

### Abstract

2-Hydroxypropyl-3-Piperazinyl-Quinoline Carboxylic Acid Methacrylate (HPQM) was used as biocide in silicone rubber compound. Antibacterial and mechanical performances of silicone rubber compound were assessed before and after exposure to UV light at different times. Drop-plate and halo tests were employed to qualitatively and quantitatively evaluate the antibacterial performance of silicone rubber compound against *Escherichia coli* (*E.coli*, ATCC 25922) and *Staphylococcus aureus* (*S.aureus*, ATCC 25923). The results suggested that the cure characteristics, and physical and mechanical properties for the HPQM added silicone rubber compound were strongly affected by the UV light. The tensile properties and hardness increased with UV aging. The lightness ( $L^*$ ) for the silicone rubber compound without HPQM did not change with UV light, whereas that for the silicone with HPQM decreased with UV light. The longer the contact time the better the killing ability of the bacteria. Experiencing the initial UV aging of 3 days, the rubber compound with HPQM showed an effective killing ability of bacteria. However, under prolonged UV exposure, the antibacterial efficacy reduced as a result of HPQM removal from the rubber surface during the condensation stage, and a post-curing reaction of the residual peroxide in the rubber compound. The silicone rubber compound with HPQM under UV light had more preference for killing the *E.coli*.

**Key words:** Silicone rubber, Crosslink density, Anti-microbial activities, UV weathering aging