



# Sugar Mill Calculations

Resource for Sugar Mill Calculations

## INPUTS

1	Crushing Capacity, TCD	10560	21	Steam admitted to # 1 Body >	185	MT/Hr
2	Working hours, Hrs	24.00	22	Pan vapour temperature. oC	65	°C
3	Mixed juice % Cane	115.00	23	SHWW %Cane	1.41	cane
4	Milk of lime % Cane ( V/V)	2.00	24	Condensate temp to boiler, oC	100	°C
5	Filterate Juice % Cane	16.00	25	SHWW Temperature, oC	117.5	°C
6	Filterate Juice brix	10.95	<b>Calculated Results</b>			
7			26	Total exhaust consumption estimated	185.00	MT/Hr
8	Mixed juice brix	12.22	27	Total exhaust consumption % cane	42.05	%
9	Mixed pol	9.53				
10	Clear juice brix	11.75	28	Brix out assumed	# 1: 16.9, # 2: 30.1, # 3: 37.6, # 4: 46.7, # 5: 60.7	
11	Clear juice pol	9.16	29	Brix out estimated	16.9, 30.1, 37.6, 46.7, 60.7	
12	Syrup brix required	60.00	30	Syrup in, MT/Hr	185.0, 158.2, 37.4, 27.3, 16.2	
13	Filtercake % Cane	2.70	31	Steam out, MT/Hr	176.0, 158.9, 41.0, 31.7, 30.2	
14	Pol % Filtercake	1.80	32	Bleeds, MT/Hr	17.7, 121.4, 13.7, 15.5, 15.2	
15	Melt quantity towards Refinery MT/Hr	0.00	33	Vapout to next	158.2, 37.4, 27.3, 16.2, 15.0	
16	Melt brix	60.00	34	Vent, MT/Hr	1.8, 1.0, 0.3, 0.1, 0.1	
17	Steam % Cane TARGET	40.00	35	E.R. ( Installed HS)	24.4, 23.4, 12.8, 15.8, 17.8	
18			36	E.R. (Calc. HS) Hug.	36.5, 31.0, 14.6, 18.0, 18.2	
19			37	E.R. (Calc. HS) HTC	29.6, 27.1, 12.3, 20.8, 34.0	
20			38	Diff. heat in/out	0.0, 0.0, 0.0, 0.0, 0.1	

Evaporator conditions	Exhaust	# 1	# 2	# 3	# 4	# 5	Live Stem
IN	OUT	OUT	OUT	OUT	OUT	OUT	
Velocity m/sec	25	30	35	40	45	50	Latent heat
delta T eff		7.50	8.90	7.20	12.80	28.80	666.56
Temperature, °C	120.2	112.7	103.8	96.6	83.8	55.0	Sen. heat
Vent qty, MT/Hr input		1.8	1	0.3	0.1	0.1	180
Vent % Vapour admitted in calendria		1.0	0.6	0.8	0.4	0.6	
Heat loss % Total Heat Admitted in Evap.		1.5	1.5	1.5	1.5	1.5	°C
Heating surface, m^2 Installed		7200	6800	3200	2000	1700	180
Number of bodies installed		2	2	2	1	1	
Dessin factor		0.0010	0.001	0.0009	0.0008	0.0007	
Juice level , m		0.600	0.600	0.600	0.600	0.600	

Vent Heaters	# 1			# 2			# 3		
%	In, C	Out, C	DC=0 Tubular = 1	In, C	Out, C	DC=0 Tubular = 1	In, C	Out, C	DC=0 Tubular = 1
0.1 Mixed juice	0	0	1	0	0	0	0	0	1
0.1 Sulphited juice	99.7	102	1	91.4	99.7	1	76.2	89.9	1
0.1 Clear juice	101	111	0	95	101	0			
0.1 Melt heating	60	90	1						
0.1									
0.1									
0.1 Melt Concentrator				Brix In	Brix Out				
				60	72				
Max C Heaters	# 4			# 5			Exhaust		
	In, C	Out, C	DC=0 Tubular = 1	In, C	Out, C	DC=0 Tubular = 1			DC=0 Tubular = 1
72 Mixed juice	60.8	72	1	30	48.3	1			
102									
111									
90									
80 Syrup heating	57.9	80	0						
75 Filterate juice heating	63.2	75	0						

Heaters	Condensate			Clarifier flash		
	In, C	Out, C	DC=0 Tubular = 1	In, C	Out, C	DC=0 Tubular = 1
Quantity			MT/Hr	Quantity	1.47	MT/Hr
Actual	372.1		MT/Hr	Actual	3.11	1.96
Temp.			°C	Temp.	100	°C
Actual	83.0		°C			
Mixed juice	48.3	60.8	1			
Sulphited juice	71.2	76.2	1	89.9	91.4	0
Clear juice						
Melt heating						
Syrup heating						
Filterate juice heating						
Loss assumed in condensate heater	5					



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Molasses Conditioners			Molasses	Brix	Brix	Molasses Temperature		Water	Loss
Direct Contact with Water Stirrer			% Cane	IN	OUT	IN	OUT	Temp IN	% Total heat Admitted
A Heavy	# 4	▼	15.00	75.00	75.00	55	70	90	5
B Heavy	# 4	▼	8.00	75.00	75.00	54	70	90	5
C Light	# 4	▼	6.00	75.00	75.00	55	70	90	5
C1 Heavy	# 4	▼	2.00	75.00	75.00	53	70	90	5
R1 Molasses	# 4	▼	0.00	72.00	72.00	55	70	90	5
R2 Molasses	# 4	▼	0.00	72.00	72.00	55	70	90	5
R3 Molasses	# 4	▼	0.00	72.00	72.00	55	70	90	5

Raw House		Masseccuite % Cane				% steam	Vent %
		#2					
A Masseccuite		35				0.45	1
B Masseccuite		12				0.35	1
C Masseccuite		8				0.45	1
C1 Masseccuite		1.5				0.45	1
Refinery		#2				% steam	Vent %
R1 Masseccuite		0				0.30	1
R2 Masseccuite		0				0.30	1
R3 Masseccuite		0				0.30	1
R 4 Masseccuite		0				0.30	1

Washing Steam % Cane		#1
1 A Side Pans		0.5
2 B Side Pans		0.25
3 C Side Pans		0.25
4 Refinery Pans		0

Sugar Melted % Cane	Ref excel			
B & C Sugar				