

Edge Strength Of Resin-composite Margins.

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Abstract:

OBJECTIVES: Marginal integrity is a major clinical problem in restorative dentistry. The aim of this study was to evaluate the applicability of an edge strength measurement device in an in vitro test to determine the force required to fracture flakes of material by a Vickers indentation at progressively increasing distances from an interface edge of bulk material. **METHODS:** Five representative resin-composites were investigated. Fourteen disks of specimens (12mm diameter x 2.5mm thick) were prepared for each material. These were divided into seven sub-groups corresponding to different edge-distances (0.4, 0.5, 0.6, 0.7, 0.8, 0.9 and 1.0mm). An edge strength measurement device (CK10) (Engineering Systems, Nottingham, UK) was used. The mode of the failure of each specimen was examined under the integral microscope of the CK10. **RESULTS:** The force (N)-to-fracture at a distance of 0.5mm from the edge was defined as the edge strength. The highest failure force (edge strength) was observed for Tetric Ceram (174.2N) and the lowest for Filtek Supreme (enamel) (87.0N). Correlations between the failure-forces to fracture materials with edge-distance were regression analyzed giving coefficients (r) ranging from 0.94 ($p=0.02$) to 0.99 ($p=0.01$). Two modes of failure were observed: chipping and—generally at greater distances—cracking. **SIGNIFICANCE:** Edge strength is a definable and potentially useful parameter to characterize this aspect of clinically related behavior. A standardized distance of 0.5mm from the specimen's edge, when chipping failure prevails, is suitable and convenient as a reference point.