



# AirMaid Overview

For Engineers & Architects



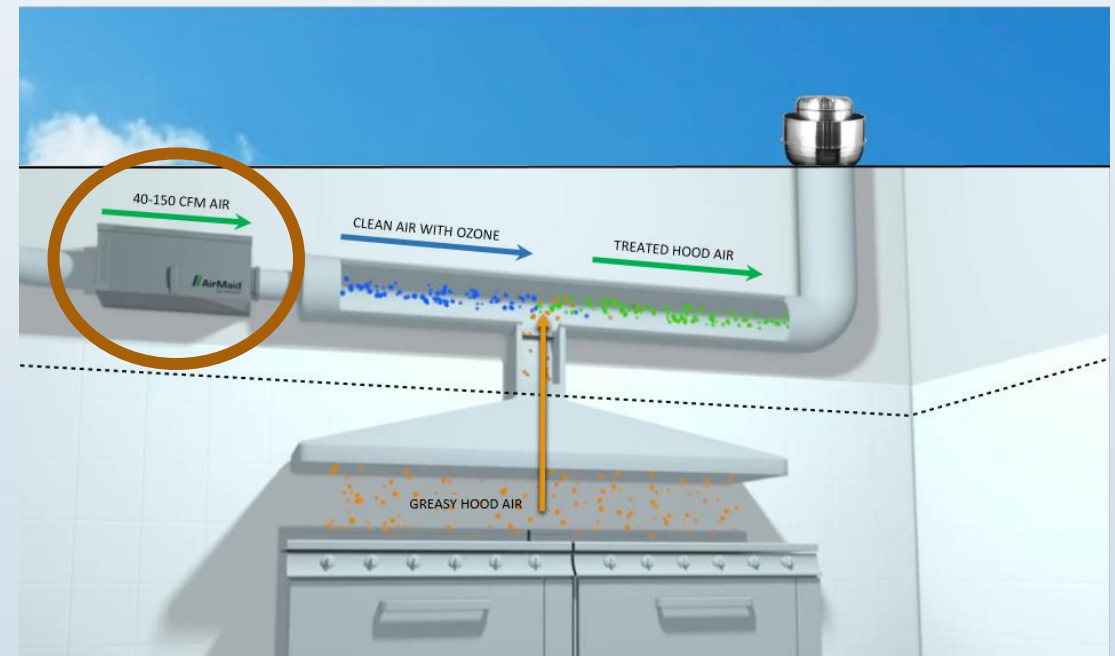
Part of Absolent  
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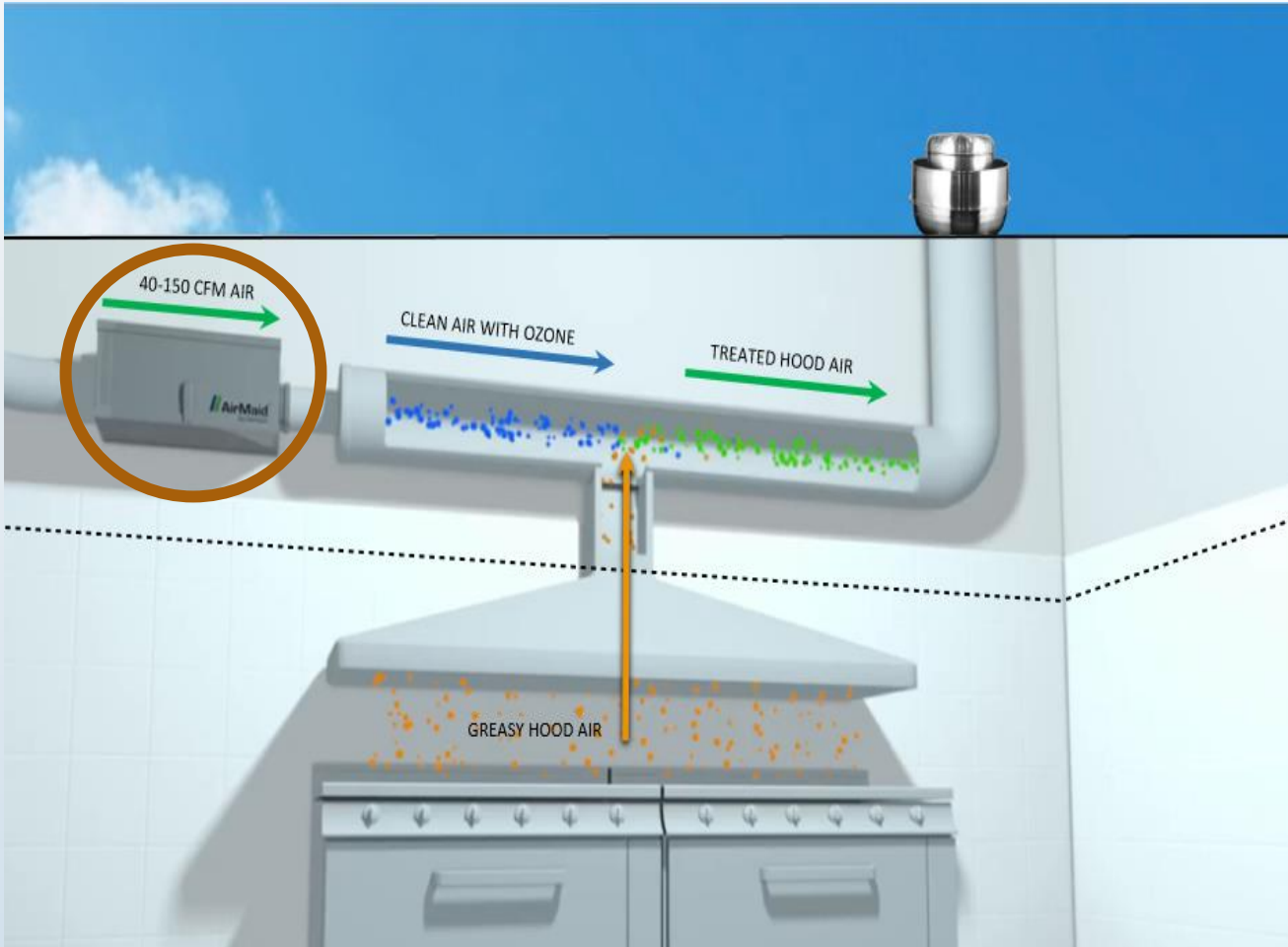
# What is AirMaid?



- Ozone-gas based cleaning system designed explicitly for easy connection to either new or existing commercial kitchens exhaust ventilation systems
- Ozone is an extremely effective oxidant
  - more so than oxygen or chlorine
- Using ozone to treat grease/odor in commercial kitchen exhausts is not new
  - Manufacturers sell kitchen hoods containing ultraviolet lamps which generate ozone
- AirMaid is mounted outside the greasy airstream, is the size of a microwave oven and almost maintenance free
- 170+ US installations ( 15+ in NYC)
- 4500+ installations worldwide



# How AirMaid Works



- AirMaid is a passive device
  - Requires no moving parts/consumables other than electricity to produce ozone
- One or more sets of electrodes inside the unit are energized with a high voltage, high frequency, yet low current energy field.
- 40-150 cfm per generator of “bleed air” is drawn through the generator and between the electrodes.
- The high energy field generates ozone from the atmospheric oxygen in the bleed air, which is then drawn into the exhaust airstream near the hood connection
  - AirMaid unit is never exposed to the kitchen affluent
- Ozone performs the same chemical oxidation process that atmospheric oxygen O<sub>2</sub> does, but at a much faster rate
  - Third oxygen atom in ozone is connected with a weak atomic bond



# How AirMaid Works *Regarding Grease*

- Grease, cooking oils and animal fats are long-chain hydrocarbons (carbon and hydrogen >99.9% by weight)
- Other components include sulfur, oxygen and other elements
- When exposed to ozone, hydrocarbon chains slowly break down into smaller components
  - Dry minerals, water vapor and carbon dioxide
    - Same by-products that occur from natural oxidation of these materials, yet at a highly accelerated rate
  - Some residue can remain in the ducts
    - Dry, non- flammable minerals left behind from oxidation of grease

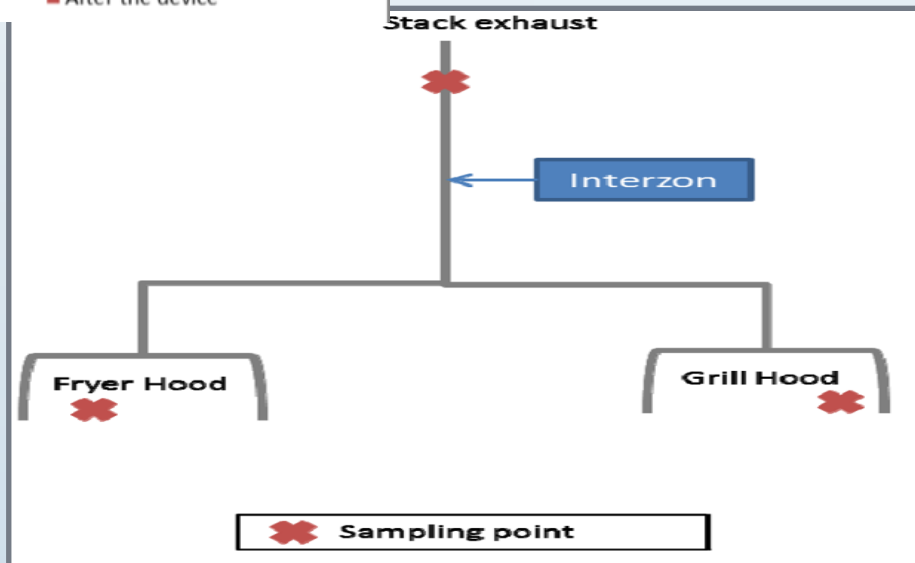
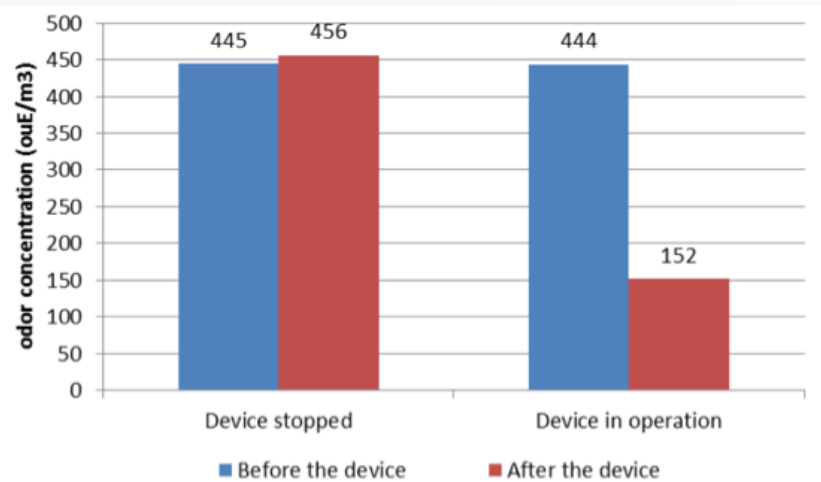


Typical 6 months without AirMaid



One year with AirMaid without cleaning

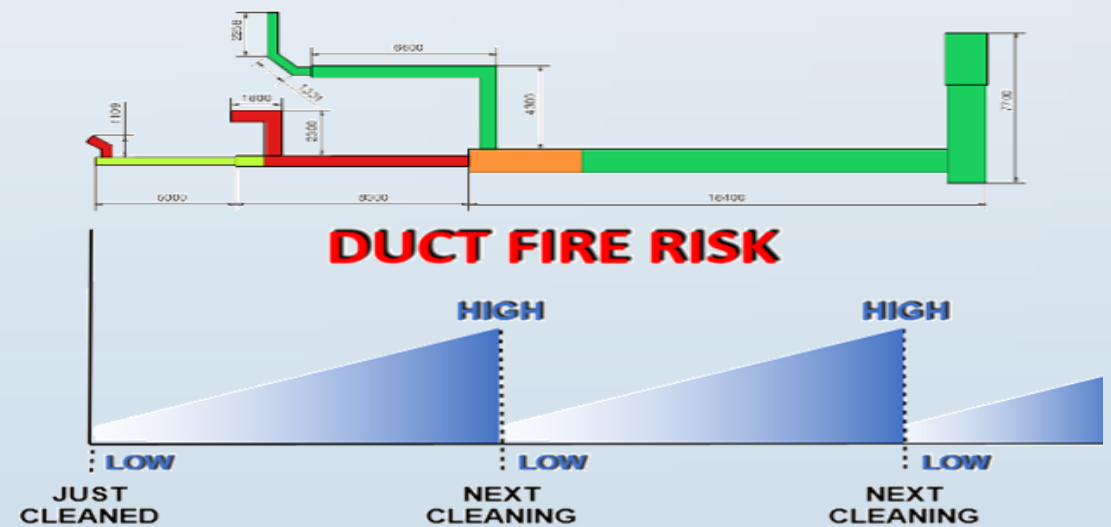
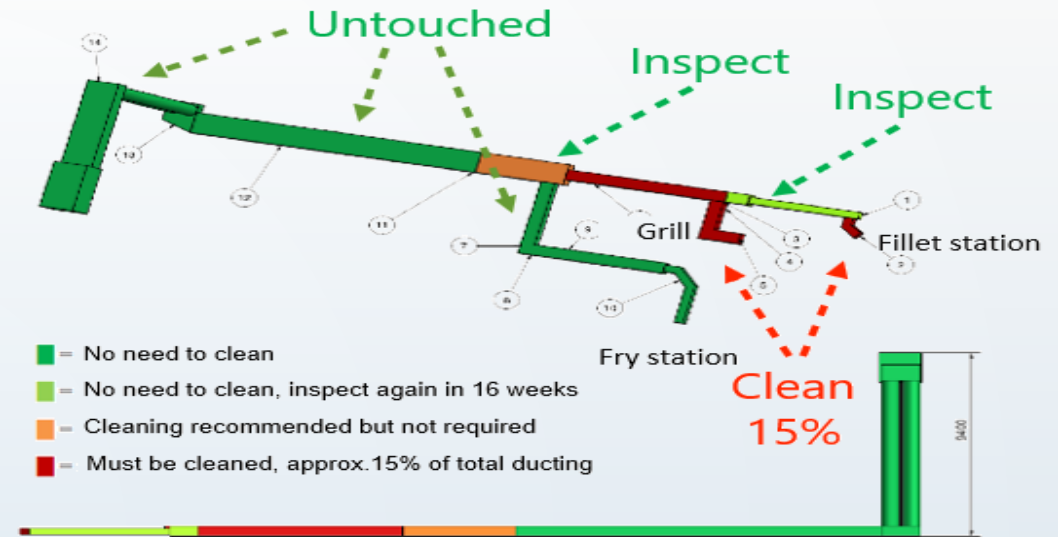
# How AirMaid Works *Regarding Cooking Odor*



- Primary odorous components in restaurant exhaust:
  - **Sulfur compounds**
    - Highly reactive with Ozone
    - Reaction Occurs about as quickly as the molecules can collide with each other
  - **Acetaldehydes**
    - Larger molecules
    - Require more work to break down
- Result of ozone oxidation of these compounds are primarily:
  - Water vapor
  - Sulfur oxides
  - Salts
  - All are common, natural compounds found in the environment with significantly less odor

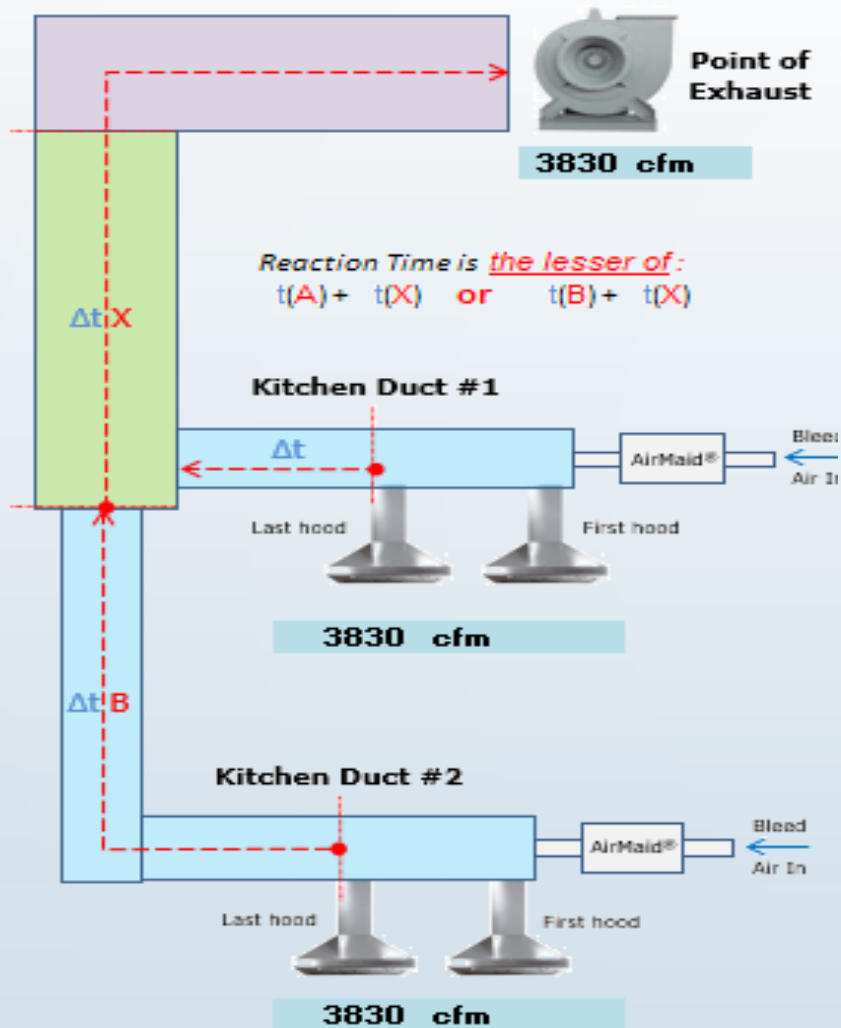
# Reduced Duct Cleanings & Fire Risk

- By reducing grease inside the ducts, maintenance companies have significantly less cleaning to carry out
  - Depending on length/complexity of the ducts, savings can be significant for the restaurant or building maintenance company
- Grease inside restaurant kitchen exhaust ducts has about the same energy equivalent as diesel fuel
  - By maintaining a low level of this combustible material inside the ducts, fire safety in the facility is markedly improved





# Importance of 2 Second “Dwell Time”



- **Dwell Time**- the importance of the ozone having enough time to react with the odor particles in the duct airstream.
  - In order to obtain “good” results for the reduction of cooking odor, **there should be at least two (2) seconds of dwell time** for the ozone mixed in the duct airstream to react with the air traveling through the duct, before it is expelled into the environment
- A longer dwell time will provide better results
- In the case of a multiple-hood or multiple-duct run you must choose the shortest dwell time of the group
  - This is the dwell time for the air traveling from the hood closest to the point of exhaust
  - Actual calculations must be made taking into account each hood’s airflow and the dimensions of its ducts
- Methods that can be used to increase dwell time:
  - Increasing duct dimensions, resulting in reduced velocity
  - Adding additional ducting, either indoors or outdoors
  - creating a “reaction chamber”
  - consider keeping an existing fire-rated PCU in place
    - re-appropriating it as a “reaction chamber”

# Limitations of Ozone in Exhaust Applications



- **Can ozone reduce the smoke or soot generated by solid fuels, or by seared or burnt foods?**
  - Smoke and soot are fully combusted materials, so the answer to this question is no, these particles cannot be broken down by ozone.
  - Any residual soot properly treated with ozone is usually minimal, non flammable, and very easily removed.
  - In a solid fuel application/cooking process generates smoke, conventional filtration such as carbon filters could be used in conjunction with ozone
    - The ozone in the airstream can extend the life of such filters by oxidizing away airborne grease they may collect
- **Can Ozone reduce the odor of smoke or soot?**
  - Ozone cannot effectively reduce smoke odor in the minuscule time it is within an exhaust duct
  - This is a process which requires long-term exposure of hours to even days



# Contact the Experts



- Learn more about AirMaid's Commercial Kitchen Ventilation Solution by going to <https://www.interzon.com/products/airmaidv/>
- See the AirMaid Ozone Generator in action: <https://www.youtube.com/watch?v=kYL6Rh5YxWo>
- Contact the Technical Air Systems' Sales Engineering Team at 973-285-0333 or by email at [solutions@technicalair.com](mailto:solutions@technicalair.com)
- Check out more Commercial Kitchen articles along with Air Handling & Air Distribution and Building Performance & Controls articles at [Technical Air Systems' Engineering Corner!](#)



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