
Closed System Volume Measurement Procedure - Using Salt

1. Fill the closed system piping with fresh water. Circulate the water and flush the lines until the water is clear.
2. Measure the chloride concentration in the closed system and estimate the volume of the closed system
3. Estimate volume in a closed system.
 - A. Rough Rule-Of-Thumb Estimate - Rated Tonnage of System X 10 gallons = Volume **or**
 - B. Use a pipe volume chart to estimated system volume
4. Add one pound of Table Salt (Sodium Chloride) per 1000 gallons of estimated volume via the by-pass feeder. Make sure the salt mixes thoroughly with the water.
5. Allow one hour of circulation to disperse chloride ions uniformly throughout the system.
6. Re-measure the chloride concentration in the closed system.
7. Multiply the estimated gallons of water by 76 ppm. Divide this product by the difference (increase) in chloride concentration of the test after adding the salt.

The answer will be the actual volume of water in the system.

Example:

- Estimated Volume = 1000 gallons
- Initial Chloride Test 100 ppm
- Final Chloride Test 180 ppm

Calculation: $\frac{1000 \text{ gals.} \times 76 \text{ ppm}}{(180 - 100) \text{ ppm}} = 950 \text{ actual gallons in system}$

This same procedure can be used to estimate the total water volume of a Cooling tower or Boiler Water System