

## AAO Foundation Award Final Report

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Award Type	Orthodontic Faculty Development Fellowship Award
Project Title	Friction between different self-ligating brackets/archwire couples during sliding mechanics
Project Year	2008
Institution	University of Pennsylvania, Department of Orthodontics
Summary/Abstract (250 word maximum)	<p>The aim of this study was to evaluate the frictional resistance between six self-ligating brackets and a 0.019" x 0.025" SS arch wire during sliding mechanics using a modified orthodontic sliding simulation device. Upper right first premolar brackets, In-Ovation R, In-Ovation C, SPEED, SmartClip and Synergy R with 0.022" inch slots with prescription of 0° angulation, -7° torque and 0° distal offset and Damon 3mx brackets with 0° angulation, -7° torque and 2° distal offset were used. Frictional force was measured using an orthodontic sliding simulation device attached to a universal mechanical testing machine. Each bracket-archwire combination was tested 30 times at 0° angulation relative to the sliding direction. Statistical comparisons were performed using One-Way Analysis of variance (ANOVA) followed by Dunn's multiple comparisons.</p> <p>Damon 3mx showed significantly (<math>p &lt; 0.05</math>) the lowest static frictional force (<math>8.6 \pm 0.4</math> g). The highest static frictional force was shown by SPEED (<math>83.1 \pm 2.5</math>g). Other brackets investigated ranked as follows, from highest to lowest, In-Ovation R, In-Ovation C, SmartClip and Synergy R. The mean static frictional forces were all statistically different from each other at the <math>P &lt; 0.05</math> levels. The ranking of the kinetic frictional forces of bracket/archwire combinations was the same as that for static frictional forces. The means of the kinetic frictional forces were however lower than the static frictional forces. All bracket arch wire combinations showed significantly (<math>p &lt; 0.05</math>) different kinetic frictional forces except SmartClip and In-Ovation C, which were not significantly different from each other. The results indicate that passive self-ligating brackets have lower static and kinetic frictional resistance than active self-ligating brackets when using a 0.019" x 0.025" SS wire.</p>

<p>Were the original, specific aims of the proposal realized?</p>	<p>Yes. A line of research on friction of different bracket/archwire couples was established. We have already conducted several experiments. Initial results were submitted and accepted for publication.</p>
<p>Were the results published? If not, are there plans to publish? If not, why not?</p>	<p>Yes. Our first manuscript was successfully submitted to the AJODO. It was accepted and will be printed in the near future.</p>
<p>Have the results of this proposal been presented? If so, when and where? If not, are there plans to do so? If not, why not?</p>	<p>Yes. The results of this study were presented at the E. H. Angle Society Eastern component and at the AAO Annual session in Boston.</p>