



# Spectrophotometrical and Subjective Analysis of Home-Bleaching versus In-Office Bleaching

T. Plein\*, M. Rosentritt, G. Handel  
(Department of Prosthetic Dentistry, University of Regensburg, Germany)

# 0238



**Objectives:** The influence of bleaching materials on human teeth is of major concern in the clinical application. In this in-vitro study the bleaching effect was determined in the L\*a\*b\*-color space and compared to a subjective evaluation.

**Materials and Methods:** 35 freshly extracted upper anterior incisors were divided in 5 groups. They were bleached with the *Home-Bleaching* and *In-Office-Bleaching* products (Table 1). The bleaching materials were applied (Table 2) and in the meantime humidly stored at 37°C.

**I. Spectrophotometrical Analysis:** L\*a\*b\*-values were measured using a reflection spectrophotometer (CM 3500d, aperture 3mm, Minolta, G) and mean discoloration  $\Delta$ -E was calculated.

**II. Subjective Analysis:** Subjective analysis was performed, where 5 dentists determined, independent of each other, the individual color shade on the basis of the Vita shade guide (Vita, G) (Table 2). Statistics were performed using Student-T-test.

Materials	Manufacturer	Concentration	Evaluation time (after ... days)	Application		Treatment
				daily	days overall	
Visalys	Kettenbach, G	7,5% H <sub>2</sub> O <sub>2</sub>	0, 1, 3, 7, 10, 12, 14	2 x 30 min.	14	Home
Visalys	Kettenbach, G	13,5% H <sub>2</sub> O <sub>2</sub>	0, 1, 2, 3, 4	1 x 30 min.	4	In-Office
Opalescence boost	Ultradent, USA	Ca. 30% Carbamide peroxide ~app. 15% H <sub>2</sub> O <sub>2</sub>	0, 1, 2, 3, 4	1 x 30 min.	4	In-Office
White Strips	blend-a-med, GB	not known	0, 1, 3, 7, 10, 12, 14	2 x 30 min.	14	Home
paint on	Ivoclar, FL	not known	0, 1, 3, 7, 10, 12, 14	2 x 30 min.	14	Home

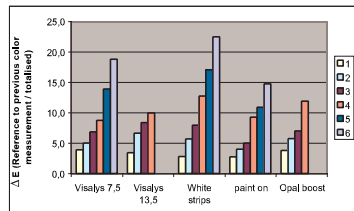
Table 1: Materials, manufacturer, concentrations, Time of evaluation, time and form of application

Shade	C4	A4	C3	B4	A3,5	B3	D3	A3	D4	C2	C1	A2	D2	B2	A1	B1
Value	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Table 2 Color assignment to Vita shade guide

**Results:** The examined bleaching agents showed clear bleaching effects from Vita color A3,5 and/or D3 up to D2, B2 and A1. The largest mean bleaching effect by all materials was assessed after the first use. The largest colour change in the reference to the Vita shade guide showed Visalys 7.5, followed by Opalescence boost and White strips. More slightly values were found for Paint on and Visalys 13.5. Table 3 illustrates the mean bleaching effect of each substance per application. Visalys 13.5 and Opalescence boost showed a  $\Delta$ -E change of app. 10-12 units after four-time use. For the homebleaching stronger  $\Delta$ -E-changes of max. app. 23 units were to be assessed. The bleaching effect for White strips was most considerable, followed by Visalys 7.5, and Paint on.

## I. Spectrophotometrical Analysis

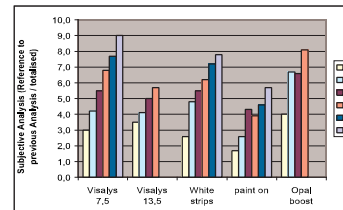


Graph 1:  $\Delta$ -E-Change

$\Delta$ E		Visuell
3,1	Visalys 7,5	1,5
2,5	Visalys 13,5	1
2,5	White strips	1,3
3,7	paint on	1,4
3	Opalescence boost	2

Table 3: Average change of  $\Delta$ -E/ color shade per application

## II. Subjective Analysis



Graph 2: Change of values according to Vita shade guide

	Color Change			
	range from	to	Maximum change	Application
Visalys 7,5	A 3,5	B2 (14,1)	A3 (3,0)	1
Visalys 13,5	D3	D2 (12,9)	C1 (3,5)	1
White strips	D3	A1 (14,7)	D4 (2,6)	1
paint on	D3	D2 (13,0)	D4 (1,7)	1
Opalescence boost	A 3,5	D2 (13,4)	D4 (4,0)	1

Table 4: Range of color change

**Conclusions:** All systems showed a time dependent effective bleaching up to a Vita color shade of D2, B2 or A1. Both in-office and all home-bleaching systems showed comparable good results. Only limited correlation between L\*a\*b\*-values and subjective analysis was found.



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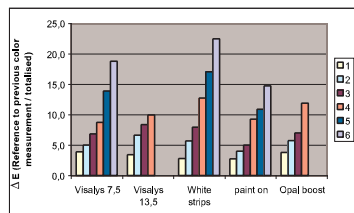
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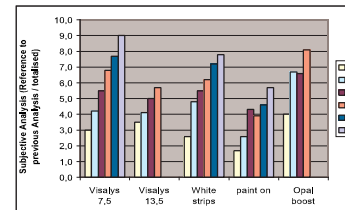


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