This work compares padding and continuous padding Layer-by-Layer processes effects for the finishing of denim fabrics. TiO2 nanoparticles were used for fabrication of multilayer film deposition on denim fabrics by both dip-coating and continuous layer-by-layer deposition processes. Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy (FTIR-ATR) and Scanning electron microscopy (SEM-EDX) were used to verify the presence of deposited nanolayers. Photocatalytic activities of the nanocomposite films were evaluated through the degradation of red wine pollutant. Tensile strength tests, spectrophotometer analysis, air permeability and some color fastness tests of the denim fabrics were achieved.