

Bulk metallic glass coating of polymer substrates

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Abstract

Bulk Metallic Glass (BMG) alloy films were deposited by sputtering on polycarbonate (PC), polymethyl methacrylate (PMMA), polyacrylamide (PAA+50GF) with 50 % glass fiber reinforcement, polyphenylene sulfide (PPS+30GF) with 30 % glass fiber reinforcement, poly(tetrafluoroethylene) (PTFE), polybutylene terephthalate (PBT+30GF) with 30 % glass fiber reinforcement and on polyamide (PA12) substrates. Coating adhesion was measured by tape test. The compositions of the deposited materials were studied with FEG-SEM and by EDS. The coating microstructure was determined with XRD and compared to microstructure of a cast specimen having the sputtering target composition. Adhesion values high enough to pass the tape test were achieved using PAA+50GF, PPS+30GF, PTFE, PBT+30GF and PA12 substrates and $Zr_{55}Cu_{30}Al_{10}Ni_5$ amorphous alloy coating and they are looking promising for future BMG-alloy applications. The residual stresses of deposited BMG coatings still need to be studied.