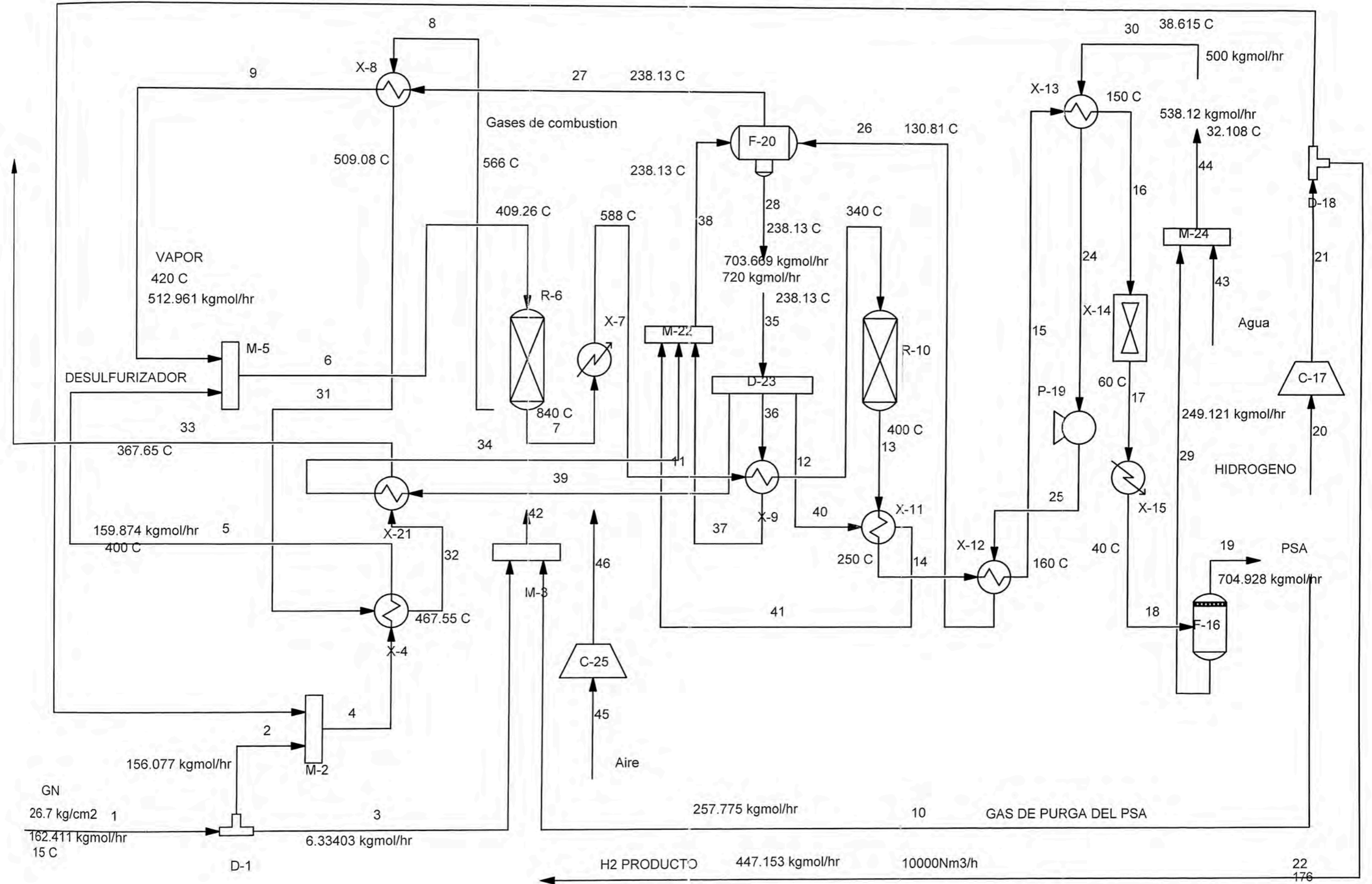


PLANTA DE HIDROGENO-DISEÑO HALDOR TOPSOE PARA 10000Nm3/h

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RECIRCULACION DE H2



STREAM SUMMARY

Stream Number		1	2	3	4	5	6	7	8	9	10	11	12
Stream Name		Strm 1	Strm 2	Strm 3	Strm 4	Strm 5	Strm 6	Strm 7	Strm 8	Strm 9	Strm 10	Strm 11	Strm 12
Thermo Method Option		GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	CHANGED	GLOBAL	GLOBAL	GLOBAL
Vapor Fraction		1	1	1	1	1	1	1	1	1	1	1	1
Temperature	C	15	15	15	15.787	400	409.26	840	566	420	30	588	340
Pressure	kg/cm2	26.7	26.7	26.7	26.7	26.7	26.7	24.7	0.8	33	0.57	24.7	24.3
Enthalpy	kcal/hr	-1431	-1375.2	-55.809	855.34	748390	2451600	6619300	9673900	1703200	61407	4470500	2471700
Vapor Cp	kcal/kgmo/C	10.022	10.022	10.022	9.9243	14.936	10.711	9.2241	8.316	9.8377	8.1328	8.6724	8.2505
Vapor Cv	kcal/kgmo/C	7.2655	7.2655	7.2655	7.213	12.877	8.5031	7.2216	6.3286	7.3555	6.1371	6.6557	6.1942
Liquid Cp	kcal/kgmo/C												
Vapor Density	kg/m3	21.582	21.582	21.582	20.963	8.3742	8.5096	3.3122	0.34539	10.527	0.57884	4.2847	5.9425
Liquid Density	kg/m3												
Liquid Specific Gravity	60F@STP												
Vapor Viscosity	cP	0.01137	0.01137	0.01137	0.011425	0.021287	0.020284	0.029643	0.03962	0.025244	0.014647	0.023947	0.018635
Liquid Viscosity	cP												
Vapor Thermal Conductivity	kcal/m/hr/C	0.029768	0.029768	0.029768	0.03082	0.086633	0.074903	0.20395	0.053366	0.058871	0.039043	0.14346	0.1057
Liquid Thermal Conductivity	kcal/m/hr/C												
Vapor Flowrate	m3v(NTP)/hr	3639.7	3497.8	141.95	3582.9	3582.9	15079	21381	49366	11496	5776.9	21381	21381
Liquid Flowrate	m3l(NTP)/hr												
Free Water Flowrate	m3l(NTP)/hr												
Total Molecular Weight		18.345	18.345	18.345	17.957	17.957	18.001	12.695	30.729	18.015	26.082	12.695	12.695
Total Flowrate	kgmol/hr	162.41	156.08	6.334	159.87	159.87	672.83	954.05	2202.8	512.96	257.77	954.05	954.05
Total Flowrate	kg/hr	2979.4	2863.2	116.2	2870.8	2870.8	12112	12112	67688	9241.2	6723.3	12112	12112
Note: All Liquid Phase calculations exclude Free Water													
Total Flowrate By Component:													
HYDROGEN	kgmol/hr	0	0	0	3.797	3.797	3.797	455.64	0	0	73.757	455.64	455.64
METHANE	kgmol/hr	140.32	134.85	5.4726	134.85	134.85	134.85	38.413	0	0	38.412	38.413	38.413
ETHANE	kgmol/hr	17.216	16.544	0.67141	16.544	16.544	16.544	0	0	0	0	0	0
PROPANE	kgmol/hr	2.9234	2.8094	0.11401	2.8094	2.8094	2.8094	0	0	0	0	0	0
I-BUTANE	kgmol/hr	0.16241	0.15608	0.006334	0.15608	0.15608	0.15608	0	0	0	0	0	0
I-PENTANE	kgmol/hr	0.16241	0.15608	0.006334	0.15608	0.15608	0.15608	0	0	0	0	0	0
N-BUTANE	kgmol/hr	0.32482	0.31215	0.012668	0.31215	0.31215	0.31215	0	0	0	0	0	0
NITROGEN	kgmol/hr	0.97447	0.93646	0.038004	0.93646	0.93646	0.93646	0.93646	1668.6	0	0.93659	0.93646	0.93646
CO2	kgmol/hr	0.32482	0.31215	0.012668	0.31215	0.31215	0.31215	54.529	320.75	0	119.83	54.529	54.529
CO	kgmol/hr	0	0	0	0	0	0	86.391	0	0	21.114	86.391	86.391
WATER	kgmol/hr	0	0	0	0	0	512.96	318.14	0	512.96	3.7304	318.14	318.14
OXYGEN	kgmol/hr	0	0	0	0	0	0	0	213.39	0	0	0	0
Total	kgmol/hr	162.41	156.08	6.334	159.87	159.87	672.83	954.05	2202.8	512.96	257.77	954.05	954.05
Total Stream Composition:													
HYDROGEN	%	0	0	0	2.375054732	2.375054732	0.564332744	47.75850322	0	0	28.61349265	47.75850322	47.75850322
METHANE	%	86.39862077	86.39800103	86.40037891	84.3497842	84.3497842	20.04220977	4.026308894	0	0	14.90165652	4.026308894	4.026308894
ETHANE	%	10.60033249	10.59969247	10.60009473	10.34840808	10.34840808	2.458867767	0	0	0	0	0	0
PROPANE	%	1.800012315	1.799974372	1.799968424	1.757302809	1.757302809	0.417549753	0	0	0	0	0	0
I-BUTANE	%	0.1	0.1	0.1	0.097629324	0.097629324	0.023197539	0	0	0	0	0	0
I-PENTANE	%	0.1	0.1	0.1	0.097629324	0.097629324	0.023197539	0	0	0	0	0	0
N-BUTANE	%	0.2	0.199993593	0.2	0.195252393	0.195252393	0.046393591	0	0	0	0	0	0
NITROGEN	%	0.600006157	0.599987186	0.6	0.585763433	0.585763433	0.13918226	0.098156281	75.74904667	0	0.363343291	0.098156281	0.098156281
CO2	%	0.2	0.199993593	0.2	0.195252393	0.195252393	0.046393591	5.715528536	14.56101326	0	46.48717849	5.715528536	5.715528536
CO	%	0	0	0	0	0	0	9.055185787	0	0	8.191023005	9.055185787	9.055185787
WATER	%	0	0	0	0	0	76.23916888	33.34626068	0	100	1.447181596	33.34626068	33.34626068
OXYGEN	%	0	0	0	0	0	0	0	9.68721627	0	0	0	0
Total	%	100	100	100	100	100	100	100	100	100	100	100	100

STREAM SUMMARY

Stream Number	13	14	15	16	17	18	19	20	21	22	23	24	25	
Stream Name	Strm 13	Strm 14	Strm 15	Strm 16	Strm 17	Strm 18	Strm 19	Strm 20	Strm 21	Strm 22	Strm 23	Strm 24	Strm 25	
Thermo Method Option	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	GLOBAL	CHANGED	CHANGED
Vapor Fraction	1	1	1	0.99209	0.7449	0.73888	1	1	1	1	1	0	0	
Temperature	400	250	160	150	60	40	40	30	83.155	83.155	83.155	54.645	52.477	
Pressure	22.3	21.9	21.5	21.1	20.4	20	20	20	30	30	30	3	33	
Enthalpy	2988900	1787600	1079000	934900	-2047900	-2298600	200580	96664	264910	262680	2230.5	-4887500	-4901600	
Vapor Cp	8.5131	8.303	8.2515	8.2337	7.5591	7.4979	7.4979	6.9378	6.9599	6.9599	6.9599	6.9599	6.9599	
Vapor Cv	6.4842	6.2377	6.1392	6.119	5.5059	5.439	5.439	4.9365	4.9588	4.9588	4.9588	4.9588	4.9588	
Liquid Cp														
Vapor Density	4.9532	6.2826	7.4908	7.5025	7.818	8.1128	8.1128	1.5499	1.9702	1.9702	1.9702	17.984	17.955	
Liquid Density												985.91	988.22	
Liquid Specific Gravity												1.0001	1.0001	
Vapor Viscosity	0.019665	0.016409	0.014389	0.014135	0.011701	0.011198	0.011198	0.0093063	0.010672	0.010672	0.010672	0.50719	0.52571	
Liquid Viscosity												0.50719	0.52571	
Vapor Thermal Conductivity	0.12382	0.10146	0.087788	0.086646	0.093128	0.089462	0.089461	0.15555	0.17901	0.17901	0.17901	0.558	0.55711	
Liquid Thermal Conductivity												0.558	0.55711	
Vapor Flowrate	21381	21381	21381	21212	15927	15798	15798	10106	10106	10021	85.093	9.0097	9.0097	
Liquid Flowrate												9.0097	9.0097	
Free Water Flowrate				0.13604	4.3855	4.489								
Total Molecular Weight	12.695	12.695	12.695	12.695	12.695	12.695	10.815	2.0159	2.0159	2.0159	2.0159	18.015	18.015	
Total Flowrate	954.05	954.05	954.05	954.05	954.05	954.05	704.93	450.95	450.95	447.15	3.797	500	500	
Total Flowrate	12112	12112	12112	12112	12112	12112	7624	909.09	909.09	901.43	7.6545	9007.7	9007.7	
Note: All Liquid Phase calculations exclude Free Water														
Total Flowrate By Component:														
HYDROGEN	520.93	520.93	520.93	520.93	520.93	520.93	520.93	450.95	450.95	447.15	3.797	0	0	
METHANE	38.413	38.413	38.413	38.413	38.413	38.413	38.413	0	0	0	0	0	0	
ETHANE	0	0	0	0	0	0	0	0	0	0	0	0	0	
PROPANE	0	0	0	0	0	0	0	0	0	0	0	0	0	
I-BUTANE	0	0	0	0	0	0	0	0	0	0	0	0	0	
I-PENTANE	0	0	0	0	0	0	0	0	0	0	0	0	0	
N-BUTANE	0	0	0	0	0	0	0	0	0	0	0	0	0	
NITROGEN	0.93646	0.93646	0.93646	0.93646	0.93646	0.93646	0.93646	0	0	0	0	0	0	
CO2	119.81	119.81	119.81	119.81	119.81	119.81	119.81	0	0	0	0	0	0	
CO	21.106	21.106	21.106	21.106	21.106	21.106	21.106	0	0	0	0	0	0	
WATER	252.85	252.85	252.85	252.85	252.85	252.85	3.7316	0	0	0	0	500	500	
OXYGEN	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	954.05	954.05	954.05	954.05	954.05	954.05	704.93	450.95	450.95	447.15	3.797	500	500	
Total Stream Composition:														
HYDROGEN	54.60196006	54.60196006	54.60196006	54.60196006	54.60196006	54.60196006	73.89811754	100	100	100	100	0	0	
METHANE	4.026308894	4.026308894	4.026308894	4.026308894	4.026308894	4.026308894	5.449193537	0	0	0	0	0	0	
ETHANE	0	0	0	0	0	0	0	0	0	0	0	0	0	
PROPANE	0	0	0	0	0	0	0	0	0	0	0	0	0	
I-BUTANE	0	0	0	0	0	0	0	0	0	0	0	0	0	
I-PENTANE	0	0	0	0	0	0	0	0	0	0	0	0	0	
N-BUTANE	0	0	0	0	0	0	0	0	0	0	0	0	0	
NITROGEN	0.098156281	0.098156281	0.098156281	0.098156281	0.098156281	0.098156281	0.132844396	0	0	0	0	0	0	
CO2	12.55804203	12.55804203	12.55804203	12.55804203	12.55804203	12.55804203	16.99601379	0	0	0	0	0	0	
CO	2.212253027	2.212253027	2.212253027	2.212253027	2.212253027	2.212253027	2.994056147	0	0	0	0	0	0	
WATER	26.50280384	26.50280384	26.50280384	26.50280384	26.50280384	26.50280384	0.529357525	0	0	0	0	100	100	
OXYGEN	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	

STREAM SUMMARY

Stream Number Stream Name	26 Strm 26	27 Strm 27	28 Strm 28	29 Strm 29	30 Strm 30	31 Strm 31	32 Strm 32	33 Strm 33	34 Strm 34	35 Strm 35	36 Strm 36	37 Strm 37	38 Strm 38
Thermo Method Option	CHANGED	CHANGED	CHANGED	CHANGED	GLOBAL	GLOBAL	GLOBAL	GLOBAL	CHANGED	GLOBAL	CHANGED	CHANGED	CHANGED
Vapor Fraction	0	1	0	0	0	1	1	1	1	0	0	1	0.90362
Temperature	130.81	238.13	238.13	40	38.615	509.08	467.55	367.65	280	238.13	238.13	379.42	238.13
Pressure	33	33	33	20	3	0.8	0.8	0.8	33	33	33	33	33
Enthalpy	-4193000	693360	-4458400	-2499200	-5031600	8637800	7890300	6121600	400060	-4561900	-1368600	630190	406390
Vapor Cp		14.954				8.2118	8.1339	7.9393	11.925			10.043	14.954
Vapor Cv		9.4733				6.2243	6.1462	5.9512	8.187			7.3993	9.4733
Liquid Cp	18.333		20.404	17.967	17.985					20.404	20.404		20.404
Vapor Density		16.19				0.37053	0.3913	0.45231	14.123			11.309	16.19
Liquid Density	935.7		816.12	992.99	992.78					816.12	816.12		816.12
Liquid Specific Gravity	1.0001		1.0001	1.0001	1.0001					1.0001	1.0001		1.0001
Vapor Viscosity		0.017149				0.037376	0.035766	0.031955	0.019091			0.023496	0.017149
Liquid Viscosity	0.21217		0.11137	0.65327	0.6705					0.11137	0.11137		0.11137
Vapor Thermal Conductivity		0.073451				0.049762	0.047203	0.041262	0.05967			0.056617	0.073451
Liquid Thermal Conductivity	0.58951		0.54504	0.54295	0.5406					0.54504	0.54504		0.54504
Vapor Flowrate		11949				49366	49366	49366	4840.7			4840.7	14579
Liquid Flowrate	9.0097		12.68	4.489	9.0097					12.974	3.8922		1.2513
Free Water Flowrate													
Total Molecular Weight	18.015	18.015	18.015	18.015	18.015	30.729	30.729	30.729	18.015	18.015	18.015	18.015	18.015
Total Flowrate	500	533.18	703.67	249.12	500	2202.8	2202.8	2202.8	216	720	216	216	720
Total Flowrate	9007.7	9605.4	12677	4488	9007.7	67688	67688	67688	3891.3	12971	3891.3	3891.3	12971
Note: All Liquid Phase calculations exclude Free Water													
Total Flowrate By Component:													
HYDROGEN	0	0	0	0	0	0	0	0	0	0	0	0	0
METHANE	0	0	0	0	0	0	0	0	0	0	0	0	0
ETHANE	0	0	0	0	0	0	0	0	0	0	0	0	0
PROPANE	0	0	0	0	0	0	0	0	0	0	0	0	0
I-BUTANE	0	0	0	0	0	0	0	0	0	0	0	0	0
I-PENTANE	0	0	0	0	0	0	0	0	0	0	0	0	0
N-BUTANE	0	0	0	0	0	0	0	0	0	0	0	0	0
NITROGEN	0	0	0	0	0	1668.6	1668.6	1668.6	0	0	0	0	0
CO2	0	0	0	0	0	320.75	320.75	320.75	0	0	0	0	0
CO	0	0	0	0	0	0	0	0	0	0	0	0	0
WATER	500	533.18	703.67	249.12	500	0	0	0	216	720	216	216	720
OXYGEN	0	0	0	0	0	213.39	213.39	213.39	0	0	0	0	0
Total	500	533.18	703.67	249.12	500	2202.8	2202.8	2202.8	216	720	216	216	720
Total Stream Composition:													
HYDROGEN	0	0	0	0	0	0	0	0	0	0	0	0	0
METHANE	0	0	0	0	0	0	0	0	0	0	0	0	0
ETHANE	0	0	0	0	0	0	0	0	0	0	0	0	0
PROPANE	0	0	0	0	0	0	0	0	0	0	0	0	0
I-BUTANE	0	0	0	0	0	0	0	0	0	0	0	0	0
I-PENTANE	0	0	0	0	0	0	0	0	0	0	0	0	0
N-BUTANE	0	0	0	0	0	0	0	0	0	0	0	0	0
NITROGEN	0	0	0	0	0	75.74904667	75.74904667	75.74904667	0	0	0	0	0
CO2	0	0	0	0	0	14.56101326	14.56101326	14.56101326	0	0	0	0	0
CO	0	0	0	0	0	0	0	0	0	0	0	0	0
WATER	100	100	100	100	100	0	0	0	100	100	100	100	100
OXYGEN	0	0	0	0	0	9.68721627	9.68721627	9.68721627	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

STREAM SUMMARY

Stream Number	39	40	41	42	43	44	45	46
Stream Name	Strm 39	Strm 40	Strm 41	Strm 42	Strm 43	Strm 44	Strm 45	Strm 46
Thermo Method Option	CHANGED	CHANGED	CHANGED	GLOBAL	GLOBAL	CHANGED	GLOBAL	GLOBAL
Vapor Fraction	0	0	0.54622	1	0	0	1	1
Temperature	238.13	238.13	238.13	29.18	25	32.108	11	287.21
Pressure	33	33	33	0.57	3	3	0.1	0.57
Enthalpy	-1368600	-1824800	-623450	61351	-2979000	-5478200	95157	2539200
Vapor Cp			14.954	8.1545			6.9502	7.2623
Vapor Cv			9.4733	6.1588			4.9624	5.2747
Liquid Cp	20.404	20.404	20.404		17.985	17.986		
Vapor Density			16.19	0.57629			0.11974	0.34601
Liquid Density	816.12	816.12	816.12		997.1	995.04		
Liquid Specific Gravity	1.0001	1.0001	1.0001		1.0001	1.0001		
Vapor Viscosity			0.017149	0.014496			0.01803	0.029556
Liquid Viscosity	0.11137	0.11137	0.11137		0.89076	0.76317		
Vapor Thermal Conductivity			0.073451	0.038544			0.022068	0.037685
Liquid Thermal Conductivity	0.54504	0.54504	0.54504		0.52216	0.53218		
Vapor Flowrate			3524.3	5918.9			27979	27979
Liquid Flowrate	3.8922	5.1896	2.3558		5.2076	9.6966		
Free Water Flowrate								
Total Molecular Weight	18.015	18.015	18.015	25.896	18.015	18.015	28.85	28.85
Total Flowrate	216	288	288	264.11	289	538.12	1248.5	1248.5
Total Flowrate	3891.3	5188.4	5188.4	6839.5	5206.4	9694.4	36019	36019
Note: All Liquid Phase calculations exclude Free Water								
Total Flowrate By Component:								
HYDROGEN	0	0	0	73.757	0	0	0	0
METHANE	0	0	0	43.885	0	0	0	0
ETHANE	0	0	0	0.67141	0	0	0	0
PROPANE	0	0	0	0.11401	0	0	0	0
I-BUTANE	0	0	0	0.006334	0	0	0	0
I-PENTANE	0	0	0	0.006334	0	0	0	0
N-BUTANE	0	0	0	0.012668	0	0	0	0
NITROGEN	0	0	0	0.97459	0	0	986.3	986.3
CO2	0	0	0	119.84	0	0	0	0
CO	0	0	0	21.114	0	0	0	0
WATER	216	288	288	3.7304	289	538.12	0	0
OXYGEN	0	0	0	0	0	0	262.18	262.18
Total	216	288	288	264.11	289	538.12	1248.5	1248.5
Total Stream Composition:								
HYDROGEN	0	0	0	27.92662148	0	0	0	0
METHANE	0	0	0	16.61618265	0	0	0	0
ETHANE	0	0	0	0.254216046	0	0	0	0
PROPANE	0	0	0	0.04316762	0	0	0	0
I-BUTANE	0	0	0	0.002398243	0	0	0	0
I-PENTANE	0	0	0	0.002398243	0	0	0	0
N-BUTANE	0	0	0	0.004796486	0	0	0	0
NITROGEN	0	0	0	0.369009125	0	0	78.99879856	78.99879856
CO2	0	0	0	45.37503313	0	0	0	0
CO	0	0	0	7.994396274	0	0	0	0
WATER	100	100	100	1.412441786	100	100	0	0
OXYGEN	0	0	0	0	0	0	20.99959952	20.99959952
Total	100	100	100	100	100	100	100	100