Tyco Fire & Building Products is a leading manufacturer and distributor of water-based fire suppression systems and components for special hazard risks, offering one of the broadest lines of fire protection system equipment worldwide for Special Hazard Systems to meet your needs.

Our complete line of standard sprinklers have a fantastic record of performance, consistency, and dependability. However, many plants and buildings contain fire hazards that standard automatic sprinklers cannot control or extinguish. These are termed "Special Hazards". In general, a special hazard is an area, process, piece of equipment, or building that a normal sprinkler system will not effectively protect.

**Generally the following “Special Hazards” fall under these criteria:**

**MATERIAL PROCESSED**

A liquid, gas, or solid that exhibits explosive flammable characteristics such as LPG, butane, gunpowder, paint storage, fuel, oil, etc.

Special Hazards systems are sometimes found within plants or areas that are protected by traditional sprinkler systems. With the advent of new and different synthetics, sophisticated paint lines, flammable liquid handling, and critical process equipment, the risk of serious fire scenarios looms greater and greater. These circumstances dictate the need for Special Hazards protection. A company should never assume that they do not have a high hazard that requires additional special hazards protection.

*Tyco Fire & Building Products is available worldwide under the leading brand names: CENTRAL®, GEM®, STAR™, and GRINNELL®.*
The nature of a piece of equipment that is a hazard, or exposes nearby vital equipment, personnel, or structures to a fire risk. Examples are cooling towers, process pumps, transformers, mill stands, storage tanks, turbines, conveyors, etc.
Breadth of Line
Tyco Fire & Building Products (TFBP) offers more than 250 fire protection products and over 1,200 items used in the fabrication of fire protection systems, including sprinklers, nozzles, valves, devices, CPVC pipe, fittings and hangers, and sprinkler system accessories.

Research and Development
TFBP is backed by one of the largest research, design, development group and facilities in the industry. Our experienced staff of engineers is continually working to develop new types of sprinklers and valves, as well as special hazard fire protection devices to fill present and future market needs. TFBP customers can contact R&D directly for technical assistance in unusual applications that are outside our literature or existing situations.

Listings and Approvals
Products offered by TFBP are listed and approved by various fire protection product approval laboratories and organizations. General listing and approval information for the following organizations is provided for each product in the specification charts. Refer to the application Technical Data Sheets for specific listing and approval information.

Customer Service
Serving a diverse group of specifiers, including architects, engineers, contractors, and associated industries, TFBP distributes its manufactured products through TFBP locations and independent distributors that are strategically located to provide our customers with the quickest delivery possible of their complete order.

Leadership
TFBP offers the widest selection of special hazards nozzles and valve packages. TFBP is committed to continuing our role as a leader in the development, manufacture, and marketing of quality fire protection products.

Tyco
Fire & Building Products
Power Plants
Chemical Plants
Offshore Platforms
Aircraft Hangars
Cooling Towers
Computer Rooms
Switchgear Rooms
Transformers
Wet Benches
Ammunition Plants
Engine Test Cells
LPG Storage
Spray Paint Booths
Battery Rooms
Oil Quenching Pits
Petrochemical Storage
Records Vaults
Electronic/Telephone Rooms
Solvent Tanks and Storage
Shipboard Machinery Rooms
Flammable Liquid Storage
Hydraulic Oil, Lubricating Oil Rooms
Tank Farm/Truck Loading Facility
Nozzles & Nozzle Accessories are designed for use in a variety of special hazards applications. Their uses include, but are not limited to, exposure protection, fire control, fire extinguishment, and explosion prevention. Many types of nozzles may be required to provide a properly designed special hazard fire protection system.

### D-3

**Protectospray® Nozzle**

- Open orifice design for use in deluge systems
- Nozzles are external deflector types that discharge a filled cone of water droplets at relatively low velocity
- Spray angles available: 65°, 80°, 95°, 110°, 125°, 140°, 160°, and 180°
- UL, ULC, FM, LPCB, SSL

<table>
<thead>
<tr>
<th>K Factor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 (17,3)</td>
<td>1.8 (25,9)</td>
</tr>
<tr>
<td>2.3 (33,1)</td>
<td>3.0 (43,2)</td>
</tr>
<tr>
<td>4.1 (59,0)</td>
<td>5.6 (80,6)</td>
</tr>
<tr>
<td>7.2 (108,7)</td>
<td></td>
</tr>
</tbody>
</table>

| Thread Size | 1/2" (15 mm) |
| Finish | Natural brass, chrome plated, electroless nickel plated, lead coated or Teflon coated. Stainless steel, plain only. |

| Tech Data | TD620A |

### EA-1

**Automatic Protectospray® Nozzle**

- Bulb type frangible element for use in closed head systems
- Discharges a filled cone of water droplets at relatively low velocity
- Spray angles available: 65°, 80°, 95°, 110°, 125°, 140°, 160°, and 180°
- UL, ULC, FM, SSL

<table>
<thead>
<tr>
<th>K Factor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4 (20,2)</td>
<td>2.8 (40,3)</td>
</tr>
<tr>
<td>5.6 (80,6)</td>
<td></td>
</tr>
</tbody>
</table>

| Thread Size | 1/2" (15 mm) |
| Finish | Natural brass finish or chrome plated finish in 135°F/57°C through 500°F/57°C; Corroproof or lead coated in 135°F/57°C and 175°F/79°C |

| Tech Data | TD610A |

Always refer to the Technical Data Sheet for complete description of all Listing and Approval criteria, design parameters, installation instructions, care and maintenance guidelines, and our limited warranty.
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### F822 through F834

**MULSFYRE® Nozzles**

- Designed to discharge a filled cone of water droplets at a relatively high velocity
- Used in either open or water primed systems
- A blow-off cap is available with the nozzle for a primed system (chrome plated finish only)
- UL, ULC, FM

<table>
<thead>
<tr>
<th>K Factor</th>
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<th>K=2.6 (37,4)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>K=2.7 (38,9)</td>
<td>K=4.6 (66,2)</td>
</tr>
<tr>
<td></td>
<td>K=5.1 (73,4)</td>
<td></td>
</tr>
</tbody>
</table>

**Thread Size**: 3/4" (20 mm)

**Finish**: Natural Brass, Chrome Plated

**Tech Data**: TD675

- Open, internal scroll type nozzles
- Six different orifice sizes and spray angles afford a variety of design options

### HV “High Velocity”

**Spray Nozzles**

- Available in six different orifice sizes
- Produces a solid conical spray pattern
- Available in six angle spray patterns
- UL, ULC, FM, SSL

<table>
<thead>
<tr>
<th>K Factor</th>
<th>K=1.6 (23,0)</th>
<th>K=1.8 (26,0)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K=2.9 (41,8)</td>
<td>K=4.3 (62,0)</td>
</tr>
<tr>
<td></td>
<td>K=5.5 (79,2)</td>
<td>K=6.0 (86,4)</td>
</tr>
</tbody>
</table>

**Thread Size**: 1" (30 mm)

**Finish**: Natural brass or stainless steel

**Tech Data**: TD680

- Open, directional spray nozzles
- Designed for use in fixed water spray fire protection systems where a high velocity water application is needed, such as the protection of flammable liquids, electrical transformers, circuit breakers, oil-fired boilers and lube oil systems

### B-1

**Foam-Water Sprinkler**

- Air aspirating foam-water nozzles
- For use with all types of foam (required for Non-AFFF type foams)
- Pendent & upright designs
- Open nozzle for use on foam-water sprinkler systems
- UL

<table>
<thead>
<tr>
<th>K Factor</th>
<th>K=3.0 (42,2)</th>
</tr>
</thead>
</table>

**Thread Size**: 1/2" (15 mm)

**Finish**: Brass

**Tech Data**: TD760
## Cooling Tower Nozzles

<table>
<thead>
<tr>
<th>K Factor</th>
<th>K=2.9 (41.8)</th>
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</thead>
<tbody>
<tr>
<td>Thread Size</td>
<td>3/4&quot; (20 mm)</td>
</tr>
<tr>
<td>Tech Data</td>
<td>TD730</td>
</tr>
</tbody>
</table>

- Intended for use in fire protection systems for cross flow cooling towers with combustible fill sections
- Open nozzle design for use in water spray deluge system
- Installed under the distribution basin, they discharge water in a relatively narrow, elongated spray pattern
- Type 1 has a waterway designed for use in towers with diffusion decks, Type 2 for those without diffusion decks
- UL, FM

## F800

<table>
<thead>
<tr>
<th>K Factor</th>
<th>K=1.8 (26.0)</th>
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</thead>
<tbody>
<tr>
<td>K=2.6 (37.4)</td>
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</tr>
<tr>
<td>K=4.1 (59.0)</td>
<td></td>
</tr>
<tr>
<td>Thread Size</td>
<td>1/2&quot; (15 mm)</td>
</tr>
<tr>
<td>Tech Data</td>
<td>TD750</td>
</tr>
</tbody>
</table>

- Specifically designed to spray a water pattern
- Typical application: F800 Nozzles are used to protect the tops of transformers and may also be used in areas such as between rollers of multi-tiered dryers
- Offered in a variety of orifices
- UL, FM

## TI-Max®

**Contact a TFBP distributor for details**

- Unique discharge devices are made from titanium and can be used in offshore and other marine applications
- Designed for use where strength, low weight, and salt water corrosion resistance are required
- Medium and high velocity type nozzles are available in various orifice sizes and spray angles
- Standard spray sprinklers are available in upright and pendent configurations
- Deluge valves, alarm valve, thermal valve, and shutoff valve all produced from titanium which is 45% lighter than steel
The aesthetically pleasing RED-E CABINET provides all the mechanical controls, valves, and electrical detection and actuation controls in one unit for ease of installation.
Single Interlock Preaction Systems

Single interlock preaction systems are used to protect areas where there is danger of serious water damage that might result from damaged automatic sprinklers or piping. Typically, such areas include computer rooms, storage areas for valuable artifacts, libraries and archives. Also, preaction systems are effectively used to protect properties where a prealarm of a possible fire condition may allow time for fire extinguishment by alternate suppression means, prior to a sprinkler discharge. In the event the fire cannot otherwise be extinguished, the preaction sprinkler system will then perform as the primary fire protection system.

Single interlock preaction systems employ automatic sprinklers attached to a piping system containing 10 psi (0.7 bar) supervisory pressure, with a supplemental electric fire detection system installed in the same area as the sprinklers. Preaction systems with 10 psi (0.7 bar) supervisory pressure may also be activated by either wet or dry pilot sprinklers instead of electric detectors. Actuation of the fire detection system from a fire opens the deluge valve, allowing water to flow into the sprinkler piping system and to be discharged only from those sprinklers that have been operated by heat over the fire. Loss of supervisory pressure from the system piping as a result of damaged sprinklers or broken piping will activate a trouble alarm to indicate impairment of the system. The deluge valve will not open due to loss of supervisory pressure.

Available with:
- DV-5 Valve (TFP1305)
- DV-1 Valve (TFP1330)
- DV-3 Valve (TFP1350)

Trim Assemblies

<table>
<thead>
<tr>
<th>Trim Assemblies</th>
<th>Wet Pilot</th>
<th>Dry Pilot</th>
<th>Elec. Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DV-5</td>
<td>TFP1410</td>
<td>TFP1415</td>
<td>TFP1420</td>
</tr>
<tr>
<td>DV-1</td>
<td>TD1125</td>
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<tr>
<td>DV-3</td>
<td>TD1120</td>
<td>TD1120</td>
<td>TD1120</td>
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</table>

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Double Interlock Preaction Systems

Double interlock preaction systems are designed for applications such as refrigerated areas that require the maximum degree of protection against an inadvertent operation that could result in unnecessary flooding of the sprinkler system piping.

The double interlock system consists of a deluge valve and swing check valve with releasing trim featuring both a solenoid valve and a dry pilot actuator in a series configuration. The swing check valve isolates the body of the deluge valve from the system air or nitrogen pressure that holds the dry pilot actuator closed. The solenoid valve remains closed until it is electrically energized by a deluge releasing panel that responds to the operation of a fire detection device.

In order to actuate the double interlock preaction system, two independent events, caused by a fire condition, must occur. The sprinkler system piping must lose air or nitrogen pressure due to the operation of one or more sprinklers, and the deluge releasing panel must energize and open the solenoid valve upon the operation of a fire detection device.

The double interlock system will operate only when both the dry pilot actuator and the solenoid valve are open at the same time. Opening of the dry pilot actuator only (for example: a forklift truck accidentally dislodges a sprinkler) or of the solenoid valve only (for example: accidental operation of an electric manual pull station) will cause an alarm, and will not trip the system or flood the sprinkler system piping.

Available with:
- DV-5 Valve (TFP1305)
- DV-1 Valve (TFP1330)
- DV-3 Valve (TFP1350)

<table>
<thead>
<tr>
<th>Trim Assemblies</th>
<th>ELEC./ELEC. ACTUATION</th>
<th>ELEC./PNEUM. ACTUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DV-5</td>
<td>TFP1465</td>
<td>TFP1460</td>
</tr>
<tr>
<td>DV-1</td>
<td>TD1153</td>
<td>TD1151</td>
</tr>
<tr>
<td>DV-3</td>
<td>TD1148</td>
<td>TD1146</td>
</tr>
</tbody>
</table>

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Deluge Valve & Deluge Systems

The “deluge valve” is the automatic water control valve that is used to control water flow into deluge, preaction, and special types of fire protection systems in response to a fire.

Deluge fire protection systems are normally used in special hazard installations where an entire area application of water is required for protection. Typical applications may include flammable liquid handling and storage areas, aircraft hangars, and other high-hazard installations where water is the most effective extinguishing agent. Deluge systems employ open sprinklers or spray nozzles attached to a piping system. The system is connected to a water supply through the deluge valve. This valve is opened by the operation of a fire detection system installed in the same areas as the open sprinklers or nozzles. Deluge systems may be activated by wet or dry pilot sprinklers, or electric detectors. When the deluge valve opens, water flows into the piping system and discharges from all open sprinklers and nozzles.

<table>
<thead>
<tr>
<th>Trim Assemblies</th>
</tr>
</thead>
<tbody>
<tr>
<td>WET PILOT</td>
</tr>
<tr>
<td>DV-5</td>
</tr>
<tr>
<td>DV-1</td>
</tr>
<tr>
<td>DV-3</td>
</tr>
</tbody>
</table>

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### DV-5
**Deluge Valve, External Resetting Diaphragm Style – 1-1/2" through 8"**

**Tech Data** TFP1305

- Available sizes: 1-1/2" (DN40), 2" (DN50), 3" (DN80), 4" (DN100), 6" (DN150), 8" (DN200)
- Vertical or horizontal installation
- One internal working part
- No linkage or clapper assembly
- Light weight ductile iron body
- Available with deluge and single & double interlock preaction trim
- Internally & externally coated
- Features external resetting
- Diaphragm operation
- For most seawater & brackish water supplies for deluge systems
- For deluge, preaction & foam systems
- Available as Flange x Flange, Flange x Groove, or Groove x Groove body styles
- Rated for 250 psi (17.2 bar) service
- Listings and Approvals: UL, C-UL, and FM

### DV-1™
**External Resetting Deluge Valve – 4" & 6"**

**Tech Data** TFP1330

- Available sizes: 4" (DN100) and 6" (DN150)
- Used as a system control valve in deluge, and single and double interlock preaction systems
- Can be reset externally without having to remove the hand-hole cover and unlatch the waterway clapper
- Positive mechanical latching style valve
- Available with three actuation trim arrangements: wet pilot, dry pilot, and electric
- Single and double interlock preaction trims available
- Rated for 175 psi (12.1 bar) maximum service pressure
- Listings and Approvals: UL, ULC, FM, LPC, and SSL

### DV-3™
**Deluge Valve, Automatic Resetting – 2-1/2"**

**Tech Data** TFP1350

- 2-1/2" (DN65), right angle type deluge valves
- Available with either a grooved or threaded inlet and outlet
- For use as a control valve in deluge, or single or double interlock preaction systems
- Can be reset externally without having to open a hand-hole cover to manually unlatch and set the center valve
- Trim arrangements provide wet pilot, dry pilot, and electric actuation
- Valves may be installed with the outlet facing either left or right
- DV-3 (F445) – 175 psi (12.1 bar)
- DV-3 (F446) – 250 psi (17.2 bar)
- Listings and Approvals: UL, ULC, FM, LPC, and SSL

### CV-1F
**Riser Check Valve**

**Tech Data** TFP950

- Available sizes: 2" through 8" (DN65) through (DN200)
- Intended for use in a preaction system riser
- Furnished with grooved ends that are compatible with grooved pipe and couplings
- Can be installed with ANSI class 150 or 300 Flanges utilizing flange adapters
- Designed with a removable cover for ease of field maintenance
- Standard seal is grade “E” EPDM
- Maximum rated working pressure is 300 psi (20.68 bar)

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AquaMist® Systems utilize the newest and most unique nozzles developed and approved for fire protection. They offer an alternative to gas systems, foam systems, or heavy density sprinkler systems. By utilizing a higher pressure than a normal sprinkler system, but a 50-80% lower water flow, the AquaMist Systems use less water more effectively, reduce costs in pipe sizing and labor, and minimize cleanup and water damage.

AquaMist Systems operate differently from normal sprinkler or gaseous systems as follows:

a) By using smaller droplet sizes, a larger droplet surface area to volume is created. This larger surface area allows heat extraction (evaporation).

b) Vapor is created that displaces, removes, and excludes oxygen from the fire tetrahedral equation.

c) Flammable vapors are diluted by the entrainment of water vapor, to the extent that the flammable vapor will not burn.

d) Larger droplets are designed to penetrate the fire plume and cool the combustibles similar to a standard sprinkler system.

e) The suspended mist will cool and “pre-wet” other combustibles in the area and cool any fuels and gases.

AquaMist Systems are used in total compartmentalized areas and are pre-engineered systems that have specific guidelines as to the availability of installation, design, and components. With the advent of the publication of NFPA 750, the introduction and awareness of mist technology has never been higher. These pages highlight some of the products available in the AquaMist product line from TFBP…the innovative leader in fire protection.
AM10 AquaMist®

K Factor  
Thread Size  
Finish  
Tech Data
K = 0.24 (3.5)  
1/2” (15 mm)  
Stainless Steel  
TD1174

• Open spray nozzles
• Designed for use in water mist protection systems protecting flammable liquids and turbine bearings

Open Type Mist Nozzle

• Minimal water demand, approximately 3.1 GPM/nozzle at 170psi (11,73 lpm at 11.6 bar)
• Mist represents latest in fire protection technology
• For use in “low pressure” mist applications
• Minimum operating pressure is 170 psi (11.6 bar)
• Nozzle coverage: maximum 86 ft² (8m²)
• UL, FM

AM4 AquaMist®

K Factor  
Thread Size  
Finish  
Tech Data
K = 0.24 (3.5)  
1/2” (15 mm)  
Stainless Steel  
TD1173

• Open, directional spray nozzles
• Listed & Approved for the protection of flammable liquid hazards (UL/FM)
• Approved for protection of gas turbines (FM)

Open Type Mist Nozzle

• Maximum ceiling height, 26’ 3” (8 m)
• Compartment volume
  – UL - 56,500 ft³ (1,600 m³)
  – FM - 45,203 ft³ (1,280 m³)
• Maximum utilization of water for flammable liquid fire protection
• Nozzle coverage: maximum 172 ft² (16 m²)
• Nozzle pressure: 185 to 250 psi (12.8 to 17.2 bar)

AM15 AquaMist®

• Available for use in IMO Mandated MSC 913 local application water mist systems
• 0.33 gpm/psi to 0.5
• 175-250 psi
• 4.36 gpm @ 175 psi

Since the water droplet sizes are much smaller, a larger surface area is created to allow the water to absorb heat more quickly than a conventional sprinkler spray having larger droplets.

The smaller droplets will be suspended and coat and cool any combustibles in the room, while pre-wetting the combustibles and thereby blocking them from radiant heat.

When the mist comes in contact with a fire, vapor (steam) is created which displaces, and reduces the oxygen level at the fire.

The fire will receive the direct impingement of the larger droplets similar to a standard sprinkler.