

Table 1. Chemical compositions and manufacturer details of the tested composite resins

Groups	Composite	Resin Matrix	Filler	Filler Rate wt.% /vol. % (Size)	Manufacturer and Serial Number
Group Z	Filtek™ Z-250	Bis-GMA, Bis-EMA, UDMA, TEGDMA	Zirconium/silica	82/60 (0.01-3.5µm, mean:0.6 µm)	3M ESPE, St Paul, MN, USA N905168
Group T	Tetric® EvoCeram Bulk Fill	BisGMA, UDMA, Bis- EMA	Ba-Al-Si-glass, pre-polymer filler, spherical mixed oxide, YbF ₃	79-81(%17 pre- polymer content)/60-61 0,04-3 µm (mean: 0,55µm)	Ivoclar Vivadent, Schaan, Liechtenstein U26276
Group B	Beautiful-Bulk Restorative	Bis-GMA, UDMA, Bis-MPEPP, TMGDMA	S-PRG filler based on fluoro- alumino-silicate glass	87.0/74.5	SHOFU Inc., Kyoto, Japan 051727
Group F	Filtek™ Bulk Fill Posterior Restorative	AUDMA, UDMA, (1,12-dodecane- DMA)	Silica, zirconium, ytterbium trifluoride	76.5/58.4 (20 nm silica, 4- 11 nm zirconium, 100 nm YbF ₃)	3M ESPE, St Paul, MN, USA N880335
Group S	SonicFill™	Bis-GMA, Bis- EMA, TEGDMA, EBPDMA	SiO ₂ , glass, oxide	83,5/66 (25-400nm)	Kerr, Orange, CA, USA 6385712

Table 2. Food simulating liquids used in this study.

Food simulating liquids	
1)Artificial saliva	125.6 mgL ⁻¹ NaCl, 963.9 mgL ⁻¹ KCl, 189.2 mgL ⁻¹ KSCN, 654.5 mgL ⁻¹ KH ₂ PO ₄ , 200.0 mgL ⁻¹ Urea, 763.2 mgL ⁻¹ NaSO ₄ .10H ₂ O, 178.0 mgL ⁻¹ NH ₄ Cl, 227.8 mgL ⁻¹ CaCl ₂ .2H ₂ O, 630.8 mgL ⁻¹ NaHCO ₃
	Type of simulation
2)Heptane	Butter, animal and herbal oils
3)Citric acid (10%)	Beverages, vegetables, fruits, alcoholic beverages
4)Ethanol (96%)	Alcoholic beverages, mouthwashes

Table 3. Means \pm standard deviations (\pm sd) of surface roughness (Ra).

Composite Groups	Food simulating liquids	1 st measurement	2 nd measurement	p
Group S	Ethanol	0.178 \pm 0.034	0.183 \pm 0.043	0.809
	Heptane	0.191 \pm 0.047	0.179 \pm 0.027	
	Citric Acid	0.167 \pm 0.034	0.176 \pm 0.029	
	Saliva	0.186 \pm 0.037	0.197 \pm 0.025	
	Total	0.181 \pm 0.038	0.184 \pm 0.032	
p			0.917	
Group F	Ethanol	0.224 \pm 0.069	0.197 \pm 0.063	0.738
	Heptane	0.198 \pm 0.040	0.210 \pm 0.050	
	Citric Acid	0.202 \pm 0.038	0.194 \pm 0.042	
	Saliva	0.194 \pm 0.033	0.199 \pm 0.037	
	Total	0.205 \pm 0.047	0.200 \pm 0.047	
p			0.962	
Group T	Ethanol	0.124 \pm 0.028	0.174 \pm 0.083	0.059
	Heptane	0.135 \pm 0.022	0.135 \pm 0.040	
	Citric Acid	0.152 \pm 0.057	0.154 \pm 0.061	
	Saliva	0.133 \pm 0.030	0.183 \pm 0.072	
	Total	0.136 \pm 0.037	0.162 \pm 0.066	
p			0.442	
Group B	Ethanol	0.246 \pm 0.051 ^B	0.322 \pm 0.092 ^{A,b}	<0.001
	Heptane	0.292 \pm 0.063 ^B	0.359 \pm 0.183 ^{A,b}	
	Citric Acid	0.309 \pm 0.097 ^B	0.698 \pm 0.120 ^{A,a}	
	Saliva	0.287 \pm 0.064 ^B	0.367 \pm 0.071 ^{A,b}	
	Total	0.284 \pm 0.072	0.437 \pm 0.194	
p			< 0.001	
Group Z	Ethanol	0.157 \pm 0.052	0.161 \pm 0.068	0.343
	Heptane	0.153 \pm 0.042	0.162 \pm 0.048	
	Citric Acid	0.138 \pm 0.027	0.154 \pm 0.036	
	Saliva	0.150 \pm 0.039	0.172 \pm 0.040	
	Total	0.150 \pm 0.040	0.162 \pm 0.048	
p			0.956	

A and B refer to the differences between initial and second surface roughness values in the same row.
a and b refer to the differences between the solutions in the same column.

Table 4. Means and standard deviations (\pm sd) of microhardness values (VHN) after exposure.

Surface Hardness	Group S	Group F	Group T	Group B	Group Z	Total	
Ethanol	82.39 \pm 7.43 ^b	87.32 \pm 7.13 ^b	67.99 \pm 7.48 ^c	87.95 \pm 8.11 ^{b.C}	108.87 \pm 8.57 ^a	86.90 \pm 15.21 ^{YZ}	<0.001
Heptane	80.47 \pm 6.78 ^b	82.72 \pm 11.01 ^b	63.07 \pm 2.82 ^c	90.37 \pm 5.78 ^{ab.C}	101.44 \pm 7.68 ^a	83.61 \pm 14.55 ^Z	<0.001
Citric acid	82.03 \pm 6.61 ^c	85.82 \pm 4.69 ^c	61.66 \pm 4.29 ^d	164.84 \pm 33.09 ^{a.A}	109.89 \pm 17.17 ^b	100.85 \pm 39.43 ^X	<0.001
Saliva	84.74 \pm 5.86 ^b	81.38 \pm 4.57 ^b	64.78 \pm 5.87 ^c	105.93 \pm 15.05 ^{a.B}	111.57 \pm 7.64 ^a	89.68 \pm 19.13 ^Y	<0.001
Total	82.41 \pm 6.61 ^y	84.31 \pm 7.44 ^y	64.38 \pm 5.72 ^z	112.27 \pm 36.35 ^x	107.94 \pm 11.29 ^x	90.26 \pm 24.98	
p	0.856	0.603	0.606	<0.001	0.178		

Upper letters refer to the differences between the solutions in the same column.

Lower letters refer to the differences between the composites in the same row.

Table 5. Means and standard deviations (\pm sd) of W_{SL} in $\mu\text{g}/\text{mm}^3$.

	ETHANOL	HEPTANE	CITRIC ACID	SALIVA	TOTAL	
	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	p
Group S	-2.88 \pm 0.80 ^{A.ab}	-2.78 \pm 1.78 ^{A.ab}	-5.67 \pm 1.19 ^{B.b}	-5.47 \pm 1.70 ^B	-4.20 \pm 1.95 ^y	<0.001
Group F	-2.68 \pm 1.54 ^{A.ab}	-4.87 \pm 1.47 ^{B.b}	-6.32 \pm 2.86 ^{BC.b}	-7.06 \pm 1.87 ^C	-5.23 \pm 2.57 ^y	<0.001
Group T	-1.69 \pm 1.45 ^{A.a}	-3.03 \pm 0.89 ^{A.ab}	-6.41 \pm 1.35 ^{B.b}	-5.32 \pm 1.81 ^B	-4.11 \pm 2.32 ^y	<0.001
Group B	-1.24 \pm 1.48 ^{B.a}	-2.43 \pm 1.47 ^{B.a}	13.03 \pm 4.56 ^{A.a}	-5.67 \pm 1.26 ^C	0.92 \pm 7.68 ^x	<0.001
Group Z	-4.08 \pm 1.85 ^b	-4.77 \pm 0.88 ^b	-5.37 \pm 1.51 ^b	-5.82 \pm 0.96	-5.01 \pm 1.47 ^y	0.167
Toplam	-2.51 \pm 1.72 ^X	-3.58 \pm 1.66 ^Y	-2.15 \pm 8.08 ^X	-5.87 \pm 1.62 ^Z		
p	0.007	0.004	<0.001	0.223		

Upper letters refer to the differences between the solutions in the same row.

Lower cases refer to the differences between the composites in the same column.
