DP3 Newsletter
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5th Anniversary of the DP3 Newsletter



This issue marks the 5th anniversary of IPI's quarterly DP3 Newsletter. As the principal investigator of our ongoing digital print preservation research, I would like to take this occasion to once again thank our DP3 Project funders the Andrew W. Mellon Foundation and the Institute of Museum and Library Services as well as all our loyal subscribers. We couldn't do it without you. Our success also wouldn't be possible without the many dedicated IPI staff, both past and present, as well as student employees, interns, fellows, and visiting scholars that have contributed time, talent, and expertise. Thank you all!
*– **Daniel Burge, Senior Research Scientist***

Tips for Handling Inkjet Prints Mini-Poster

IPI has created a small poster with the basic "Do's" and "Don'ts" for handling inkjet photographs and fine art. It is free for download. It can be hung up in spaces where inkjet prints may be handled such as exhibition preparation areas, conservation labs, and reading rooms. It can also be placed directly in boxes with prints to ensure that no matter where the objects are handled, the right care will be taken.

Download the mini-poster (PDF).

Summary of Arrhenius Pollution Project



A 2009 IPI survey found that approximately 80% of museums, libraries and archives already have inkjet prints in their collections and that they are concerned about receiving increasing numbers of these materials. The survey also showed that objectionable deterioration had already occurred to some of their prints including fading, yellowing, color bleed, and surface cracking and delamination. In total, 71% of institutions had already experienced deterioration in their digital print collections. Previous experimental research, both by IPI and others, was able to establish a clear connection between ozone and nitrogen dioxide exposure and each of those forms of decay. Development of effective methods to mitigate such damage will, therefore, be critical to the survival of these objects for future generations. This current study was aimed specifically at determining the efficacy of one particular approach, mitigating pollutant damage to inkjet prints through lowered-temperature storage. Since the deterioration due to pollutants occurs through chemical reactions, it should be possible to slow decay through cool or cold storage.

The Arrhenius method was used to predict the times to significant fade or yellowing of prints exposed to 1ppm ozone or 5ppm nitrogen dioxide. Test targets were incubated at 25°C, 30°C, 35°C, 40°C, and 45°C at 50% RH for multiple intervals up to 56 days. Cyan, magenta, yellow, and black color patches were monitored for density loss. Unprinted, white areas were monitored for paper yellowing. Samples were also visually evaluated for signs of color bleed and surface cracking. It was found that lower temperature does in fact reduce the rates of decay but not equally for both pollutants. Low temperature was more effective at reducing yellowing caused by nitrogen dioxide than it was at reducing the fade caused by ozone; however, cool or cold storage can clearly extend the usable life of inkjet prints in collections.

IPI is also studying whether various enclosure materials and designs can be effective at mitigating pollutant-induced damage. When that experiment is complete, we will integrate the results of all our pollution experiments with our thermal stability studies to create a comprehensive set of storage temperature and humidity recommendations.

Download the full technical article (PDF).

ID Tips: Offset vs. Liquid-toner Electrophotography

While liquid-toner electrophotography does share similar dot patterns and appearances with offset lithography, there are tell-tale clues to help differentiate the two. The first is the date the print was made. While liquid-toner as a technology had been experimented with even prior to the digital print age, it didn't really come into its own until the Indigo Digital Press was introduced in 1993. Since then, this technology has been used by the commercial printing industry to fulfill jobs both large and small, and with quality ranging from low-end disposable advertisements to high-end photography and art reproduction books.

If a print in question was created after 1993 or if the date of creation is unknown, then a microscope, along with some practice, should provide all the information necessary to make an accurate ID. Optimal magnification will be from 50-100x.

The second clue to look for is dot morphology. Morphology refers to the shape of the half-tone dot. An offset press compresses the ink first against the surface of a transfer blanket and from there to the paper, giving the dot a squished-looking ragged edge. The liquid-toner dot on the other hand is formed by the pooling of liquid on the blanket and is mostly dried before being transferred to the paper allowing the dot to be more circular in shape.

Read More

Terminology

Electrophotography - This is a printing process in which the image is formed by transfer of charged toner to paper and then fixing it by heat, pressure, or evaporation. It was the technology originally used in analog photocopiers but is now the process used by laser printers, digital photocopiers, and many commercial digital printers.