VORTEX™

FIRE SUPPRESSION SYSTEM

Features

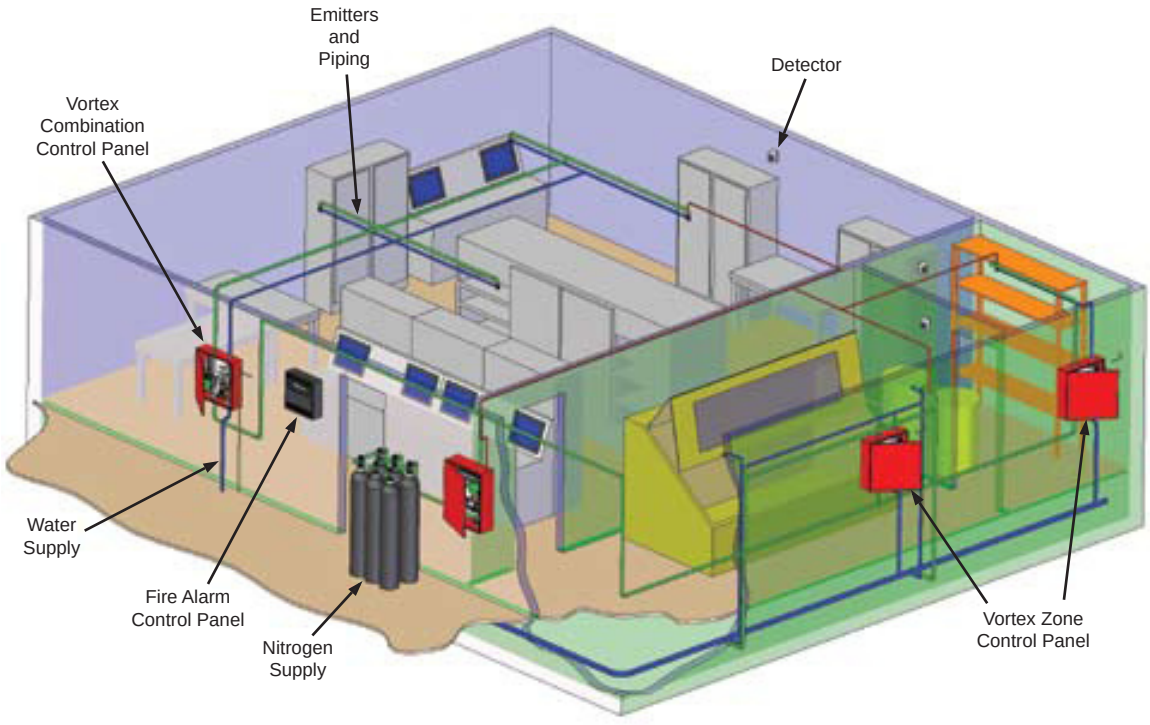
- Nearly zero wetting of protected area; no need for costly clean up or equipment replacement
- Green design that is safe for the environment and personnel
- Quick system recharge; minimal facility downtime
- Open space effectiveness; no need for assurance of room integrity

For special hazards requiring rapid response, green design, and a simple, scalable system, Janus Fire Systems supplies and designs Vortex Fire Suppression Systems, the only hybrid nitrogen-water fire suppression system. The Vortex system is particularly useful for suppressing fires in hazards where an electrically non-conductive medium is essential or desirable, where clean up of other agents present a problem, or where the hazard is normally occupied and requires a non-toxic agent.

DESCRIPTION

The Vortex fire suppression system is a hybrid system incorporating liquid (water) and gaseous (nitrogen) extinguishing agents discharged together from a single emitter.

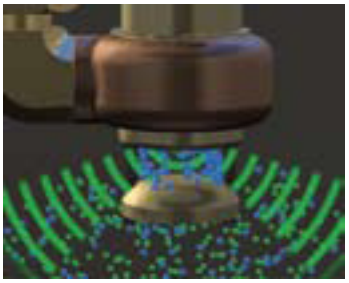
Using proprietary supersonic technology, the system atomizes the water to <10 µm forming a dense homogeneous suspension of nitrogen and water. In this manner two extinguishment mechanisms are occurring simultaneously: cooling and oxygen reduction.



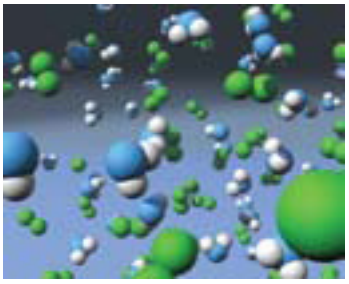
Typical Vortex System Layout

OPERATION

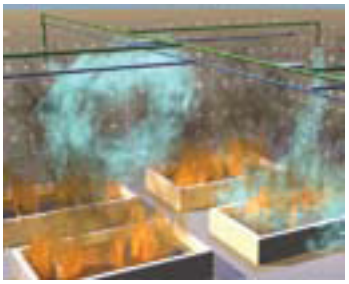
The unique swirling pattern quickly fills the hazard space and attacks the fire, overcoming aerodynamic forces that typically decelerate and diffuse water droplets making them ineffective. High velocity and low pressure creates a uniform blend of water and nitrogen; water is introduced to a jet stream of nitrogen at supersonic speed, then delivered with the nitrogen into the protected space at 40 mph.



Water droplets are up to 100 times smaller than water particles delivered by a traditional water mist system, providing 50% improved heat absorption and total extinguishing. The average Vortex droplet size is less than 10 microns, and the minimal amount of water released per emitter — as little as one gallon per minute — **virtually eliminates any wetting in a space.** Traditional sprinklers typically release more than 25 gallons of water per minute per sprinkler, or 96% more than the Vortex system. In addition, **high-pressure water mist systems release approximately 8 gallons of water per nozzle per minute, or *88% more than the Vortex system***. Nearly zero water residue in protected areas means there is no water damage after the fire is extinguished.



For smaller fires, the nitrogen is the primary extinguishing agent, reducing the oxygen level in the space to a level where combustion cannot be sustained yet within safe breathing tolerances.



In larger fires, the water mist is more effective, cooling the fire by absorbing the heat and reducing the available oxygen. In fact, the heat-absorbing water droplet surface area is 90 times greater than that of any standard sprinkler system, providing maximum heat absorption efficiency.

Unlike other systems, maintaining room integrity is not essential; fires are extinguished in open, naturally ventilated areas. Low system pressures — less than 25 psi of nitrogen and ~ 25 psi of water — permit lighter wall pipe providing direct savings in installation and material costs

The system is scalable from one zone as large as 124,000 ft^3 to broad networks of zones as large and as many as required. Zones can be centrally controlled yet independently activated for delivery of fire suppression mist only where required. The system delivers as little as one gallon of water per emitter per minute; each emitter can protect up to 2,500 cubic ft.

Made entirely of non-toxic agents — personnel are safe even during activation; reduction of oxygen in the space is at levels within safe breathing tolerances. System activation is immediate when sensors detect smoke or heat — there is no delay in activation to evacuate personnel to avoid a toxic environment.

The system is compatible with facility fire protection systems providing greater design flexibility in both retrofit and new construction. The system fully extinguishes fires in enclosed cabinets and isolated equipment within protected spaces. System is recharged rapidly allowing for a return to working conditions almost immediately after a fire.

APPLICATION

The Vortex Fire Suppression System can effectively be applied in total flooding fire suppression applications in the following areas:

- Industrial Machine Spaces such as power generation plants, turbine enclosures, automotive manufacturing, steel foundry
- Flammable liquids storage
- Data Centers
- Areas with delicate materials such as museums and libraries

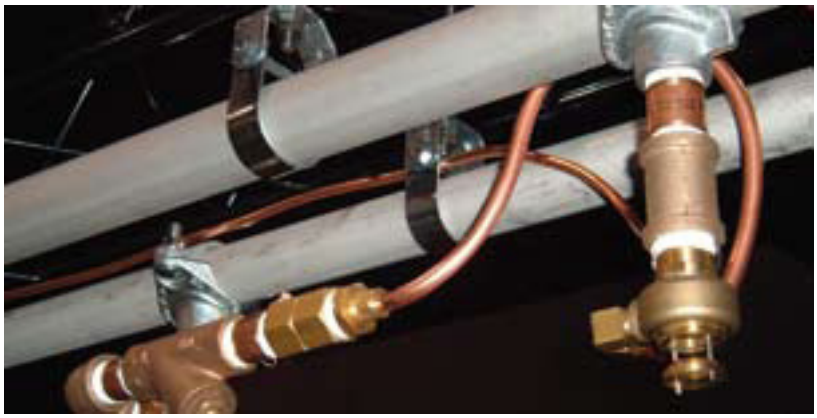
Nitrogen Storage

ENVIRONMENTAL IMPACT

Since the Vortex system only discharges pure Nitrogen and potable or de-ionized water, there are no environmental or life-safety risks as a result of system discharge. The EPA SNAP approval recognizes the Vortex homogenous suspension discharge as a suitable replacement for Halon 1301. The system can be discharged immediately upon hazard detection, without a delay for occupant evacuation.

Water Characteristics Comparison				
Agent	**Flow, GPM per emitter, nozzle, or sprinkler**	**Drop size, µm**	**Operating Pressure, PSIG**	**Velocity**
Vortex Fire Suppression System	<= 1	<10	25	High
Intermediate Pressure Water Mist	37	400 – 1000	350	High
High Pressure Water Mist	~ 8*	50 – 100	1500 – 2500	Low
Sprinkler Systems	>25	>1000	>20	Moderate

* Dependent upon system design



Emitter and Piping

AGENCY TESTING AND EVALUATIONS

The Vortex system has successfully completed all testing required by Factory Mutual for:

- Special hazard machinery spaces
- Turbine enclosures
- Flammable liquids

FM testing has proven the use of 2500 ft^3 (70 m^3) per emitter for any room size.

The Vortex system has been witnessed by Underwriter's Laboratory and found to effectively extinguish Class A polymeric and wood crib materials and Class B flammable liquid fire test scenarios as outlined in UL 2127, "Standard for Inert Gas Clean Agent Extinguishing System Units".

By only using the natural materials of water and nitrogen, the Vortex system:

- is not subject to specific government regulations such as certificates of approval due to Ozone Depletion Potential (ODP).
- does not require special processes for the replacement of proprietary agents since the materials required for system recharging are readily available.

Note: Approvals/Listings maintained by and manufactured by Victaulic Company.

1102 Rupcich Drive
Millennium Park
Crown Point, IN 46307
TEL: (219) 663-1600 FAX: (219) 663-4562
e-mail: info@janusfiresystems.com
www.janusfiresystems.com