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ภาคผนวก

<u>ทดสอบความเที่ยงตรงของการผสมด้วยมือ</u>

ค่าระยะเวลาการแข็งตัวสุดท้ายของวัสดุ Provil 10 ครั้งเพื่อใช้ในการวัดมาตราฐานของการผสมด้วยมือของผู้ทำการวิจัย มีค่าดังต่อไปนี้ 234 240 233 233 243 241 235 241 241 245 วินาที นำมาวิเคราะห์เปรียบเทียบกับค่ามาตราฐานของระยะเวลาการแข็งตัวสุดท้ายคือ 240 วินาที

H_0 : $\mu = 240$

H_1 : $\mu \neq 240$

$X = 238.6$

S.D. = 4.43

$$t = \frac{X - 240}{S/\sqrt{n}}$$

$$= \frac{238.6 - 240}{4.43/\sqrt{10}}$$

$$= -0.09$$

เปิดตาราง t ที่ df = 10 α = .05 มีค่าเท่ากับ -2.262

ดังนั้น ค่าที่คำนวณได้จึงตกอยู่ในช่วง ยอมรับสมมติฐาน (H_0)

ทดสอบความเที่ยงตรงของเครื่องมือวัดความหนืดที่ใช้

โดยการทดลองใช้วัสดุ Perfectim flexi-velvet แบบผสมอัตโนมัติ และนำมาพิจารณาค่าเบี่ยงเบนมาตราฐานของระยะเวลาการแข็งตัวสุดท้ายและความหนืด

	st	vis
1	400	11954
2	375	8321
3	395	18801
4	320	13213
5	300	28608

Number of valid observations (listwise) = 5.00

Variable	Mean	Std Dev	Valid N	Label
ST	358.00	45.36	5	setting time (sec)
VIS	16179.40	7901.75	5	viscosity (Pa.s)

Two-way Analysis of Varience

* * * A N A L Y S I S O F V A R I A N C E * * *

ST setting time (seconds)
by CONTA contaminants
MATERIAL

EXPERIMENTAL sums of squares
Covariates entered FIRST

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Main Effects	23982248	16	1498890.508	1189.640	.000
CONTA	4456710	6	742785.059	589.534	.000
MATERIAL	19525538	10	1952553.777	1549.703	.000
2-Way Interactions	5719654	60	95327.574	75.660	.000
CONTA MATERIAL	5719654	60	95327.574	75.660	.000
Explained	29701903	76	390814.508	310.182	.000
Residual	368066	308	1259.953		
Total	30069968	384	78359.292		

385 cases were processed.
0 cases (.0 pct) were missing.

* * * A N A L Y S I S O F V A R I A N C E * * *

VIS viscosity (Pa.s)
by CONTA contaminants
MATERIAL

EXPERIMENTAL sums of squares
Covariates entered FIRST

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Main Effects	33343024955	16	2083939059.66	149.306	.000
CONTA	303146465	6	50524410.903	3.620	.002
MATERIAL	33039878489	10	3303987848.92	236.718	.000
2-Way Interactions	4340356640	60	72339277.336	5.183	.000
CONTA MATERIAL	4340356640	60	72339277.336	5.183	.000
Explained	37683381595	76	495833968.352	35.525	.000
Residual	4298906031	308	13957493.608		
Total	41982287626	384	109328879.234		

385 cases were processed.
0 cases (.0 pct) were missing.

Non-Parametric Test

- - - - - Kruskal-Wallis 1-Way Anova

ST setting time (seconds)
by MATERIAL

Mean Rank	Cases		
254.77	35	MATERIAL = 1	president
321.60	35	MATERIAL = 2	coltex fine
119.71	35	MATERIAL = 3	provil
218.01	35	MATERIAL = 4	perfecflex
251.57	35	MATERIAL = 5	perfectsing
182.71	35	MATERIAL = 6	panasil
67.14	35	MATERIAL = 7	panacon
332.09	35	MATERIAL = 8	lastic 90
38.03	35	MATERIAL = 9	expfast
151.10	35	MATERIAL = 10	expregular
186.26	35	MATERIAL = 11	silagum

	385	Total	

			Corrected for ties		
Chi-Square	D.F.	Significance	Chi-Square	D.F.	Significance
256.8686	10	.0000	256.9278	10	.0000

- - - - - Kruskal-Wallis 1-Way Anova

VIS viscosity (Pa.s)
by MATERIAL

Mean Rank	Cases		
242.69	35	MATERIAL = 1	president
52.64	35	MATERIAL = 2	coltex fine
203.00	35	MATERIAL = 3	provil
314.20	35	MATERIAL = 4	perfecflex
359.49	35	MATERIAL = 5	perfectsing
135.14	35	MATERIAL = 6	panasil
167.60	35	MATERIAL = 7	panacon
55.26	35	MATERIAL = 8	lastic 90
256.00	35	MATERIAL = 9	expfast
263.46	35	MATERIAL = 10	expregular
73.53	35	MATERIAL = 11	silagum

	385	Total	

			Corrected for ties		
Chi-Square	D.F.	Significance	Chi-Square	D.F.	Significance
313.2776	10	.0000	313.2776	10	.0000

- - - - - Kruskal-Wallis 1-Way Anova

ST setting time (seconds)
by CONTA contaminants

Mean Rank	Cases		
123.17	55	CONTA = 0	control
229.97	55	CONTA = 1	alcohol 0.1 ml
241.67	55	CONTA = 2	alcohol 0.2 ml
252.32	55	CONTA = 3	alcohol 0.3 ml
163.75	55	CONTA = 4	mouthwash 0.1 ml
164.65	55	CONTA = 5	mouthwash 0.2 ml
175.47	55	CONTA = 6	mouthwash 0.3 ml

	385	Total	

			Corrected for ties		
Chi-Square	D.F.	Significance	Chi-Square	D.F.	Significance
62.6093	6	.0000	62.6237	6	.0000

- - - - - Kruskal-Wallis 1-Way Anova

VIS viscosity (Pa.s)
by CONTA contaminants

Mean Rank	Cases		
210.00	55	CONTA = 0	control
188.48	55	CONTA = 1	alcohol 0.1 ml
177.75	55	CONTA = 2	alcohol 0.2 ml
181.34	55	CONTA = 3	alcohol 0.3 ml
199.51	55	CONTA = 4	mouthwash 0.1 ml
186.69	55	CONTA = 5	mouthwash 0.2 ml
207.24	55	CONTA = 6	mouthwash 0.3 ml

	385	Total	

			Corrected for ties		
Chi-Square	D.F.	Significance	Chi-Square	D.F.	Significance
4.2768	6	.6393	4.2768	6	.6393

One-way Analysis of Varience

เมื่อพิจารณาระยะเวลาการแข็งตัวสุดท้ายในวัสดุชนิดเดียวกัน ซึ่งเติมสารปนเปื้อน ต่างๆ กันทั้ง 7 กลุ่ม

President

- - - - - O N E W A Y - - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	495096.6857	82516.1143	209.5609	.0000
Within Groups	28	11025.2000	393.7571		
Total	34	506121.8857			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
2.6791	6	28	.035

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 14.0313 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	G r p 0	G r p 5	G r p 4	G r p 6	G r p 1	G r p 2	G r p 3
465.0000	Grp 0							
623.0000	Grp 5	*						
626.0000	Grp 4	*						
630.0000	Grp 6	*						
785.0000	Grp 1	*	*	*	*			
807.4000	Grp 2	*	*	*	*			
810.0000	Grp 3	*	*	*	*			

Coltex fine

- - - - - O N E W A Y - - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	285044.3429	47507.3905	12.5894	.0000
Within Groups	28	105660.6000	3773.6000		
Total	34	390705.1429			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
8.8108	6	28	.000

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 43.4373 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 0	Grp 1	Grp 2	Grp 6	Grp 5	Grp 4	Grp 3
766.0000	Grp 0							
861.0000	Grp 1							
896.0000	Grp 2	*						
936.2000	Grp 6	*						
954.6000	Grp 5	*						
1007.2000	Grp 4	*	*					
1063.0000	Grp 3	*	*	*	*			

Provil

- - - - - O N E W A Y - - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	334334.2857	55722.3810	99.4408	.0000
Within Groups	28	15690.0000	560.3571		
Total	34	350024.2857			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
2.4979	6	28	.046

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 16.7385 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 0	Grp 4	Grp 6	Grp 5	Grp 1	Grp 2	Grp 3
231.0000	Grp 0							
309.0000	Grp 4	*						
318.0000	Grp 6	*						
325.0000	Grp 5	*						
444.0000	Grp 1	*	*	*	*			
488.0000	Grp 2	*	*	*	*	*		
511.0000	Grp 3	*	*	*	*	*		

Perfectim flexi-velvet

- - - - - O N E W A Y - - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	2484390.571	414065.0952	250.1494	.0000
Within Groups	28	46347.6000	1655.2714		
Total	34	2530738.171			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
3.1534	6	28	.017

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 28.7687 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 0	Grp 4	Grp 5	Grp 6	Grp 1	Grp 2	Grp 3
268.0000	Grp 0							
364.0000	Grp 4	*						
435.0000	Grp 5	*	*					
622.0000	Grp 6	*	*	*				
903.4000	Grp 1	*	*	*	*			
923.6000	Grp 2	*	*	*	*			
940.4000	Grp 3	*	*	*	*			

Perfectim single phase

- - - - - O N E W A Y - - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	5141426.000	856904.3333	287.4016	.0000
Within Groups	28	83483.6000	2981.5571		
Total	34	5224909.600			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
10.4977	6	28	.000

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 38.6106 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 0	Grp 6	Grp 5	Grp 4	Grp 1	Grp 2	Grp 3
307.0000	Grp 0							
451.0000	Grp 6	*						
462.0000	Grp 5	*						
489.0000	Grp 4	*						
1152.2000	Grp 1	*	*	*	*			
1181.0000	Grp 2	*	*	*	*			
1244.2000	Grp 3	*	*	*	*			

Panasil

- - - - - O N E W A Y - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	963937.1429	160656.1905	193.3121	.0000
Within Groups	28	23270.0000	831.0714		
Total	34	987207.1429			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
2.7560	6	28	.031

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 20.3847 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 0	Grp 4	Grp 5	Grp 6	Grp 1	Grp 2	Grp 3
339.0000	Grp 0							
399.0000	Grp 4	*						
410.0000	Grp 5	*						
440.0000	Grp 6	*						
525.0000	Grp 1	*	*	*	*			
712.0000	Grp 2	*	*	*	*	*		
820.0000	Grp 3	*	*	*	*	*	*	

Panasil contact plus

- - - - - O N E W A Y - - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	225697.1429	37616.1905	114.4841	.0000
Within Groups	28	9200.0000	328.5714		
Total	34	234897.1429			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
4.1884	6	28	.004

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 12.8174 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	G r p 0	G r p 4	G r p 5	G r p 6	G r p 1	G r p 2	G r p 3
217.0000	Grp 0					*	*	*
243.0000	Grp 4					*	*	*
249.0000	Grp 5					*	*	*
250.0000	Grp 6					*	*	*
382.0000	Grp 1	*	*	*	*			
401.0000	Grp 2	*	*	*	*			
416.0000	Grp 3	*	*	*	*			

Lastic 90

- - - - - O N E W A Y - - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	126515.7714	21085.9619	10.0123	.0000
Within Groups	28	58968.4000	2106.0143		
Total	34	185484.1714			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
3.6890	6	28	.008

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 32.4501 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 0	Grp 2	Grp 1	Grp 3	Grp 4	Grp 6	Grp 5
828.0000	Grp 0							
898.0000	Grp 2							
947.8000	Grp 1	*						
959.4000	Grp 3	*						
996.6000	Grp 4	*	*					
999.6000	Grp 6	*	*					
1005.0000	Grp 5	*	*					

Express fast set

- - - - - O N E W A Y - - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	23097.1429	3849.5238	24.6651	.0000
Within Groups	28	4370.0000	156.0714		
Total	34	27467.1429			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
3.1413	6	28	.018

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 8.8338 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 5	Grp 6	Grp 4	Grp 0	Grp 3	Grp 2	Grp 1
219.0000	Grp 5							
231.0000	Grp 6							
247.0000	Grp 4	*						
252.0000	Grp 0	*						
281.0000	Grp 3	*	*	*	*			
286.0000	Grp 2	*	*	*	*			
288.0000	Grp 1	*	*	*	*			

Express regular set

- - - - - O N E W A Y - - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	76818.5714	12803.0952	19.3777	.0000
Within Groups	28	18500.0000	660.7143		
Total	34	95318.5714			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
3.3873	6	28	.012

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 18.1757 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 4	Grp 6	Grp 5	Grp 3	Grp 1	Grp 2	Grp 0
369.0000	Grp 4							
376.0000	Grp 6							
379.0000	Grp 5							
449.0000	Grp 3	*	*	*				
463.0000	Grp 1	*	*	*				
476.0000	Grp 2	*	*	*				
481.0000	Grp 0	*	*	*				

Silagum

- - - - - O N E W A Y - - - - -

Variable ST setting time (seconds)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	20007.1429	3334.5238	8.0837	.0000
Within Groups	28	11550.0000	412.5000		
Total	34	31557.1429			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
3.5095	6	28	.010

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 14.3614 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 0	Grp 4	Grp 5	Grp 1	Grp 6	Grp 2	Grp 3
410.0000	Grp 0		*	*	*	*	*	*
464.0000	Grp 4	*						
464.0000	Grp 5	*						
469.0000	Grp 1	*						
473.0000	Grp 6	*						
478.0000	Grp 2	*						
492.0000	Grp 3	*						

เมื่อพิจารณาความหนืดในวัสดุชนิดเดียวกัน ซึ่งเติมสารปนเปื้อนต่างๆ กันทั้ง 7 กลุ่ม

President

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	780829670.7	130138278.4	7.3208	.0001
Within Groups	28	497745310.0	17776618.21		
Total	34	1278574981			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
2.4612	6	28	.049

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 2981.3267 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 4	Grp 1	Grp 6	Grp 5	Grp 3	Grp 2	Grp 0
13002.8000	Grp 4							
15482.8000	Grp 1							
16435.4000	Grp 6							
17222.4000	Grp 5							
18052.0000	Grp 3							
20170.8000	Grp 2							
28890.6000	Grp 0	*	*	*	*	*	*	

Coltex fine

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	104670422.0	17445070.33	19.1459	.0000
Within Groups	28	25512598.40	911164.2286		
Total	34	130183020.4			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
1.3402	6	28	.273

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 674.9682 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 2	Grp 0	Grp 1	Grp 3	Grp 4	Grp 6	Grp 5
4697.0000	Grp 2							
4936.0000	Grp 0							
5020.8000	Grp 1							
6090.0000	Grp 3							
8111.6000	Grp 4	*	*	*	*			
8702.4000	Grp 6	*	*	*	*			
8856.4000	Grp 5	*	*	*	*			

Provil

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	320969633.5	53494938.91	5.7791	.0005
Within Groups	28	259183286.4	9256545.943		
Total	34	580152919.9			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
.8626	6	28	.534

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 2151.3421 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 3	Grp 1	Grp 2	Grp 5	Grp 6	Grp 4	Grp 0
11758.6000	Grp 3							
12188.6000	Grp 1							
13030.8000	Grp 2							
14345.8000	Grp 5							
15025.4000	Grp 6							
19494.4000	Grp 4	*	*	*				
19616.0000	Grp 0	*	*	*				

Perfectim flexi-velvet

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	1487457369	247909561.4	12.9984	.0000
Within Groups	28	534026044.0	19072358.71		
Total	34	2021483413			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
1.3668	6	28	.262

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 3088.0705 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 3	Grp 2	Grp 1	Grp 5	Grp 0	Grp 4	Grp 6
17032.8000	Grp 3							
21444.4000	Grp 2							
24221.6000	Grp 1							
25310.8000	Grp 5	*						
30082.4000	Grp 0	*	*					
34638.0000	Grp 4	*	*	*	*			
36427.2000	Grp 6	*	*	*	*			

Perfectim single phase

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	1095847086	182641181.0	3.7660	.0071
Within Groups	28	1357917987	48497070.96		
Total	34	2453765073			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
.7119	6	28	.643

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 4924.2602 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

- No two groups are significantly different at the .050 level

Panasil

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	152399830.3	25399968.39	5.2564	.0010
Within Groups	28	135301206.4	4832185.943		
Total	34	287700536.7			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
1.1740	6	28	.348

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 1554.3786 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 3	Grp 2	Grp 1	Grp 4	Grp 5	Grp 0	Grp 6
7696.4000	Grp 3							
7822.6000	Grp 2							
11156.0000	Grp 1							
11787.0000	Grp 4							
12260.6000	Grp 5	*	*					
12759.2000	Grp 0	*	*					
13043.2000	Grp 6	*	*					

Panasil contact plus

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	100930722.7	16821787.12	2.2311	.0695
Within Groups	28	211109380.4	7539620.729		
Total	34	312040103.1			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
1.2730	6	28	.301

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 1941.5999 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

- No two groups are significantly different at the .050 level

Lastic 90

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	81150361.54	13525060.26	11.0505	.0000
Within Groups	28	34270232.00	1223936.857		
Total	34	115420593.5			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
2.0974	6	28	.085

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 782.2841 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	G r p 0	G r p 4	G r p 3	G r p 5	G r p 1	G r p 2	G r p 6
4368.2000	Grp 0							
5674.0000	Grp 4							
6479.2000	Grp 3	*						
6785.6000	Grp 5	*						
6957.4000	Grp 1	*						
8675.6000	Grp 2	*	*	*				
9131.2000	Grp 6	*	*	*	*	*		

Express fast set

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	158737674.6	26456279.10	2.2811	.0644
Within Groups	28	324752064.0	11598288.00		
Total	34	483489738.6			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
.8170	6	28	.566

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 2408.1412 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

(*) Indicates significant differences

Mean	CONTA	Grp 6	Grp 5	Grp 2	Grp 3	Grp 1	Grp 4	Grp 0
		6	5	2	3	1	4	0
15162.8000	Grp 6							
16952.6000	Grp 5							
18698.4000	Grp 2							
18979.6000	Grp 3							
19112.8000	Grp 1							
20099.8000	Grp 4							
22444.0000	Grp 0							*

Express regular set

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	3291133553.0	548522258.83	1.8286	.1295
Within Groups	28	8398869929.6	299960247.49		
Total	34	11690002883			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
4.4859	6	28	.003

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 3872.7282 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

- No two groups are significantly different at the .050 level

Silagum

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	31397282.60	5232880.467	1.8500	.1253
Within Groups	28	79200593.20	2828592.614		
Total	34	110597876.0			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
1.2474	6	28	.313

- - - - - O N E W A Y - - - - -

Variable VIS viscosity (Pa.s)
By Variable CONTA contaminants

Multiple Range Tests: Tukey-B test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 1189.2419 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE:

Step	2	3	4	5	6	7
RANGE	3.69	3.99	4.17	4.30	4.40	4.49

- No two groups are significantly different at the .050 level

ประวัติผู้เขียน

นางสาวเทมวรรณ ดำริห์อนันต์ เกิดวันที่ 30 เมษายน พ.ศ. 2514 ที่จังหวัดกรุงเทพมหานคร สำเร็จการศึกษาปริญญาตรีทันตแพทยศาสตรบัณฑิต คณะทันตแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ในปีการศึกษา 2537 และเข้าศึกษาต่อในหลักสูตรวิทยาศาสตรมหาบัณฑิต สาขาวิชาทันตกรรมประดิษฐ์ คณะทันตแพทยศาสตร์ ที่จุฬาลงกรณ์มหาวิทยาลัย เมื่อ พ.ศ. 2539 ปัจจุบันทำงานตำแหน่งทันตแพทย์ ในโรงพยาบาลเอกชน