

Venus®

Colour adaptation – University of Texas at Houston, USA

Colour adjustment potential of resin composites in simulated class I restorations.

Colour is a psycho-physical sensation¹. And the determination of the correct tooth shade is still challenging and is considered to be related to several factors e.g. gender, value and experience². For this reason dental composite materials have been developed possessing a blending effect, also called chameleon effect, colour adaptation or colour potential. This effect describes that the clinical perception of colour differences between teeth and their restorations are smaller than if they are viewed in isolation³. A good colour adjustment potential of the composite is essential for high aesthetic restorations. It helps to mask the restoration margins and furthermore a good colour adaption compensates to a certain degree slight shade selection errors. Quantifying the colour adjustment potential might provide useful clinical information for dental professionals⁴.

The following investigation done by Professor R. Paravina from the University of Texas Health Science Centre at Houston, USA, confirms the excellent colour adaptation potential of Venus Pearl.

Giving a hand to oral health.

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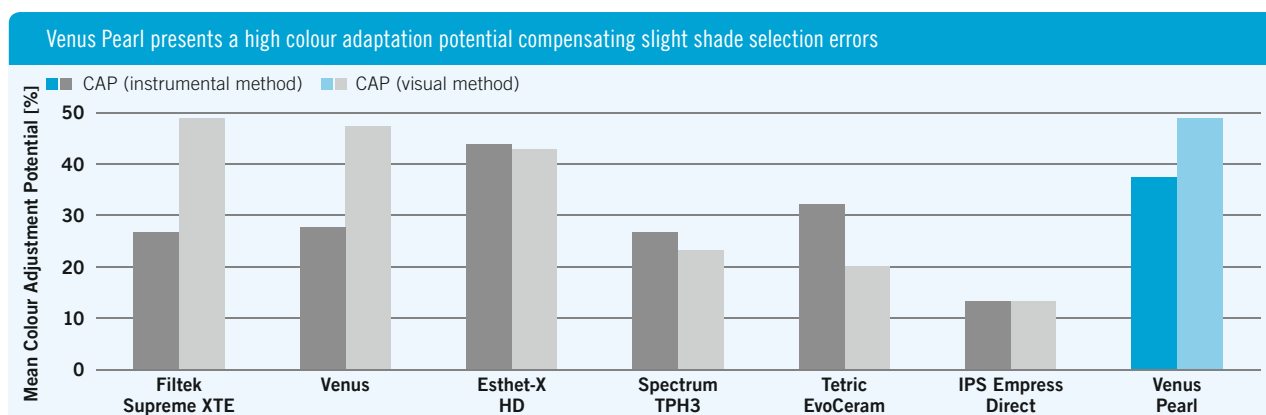
Objective

Aim of this test was to evaluate the colour adjustment potential (CAP) of resin composites in simulated class I restorations using visual and instrumental method.

Materials and Methods

Tested composites (shade A2) were Venus Pearl, Venus (both Heraeus), Filtek Supreme XTE (3M ESPE), Tetric EvoCeram, IPS Empress Direct (both Ivoclar Vivadent), Esthet-X HD and Spectrum TPH3 (both Dentsply). As control composite B2 shade of Venus Diamond (Heraeus) was used. 2 types of disc-shaped specimens were produced from the composites to be analysed (diameter 10 mm, thickness 2 mm): single shade specimens made of all composites and control (n=5/composite) and dual shade specimens which were composed of an outer ring of the B2 control material leaving space (diameter 4 mm) for a filling of the test A2 composites or the control material (n=5/composite). After polymerisation, all discs were polished using the PoGo polishing system (Dentsply). Evaluation of the colour adjustment potential was done visually and instrumental. For the instrumental investigation a non-contact spectroradiometer was used without backing and a 1 mm circular area was measured in the centre of the specimens. Visual evaluation was performed by five independent evaluators with superior shade matching competency under standard conditions. The colour difference between test shades and the control was rated from 1 (perfect match) to 5 (total mismatch). Means and standard deviations were determined followed by an analysis of variance and Fisher's PLSD test ($p=0.05$).

Results



Specimen type, composite brand and their interaction were found to be statistically significant ($P \leq 0.001$), for the instrumental and visual CAP method. Fisher's PLSD intervals for comparisons of ΔE^* values among specimen type and brands were 0.09 and 0.16, respectively. Corresponding values for visual ratings were 0.17 and 0.31, respectively.

Conclusion

Colour adjustment potential was specimen type and composite brand dependent. CAP_{instrumental} decreased in the following order: Esthet-X HD, Venus Pearl, Tetric EvoCeram, Venus, Filtek Supreme XTE=Spectrum TPH3, IPS Empress Direct. Corresponding order for CAP_{visual} was: Venus Pearl=Filtek Supreme XTE, Venus, Esthet-X HD, Spectrum TPH3, Tetric EvoCeram and IPS Empress Direct.

Source

Paravina R: Colour adjustment potential of resin composites in simulated class I restorations, test report 02-07-2012. Unpublished data. Data on file. The study was abbreviated and summarised and all diagrams and titles have been established by Heraeus Kulzer.

¹ Paravina et Powers: Esthetic colour training in dentistry. 2004.

² Miranda: Effect of gender, experience and value on color perception. Oper Dent, 37(3), 2012: 228–33.

³ Paravina et al.: Evaluation of blending effect of composites related to restoration size. Dent Mat, 22(4), 2006: 299–307.

⁴ Paravina et al.: Color interaction of dental materials: Blending effect of layered composites. Dent Mat 22 (10), 2006: 903–8.