

Microcasting of Dental Products of Ti-Alloy

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ABSTRACT

Microcasting is a metal forming process based on the well-known investment casting. The construction of high quality crown and bridge restorations depends on the various materials involved in the dental casting process. The working temperature of the investment powder and liquid are critical factors in determining the setting time, expansion, surface roughness and consequently the final fit of the castings. An increase in temperature of slurry and/or powder decreases the working time and accelerates setting. The correct positioning of the wax/resin patterns is important in order to ensure sufficient thickness of investment material around the objects to withstand the casting forces and provide sufficient expansion. It is always advisable to cover the pattern resin with a layer of wax to allow for its expansion during the burnout process. A surface tension reducing agent is designed to allow the investment to flow uniformly and smoothly over all areas of the pattern helping to eliminate casting bubbles. All of the phosphate bonded investment materials. For the crown and bridgework technique, the powder/ binder ratio is of 100 g to 22 ml. Insufficient mixing produces result rougher casting surfaces.

The purpose of this investigation was characterization of Ti- 6Al-7Nb alloy cast by vacuum pressure casting process in phosphate bonded investment moulds.

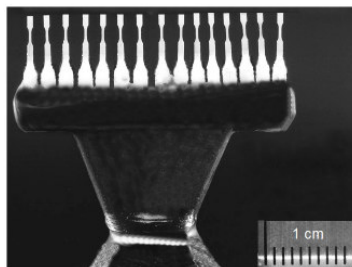


Figure 1: Pattern assembly.

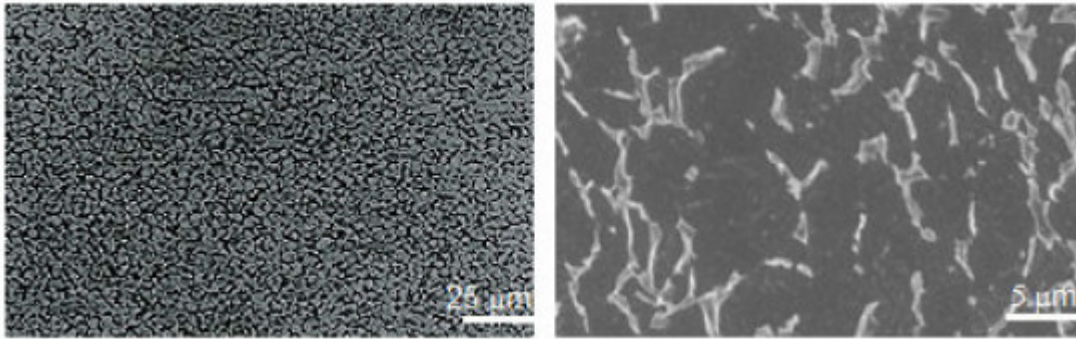


Figure 2: Microstructure of Ti-6Al- 7Nb alloy.

This paper proves that the microcasting is an ideal fabrication method for metal parts in microdimensions. Investment casting is a suitable technique for the manufacture of metallic microparts. The thermal and chemical expansion of the binder is controlled by the silica sol concentration of the liquid. The hardened layer thickness appears to be roughly 100–150 mm for Ti-6Al-7Nb alloy. Ti-6Al-7Nb alloy has a high biocompatibility.

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