

Cross Connections and Water Softeners

What is a cross connection?

Any connection between a drinking water supply and a potential source of contamination is called a cross connection. Incorrect placement of a softening unit discharge line, also referred to as the regeneration waste or backwash drain line, can create a cross connection between the drinking water (potable) system and the sanitary sewer. Both the Minnesota's Public Water Supply Rules (Minnesota Rules, Chapter 4720) and Minnesota Plumbing Code (Minnesota Rules, Chapter 4714) have provisions prohibiting cross connections of potable water supplies.

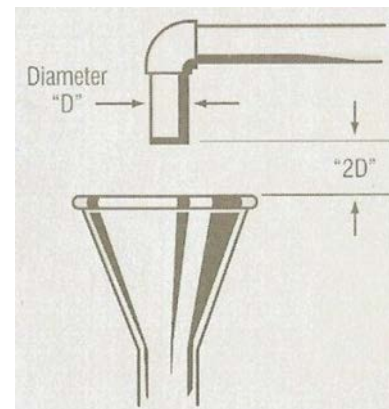
Where are cross connections commonly found?

Minnesota Rules, Chapter 4714 Section 611.2 requires air gap discharge for water conditioning equipment. MDH field sanitarians have identified cross connections created when water conditioning equipment was not installed correctly. Some of these cross connections have resulted in actual contamination of the drinking water system. Whenever a plumbing fixture is connected to the potable water supply, a potential cross connection exists. Attempts to control the splashing of water on the floor during the recharge cycle of the water softener may result in the creation of cross connections. Examples of incorrect installations are:

1. Connection of a softener discharge drain line to a plumbing drain line.
2. Drainage of the softener discharge line to a floor drain without an air gap.
3. Placing the softener discharge drain line into a sink without an air gap.

How to provide a proper air gap for backflow prevention

Air gaps are a non-mechanical means of backflow prevention. Air gaps are very effective protection against back siphonage. Air gaps must be fabricated from commercially available plumbing components and rigidly mounted. All plumbing components, including piping and fittings, must be listed in the MN Plumbing Code as approved for water distribution. An acceptable air gap must be twice the diameter of the discharge piping and above the flood rim of an individual vented receptor (example). In addition, all residential water softeners must have an air gap that is at least one and a half inches. If discharged to a vented floor drain, the air gap measurement should be made from the high point of the floor and not the strainer.



For more information and questions

[Minnesota Department of Labor and Industry \(http://www.dli.mn.gov/business/plumbing-and-mechanical-contractors\)](http://www.dli.mn.gov/business/plumbing-and-mechanical-contractors)

Water Softener Discharge Line

Unprotected



Softener discharge drain line directly plumbed to a sewer



Drainage of the softener discharge line to a floor drain without an air gap



Placing the softener discharge drain line into a sink without an air gap

Protected



Softener discharge drain line with air gap



Drainage of the softener discharge line to a floor drain with an air gap



Placing the softener discharge drain line into a sink with an air gap

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