

**The Potential Effects of Different Photochemical Solution
Compositions for Color Film and Print Processing on Silver
Discharge Concentrations from Pureflow
Silver Recovery Cartridges
Photochemical Solutions and PF-16 Columns:**

Introduction:

PF-16 Columns are designed for the removal of silver from a standard mixture of photochemicals from color film and print processing. This includes fixer, bleach-fix, and developer (in concentrations usual for standard mini-labs). The standard silver discharge level for these solutions, using a PF-16 cartridge set, is less than 0.4 ppm silver. However, the discharge silver concentration may rise if there are deviations from the standard mixture of photochemicals. The following solution compositions are examined for their effect on silver discharge levels.

Developer:

No Developer: A photochemical solution with the developer removed will have almost equal volumes of fixer and bleach-fix. PF-16 Columns will perform to specification treating a mixture of fixer and bleach-fix. In general, the removal of developer from any photochemical mixture will help PF-16 columns perform better and reduce the silver discharge concentration. Equal mixtures of fixer and bleach-fix are recommended for PF-16 columns.

Pure Developer: Pure developer will cause the discharge silver concentration to rise sharply. The silver concentration will likely exceed 5 ppm. Any increase in developer concentration beyond that for a typical photochemical mixture will generally cause a rise in the silver discharge concentration. Photochemical solutions with abnormally high concentrations of developer are not recommended for PF-16 columns.

Bleach-fix:

No Bleach-fix: A photochemical solution with the bleach-fix removed will have almost equal volumes of fixer and developer. The increase in developer concentration (for the mixture) will cause the silver discharge concentration to likely exceed 5 ppm for color processing. Color photochemical solutions with high concentrations of developer are not recommended for PF-16 columns. However, Black and white chemistry solutions are recommended for processing by PF-16 columns without bleach-fix.

Pure Bleach-fix: Pure Bleach-fix are recommended for treatment by PF-16 columns. The reduction of fixer chemicals to help in the recovery of silver is compensated by a reduced pump flow rate. The pump flow rate should not exceed 0.5 gph.

Fixer:

No Fixer: A photochemical solution with the fixer removed will have increased concentrations of bleach-fix and developer. The increase in developer concentration (for the mixture) will probably cause the silver discharge concentration to exceed 5 ppm. Photochemical solutions with high concentrations of developer are not recommended for PF-16 columns.

Pure Fixer: Pure fixer solutions are recommended for PF-16 columns. Pure fixer solutions from one-hour processors can produce silver discharge concentration \leq 0.1 ppm

General Guidelines:

- Any increase in developer concentration will increase the discharge concentration of silver.
- Any decrease in developer concentration will reduce the concentration of silver in the discharge.
- An increase in bleach-fix concentration above normal will have some negative affect on the discharge concentration of silver unless the flow rate is reduced.
- Decreases in bleach-fix concentrations will reduce the silver discharge concentration, as long as the developer concentration does not increase.
- Any increase in fixer concentration will reduce the silver discharge concentration.
- Any decrease in fixer concentration will tend to increase the silver discharge concentration, but may not cause silver discharge to exceed 5 ppm.