

pH and CONDUCTIVITY

pH and conductivity in fountain solution are necessary
for plate humidification.

CONTROL OF VARIATIONS OF FOUNTAIN SOLUTION CONCENTRATE FOR A BETTER PRINTING QUALITY

Two major control elements

- No direct link between pH and conductivity
- Conductivity is more sensitive to concentration changes than pH
- Be sure to control pH as well as conductivity

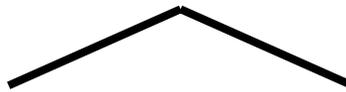
WHAT IS pH ?

- It measures the acidity or alkalinity in a solution
- Scale from 0 to 14. Neutral point: 7
- Acid when pH lower than 7
- Alkaline when pH higher than 7
- Logarithmic scale (multiply by 10 the acidity or alkalinity degree)

EXAMPLE : pH 5 solution = 10 X more acid than a pH 6 solution
pH 4 solution = 100 X more acid than a pH 6 solution

HOW TO MEASURE pH ?

TWO MEASURES



pH INDICATOR PAPER

- Paper strip chemically coated
- Changes colour according to acid or alkaline conditions

OPERATING DIRECTIONS:

- Soak in solution for as long as recommended.
- Compare results with reference chart.

ELECTRONIC pH INDICATOR

- The most accurate pH measurement method
- Reads pH measurements within one-tenth of a degree

OPERATING DIRECTIONS :

- Submerge the electrode in the solution to be tested.
- Be assured to calibrate periodically using a buffer solution with a known pH value.

WHAT IS CONDUCTIVITY?

- A solution's ability to transmit an electrical charge
 - ⇒ Conductivity is established according to the number of ions in the solution
- The higher the ions concentration is, the higher the conductivity degree is

HOW TO MEASURE CONDUCTIVITY?

METHOD: CONDUCTIVITY INDICATOR

- Measures a solution's conductivity degree
- Gives results in micromhos

DIRECTIONS FOR USE:

- Submerge the electrode in solution
- Stir for a few seconds, and see the results.

- ✓ **Conductivity is linked to temperature**
- ✓ **Small variations (50 to 100 micromhos) during the week, the day or shifts**



NORMAL CHARACTERISTICS

WHY MEASURE CONDUCTIVITY?

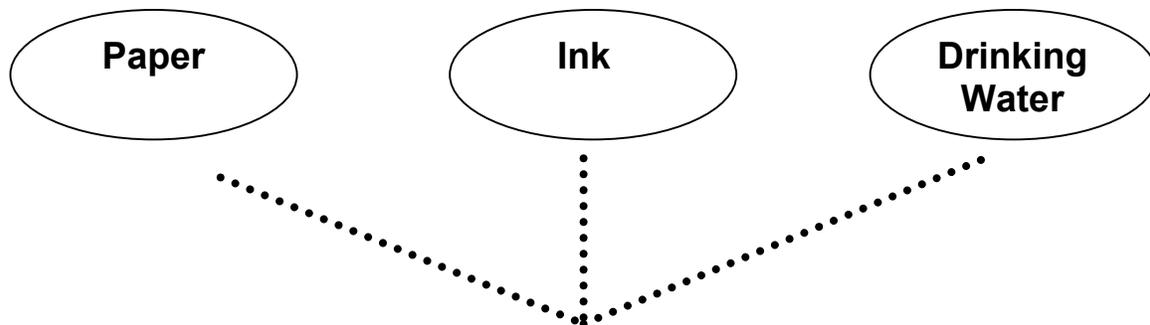
- ⇒ Because pH measurements don't indicate precisely the difference between the quantity of a solution concentrate (etch), and the quantity of a diluted fountain solution.

NON-BUFFER solution concentrates (etch)

- Acid : pH of 3 or less
 - ⇒ Conductivity measurements show whether the appropriate concentrate (etch) has been added to the diluted solution.
 - ⇒ Use the supplier's recommended quantity per gallon when preparing the fountain solution.

BUFFER solution concentrates (etch)

- Contain chemical salts that brings the fountain solution to a nearly constant pH (between 3.5 and 5.5 degrees)
- Maintain a constant pH during the press-run, despite the residues of:



Can't be detected with the pH only

•
Affects the concentration of a fountain solution

CONDUCTIVITY READING

- High conductivity readings ⇔ **HIGH** concentration of etch
- Low conductivity readings ⇔ **LOW** concentration of etch

PRINTING PROBLEMS

RESULTS OF AN INCORRECT SOLUTION CONCENTRATE (etch)

EXCESSIVE CONCENTRATE

- ✓ Emulsification of ink
- ✓ Flat tint
- ✓ Bad ink receptivity
- ✓ Premature plate wear
- ✓ Slow drying of ink
- ✓ Degradation of the rollers

INSUFFICIENT CONCENTRATE

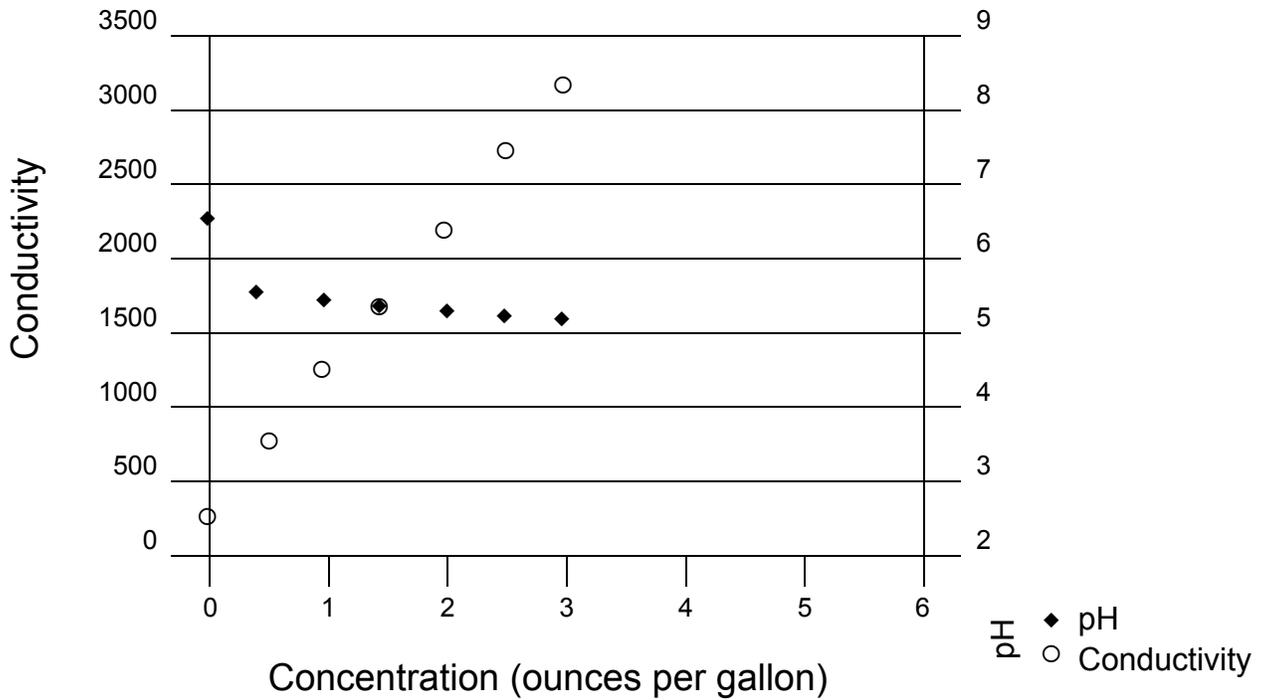
- ✓ Skimming
- ✓ Flat tint
- ✓ Insufficient gum
- ✓ Premature plate wear

HOW TO CONTROL pH AND CONDUCTIVITY?

- Establish pH and conductivity according to the quantity of concentrate (etch) used
- Add ½ ounce (15 ml) of concentrate (etch)
- Measure pH and conductivity
- Place the value on a diagram. (See chart on next page)
- Increase fountain solution concentrate by ½ ounces increments
- Continue to outline the diagram with the results of pH and conductivity, until you have a few related points on the diagram
- Draw lines between pH and conductivity points

pH vs Conductivity

Concentration of an acid buffer solution (etch)



pH vs Conductivity

Concentration of an acid non-buffer solution (etch)

