

A photograph of a busy commercial kitchen. Several chefs in white uniforms and tall white hats are working at a long stainless steel counter. The kitchen is filled with various cooking equipment, including pots, pans, and a large range hood. The lighting is bright, and the overall atmosphere is one of active food preparation.

PART 2
THE RIGHT
PRODUCT FOR
THE RIGHT
APPLICATION

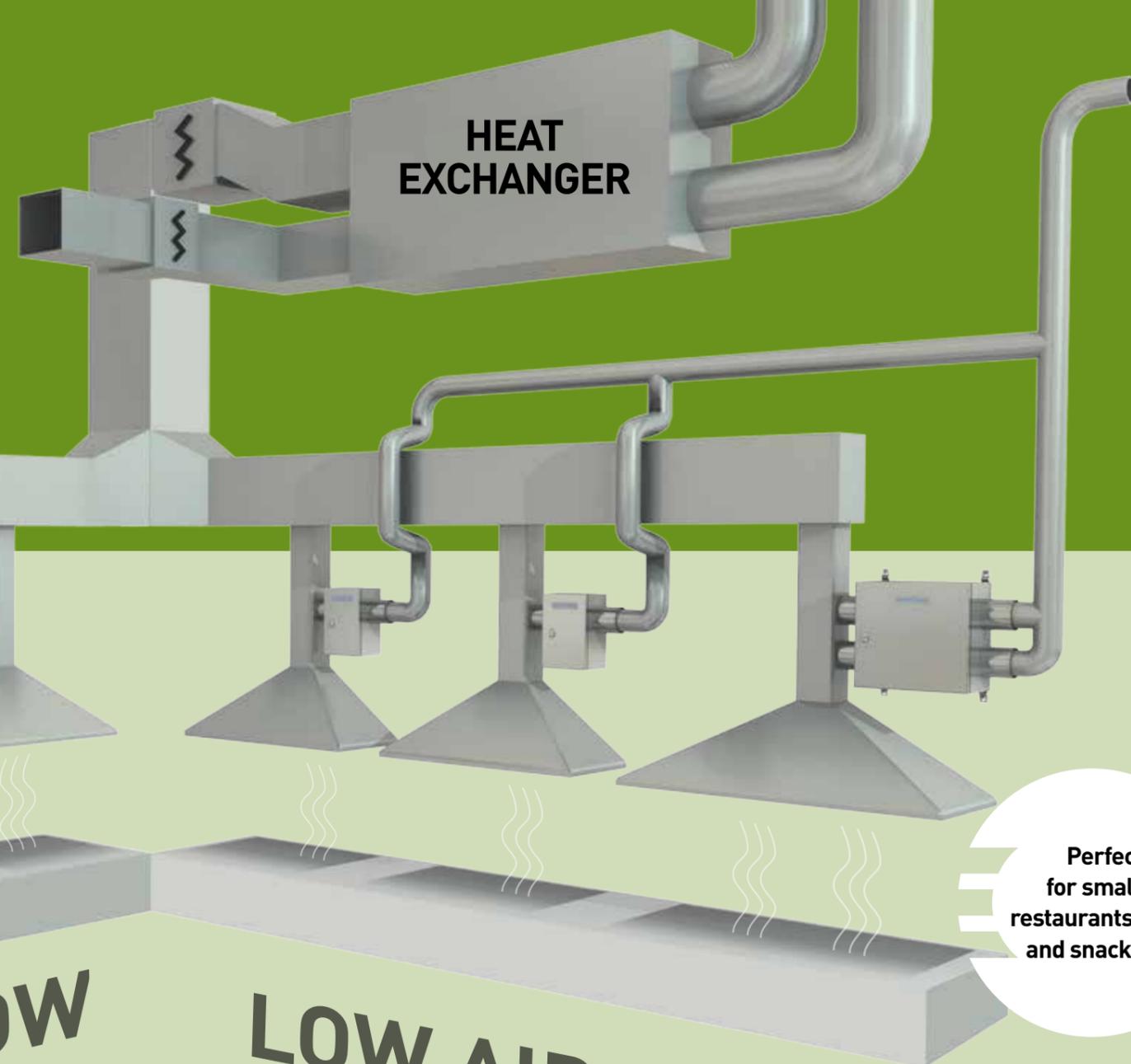
Guide for Air Treatment with Ozone for Restaurants and Commercial Kitchens

THERE ARE A NUMBER OF TECHNOLOGIES, METHODS AND PRODUCTS FOR AIR TREATMENT WITH OZONE ON THE MARKET. KNOWLEDGE MAKES IT EASIER TO CHOOSE THE RIGHT PRODUCT FOR THE RIGHT APPLICATION.

 **ozonetech.**



Right product for the right application



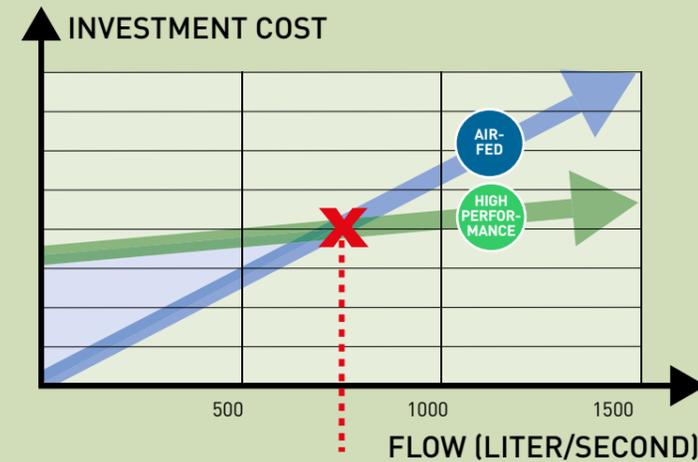
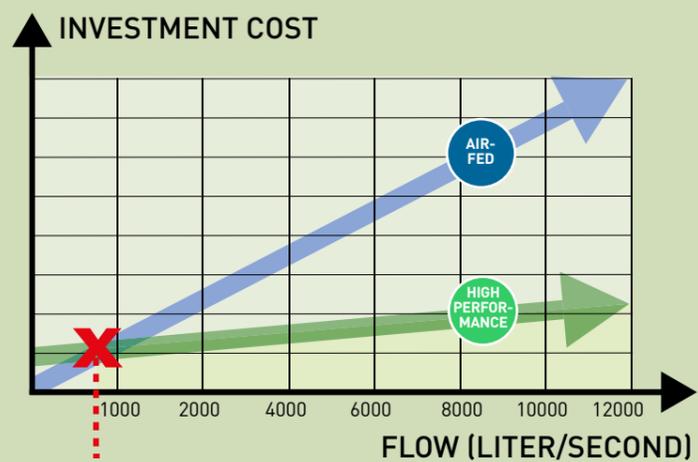
Ideal for medium- to large-sized restaurants and commercial kitchens

Perfect for smaller restaurants, cafés and snack bars

HIGH AIR FLOW

LOW AIR FLOW

- Up to 43 000 CMH (1 500 000 SCFH) per ozone module
- One ozone module services several hoods and/or kitchens
- High and consistent treatment effect over time
- Meets industrial requirements
- Adjustable ozone production



- Excellent for air flows below 750 l/s
- Easy installation
- Basic technology

High-performance ozone systems

Restaurants and commercial kitchens with a fryer, grill, wok or griddle demand a highly functional air treatment system. The kitchen should be fireproof as well as efficient from a purification and cost perspective.

A high cleaning capacity is required to eliminate grease and cooking odors in the extract air. Our experience shows that greasy air flows require a high-performance RENA system to meet the task. These systems have previously only been

available to the industrial market, but we are now able to offer their unique advantages to all restaurants and commercial kitchens.

**RENA
High-
performance
air treatment
system**



ADVANTAGES OF RENA HIGH-PERFORMANCE SYSTEM

- **HIGH CLEANING POWER**
One module for up to 43 000 CMH (1 500 000 SCFH).
- **CENTRAL OZONE SYSTEM**
One system can serve several hoods and/or kitchens.
- **EVEN OZONE PRODUCTION**
Ozone production is constant and does not degrade over time.

COST EFFICIENT SOLUTION WITH LOW LCC

High-performance ozone solutions are less expensive and have a lower lifecycle cost (LCC) than multiple air-fed ozone solutions.

- **HIGH RELIABILITY**
Water as a refrigerant, a well-developed design and tough requirements from the industry make this a dependable choice.
- **LOW MAINTENANCE**
No NOx, no acids and no salt build-up minimizes service requirements.
- **FLEXIBLE INSTALLATION**
Equipment can be installed far from the kitchen hoods or in another room. Ozone is distributed easily through a hose.
- **ADJUSTABLE CLEANING POWER**
- **NO FEED AIR**
RENA high-performance ozone systems consume a minimal amount of indoor air.
- **QUIET**
Below 50 dBA, which is the recommended level for a healthy working environment.



EXAMPLE: MEDIUM-SIZED RESTAURANT

Through a simple offshoot of outgoing ozone pipes, the ozone generator can provide ozone to several adjacent hoods.

A high cleaning capacity reduces both grease and cooking odors, while enabling the potential for heat recovery and improved safety by lowering the risk of fires.



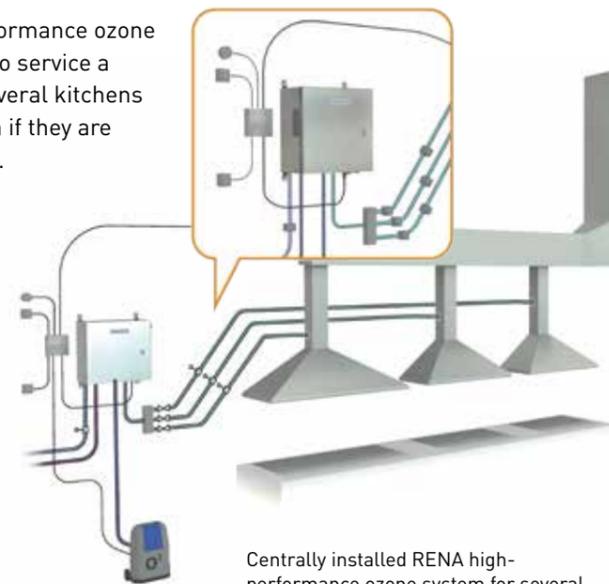
RENA high-performance ozone system for a medium-sized restaurant

EXAMPLE: MULTI-KITCHEN INSTALLATIONS, SUCH AS IN FOOD COURTS

A central RENA high-performance ozone system can be expanded to service a complete food court or several kitchens in the same building, even if they are located on different floors.

The amount of ozone is regulated into each duct through valves.

The system can also be customized to shut down the ozone flow to different hoods, as well as control and monitor through the building system's control system or through our O₃Eye.



Centrally installed RENA high-performance ozone system for several kitchens such as in a food court.

SAFE AND SECURE WORKING ENVIRONMENT

Ozone treatment is an efficient and eco-friendly method that should be used responsibly. We recommend the following for installations:

PRESSURE SWITCH

Use a pressure switch to stop the ozone system if the ventilation fan is not operating or if there is no flow (and pressure) in the ventilation duct.

OZONE SENSOR

The sensor measures the ambient ozone level continuously and shuts down the ozone system if levels rise above recommended thresholds. Ozone sensors are placed in kitchens below the height of the hoods.



TIP! ALWAYS ASK FOR A NIST-TRACEABLE CERTIFICATE OF CALIBRATION FOR YOUR UNIQUE OZONE SENSOR.

Air-fed ozone generators

Air-fed ozone generators have a lower air treatment capacity than RENA high-performance ozone systems. As a result, they are the right choice for smaller restaurants, cafés and snack bars that have

low air flows below 750 l/s, one hood and a low or moderate grease load. The air-fed FTX system is the economic choice in this case.

FTX
Air-fed
treatment
system



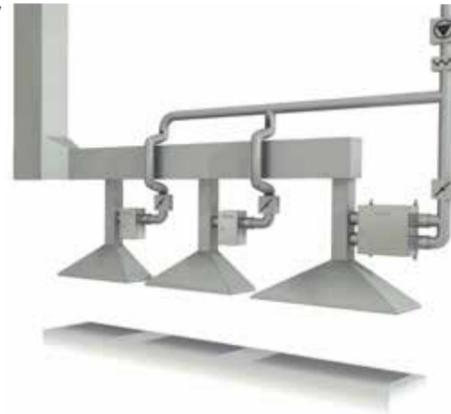
ADVANTAGES OF AIR-FED OZONE GENERATORS (FTX SERIES)

- **SIMPLE ENGINEERING**
Connection to electricity and an air duct is all that is required.
- **SUITABLE FOR SMALLER FLOWS**
Air-fed ozone generators are well-suited for kitchen hoods in smaller restaurants with a moderate grease load and low air flows.
- **STAINLESS STEEL**
All of our ozone generators are made of robust, ozone resistant stainless steel.
- **IP64 ENCLOSURE**
- **COMPACT DESIGN**
- **SILENT OPERATION**
Below 30 dBA, thus meeting recommendations for commercial kitchens.
- **ADJUSTABLE OZONE PRODUCTION**
4-20 mA control input (optional).

OUTDOOR AIR FEED

In the rare cases when a clean supply air is not available, filtered outdoor air can be used to feed the FTX ozone generator. The air should be F7-filtered (or better) before entering the ozone generator to reduce the amount of particles passing through.

When feeding outdoor air with a high temperature or high humidity, ozone production can be affected and eventually cause disruptions.



TIP! FOR THE BEST RESULT, CLEAN ALL DUCTS/FLUES BEFORE AN OZONE INSTALLATION.

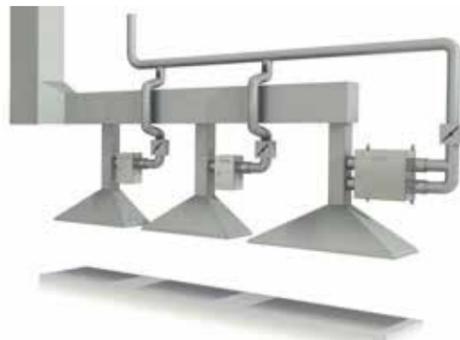
EXAMPLE OF AN AIR-FED FTX INSTALLATION

Beside the generator an air pressure switch is needed mounted on the duct for start/stop of the unit. Moreover, one can, as an option, connect the generator to a monitoring unit for external communication, operation indication, alarm etc. We always recommend at least three-seconds reaction time from ozone injection point to where the ventilation ducts are merged for optimal odor and grease reduction.



SUPPLY AIR FEED

Air-fed ozone generators are installed with F7 filtered supply air as standard. An iris damper is installed in front of the ozone generator to adjust the air feed flow through the FTX ozone generator.



A stainless steel (SS316L) ventilation duct connects the grease duct and the FTX ozone generator.

O₃Eye - Round-the-clock Monitoring

Our service organization is very competent and has a high level of availability to meet your needs.

Our remote monitoring system O₃Eye monitors your ozone system continuously. This allows us to anticipate the need for service before the occurrence of any malfunctions or downtime. Benefits include:

- Round-the-clock monitoring (24/7) of:
 - alarms from external sensors, such as ozone sensors and pressure/flow switches
 - ozone system alarm outputs
- Automatic alarms sent directly to our service department
- Monitoring of peripheral equipment
- Ability to customize functionality



KEY FACTORS FOR SUCCESS

We have 20 years of experience designing and installing ozone systems. We have learned which factors are most important and influence the choice of an ozone solution. Based on our experience, we believe the 20 key factors listed below should be taken into account to ensure a successful ozone installation.

- 1 **Purpose of the treatment:** Grease reduction and fire safety, energy recovery or odor reduction?
 - 2 **Type of cooking:** What is the grease load in the extract air? What are the sources of grease and cooking odors?
 - 3 **Air flow:** What is the air flow that needs to be treated? High or low?
 - 4 **Number of hoods/kitchens:** Do you need to treat several hoods/kitchen extracts? Are there multiple injection points?
 - 5 **Exhaust air:** Where is the discharge point? On the roof, from the facade or into a courtyard/pedestrian street?
 - 6 **Ducting:** What are the length and dimensions of the duct? Is optimal reaction distance reached?
 - 7 **Cleaning capacity:** Is there the right amount of ozone for the flow and type of cooking?
 - 8 **Ventilation balance:** Is the ozone system allowed to affect the ventilation balance in the building's ventilation system?
 - 9 **Injection point:** Where is the injection point? Is the most flammable part of the duct treated?
 - 10 **Energy recovery:** Should heat be recycled? What type of heat exchanger is used?
 - 11 **SFP value:** Does the intended ozone system affect the SFP value?
 - 12 **Filter:** Is an additional filter required?
 - 13 **References:** How has the solution worked in similar installations?
 - 14 **Choice of material:** What material is used in the generator? Stainless steel or ozone resistant stainless steel?
 - 15 **Product specifications:** Does the product have a calibration certificate?
 - 16 **Operating costs:** What are the actual operating costs?
 - 17 **Maintenance:** What type of maintenance is required? How often? What are the costs?
 - 18 **Noise level:** How much noise is generated from the generator?
 - 19 **Experience:** How much experience does the supplier have? What do other clients think of them?
- Last but not least ...
- 20 **Do you have "the right product for the right application"?**

Please contact us for additional information or assistance regarding your next energy efficient kitchen/restaurant!

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