A Novel NF_3-HDP-CVD Process for STI-Filling in Sub-90nm DRAM and Beyond

Yong-Won Cha, Sang-Ho Rha, Won-Jin Kim, Kyu-Tae Na, U-In Chung, Joo-Tae Moon

Process Development Team, Memory Division, Samsung Electronics Co., LTD.
San #24, Nongseo-Ri, Giheung-Eup, Yongin-City Gyeonggi-Do, Korea 449-711

Tel : 82-31-209-4801, FAX : 82-31-209-6299, E-mail : yongwon.cha@samsung.com

A complete filling of the shallow trench isolations (STI) in sub-90nm DRAM is realized with the novel NF_3-HDP-CVD process. The gap-fill capability of the NF_3-HDP-CVD increased dramatically as NF_3 gas is added to the conventional SiH_4/O_2 chemistry of HDP-CVD process. The effect of the NF_3-HDP-CVD processed STI is investigated by analyzing the transistor characteristics and yield in 512M DRAM.