

We demonstrate a fiber Bragg grating (FBG) pressure sensor based on a spring–diaphragm elastic structure (SDES) for measuring ultimate pressure. The ultimate pressure experiment demonstrates a stable linear relationship between the fiber Bragg grating central wavelength and external pressure in the range of 0–100 MPa, and the sensitivity of the pressure sensor is 79.7 pm/MPa with a linear correlation coefficient of 0.9998. In addition, the relative temperature sensitivity coefficients of the FBGs were obtained as  $K_P = 5.99 \times 10^{-6}/^{\circ}\text{C}$  and  $K_T = 6.265 \times 10^{-6}/^{\circ}\text{C}$  respectively to eliminate the temperature cross–sensitivity effect.