Contemporary Analog and Digital Color Photographic Prints: Dye and Pigment Print Process Descriptors, Naming Conventions, Dating, and Permanence Characteristics

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Introduction:
Drawing on the many years of research associated with The Wilhelm Analog and Digital Color Print Materials Reference Collection – 1971 to 2014, this paper describes the wide range of color print processes that comprise the modern era of color photography and traditional photographic processes, as well as the taxonomic classification and nomenclature that has emerged since Kodak’s introduction of Kodakchrome transparency film and the companion Kodak Mini- color print process announced in 1941, both of which utilized inorganic compounds of cadmium, manganese, and yellow dyes formed by a process known as chromogenic development using external couplers. These products were followed by a large number of color transparency and color negative film and print systems from Kodak, Agfa, Anso, GAF, Fuji, Konica, 3M, Ferrania, and others. Photographers, galleries, and museums have variously referred to color print materials by these dye image processes as: Type C Prints; Type R Prints; Chromogenic Prints; Color Coupler Prints; Silver-Halide Prints; Lightjet Prints; Lambda Prints; Digital Type C Prints; Digital C Prints; Digital Chromogenic Prints; Duratrans; Digital Duratrans; and brand-associated names such as Ektacolor or Printkodak; Fuji Prints; Crystal Archive Prints; Fujiflex Prints; DigitalPhotos; Endura Transparency Display Material; and so forth.

In recent years, many of these print materials could be exposed with an enlarger or contact printed in an “analog” fashion, and the same print material could also be digitally imaged with scanning RGB laser or LED light sources (which can also produce monochromatic images on color papers), further adding to the confusion about what the print materials should be properly called. Face-mounting on acrylic sheets, lamination, and various types of print coatings have further complicated the naming situation.

Likewise, dye image prints made by the silver-dye-bath process and dye transfer prints have been described using a variety of names, some brand-associated and some with names descriptive of the image formation process. Digital inkjet processes began entering the photography market in 1991, with dye image prints made on a wide variety of papers by Nash Images and others using Iris Graphics Printers. A few years later, affordable desktop and large-format inkjet printers were introduced by Epson, Hewlett-Packard, and Canon, which were soon followed by Brother, Kodak, Agfa, HP-Scitex, Mutoh, Mimaki, Roland, EFI-Vutek, Durst, swissQprint, Canon-Oce, Fuji, Noritsu, and many other manufacturers.

Inkjet printers with improved stability pigment inks came into the market in 1998 and by 2006 most professional and fine art photographic prints were being made with pigment inks, often with printers utilizing six, eight, ten, or even twelve inks. Aqua-based aqueous pigment inks were later supplemented by solvent-based inks, UV-curable inks, dye-sublimation inks (used with a transfer process for both prints on fabrics and on treated aluminum base “Metal Prints”), and aqueous Latax inks.

Unlike earlier color print processes, inkjet prints can be made on a very wide variety of substrates, including cotton-fiber fine art papers, acceptor paper, photographic papers, plastic supports, and fabrics. UV-curable ink prints can be made with rigid panels, including large sheets of acrylic, aluminum, glass, plywood, and other materials.

In part because the inks and supports used to make inkjet prints are supplied as separate parts of the printmaking process, there are essentially an unlimited number of combinations of inks and supports, which has in turn greatly complicated the description, dating, and naming of these prints. This paper presents an outline of an approach to understanding these processes and naming their outputs, based on the wide variety of digital imaging techniques and the names with which they are agreed.

Proposed Naming Conventions for Digital Print Processes (a work in progress....)

The era of analog silver-based color photography is rapidly drawing to a close. It is believed that on the order of ninety-nine percent of all prints now being produced are being printed with digital technologies.

Whether for wall labels, auction catalogs, captions in magazines and books, or with museum acquisition records, there are a number of important considerations to follow when determining the name of a print process:

1) What name or names do the manufacturers of the materials use? For example, Kodak’s and Fuji’s product literature, data sheets, and websites do not use the terms “chromogenic” or “dye-coupling” to describe their traditional silver-based color papers. Rather, these products are referred to as “silver-halide color paper” or, more often, simply, “silver-halide paper” (it should be noted that Kodak no longer manufactures B&W paper).

2) What do the photographers and print-making labs call their prints? This is where things have become really complicated, and a wide variety of names have been or are being used. As an example, many photographers and printmaking labs refer to prints made with silver-halide color paper (whether exposed digitally or from a color negative with an analog enlarger) as a “Type C” print. This name dates all the way back to “Kodak Color Print Material, Type C” that Kodak introduced in 1955 (this was the first color negative paper that Kodak sold to non-Kodak labs and individual photographers). In 1958, Kodak renamed the product “Kodak Ektacolor Paper.” The “Type C” name stuck however, and it is still widely used (or misused) today. It is important to note that genuine “Type C” prints do exist; that is, color prints that were made on the material during the period of 1955 to around 1960.

3) What print process descriptors do dealers, galleries, and auction houses use? In the author’s experience, dealers, galleries, and auction houses either adopt (carry forward) the process names used by the photographers and/or print-making labs. Or, in an often inconsistent manner, dealers, galleries, and auction houses replace the photographer’s designations with their own terminology.

4) What print process descriptors do collectors, museums, and archives use? This appears to be an inconsistently applied combination of numbers 1 through 3 above.

It is important to have an understanding and a respect for both historical usage and the current practice of all of these different constituencies in attempting to develop a more unified set of process descriptors that will be both understood and widely adopted by the photography field. It is hoped that he proposed descriptors listed below will be a step in that direction.

Names to avoid:

- Giclee Print
- Giclee Image Print
- Digital Fine Art Print
- Fine Art Inkjet Print
- Archival Inkjet Print
- Archival Giclee Print
- DirectPrint on Aluminum (UV-Curable Inks printed on aluminum)
- Acrylic Print (UV-Curable Inks hanged/painted on acrylic)
- Archival Print on Fine Art Paper
- Epson Print

Silver-Halide Dye Processes

Chromogenic color silver-based dye prints: Kodak Type C photo-slab supplied by SIOC, Fuji, Konica, Agfa, Ilford, 3M, Fomabrom, GAF, Anso, and other manufacturers.

- Silver-Halide Dye Print (Fuji)
- Silver-Halide Dye Backlit Print (Fuji)
- Silver-Halide Dye Print (Kodak)
- Silver-Halode Dye Backlit Print (Kodak)

Heat-Set Dye Sublimation Processes:

- Dye Sublimation Print (ChromaLuxe)
  (Printed on aluminum with a proprietary gloss or matte white coating)
- Dye Sublimation Print (Hiefechrome)
- Dye Sublimation Print (Cibachrome)
- Dye Sublimation Print (Hiefechrome was last manufactured in 2011, but some prints are still being made).

Silver-Dye-Bleach Processes:

- Silver Dye-Bleach Print (xerox)
- Silver Dye-Bleach Print (Hiefechrome)
- Silver Dye-Bleach Print (Cibelchrome)

Archival Inkjet Print

- Dye Transfer Process (Kodak)
  (Dye Transfer was last manufactured in 1994 but some prints are still being made).

Next Steps:

Working in collaboration with others in the field, this list of process descriptors is being expanded, and histories with detailed technical descriptions are being added to each entry (both for the recommended descriptors and for those that should be avoided).

Where possible the entries will be linked to the WIPI print permanence database so as to offer guidance on display, storage, temperatures, and handling. It is intended to structure the process descriptors in a way that will be compatible with the protocols being developed for the “Identification and Characterization of Materials and Techniques” as part of the “Guidelines for Descriptive Terminology for Works of Art on Paper” project at the Philadelphia Museum of Art (see below). Comments and suggestions are welcome!

At the same time, the process naming descriptors presented in outline form here will be used in the forthcoming book by Henry Wilhelm and colleagues: The Digitally-Printed Photograph: History, Processes, Practice, Identification, Dating, Permanence, and Care (working title). The book will be made available in updateable eBook and Print-on-Demand (POD) editions to better address this constantly evolving field.