

Steam System Piping

Mechanical Systems - Multifamily

Learning Objectives

By attending this session, participants will understand:

- Near-boiler piping, on both the supply and return sides, and its functions.
- The importance of proper header design.
- How steam and condensate flow through a building.
- The differences between dry and wet returns.
- How gravity and pumped returns work.
- Some causes of water hammer and their solutions.

Key Terminology

“A” dimension

“B” dimension

Boiler feed tank

Carryover

Cavitation

Concentric reducer

Condensate

Condensate receiver tank

Counterflow

Dry return

Dry steam

Eccentric reducer

Equalizer

Gravity return

Hartford Loop

Header

Low-water cutoff

Near-boiler piping

Normal Water Line (NWL)

Parallel flow

Pounds per square inch (psi)

Pressure drop

Pump return

Reducing elbow (also reducing fitting)

Riser

Steam main

Water hammer

Wet return

Wet steam

Supplemental Materials

Handouts & Resources

Siegenthaler, John. "Selecting a Primary Loop Circulator – The Myths and the Facts." *PME* Mar 2003.
www.pmengineer.com/Articles/Feature_Article/634b154796298010VgnVCM100000f932a8c0

Dan Holohan. Articles from *A Pocketful of Steam Problems (with Solutions!)*. D. Holohan Associates.
1996. www.heatinghelp.com/article-categories/16/Steam.

Class Overview

Use the presentation and class discussion to introduce the various types of steam system piping, including:

- Near-boiler piping.
 - Proper riser and header design.
 - Equalizer.
 - Hartford loop.
- Parallel vs. counterflow design.
- Types of returns.
 - Dry.
 - Wet.
 - Gravity.
 - Pump.
- "A" and "B" dimensions.

Make sure students understand the causes of water hammer and appropriate remedies.