

**Development and Assessment of a New  
Iraqi  
Phosphate Bonded Investment  
Used in Fixed Prosthodontics.**

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## Abstract

In this study a new Iraqi made P – B investment was manufactured and evaluated for its effectiveness in casting high melting base metal alloys to be used as crown or retainer in fixed prosthesis.

This investment had been formulated completely from Iraqi raw materials starting from the refractory (silica quartz), the cristobalite (that had been prepared in the laboratories of the I.A.E.C) to the binder of mono – ammonium phosphate and magnesium – oxide. And for the first time in Iraq the manufacturing of Iraqi special mixing liquid.

The manufactured investment was formulated through many mixes, until the optimum result had been obtained, using the ISO Specification No. 9694 \1996 tests (Fluidity test, setting time, compressive strength, linear setting expansion and linear thermal expansion) in the evaluation of each mix.

The manufactured investment was given a name (WYMvest).

It had been compared with the Castorit super C P – B investment using the ISO Specification tests, the WYMvest P – B investment was fulfilled the requirements of the ISO specification.

The casting capability and effectiveness of the WYMvest P – B investment and its special liquid was evaluated by laboratory study, by measuring the vertical marginal discrepancy, using two types of base metal Ni–Cr alloys (CB Blando and Remanium CS) in comparison with that of Castorit super C P – B investment.

In this laboratory study, 120 wax patterns were divided into two groups:

Group (G): included 60 wax patterns invested by Castorit super C P – B Investment with different dilutions of its special liquid (100%, 50%, and 0%), every 10 patterns invested in one ring. Three rings, with 30 patterns casted by Ni – Cr. metal of (CB Blando) the other three rings casted by Ni – Cr metal Remanium CS.

Group (I): included 60 wax patterns invested by WYMvest P – B Investment and the same as that of group G.

The statistical analysis of the results related to the type of investment showed that there were highly significant differences between the types of investments, indicating that the mean marginal discrepancy in using Castorit super C P – B investment was less than that in using WYMvest P–B investment.

In relation to the dilution of the special liquids, there were highly significant differences among the subgroups for both types of investments indicating that the reduction of the marginal discrepancy increased with the increase of the concentration of the special liquids. On the other hand, it indicated the efficiency of the Iraqi made special liquid in the reduction of vertical marginal discrepancy.

Concerning the alloy type, both tested alloys (CB Blando and Remanium CS) did not show significant differences between their subgroups in both types of investments, indicating that the type of metal alloy did not cause adverse changes on the marginal fitness.

As a conclusion, this study indicated that the Iraqi WYMvest P – B investment could be used in the casting of the Ni– Cr base metal alloys successfully, and the Iraqi made special liquid in improving the marginal fit of PFM copings during casting with WYMvest P – B investment was efficient.