



# **Victaulic**Vortex<sup>®</sup>

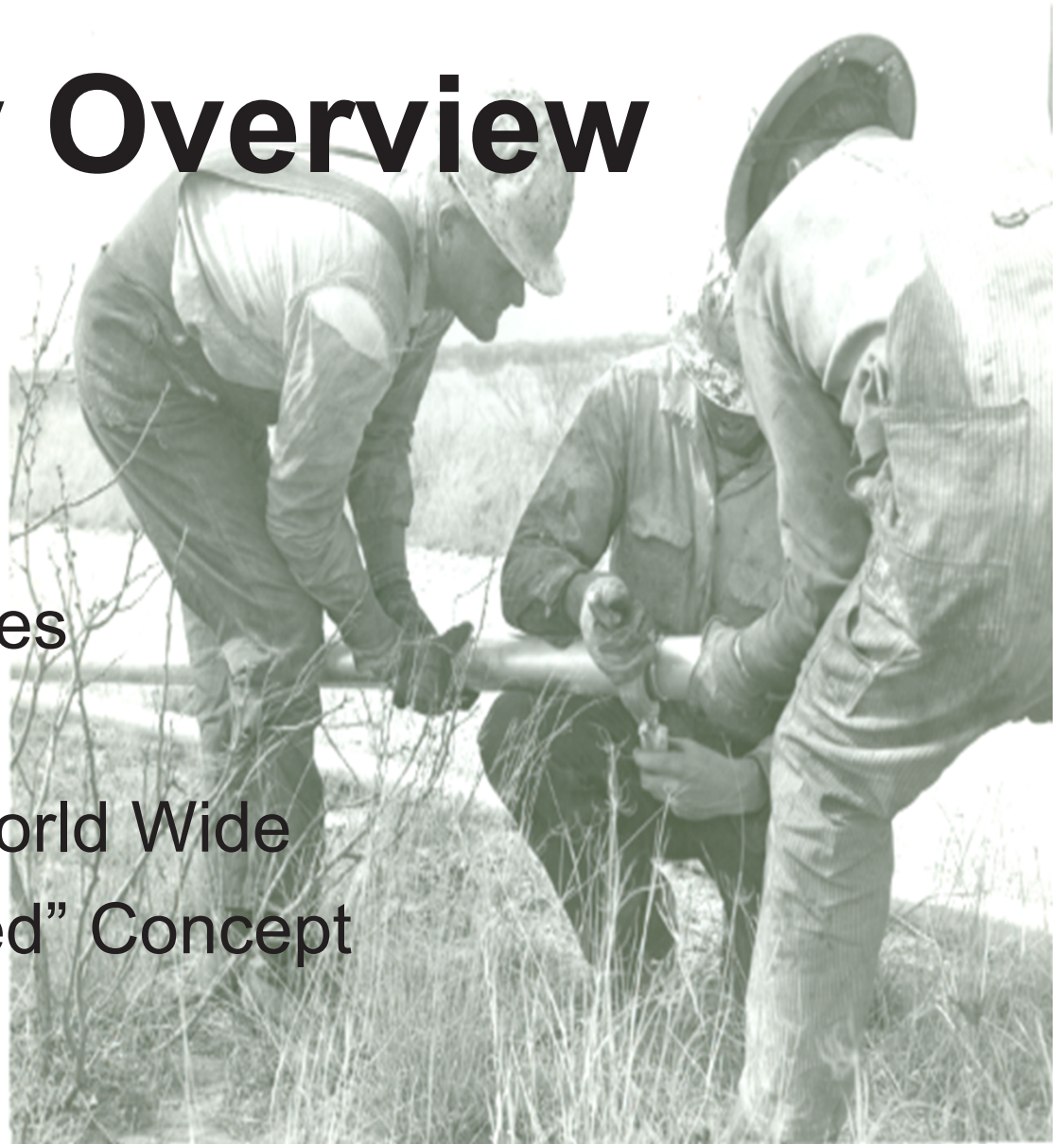
Cutting Edge Special Hazard "Hybrid" Fire Extinguishment System

**Mark Martella**  
**Vortex Sales Manager**

*since* **1919**

# Company Overview

- Easton, PA
- 150+ Engineers
- Thousands of Patents/Employees
- Privately Held
- Manufacturing World Wide
- Invented “Grooved” Concept



## What Is Vortex?

A special hazards hybrid system that utilizes both an inert gas and atomized water droplets to extinguish a fire

Combination of a water mist and clean agent/gaseous system

# Vortex Hybrid System Inerts & Cools To Fully Extinguish Fires



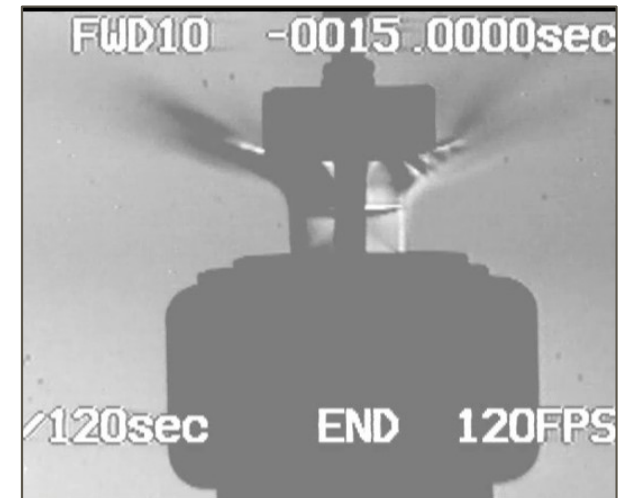
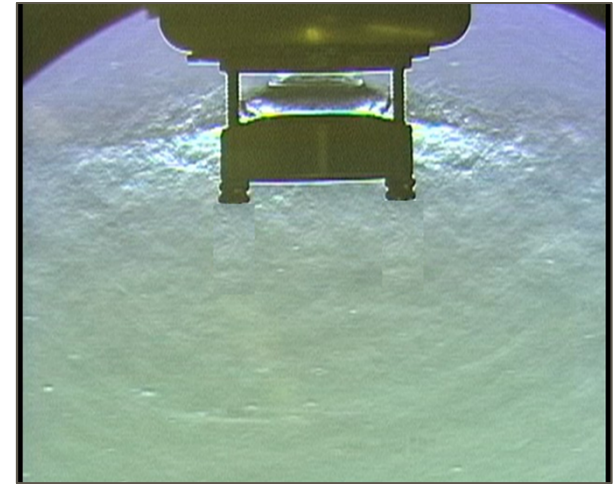
# Vortex Approvals

- NFPA 770
- FM 5580
- UL 2127 Class A&B
- FM Local Application For Wet Benches
- EPA SNAP Approval



## How Does The Vortex Hybrid System Work?

- The patented supersonic emitter creates a multi-layer shock wave of nitrogen that atomizes water to a sub 10 micron level. Then it:
- Creates a homogenous suspension of nitrogen and water by embedding the water molecules into the nitrogen molecules



## How Does The Vortex Hybrid System Work?

### **Clean Agent/Gaseous Component**

Nitrogen gas actively dilutes the oxygen level down to a safe 14 to 15%

### **Water Mist Component**

Sub 10 micron non conductive atomized water droplets absorb heat from the fire to vaporize as steam

# Differences Between Gaseous/Clean Agent & Vortex Hybrid Systems.....

- Reduced Room Integrity Issues
  - No dampers, fan tests or sealing the room
- Sustainable “Green” System
  - Only uses water and nitrogen
- Inexpensive Refill
  - Nitrogen and water are inexpensive and readily available
- Eliminates Life Safety Concerns
  - Safe for occupied spaces



# 150,000ft<sup>3</sup> Data Center





*since* 1919



# Differences Between Water Mist & Vortex Hybrid Systems.....

- Little or no containment needed
  - Reduced disposal costs & eliminates containment tanks
- No risk of damage to high value assets
  - Completely safe on records storage, turbines, bearings..
- Multiple piping material options
  - Schedule 10 plastic/metal piping
- Uses less water more efficiently
  - 1gpm per emitter per minute down to < a 1/4gpm



# Pickle Line Local Application





# Water Tanks

- Multiple sizes
- No pumps
- Low maintenance
- Potable/distilled water
- Site glass
- ASME rated



# Nitrogen Cylinder Options



# Performance Analysis

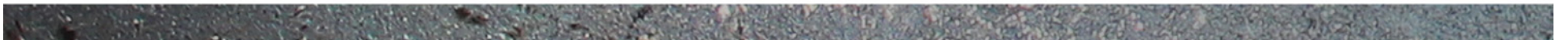
Agent	Flow, gpm	Drop Size, $\mu\text{m}$	Pressure, psig	Momentum
<b>Vortex</b>	<b><math>\leq 1</math></b>	<b><math>&lt; 10</math></b>	<b>25</b>	<b>High</b>
Intermediate Pressure Water Mist	20	400-1000	350	High
High Pressure Water Mist	8	100	1500-2500	Low to Moderate
Sprinkler Systems	$>25$	$>1000$	20-min	High
Inert Gases	NA	NA	2500	NA
Halogenated Agents	NA	N/A	350	NA

# Performance Analysis

Agent	Fuel Wetting	Oxygen Depletion	Temp. Reduction	Block Radiative Heat Transfer	Reduce Convective Heat Transfer	Total Flooding
<b>Vortex</b>	<b>negligible</b>	<b>Gradual</b>	<b>Fast</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (insignificant wetting)</b>
Intermediate Pressure Water Mist	High	Gradual	Moderate	Moderate	Moderate	Deluge (significant wetting)
High Pressure Water Mist	medium	Gradual	Fast	Yes	Yes	Yes (heavy wetting)
Sprinkler Systems	Very High	Gradual	Moderate	Moderate	Moderate	Deluge (significant flooding)
Inert Gases	None	Rapid	Minimal	No	No	Yes (no wetting)
Halogenated Agents	None	N/A	Moderate	No	No	Yes (no wetting)



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## The “Solution” System

- Room integrity issues
- Lock out/down time
- Little or no running water
- Life safety concerns
- Sustainability
- Agent recharge costs
- Multi-zoned applications
- Asset protection





THANK YOU

*since* 1919