Modeling a Cooling Tower

A cooling tower can be modeled in PIPE-FLO and Flow of Fluids software by using a Tank. A typical cooling tower is shown in Figure 1.

**Figure 1.** Typical Cooling Tower

Figure 2 shows how the cooling tower can be modeled in PIPE-FLO or Flow of Fluids. The Curve dP Device in the pipe at the top of the tower represents the spray nozzle header just prior to it branching out to the six spray nozzles.

For an alternative method of modeling the spray nozzles, refer to [Modeling a Spray Nozzle](#) article.

**Figure 2.** Cooling Tower modeled in PIPE-FLO

The cooling tower itself should be modeled as a tank with design data entered through the Tank property grid as shown in Figure 3.

- **Elevation** should be set to the elevation of the bottom of the basin of the cooling tower.
- **Surface Pressure** should be set to 0.0 psig if the cooling tower is open to atmosphere. If the cooling tower is pressurized or under vacuum, the pressure (or vacuum) exerted on the surface of the liquid should be entered.

- **Liquid Level** should be set to the level of the liquid as measured from the bottom of the tank, typically the basin depth (5 feet in the model shown above) for cooling towers.

![Figure 3. Tank design data in the property grid.](image)

Click the **Penetrations** field of the **Tank's property grid** to open the **Tank Penetrations** dialog box, shown in Figure 4. This is where you must specify the **Penetration Height** of each pipe connected to the tank.

For example, the return sprayers come in to the top of the cooling tower at 20 feet measured from the bottom of the tower. The outlet pipe to the suction of the pump penetrates the tower at the bottom of the tank, or 0 feet.

The default penetration height is 0 feet (or meters if metric units are selected).

![Figure 4. Tank Penetrations dialog box to define the height at which each pipe enters the tank, as measured from the Bottom Elevation of the tank.](image)

For reference to older versions of PIPE-FLO see [Modeling a Cooling Tower old.pdf](link).

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