

PROCESS OPTIMIZATION OF PPS BY USING TAGUCHI METHOD FOR EROSIVE BEHAVIOR: MICROCOMPOUNDING AND INJECTION MOLDING

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ABSTRACT

Erosive behavior of polyphenylene sulfide (PPS) was optimized as a function of micro-compounding and injection molding parameters: Barrel temperature (°C), compounding round (rpm), compounding time (min.), mold temperature (°C), injection pressure (bar), holding pressure (bar) and holding time at pressure (sec). For this purpose, design of experiments approach utilizing Taguchi's L27 (37) orthogonal arrays were used. Design of experiments was carried out on the basis of three different levels of the processing parameters mentioned above. Solid particle erosion tests were performed according to ASTM G76-07 and the output of erosion rate value was obtained and analyzed. With optimized process parameters; confirmation solid particle erosion tests were performed for the best erosive behavior. Lastly; it was suggested that with optimized erosive resistance behavior, PPS can be reinforced for further improvement in erosive behavior.

Key Words: Polyphenylene Sulphide (PPS), Differential Scanning Calorimeter (DSC), Taguchi Analysis, Microcompounding, Injection Molding