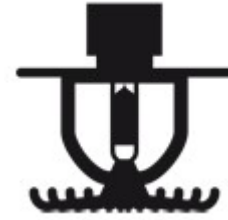


CYPEFIRE SPRINKLERS



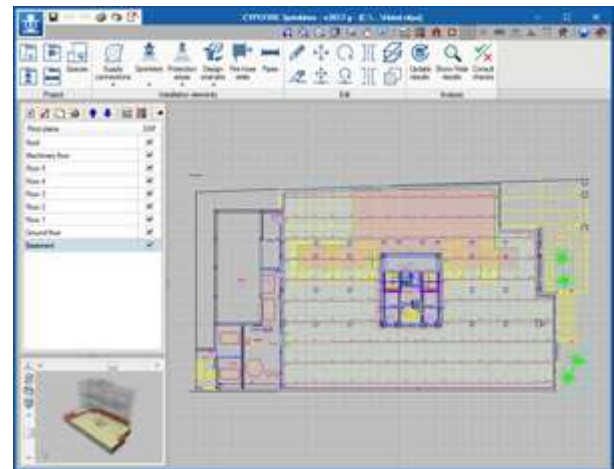
Hydraulic fire extinguishing installations

CYPEFIRE Sprinklers is a tool created to design hydraulic networks for fire protection using sprinklers and fire hose reels in accordance with the **NFPA®13** (National Fire Protection Association) standard. It includes the **EPANET®** application (developed by the “Water Supply and Water Resources Division of the U.S. Environmental Protection Agency’s National Risk Management Research Laboratory”) to carry out the hydraulic calculations.

CYPEFIRE Sprinklers is integrated in the Open BIM workflow using IFC standard.

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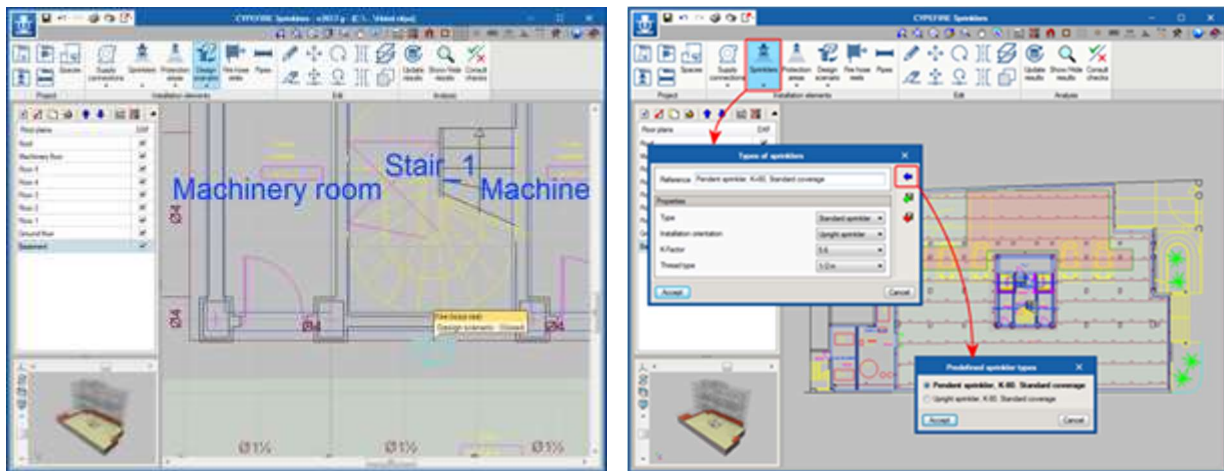
Program properties

CYPEFIRE Sprinklers allows users to **design, analyse and size a fire extinguishing installation composed of sprinklers**. The program carries out the necessary **hydraulic calculations and checks** to ensure the requirements of the **NFPA®13** standard are met. These include:

- **Hydraulic design of grid and branch systems**
- **Horizontal and vertical pipes**
- **Flow and minimum pressure in the sprinklers**
- **Distribution of the sprinklers**

- Maximum allowable distance between sprinklers
- Maximum distance between the sprinklers and the wall
- **Design of the tank**
- **Design of the fire hose reels**

Main features of CYPEFIRE Sprinklers



Sprinklers

CYPEFIRE Sprinklers allows users to use any type of sprinkler included in the **NFPA®13 standard**.

Users can choose the type of sprinkler, state its orientation in the installation, its discharge factor, k, and its thread diameter. The sprinklers can be defined in the program or can be imported from the CYPEFIRE Sprinklers library.

Once the type of sprinkler has been defined, the program allows users to save the photometric data in a file to then be able to import it in another CYPEFIRE Sprinklers project.

Fire hose reels

CYPEFIRE Sprinklers incorporates fire hose reels as a design element. Even though the **NFPA®13 standard** focuses on the design of sprinklers, it does state a set of minimum requirements for the design of fire hose reels, which are taken into account to design the network.

Hydraulic analysis and Analysis motor

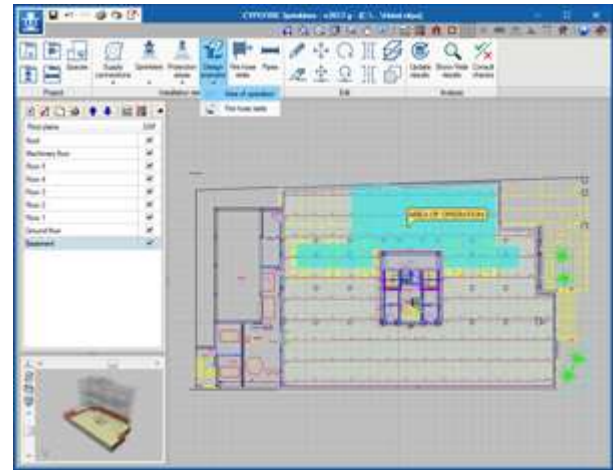
CYPEFIRE Sprinklers uses the EPANET 2 analysis motor (developed by the “Water Supply and Water Resources Division National Risk Management Research Laboratory”) to carry out the hydraulic calculations required to design the network of sprinklers and fire hose reels.



By using EPANET, very precise analysis results are obtained, which are sufficiently valid to comply with the requirements of the **NFPA®13** standard, without considering the losses of individual elements (which can currently be accounted for if users replace the real length of a span by its equivalent length).

Area of operation

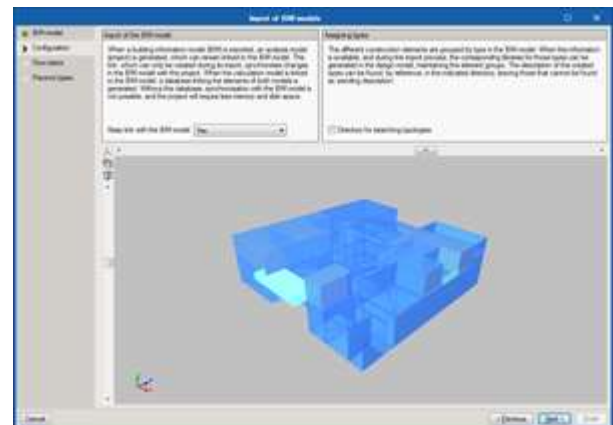
The program allows users to introduce the design area of operation of the sprinklers. The code prescribes a series of requirements to obtain the area of operation of the sprinklers depending on their layout. Using this tool, users can define different design scenarios.



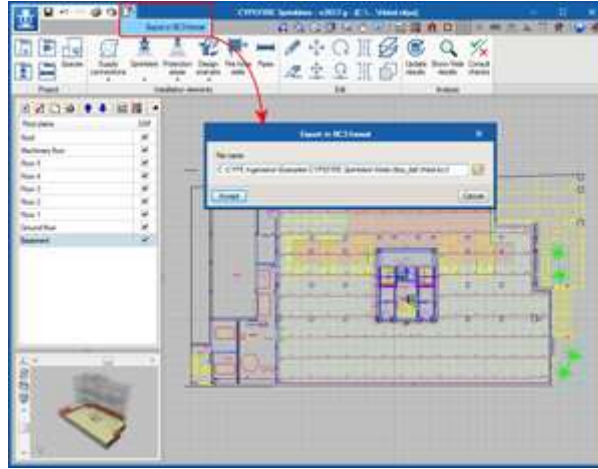
Integration in the Open BIM workflow

CYPEFIRE Sprinklers is an application that is integrated in the Open BIM workflow. This is achieved by importing information files of a previously defined BIM model.

- **Imports geometric models** based on IFC4 files that have been generated by CAD/BIM programs such as IFC Builder, Allplan, Archicad or Revit. This function allows CYPEFIRE Sprinklers to automatically incorporate elements such as floor plans and spaces.
- **Exports information** in an IFC file. Once the project has been analysed, CYPEFIRE Sprinklers is capable of exporting the information of all the **sprinkler system installations**, so they can be introduced in other programs that work in the Open BIM workflow.



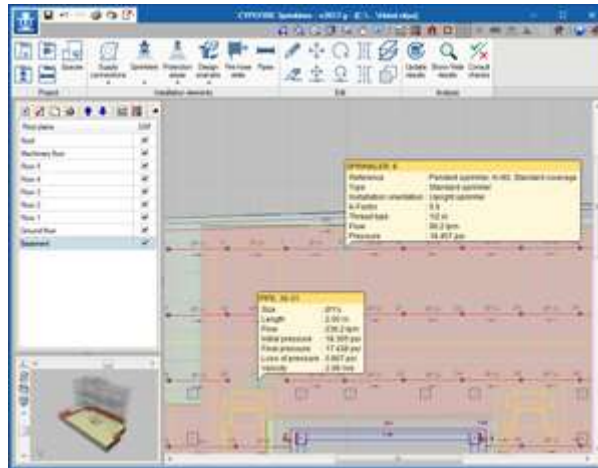
More information on Open BIM workflow proposed by CYPE can be found on the Open BIM technology in CYPE programs webpage.



Export to FIEBDC-3

CYPEFIRE Sprinklers generates files containing all the quantities of the materials used in the fire extinguishing installations in FIEBDC-3 format, which is to be imported by bill of quantities management programs such as Arquimedes.

Checks and reports



Once the sprinkler systems and hydraulic analysis have been defined, CYPEFIRE Sprinklers carries out the checks corresponding to the **NFPA®13** standard and generates the justification reports and required drawings.

On-screen results

Once the hydraulic design and checks have been carried out on the system, CYPEFIRE Sprinklers can provide an on-screen display of any errors or information on the results of the hydraulic design and the design of the sprinkler system.

Justification files

CYPEFIRE Sprinklers generates the justification files that are necessary to meet the requirements of the **NFPA®13** standard, such as:

- **Analysis of the nodes**
 - Flow in the sprinklers
 - Pressure in the sprinklers
 - Elevation of the nodes
- **Analysis of the pipes**
 - Elevation and length of the pipes
 - Diameter used
 - Flow and velocity of the fluid

Project

1.- NODES

| Nodes | | | | |
|-------|---------------|-------------------|--------------|------------|
| Node | Elevation (m) | Type | Pressure (m) | Flow (lpm) |
| 14 | 0.00 | Supply connection | 39.370 | 3023.3 |
| 1 | 2.70 | Transition node | 49.824 | 3023.3 |
| 6 | 2.70 | Sprinkler | 19.206 | 92.0 |
| 7 | 2.70 | Sprinkler | 18.430 | 90.7 |
| 8 | 2.70 | Sprinkler | 18.417 | 90.2 |
| 9 | 2.70 | Sprinkler | 18.456 | 90.2 |
| 10 | 2.70 | Sprinkler | 18.577 | 90.5 |
| 11 | 2.70 | Sprinkler | 19.059 | 91.7 |
| 12 | 2.70 | Sprinkler | 20.023 | 94.2 |
| 13 | 2.70 | Sprinkler | 21.995 | 98.5 |
| 16 | 2.70 | Sprinkler | 19.312 | 92.3 |
| 19 | 2.70 | Sprinkler | 18.720 | 90.9 |
| 20 | 2.70 | Sprinkler | 18.538 | 90.4 |
| 21 | 2.70 | Sprinkler | 18.531 | 90.4 |
| 22 | 2.70 | Sprinkler | 18.850 | 90.7 |
| 23 | 2.70 | Sprinkler | 19.222 | 91.9 |
| 24 | 2.70 | Sprinkler | 20.172 | 94.3 |
| 25 | 2.70 | Sprinkler | 22.827 | 98.6 |
| 26 | 2.70 | Sprinkler | 18.395 | 89.9 |
| 27 | 2.70 | Sprinkler | 17.438 | 87.7 |
| 32 | 2.70 | Sprinkler | 17.171 | 86.8 |
| 33 | 2.70 | Sprinkler | 16.999 | 86.0 |
| 34 | 2.70 | Sprinkler | 17.012 | 86.6 |
| 35 | 2.70 | Sprinkler | 17.228 | 87.2 |
| 36 | 2.70 | Sprinkler | 17.857 | 88.8 |
| 37 | 2.70 | Sprinkler | 19.094 | 91.8 |
| 41 | 2.70 | Sprinkler | 25.083 | 105.1 |
| 42 | 2.70 | Sprinkler | 24.987 | 104.9 |
| 43 | 2.70 | Sprinkler | 24.965 | 104.9 |
| 44 | 2.70 | Sprinkler | 25.297 | 105.6 |
| 45 | 2.70 | Sprinkler | 25.261 | 105.6 |
| 46 | 2.70 | Sprinkler | 24.832 | 104.2 |
| 47 | 2.70 | Sprinkler | 24.974 | 103.9 |
| 48 | 2.70 | Sprinkler | 24.976 | 103.9 |

2.- PIPES

| Pipes | | | | | | |
|--------------|---------------|-----------|------------|------|------------|----------------|
| Initial code | Final node | | Length (m) | Size | Flow (lpm) | Velocity (m/s) |
| Reference | Elevation (m) | Reference | | | | |
| 3 | 2.70 | 3 | 2.70 | 2.00 | 281.6 | 3.56 |
| 4 | 2.70 | 4 | 2.70 | 2.00 | 281.6 | 3.56 |
| 5 | 2.70 | 5 | 2.70 | 2.00 | 281.6 | 3.56 |
| 6 | 2.70 | 6 | 2.70 | 2.00 | 189.5 | 2.49 |
| 7 | 2.70 | 7 | 2.70 | 2.00 | 98.9 | 1.25 |

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Installation drawings

The program provides detailed drawings of the installation of the sprinkler system. It provides a tool that allows users to configure the floor plans that will be represented in the drawings.

Users can print the drawings directly or export them to different formats (DWG, DXF, PDF, XPS).

Required user license permits

To be able to work with CYPETHERM HVAC, users must have the corresponding permission to use the program.

For project consultancy and detailed information; cype@cype.ist or cype@cype.ae