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Reliability design of mechanical systems subject to repetitive stresses

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The basic reliability concepts - parametric ALT plan, failure mechanism and design, acceleration factor, and sample size equation were used in the development of a parametric accelerated life testing method to assess the reliability quantitative test specifications (RQ) of mechanical systems subjected to repetitive stresses. To calculate the acceleration factor of the mechanical system, a generalized life-stress failure model with a new effort concept was derived and recommended. The new sample size equation with the acceleration factor also enabled the parametric ALT to quickly evaluate the expected lifetime. This new parametric ALT should help an engineer uncover the design parameters affecting reliability during the design process of the mechanical system. Consequently, it should help companies improve product reliability and avoid recalls due to the product failures in the field. As the improper design parameters in the design phase are experimentally identified by this new reliability design method and recent patents are addressed, the mechanical system should improve in reliability as measured by the increase in lifetime, LB, and the reduction in failure rate, γ .

Biography

Seong-Woo Woo has a BS and MS in Mechanical Engineering, and he has obtained PhD in Mechanical Engineering from Texas A&M University. He major in energy system such as HVAC and its heat transfer, optimal design and control of refrigerator, reliability design of thermal components, and failure Analysis of thermal components in marketplace using the non-destructive such as SEM & X-ray. He worked in Agency for Defense Development, Chinhae, South Korea, where he was Researcher in Charge of Development of Naval Weapon System. Now he is working as a Senior Reliability Engineer in Side-by-Side Refrigerator Division, Digital Appliance, Samsung Electronics, and focus on enhancing the life of refrigerator as using the accelerating life testing. He also has experience about side-by-side refrigerator design for best buy, Lowe's, cabinet-depth refrigerator design for general electrics.

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