

# [As a bubble to form. this bubble then](https://assignbuster.com/as-a-bubble-to-form-this-bubble-then/)

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Asprinting evolves from one method to the next, so do the inks utilized in themachine. Inkjet printing was first developed during the 1950’s. However, thetechnology didn’t begin to produce digital images until the 1970’s. It wasn’tuntil the late 1980’s that these printers hit the consumer market (Haigh, 2018). Now inkjet printers are the most commonly used type of printerthroughout the world. Inkjet printers are a type of computer printing thatcreates a digital image by streaming drops of ink onto a substrate.

There aretwo different technologies of inkjet printing; continuous inkjet printers anddrop on demand inkjet printers. Continuous inkjet printers contain a highly-pressurizedpump which dispenses a liquid ink through a nozzle, creating a continuousstream of ink droplets. Drop on demand printers are separated into thermal andpiezoelectric processes. During the thermal inkjet process tiny chambers, eachcontaining a heater, receive a pulse of current which causes a bubble to form. This bubble then causes pressure which forces a droplet of ink onto thesubstrate. During the piezoelectric drop on demand process, a piezoelectricmaterial inside the tiny chambers change shape when a current is applied, creating pressure (Woodford, 2017). Similar to the thermal process, thispressure then forces a droplet of ink to release.

So which inks do we use foreach process? Which inks are best for the particular substrate being used? Thethree kinds of ink used for inkjet printers are solvent inks, UV-curable inks, and water based inks. Solventinks create vibrant, beautiful prints that are fade resistant and typicallywaterproof. Based on the volatile organic compounds these inks are made from, theink is relatively inexpensive and capable of printing on all types ofsubstrates.

The vibrant color is a result of the use of pigment in the inkinstead of dye. The pigment also contributes to the lack of fading anddurability of the print. Inkjet printers that use solvent ink have generally ahigh print speed and utilize particular drying equipment such as heaters andblowers. Solvent inks are divided into two separate categories, hard solventinks and mild solvent inks.

Due to the high content of volatile organiccompounds in hard solvent inks, specialized ventilation is necessary to avoidthe dangerous fumes. However, these inks do provide the greatest amount of durabilityand least amount of coatings after printing. Similar to hard solvent inks, mildsolvent inks produce the same amount of durability but are safe to use in anenclosed area.

The main disadvantage of solvent inks are the hazardous vaporsthat are produced and the inefficient method of disposal of used solvent inks. Basedon their properties of durability and vibrancy, solvent inks are typically usedfor billboards and other large printed displays. Solvent inkjet inks areexcellent high quality inks are used versatility in the industry. Ultra-violetcurable inkjet inks provide a huge advantage in the printing industry, apractically inexistent drying time. Due to this method, the print process forultra-violet inks is extremely fast.

UV curable inks are composed of acrylic monomerswhich are cured after printing with a strong ultra-violet light. This radiationthat the ink is exposed to causes the initiators within the ink to chemicallyreact, converting the liquid ink into a solid. During this chemical reaction noink is evaporated through heating, but cured through firmly setting into thesubstrate. This results in the entirety of the ink being used, providing highquality colorization. A major disadvantage of ultra-violet cured inks is thelimited number of substrates that it can be applied to.

These inks are oftensubject to crack when adhered to flexible substrates due to the volume of ink thatremains after being cured. Because of this UV cured inks are typically onlyapplied to rigid surfaces such as wood, plastic, or aluminum. However, companies around the world are continuously researching and expanding knowledgeon these technologies. In Ink World magazinePeter Saunders states, “ Over the years as lamp and ink technology haveadvanced, at Sun Chemical we have developed a series of graphic inks whichfully cure with LED UV exposure” (Savastano, 2016). Another disadvantage to ultra-violetcured inks is the expense it requires to acquire the curing modules and ink. Overall, ultra-violet curable inks produce high quality images through the latest inkjettechnology. Waterbased inkjet inks are commonly found in family homes with a basic desktopprinter.

These inks are based on a mixture of water, glycol, and a dye orpigment. Water based inks are typically used in thermal drop on demand inkjetprinters due to the need of water in the thermal heads. Although relativelyinexpensive, water based inks provide a wide range of color gamut and vividdisplays of images (FESPA staff, 2014). However, due to the composition ofthese inks they are often difficult to manage on the substrate. Unless the substrateis coated, in the presence of water the ink will begin to run. Water based inksincorporating dye instead of pigment are less durable and prone to fading.

Pigment incorporated water based inks tend to cost more but will provide betterlong-term wear. Although water based inks are not always portrayed as highquality, these inks are common for basic printing due to the low cost. Inkjetinks have adapted to the high pace, technology driven world we live in today.

With the extensive amount of printed materials being developed daily, thedemands of printers have increased tremendously. Although the printing industryhas developed many new technological advances in the past few decades, companies and organizations are still researching further ways to advance thisfield.