



Industrial Ventilation and LEV Course: Hood Design, Testing and Thorough Examination



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Introduction:

Industrial ventilation and LEV hood design, testing and thorough examination is a 1-week course for HSE engineering, maintenance and plant engineering units that ends with an LEV Design, Testing and Thorough Examination Plan for a case plant. Extraction systems in fabrication shops, cement mills, pharmaceutical suites and chemical plants often lose capture after duct changes, blocked filters or worn fans, and nobody notices until dust or fume reaches the breathing zone. Nominees already maintain or specify extraction equipment, and learning is by inspection walkthrough on hood, duct and fan test data. CoreConcept Training Center delivers this industrial ventilation and LEV course.

Course Objectives:

- Classify enclosing, receiving and capturing hoods and match each to the contaminant cloud released by a process
- Calculate capture velocity, hood airflow and duct transport velocity for dust and fume sources
- Size duct branches, balance pressure losses and select a fan from its curve against system resistance
- Specify extraction for welding, grinding, abrasive blasting and powder handling, including the dust collector type
- Commission an extraction system and record baseline face velocity, static pressure and volume flow
- Carry out a periodic thorough examination and test and issue an LEV Design, Testing and Thorough Examination Plan

Target Audience:

- HSE engineering units responsible for selecting and specifying dust and fume controls
 - Maintenance units responsible for fans, ducts, filters and collector upkeep
 - Plant engineering units responsible for modifying production lines and their extraction branches
 - Technical units responsible for commissioning records and periodic airflow testing
 - Site services units responsible for purchasing and accepting extraction equipment from contractors
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Course Outline:

Day 1: Industrial Ventilation Principles and LEV System Anatomy

- Capture, Convey and Collect Model of Extraction Systems
- General Dilution Ventilation Versus Local Exhaust Ventilation Choice
- Contaminant Cloud Behaviour for Dust, Fume, Mist and Vapour
- LEV Component Inventory From Hood to Discharge Stack
- Existing Extraction System Walkdown and Condition Survey

Day 2: Hood and Enclosure Design With the ACGIH Industrial Ventilation Manual

- Enclosing Hoods, Booths and Glove Box Containment Options
- Receiving Hoods Over Hot Processes and Grinding Wheels
- Capturing Hoods, Slots and Flanged Openings Compared
- Capture Velocity Selection From the ACGIH Industrial Ventilation Manual
- Hood Airflow Calculation From Opening Area and Distance

Day 3: Duct Sizing, Pressure Losses, Fans and Dust Collectors

- Duct Transport Velocity Settings for Heavy and Light Dust
- Velocity Pressure, Static Pressure and Hood Entry Loss Calculation
- Branch Balancing by Design Versus Blast Gate Adjustment
- Centrifugal Fan Curve Reading and System Resistance Matching
- Cyclone, Cartridge, Baghouse and Wet Scrubber Collector Selection

Day 4: Process Extraction Cases, Commissioning and Airflow Measurement

- Welding Fume On-Torch Extraction and Movable Arm Placement
- Grinding, Abrasive Blasting Room and Powder Tipping Station Extraction
- Pitot-Static Traverse Under ISO 3966 for Volume Flow
- Anemometer Grid Readings and Smoke Visualisation at Hood Faces
- Commissioning Report Baseline and Airflow Indicator Settings

Day 5: Inspection Walkthrough and the LEV Design, Testing and Thorough Examination Plan

- Periodic Thorough Examination Checklist for Hoods, Ducts and Fans
 - Filter Pressure Drop Trend and Reverse-Pulse Cleaning Review
 - Defect Grading, Out-of-Service Tagging and Retest Rules
 - Case Plant Extraction Redesign for a New Production Line
 - LEV Design, Testing and Thorough Examination Plan Completion
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Skills You Will Gain:

- Hood Type Selection
- Capture Velocity Calculation
- Duct Pressure Loss Analysis
- Fan Curve Interpretation
- Dust Collector Specification
- Pitot Traverse Measurement
- Extraction Defect Grading
- Commissioning Record Keeping

Why Attend This Course:

- Deliver an LEV Design, Testing and Thorough Examination Plan to the plant manager and the HSE lead for approval and budgeting
- Decide whether an extraction branch needs a hood change, rebalancing, a larger fan or a different collector
- Avoid lost capture, blocked ducts and dust build-up that follow unrecorded line changes and missed filter cleaning
- Equip maintenance colleagues with traverse sheets, hood test grids and examination checklists used in the walkthroughs

Conclusion:

Back at work, the participant gives the plant manager and the HSE lead an LEV Design, Testing and Thorough Examination Plan listing each hood, duct branch, fan and collector with design airflow, commissioning baseline and examination interval. Maintenance planners use it to schedule tests and filter work, and engineering uses it to judge any new branch before it is connected. After the first round of periodic examinations, the site should compare measured face velocities and static pressures with the baseline and correct branches that have drifted.

Frequently Asked Questions FAQ:

What should participants know before an industrial ventilation and LEV course?

Participants should already maintain, specify or inspect extraction equipment and read basic airflow units. Bringing a site extraction drawing, a fan data sheet or a recent test record helps them apply the walkthroughs to their own plant.

How does an industrial ventilation and LEV course differ from an industrial hygiene course?

It concentrates on the extraction hardware: hoods, ducts, fans, collectors, commissioning and periodic examination. Industrial hygiene courses cover sampling worker exposure, exposure limits, noise, heat and health surveillance, and treat ventilation as one control among many.

Why does capture velocity matter in industrial ventilation and LEV design?

Capture velocity is the air speed needed at the source to pull dust or fume into the hood. It falls sharply with distance, so a hood placed too far away or starved of airflow lets contaminants escape into the breathing zone.

What do participants take back from the industrial ventilation and LEV course?

Participants take back an LEV Design, Testing and Thorough Examination Plan for a case plant, with a hood register, duct and fan calculations, commissioning baselines, examination checklists and a defect grading table they can adapt to their own site.
