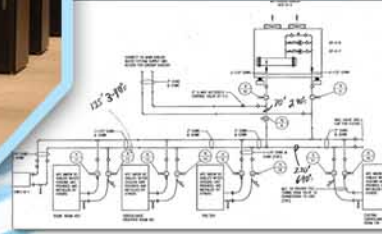


Data Center Chilled Water System

with
Design Flow Solutions®



Data Center with air cooled server racks



A chilled water system consists of a closed system of piping and pumps that circulate cold water through heat exchangers to remove heat generated from the operation of the data center servers.

Design Flow Solutions (DFS) provides the engineer with a range of computer tools to ensure proper design and operation of a chilled water system.

DFS gives the engineer the ability to:

Determine the flow rates through each of the cooling units to ensure that they meet the required water flow rate.

Determine the pressure drops through each component in the system.

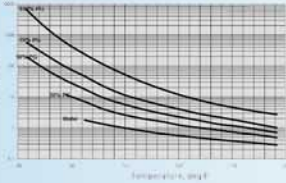
Find system operating point to size pump and chiller.

Analyze valve lineups and emergency or maintenance scenarios.

F

1. Define System Fluid and Properties

- Define custom fluid, or select fluid from a **DFS** Library
- Enter temperature and pressure

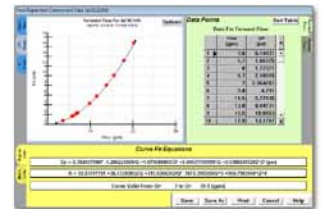


A common chilled water system fluid is a mixture of propylene glycol and water. Using a weighted average to find the density, a custom fluid can be created in **DFS**. In addition, the viscosity can be found using readily available data from propylene vendors.

2. Input Data and Evaluate Assumptions

- Calculate resistance coefficients (C_v) for the cooler and chiller. If the data is available, make a Flow Dependent Custom Component in **DFS** which takes into account the change in C_v with flowrate.

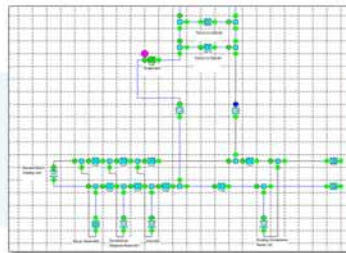
$$C_v = Q \sqrt{\frac{S_g}{\Delta P}}$$



Flow Dependent Component

3. Enter Piping Geometry and Dimensions

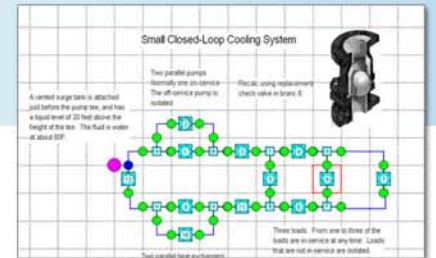
- Build model with **DFS**
- Pipe specifications, diameter, valves, fittings, size changes, elevation changes



DFS Workspace

4. Enter Custom Components

- Insert pump, chiller, and custom components
- **DFS** will calculate the pressure drop and flowrates



Insert Pictures and Text

5. Analyze System & Check Flow Rates

- Find pump operating point, power usage
- Determine flow rates, pressure drops
- Compare to cooler specs
- Model valve lineups, print reports



DFS Reports

ABZ
www.abzinc.com

ABZ, Incorporated
4451 Brookfield Corp. Dr., Suite 107
Chantilly, VA 20151
Phone: (800) 747-7401
Fax: (703) 631-5282
Email: sales@abzinc.com