Milk Pre-Cooler Plumbing Considerations

ATCP 65, Wisconsin Administrative Code and the 2015 PMO
Protection of Potable Water Supply

• Protecting potable water supply (well)
  • Raw milk and chemical cleaning solutions used in pre-coolers

• Protecting other potable water applications
  • Pre-cooler water discharge separation
    • From potable system
    • From other sources of contamination
  • Reclaimed water separation from potable water systems
    • Reclaimed water must not connect back into the potable water system
PRE-COOLER – NO SUBMERGED OUTLET – NO BY-PASS

WATER AND MILK PROTECTED

POTABLE WATER SUPPLY

OPEN TO ATMOSPHERE (NO SUBMERGED INLET)
PLATE COOLER
NO SUBMERGED OUTLET – NO BY-PASS
TUBE COOLER
NO SUBMERGED OUTLET, NO BY-PASS, NO VALVES DOWNSTREAM
Protection of Potable Water Supply

• Pre-cooler water discharge separation
  • From potable system via a pre-cooler water bypass line
    • Backflow prevention device required in by-pass line

• Not a violation on state regulatory inspections
• A 5 point major water violation on IMS surveys and FDA check ratings.
PRE-COOLER – NO SUBMERGED OUTLET – WITH BYPASS

WATER & MILK PROTECTED

POTABLE WATER BYPASS
Backflow prevention device required in by-pass line
Not a violation on state inspections
Is a 5 point major water violation on IMS surveys and FDA check ratings.

POTABLE WATER SUPPLY

NON-POTABLE RE-USE DISCHARGE FROM PRE-COOLER OPEN TO ATMOSPHERE (NO SUBMERGED INLET)
PRE-COOLER
NO SUBMERGED OUTLET – WITH BYPASS

BYPASS PROTECTED
• PMO Requirement

BYPASS NOT PROTECTED
• DATCP Accepted/PMO Debit
NO BACKFLOW PROTECTION ON BYBASS LINE
Not a violation on state inspections. Is a 5 point major water violation on IMS surveys and FDA check ratings.

Where should I go?

BACKFLOW PREVENTER (valves downstream)

VENT RESTRICTED
Must not be reduced in size and must be freely draining open to atmosphere.
NO BACKFLOW PROTECTION ON BYBASS LINES
Not a violation on state inspections. Is a 5 point major water violation on IMS surveys and FDA check ratings.

Automatic bypass solenoid valve

Manual bypass ball valve

OUT TO SECOND USE NON-POTABLE WATER STORAGE TANK WITH ADEQUATE AIR GAP

POTABLE WATER SUPPLY

NON-POTABLE WATER DISCHARGE
Water flow to and from a plate cooler.

- The valves are currently set to wash, so the water is bypassing the plate cooler and going directly to cow drinking cups.
- Arrow A is water from the well.
- Arrow B shows line going to plate cooler.
- Arrow C is return water from the plate cooler.
- Arrow D is the water line going to the cow drinking cups.

Is there a cross-connection?
If yes, where is the proper location for the backflow preventer?
CROSS CONNECTION BETWEEN NON-POTABLE DISCHARGE FROM PRE-COOLER AND POTABLE WATER SUPPLY SYSTEM
NO BACKFLOW PROTECTION ON BYBASS LINE
Not a violation on state inspections.
Is a 5 point major water violation on IMS surveys and FDA check ratings.

3-way valve?
THERE SHALL BE NO UNPROTECTED WATER SUPPLY LINES THAT CONNECT TO THE LINE EXITING THE PRE-COOLER, NO MATTER WHAT TYPE OF INSTALLATION IS PRESENT. IF ONE DOES EXIST IT MUST HAVE THE PROPER BACK-FLOW PROTECTION ON IT.

ACCEPTABLE

NOT ACCEPTABLE

TO PROPERLY AIR GAPPED STORAGE OR STOCK TANK
POTABLE WATER SUPPLY backflow preventer required in supply line

PRESSURIZED OUTLET – ball valve in discharge line, solenoid valve in discharge line, stock tank float at end of line, etc.
PLATE COOLER PRESSURIZED OUTLET (VALVES IN LINE)

- DATCP Requirement
- PMO – Wisconsin SRO’s require for protection of potable water supply
- ASSE 10XX Device
  - Low Hazard
- Valve on water outlet
There is a valve on the water discharge from the plate cooler necessitating the backflow preventer on the supply line.

Is the backflow preventer vent line reduced or submerged?

Is the plate cooler discharge hose submerged?

**PLATE COOLER PRESSURIZED OUTLET (VALVES IN LINE)**
Does the discharge connect back to the potable water supply?

This hose is not allowed under 3-A.

Backflow prior to plate.

Milk line bypass hose not close-coupled at both ends.

Valves downstream.
PRE-COOLER – PRESSURIZED Outlet

WATER & MILK PROTECTED

POTABLE WATER SUPPLY
backflow preventer required in supply line and in by-pass line

PRESSURIZED OUTLET
ball valve in discharge line, solenoid valve in discharge line, stock tank float at end of line, etc.
Pressurized second use water out to drinking cups, stock tank float, etc.

POTABLE WATER SUPPLY backflow preventer required in supply line and in by-pass line

Second use water from milk pre-cooler

To milk pre-cooler
PRE-COOLER – SUBMERGED OUTLET

WATER & MILK PROTECTED

POTABLE WATER SUPPLY backflow preventer required in supply line, if outlet is pressurized.

SUBMERGED OUTLET Line submerged in stock tank, non-siphon float mounted below flood rim of stock tank, etc.

Backflow protection required.
SUBMERGED OUTLETS
Submerged Outlet

Vacuum breaker tee assembly not acceptable for this application.

Pre-cooler discharge submerged in non-potable second use water storage tank.

Water coming out of non-potable second use water storage tank must never be connected to the potable water system or be used for applications requiring the use of potable water.
AIR-GAP

Minimum 1 inch or two times the pipe diameter, whichever is greater

WATER SUPPLY AIR-GAP ASME 112.1.2
Is this permissible?

Air break versus Air Gap

Air Gap Calculator
PRE-COOLER – SUBMERGED OUTLET WITH BY-PASS

WATER & MILK PROTECTED

POTABLE WATER SUPPLY
Backflow preventer required in supply line and bypass line if discharge is pressurized (float, ball valve, etc.)

SUBMERGED OUTLET
Line submerged in stock tank, non-siphon float mounted below flood rim of stock tank, etc.

Backflow protection required
PLATE COOLER
PRESSURIZED OUTLET PROTECTION
BY-PASS PROTECTION
SUBMERGED OUTLET PROTECTION
PRE-COOLER – DISCHARGE TO POTABLE WATER SYSTEM

***NOT ACCEPTABLE***

OUTLET TO POTABLE APPLICATIONS
Wash sinks, water heater, milkhouse hose faucet, CIP supply, etc.
OUTLET LINES FROM PRE-COOLERS
MUST NEVER BE FED BACK INTO THE
MILKHOUSE OR CONNECTED TO
POTABLE WATER SYSTEM AS SHOWN

POTABLE WATER IN FROM WELL

COOLING WATER IN

PRE-COOLER

NON-POTABLE DISCHARGE FROM PRE-COOLER

OPTIONAL BY-PASS LINE

STOCK DRINKING CUPS

TO MILKHOUSE USES

WATER HEATER
CROSS CONNECTION BETWEEN NON-POTABLE DISCHARGE FROM PRE-COOLER AND POTABLE WATER SUPPLY SYSTEM
POSSIBLE CROSS CONNECTION BETWEEN NON-POTABLE DISCHARGE FROM PRE-COOLER AND POTABLE WATER SUPPLY SYSTEM
PRE-COOLER – NO SUBMERGED OUTLET – SEPARATE BYPASS

WATER & MILK PROTECTED

POTABLE WATER SUPPLY

OPEN TO ATMOSPHERE
(NO SUBMERGED INLET)
BOTH PRE-COOLER DISCHARGE LINE AND POTABLE WATER MAKE-UP LINE SUBMERGED IN FILL PIPE FOR NON-POTABLE SECOND USE WATER STORAGE TANK
ADEQUATE AIR GAPS FOR PRE-COOLER DISCHARGE AND POTABLE WATER MAKE-UP LINES TO NON-POTABLE SECOND USE WATER STORAGE TANK