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Pigment or Dye-based Inks

The dye in the dye-based ink dissolves in water like sugar does in water. Pigment does not dissolve completely. It is more like a flour and water mixture. Because of this, dye-based inks flow better and have been the standard in inkjet printers. But the dye will re-dissolve and the ink will flow across the paper if drops of water hit the paper.

Pigment-based ink particles tend to settle into the tiny fibers that make up the paper. As the ink dries, the pigment particles get stuck in the fibers. Thus, the pigment-based inks are more water resistant than the dye-based inks.

Only about 5 to 10 percent of the ink will re-flow if the paper is touched by water.

Fade Resistance

The molecules in dye-based inks are spread out. You might think of dye-based ink on paper as similar to a beach covered with sand. Because of this, dye-based ink tends to fade quicker, since all of the molecules are exposed to the chemical and sunlight-caused reactions that fade the ink. You may notice fading of dye-based inks exposed to direct sunlight commonly in 6 to 12 weeks, although when protected from air and sunlight, these inks can last several years. However, new dyes developed originally by HP, Fuji, and Epson have improved the fade resistance of dye-based inks to be equivalent to the capability of many pigment-based inks.

Pigment particles are similar to large pebbles on a beach. It is much more difficult for sunlight and chemicals to react with all of the pigment molecules, since most of them are hidden inside the "pebbles". Pigment-based inks will usually last for several months before fading becomes noticeable, and when protected from air and sunlight, these inks can last for many years.

Special Pigment-based inks are those which are rated as "Archival Quality". Archival quality pigment-based inks use special pigments to improve the fade performance beyond that of normal pigment-based inks. Fading becomes noticeable when exposed to direct sunlight in 6-12 months, but when protected from air and sunlight these inks will last for decades.

For extremely long archival conditions, the best thing to do is enclose a CD with the document or photographs.

That way, if there is any damage down the road, you can simply reprint the material.

Print Quality

It is possible to get more "colour" into dye-based ink than into pigment-based ink. Therefore, dye-based ink colours tend to be more vibrant than pigment-based colours. Pigment-based black inks tend to be slightly lighter than dye-based inks.