

## **IN-SITU CHARACTERIZATION OF TA THIN FILMS FOR THERMAL INK JET DEVICES**

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Ta is the most common material used in thermal ink-jet (TIJ) print cartridges due to its thermal properties, resistance to cavitation damage, resistance to damage from corrosive inks, low cost and ease of deposition. Ta thin films are not, however, immune to crystallographic changes as a result of an extended TIJ firing process. In fact, as the on-board lifetime of individual print cartridges is extended, the behavior of the Ta film plays a critical role in the reliability of the device. In this study, the phase, orientation and thin film morphology of Ta resistor films have been characterized via in-situ two dimensional x-ray diffraction methods as a function of the number of drops of inks fired from those resistors. The effects of an electrical "pre-anneal" or resistor conditioning process, is also addressed.