



Introduction:

Surface quality of dental restorations is one of the most important factors that determine the success of a restoration (1). The smooth surface of a restoration provides both optimum esthetics and low plaque accumulation (2).

For some years there has been liquid polish products on the market, which seal the restoration while leaving a smooth polished surface and may eliminate the need for manual polishing.

Objectives:

This study examined gloss and roughness of composites, which were polished utilizing one of three different rotating polishing systems or a brush-on liquid polish.

Methods:

The polishing systems evaluated were iPol (IP, Heraeus Kulzer), Sof-Lex (SL, 3M Espe) and an experimental polishing system (EP, Heraeus Kulzer). The liquid polish used was an experimental sealer (HKS, Heraeus Kulzer). 32 flat specimen of the composites Venus (VE, Heraeus Kulzer), Tetric Evo Ceram (TEC, Ivoclar Vivadent) and an experimental composite (EC, Heraeus Kulzer) were prepared. 8 specimen of each composite were polished with one of the three rotating polishing systems or the liquid polish was brushed-on and polymerized.

Gloss is defined as percentage of the totally reflected light from a perfect mirror (= 100 %). Reflection (%) and surface roughness average R_a (μm) were measured with a surface laser scanner (UBM). Statistical analysis by ANOVA.



Figure 1: Surface Laser Scanner (UBM)

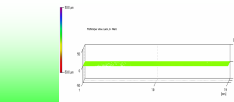


Figure 2: Laser Scan of a polished surface.

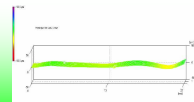


Figure 3: Laser Scan of a liquid polish surface.

Results:

- The best gloss result was achieved with EC/EP (7,5%).
- The best roughness result was shown by VE/HKS, TEC/HKS and VE/SL (0,06 μm).
- Roughness achieved with SL and HKS was significantly better ($p \leq 0,05$).
- The gloss results of SL were significantly lower.
- No significant difference was found between the composites within the HKS-polished group.
- There was no significant correlation between gloss and roughness.

1. Roughness (in μm)

	iPol	exp. Polisher	Sof-Lex	exp. Sealer
Venus	0,17	0,16	0,06	0,06
exp. Composite	0,37	0,2	0,07	0,07
Tetric Evo Ceram	0,12	0,12	0,1	0,06

Table 1: Roughness in μm

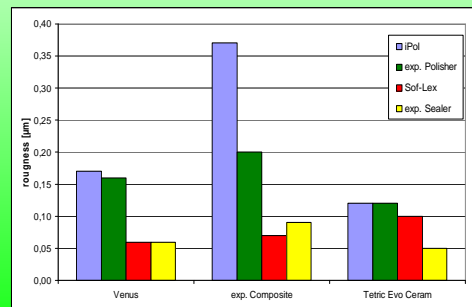


Figure 4: Roughness in μm sorted by composites

2. Gloss (Reflection in %)

	iPol	exp. Polisher	Sof-Lex	exp. Sealer
Venus	7,2	7,3	4,5	6,2
exp. Composite	6,6	7,5	4,2	6
Tetric Evo Ceram	6,8	7	4,9	6,8

Table 2: Gloss as reflection in %

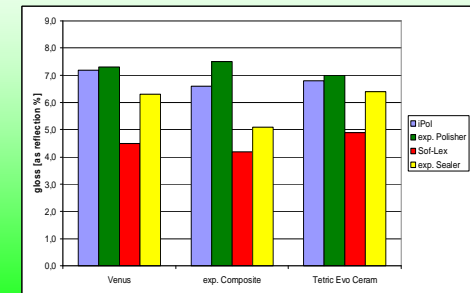


Figure 5: Gloss as reflection in % sorted by composites

Conclusions:

The roughness results found with the liquid polish were independent from the used composite material. Gloss and roughness stability under loading and oral conditions as well as the clinical relevance of the assessed results e.g. for increased plaque accumulation must be evaluated in further studies.

References:

1. Lu, H., Roeder, L. B., Lei, L., Powers, J.M.: Effect of surface roughness on stain resistance of dental resin composites. J Esthet Restor Dent 2005;17: 102-8.
2. Hotta M., Hirukawa, H., Aono, M.: The effect of glaze on restorative glass-ionomer cements. J Oral Rehabil 1995; 22: 197-201