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ภาคผนวก

ตารางที่ 8 แสดงค่าแรงที่ทำให้ฉีกตัวอย่างแตกหักและค่าความแข็งแรงยึดไมโครเทนไซล์
ของกลุ่มที่ 1

ตัวอย่างกลุ่มที่ 1	ชิ้นตัวอย่างที่	load (N)	bonded area	μ TBS (MPa)
DT light+Monobond s group 1	1	15.2	0.73	20.84
	2	17.4	0.72	24.09
	3	17.67	0.72	24.70
DT light+Monobond s group 2	1	8.48	1.64	5.18
	2	7.33	1.62	4.52
	3	8.86	1.64	5.41
DT light+Monobond s group 3	1	8.64	0.59	14.73
	2	6.14	0.62	9.95
	3	8.02	0.59	13.68
DT light+Monobond s group 4	1	17.36	0.90	19.35
	2	13.84	0.90	15.43
	3	9.95	0.88	11.31
DT light+Monobond s group 5	1	10.82	0.65	16.60
	2	10.62	0.66	15.98
	3	12.41	0.65	19.04
DT light+Monobond s group 6	1	11.74	0.73	16.10
	2	14.85	0.74	19.98
	3	8.1	0.73	11.11

ตารางที่ 9 แสดงค่าแรงที่ทำให้ฉีกตัวอย่างแตกหักและค่าความแข็งแรงยึดไมโครเทนไซล์
ของกุ่มที่ 2

ตัวอย่างกุ่มที่ 2	ชั้นตัวอย่างที่	load (N)	Bonded area	μ TBS (MPa)
DT light+porcelain liner M gr 1	1	16.39	0.95	17.34
	2	20.08	0.89	22.66
	3	17.33	0.89	19.56
DT light+porcelain liner M gr 2	1	20.07	1.07	18.73
	2	22.34	0.88	25.46
	3	15.21	0.91	16.69
DT light+porcelain liner M gr 3	1	12.21	0.97	12.58
	2	19.11	0.98	19.52
	3	14.82	1.05	14.16
DT light+porcelain liner M gr 4	1	13.28	0.71	18.81
	2	12.18	0.70	17.42
	3	11.43	0.69	16.51
DT light+porcelain liner M gr 5	1	12.09	0.90	13.38
	2	22.64	0.99	22.78
	3	19.5	0.95	20.55
DT light+porcelain liner M gr 6	1	20.88	0.60	35.01
	2	14.86	0.61	24.20
	3	14.86	0.50	29.90

ตารางที่ 10 แสดงค่าแรงที่ทำให้ขึ้นตัวอย่างแตกหักและค่าความแข็งแรงยึดไมโครเทนไซล์
ของกลุ่มที่ 3

ตัวอย่างกลุ่มที่ 3	ขึ้นตัวอย่างที่	load (N)	bonded area	μ TBS (MPa)
FRC+Monobond s group 1	1	4.89	0.96	5.08
	2	8.2	0.96	8.52
	3	2.67	0.84	3.18
FRC+Monobon s group 2	1	10.73	0.93	11.53
	2	15.07	1.02	14.72
	3	9.84	0.98	10.01
FRC+Monobond s group 3	1	4.86	0.86	5.68
	2	5.39	0.84	6.42
	3	8.58	0.71	12.12
FRC+Monobond s group 4	1	5.67	0.75	7.61
	2	7.52	0.69	10.98
	3	11.28	0.74	15.29
FRC+Monobond s group 5	1	5.81	0.70	8.35
	2	5.28	0.68	7.74
	3	5.64	0.68	8.35
FRC+Monobond s group 6	1	12.95	0.77	16.77
	2	10.04	0.77	13.00
	3	12.95	0.80	16.13

ตารางที่ 11 แสดงค่าแรงที่ทำให้ชั้นตัวอย่างแตกหักและค่าความแข็งแรงยึดไมโครเทนไซล์
ของกลุ่มที่ 4

ตัวอย่างกลุ่มที่ 4	ชั้นตัวอย่างที่	load (N)	bonded area	μ TBS (MPa)
FRC+Porcelain liner M gr 1	1	17.41	0.92	18.96
	2	19.94	1.05	18.98
	3	22.48	1.04	21.58
FRC+Porcelain liner M gr 2	1	27.27	1.10	24.87
	2	30.05	1.17	25.71
	3	32.69	1.13	28.99
FRC+Porcelain liner M gr 3	1	19.82	0.73	27.15
	2	17.49	0.74	23.72
	3	22.47	0.77	29.31
FRC+Porcelain liner M gr 4	1	32.29	1.21	26.65
	2	17.31	1.31	13.20
	3	42.73	1.87	22.82
FRC+Porcelain liner M gr 5	1	22.58	1.07	21.02
	2	24.91	1.07	23.19
	3	19.94	0.92	21.63
FRC+Porcelain liner M gr 6	1	17.56	0.90	19.58
	2	22.92	0.87	26.28
	3	19.12	0.88	21.72

ตารางที่ 12 แสดงค่าแรงที่ทำให้ชิ้นตัวอย่างแตกหักและค่าความแข็งแรงยึดไมโครเทนไซล์
ของกลุ่มที่ 5

ตัวอย่างกลุ่มที่ 5	ชิ้นตัวอย่าง ที่	load (N)	bonded area	μ TBS (MPa)
Easy post+Monobond s Group 5.1	1	7.54	0.66	11.38
	2	7.58	0.66	11.44
	3	9.55	0.87	10.99
Easy post+Monobond s Group 5.2	1	9.8	1.34	7.34
	2	10.11	1.34	7.57
	3	7.43	1.42	5.25
Easy post+Monobond s Group 5.3	1	7.54	0.78	9.64
	2	7.58	0.91	8.33
	3	9.55	0.89	10.70
Easy post+Monobond s Group 5.4	1	12.97	0.96	13.47
	2	9.97	1.09	9.15
	3	8.32	1.07	7.79
Easy post+Monobond s Group 5.5	1	6.42	1.07	6.03
	2	7.4	1.10	6.75
	3	4.05	1.13	3.59
Easy post+Monobond S Group 5.6	1	12.97	0.94	13.78
	2	9.97	0.97	10.29
	3	8.32	0.95	8.75

ตารางที่ 13 แสดงค่าแรงที่ทำให้ชิ้นตัวอย่างแตกหักและค่าความแข็งแรงยึดไมโครเทนไซล์
ของกลุ่มที่ 6

ตัวอย่างกลุ่มที่ 6	ชิ้นตัวอย่าง ที่	load (N)	bonded area	μ TBS (MPa)
Easy post+Porcelain liner M gr 1	1	24.8	1.08	22.98
	2	24.66	1.10	22.41
	3	22.36	1.09	20.52
Easy post+Porcelain liner M gr 2	1	22.4	1.14	19.69
	2	23.98	1.10	21.70
	3	22.65	1.10	20.50
Easy post+Porcelain liner M gr 3	1	22.24	0.98	22.73
	2	20.16	0.96	21.01
	3	19.76	0.96	20.59
Easy post+Porcelain liner M gr 4	1	27.5	1.00	27.64
	2	20.21	1.01	19.92
	3	29.86	1.02	29.15
Easy post+Porcelain liner M gr 5	1	16.8	1.05	16.02
	2	17.56	1.01	17.41
	3	27.6	1.04	26.57
Easy post+Porcelain liner M gr 6	1	17.58	0.85	20.74
	2	30.02	1.30	23.08
	3	22.17	0.86	25.65

ตารางที่ 14 แสดงค่าแรงที่ทำให้ชั้นตัวอย่างแตกหักและค่าความแข็งแรงยึดไมโครเทนไซล์
ของกลุ่มที่ 7

ตัวอย่างกลุ่มที่ 7	ชั้นตัวอย่างที่	load (N)	bonded area	μ TBS (MPa)
Innopost+Monobond s gr 1	1	3.64	0.89	4.11
	2	2.95	0.86	3.43
	3	3.74	0.98	3.82
Innopost+Monobond s gr 2	1	2.67	0.75	3.58
	2	3.81	0.75	5.11
	3	5.62	0.75	7.54
Innopost+Monobond s gr 3	1	1.2	0.80	1.50
	2	2.4	0.81	2.95
	3	2.4	0.81	2.95
Innopost+Monobond s gr 4	1	8.27	0.88	9.43
	2	8.56	0.89	9.67
	3	9.56	0.92	10.40
Innopost+Monobond s gr 5	1	7.51	0.86	8.77
	2	7.56	0.85	8.92
	3	5.43	0.85	6.40
Innopost+Monobond s gr 6	1	9.49	0.72	13.10
	2	8.3	0.71	11.69
	3	6.93	0.72	9.57

ตารางที่ 15 แสดงค่าแรงที่ทำให้ชั้นตัวอย่างแตกหักและค่าความแข็งแรงยึดไมโครเทนไซล์
ของกลุ่มที่ 8

ตัวอย่างกลุ่มที่ 8	ชั้นตัวอย่างที่	load (N)	bonded area	μ TBS (MPa)
Innopost+Porcelain liner M gr 1	1	13.11	1.07	12.31
	2	13.91	1.10	12.69
	3	14.97	1.13	13.28
Innopost+Porcelain liner M gr 2	1	19.66	1.01	19.48
	2	15.57	0.80	19.42
	3	19.8	0.94	21.13
Innopost+Porcelain liner M gr 3	1	10.1	0.84	12.05
	2	12.45	0.88	14.13
	3	12.04	0.93	12.91
Innopost+Porcelain liner M gr 4	1	8.53	0.85	10.02
	2	10.31	0.86	11.99
	3	12.94	0.82	15.79
Innopost+Porcelain liner M gr 5	1	17.14	0.74	23.25
	2	13.67	0.76	18.00
	3	14.68	0.79	18.60
Innopost+Porcelain liner M gr 6	1	12.97	0.98	13.27
	2	9.97	1.01	9.90
	3	8.32	0.99	8.43

ตารางที่ 16 แสดงค่าแรงที่ทำให้ชั้นตัวอย่างแตกหักและค่าความแข็งแรงยึดไมโครเทนไซล์
ของกลุ่มที่ 9

ตัวอย่างกลุ่มที่ 9	ชั้นตัวอย่างที่	load (N)	bonded area	μ TBS (MPa)
Exacto+Monobond s gr 1	1	12.38	0.66	18.78
	2	7.54	0.68	11.11
	3	11.28	0.68	16.62
Exacto+Monobond s gr 2	1	9.11	0.54	16.84
	2	9.52	0.63	15.08
	3	8	0.63	12.67
Exacto+Monobond s gr 3	1	9.81	0.64	15.40
	2	6.32	0.65	9.74
	3	7.1	0.67	10.64
Exacto+Monobond s gr 4	1	7.4	0.71	10.42
	2	7.43	0.68	10.97
	3	9.21	0.68	13.46
Exacto+Monobond s gr 5	1	7.72	0.97	7.94
	2	15.94	0.98	16.24
	3	14.5	1.08	13.46
Exacto+Monobond s gr 6	1	10.5	0.58	18.16
	2	13.89	0.58	24.02
	3	7.53	0.57	13.16

ตารางที่17แสดงค่าแรงที่ทำให้ชั้นตัวอย่างแตกหักและค่าความแข็งแรงยึดไมโครเทนไซล์
ของกลุ่มที่ 10

ตัวอย่างกลุ่มที่ 10	ชั้นตัวอย่างที่	load (N)	bonded ara	μ TBS (MPa)
Exacto+Porcelain liner M gr 1	1	9.61	1.09	8.84
	2	9.84	0.94	10.46
	3	11.11	0.91	12.16
Exacto+Porcelain liner M gr 2	1	17.82	0.77	23.18
	2	15.1	0.79	19.09
	3	14.17	0.79	17.92
Exacto+Porcelain liner M gr 3	1	21.66	1.01	21.45
	2	20.14	1.01	19.95
	3	18	1.07	16.85
Exacto+Porcelain liner M gr 4	1	20.14	0.79	25.55
	2	21.72	0.77	28.05
	3	15.3	0.74	20.70
Exacto+Porcelain liner M gr 5	1	12.76	0.86	14.88
	2	13.2	0.87	15.13
	3	16.01	0.89	18.05
Exacto+Porcelain liner M gr 6	1	10.05	0.47	21.59
	2	10.53	0.48	21.74
	3	8.65	0.48	18.04

ตารางที่ 18 แสดงค่าสถิติเชิงพรรณนาของตัวอย่างกลุ่มที่ 1 และ กลุ่มที่ 2

Group	Post type	Silane type	Statistic	value	Std. Error
1	DT light	Monobond S	mean	14.89	1.43
			median	15.70	
			Std. dev.	6.09	
			minimum	4.52	
			maximum	24.70	
2	DT light	Porcelain liner M	mean	20.29	1.35
			median	19.17	
			Std. dev.	5.73	
			minimum	12.58	
			maximum	35.01	

ตารางที่ 19 แสดงค่าสถิติเชิงพรรณนาของตัวอย่างกลุ่มที่ 3 และ กลุ่มที่ 4

Group	Post type	Silane type	Statistic	value	Std. Error
3	FRC postec	Monobond S	mean	10.08	0.94
			median	9.27	
			Std. dev.	3.99	
			minimum	3.18	
			maximum	16.77	
4	FRC postec	Porcelain liner M	mean	23.08	0.95
			median	23.00	
			Std. dev.	4.04	
			minimum	13.20	
			maximum	29.31	

ตารางที่ 20 แสดงค่าสถิติเชิงพรรณนาของตัวอย่างกลุ่มที่ 5 และ กลุ่มที่ 6

Group	Post type	Silane type	Statistic	value	Std. Error
5	Easy post	Monobond S	mean	9.01	0.65
			median	8.95	
			Std. dev.	2.74	
			minimum	3.59	
			maximum	13.78	
6	Easy post	Porcelain liner M	mean	22.13	0.79
			median	21.36	
			Std. dev.	3.39	
			minimum	16.02	
			maximum	29.15	

ตารางที่ 21 แสดงค่าสถิติเชิงพรรณนาของตัวอย่างกลุ่มที่ 7 และ กลุ่มที่ 8

Group	Post type	Silane type	Statistic	value	Std. Error
7	Innopost	Monobond S	mean	6.56	0.74
			median	6.97	
			Std. dev.	3.15	
			minimum	1.5	
			maximum	11.69	
8	Innopost	Porcelain liner M	mean	14.81	0.99
			median	13.27	
			Std. dev.	4.22	
			minimum	8.43	
			maximum	23.25	

ตารางที่ 22 แสดงค่าสถิติเชิงพรรณนาของตัวอย่างกลุ่มที่ 9 และ กลุ่มที่ 10

Group	Post type	Silane type	Statistic	value	Std. Error
9	FRC postec	Monobond S	mean	14.15	0.93
			median	13.46	
			Std. dev.	3.93	
			minimum	7.94	
			maximum	24.02	
10	FRC postect	Porcelain liner M	mean	18.54	1.18
			median	18.57	
			Std. dev.	4.99	
			minimum	8.84	
			maximum	28.05	

ตารางที่ 23 แสดงการทดสอบการกระจายของข้อมูล

post type	silane type		Kolmogorov-Smirnov ^a		
			Statistic	df	Sig.
DT light	Monobond	bond strength	.107	18	.200*
	porcelain liner M	bond strength	.162	18	.200*
FRC post	Monobond	bond strength	.152	18	.200*
	porcelain liner M	bond strength	.099	18	.200*
Easy post	Monobond	bond strength	.077	18	.200*
	porcelain liner M	bond strength	.167	18	.199
Innopost	Monobond	bond strength	.171	18	.176
	porcelain liner M	bond strength	.197	18	.062
Exacto	Monobond	bond strength	.125	18	.200*
	porcelain liner M	bond strength	.118	18	.200*

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

ตารางที่ 24 แสดงการทดสอบความแปรปรวนของข้อมูล

Levene's Test of Equality of Error Variances

Dependent Variable: bond strength

F	df1	df2	Sig.
1.753	9	170	.081

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept+post+silane+post * silane

ตารางที่ 25 แสดงผลทดสอบ The-2-way ANOVA

Tests of Between-Subjects Effects

Dependent Variable: bond strength

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	5171.167 ^a	9	574.574	30.355	.000
Intercept	42434.464	1	42434.464	2241.847	.000
post	1054.905	4	263.726	13.933	.000
silane	3508.512	1	3508.512	185.358	.000
post * silane	607.750	4	151.938	8.027	.000
Error	3217.820	170	18.928		
Total	50823.451	180			
Corrected Total	8388.987	179			

a. R Squared = .616 (Adjusted R Squared = .596)

ตารางที่ 26 แสดงผลการทดสอบ one-way ANOVA สำหรับปัจจัยชนิดผลิตภัณฑ์เดี่ยวสำเร็จรูป

Tests of Between-Subjects Effects

Dependent Variable: bond strength

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1054.905(a)	4	263.726	6.293	.000
Intercept	42434.464	1	42434.464	1012.537	.000
post	1054.905	4	263.726	6.293	.000
Error	7334.082	175	41.909		
Total	50823.451	180			
Corrected Total	8388.987	179			

a R Squared = .126 (Adjusted R Squared = .106)

ตารางที่ 27 แสดงผลการเปรียบเทียบเชิงซ้อนแบบทุกี่ระหว่างเดือยสำเร็จรูปแต่ละผลิตภัณฑ

Bond strength

Tukey HSD

post type	N	Subset	
		1	2
Innopost	36	10.6875	
Easy	36		15.5708
post	36		16.3425
Exacto	36		16.5789
FRC post	36		17.5906
DT light	36		
Sig.		1.000	.677

Means for groups in homogeneous subsets are displayed.

Based on Type III Sum of Squares

The error term is Mean Square(Error) = 41.909.

a Uses Harmonic Mean Sample Size = 36.000.

b Alpha = .05.

ตารางที่28 แสดงผลการทดสอบ one-way ANOVA สำหรับอิทธิพลร่วมระหว่างปัจจัยรูปแบบสารไซเลน และปัจจัยชนิดผลิตภัณฑเดือยสำเร็จรูป

ANOVA

bond strength

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5171.167	9	574.574	30.355	.000
Within Groups	3217.820	170	18.928		
Total	8388.987	179			

ตารางที่ 29 แสดงการเปรียบเทียบเชิงซ้อนแบบทุกี้อยู่
ระหว่างเดือยฟันแต่ละผลิตภัณฑ์และสารไซเลนแต่ละรูปแบบ

Bond strength

Tukey HSD

group	N	Subset for alpha = .05			
		1	2	3	4
post=4&silane=1	18	6.5611			
post=3&silane=1	18	9.0133			
post=2&silane=1	18	10.0822	10.0822		
post=5&silane=1	18		14.1500	14.1500	
post=4&silane=2	18			14.8139	
post=1&silane=1	18			14.8889	
post=5&silane=2	18			18.5350	18.5350
post=1&silane=2	18				20.2922
post=3&silane=2	18				22.1283
post=2&silane=2	18				23.0756
Sig.		.316	.143	.083	.062

Means for groups in homogeneous subsets are displayed.

a Uses Harmonic Mean Sample Size = 18.000.

ประวัติผู้เขียนวิทยานิพนธ์

นายกุลภพ สุทธิอาจ เกิดเมื่อวันที่ 9 ตุลาคม พ.ศ. 2518 ณ อำเภอเมือง จังหวัดปัตตานี ประวัติการศึกษา จบการศึกษาระดับมัธยมศึกษาตอนปลายจากโรงเรียนสาธิต มหาวิทยาลัย สงขลานครินทร์ วิทยาเขตปัตตานี สำเร็จการศึกษาระดับปริญญาตรี จากคณะทันตแพทยศาสตร์มหาวิทยาลัยเชียงใหม่ เมื่อปี พ.ศ. 2542 สำเร็จการศึกษาระดับประกาศนียบัตรบัณฑิต ทางวิทยาศาสตร์การแพทย์คลินิก สาขาทันตกรรมประดิษฐ์ จากคณะทันตแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่ เมื่อปี พ.ศ. 2547 ปัจจุบันเป็นพนักงานมหาวิทยาลัย ตำแหน่งอาจารย์ ประจำภาควิชาทันตกรรมประดิษฐ์ คณะทันตแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่