

# Laser welding of Ni-Cr-Mo and Cr-Co-Mo alloys

*The laser welding technique applied to the non precious dental alloys procedure and results C. Bertrand, Y. Le Petitcorps, L. Albingre and V. Dupuis Br Dent J 2001; 190: 255-257*

## Aim

The laser welding technique was chosen for its versatility in the repair of dental metal prosthesis. The aim of this research is to assess the accuracy, quality and reproducibility of this technique applied to Ni-Cr-Mo and Cr-Co-Mo alloys which are often used to make these prostheses.

## Method

The alloy's ability to weld was evaluated with a pulsed Nd-Yag Laser equipment. In order to evaluate the joining, various cast wires with different diameters were used. The efficiency of the joining was measured with tensile tests. In order to understand this difference, metallographic examinations and X-Ray microprobe analysis were performed through the welded area and compared with the cast part.

## Results

It was found that a very slight change in the chemistry of the Ni-Cr alloys had a strong influence on the quality of the joining. The Co-Cr alloy presented an excellent weldability. A very important

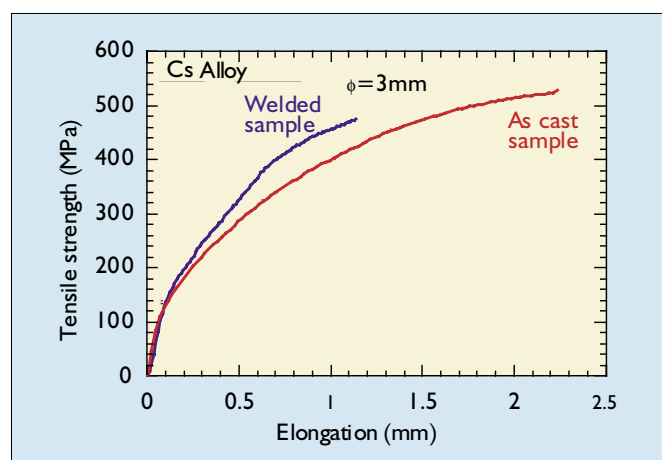
change in the microstructure due to the effect of the laser was pointed out in the welding zone, increasing its micro-hardness.

## Conclusion

The higher level of carbon and boron in one of the two Ni-Cr was found to be responsible for its poor welding ability. However for the others, the maximum depth of welding was found to be around 2mm which is one of the usual thicknesses of the components which have to be repaired.

## In Brief

- This paper reports on the use of one laser type to weld non-precious alloys
- The potential for adverse effects is pointed out
- The need for more research is discussed



**Stress-strain curves plotted for the Cs alloy.** Only one curve is shown because the others were similar

## Comment

Laser technology is currently receiving considerable attention in prosthodontics and this interest covers both clinical and technical aspects of prosthodontics. Given the increasing use of lasers in Europe, these authors set out to evaluate the effects of one laser type (Nd Yag) on three non-precious alloys. The methods section is slightly vague, with little explanation of the series of wires chosen and no

explanation why alternative welding techniques were not used as a treatment control. Interesting results showing differences between the alloys flag up the potential for clinically significant findings. Unfortunately, no statistical analysis appears to have been carried out on the results to substantiate the findings of the investigation. The discussion makes valid points about the need to be familiar with

the composition of the alloys and they make a valid point about the need to manipulate the components of the weld joint more critically.

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