MEMs Drying using Supercritical Carbon Dioxide

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Pattern collapse (deformation or bending) of structures, a phenomenon related to the surface tension of rinse solution and a function of spacing and aspect ratio of patterns, becomes an increasingly serious problem as smaller features are desired. Excellent success using supercritical drying to prevent collapse by eliminating surface tension by means of supercritical fluid has been demonstrated on MEMS and silicon structures. By performing an exchange step to replace resist rinse liquid with liquid CO2 , then pressurizing to supercritical and gradually reducing density until vapor is present, the rinse liquid can be 'dried' without allowing the presence of a liquid /vapor interface.