

Wear and Friction Behavior of Porcelain Coated with Polyurethane/SiO₂ Coating Layer

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Abstract : Various loading of nano silica is added into polyurethane (PU) and then coated on porcelain substrate. The wear and friction properties of the porcelain substrates coated with polyurethane/nano silica nano composite coatings were investigated using the reciprocating wear testing machine. The friction and wear test of polyurethane/nano silica coated porcelain substrate was studied at different sliding speed and applied load. It was found that the optimum composition of nano silica is 3 wt% which gives the lowest friction coefficient and wear rate in all applied load ranges and sliding speeds. For 3 wt% nano silica filled PU coated porcelain substrate, the increment of sliding speed caused higher wear rates but lower frictions coefficient. Besides, the friction coefficient of nano silica filled PU coated porcelain substrate decreased but the wear rate increased with the applied load.

Keywords : porcelain, nanocomposite coating, morphology, friction, wear behavior

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