CHEM-AQUA

UNDERSTANDING CYCLES OF CONCENTRATION

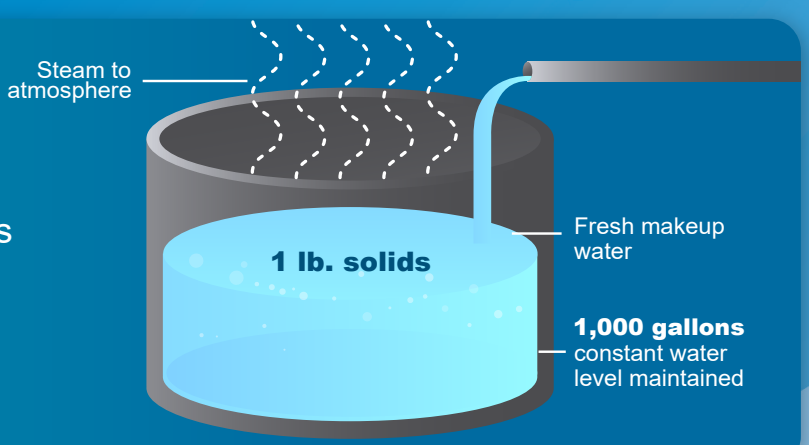
The cycles of concentration measure the degree to which the dissolved-solid impurities in the makeup water are concentrated in the recirculating water of a cooling tower system.

EXAMPLE CONDITIONS

- 1,000 gallon tank of water
- Fresh makeup water contains 1 pound of dissolved-solids impurities per 1,000 gallons
- 1,000 gallon water level maintained in each tank after evaporative losses by using fresh makeup water

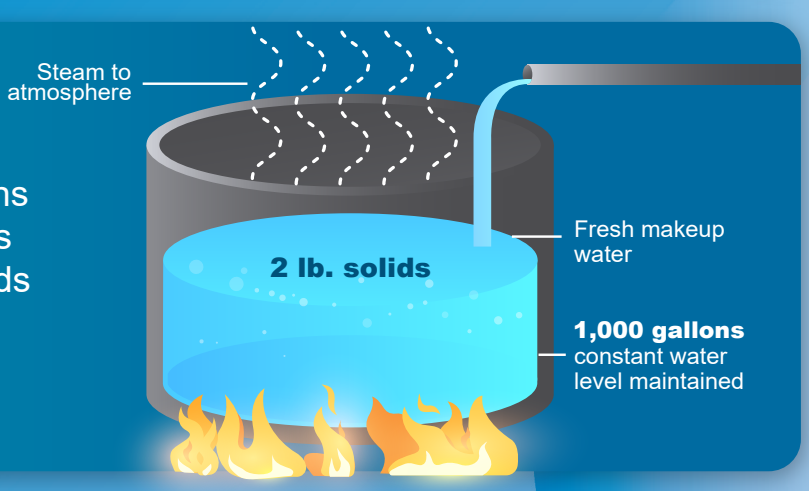
1 CYCLE

- 1,000-gallons
- 1 pound dissolved solids



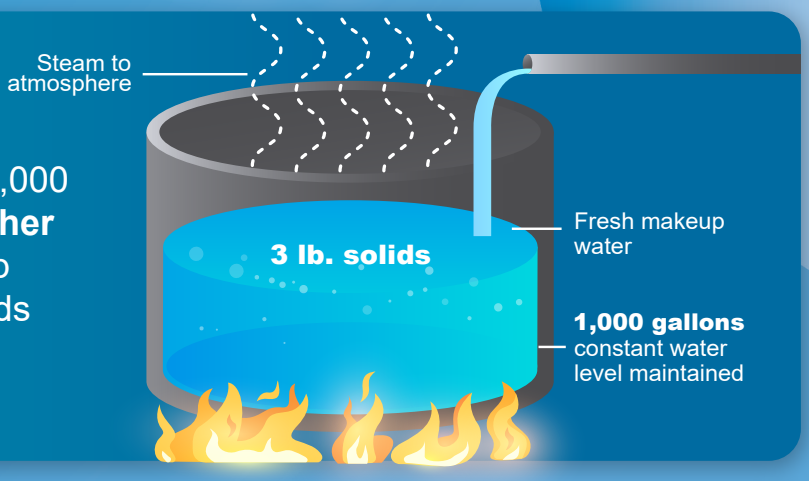
2 CYCLES

- Evaporated 1,000 gallons and added 1,000 gallons
- 2 pounds dissolved solids



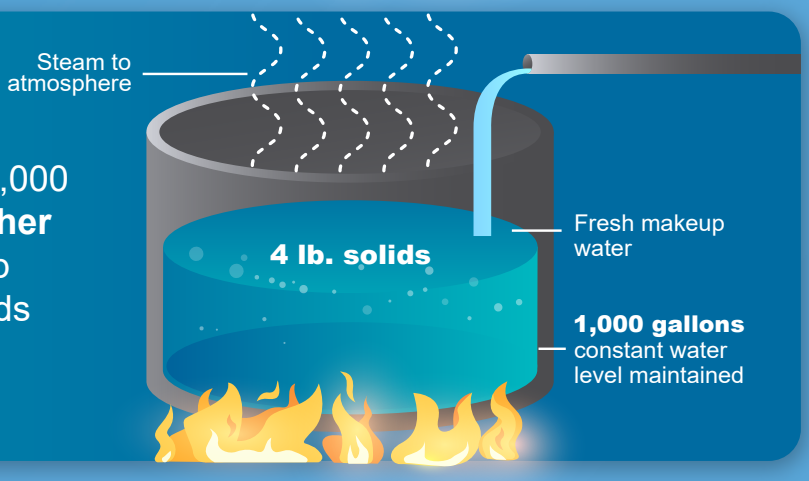
3 CYCLES

- Evaporated additional 1,000 gallons and added **another** 1,000 gallons of makeup
- 3 pounds dissolved solids



4 CYCLES

- Evaporated additional 1,000 gallons and added **another** 1,000 gallons of makeup
- 4 pounds dissolved solids



$$\text{Cycles} = \frac{\text{Conductivity}_{\text{System Water}}}{\text{Conductivity}_{\text{Makeup}}} = \frac{\text{Chloride}_{\text{System Water}}}{\text{Chloride}_{\text{Makeup}}} = \frac{\text{Silica}_{\text{System Water}}}{\text{Silica}_{\text{Makeup}}}$$

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