



AquaMist Low Pressure Water Mist for Industrial Fryer Protection

 AquaMist

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Low Pressure Water Mist Case Study: Industrial Fryer Protection

Hans Schipper from Johnson Controls International is based out of Enschede, the Netherlands. Hans, with a background as a mechanical engineer in the process industry started his career with JCI more than 13 years ago as a Technical Service Engineer for fire suppression systems. Through the years he primarily focused on water mist and sprinkler systems and got promoted to Senior Engineer of the Technical Service and Training department for Water Mist Fire Suppression Systems. In this role Hans is the Technical Trainer and Engineering contact for in- and external customers to develop new opportunities for today's and future developments in the water mist industry.



Hans Schipper
Senior Engineer

Hans Schipper is a delegate committee member of the CEN/TC 191 WG10 'Water mist systems'. He also has extensive relationships within the industry and AHJ bodies.

Hans Schipper is a certified engineer for Water Mist Fire Suppression Systems and Sprinkler Systems.

Low Pressure Water Mist Case Study: Industrial Fryer Protection



Dirk Laibach boasts over 30 years of varied global experience in the fire suppression/detection industry, including 23 years related to Water Mist. He has held positions of increasing responsibility with Siemens, KIDDE, FOGTEC Fire Protection, Marioff and currently as Senior Product Manager for Water Mist at Johnsons Control.

Through his involvement and membership in a number of trade associations, codes and standards organizations (CEN) and approval authorities (like VdS, FM) in Europe and USA. He also has extensive relationships within the industry and AHJ bodies.

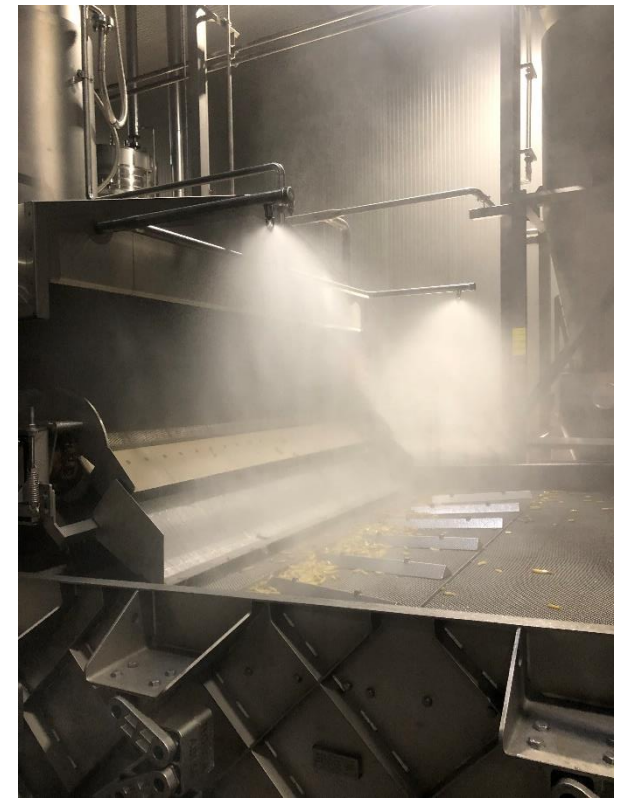
Dirk Laibach holds a degree in electrical engineering (Dipl.-Ing.) from the University of Applied Sciences Düsseldorf, Germany, and is a VdS-certified engineer for Water Mist Fire Suppression Systems



Dirk Laibach
Senior Product Manager
Global

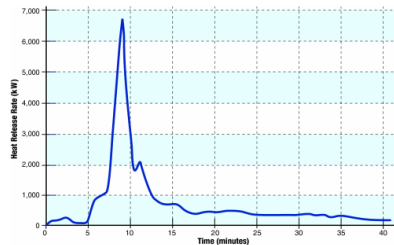
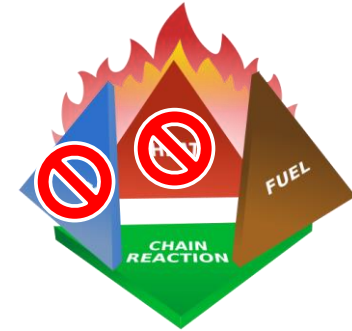
Topics

- Low Pressure Water Mist System Characteristics
- Fryer / IFP system high lights
- Approval testing to FM5560
- Project Application
- System Approved Components
- Project Examples



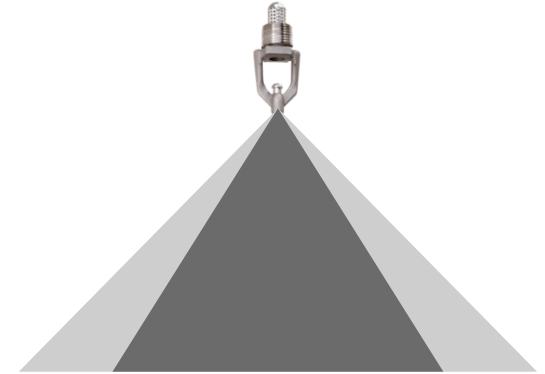
Low Pressure Water Mist System Characteristics Industrial Fryer Protection

- Objective: Extinguishment of Fire
 - Open Deluge systems
 - Class K fires – Cooking Oils
 - Flame cooling / Oxygen displacement
 - Radiant heat blocking
- DIOM, TFP2240 (Industrial Fryers)
- Min nozzle design pressure 11.7bar
- Nozzle flow 14lpm (AM31, hood)
- System demand flows 200 – 600lpm
- Pipe sizes, 54mm and 28mm



Low Pressure Water Mist System Characteristics: discharge

- Industrial Fryers
- Tyco AquaMist
- ULF Nozzle: AM31/AM4
- Flow: 14lpm

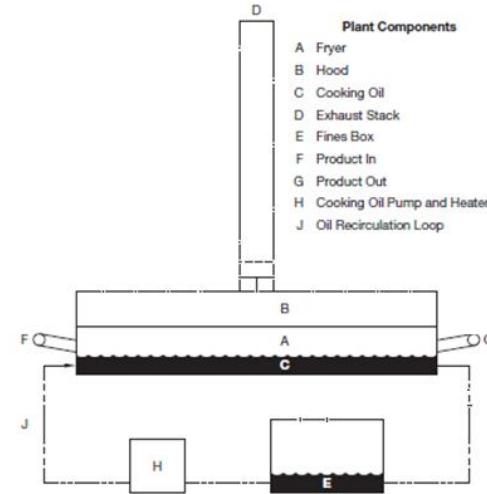


Unique
spray
pattern

Fryer / IFP system high lights

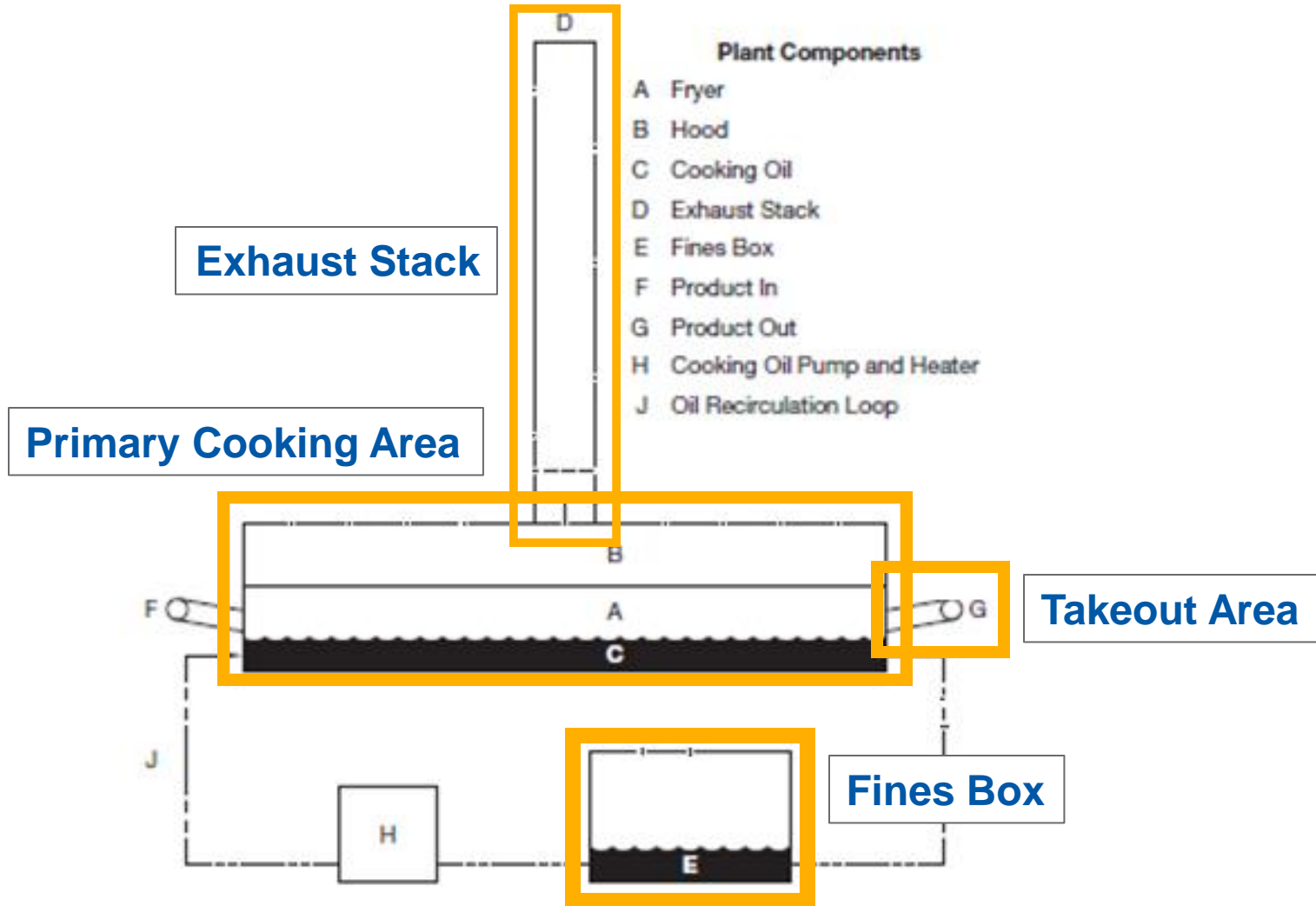
What is an Industrial Fryer?

- Large cookers of food products
 - Oils used as cooking medium
 - Up to 19000 l of oil
- Cooker typically includes:
 - Primary Cooking Area
 - Takeout Area
 - Fines Box
 - Exhaust Stack(s)
- Placed in large industrial manufacturing environments



Fryer / IFP system high lights

Industrial Fryer Components



Approval testing to FM5560

Fire Testing per FM 5560

- Appendix J: Fire Tests for Water Mist Systems for the Protection of Industrial Oil Cookers

Primary Cooking Area Dimensions

- Mock-Up A: 8.0 ft (2.4 m) wide by 8.0 ft (2.4 m) long (1 x L)
- Mock-Up B: 8.0 ft (2.4 m) wide by 16.0 ft (4.8 m) long (2 x L)
- Mock-Up C: 8.0 ft (2.4 m) wide by 24.0 ft (7.2 m) long (3 x L)

Test	Mock-Up	Hood Position
1	A	Up
2	A	Down
3	B	Up
4	B	Down
5	C	Up
6	C	Down

We have proved infinite length scalability through fire testing; the results suggest there is no trend between fryer length and rapid extinguishment reliability.

Approval testing to FM5560

Fire Test Approval Criteria

- Extinguish Auto Ignition Point (AIT) fire inside oil cooker mockup, regardless of hood position
- Extinguish all open flames within 1-minute of system discharge
- Cool oil so its average temperature is below the oil's flash point within 2 min of system discharge
- Design Duration shall be twice the cooling time to get below Flash point, or 10 minutes, whichever is greater
- No excessive fire flare-ups, micro explosions of oil reacting with water, or splashing of burning oil

Approval testing to FM5560

JCI Fire Tests

- More than 50 full-scale fire tests were performed
- 14 tests were witnessed by FM Global in JCI Test House USA



Approval testing to FM5560

Mock-Up C: 8.0 ft (2.4 m) wide by 24.0 ft (7.2 m) long (3 x L)



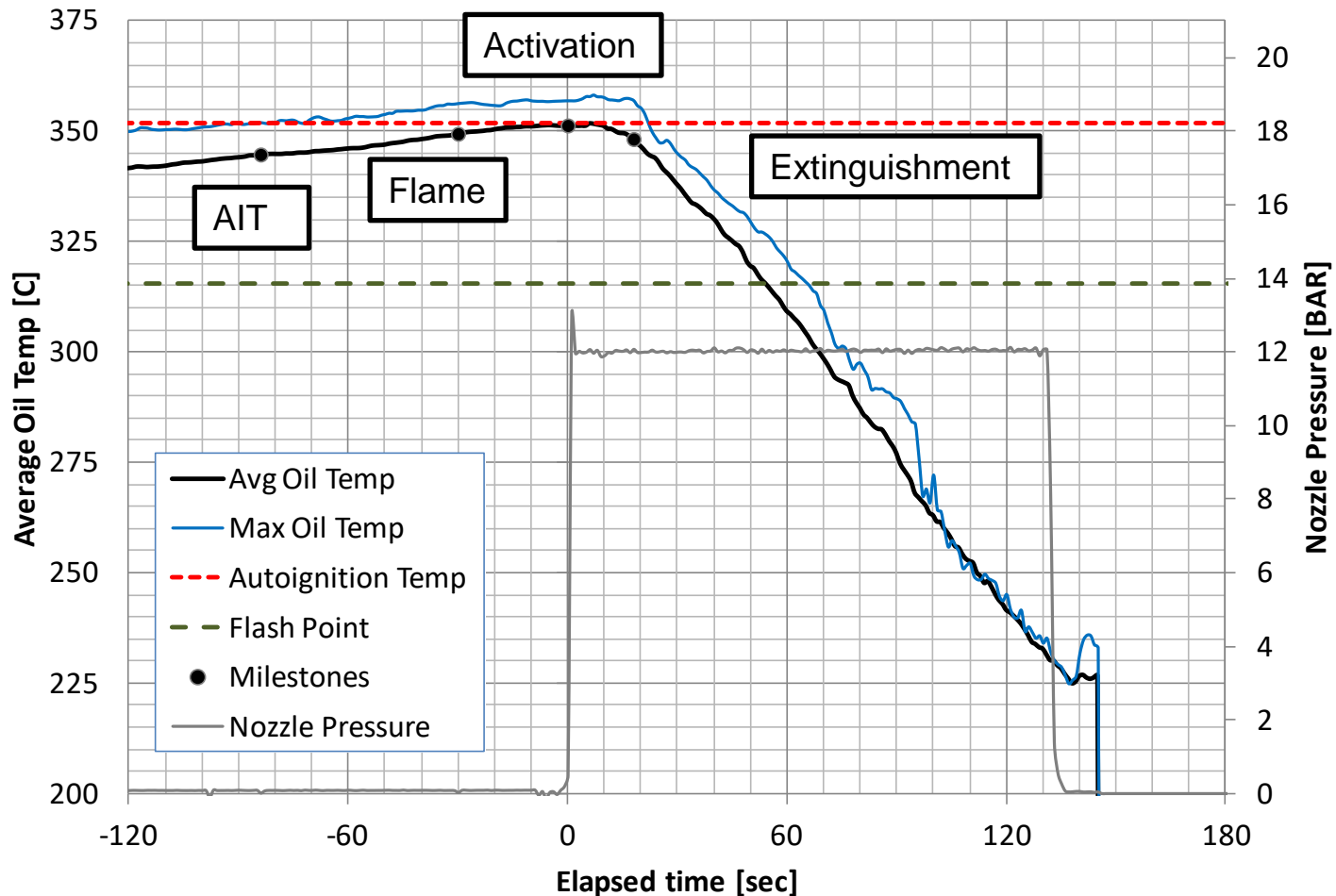
Approval testing to FM5560

Mock-Up C: 8.0 ft (2.4 m) wide by 8.0 ft (2.4 m)



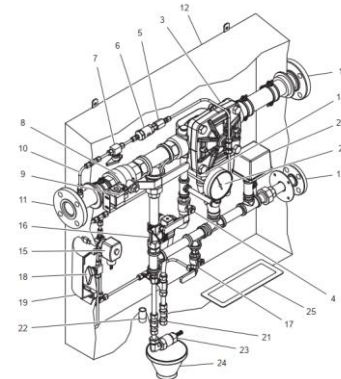
Approval testing to FM5560

Mock-Up C: 8.0 ft (2.4 m) wide by 24.0 ft long (7.2 m) (3 x L)

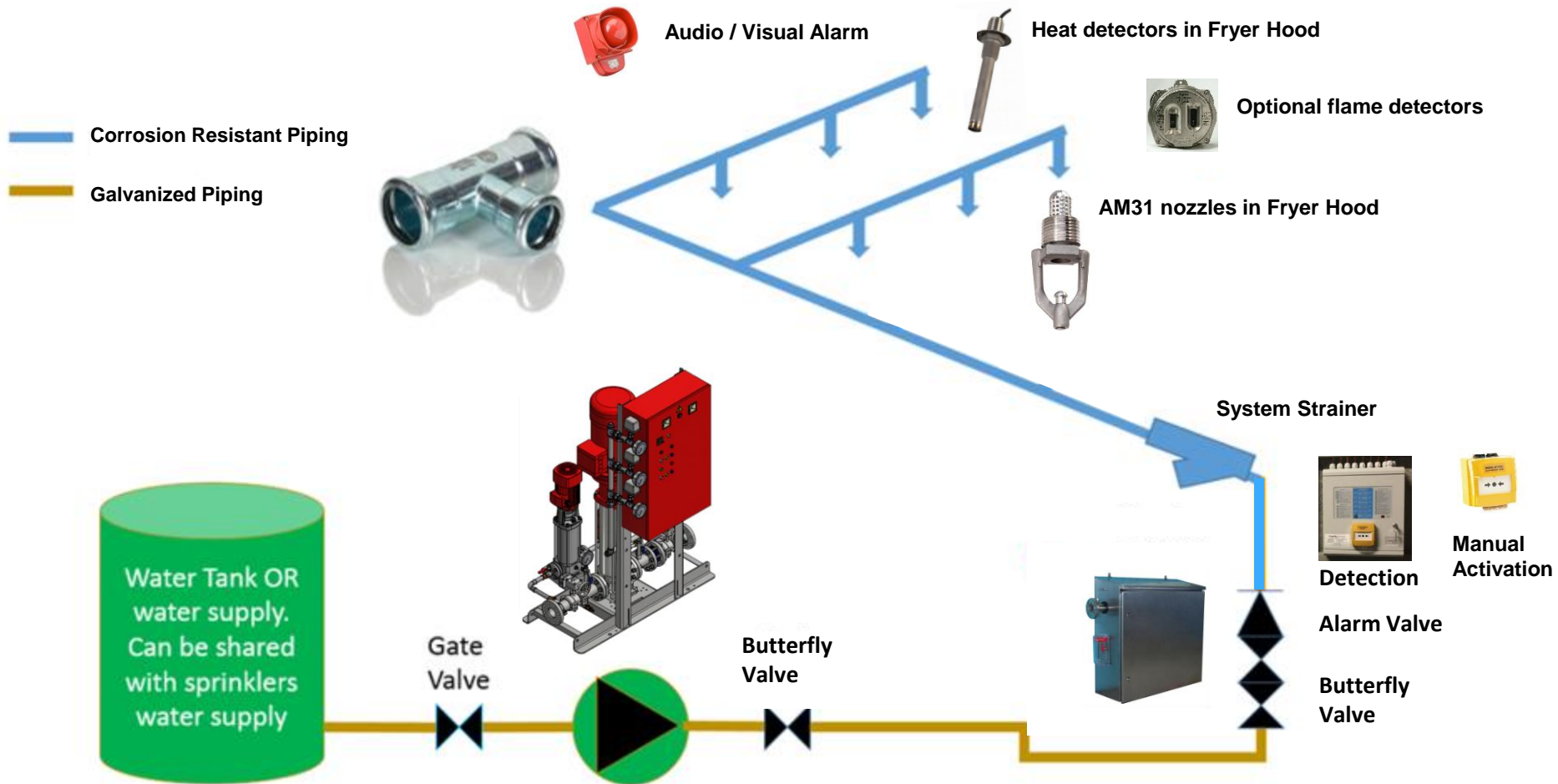


Project Application

- Industrial Fryer
 - 13m length
 - 2.4m width
 - 20 ton/hrs. of French fries
 - 26 nozzles (2 rows)
 - 2 zones per fryer
 - Fryer, stacks
 - Filter
- Total flow demand 360lpm
- Min 10 minutes discharge
- Activation by heat detectors

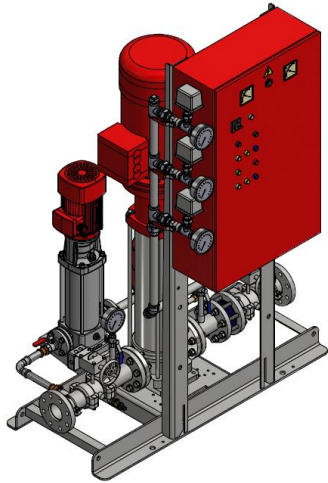


Typical Schematic



Approved Components

- **Pump skid**
 - Electric Centrifugal Pump unit
 - 400lpm@14bar, 11kW



- **Nozzles**
 - 20 x AM31 hood/takeout area
 - 4 x AM4 exhaust / stacks
 - 2 x AM10 filter



- **G-Press Stainless Steel Piping System**
- **Alarm valves**



Third party approvals:



Installation examples



Installation examples



Installation examples



Installation examples



Installation examples



Installation examples



Installation examples



Installation examples



Installation examples



Summarizing

- FM Approved (FM5560) low pressure water mist systems that can protect (extinguish fires) one or more industrial deep fat fryers within a single facility
- Large scale industrial fryers up to 8 ft (2.44 m) wide & of unlimited length
- Protection of the primary cooking area, takeout area, exhaust stack(s), fines box, or any other areas or components.
- We can protect an unlimited number of oil cookers, as long as the system is sized for the largest hazard, with a single water supply.
- Minimize business interruption cost potential
- Does not harm humans and production process
- Is an eco-friendly green technology
- Very low water demand needed





Questions?

Thank you!



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