

AMEREX® CORPORATION

7595 Gadsden Hwy.

Trussville, AL 35173

205.655.3271 p

800.654.5980 f

<http://www.amerex-fire.com>



Subject: Use of Amerex KP systems to protect grease ducts

Date: August 23th 2019

System: Amerex KP™

To Whom it may concern:

This letter is to reiterate that Amerex KP™ is UL approved and tested to protect unlimited lengths of duct work relating to kitchen ducting without the need for any additional protection systems. In addition, Amerex does not recommend the use of CO2 to protect ducts due to the following potential issues:

- 1) In most countries around the world CO2 is generally only used in areas that do not have potential human occupation. This is because the CO2 can displace so much oxygen that it can pose a health hazard.
- 2) CO2 is heavier than air with an atomic mass of 44 which would mean in highly populated areas it would tend to settle towards the ground where people would be.
- 3) At 7.5% concentration, CO2 can cause asphyxiation to humans. Most CO2 based fire suppression systems require that 34% CO2 concentration be reached to adequately control a fire in total flood applications. This means that many additional life safety steps and precautions must take place should CO2 even be considered including dampers, fan controls, discharge warning systems, etc.
- 4) CO2 protection does not offer the cooling or saponification effect on grease fires that wet agents can.

Amerex has proven their wet agent Kitchen Protection system reliability puts out kitchen, plenum, and duct fires when designed per the manual. The UL 300 specification relating to fires is in UL300 section 7.

*7.4.4 The duct is to be 20, 50, or 75 feet (6.1, 15.2, or 22.9 m) long or other intermediate length as specified by the manufacturer. **When the 75 foot (22.9 m) length is used, the extinguishing system unit is capable of being installed without limitation of maximum duct length.** Access ports are to be provided at least every 8 feet (2.4 m) along the duct to permit inspection and greasing of the duct. Duct sections are to be provided with gaskets to prevent leakage of grease at the point of connection. The gasket material is to be made of a material that withstands the heat exposure generated during testing. The duct is to be supported at least every 8 feet (2.4 m) to help maintain duct integrity.*

The UL test procedure used to prove out our coverages were as follows. We have performed this test with a 75 + foot duct and nozzles installed per our manual at our amerex to prove out our system with UL present.

- 1) Line the entire 75ft+ of duct with grease. The test procedure calls for putting 1.5kg/m² of grease along the entire length of the duct

“Quality is Behind the Diamond.”

AMEREX® CORPORATION

7595 Gadsden Hwy.

Trussville, AL 35173

205.655.3271 p

800.654.5980 f

<http://www.amerex-fire.com>

- 2) Set the air velocity must be between 150 to 305 m/min
- 3) Light all the grease on fire to where 4 meters inside from the start of the duct you get the temperature above 1600 degrees (or 4 meters inside above 1200 degrees F).
- 4) Make sure the entire length stays above 900 degrees F for at least 30 seconds
- 5) Manually discharge the fire suppression system (in this case we would have our plenum nozzle and duct nozzle putting out this entire fire).
- 6) Ensure that our nozzle configuration puts out and keeps out the fire along the entire length of duct
- 7) We have passed this test procedure with the duct fully open, partially open, and fully closed.

The key aspect of protection that allows us to protect using our KP agent without the need for any other agent is that a large portion of our agent is water and when water becomes vapor, it is lighter than air, with an atomic mass of 18 vs 29 for typical air mixture. This water vapor is generally cooler than the flame (most vapor will be around 100°C) which has a cooling effect. It also slows down the rate with which fresh air is being drawn into the fire (which is the purpose of the CO₂) without being an asphyxiation risk. As such, our system acts as coolant of the fuel (which slows down the rate of the exothermal reaction taking place) and slows the rate oxygen can be fed to the fire since water when turning to steam expands by 1700 times.

No UL300 compliant kitchen hood fire protection manufacturer would accept local unlisted, untested CO₂ in kitchen ducts in lieu of their system nozzles. Only approved, tested, wet agent systems meet the stringent UL300 and NFPA 17A fire protection guidelines. It is important to understand that duct systems must be installed and maintained per NFPA 96. This is not specific to wet agent systems but any kitchen ducting, it would be even more important to have a properly designed and sealed duct if CO₂ were used to prevent it from escaping.

If additional protection above what has been proven is desired nozzles could be added further downstream. Also, separate protection can also be installed in pollution control units utilizing our Helix PCU system.

This recommendation and guidance is based on sound fire protection backed by our extensive knowledge of kitchen protection and fire testing. Please let us know of any further questions you may have concerning this issue.

Michael J Gaston

Sincerely,

Michael J Gaston

KP™/ IS Product Manager

AMEREX® Corporation

Trussville, Alabama 35173

E-mail: Michael.Gaston@amerex-fire.com