**Comparison of Compressive Strength of Expired and Fresh Composites**

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**Objectives:** A research priority of the World Health Organization is to identify affordable methods for use of restorative materials in under-resourced nations. We compared the compressive strength (CS) of expired composites to a new composite.

**Methods:** Expired and new samples of Dentsply TPH Spectra® Universal Composite were tested with 4 groups of varying expiration dates (n=10). Group 1: Fresh composite. Group 2: Composite 2 years past expiration. Group 3: Composite 3 years past expiration. Group 4: Composite 4 years past expiration. The composite was inserted into the Ultradent bonding clamp containing a white plastic button mold with a hole diameter of 2. 38mm.The composites were applied in 2mm layers. A 20 second light cure, with the Kerr Demi curing light, was done between layers, with a 40 second light cure being applied after the second layer. The Instron® 5566A with a 10K load cell and a crosshead speed of 1 mm/minute was used for the CS test. The statistical tests used were one-way ANOVA and Tukey’s HSD. P-values <0.05 were considered statistically significant.

**Results**: The overall ANOVA results are presented in Table 1. Using Tukey’s HSD for pairwise comparisons, we found that there were statistical differences between Group 2 vs Group 3 (p = .001) and Group 2 vs Group 4 (p = .003)

Table 1. CS (MPa) (n = 10 per group) \*

| **Group** | **Composite** | **Mean (MPa)** | **Std Dev** |
| --- | --- | --- | --- |
| 1 | New | 157.84 | 30.76 |
| 2 | 2 Years Expired | 183.48 | 31.74 |
| 3 | 3 Years Expired | 118.72 | 39.21 |
| 4 | 4 Years Expired | 123.03 | 37.93 |

**Conclusion:** The fresh composite, Group 1, was not statistically different from any of the expired groups, Groups 2, 3, and 4. The two years expired composite performed the best and was statistically different from the 3 and 4 years expired groups. A possible reason for these results is that the shade of the 2 years expired group was a lighter composite shade which could have given it a better cure. As this was a pilot study further testing with more samples is necessary.