

CHAPTER IV

RESULTS

The results of this study are presented as follows:

- I. The statistics describing the shear bond strength values in each sample group
- II. The comparison of mean shear bond strength in each group by analysis of variance and multiple comparisons
- III. The frequency of adhesive remnant index scores in each group.

I. The statistics describing the shear bond strength values in each sample group

The results in Table 5 and Figure 40 show that the control group (Transbond™ XT under dry conditions; Group I) provided the highest mean shear bond strength values of 11.70 ± 3.14 MPa. The values were, in descending order, as follows: Groups III, VIII, II, VII, VI, IV and V provided mean shear bond strength values of 7.37 ± 1.59 , 7.28 ± 1.06 , 7.24 ± 1.86 , 6.74 ± 1.61 , 6.66 ± 2.01 , 6.44 ± 1.40 and 6.28 ± 2.05 MPa, respectively.

Table 5 Means (\bar{x}), standard deviations (SD), and ranges (Min, Max) of shear bond strength for each adhesive system under non-contaminated and saliva-contaminated conditions.

Group	Adhesive system	Condition	Shear bond strength (MPa)			
			\bar{x}	SD	Min	Max
I	Transbond™ XT	Non-contaminated	11.70	3.14	6.35	18.10
II	Transbond™ XT	Saliva-contaminated	7.24	1.86	4.24	10.58
III	Transbond™ Plus Color Change	Non-contaminated	7.37	1.59	4.47	11.16
IV	Transbond™ Plus Color Change	Saliva-contaminated	6.44	1.40	4.04	9.34
V	Beauty Ortho Bond®	Non-contaminated	6.28	2.05	1.81	11.48
VI	Beauty Ortho Bond®	Saliva-contaminated	6.66	2.01	4.10	11.46
VII	Assure®	Non-contaminated	6.74	1.61	4.32	9.88
VIII	Assure®	Saliva-contaminated	7.28	1.06	5.33	9.11

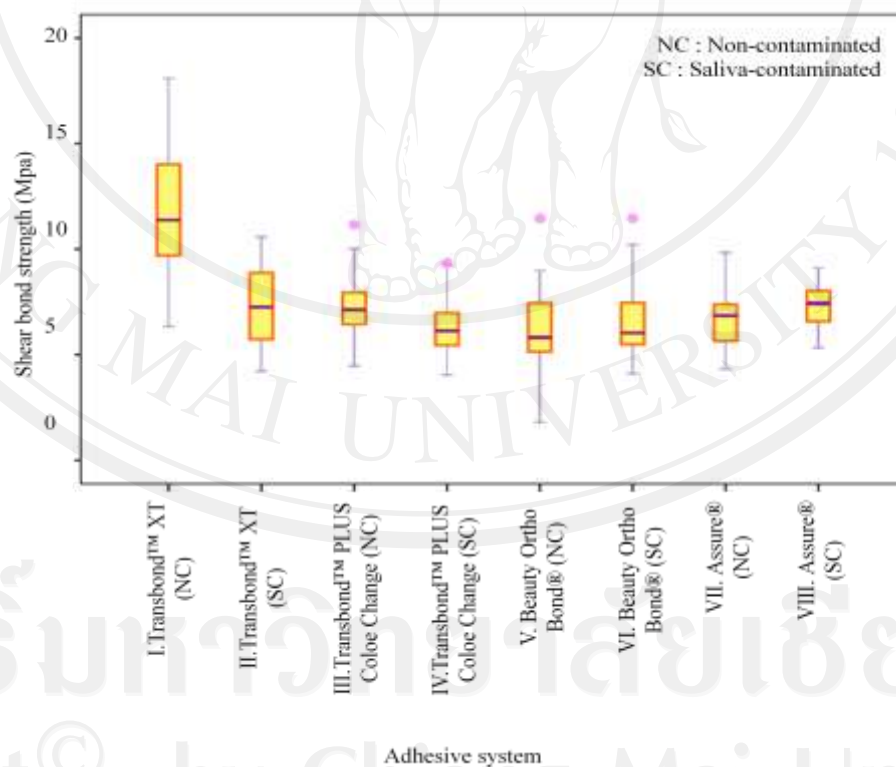


Figure 40 Diagram showing mean shear bond strength in each group.

II. The comparison of mean shear bond strength in each group by analysis of variance and multiple comparisons

In order to compare the means of shear bond strength among the eight groups, one-way analysis of variance was applied.

The following inferences of the analysis of variance were achieved:

1. Samples were selected randomly and independently.
2. The Shapiro-Wilk test showed normal distributions of the data within each group (Table 6).
3. Levene's test showed the same variance data for each group.

The one-way analysis of variance and Tukey's test showed significant differences at $p < 0.05$ (Tables 7, 8 and 9).

Table 6 The normality test of the shear bond strength values.

Group	Adhesive system	Condition	Shapiro-Wilk		
			Statistic	df	Sig.
I	Transbond™ XT	Non-contaminated	.981	20	.942
II	Transbond™ XT	Saliva-contaminated	.968	20	.708
III	Transbond™ PLUS Color Change	Non-contaminated	.945	20	.295
IV	Transbond™ PLUS Color Change	Saliva-contaminated	.921	20	.105
V	Beauty Ortho Bond®	Non-contaminated	.956	20	.468
VI	Beauty Ortho Bond®	Saliva-contaminated	.910	20	.063
VII	Assure®	Non-contaminated	.945	20	.291
VIII	Assure®	Saliva-contaminated	.970	20	.756

Table 7 Analysis of variance (ANOVA) of mean shear bond strength.

	Sum of squares	df	Mean square	F	Sig.
Between groups	432.898	7	61.843	16.643	.000
Within groups	564.789	152	3.716		
Total	997.687	159			

Table 7 shows significant differences in mean shear bond strength values among the eight groups at $p < 0.05$. Tables 8 and 9 show the highest statistically significant mean shear bond strength value of the control group at $p < 0.05$. No significant difference was found between shear bond strength values for adhesives bonded in saliva-contaminated conditions. For each adhesive, no significant difference in shear bond strength values was detected between non-contaminated and saliva-contaminated conditions, with the exception of Transbond™ XT, whose shear bond strength in non-contaminated conditions was significantly higher than that in saliva-contaminated conditions ($p < 0.05$).

Table 8 Statistical comparisons of mean shear bond strength using Tukey's test.

Group	Bonding	Condition	N	Subset for alpha = 0.05	
				1*	2*
V	Beauty Ortho Bond®	Non-contaminated	20	6.2812095	
IV	Transbond™ PLUS Color Change	Saliva-contaminated	20	6.4387545	
VI	Beauty Ortho Bond®	Saliva-contaminated	20	6.6616970	
VII	Assure®	Non-contaminated	20	6.7402585	
II	Transbond™ XT	Saliva-contaminated	20	7.2361645	
VIII	Assure®	Saliva-contaminated	20	7.2753695	
III	Transbond™ PLUS Color Change	Non-contaminated	20	7.3709820	
I	Transbond™ XT	Non-contaminated	20		11.6985185
Sig.				.629	1.000
*Means for groups in homogeneous subsets are displayed					

Table 9 Statistically significant differences of mean shear bond strength using Tukey's test.

Group	I(Control)	II	III	IV	V	VI	VII	VIII
I(Control)								
II	*							
III	*							
IV	*							
V	*							
VI	*							
VII	*							
VIII	*							

*Significant differences at $p < 0.05$

III. The frequency of adhesive remnant index scores in each group.

The Chi-square test showed that there was no significant difference in the adhesive remnant index (ARI) scores among the eight groups (Table 10). The ARI scores indicated that more than half of the samples in the control group (Transbond™

XT under non-contaminated conditions; Group I) had adhesive remnant on the enamel surfaces, whereas, in the remaining groups (Groups II through VIII) less than half of the samples had adhesive remnant on the enamel surfaces (Table 11).

Table 10 Chi-square test of the Adhesive Remnant Index scores of each group.

	ARI Score
Chi-square	6.025
df	7
Asymp. Sig.	.537

Table 11 The frequency of adhesive remnant index scores (percentages in parentheses) in each group.

Group	Adhesive system	Condition	ARI Score			
			0	1	2	3
I	Transbond™ XT	Non-contaminated	3(15.0%)	6(30.0%)	11(55.0%)	0(0%)
II	Transbond™ XT	Saliva-contaminated	2(10.0%)	12(60.0%)	6(30.0%)	0(0%)
III	Transbond™ PLUS Color Change	Non-contaminated	0(0%)	11(55.0%)	9(45.0%)	0(0%)
IV	Transbond™ PLUS Color Change	Saliva-contaminated	2(10.0%)	11(55.0%)	7(35.0%)	0(0%)
V	Beauty Ortho Bond®	Non-contaminated	0(0%)	14(70.0%)	5(25.0%)	1(5.0%)
VI	Beauty Ortho Bond®	Saliva-contaminated	1(5.0%)	17(85.0%)	1(5.0%)	1(5.0%)
VII	Assure®	Non-contaminated	4(20.0%)	8(40.0%)	8(40.0%)	0(0%)
VIII	Assure®	Saliva-contaminated	2(10.0%)	10(50%)	8(40.0%)	0(0%)
Total			14(8.8%)	89(55.6%)	55(34.4%)	2(3.3%)