

IN VITRO Reliability of intra-oral spectrophotometer

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Introduction: Performances of digital measuring devices of tooth color still have not been researched enough because they have recently started to be more widely used in dentistry.

Aim: The purpose of this study was to evaluate the reliability of an intra-oral spectrophotometer in vitro.

Materials and Methods: We used spectrophotometer SpectroShade Micro MHT and new sample of VITA Classical shade guide. All of the 16 shade tabs were measured by single operator 10 nonconsecutive times with calibration in between. In order to imitate clinical conditions and minimize the influence of the surroundings, the tabs were fixed in the same position on a phantom model on a black background, surrounded by the same shade. The reliability was calculated by two methods: first as a percentage of the repeated measurements of perfect shade matches for each tab and then averaged and second, as a mean of all color differences ΔE .

Results: The reliability of this spectrophotometer was 97.5 %. The shade tabs C2 and B3 showed smallest percentage of repeated measures 90% and 70%. The mean of the color difference was $0.9 \pm 0.28 \Delta E$ units, with standard error of mean SEM=0,022.

Conclusions: The results of high performance of this shade matching device in vitro controlled circumstances indicates predictable repeated measurements with high reliability in clinical condition as well. Users should determine the elements that influence on accuracy of repeated measures and always use the orientation angle bars on the small display of the spectrophotometer to achieve better results.

Key words: shade matching, shade guide, spectrophotometer