CHAPTER 6

CONCLUSIONS & SUGGESTIONS FOR FURTHER WORK

6.0 CONCLUSIONS & SUGGESTIONS FOR FURTHER WORK

6.1 CONCLUSION

In conclusion it is possible to state that at the commencement of working the extruder there is a higher backflow of material. After a very short period it attains a flow forward. This forward flow is constant for a larger period and ultimately fails to give a forward flow at all, within a very short period.

This is well expressed in relation with the 20 T 1000 pipe. Only a very few pipes were manufactured in the extruder which was in consideration.The results of the 20 T 1000 pipe was more realistic than the other types since the compound used was more or less the same throughout. Also the same die was used throughout and a large number of results could be obtained since this particular pipe was produced almost always.

6.2 SUGGESTIONS FOR FURTHER WORK

Within the time frame of this research project, it was not possible to obtain exact out put in relation to the screw-barrel wear. As explained in Chapter 5 a straight foreward change in out put with the duration could have been obtained if all the processing variables described were kept constant.

But this cannot be done with the fluctuation of raw material and sales (which dictates the type of pipe and the rate of out put to be manufactured) which varies the flow behaviour. The fluctuations effects the change in temperature profile, screw speed, dossing feeder speed and haul off speed. These

fluctuations may also depend on the extruder operator and the cleanliness of the equipment which can be minimized.

In relation to fig 5.7 where the change in out put was obtained with duration which dictates the screw and barrel wear we have assumed that the temperature profile and the dossing feeder to be constant throughout the period the study was done.

Following are some suggestions to make it maore realistic:

a. To obtain the change in out put with screw speed(eg. fig 5.1) at instants when the temperature profile and the dossing feeder speed were constant.

b. Obtaining relationship between dossing feeder speed and screw speed with different processing variables.

c. This relationship can be obtained as eq. 5.1 & eq. 5.2 other than the simpler linear relationship.

d. Both (b) & (c) can be done only on stages with a constant temperature profile or a narrow band of the temperature profile.

e. Obtaining a hypothetical value for the screw speed in relation to the temperature profile.

f. Obtaining a hypothetical value for the screw speed in relation to both the temperature profile and dossing feeder speed.

g. The investigations carried out in this project and also above factors a,b,c,d,e & f can be evaluated with different types of pipes when the restrictions for the flow will be different (ie. different dies).

h. The evaluation done can be checked by examining the wear of the barrel at different time interval as per fig 4.4,

fig 4.5 and fig 4.6.

In general this was a basic study on the effect of out put due to screw/barrel wear of a conical twin screw extruder. This was well emphasised as the effect on screw/barrel clearance in relation with the theory behind single screw extrusion. This can lead to evaluation of a theory for out put of conical,twin screw extrusion.

APPENDIX A

VALUES OF 20 T 1000

	Date	Time	Torque	Dosing feeder speed(x)	Out put (kg/hr)	Screw speed (r)	Different in out put with screw speed	Y_1	Y_1+Y_2	Difference in out put with Hypothetical screw speed
1	09/01/86	4 am	63	2.5	83.7	22.3	+21.25	12.62	34.92	+38.0
2	10/06/86	9 am	57	2.5	78.0	20.7	+26.5	12.62	33.32	+36.0
3	10/06/86	3 pm	59	3.0	80.0	20.7	+28.5	13.1	33.7	+37.0
4	03/08/86	9 am	55	2.5	64.0	17.6	+13.75	12.62	30.22	+38.9
5	03/08/86	1 pm	60	3.5	72.0	17.5	+22.0	13.55	31.0	+44.5
6	04/09/86	3 am	68	8.2	83.0	27.8	+12.25	17.9	45.7	+13.25
7	05/09/86	8 am	65	8.2	89.0	27.8	+18.25	17.9	45.7	+20.0
8	19/09/86	2 pm	77	9.0	87.0	33.2	+ 5.25	18.65	51.85	+ 3.25
9	19/09/86	1 pm	79	9.0	87.0	27.7	+16.5	20.23	47.9	+13.25
10	27/09/86	11am	78	7.5	89.0	26.9	+20.0	17.26	44.16	+23.25
11	27/09/86	6 pm	70	7.5	102.0	33.1	+20.5	17.26	50.36	+22.5
12	27/09/86	3 am	67	7.5	103.0	33.0	+21.75	17.26	50.26	+24.0
13	28/09/86	8 am	66	7.5	89.0	33.0	+ 7.75	17.26	50.26	+10.0
14	20/10/86	5 pm	68	8.0	92.25	31.1	+15.0	17.72	48.72	+16.5
15	21/10/86	10pm	59	7.5	90.5	29.6	+16.25	17.76	48.76	+14.5
16	14/11/86	1 pm	58	6.0	47.0	18.0	- 4.0	15.87	33.86	+ 4.0
17	29/11/86	1 pm	67	11.5	70.0	20.6	+18.75	20.97	31.58	+10.0
18	30/11/86	10 pm	71	11.5	69.0	20.7	+12.5	20.97	41.56	+ 9.0
19	03/12/86	2 pm	81	11.5	70.0	20.4	+19.25	20.97	41.56	+10.0
20	06/12/86	10pm	70	11.0	65.0	20.7	+ 8.5	20.51	41.21	+ 5.85
21	11/12/86	1 pm	64	11.3	70.0	16.0	+23.0	25.1	41.96	+ 9.5
22	23/03/87	3 pm	74	13.5	69.0	20.0	+14.0	22.83	42.83	+ 6.75
23	23/03/87	9 pm	74	13.5	67.0	20.0	+12.0	22.83	42.83	+ 4.75
24	24/03/87	8 am	83	14.0	73.0	19.9	+18.25	23.3	43.29	+ 9.25
25	15/04/87	9 pm	63	12.5	68.0	22.6	+ 7.75	21.9	44.5	+ 1.5
26	16/04/87	8 am	62	13.5	79.0	22.9	+18.25	22.83	45.93	+ 9.5

	Date	Time	Torque	Dosing feeder speed(x)	Out put (kg/hr)	Screw speed (r)	Different in out put with screw	Y_1	Y_1+Y_2	Difference in out put with hypothetical screw speed
27	15/05/87	9 am	63	6.0	69.0	20.0	+14.0	15.87	35.87	+21.5
28	15/05/87	4 pm	59	6.1	67.0	20.1	+16.75	15.96	36.06	+24.0
29	15/05/87	4 am	56	6.1	70.0	20.3	+19.25	15.96	36.06	+21.75
30	16/05/87	10am	62	6.0	64.5	20.3	+13.75	15.87	36.17	+16.0
31	12/06/87	10pm	68	7.0	71.0	20.3	+20.25	16.71	37.1	+20.75
32	28/06/87	3 am	66	5.0	59.0	19.4	+ 5.25	14.94	34.37	+14.75
33	29/07/87	4 pm	69	6.0	72.0	24.0	+ 9.0	15.87	39.87	+15.75
34	30/07/87	3 pm	66	6.0	72.0	24.0	+ 9.0	15.87	39.87	+15.75
35	11/09/87	7 pm	80	17.0	80.0	20.0	+25.0	26.08	46.08	+10.25
36	12/09/87	1 pm	78	16.5	72.0	20.1	+16.75	25.6	45.7	+ 3.0
37	12/09/87	10pm	88	16.5	73.0	20.3	+17.25	25.6	45.9	+ 3.5
38	07/10/87	10pm	68	15.5	70.0	24.3	+ 6.25	22.8	47.13	- 2.25
39	08/10/89	8 am	67	13.5	73.0	22.2	+13.5	22.8	45.0	+ 5.5
40	28/10/87	12noon	70	12.0	66.0	22.2	+ 6.5	21.44	43.64	+ 1.5
41	28/10/87	10pm	72	12.0	65.0	22.6	+ 4.75	21.44	44.04	- 0.5
42	29/10/87	9 am	76	13.0	70.0	22.4	+10.0	22.36	44.77	+ 3.0
43	30/10/87	10am	69	12.0	65.0	22.3	+ 5.25	21.44	43.74	0
44	30/10/87	10pm	63	12.0	63.0	22.3	+ 3.25	21.44	43.74	- 2.0
45	01/02/88	10pm	67	2.0	76.0	25.4	+10.25	12.16	37.56	+ 4.75
46	22/03/88	5 am	66	4.0	59.0	25.3	- 6.75	14.01	39.3	+ 4.0
47	23/03/88	5 am	72	4.5	63.0	25.3	- 2.75	14.48	39.78	+ 7.0
48	09/04/88	10pm	61	3.8	56.0	25.5	-10.0	13.83	39.33	+ 0.75
49	18/04/88	9 pm	68	4.4	55.0	24.9	-10.0	14.38	39.28	0

	Date	Time	Torque	Dosing feeder speed(x)	Out put (kg/hr)	Screw speed (r)	Difference in out put with screw	y_1	Y_1+Y_2	Difference in out put with hypothetical screw speed
50	13/05/8	9 pm	73	6.5	41	27.0	-28	16.33	43.3	-22.75
51	16/05/88	8 pm	54	5.5	44.5	27.7	-26	15.40	43.1	-19.0
52	17/05/88	11pm	52	6.0	55	31.8	-23.75	15.87	47.67	-17.75
53	18/05/88	10pm	54	6.5	71	28.4	-1	16.3	44.7	+ 4.0
54	21/06/88	9 am	59	6.0	56	29.7	-18.5	15.87	45.57	-12.75
55	22/06/88	11am	72	4.5	50	30.9	-27	14.48	45.38	-18.5
56	22/07/88	5 pm	46	9.0	80	30.1	+ 9.75	18.65	48.75	+ 4.25
57	24/07/88	7 pm	43	8.0	83.3	34	0	17.72	51.92	+0.55
58	19/08/88	11pm	44	9.5	56	20.5	0	19.12	39.62	0
59	20/08/88	5 pm	45	9.6	50	21.3	- 7.75	19.2	40.5	- 7.75
60	24/08/88	9 pm	41	8.5	77	31.2	- 0.5	18.19	49.39	0
61	25/08/88	11 am	48	9.5	77	30.8	+ 0.25	19.12	49.92	0
62	27/08/88	2 pm	32	7.9	61	26.1	- 6.25	17.63	43.73	- 4.0

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