

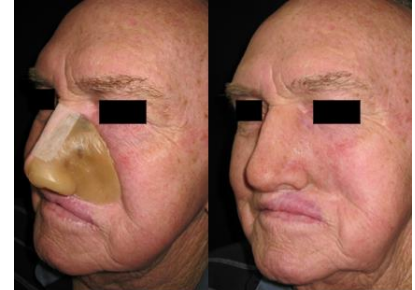
# Color Stability of Commonly Used Silicone Extraoral Maxillofacial Prosthetic Elastomers

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**Objectives:** The most common reason for the remaking of extraoral maxillofacial prosthesis is color fading. The purpose of this study was to determine the effects of opacifiers and pigments on the color stability of three commonly used silicone elastomers after being subjected to artificial aging.

**Methods:** Fifty-four specimens were made using a 1:1 ratio of base: crosslinker of silicone A-2000, A-2006, and A-2009. Each type of silicone included 6 subgroups: no pigment (control), opacifier only, red, yellow, blue, and a mixed pigment group of primary colors (red+blue+yellow). All



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specimens were subjected to energy exposure of 450 kJ/m<sup>2</sup> in an artificial aging chamber. Baseline and post-artificial aging color measurements were read using a reflection spectrophotometer from which the color differences ( $\Delta E^*$ ) were calculated. For interpretation, a color difference of  $\Delta E^*=3.0$  was used as a 50:50% acceptability threshold, while  $\Delta E^*=1.1$  was used as a 50:50% perceptibility threshold. All means were compared using ANOVA and Tukey HSD test at the level of  $\alpha=0.05$ .

**Results:** There was significant difference ( $P<0.05$ ) between pigmentation groups in all types of silicones tested. From the table below, the bolded values represent  $\Delta E^* > 3.0$  and is considered clinically unacceptable color changes. Red pigment showed the highest color change in A-2006 and A-2009 silicones, while yellow pigment exhibited the highest color change in A-2006 silicone. Furthermore, there was no statistical difference between the control, opacifier, and mixed pigmentation groups at all three silicone elastomer levels, which is within the acceptable threshold of  $\Delta E^*=3.0$ .

	A-2000			A-2006			A-2009		
	Mean (SD)	Min	Max	Mean (SD)	Min	Max	Mean (SD)	Min	Max
<b>Control</b>	2.23 (0.56)	0.84	3.62	1.90 (0.46)	0.74	3.05	1.17 (0.19)	0.70	1.63
<b>Opacifier</b>	2.47 (0.77)	0.55	4.40	1.86 (0.58)	0.43	3.29	1.48 (0.46)	0.34	2.62
<b>Red</b>	<b>7.89 (0.81)</b>	<b>5.87</b>	<b>9.90</b>	<b>10.20 (0.42)</b>	<b>9.16</b>	<b>11.24</b>	<b>10.78 (0.34)</b>	<b>9.93</b>	<b>11.64</b>
<b>Yellow</b>	<b>7.24 (0.90)</b>	<b>4.99</b>	<b>9.49</b>	<b>11.80 (0.07)</b>	<b>11.63</b>	<b>11.96</b>	<b>6.57 (0.12)</b>	<b>6.28</b>	<b>6.86</b>
<b>Blue</b>	2.34 (0.83)	0.29	4.39	<b>3.68 (0.14)</b>	<b>3.34</b>	<b>4.03</b>	<b>6.29 (0.25)</b>	<b>5.67</b>	<b>6.91</b>
<b>Mixed</b>	1.42 (0.21)	0.91	1.94	1.46 (0.33)	0.63	2.29	2.14 (1.18)	0.78	5.06

**Conclusion:** Overall, A-2000 is the most color-stable silicone tested. Pigments affect the color stability of silicones differently. Clinicians should exercise caution when incorporating varying amounts of each pigment into silicones to match patients' skin shades.

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