



PIPENET - SPRAY/SPRINKLER

The PIPENET Spray/Sprinkler Module is a powerful tool in the design of fixed fire-protection systems complying with NFPA and FOC rules. It can be used to design deluge, ringmain, sprinkler and foam solution systems for offshore platforms, refineries, petrochemical and chemical plants. This module was specifically developed for the design of the type of fire protection systems which are used on process plant.

Summarised below are salient features of the Spray/Sprinkler Module:

Network

Networks can be defined from a wide choice of elements - pipes and fittings, nozzles, deluge valves, pumps/fans, filters, non-return valves, orifice plates, special equipment items, specifications and overboard dump valves.

PIPENET has built-in data of fittings, pipe linings and pipe schedules. Users can also create their own pump, pipe schedule, pipe lining, nozzle and deluge valve data libraries that can be used in any network.

Schematic Capabilities and On-line Help

A network can be defined using schematic or text input. However, a text input network can also be displayed using the schematic. Results can also be displayed on the schematic. On-line help is also available for more information on the features of PIPENET.

Schematic input/output can be in isometric or orthogonal formats.

Units

In PIPENET units can be chosen to be Metric, U.S., English or SI units. Units in PIPENET are so flexible that any combination of units can be chosen for the different variables.

It is even possible to input the problem in one set of units, carry out the design and fine tuning. The units could be changed later and the results presented in another set of units.

Fittings

Multiple fittings can be inserted on a pipe and it is not necessary to treat them as separate entities. They are simply defined as attributes of a pipe. This is a powerful feature of PIPENET.

Ringmain Capabilities

Fire pumps (including booster pumps) may be connected in series or in parallel anywhere in the network. One or more of them may be operating in a given scenario, and it is easy to switch pumps on and off. For ringmain systems, the program handles the following tasks:

- pump selection calculations using manufacturer's pump data
- connecting pumps or booster pumps in series or in parallel at any point in the network
- modelling of conventional deluge valves in addition to constant flow deluge valves
- attachment of monitors and hydrants



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- performing case studies with different fire scenarios
- use of lined and unlined pipes in the same system
- modelling of breaks and blocks in pipework
- modelling operation of isolation valves
- connecting loops, grids and trees in any combination

Deluge Valves

Deluge valves may be of conventional “clack” shut type or “constant flow” type. Monitors and hydrants may be attached anywhere in the network. Loops, grids and trees may be incorporated in any combination. Lined and unlined pipes can be used in the same system. Pump selection calculations can be performed or manufacturer’s data can be used to model the exact behaviour of the system once a pump has been selected. The module makes it possible to perform case studies with different fire scenarios. Breaks and blocks in the pipework may be modelled with ease.

Deluge System Capabilities

A powerful range of alternative calculation types is available. The program can automatically identify the most remote nozzle and set its flow rate or the average density option may be chosen. The user may even specify the flow rate or flow density at a selected nozzle, or the available inlet pressure or flow rate. Orifice plates may be sized to balance the pressure required by the deluge system and the pressure available in the ringmain.

For deluge systems the program can handle

- automatic identification of the most remote nozzle and setting its flow rate
- sizing orifice plates to match the pressure required by the deluge system
- specifying the flow rate or the flow density at a specific nozzle
- specifying the available inlet pressure
- selecting the average density option

Pipe Schedule

Pipes may be lined or unlined, selected from eight built-in pipe schedules and three pipe linings. Alternatively, users can set up their own pipe schedule and lining data. Pipe sizes can be referred to by nominal or external diameters. A network can include several different lined and unlined pipe types.

Pipe Sizing

The user may leave some or all pipe sizes unspecified. PIPENET will automatically suggest appropriate pipe sizes based on the user selected pipe schedule.



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Orifice Plates

Restriction Orifice plates can be modelled in compliance with Crane, Heriot-watt and BS1042, taking into account downstream pressure recovery. Given the pressure drop the orifice diameter is determined, and vice-versa.

Remote Nozzle Calculation

Calculations can match the minimum flow rate required at the nozzle that is hydraulically most remote. Nozzles may also be switched on or off individually or in banks.

Materials Take-Off

Materials take-off tables can also be produced for weight and cost estimation purposes.

Output

Output reports can be created using Word, Write or PIPENET Output Browser.

Pump/Fan

A standard PIPENET pre-processor is provided for the creation of libraries of performance characteristics. These can be readily accessed to include pumps/fans in networks. A given pump type need therefore be input to the module only once for it to be available for repeated use in different network designs.

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