

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Borosilicate films as permeability barriers¹ J. R. APPELEGATE, C. E. STEINMETZ, J. D. HETTINGER, Department of Physics and Astronomy, Rowan University, J. F. CARROLL, R. KRCHNAVEK, Department of Electrical and Computer Engineering, Rowan University — Borosilicate films have been deposited using rf-sputtering techniques from a composite target at room temperature onto polypropylene (PP), high density polyethylene(HDPE), low density polyethylene(LDPE), and polyethylene terephthalate (PETG) substrates. Films were found to be smooth, flexible, with excellent adhesion to the substrates. Repeated rolling the coated substrates on a radius of 0.5mm resulted in no discernable damage for films less than 200nm in thickness. Creasing the substrates did result in local damage. However excellent adhesion did not allow the fractured glass to come off the substrate. Heat generated during deposition only influenced the films grown on LDPE where the thermal expansion mismatch between the film and substrate induced strains caused fractures in thick films. Modifications to processing parameters allowed thick films to be grown without fractures. Permeability measurements of nitrogen resulted in significant improvements in comparison to uncoated substrates.

¹This work supported by Wheaton Industries, Inc. Millville, NJ

Jeffrey Hettinger
Department of Physics and Astronomy, Rowan University

Date submitted: 19 Nov 2008

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