Abstract：Laminated fluoropolymer films with regular void structure, fabricated by using a process consisting of the patterning and fusion bonding steps, are polarized to be piezoelectric. The influence of the applied voltage on the piezoelectric d_{33} coefficient is investigated. The measurements of ferroelectric-like polarization-voltage hysteresis loops are taken to further understand the capability of polarization in the laminated films. The compressive Young's moduli of the films are determined from the dielectric resonance spectra. The results show that the laminated fluoropolymer films are piezoelectric after proper charging. The maximum d_{33} coefficients of the five-layer laminated piezoelectrets are achieved at the applied voltage of 5 kV. The remnant charge density of 0.3 mC/m^2 is obtained from the polarization-voltage hysteresis loop at a bias voltage of 4 kV. The measured anti-resonance frequency and calculated compressive Young's modulus for the five-layer laminated films are 112 kHz and 0.48 MPa, respectively.