



J22 Writing Instrument Developments: Hybrid Pens, Rollerball Pens, and Mixable Fountain Pen Ink

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Learning Overview: After attending this presentation, attendees will be aware of three evolutions in writing instruments: (1) hybrid pens; (2) roller ball pens that are compatible with fountain pen ink; and (3) mixable ink for fountain pens. Examples of the physical and optical characteristics of these pens and inks when examined with a variety of instrumentation including hand magnifiers, microscopes, spectral examinations, and scanned images of the writings will be shown.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by raising awareness of these developments in the writing instrument industry. This presentation will provide information on the features that may be observed if examining such writings or inks.

Far from being a static industry, the writing instrument world continues to develop new and evolving products that may be used in writing. Although document examiners may not always need to precisely identify the type of writing instrument used in the production of writing, there is a need for an awareness of the ever-increasing types of writing instruments in use. Standards, such as those from the Scientific Working Group for Forensic Document Examination (SWGDOC) and the European Document Experts Working Group (EDEWG) outline some instances in which observations may disclose evidence that must be considered as part of an examination.¹⁻⁴

Hybrid pens utilize a combination of ballpoint and gel ink. The intention of the manufacturer is to provide a longer-lasting ink supply typical of ballpoint pens, with the benefits of smooth writing as often experienced with gel pens. Differentiating between hybrid pen lines and those of ballpoint or gel can be very challenging.

Most rollerball pens are supplied with rollerball refills, but a few are designed to take fountain pen ink. Even when chemical analysis is permitted, there is the potential for misinterpretation of the writing instrument type if too much reliance is weighted on the chemical composition alone.

Ink manufacturers advise against the blending of fountain pen inks. The reason being that blending different inks may result in coagulation of the ink and clogging of the pen; other more adverse chemical reactions have been known to occur. Mixable ink is formulated to permit the blending with variable proportions to make a wide variety of desired colors.

This presentation will provide some indication of what features may be reliable indicators of hybrid ink writing and rollerball pens that use fountain pen ink. For mixable fountain pen inks, this presentation will highlight how well the inks blend together, the homogeneity of any such mixture, and the evidence that may indicate to a document examiner that the written line may be the result of blended fountain pen ink.

Reference(s):

1. SWGDOC. *Standard for Test Methods for Forensic Writing Ink Comparison.*
 2. SWGDOC. *Standard for Writing Ink Identification.*
 3. SWGDOC. *Standard for Examination of Handwritten Items.*
 4. European Document Experts Working Group (EDEWG). *Examination of Alterations.*
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Writing Instruments, Fountain Pen Ink, Hybrid and Rollerball Pens