A Study on Rebound Characteristic of Sealing Ring Used in Solid Rocket Motor

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Solid Rocket Motor (SRM) is a key component for the missile and space rocket. Sealing performance is an important index for SRM assembled. It is a necessary condition for study on the sealing performance of SRM to determine the residual stress of sealing ring which is difficult to be obtained by direct detection in engineering practice. This paper derives the quantitative expression of the relationship between residual stress, pressure difference and preload stress and establishes the method of determining residual stress of sealing ring by mechanical analysis. With the help of experiment, verify the correctness and applicability for expression meanwhile, analyze the influence of SRM's types and rubber sealing ring materials on residual stress changed under the effect of pressure difference. Therefore, the method of residual stress determined provides theoretical support to improve the SRM assembly process and lays a foundation for later study on the leakage rate of SRM.

Keywords: Solid rocket motor, Rubber sealing ring, Rebound characteristic, Residual stress

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