Abstract：Layered polytetrafluoroethylene (PTFE) films of large area, composed of a porous PTFE core and two compact PTFE cover layers, which are commercially available, were internally charged by application of a corona discharge. The internal charges, which probably reside on the inner surfaces of the compact layers, make the films piezoelectric. Initial quasi-static piezoelectric d_{33} coefficients are in the range of 1000-2700 pCN^{-1}. After a 1500 min annealing treatment at temperatures of 90 °C, 120 °C and 150 °C, the d_{33} coefficients stabilize and typically reach about 75%, 40% and 25% of their initial values, respectively. They drop to 18% after a thermally stimulated discharge measurement extending from 30 to 215 °C at a heating rate of 3 °C min^{-1}. A pressure dependence of the piezoelectric d_{33} coefficients in such films is observed. This is due to the progressive densification of the core between the compact cover layers of the films. Microphones built with such films exhibit a somewhat decreasing frequency response up to about 2 kHz, an increase of the response due to diffraction effects at higher frequencies, and eventually a peak due to a thickness resonance at about 40 kHz. The microphone sensitivity below the diffraction and resonance ranges is about 1 to 1.5 $mVPa^{-1}$. This corresponds to dynamic d_{33} coefficients of 200 to 300 pCN^{-1}.