - 1. ASHRAE 62-1999
 - 2. ASHRAE 55-1992
 - 3. ASHRAE 52-1992
 - C. Regulatory Standards
- VI. Testing, Troubleshooting, and Maintaining HVAC Systems
 - A. Testing
 - B. Troubleshooting
 - C. Operation and Maintenance