146839 Color stability of the experimental resin based composite UBC

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Objectives: To evaluate the color stability of experimental resin based composite (RBC) UBC.

Methods: UBC-001 (UBC, A2-Enamel, Tokuyama Dental Corporation, Experimental), Filtek Supreme Plus (SP, A2E, 3M-ESPE), Esthet-X HD (EX, A2, DENTSPLY), Durafill VS (DV, A2, Heraeus Kulzer), PREMISE (PM, A2, Kerr) and Venus Diamond (VD, A2E, Heraeus Kulzer) were evaluated for color stability. 96 disk-shaped specimens (N =16 per RBC, D =10mm, 2mm thick) were made by light polymerizing for 10 or 20 seconds, based on the manufacturer's recommendation, using Optilux 500 (Kerr Inc, Orange, CA, USA) at more than 800 mW/cm^2. After 24 hour dark storage in distilled water at 37°C the directly irradiated surfaces were ground with P800 grit SiC paper on a grinding/polishing machine (Rotopol V, Stuers, Cleveland, Ohio, USA) under continuously water cooling at 150 rpm, followed by dry polishing with a Sof-Lex disc fine and super-fine grit for 20 seconds (30,000 rpm, Upower UP500, Brasseler, USA). Each specimen was then thermocycled between 5°C and 55°C with the dwell time of 1 min each in distilled water. Color of each RBC was measured using VITA Easyshade compact (Model # DEASYCHP, VITA) before and after thermocycling (TC) and delta-E = (delta-a^2+delta-b^2+delta-L^2)$^{1/2}$ was used to analyze the color stability. One-way ANOVA and repeated measures ANOVA with appropriate post-hoc tests were conducted to assess the effects of composites and polishing times on the color stability, within each polishing and thermocycling step and within each composite, respectively.

Results:

RBC	Delta-Eb (color change using black background)				
	TC 3K	TC 10K	TC 20K	TC 30K	TC 50K
UBC	0.91 (0.10)^{B,1}	0.86 (0.15)^{A,B,1}	1.20 (0.17)^{A,2}	2.08 (0.17)^{B,3}	3.20 (0.17)^{B,4}
SP	3.45 (0.35)^{D,1}	4.22 (0.34)^{E,2}	4.44 (0.27)^{D,2}	4.37 (0.29)^{D,2}	4.43 (0.28)^{C,2}
EX	0.55 (0.27)^{A,1}	0.76 (0.19)^{A,1,2}	1.74 (0.45)^{B,3}	1.03 (0.23)^{A,2}	1.01 (0.27)^{A,2}
DV	0.63 (0.22)^{A,1}	0.99 (0.23)^{B,2}	1.34 (0.08)^{A,3}	1.76 (0.29)^{B,4}	2.93 (0.68)^{B,5}
PM	1.62 (0.41)^{C,2}	1.90 (0.33)^{C,2}	1.90 (0.28)^{B,2}	1.76 (0.33)^{B,2}	1.08 (0.34)^{A,1}
VD	1.79 (0.25)^{C,1}	2.65 (0.33)^{D,2}	3.33 (0.32)^{C,3}	3.43 (0.32)^{C,3}	3.95 (0.43)^{C,4}
Groups within columns with same letter and within row with same number are not significantly different (p >.05).					

Conclusion: Color stability for all RBCs, including UBC, was within the stated clinically perceptual limit (delta-E; less than 3.3, Craig and Powers, 2002) with the exception of SP after 3,000 TC and VD after 30,000 TC challenge.

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Keywords: Color, Composites, Dental materials and Stability

Presenting author's disclosure statement: employment

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