Counter Current

Vs #1:

Pump speed = 35 approx. Vol. reading (AVR) = 5.10

mass (1) = 8.53 Kg time (1) = 20.05 sec

mass (2) = 8.32 Kg time (2) = 19.99 sec

Cold flow	AVR=	AVR= 1.81	AVR=	AVR=	AVR=	AVR=
	mass 1 = 1.50	mass 1 = 5.87	mass 1 = 6.94	mass 1 = 14.15	mass 1 = 12.44	mass 1 = 9.78
	time 1 = 40.1	time 1 = 53.02	time 1 = 30.03	time 1 = 40.05	time 1 = 20.24	time 1 = 15.0
	mass 2 = 1.52	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 = 12.89
	time 2 = 40.0	time 2 =	time 2 =	time 2 =	time 2 =	time 2 = 19.99
$T_{H,in}$	55.82	57.58	58.62	58.67	57.00	55.45
$T_{H,out}$	53.74	53.69	52.93	51.37	48.17	46.75
$T_{c,in}$	16.27	16.84	16.04	15.27	14.81	14.43
$T_{c,out}$	38.66	30.91	26.24	24.25	20.81	20.09
	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6

Counter Current

Vs #2:

Pump speed = 45.19 approx. Vol. reading (AVR) =

mass(1) = 10.78 time(1) = 19.92

mass(2) = 10.86 time(2) = 20.07

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = 1.25	mass 1 = 4.85	mass 1 = 7.60	mass 1 = 10.03	mass 1 = 7.18	mass 1 = 9.48
	time 1 = 60.15	time 1 = 60.10	time 1 = 50.04	time 1 = 40.16	time 1 = 20.18	time 1 = 20.10
	mass 2 = 1.26	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 =
	time 2 = 60.09	time 2 =	time 2 =	time 2 =	time 2 =	time 2 =
$T_{H,in}$	63.52	64.26	64.30	63.58	62.74	62.00
$T_{H,out}$	62.29	60.96	60.19	57.67	56.07	54.66
$T_{c,in}$	15.17	15.13	15.16	14.99	14.96	14.93
$T_{c,out}$	47.48	37.33	29.45	28.27	25.50	23.61
	Run 7	...	...	...	...	Run 12

Counter Current

Vs #3:

Pump speed = 50.11 approx. Vol. reading (AVR) =

mass(1) = 12.06 time(1) = 20.07

mass(2) = time(2) =

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = 0.83	mass 1 = 2.56	mass 1 = 4.19	mass 1 = 6.56	mass 1 = 6.89	mass 1 = 7.42
	time 1 = 30.07	time 1 = 30.13	time 1 = 29.92	time 1 = 25.07	time 1 = 20.17	time 1 = 15.21
	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 = 7.28
	time 2 =	time 2 =	time 2 =	time 2 =	time 2 =	time 2 = 15.10
$T_{H,in}$	63.38	64.11	64.08	63.75	63.02	62.10
$T_{H,out}$	61.98	60.90	60.11	58.27	57.00	55.28
$T_{c,in}$	15.26	15.11	15.12	15.17	15.14	15.16
$T_{c,out}$	48.06	38.24	32.74	28.52	26.42	23.86
	Run 13	...	...	...	...	Run 18

Counter Current

V_s #4:

Pump speed = 55.03 approx. Vol. reading (AVR) =

mass(1) = 10.04 time(1) = 15.0

mass(2) = time(2) =

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = 0.51	mass 1 = 1.88	mass 1 = 2.81	mass 1 = 3.84	mass 1 = 6.02	mass 1 = 7.42
	time 1 = 20.27	time 1 = 20.13	time 1 = 20.03	time 1 = 15.15	time 1 = 15.12	time 1 = 15.21
	mass 2 = 0.51	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 = 7.28
	time 2 = 20.02	time 2 =	time 2 =	time 2 =	time 2 =	time 2 = 15.10
$T_{H,in}$	58.49	57.64	57.61	57.73	58.35	60.01
$T_{H,out}$	57.57	55.10	54.37	53.53	53.13	54.05
$T_{c,in}$	15.61	15.33	15.28	15.28	15.19	15.12
$T_{c,out}$	39.95	33.58	30.58	26.82	23.96	23.50
	Run 19	...	...	...	...	Run 24

Counter Current

V_s #5:

Pump speed = 60.30 approx. Vol. reading (AVR) =

mass(1) = 10.95 time(1) = 15.04

mass(2) = time(2) =

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = 0.51	mass 1 = 1.39	mass 1 = 2.85	mass 1 = 4.77	mass 1 = 4.14	mass 1 = 5.23
	time 1 = 20.27	time 1 = 15.23	time 1 = 14.98	time 1 = 15.08	time 1 = 10.00	time 1 = 10.09
	mass 2 = 0.51	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 = 5.20
	time 2 = 20.02	time 2 =	time 2 =	time 2 =	time 2 =	time 2 = 10.05
$T_{H,in}$	60.09	60.37	60.37	60.13	59.44	58.59
$T_{H,out}$	59.27	58.12	57.00	55.61	54.32	53.08
$T_{c,in}$	15.70	15.59	15.50	15.56	15.52	15.41
$T_{c,out}$	41.29	34.10	29.14	26.76	24.67	23.16
	Run 25	...	...	...	...	Run 30

Counter Current

Vs #6:

Pump speed = 65.08 approx. Vol. reading (AVR) =

mass(1) = 7.97 time(1) = 10.07

mass(2) = 8.09 time(2) = 10.15

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = 0.33	mass 1 = 0.82	mass 1 = 1.86	mass 1 = 2,14	mass 1 = 3.50	mass 1 = 5.23
	time 1 = 25.17	time 1 = 15.05	time 1 = 15.07	time 1 = 9.99	time 1 = 10.03	time 1 = 10.09
	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 = 5.20
	time 2 =	time 2 =	time 2 =	time 2 =	time 2 =	time 2 = 10.05
$T_{H,in}$	56.90	56.07	55.81	55.81	55.97	56.84
$T_{H,out}$	56.47	54.64	53.34	52.68	52.03	52.01
$T_{c,in}$	15.61	15.46	15.34	15.33	15.30	15.31
$T_{c,out}$	40.51	36.32	30.67	26.92	24.37	22.89
	Run 31	...	...	...	...	Run 36

Co-Current

Vs #1:

Pump speed = 65.03 approx. Vol. reading (AVR) =

mass(1) = 7.97 time(1) = 10.07

mass(2) = 8.09 time(2) = 10.15

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = .47	mass 1 = 1.01	mass 1 = 2.12	mass 1 = 2.16	mass 1 = 3.51	mass 1 = 6.14
	time 1 = 30.06	time 1 = 15.08	time 1 = 15.14	time 1 = 10.20	time 1 = 10.05	time 1 = 10.04
	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 = 6.18
	time 2 =	time 2 =	time 2 =	time 2 =	time 2 =	time 2 = 10.12
$T_{H,in}$	61.30	62.26	62.26	62.12	61.69	60.88
$T_{H,out}$	60.60	60.19	59.32	58.51	57.30	55.41
$T_{c,out}$	52.25	39.38	32.42	28.84	25.76	22.53
$T_{c,in}$	16.16	15.94	15.95	15.89	15.86	15.71
	Run 37	...	...	...	...	Run 42

Co-Current

Vs #2:

Pump speed = 60.16 approx. Vol. reading (AVR) =

mass (1) = 7.38 time (1) = 10.15

mass (2) = time (2) =

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = 0.42	mass 1 = 1,14	mass 1 = 1.24	mass 1 = 2.51	mass 1 = 4.12	mass 1 = 6,14
	time 1 = 20.04	time 1 = 15.07	time 1 = 10.14	time 1 = 10.17	time 1 = 10.09	time 1 = 10.04
	mass 2 = 0.39	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 = 6.18
	time 2 = 20.05	time 2 =	time 2 =	time 2 =	time 2 =	time 2 = 10.12
$T_{H,in}$	57.90	57.39	57.11	57.22	57.50	59.58
$T_{H,out}$	57.04	55.43	54.58	53.68	53.09	53,94
$T_{c,out}$	46.32	34.58	30.22	25.61	23.15	22.10
$T_{c,in}$	15.72	15.57	15.46	15.41	15.44	15.55
	Run 43	...	...	...	...	Run 48

Co-Current

Vs #3:

Pump speed = 55.30 approx. Vol. reading (AVR) =

mass(1) = 6.74 time(1) = 10.14

mass(2) = time(2) =

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = 0.42	mass 1 = 1.10	mass 1 = 2.09	mass 1 = 4.36	mass 1 = 5.92	mass 1 = 8.03
	time 1 = 20.04	time 1 = 15.15	time 1 = 10.03	time 1 = 10.12	time 1 = 10.09	time 1 = 10.13
	mass 2 = 0.39	mass 2 =	mass 2 =	mass 2 =	mass 2 =	mass 2 = 7.99
	time 2 = 20.05	time 2 =	time 2 =	time 2 =	time 2 =	time 2 = 10.12
$T_{H,in}$	59.44	60.01	59.99	59.67	58.82	57.75
$T_{H,out}$	58.46	57.67	56.15	54.41	53.01	51.03
$T_{c,out}$	49.16	36.50	27.77	23.65	22.03	20.82
$T_{c,in}$	15.81	15.69	15.74	15.67	15.80	15.32
	Run 49	...	...	...	...	Run 54

Co-Current

Vs #4:

Pump speed = 50.11 approx. Vol. reading (AVR) =

mass (1) = 6.11 time (1) = 10.18

mass (2) = time (2) =

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = 0.34	mass 1 = 1.22	mass 1 = 1.88	mass 1 = 3.27	mass 1 = 5.58	mass 1 = 8.03
	time 1 = 20.0	time 1 = 15.13	time 1 = 10.15	time 1 = 10.10	time 1 = 10.19	time 1 = 10.13
	mass 2 = 0.31	mass 2 = 1.21	mass 2 =	mass 2 =	mass 2 =	mass 2 = 7.99
	time 2 = 20.12	time 2 = 15.12	time 2 =	time 2 =	time 2 =	time 2 = 10.12
$T_{H,in}$	56.05	55.27	54.91	54.92	55.23	56.59
$T_{H,out}$	55.20	52.92	51.39	50.43	49.64	49.54
$T_{c,out}$	47.79	33.11	26.41	23.43	21.20	20.42
$T_{c,in}$	15.43	15.28	15.28	15.25	15.23	15.18
	Run 55	...	...	...	...	Run 60

Co-Current

Vs #5:

Pump speed = 45.12 approx. Vol. reading (AVR) =

mass(1) = 5.66 time(1) = 10.50

mass(2) = time(2) =

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = 0.34	mass 1 = 0.82	mass 1 = 1.96	mass 1 = 3.01	mass 1 = 5.16	mass 1 = 7.95
	time 1 = 20.0	time 1 = 20.14	time 1 = 11.15	time 1 = 10.03	time 1 = 10.17	time 1 = 10.06
	mass 2 = 0.31	mass 2 =	mass 2 =	mass 2 =	mass 2 = 5.16	mass 2 = 7.95
	time 2 = 20.12	time 2 =	time 2 =	time 2 =	time 2 = 10.06	time 2 = 10.00
$T_{H,in}$	59.69	60.72	60.76	60.44	59.83	58.07
$T_{H,out}$	58.65	58.69	56.29	54.90	52.99	50.16
$T_{c,out}$	52.21	42.79	28.88	25.42	22.79	20.77
$T_{c,in}$	15.64	15.64	15.66	15.65	15.59	15.40
	Run 61	...	...	...	...	Run 66

Co-Current

Vs #6:

Pump speed = 35.04 approx. Vol. reading (AVR) =

mass (1) = 6.18 time (1) = 15.15

mass (2) = time (2) =

	AVR=	AVR=	AVR=	AVR=	AVR=	AVR=
	mass 1 = 0.95	mass 1 = 2.31	mass 1 = 4.27	mass 1 = 4.56	mass 1 = 6.02	mass 1 = 7.95
	time 1 = 21:00	time 1 = 15.15	time 1 = 15.15	time 1 = 10.11	time 1 = 10.13	time 1 = 10.06
	mass 2 =	mass 2 =	mass 2 =	mass 2 = 4.59	mass 2 =	mass 2 = 7.85
	time 2 =	time 2 =	time 2 =	time 2 = 10.08	time 2 =	time 2 = 10.00
$T_{H,in}$	54.19	53.48	53.70	53.74	54.77	55.89
$T_{H,out}$	51.93	49.35	47.86	47.02	46.91	46.63
$T_{c,out}$	37.07	26.48	23.36	21.53	20.71	19.90
$T_{c,in}$	15.60	15.47	15.41	15.47	15.45	15.19
	Run 67	...	...	...	...	Run 72