

Semi-Conductive Printing Rolls for Improved Print Quality

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Abstract

In the evolution of producing an ink/toner transfer roll for electrophotography, the resultant print quality is a complex function of many variables and variable-interactions within a given print system. Print system component compatibility, including semi-conductive rollers, inks/toners, substrates, and system configurations can be evaluated independently on a limited basis, but ultimately, print quality must be evaluated in the complete print system. Key to roller performance are dielectric properties, surface properties, and wear properties. Uniform and stable dielectric properties are critical to desired print quality through the expected service life of semi-conductive rollers. Volume resistivity, for

example, is a basic electrical measurement that can be used to correlate with print quality over a roller's service life. OEM print system components and design must be factored into the design and construction of semi-conductive rollers – including polymer selection. Targets for expected service life and print quality can then be used to design these rollers to ensure achieving total print system performance. Electrical and mechanical characteristics of these rollers are optimized through design of experiments. Determination and design of performance attributes of semi-conductive rollers will be presented. A model resin system with active dielectric and mechanical additives has been extensively tested for electrical, surface, and wear properties to optimize print quality.