CHAPTER 06

CONCLUSION AND SUGGESTIONS FOR FURTHER WORK

6.1. Conclusion:

Possibility of determining process parameter settings making use of basic rheological and heat transfer theory and empirical equations were investigated in this project.

As stated in the discussion several assumptions and approximations have been made to simplify the theoretical factors involved. However actual results suggest that the procedures followed to obtain the objectives have sufficient accuracy and validity.

6.2. Suggestions for further work:

The further work needed in this regard may be summarized as follows:

i. Confirmation of the values obtained for heat transfer coefficient, viscosity coefficient and power law Index using a Capillary Rheometer or some other sophisticated means, and investigate the possibility of use of MFI for further evaluation.

ii. Evaluate these models using different moulds and raw materials at different processing conditions and predict the validity or add corrective factors for each parameter as applicable.

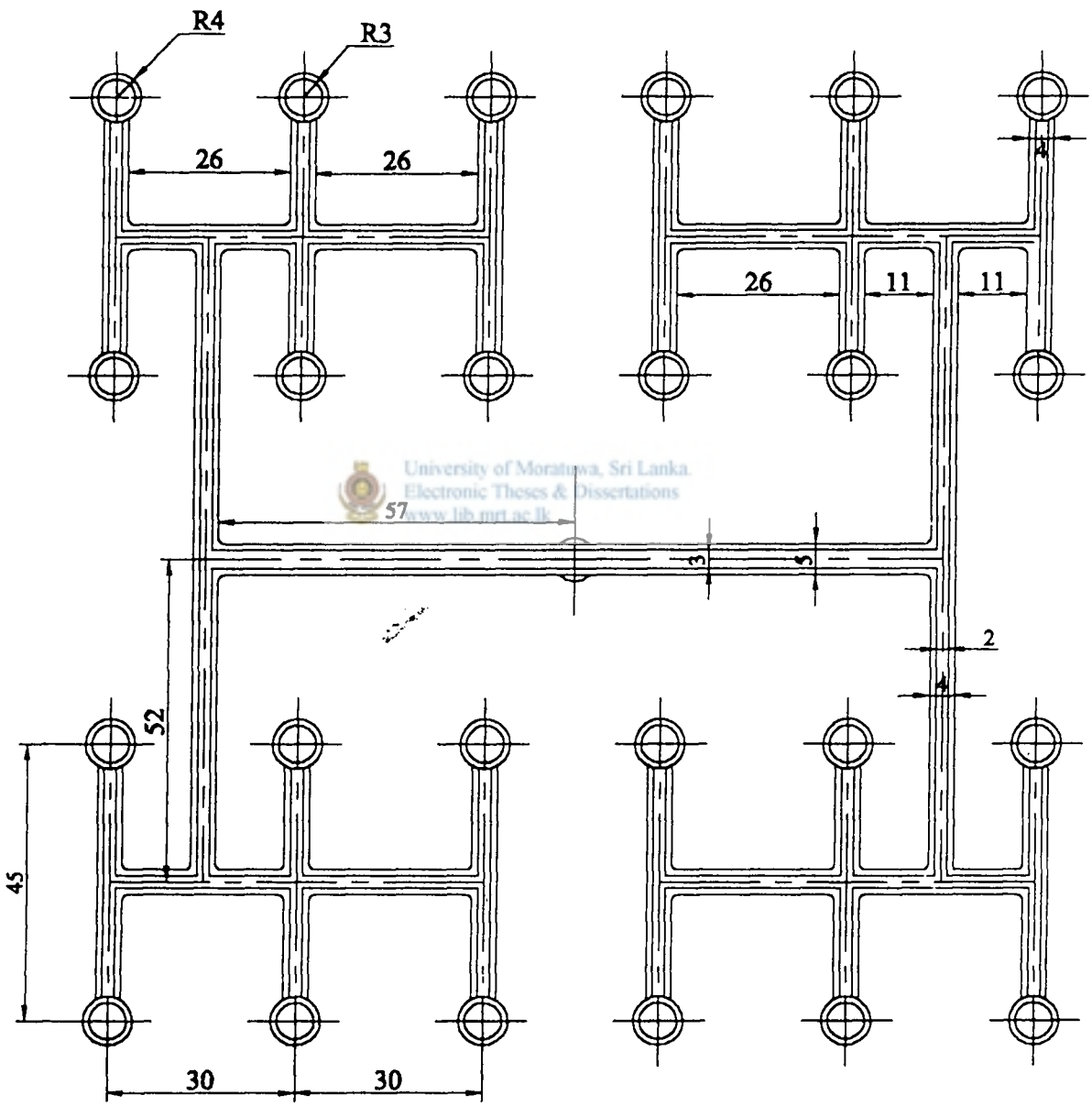
ANNEXURE 1

MACHINE SPECIFICATIONS

Principle specification and values for ISEN 150 machine		
Injection unit	Modle/Unit	IS150EN
Cylinder symbol		A
Screw diameter	mm	40
Injection volume - Calculated	cm^2	250
Injection capacity		
PS	g	230
PE	g	180
Injection pressure	kgf/cm^2	2000
Injection rate		
Standard	$cm^3/sec.$	169 (141)
Speed acceleration (Optional)	$cm^3/sec.$	330
Pl astisicing Capacity (PS)	kg/h	100
Maximum screw rotation speed	r.p.m	320
Clamping unit		
Clomping force	Ton	150
Mold opening force	Ton	9.4
Distance between tie rods (H.V)	mm	510x510
Platen Dimensions (H.V)	mm	740x740
Clamping stroke	mm	660
Open daylight - maximum	mm	810
Close daylight - minimum	mm	150
Mould closing speed		
Fast speed	m/min	7.49.5(41)
Slow speed	m/min	2
Mould opening speed		
Fast speed	m/min	7 49(40.5)
Slow speed	m/min	3.1(2.6)
Ejection Force (Hydraulic Ejection)	Ton	4.6
Ejection stroke	mm	120
Required oil quantity	Liter	540
Motor for pump	kw	22
Machine dimensions (L x W x H)	m	5.2 x 7.3 x 1.8
Machine weight	Ton	7.1

ANNEXURE 2.1.

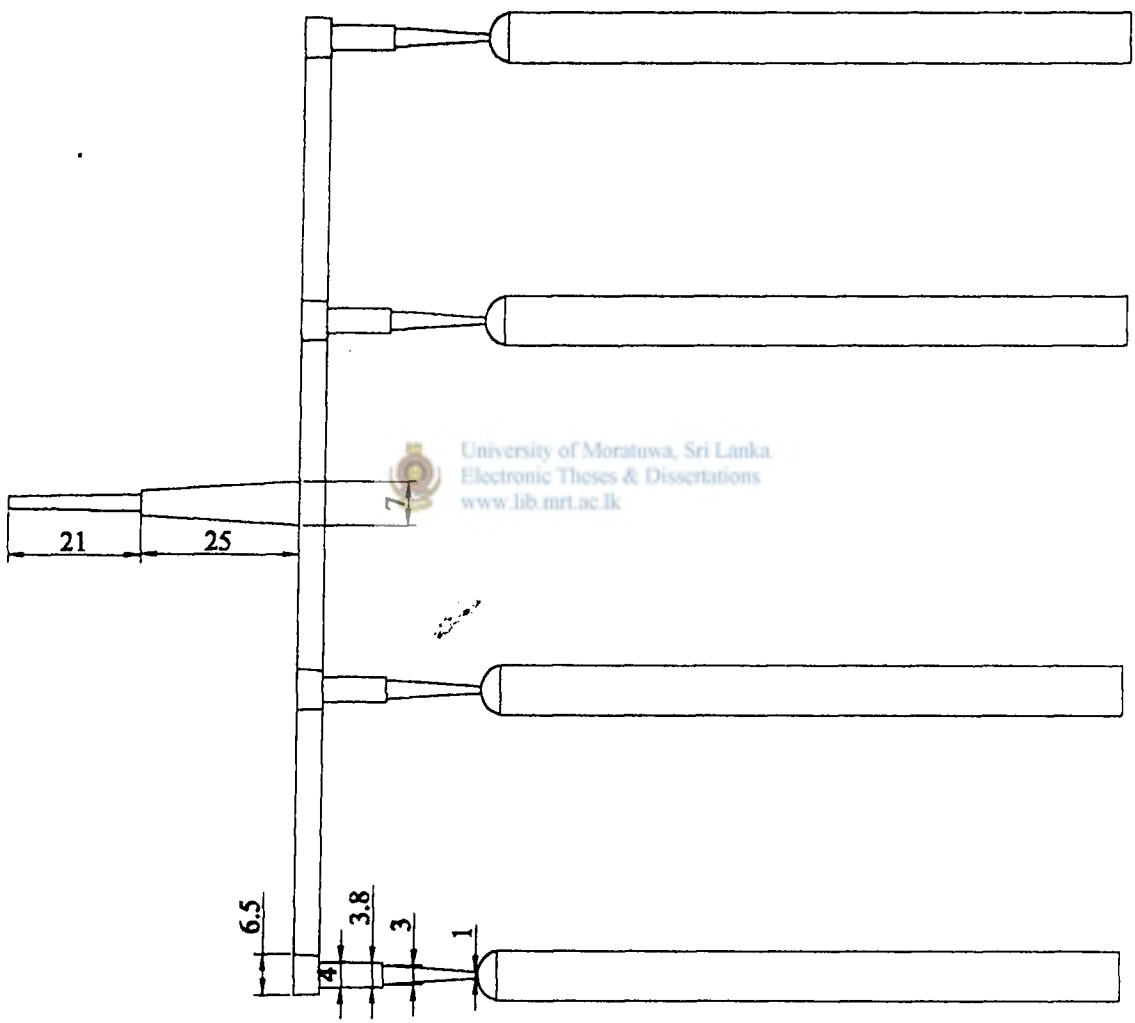
CAVITY LAYOUT OF THE MOULD



FRONT ELEVATION

ANNEXURE 2.2.

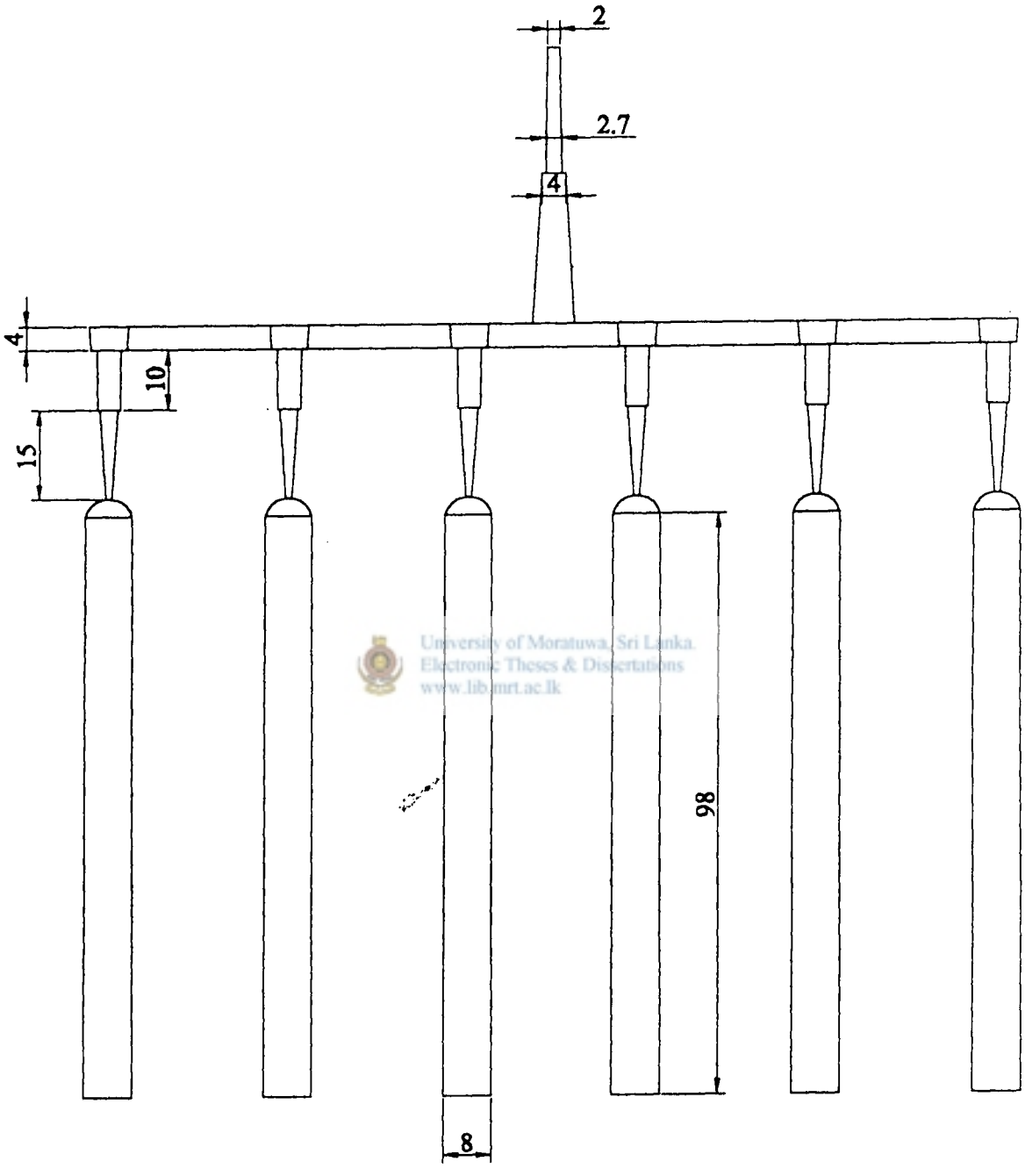
CAVITY LAYOUT OF THE MOULD



END ELEVATION

ANNEXURE 2.3.

CAVITY LAYOUT OF THE MOULD



PLAN

ANNEXURE 3

RAW MATERIAL SPECIFICATION SHEET

Features:

Chemical name:	SAN
Commercial name:	Luran 358N
Density:	1.08 g/cm^3
Reinforcing filler type:	non
Colour:	transparent
Water absorption, saturation at 23C:	0.2

Processing:

Method of processing:	injection Moulding
Melt volume rate(MVR),200/21.6:	27 ml/10 min.
Melt volume rate(MVR), 220/10:	22 ml/10 min.
Melt temperature range:	200 - 250 C
Mould temperature range:	40 - 80 C
Moulding shrinkage:	0.3 - 0.7 %

Fire behavior:

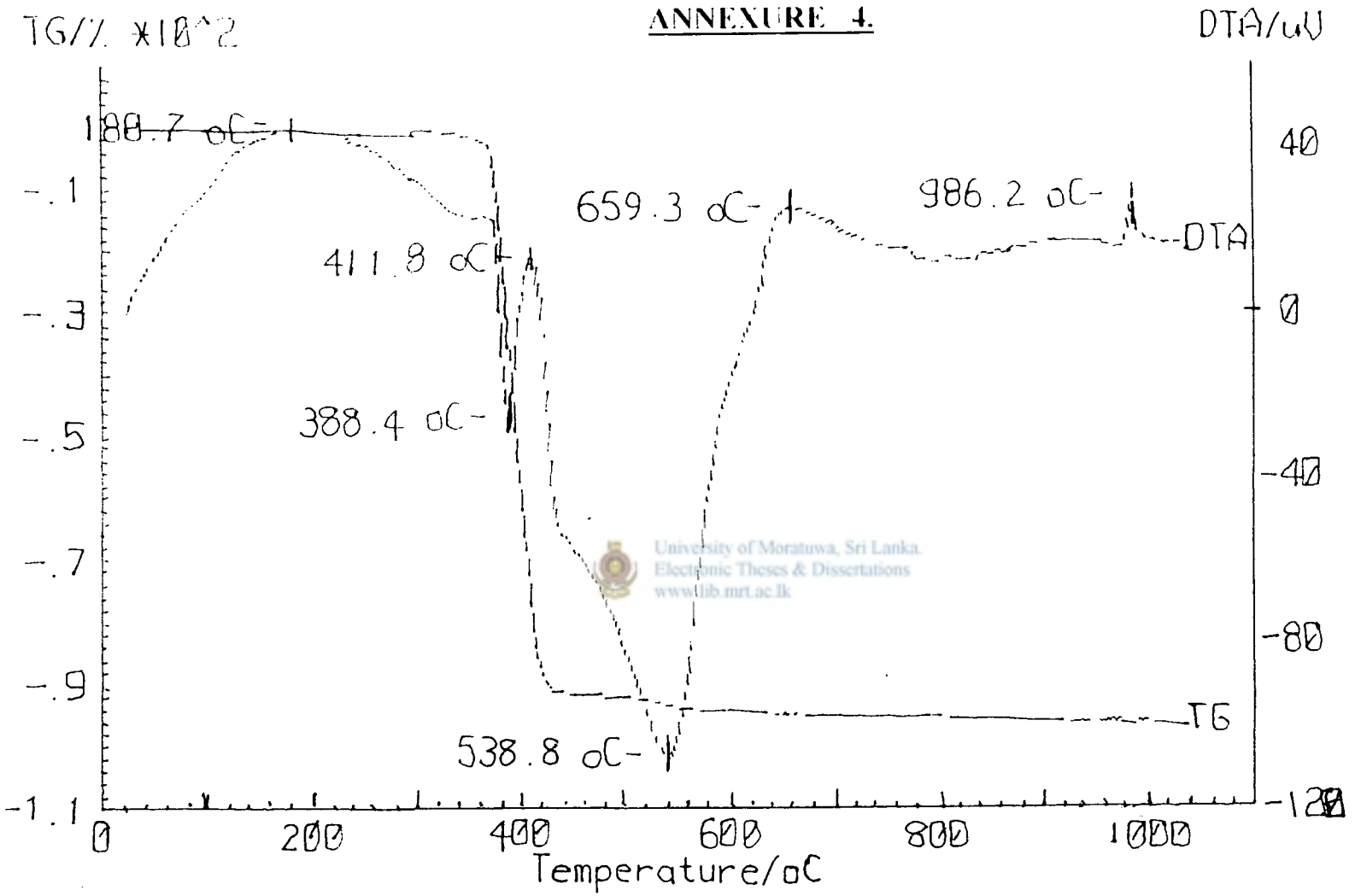
Flammability according to UL standard(UL 94):

at h = 1.6 mm thickness:	94HB
at h = 0.8 mm thickness:	94HB

Applications:

Easy flow grade specially intended for injection mouldings that present difficulties in production.

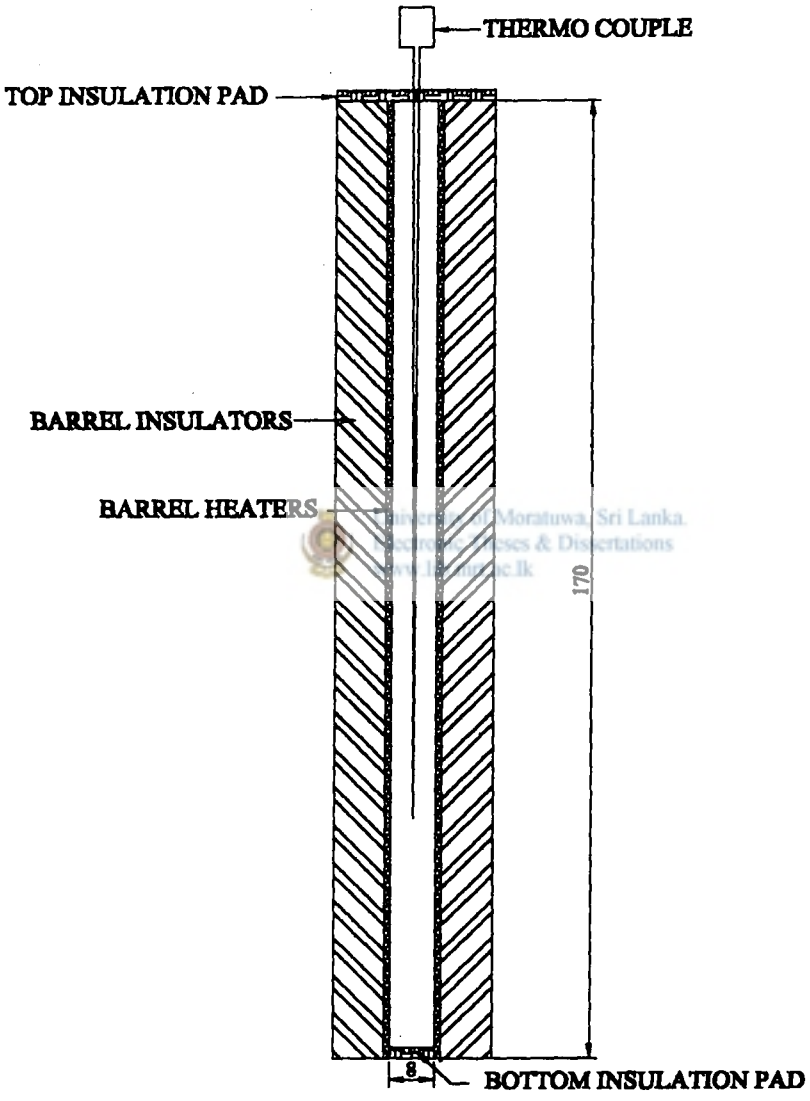
ANNEXURE 4.



DTA Curvefor SAN

ANNEXURE:5

DETERMINATION OF HEAT TRANSFER COEFFICIENT AT POLYMER METAL INTERFACE.



M.F.I BARREL

ANNEXURE 6

MFI ANALYSIS DATA AT LOW TEMPERATURE (200C)

DEAD LOAD(kg)	SHEAR RATE (s^{-1})	VISCOSITY(Pa)
1.2	37.669	285.318
1.2	37.824	284.145
1.2	37.874	283.771
1.2	38.448	279.532
2.16	39.651	271.054
2.16	87.485	221.13
2.16	88.658	218.203
2.16	88.885	218.123
2.16	88.971	217.435
3.4	197.516	172.309
3.4	197.904	171.972
3.4	198.448	171.465
3.4	199.273	170.79
3.4	199.965	170.199
5.0	276.116	162.183
5.0	283.296	158.073
5.0	283.495	157.962
5.0	285.099	157.073
5.0	289.605	154.629
5.0	443.975	144.438
5.0	446.434	143.643
5.0	447.922	143.165
5.0	448.919	142.847
5.0	707.245	111.44
5.0	710.987	110.853
5.0	713.504	110.4
5.0	716.039	110.071
5.0	726.36	108.507
5.0	899.843	99.531
5.0	907.95	98.643
5.0	909.999	98.421
5.0	920.387	97.31

ANNEXURE 7

MFI ANALYSIS DATA AT HIGH TEMPERATURE(230 C)

DEAD LOAD(kg)	SHEAR RATE $\dot{S}^1$	VISCOSITY($N s/m^2$)
1.2	2102.256	18.62126
1.2	2115.695	18.25
1.2	2155.569	18.1
1.2	2165.248	18.45
1.2	2175.104	18.2
1.2	2198.568	18.05855
2.16	2201.57	18.04168
2.16	2210.054	17.85
2.16	2214.8	17.96779
2.16	2227.748	17.92
2.16	2259.745	17.72222
2.16	2265.554	17.66
2.16	2275.228	17.5
2.16	2289.548	17.56387
3.8	3102.258	14.6
3.8	3112.586	14.23182
3.8	3125.264	14.2
3.8	3138.659	14.001
3.8	3148.249	14.12119
3.8	3155.269	14.1
3.8	3168.875	14.03
3.8	3175.269	14.03877
3.8	3182.659	14.01643
3.8	3189.884	14.1
3.8	3192.564	13.98663
3.8	3090.414	14.30169
3.8	3314	13.63350
3.8	3276.559	13.5
5.0	3633.54	12.80037
5.0	3642.558	12.9
5.0	3670.258	12.71252
5.0	3685.224	12.4
5.0	3698.547	12.64583
5.0	3702.225	12.63722
5.0	3715.225	12.8

DEAD LOAD(kg)	SHEAR RATE($\dot{S}$)	VISCOSITY($\frac{Ns}{m^2}$)
5.0	3732.55	12.56680
5.0	3744.552	12.53920
5.0	3755.254	12.55
7.16	4602.312	10.88705
7.16	3782.025	12.45396
7.16	3790.668	12.4
7.16	3799.582	12.41451
10.0	4512.154	11.03559
10.0	4598.984	10.9
10.0	4625.589	10.84949
10.0	4655.124	10.5
10.0	4672.895	10.77413
10.0	4701.187	10.72967
10.0	4730.589	10.5
10.0	4752.224	10.65061
10.0	4781.111	10.52
10.0	4399.295	11.22874
10.0	4825.665	10.44
10.0	4855.257	10.49526
10.0	4875.695	10.46511
10.0	4958.258	10.2
12.16	6950.511	8.208568
12.16	6981.813	8.42
12.16	7001.007	8.167965
12.16	7105.658	8.1
12.16	7198.125	8.014078
12.16	7229.63	7.8
12.16	7256.658	7.969741
12.16	7268.784	7.8
12.16	7602.889	7.719310
12.16	7655.998	7.9
12.16	7758.966	7.612603
12.16	7904.503	7.516311
12.16	8032.593	7.32
12.16	8125.985	7.375369

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