



# CONDUCTING AN INDOOR AIR QUALITY COMPLAINT INVESTIGATION

APPLICATION NOTE TSI-164 (US)

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## Investigating Indoor Air Quality (IAQ) Complaints

A general approach on investigating an indoor air quality complaint is summarized below which provides an insight into the process. However, it is advisable to consult with an experienced IAQ professional, health and safety specialist or industrial hygienist when devising an IAQ investigation and strategy. Many issues must be considered in a complete investigation that this precaution of reaching out to a professional will probably end up saving time and increasing the likelihood of a successful outcome.

1. Gather background information about the building and its systems. This may involve the owner, management, facilities and plant maintenance or building engineers.
  - Usage, manufacturing processes, age, renovations, building drawings and mechanical schedule, general maintenance schedules, hours of operation, number of employees.
  - Special design features, new furniture, types of cleaning supplies, change in building or room usage, new equipment (office and manufacturing).
  - Temperature and humidity set points, outdoor air ventilation rates, building pressures.
2. Perform a walk-through of the building and areas of concern. Conduct interviews for additional insight.
  - Visually look at the work areas for cleanliness and general housekeeping, condition of floors, walls and ceiling, water intrusion, evidence of pests, or mold, stained ceiling tiles. Note any odors.
  - Inspect adjacent areas and what they are used for such as kitchens, storage cabinets, rest rooms, copiers, manufacturing area, entry and exit ways, location of parking areas and shipping docks.
  - Interview affected people to better understand the complaints, concerns, symptoms and check for patterns as to where and when they occur.
    - What symptoms are you experiencing?
      - When did they begin?
      - Where do they occur?
      - Are they present all the time or just during certain times (hour, day, season of the year, etc.)?
      - Do they subside when you leave the affected the area? How soon?
    - Does anyone else near the affected area have symptoms similar to yours?
    - Have there been changes to the area-new furniture, carpet, paint, remodeling or construction projects, etc.?



3. Deploy instrumentation to monitor and log data over the course of several hours or days by taking necessary measurements throughout the building or area of concern. This will help to identify trends based on occupancy and building operation modes.

- Common measurements include:
  - Temperature
  - Humidity
  - Carbon dioxide (CO<sub>2</sub>)
  - Carbon monoxide (CO)
  - Particles (PM10, PM2.5)
  - Volatile organic compounds (VOC)
- Additional gas measurements to consider may include:
  - Formaldehyde (H<sub>2</sub>CO)
  - Chlorine (CL)
  - Ammonia (NH<sub>3</sub>)
  - Hydrogen sulfide (H<sub>2</sub>S)
  - Nitrogen dioxide (NO<sub>2</sub>)
  - Nitric Oxide (NO)
  - Ozone (O<sub>3</sub>)

4. Analyzing the data.

Review the data gathered in order to eliminate certain areas or suspected problems as well as anomalies. Also, overlaying the measurement data with some of the answers from the occupants regarding time, location and length of adverse conditions can be a very useful tool in zeroing in on the source(s) of air quality concerns. Trends may appear that can help identify when and where an issue arises from.

5. Report findings.

- Document results and findings.
- Call out areas of concern in need of corrective action.
- Communicate findings with the building representatives.
- Offer suggestions and recommendations along with a potential action plan.



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