SHPB 기법과 Pulse shaper 기법을 이용한 저온상태 고무재료의 동적 변형 거동 특성

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Dynamic deformation behavior of rubber material at the low temperature by using SHPB technique and Pulse shaper

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Key Words: Split Hopkinson pressure bar(SHPB), High strain rate(고 변형률 속도), Pulse shaper (펄스 조정기)

Abstract : The rubber is generally used as a primary suspension component in a vehicle or a mechanical structure.An experimental technique with a modified SHPB has been developed for measuring the compressive stress strain responses of materials with low mechanical impedance and low compressive strengths such as the rubber. This paper uses an aluminum pressure bar to achieve a closer impedance match between the pressure bar and the specimen materials. In addition, a pulse shaper is utilized to lengthen the rising time of the incident pulse to ensure dynamic stress equilibrium. We have examined the low temperature effects on the response of the rubber at high strain rate loading condition.

Al Alloy에 코팅된 TiAlN 박막의 기계적 성질에 미치는 interlayer의 영향

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Effect of interlayers in the mechanical properties of the TiAlN on Al Alloy

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Key Words: hard coating(경질박막), adhesion(접착력), TiAlN thin film(TiAlN 박막)

Abstract : Aluminum alloy is a very useful material in terms of weight and ralative strength compared to any other metallic material. However hardness of this material made limitations in its application.
We have been successfully developed TiAlN thin film of hard coating on Al alloy as a promising alternative to hard and light weight material for the application of high speed rotating machining elements. In this application the adhesion of hard coating to base material is the most important parameter. TiAlN coatings were deposited by DC magnetron sputtering with the negative bias using Ti based alloy cathode with interlayer of metal, like Ti, Zr or Cr at various N_2 partial pressures of the coating process. These metal interlayer were chosen from the affinity of base material and high reactivity. The coating experiments were carried out at varying N_2/Ar ratio. In this report, influence of interlayer and and nitrogen flow rate on the mechanical properties of TiAlN coating were investigated. As using of this experiments, we found that the hardness of this TiAlN is related with nitrogen to Ar ratio and the hardness was recognized through the XRD and scratch test.