Translucency of “cloud-shade” and “one-shade” resin composites, Color difference metrics

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Objectives: To compare the translucency parameter (TP) of two “cloud shade” and three “one-shade” resin composites.

Experimental Methods: The “cloud-shade” composites were 3M experimental composites – 3 Shades (3ML - light, 3MM - medium, 3MD - dark), and SimpliShade – 3 Shades (SSL - light, SSM - medium, SSD - dark), while the “one shade” composites were Omnichroma (OCH), Admira Fusion x-tra (AFX), and Venus Diamond One (VDO), with n=5 per shade. Polymerized composite samples (10 mm in diameter, 2-mm thick) were polished using PoGo disks for 40 seconds. TP measurements were performed using a benchtop spectrophotometer, against white and black background. CIEDE2000 and CIELAB TP values (TP_{00} and TP_{ab}, respectively), were calculated. The data were analyzed by analysis of variance at a=0.05 level of significance.

Results: Means (s.d.) of translucency parameter are shown in the table

Material	TP_{00}	TP_{ab}
3ML[a]	5.9 (0.5)	6.9 (0.7)
3MM[a]	5.7 (0.5)	6.8 (0.6)
3MD[a]	5.6 (0.3)	6.9 (0.5)
SSL[a]	5.5 (0.3)	6.3 (0.4)
SSM[a]	6.2 (1.2)	7.6 (1.9)
SSD[a]	5.4 (0.4)	6.3 (0.5)
OCH[c]	10.9 (0.6)	13.3 (0.7)
AFX[b]	8.5 (0.2)	9.7 (0.2)
VD[b]	10.3 (0.7)	11.5 (0.9)

TP_{00} and TP_{ab} values were significantly different ($p<0.001$) yet strongly correlated ($r=0.99$), with the conversion equations as follows: $TP_{00} = 0.845 \times TP_{ab} + 0.016$; $TP_{ab} = 1.159 \times TP_{00} + 0.116$.

Conclusions: The “one-shade” composites exhibited higher TP values than the “cloud-shade” composites, which might explain the need to use “blockers” in certain types of restorations. TP_{00} and TP_{ab} values were analogous and strongly correlated yet significantly different.

This study was supported in part by 3M.