

## The Influence of Commercially Pure Titanium and Titanium-Aluminum-Vanadium Alloy on the Final Shade of Low-fusing Porcelain

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### Abstract

**Aims:** The aims of this study were to investigate the influence of commercially pure titanium (PTi) and titanium-aluminum-vanadium (Ti-6Al-4V) alloys (TiA) on the final shade of low-fusing porcelain bonded to them and to compare the shade changes with those of three conventional metal-ceramic systems.

**Methods and Materials:** A titanium casting unit was used to cast PTi and Ti-6Al-4V alloy specimens followed by A3 shade low-fusing porcelain (Noritake) being bonded to them. Gold-based (AuA), palladium-based (PdA), and nickel-chromium (Ni-Cr) alloys were cast with an automatic centrifugal casting machine, then A3 shade conventional porcelain material (Vita, VMK 95) was applied to them. Ten specimens of each metal were then fabricated. The CIE L\* a\* b\* color coordinates of the specimens were measured with a spectrophotometer.

**Results:** All alloys had significant color changes when compared with A3 shade tabs. The color differences from the shade tabs were 5.79 for the Ti-6Al-4V group, 6.46 for PdA alloy, 8.12 for AuA alloy, 8.15 for Ni-Cr alloy, and 12.58 for PTi. The specimens differed from the shade tabs primarily because of the differences in a\* and b\* coordinate values.

**Conclusions:** Predictable shade reproduction of metal-ceramic restorations (MCRs) may be impaired by the underlying metal. The PTi had the greatest color differences among all the tested metal when compared with the shade tabs, whereas the Ti-6Al-4V alloy had the lowest. PTi is more likely to affect the final shade of low-fusing porcelain than Ti-6Al-4V alloy.

**Keywords:** Commercially pure titanium, PTi, metal-ceramic restoration, shade, CIE L\* a\* b\* coordinates, colorimetry

**Citation:** Al Wazzan KA, Al Hussaini IS. The Influence of Commercially Pure Titanium and Titanium-Aluminum-Vanadium Alloy on the Final Shade of Low-fusing Porcelain. J Contemp Dent Pract 2007 February;(8)2:097-104.