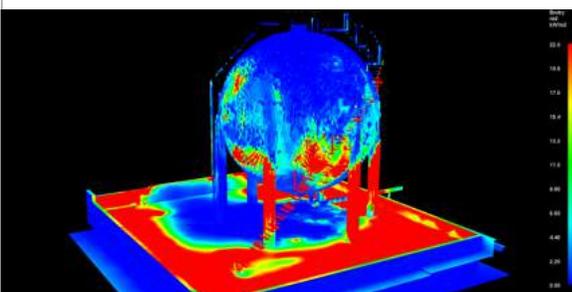
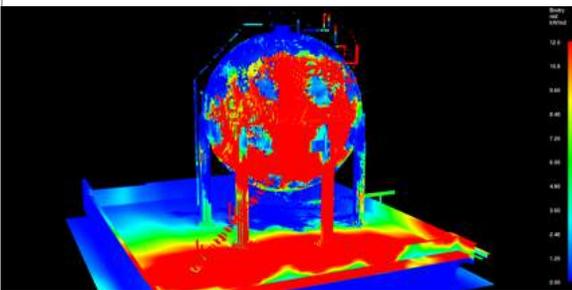
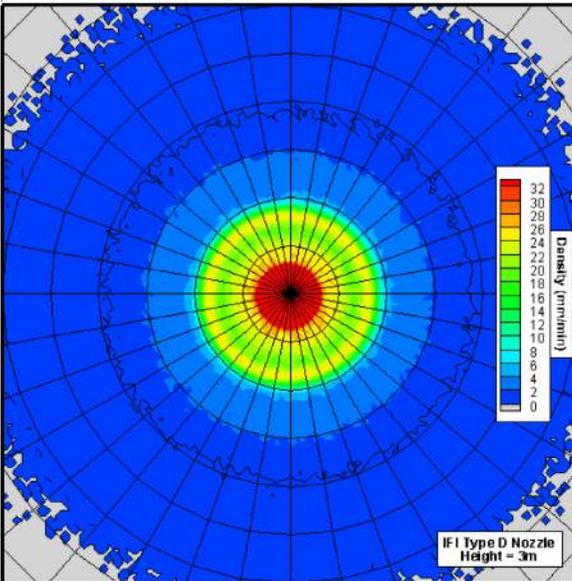




IFI Case Study - LNG Sphere Fire Protection



Typically, LNG spheres (Fig 1) are protected by generating a specified water design density on the surface of the sphere. This can be achieved by introducing the water from the top of the tank (weir method) or by spacing open head deluge nozzles around the sphere. Both methods have advantages and disadvantages. The weir method requires weir dams to be situated along the top side of the sphere to ensure an even distribution of water. While also requiring the bottom half of the sphere to be protected with direct impingement nozzle. A typical open head deluge system requires a large number of nozzles to provide proper coverage. Both methods require a significant amount of piping.

In an effort to reduce cost and system complexity, International Fog Inc., in collaboration with Custom Spray Solutions, has developed a more efficient fire suppression nozzle for LNG tank fire protection. The Deluge-Tech™ nozzle uses patented IFI fog and rotor technology that was designed to optimize spray pattern and droplet size for a more effective and efficient suppression nozzle. This technology allows for a more effective distribution of water as it provides an even distribution of the desired water droplet size and design density (Fig 2) for the given application. This results in wider coverage areas and more flexible designs, saving money on installation and maintenance, while maintaining system capabilities. Using Deluge-Tech™ nozzles, engineers were able to design an NFPA compliant deluge suppression system that reduced the number of heads, while providing better cooling and radiant protection to the sphere.



Two separate design methods were compared for performance. The first method utilized standard deluge type spray nozzles, which required 112 nozzles to provide coverage of the sphere. The modeling results indicated that sufficient cooling was not achieved (Fig 3). The second design used IFI Deluge-Tech™ nozzles, which provided greater coverage and reduced the quantity of nozzles required to 60 total nozzles while also effectively maintaining the quantity of water. In addition, the modeling results indicated that the IFI design was far more effective at heat removal and radiation attenuation (Fig 4).

The comparison showed that using IFI Deluge-Tech™ nozzles provided a reduction of almost 50% in the number of nozzles required, while simultaneously increasing the cooling efficiency, lowering the upfront capital cost and reducing the long term maintenance costs.

MODEL DESIGNATION	RC150A
Nominal K-Factor	10.2
Strainer	Included in assembly
Installation Positions	Horizontal or Vertical (0 to 180 degrees)
Min and Max Working Pressures	25 to 175 PSI
Nominal Spray Angle	170 Degrees
Spray Coverage	The RC150A provides a wide angle spray reaching 28 ft wide and out to 8 ft at its maximum pressure

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- **1.5" Deluge Nozzle**
- **Made of Stainless Steel and Kevlar Composite**
- **Flows Water or Foam-Water Solution**
- **Mount Vertically or Horizontally**
- **FM Approved**
- **Weight: 2 lbs 4 oz**
- **Length: 5-1/2 inches**
- **NPT Threading**