CHAPTER V
EXPERIMENTAL RESULTS

5.1 Circular motion experimental result

From experimental procedure the results were classified into diameter of foi-tong, strength per extension distance of Foi-tong and statistical analysis. The variable factors used in this experiment were circular speed (rpm), fluid pressure (bar) and rilling high (mm) which ranged between 50-90 rpm, 0.3-0.9 bar and 100-130 mm. respectively.

5.1.1 Diameter test result

Data of foi-tong diameter test obtained from the experiment were summarized in Table 5.1 . Figure 5.1 to Figure 5.5 should be the pressure versus mean diameter of foi-tong performed at 50-90 rpm. of speed and 100-130 mm. of rilling high.

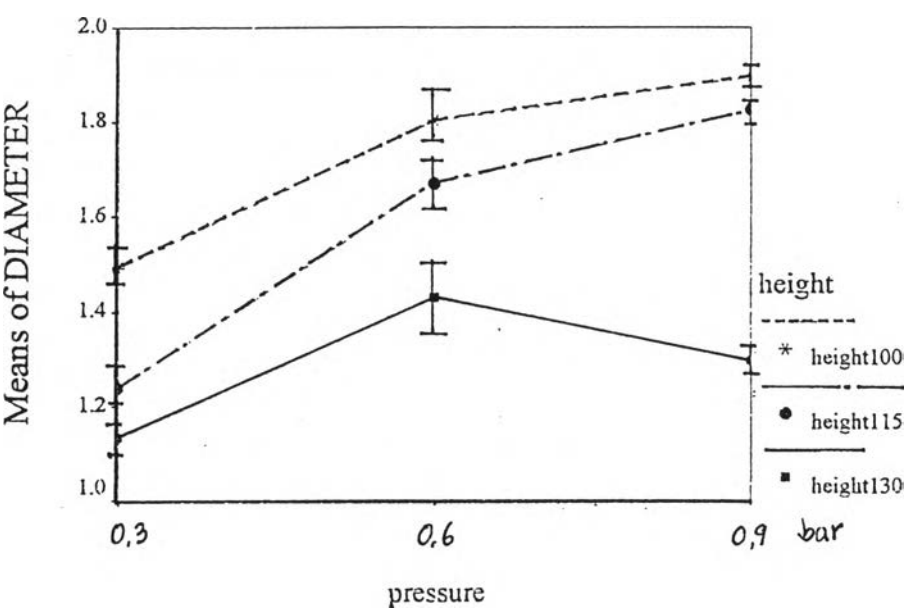

Figure 5.1 Pressure versus mean diameter of Foi-tong **run at 50 rpm.**

Result: By higher pressure and higher rilling high caused smaller foi-tong diameter.

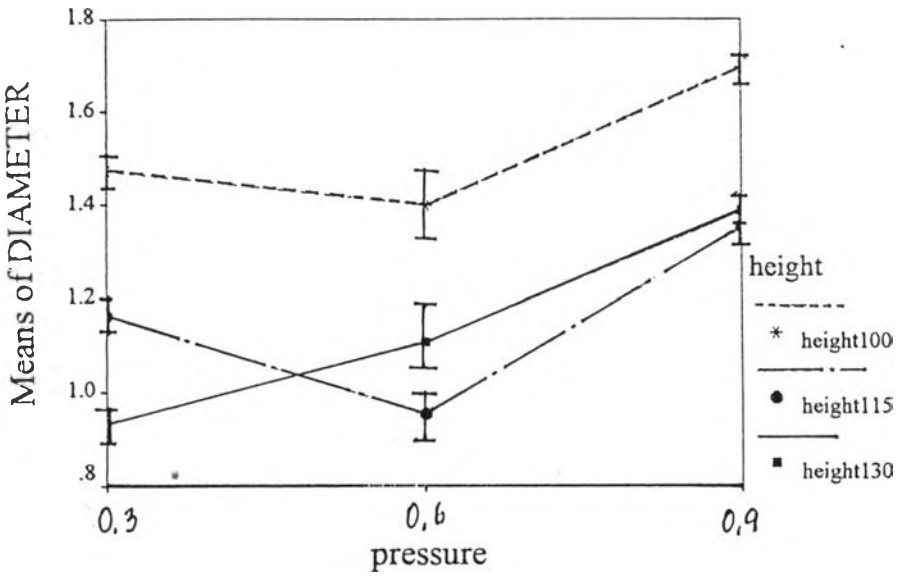

Figure 5.2 Pressure verus mean diameter of Foi-tong **run at 60 rpm.**

Result: By higher pressure and higher speed caused smaller diameter. But if increase the pressure upto p = 0.9 bar. The diameter of foi-tong would be swollen.

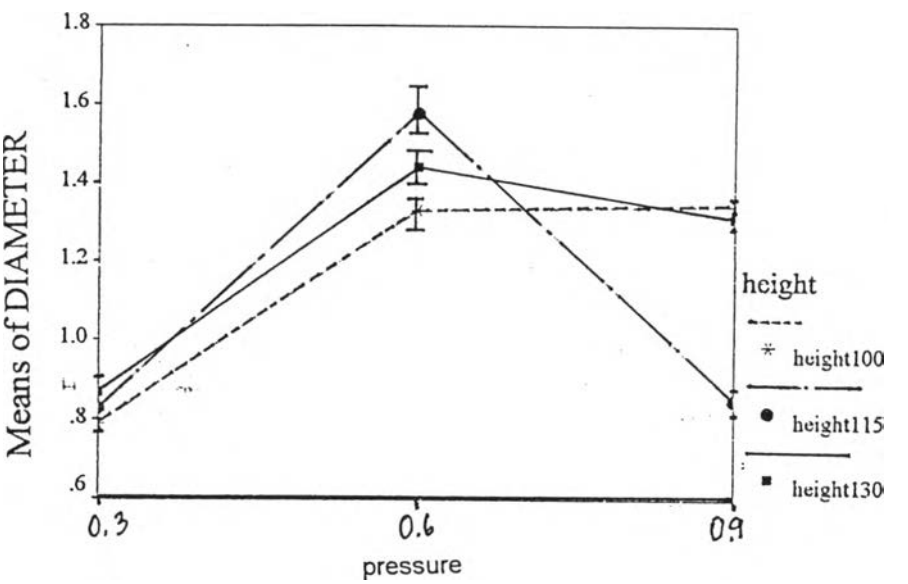

Figure 5.3 Pressure versus mean diameter of foi-tong **run at 70 rpm.**

Result: At pressure 0.6 bar and height of 115 mm. Foi-tong diameter was the biggest But at p=0.9 bar the smallest. This curve was not logical.

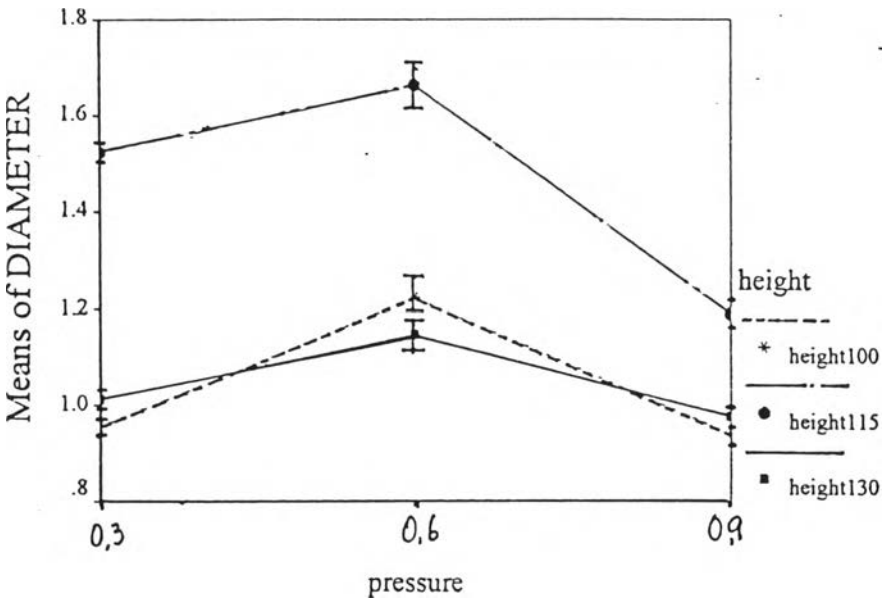

Figure 5.4 Pressure versus mean diameter of Foi-tong **run out 80 rpm.**

Result: By the rilling height of 115 was the worst. The mean diameter was also the most exceeded.

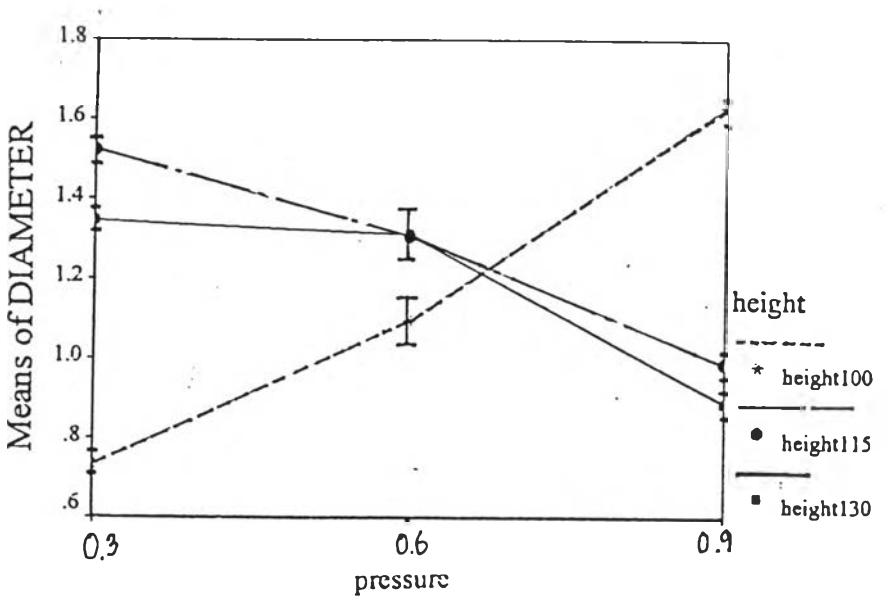

Figure 5.5 Pressure versus mean diameter of Foi-tong **run at 90 rpm.**

Result: At the lower pressure of 0.3 bar, rilling height of 100 mm. brought about the smallest diameter while the other two caused the bigger diameter.

Table 5.1 Diameter and tensile test result of foi-tong using circular motion equipment.

No.	Variable factors			Test result		Remarks
	Speed (rpm)	Pressure (bar)	Height (mm)	Diameter (mm.)	Strength (kg/cm)	Physical prop. Diameter. Consistency
1	50	0.3	100	1.49 ± 0.10	1.52	
2			115	1.24 ± 0.11	1.26	
3			130	1.13 ± 0.10	1.05	
4		0.6	100	1.80 ± 0.15	1.78	less drop
5			115	1.67 ± 0.13	1.63	
6			130	1.43 ± 0.11	1.46	
7		0.9	100	1.90 ± 0.05	0	more drop
8			115	1.83 ± 0.14	1.70	medium drop
9			130	1.30 ± 0.17	1.52	less drop
10	60	0.3	100	1.47 ± 0.18	1.64	
11			115	1.16 ± 0.12	1.81	
12			130	0.93 ± 0.07	1.43	
13		0.6	100	1.40 ± 0.31	1.51	less drop
14			115	0.95 ± 0.09	1.54	medium drop
15			130	1.11 ± 0.02	1.66	less drop
16		0.9	100	1.70 ± 0.16	0	drop+ bubble
17			115	1.35 ± 0.09	1.32	many drop
18			130	1.39 ± 0.27	1.55	medium drop
19	70	0.3	100	0.79 ± 0.221	1.74	
20			115	0.83 ± 0.09	1.88	
21			130	0.87 ± 0.31	1.94	medium drop
22		0.6	100	1.33 ± 0.34	1.63	medium drop
23			115	1.58 ± 0.28	1.92	less drop
24			130	1.44 ± 0.24	1.95	less drop
25		0.9	100	1.34 ± 0.21	1.22	drop+ bubble
26			115	0.85 ± 0.01	1.58	medium drop

Table 5.1 (Cont.)

27			130	1.31 ± 0.65	0	short string
28	80	0.3	100	0.96 ± 0.37	1.43	short string
29			115	1.52 ± 0.15	1.26	short string
30			130	1.01 ± 0.18	0	bubbles ,bad
31		0.6	100	1.22 ± 0.15	0	bubbles, bad
32			115	1.66 ± 0.12	0	bubbles, bad
33			130	1.15 ± 0.14	0	bubbles, bad
34		0.9	100	0.94 ± 0.28	1.92	
35			115	1.13 ± 0.36	1.85	
36			130	0.98 ± 0.27	1.83	
37	**90**	**0.3**	**100**	**0.74 ± 0.15**	**1.83**	*accepted
38			115	1.52 ± 0.19	1.63	
39			130	1.35 ± 0.17	1.66	
40		0.6	100	1.10 ± 0.18	1.84	
41			115	1.31 ± 0.69	0	bubbles, bad
42			130	1.31 ± 0.26	0	bubbles, bad
43		0.9	100	16.33± 0.09	1.74	
44			115	0.99 ± 0.21	1.84	
45			130	0.89 ± 0.30	0	bubbles, bad

5.1.2 Tensile test result

According to the data in Table 5.1 the strength in kg/cm will be shown

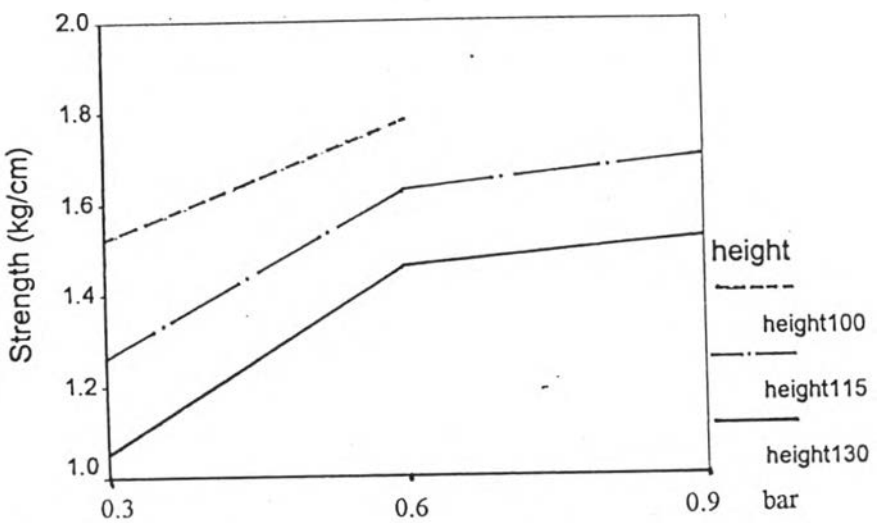

Figure 5.6 Pressure versus strength of Foi-tong **run at 50 rpm.**

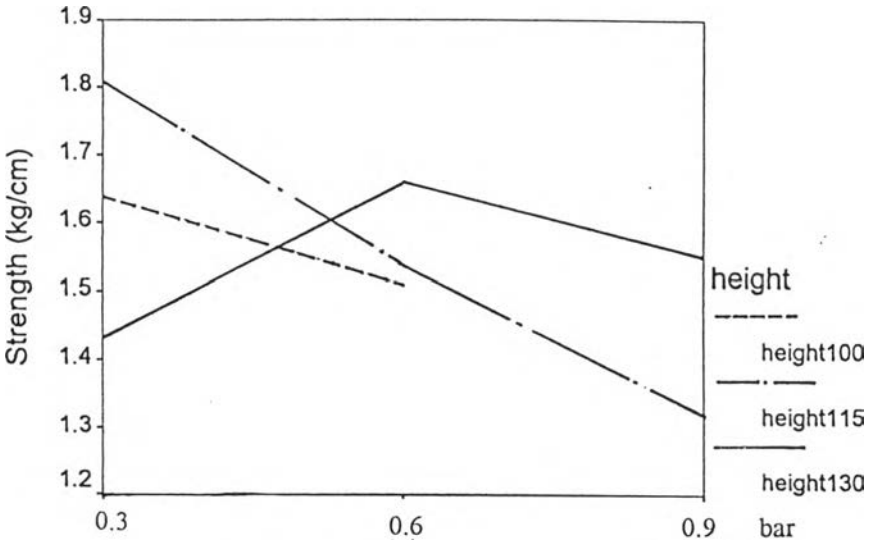

Figure 5.7 Pressure versus strength of Foi-tong **run at 60 rpm.**

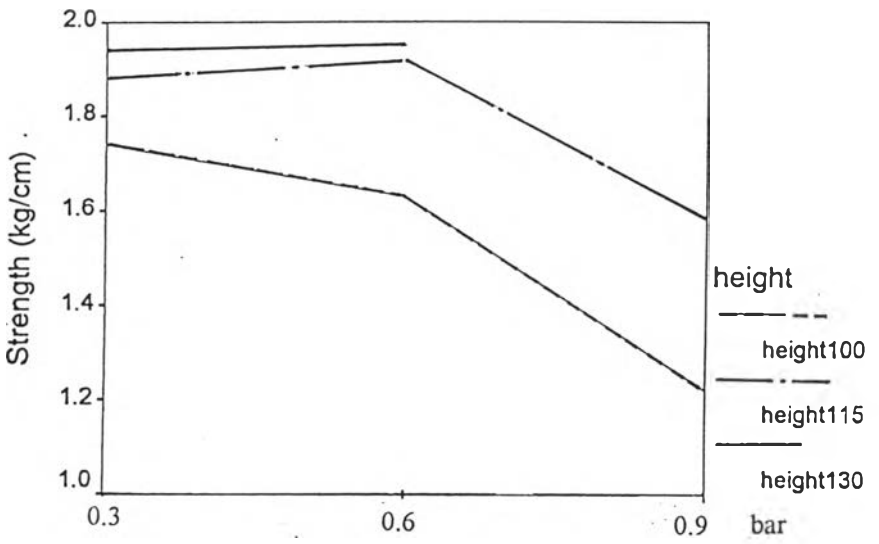

Figure 5.8 Pressure versus strength of Foi-tong **run at 70 rpm.**

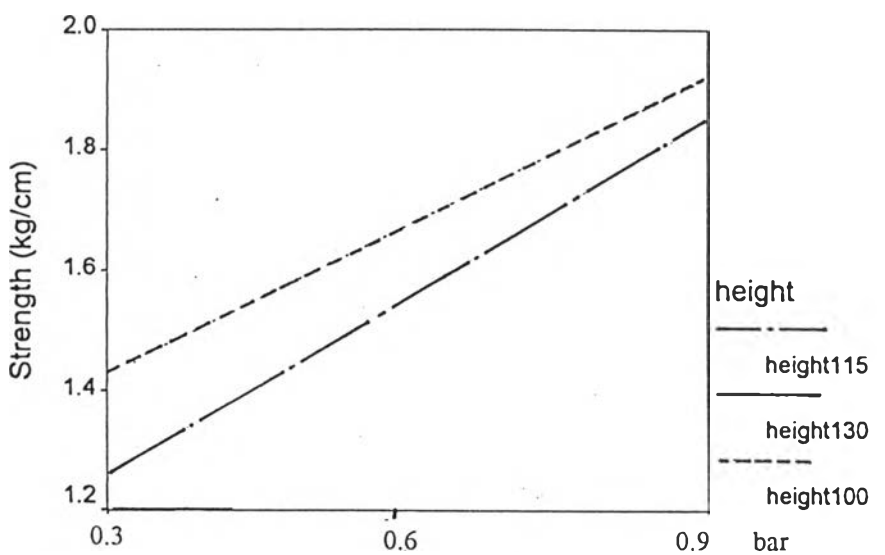

Figure 5.9 Pressure versus strength of Foi-tong **run at 90 rpm.**

5.1.3 Statistical analysis result

The statistic result by running ANOVA Release 7.1 on Window (SPSS)

Table 5.3 Homogeneous subset of diameter and speed by DUNCAN

Speed	N	Subset 1	Subset 2
Speed 70	27	1.1481	
Speed 80	27	1.1815	
Speed 90	27	1.2041	
Speed60	27	1.2741	
Speed 50	27		1.5322
Significant		0.084	1.000

Table 5.4 Homogeneous subset of diameter and rillling heigh by DUNCAN

Height	N	Subset 1	Subset 2
Height 130	45	1.1727	
Height 115	45		1.3104
Height 100	45		1.3209
Significant		1.000	.839

Table 5.5 Homogeneous subset of diameter and pressure by DUNCAN

Pressure	N	Subset 1	Subset 2
0.3 bar	45	1.1347	
0.9 bar	45		1.3053
0.6 bar	45		1.3640
Significant		1.000	.254

Table 5.6 Analysis of Variance results for circular motion method

Dependent Variable: DIAMETER

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	11.997[b]	44	.273	4.632	.000	203.799	1.000
Intercept	217.056	1	217.056	3687.298	.000	3687.298	1.000
HEIGHT	.616	2	.308	5.232	.007	10.463	.820
PRESSURE	1.277	2	.639	10.850	.000	21.701	.989
SPEED	2.586	4	.647	10.984	.000	43.934	1.000
HEIGHT * PRESSURE	.788	4	.197	3.348	.013	13.393	.827
HEIGHT * SPEED	2.316	8	.289	4.918	.000	39.341	.997
PRESSURE * SPEED	2.296	8	.287	4.876	.000	39.009	.997
HEIGHT * PRESSURE * SPEED	2.117	16	.132	2.247	.009	35.958	.969
Error	5.298	90	5.887E-02				
Total	234.351	135					
Corrected Total	17.295	134					

a. Computed using alpha = .05

b. R Squared = .694 (Adjusted R Squared = .544)

From ANOVA table 5.6 showed the interaction of all operational factors effected on diameter of Foi-tong string. It described :

1) Pressure (p); Speed (s); and rilling height(h) were effecting on the diameter of Foi-tong string

2) The interaction of them :

Rilling height (h) & Pressure (p)

Rilling height (h) & Speed (s)

Pressure (p) & Speed (s)

were also effect on the diameter of Foi-tong string

3) The interaction of h & p & s were also effect on the diameter

4) At the significant level of 0.05 ($\alpha = 0.05$)

5.2 **Linear motion experimental result**

5.2.1 Diameter test results

Table 5.7 Diameter and tensile test result of Foi-tong using linear motion equipment

Run No:	Variable Factors			Test results		Remarks
	Speed (S)	Pressure (P)	Height (H)	Diameter	Strength	
1	50	2	100	1.8	-	
2	50	2	100	1.65	-	
3	50	2	100	1.32	-	
4	50	3	100	1.45	-	Strength
5	50	3	100	1.63	-	could be
6	50	3	100	1.70	-	not mea-
7	50	4	100	1.60	-	sured due
8	50	4	100	1.22	-	to string
9	50	4	100	1.56		break and too short

Because of the data collecting was in completed due to the linear equipment performed the compression action under the high friction force .The rilling process has been interrupted and brought about some data as shown in Table 5.7 above.

To analyze the data could be approximately by application of One Way ANOVA

The explanation of the ANOVA result

From One-way ANOVA result as shown in Table 5.8 the calculated P-value was 0.460 that was higher than $\alpha = 0.05$ This meant that by each pressure had no effect on diameter of Foi-tong. However there was a trend of larger diameters at higher pressure . The average diameter at the pressure of 4 bar was larger than at yhe pressure of 2 and 3 bar.

Table 5.8 Diameter test results of Foi-tong using linear motion equipment

Run	Variable Factors			Test results	Remarks
No:	Speed(m/s)	Pressure (bar)	Hight (mm)	Diameter (mm)	
1	50	2	100	1.59 ± 0.25	
2	50	3	100	1.60 ± 0.13	
3	50	4	100	1.46 ± 0.21	

Duncan[a]

pressure	N	Subset for alpha = .05
		1
pressure4	3	1.4600
pressure2	3	1.5900
pressure3	3	1.5933
Sig.		.460

Descriptives

			N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
							Lower Bound	Upper Bound
DIAMETER	pressure	pressure2	3	1.5900	.2456	.1418	.9800	2.2000
		pressure3	3	1.5933	.1290	7.446E-02	1.2729	1.9137
		pressure4	3	1.4600	.2088	.1206	.9413	1.9787
		Total	9	1.5478	.1857	6.189E-02	1.4051	1.6905