Inlay Fixed Partial Denture Framework 3-D Structural Integrity Validation Using COMSOL Multiphysics 3.5a

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Introduction

Manual manufacturing of inlay fixed partial denture frameworks by metal casting can take hours of dental practitioners work time. This paper introduces 3-D simulations of pre-manufactured inlay fixed partial denture framework assembled from laser cut sheet metal parts. The study gives a good estimation of how well the frameworks can withstand strong human occlusion forces and masticatory cycle. The simulated forces corresponds to average maximum biting force of an adult young male in static analysis and in time depended simulations the acting forces are scaled down to mimic the masticatory cycle with changing force amplitude.

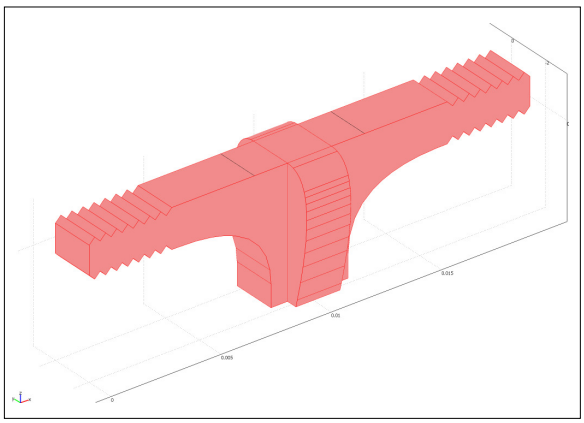

Figure 1: 3-D model of a laser cut inlay fixed partial denture framework in COMSOL Multiphysics