

OPTIMIZATION AND EROSION WEAR RESPONSE OF UNCOATED PUMP IMPELLER MATERIAL SS-404 USING FLY ASH

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ABSTRACT

BACKGROUND/OBJECTIVES

The paper deals with the Optimization and Erosion Wear Response of Uncoated Pump Impeller Material SS-404 using fly ash; investigated and evaluated using a pot tester under varying impact parameters.

METHODS/STATISTICAL ANALYSIS

SS-404 was considered for experimentation and the experiments were conducted under the influence of varying factors of solid concentration, rotational speed and time period using Taguchi approach. Pot tester was used for experimentation at the rotational speeds of 700, 900, 1100 and 1300 rpm while time periods were 75, 100, 125 and 150 minutes. The solid to liquid concentrations of erodent fly ash were kept at 40, 50, 60 and 70%.

FINDINGS

Taguchi approach was employed to investigate the erosion wear response of pump impeller material stainless steel SS-404 and a slurry pot tester was used for the purpose of experimentation. The experiments were performed randomly at the varying impact parameters of speed, concentration and time. It was found that speed contributes the most in erosion wear of the pump impeller material followed by concentration and time, respectively. At the lowest impact parameters, ploughing was found to be the major wear mechanism and erosion wear as the minor wear mechanism. However, at the highest impact parameters erosion wear was found to be the major wear mechanism while ploughing was found to be the minor wear mechanism.

IMPROVEMENTS/APPLICATIONS

Erosion wear response is investigated with HVOF sprayed coatings. It is also observed that the erosion wear response of WC-12Co-4Cr and Stellite-6 coated pipeline material SS-317L increase with the increase in the impingement angle till 30 degree observe maximum value and decreases with the impingement angle 90 degree.

KEYWORDS: Optimization, Erosion Wear, Stainless Steel SS-404, Rotational Speed, Concentration, Time Period & Fly Ash Slurry