Plasma modification method was used in order to increase the performance of the hot mix asphalt. Surface of mineral filler was modified by using three different components: methylmethacrylate (MMA), hexamethyldisiloxane (HMDSO) and silicon tetrachloride ($SiCl_4$). Plasma modified mineral fillers with hot mix asphalts were evaluated by Marshall Stability (MS) and Indirect Tensile (IDT) Strength tests, comparatively. According to the results, plasma modified samples showed higher stabilities and better properties. Especially, tensile strength of MMA plasma modified sample exhibit increase of 30%. Eco-friendly plasma modification technique provided homogenous, single step and fast processing for the modification of the asphalt materials.