

## Optimal sintering procedure to fabrication of functionally graded Hydroxyapatite-Titanium

### ABSTRACT

Functionally graded metal-ceramic composite was fabricated by pressure-less sintering. The pure metallic component (Ti) and the pure ceramic component (HA) were located at the ends of a cylindrical specimen. Titanium and-Hydroxyapatite were utilized as a metallic and ceramic layer. The target sample thickness was 6 mm with radius cylindrical 20 mm. The sample was made from the cylindrical type of carbon die consisting of 5 layers. The composition of layers were 100%Titanium; 75 % Titanium +25% HA; 50% Titanium +50% HA; 25% Titanium+75% HA, and 100% Hydroxyapatite. The optimum thermal load mapping was obtained experimentally. The properties of all FGM products were characterized by shrinkage, optical-microscope, energy dispersive spectrometry (EDX) scanning electron microscope (SEM). The grade of the FGM material was proven by comparing amount of shrinkage after sintering. Result from optical micrograph, SEM and EDX indicated that the HA-Ti FGM could be produced successfully by using the optimal sintering procedure that was highlighted in this paper.

**Keyword:** FGM; Hydroxyapatite-Titanium; Pressure-less method; Sintering