

DISCUSSION

The attached Figure 1 shows the variation of the aeriated densities of the dense and dilute phases plotted against the quantity of catalyst carried out of the reactor. It will be noted that the first $1\frac{1}{2}\%$ of catalyst lost gave an increase in dense phase density from 122 to 140 #/cu.ft. and that further loss had no material effect on bed density. This result is not unexpected in that the catalyst used had been used in the Montebello reactor which is fitted with cyclones and the catalyst had therefore already been fairly well fractionated. Future tests to be made with a sample of catalyst from the Tulsa unit which is equipped with filters may be expected to show a marked effect of fines removal on the density of the residual dense phase.

Figure 2 is a plot of the variation of loss with time, the loss being expressed in grains per cubic foot of gas. As might be expected, the loss declined logarithmically with time from an initial value of 2 gr./cu.ft. to a final value of 0.16 gr./cu.ft. at the end of $27\frac{1}{2}$ hours. The gas rate was then increased and a further period of 20 hours of operation obtained. Although there is some irregularity in the loading figures immediately following the increase in gas rate, the indicated initial carry-over at the higher gas rate is about 0.8 gr./cu.ft. The increase in quantity of catalyst

carried over was therefore $0.8 \times 2.90 / 2.09 \times 0.16$ or 7 fold. This corresponds satisfactorily with the 7.2 fold increase which would be expected on the basis of the sixth power of the velocity, the theoretical value.

Since the carry-over measured with the wheel rotated at 1000 R.P.M is indicated to be 2 gr./cu.ft., and since the loading test made with the stationary wheel showed a carry-over of $4\frac{1}{4}$ gr./cu.ft. the separating power of the wheel is indicated to be $42/44$ or 95.5%

The Stratco reactor performed satisfactorily from a mechanical standpoint during these tests showing no signs of severe vibration, or of undue difficulty with the sealing system. There was no evidence of erosion at the end of the test.

Particle size analyses are now being obtained on the catalyst samples from these tests.

THE TEXAS COMPANY
MONTEBELLO LABORATORY
STRATCO SEPARATOR TESTS

TEST NUMBER	5	6	7	8	9	10	11	12	13
DATE	3/8	3/8	3/9	3/9	3/10	3/10	3/10	3/10	3/11
R.P.M.	1000	1000	1000	1000	1000	1000	1000	1000	1000
PERIOD-Min.	184	215	255	252	120	181	240	360	490
PRESSURE-psig	28	28	28	28	28	16	16	16	16
POLW RATES-scf/min.									
Total Feed	416.6								
Top Labyrinth	15.4								
Middle Bearing	15.3								
Bottom Labyrinth	31.0								
Shaft Feed	31.3								
Bottom Sweep	108.3								
Annular Ring	215.4								
Total to Center	170.9								
Total to Annulus	215.4								
Total to Wheel	401.3								
FDOW RATES-Actual cfm									
Total to Center	58.8	58.8	58.8	58.8	81.5	81.5	81.5	81.5	81.5
Total to Annulus	74.2	74.2	74.2	74.2	74.2	103.0	103.0	103.0	103.0
Total to Wheel	138.0	138.0	138.0	138.0	138.0	192.0	192.0	192.0	192.0
SUPERFICIAL VELOCITIES- ft./sec.									
Center Tube	3.01	3.01	3.01	3.01	3.01	4.18	4.18	4.18	4.18
Annulus	2.93	2.93	2.93	2.93	2.93	4.06	4.06	4.06	4.06
Dilute Phase	2.09	2.09	2.09	2.09	2.09	2.90	2.90	2.90	2.90
Wheel	3.15	3.15	3.15	3.15	3.15	4.40	4.40	4.40	4.40
Total Gas Flow- cu.ft.	25392	29670	25190	34776	16560	34750	46080	60120	94080
Bag Weight, Final-Lbs.-Oz	12-14	8-13	9-11	7-8	6-13	8-1 $\frac{1}{2}$	9-8 $\frac{1}{2}$	9-15	8-7 $\frac{1}{2}$
Initial	7-12	6-11	7-9	6-8 $\frac{1}{2}$	6-7	6-6	6-12 $\frac{1}{2}$	6-6 $\frac{1}{2}$	6-10
Contents	5-2	2-2	2-2	0-15 $\frac{1}{2}$	0-6	1-11 $\frac{1}{2}$	2-11 $\frac{1}{2}$	3-8 $\frac{1}{2}$	1-13 $\frac{1}{2}$
Carry-over-Grains/cu.ft.	1.42	0.50	0.42	0.195	0.158	0.347	0.415	0.35	0.139
Fines Density-#/cu.ft.									
Aeriated		51.0	50.5	51.8		56.0	60.0	55.2	52.5
Settled		5.28	51.8	53.9		59.5	61.8	58.0	53.5
Packed		91.0	95.0	98.0		105.0	106.2	104.0	103.5
Residue Density-#/cu.ft.									
Aeriated		140.0		139.0		140.5		141.0	142.0
Settled		145.5		144.0		144.0		146.5	146.0
Packed		176.0		175.0		175.0		173.0	162.0
Inventory at Start	404.2	399.07	397.08	395.82	394.84	394.47	391.75	389.01	385.46
Cumulative Wt.% Over	6.10	6.60	7.10	7.35	7.42	7.82	8.45	9.30	9.74

Note: Turbine stopped during Run 5 - Results unreliable

THE TEXAS COMPANY
MONTEBELLO LABORATORY
STRATCO SEPARATOR TESTS

TEST NUMBER	A	B	C	D	E	1	2	3	4
DATE	3/7	3/7	3/7	3/7	3/7	3/7	3/8	3/8	3/8
R.P.M.	0	0	0	0	0	1000	1000	1000	1000
PERIOD-Min.	2	4	4	4	4	60	120	180	240
PRESSURE-psig	51	51	28	28	28	28	28	28	28
FLOW RATES-scf/min									
Total Feed	416.6	416.6	416.6						
Top Labyrinth	15.4	15.4	15.3						
Middle Bearing	15.4	15.4	15.3						
Bottom Labyrinth	30.9	30.9	31.0						
Shaft Feed	30.8	30.8	31.3						
Bottom Sweep	106.3	106.3	108.3						
Annular Ring	217.6	217.6	215.4						
Total to Center	168.0	168.0	170.9						
Total to Annulus	217.6	217.6	215.4						
Total to Wheel	401.2	401.2	401.3						
FLOW RATES-Actual cfm									
Total to Center	37.6	37.6	58.8	58.8	58.8	58.8	58.8	58.8	58.8
Total to Annulus	48.7	48.7	74.2	74.2	74.2	74.2	74.2	74.2	74.2
Total to Wheel	89.7	89.7	138.0	138.0	138.0	138.0	138.0	138.0	138.0
SUPERFICIAL VELOCITIES- ft./sec.									
Center Tube	1.93	1.93	3.01	3.01	3.01	3.01	3.01	3.01	3.01
Annulus	1.92	1.92	2.93	2.93	2.93	2.93	2.93	2.93	2.93
Dilute Phase	1.36	1.36	2.09	2.09	2.09	2.09	2.09	2.09	2.09
Wheel	2.05	2.05	3.15	3.15	3.15	3.15	3.15	3.15	3.15
Total Gas Flow- cu.ft.	179.4	358.8	558.0	558.0		8280	16560	24840	33120
Bag Weight, Final-Lbs.Oz.	5-9 $\frac{1}{2}$	6-3	9-11	9-12 $\frac{1}{2}$		10-3 $\frac{1}{2}$	11-15	14-13	16-14 $\frac{1}{2}$
Initial	5-5	5-9 $\frac{1}{2}$	6-4	6-4		8-1	8-10	8-13	8-9
Contents	0-4 $\frac{1}{2}$	0-9 $\frac{1}{2}$	3-8	3-8 $\frac{1}{2}$		2-2 $\frac{1}{2}$	3-5	6-0	8-5 $\frac{1}{2}$
Carry-over- grains/cu.ft	11.0	11.6	44.0	44.3		1.82	1.40	1.69	1.76
Fines Density-#/cu.ft.									
Aeriated								44.5	45.7
Settled							46.0	46.2	47.3
Packed						79.2	81.0	85.5	92.2
Residue Density-#/cu.ft.									
Aeriated							137.0	137.5	137.5
Settled							138.0		146.0
Packed							178.0		179.0
Inventory at Start	425	424.7	424.1	424.1		424.0	421.85	418.54	412.54
Cumulative Wt.% Over						0.74	1.52	2.92	4.88

Note: Turbine stopped during Run 4 - Results unreliable