Design and Test of Microfabricated Strain Gauge for the Application of Flexible PU Heart Valve Membrane

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Abstract

Artificial heart valve has already been developed and studied for a long time [1]. Mechanical heart valves with flexible leaflets made of segmented polyurethane(PU) have reduced the phenomena of thrombus greatly due to the good biocompatibility of segmented PU. However, the flexible PU of prosthetic heart valve is prone to fatigue fracture due to the substantial and repetitive stresses during opening and closing cycles, which hinders its practicality and application [2]. Numerical simulation was often utilized to investigate the stress-strain relation when the flexible PU heart valve was operated [3]. While, accurate prediction of stress-strain relation is difficult to obtain when numerical simulation method was used. Therefore, it is necessary to directly investigate the strain distribution in the membrane when it exposed to a dynamic pressure, so as to improve the structure of flexible PU heart valve.

Keyword：Microfabricated Strain,PU,Heart Valve Membrane