

# A COMPARATIVE STUDY ON PHYSICAL PROPERTIES OF NANOHYBRID AND NANO-CERAMIC COMPOSITE RESINS

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**Aim:** Composite resins are one of the most crucial restorative materials that dentists need. During recent years, these restoration materials became very popular among dentists because of their physical properties, esthetics and variety in color. However, there are still opportunities for further enhancements, thus companies have been trying different particles and making new materials such as Nanohybrid and Nano-ceramic composite resins, which has been introduced recently. This study aims to compare physical properties of Nanohybrid and Nano-ceramic composite including flexural strength, flexural modulus, contact angle test and surface roughness.

**Material and Methods:** Nano-ceramic composite, DRM DiamondLite, and nanohybrid composite resins; MI Gracefil and Herculite Ultra were evaluated in this study. Surface roughness (using 400# and 80# polish paper), flexural strength, flexural modulus and contact angle test were determined for each composite (n=10). Scanning Electron Microscopy (SEM) analysis was performed to evaluate the fractural section surface morphology of the composite resins.

**Results:** SEM images showed some cracks in DiamondLite composite resin. Herculite composite has the highest and MI-Gracefil has the lowest flexural strength ( $P < 0.05$ ). On the other hand, flexural modulus test result showed that there is no significant difference between nanohybrid and nano-ceramic composite resins ( $P < 0.05$ ). MI-Gracefil mentioned the highest roughness after polishing with 80# polish paper, but there was not a significant difference among composites after polishing with 400# polish paper ( $P < 0.05$ ).

**Conclusion:** Herculite Ultra shows higher mechanical properties among all studied composite resins. There is no significant difference in physical and mechanical properties between nanohybrid and nano-ceramic restorative materials.