A dielectric film is formed on a free-standing conductive metal layer to form a multi-layer foil comprising a conductive metal layer, a barrier layer and a dielectric oxide layer. Such multi-layer foils are mechanically flexible, and useful for the manufacture of capacitors. Examples of barrier layers include Ni—P or Ni—Cr alloys. After a second layer of conductive metal is deposited on a dielectric oxide surface opposing the first conductive metal layer, the resulting capacitor foil is processed into a capacitor. The resulting capacitor is a surface mounted capacitor or is formed as an integrated or embedded capacitor within a circuit board.