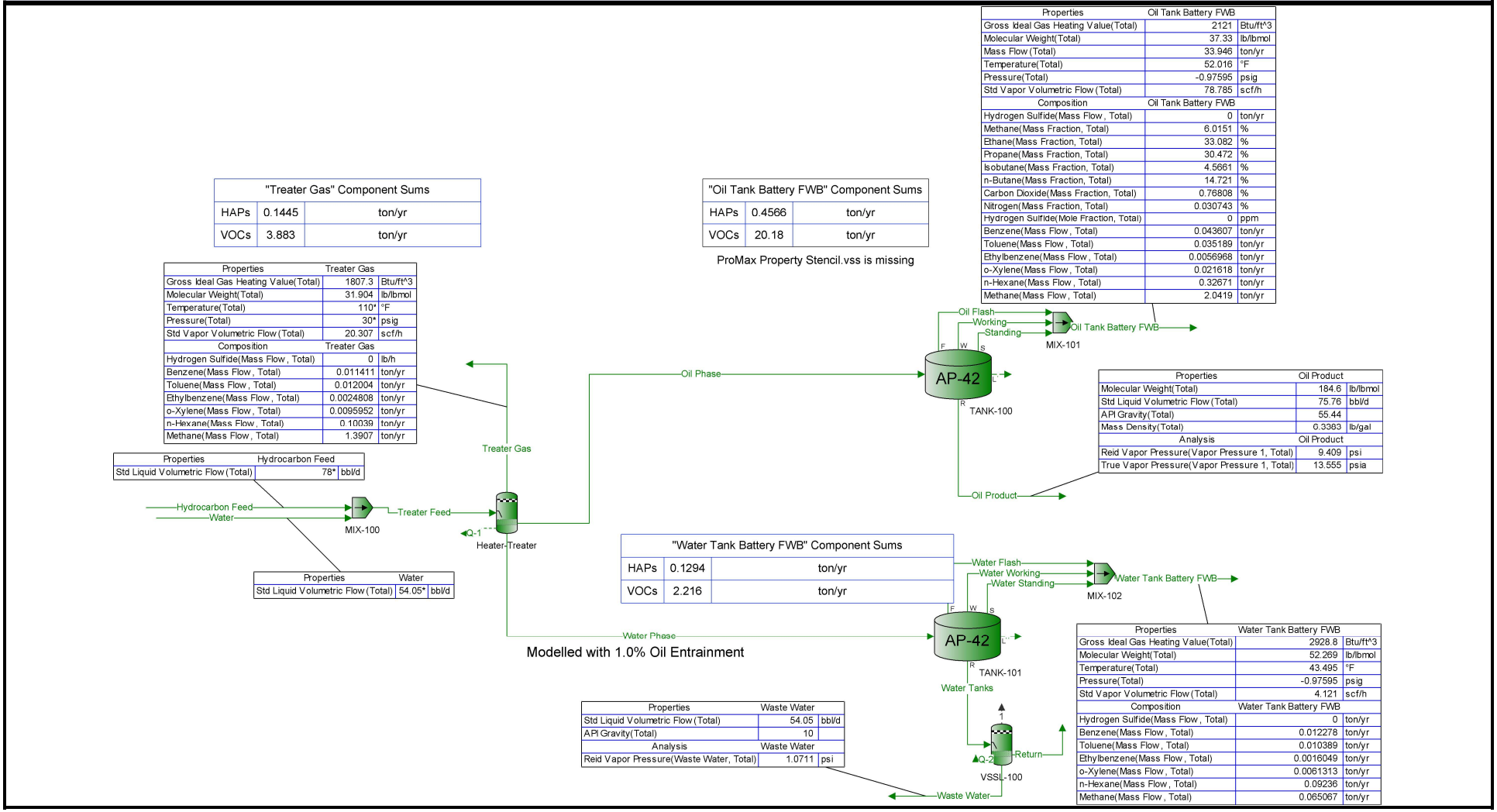
Flowsheet1
Plant Schematic

Client Name:		Job:	
Location:			
Flowsheet:	Flowsheet1		



* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:		Job:	
Location:			
Flowsheet:	Flowsheet1		

Connections

	Hydrocarbon Feed				
From Block	--				
To Block	MIX-100				

Stream Composition

Mole Fraction	Hydrocarbon Feed %				
Carbon Dioxide	0.043 *				
Nitrogen	0.005 *				
Hydrogen Sulfide	0 *				
Methane	1.037 *				
Ethane	2.631 *				
Propane	4.955 *				
Isobutane	1.208 *				
n-Butane	5.499 *				
n-Pentane	4.117 *				
Cyclopentane	0 *				
Isopentane	2.164 *				
n-Hexane	3.23 *				
Cyclohexane	0 *				
Heptane	4.822 *				
Octane	4.439 *				
Nonane	2.864 *				
Methylcyclohexane	0 *				
2,2,4-Trimethylpentane	0.553 *				
Benzene	0.258 *				
Toluene	0.797 *				
Ethylbenzene	0.421 *				
o-Xylene	1.904 *				
Water	0 *				
2-Methylpentane	1.473 *				
3-Methylpentane	0.863 *				
C6Alkanes(dibranched)	0.427 *				
Decanes Plus	56.29 *				

Molar Flow	Hydrocarbon Feed lbmol/h				
Carbon Dioxide	0.00207873 *				
Nitrogen	0.000241713 *				
Hydrogen Sulfide	0 *				
Methane	0.0501313 *				
Ethane	0.127189 *				
Propane	0.239538 *				
Isobutane	0.0583979 *				
n-Butane	0.265836 *				
n-Pentane	0.199027 *				
Cyclopentane	0 *				
Isopentane	0.104613 *				
n-Hexane	0.156147 *				
Cyclohexane	0 *				
Heptane	0.233108 *				
Octane	0.214593 *				
Nonane	0.138453 *				
Methylcyclohexane	0 *				
2,2,4-Trimethylpentane	0.0267335 *				
Benzene	0.0124724 *				
Toluene	0.0385291 *				
Ethylbenzene	0.0203522 *				

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:		Job:	
Location:			
Flowsheet:	Flowsheet1		

Molar Flow	Hydrocarbon Feed lbmol/h					
o-Xylene	0.0920444	*				
Water	0	*				
2-Methylpentane	0.0712087	*				
3-Methylpentane	0.0417197	*				
C6Alkanes(dibranched)	0.0206423	*				
Decanes Plus	2.72121	*				

Mass Fraction	Hydrocarbon Feed %					
Carbon Dioxide	0.0107105	*				
Nitrogen	0.000792743	*				
Hydrogen Sulfide	0	*				
Methane	0.0941556	*				
Ethane	0.447751	*				
Propane	1.23662	*				
Isobutane	0.397379	*				
n-Butane	1.80893	*				
n-Pentane	1.68115	*				
Cyclopentane	0	*				
Isopentane	0.883655	*				
n-Hexane	1.57537	*				
Cyclohexane	0	*				
Heptane	2.73464	*				
Octane	2.86983	*				
Nonane	2.07895	*				
Methylcyclohexane	0	*				
2,2,4-Trimethylpentane	0.357516	*				
Benzene	0.11406	*				
Toluene	0.415619	*				
Ethylbenzene	0.252965	*				
o-Xylene	1.14405	*				
Water	0	*				
2-Methylpentane	0.718426	*				
3-Methylpentane	0.420911	*				
C6Alkanes(dibranched)	0.208261	*				
Decanes Plus	80.5483	*				

Mass Flow	Hydrocarbon Feed lb/h					
Carbon Dioxide	0.091484	*				
Nitrogen	0.00677121	*				
Hydrogen Sulfide	0	*				
Methane	0.804229	*				
Ethane	3.82446	*				
Propane	10.5626	*				
Isobutane	3.39421	*				
n-Butane	15.451	*				
n-Pentane	14.3595	*				
Cyclopentane	0	*				
Isopentane	7.54773	*				
n-Hexane	13.456	*				
Cyclohexane	0	*				
Heptane	23.3579	*				
Octane	24.5126	*				
Nonane	17.7573	*				
Methylcyclohexane	0	*				
2,2,4-Trimethylpentane	3.05373	*				
Benzene	0.974242	*				

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:		Job:	
Location:			
Flowsheet:	Flowsheet1		

Mass Flow	Hydrocarbon Feed lb/h					
Toluene	3.55001	*				
Ethylbenzene	2.1607	*				
o-Xylene	9.77189	*				
Water	0	*				
2-Methylpentane	6.13643	*				
3-Methylpentane	3.59521	*				
C6Alkanes(dibranched)	1.77886	*				
Decanes Plus	688.003	*				

Stream Properties

Property	Units	Hydrocarbon Feed					
Temperature	°F	54	*				
Pressure	psig	31	*				
Mole Fraction Vapor	%	0					
Mole Fraction Light Liquid	%	100					
Mole Fraction Heavy Liquid	%	0					
Phase Mole Fraction	%	100					
Molecular Weight	lb/lbmol	176.687					
Mass Density	lb/ft^3	47.1885					
Molar Flow	lbmol/h	4.83426					
Mass Flow	lb/h	854.15					
Vapor Volumetric Flow	ft^3/h	18.1008					
Liquid Volumetric Flow	gpm	2.25672					
Std Vapor Volumetric Flow	MMSCFD	0.0440286					
Std Liquid Volumetric Flow	sgpm	2.275	*				
Compressibility		0.0310383					
Specific Gravity		0.756605					
API Gravity		56.1482					
Enthalpy	Btu/h	-744555					
Mass Enthalpy	Btu/lb	-871.691					
Mass Cp	Btu/(lb*°F)	0.498618					
Ideal Gas CpCv Ratio		1.02974					
Dynamic Viscosity	cP	1.84229					
Kinematic Viscosity	cSt	2.43726					
Thermal Conductivity	Btu/(h*ft*°F)	0.0722663					
Surface Tension	lbf/ft	0.00189435	?				
Net Ideal Gas Heating Value	Btu/ft^3	8829.43					
Net Liquid Heating Value	Btu/lb	18811.6					
Gross Ideal Gas Heating Value	Btu/ft^3	9451.62					
Gross Liquid Heating Value	Btu/lb	20148					

Remarks

Blocks
TANK-100
Tank Losses

Client Name:		Job:	
Location:		Modified: 3:41 PM, 4/1/2025	
Flowsheet:	Flowsheet1	Status: Solved 3:48 PM, 4/1/2025	

Connections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
Oil Phase	Inlet	Heater-Treater	Oil Flash	Flashing Losses Stream	MIX-101
Working	Working Losses Stream	MIX-101	Standing	Standing Losses Stream	MIX-101
.	Loading Losses Stream		Oil Product	Residual Liquid Stream	

Working and Standing Properties

	Tank Geometry	Vertical Cylinder		Roof Type	Cone
*	Shell Length	20 ft		Slope of Coned Roof	0.0625
*	Shell Diameter	12 ft		Breather Vent Pressure	0.03 psi
*	Number of Storage Tanks	6		Breather Vacuum Pressure	-0.03 psi
	Maximum Fraction Fill of Tank	90 %	*	Location	Williston, ND
	Average Fraction Fill of Tank	50 %		Time Frame	Year
	Minimum Fraction Fill of Tank	10 %		Known Liquid Bulk Temperature?	False
*	Material Category	Light Organics		Liquid Bulk Temperature	43.3037 °F
	Insulation	Uninsulated		Use AP 42 Raoult's Vapor Pressure?	False
	Bolted or Riveted Construction?	False		Flashing Temperature	52.0213 °F
*	Vapor Balanced Tank?	True		Average Daily Maximum Ambient Temperature	53.2 °F
	Known Sum of Increases in Liquid Level?	False		Average Daily Minimum Ambient Temperature	29.9 °F
	Sum of Increases in Liquid Level	228.184 ft/yr		Atmospheric Pressure at Tank Location	13.72 psia
*	Shell Color	Tan		Daily Solar Insolation	1193 Btu/(day*ft^2)
	Shell Paint Condition	Average		Average Wind Speed	8.9 mph
*	Roof Color	Tan		Include Short Term Emissions	False
	Roof Paint Condition	Average			

Composition Subset Properties

*	Component Subset	VOCs		Species in Results	Selected Species
	Atomic Basis	False		Fraction Denominator	Selected Species

Tabulated Composition Subset Properties

Index	Selected Components			
Carbon Dioxide	False			
Nitrogen	False			
Hydrogen Sulfide	False			
Methane	False			
Ethane	False			
Propane	True			
Isobutane	True			
n-Butane	True			
n-Pentane	True			
Cyclopentane	True			
Isopentane	True			
n-Hexane	True			
Cyclohexane	True			
Heptane	True			
Octane	True			
Nonane	True			
Methylcyclohexane	True			
2,2,4-Trimethylpentane	True			
Benzene	True			
Toluene	True			

Blocks
TANK-100
Tank Losses

Client Name:		Job:	
Location:		Modified: 3:41 PM, 4/1/2025	
Flowsheet:	Flowsheet1	Status: Solved 3:48 PM, 4/1/2025	

Tabulated Composition Subset Properties

Index	Selected Components			
Ethylbenzene	True			
o-Xylene	True			
Water	False			
2-Methylpentane	True			
3-Methylpentane	True			
C6Alkanes(dibranched)	True			
Decanes Plus	True			

Details Properties

Vapor Space Volume	1145.11	ft^3	Roof Outage	0.125	ft
Vapor Density	0.0811457	lb/ft^3	Tank Roof Height	0.375	ft
Vapor Space Expansion Factor	1	1/day	Tank Shell Radius	6	ft
Vented Vapor Saturation Factor	0.128883		Vapor Molecular Weight	34.9807	lb/lbmol
Vapor Space Outage	10.125	ft	Average Vapor Temperature	505.953	°R
Average Daily Vapor Temperature Range	28.9126	°R	Average Daily Ambient Temperature	501.22	°R
Average Daily Vapor Pressure Range	2.17161	psi	Net Working Loss Throughput	25807	ft^3/yr
Breather Vent Pressure Setting Range	0.06	psi	Working Loss Turnover (Saturation) Factor	1	
Vapor Pressure at Average Daily Liquid Surface Temperature	12.5953	psia	Number of Turnovers per Year	14.2615	
Average Daily Liquid Surface Temperature	504.463	°R	Annual Net Throughput	27581.5	bbl/yr
Average Daily Ambient Temperature Range	23.3	°R	Maximum Liquid Height	18	ft
Tank Roof Surface Solar Absorptance	0.49		Minimum Liquid Height	2	ft
Tank Shell Surface Solar Absorptance	0.49		Working Loss Product Factor	1	
Vapor Pressure at Maximum Liquid Surface Temperature	13.72	psia	Vent Setting Correction Factor	1	
Vapor Pressure at Minimum Liquid Surface Temperature	11.5484	psia	Saturation Factor	0.5	
Maximum Liquid Surface Temperature	511.691	°R	Vapor Pressure of Liquid Loaded	12.5953	psia
Minimum Liquid Surface Temperature	497.235	°R	Collection Efficiency	70	%
Liquid Height	10	ft	Annual Net Throughput Per Tank	4596.91	bbl/yr

Loading Properties

Cargo Carrier	Tank Truck or Rail Tank Car		Truck Annual Leak Test Passed	None	
Land Based Mode of Operation	Submerged Loading of a Clean Cargo Tank		Overall Reduction Efficiency	0	%
* Control Efficiency	0	%			

Results Properties

Flashing Losses	9.32413	ton/yr	Standing Losses per Tank	1.22276	ton/yr
Working Losses	3.51476	ton/yr	Flashing Losses per Tank	1.55402	ton/yr
Standing Losses	7.33657	ton/yr	Working and Standing Losses	10.8513	ton/yr
Loading Losses	1.93584	ton/yr	Working and Standing Losses per Tank	1.80856	ton/yr

Blocks
TANK-100
Tank Losses

Client Name:		Job:	
Location:		Modified: 3:41 PM, 4/1/2025	
Flowsheet:	Flowsheet1	Status: Solved 3:48 PM, 4/1/2025	

Results Properties

Working Losses per Tank	0.585793 ton/yr	Loading Losses per Tank	0.322639 ton/yr

Tabulated Results Properties

Index	Flashing Losses Mass Flows ton/yr	Working Losses Mass Flows ton/yr	Standing Losses Mass Flows ton/yr	Loading Losses Mass Flows ton/yr
Propane	4.73027	1.8183	3.79546	1.00147
Isobutane	0.716564	0.269947	0.563477	0.14868
n-Butane	2.31926	0.867407	1.81059	0.477745
n-Pentane	0.601298	0.217888	0.45481	0.120007
Cyclopentane	0	0	0	0
Isopentane	0.424818	0.155237	0.324037	0.0855007
n-Hexane	0.156808	0.055032	0.114872	0.0303102
Cyclohexane	0	0	0	0
Heptane	0.0856563	0.0292763	0.0611102	0.0161246
Octane	0.0256457	0.00850882	0.017761	0.00468644
Nonane	0.00521953	0.00167754	0.00350162	0.000923942
Methylcyclohexane	0	0	0	0
2,2,4-Trimethylpentane	0.011533	0.00396247	0.0082711	0.00218242
Benzene	0.0206956	0.00742088	0.0154901	0.00408723
Toluene	0.0170044	0.00588994	0.0122944	0.00324402
Ethylbenzene	0.00279785	0.000938974	0.00195998	0.000517162
o-Xylene	0.0106296	0.00355925	0.00742944	0.00196034
2-Methylpentane	0.105246	0.0374278	0.0781252	0.0206142
3-Methylpentane	0.0553892	0.0196446	0.0410054	0.0108197
C6Alkanes(dibranched)	0.0352964	0.0126364	0.0263767	0.00695979
Decanes Plus	2.79652E-06	6.85355E-07	1.43058E-06	3.77475E-07

Index	Working and Standing Losses Mass Flows ton/yr			
Propane	5.61376			
Isobutane	0.833424			
n-Butane	2.678			
n-Pentane	0.672698			
Cyclopentane	0			
Isopentane	0.479274			
n-Hexane	0.169904			
Cyclohexane	0			
Heptane	0.0903865			
Octane	0.0262698			
Nonane	0.00517916			
Methylcyclohexane	0			
2,2,4-Trimethylpentane	0.0122336			
Benzene	0.0229109			
Toluene	0.0181844			
Ethylbenzene	0.00289895			
o-Xylene	0.0109887			
2-Methylpentane	0.115553			
3-Methylpentane	0.06065			
C6Alkanes(dibranched)	0.0390131			
Decanes Plus	2.11594E-06			

Warnings

ProMax:ProMax!Project!Flowsheets!Flowsheet1!Blocks!TANK-100
Warning: Vapor adjusted to ensure mass balance.

Remarks

Blocks
TANK-100
Tank Losses

Client Name:		Job:	
Location:		Modified: 3:41 PM, 4/1/2025	
Flowsheet:	Flowsheet1	Status: Solved 3:48 PM, 4/1/2025	

Blocks
TANK-101
Tank Losses

Client Name:		Job:	
Location:		Modified: 3:42 PM, 4/1/2025	
Flowsheet:	Flowsheet1	Status: Solved 3:48 PM, 4/1/2025	

Connections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
Water Phase	Inlet	Heater-Treater	Water Flash	Flashing Losses Stream	MIX-102
Water Working	Working Losses Stream	MIX-102	Water Standing	Standing Losses Stream	MIX-102
..	Loading Losses Stream		Water Tanks	Residual Liquid Stream	VSSL-100

Working and Standing Properties

	Tank Geometry	Vertical Cylinder		Roof Type	Cone
*	Shell Length	20 ft		Slope of Coned Roof	0.0625
*	Shell Diameter	12 ft		Breather Vent Pressure	0.03 psig
*	Number of Storage Tanks	3		Breather Vacuum Pressure	-0.03 psig
	Maximum Fraction Fill of Tank	90 %	*	Location	Williston, ND
	Average Fraction Fill of Tank	50 %		Time Frame	Year
	Minimum Fraction Fill of Tank	10 %		Known Liquid Bulk Temperature?	False
*	Material Category	Heavy Crude		Liquid Bulk Temperature	43.3037 °F
	Insulation	Uninsulated		Use AP 42 Raoult's Vapor Pressure?	False
	Bolted or Riveted Construction?	False		Flashing Temperature	52.0213 °F
*	Vapor Balanced Tank?	True		Average Daily Maximum Ambient Temperature	53.2 °F
	Known Sum of Increases in Liquid Level?	False		Average Daily Minimum Ambient Temperature	29.9 °F
	Sum of Increases in Liquid Level	330.411 ft/yr		Atmospheric Pressure at Tank Location	13.72 psia
*	Shell Color	Tan		Daily Solar Insolation	1193 Btu/(day*ft^2)
	Shell Paint Condition	Average		Average Wind Speed	8.9 mph
*	Roof Color	Tan		Include Short Term Emissions	False
	Roof Paint Condition	Average			

Composition Subset Properties

Component Subset	VOCs	Species in Results	Selected Species
Atomic Basis	False	Fraction Denominator	Selected Species

Tabulated Composition Subset Properties

Index	Selected Components			
Carbon Dioxide	False			
Nitrogen	False			
Hydrogen Sulfide	False			
Methane	False			
Ethane	False			
Propane	True			
Isobutane	True			
n-Butane	True			
n-Pentane	True			
Cyclopentane	True			
Isopentane	True			
n-Hexane	True			
Cyclohexane	True			
Heptane	True			
Octane	True			
Nonane	True			
Methylcyclohexane	True			
2,2,4-Trimethylpentane	True			
Benzene	True			
Toluene	True			

Blocks
TANK-101
Tank Losses

Client Name:		Job:	
Location:		Modified: 3:42 PM, 4/1/2025	
Flowsheet:	Flowsheet1	Status: Solved 3:48 PM, 4/1/2025	

Tabulated Composition Subset Properties

Index	Selected Components			
Ethylbenzene	True			
o-Xylene	True			
Water	False			
2-Methylpentane	True			
3-Methylpentane	True			
C6Alkanes(dibranched)	True			
Decanes Plus	True			

Details Properties

Vapor Space Volume	1145.11	ft^3	Roof Outage	0.125	ft
Vapor Density	0.0769984	lb/ft^3	Tank Roof Height	0.375	ft
Vapor Space Expansion Factor	1	1/day	Tank Shell Radius	6	ft
Vented Vapor Saturation Factor	0.129743		Vapor Molecular Weight	33.4473	lb/lbmol
Vapor Space Outage	10.125	ft	Average Vapor Temperature	505.953	°R
Average Daily Vapor Temperature Range	28.9126	°R	Average Daily Ambient Temperature	501.22	°R
Average Daily Vapor Pressure Range	2.36733	psi	Net Working Loss Throughput	37368.6	ft^3/yr
Breather Vent Pressure Setting Range	0.06	psi	Working Loss Turnover (Saturation) Factor	1	
Vapor Pressure at Average Daily Liquid Surface Temperature	12.4995	psia	Number of Turnovers per Year	20.6507	
Average Daily Liquid Surface Temperature	504.463	°R	Annual Net Throughput	19969	bbl/yr
Average Daily Ambient Temperature Range	23.3	°R	Maximum Liquid Height	18	ft
Tank Roof Surface Solar Absorptance	0.49		Minimum Liquid Height	2	ft
Tank Shell Surface Solar Absorptance	0.49		Working Loss Product Factor	0.75	
Vapor Pressure at Maximum Liquid Surface Temperature	13.72	psia	Vent Setting Correction Factor	1	
Vapor Pressure at Minimum Liquid Surface Temperature	11.3527	psia	Saturation Factor	0.5	
Maximum Liquid Surface Temperature	511.691	°R	Vapor Pressure of Liquid Loaded	12.4995	psia
Minimum Liquid Surface Temperature	497.235	°R	Collection Efficiency	70	%
Liquid Height	10	ft	Annual Net Throughput Per Tank	6656.32	bbl/yr

Loading Properties

Cargo Carrier	Tank Truck or Rail Tank Car		Truck Annual Leak Test Passed	None	
Land Based Mode of Operation	Submerged Loading of a Clean Cargo Tank		Overall Reduction Efficiency	0	%
* Control Efficiency	0	%			

Results Properties

Flashing Losses	0.231675	ton/yr	Standing Losses per Tank	0.436104	ton/yr
Working Losses	0.676171	ton/yr	Flashing Losses per Tank	0.0772251	ton/yr
Standing Losses	1.30831	ton/yr	Working and Standing Losses	1.98448	ton/yr
Loading Losses	2.07879	ton/yr	Working and Standing Losses per Tank	0.661495	ton/yr

Blocks
TANK-101
Tank Losses

Client Name:		Job:	
Location:		Modified: 3:42 PM, 4/1/2025	
Flowsheet:	Flowsheet1	Status: Solved 3:48 PM, 4/1/2025	

Results Properties

Working Losses per Tank	0.22539 ton/yr	Loading Losses per Tank	0.692931 ton/yr

Tabulated Results Properties

Index	Flashing Losses Mass Flows ton/yr	Working Losses Mass Flows ton/yr	Standing Losses Mass Flows ton/yr	Loading Losses Mass Flows ton/yr
Propane	0.112486	0.119317	0.230864	0.366822
Isobutane	0.017785	0.0434837	0.084136	0.133685
n-Butane	0.0599327	0.210316	0.406937	0.646586
n-Pentane	0.0159727	0.117897	0.228118	0.362459
Cyclopentane	0	0	0	0
Isopentane	0.0112183	0.0834882	0.16154	0.256673
n-Hexane	0.0042027	0.0300377	0.0581195	0.0923466
Cyclohexane	0	0	0	0
Heptane	0.00229964	0.0160056	0.030969	0.0492069
Octane	0.000688682	0.00465273	0.00900249	0.0143041
Nonane	0.000140248	0.000917856	0.00177594	0.00282182
Methylcyclohexane	0	0	0	0
2,2,4-Trimethylpentane	0.000309524	0.00216539	0.00418977	0.00665717
Benzene	0.00055033	0.00399584	0.00773149	0.0122846
Toluene	0.00047689	0.00337737	0.00653482	0.0103832
Ethylbenzene	7.61433E-05	0.000520886	0.00100785	0.00160139
o-Xylene	0.000291322	0.00198984	0.00385011	0.00611748
2-Methylpentane	0.00281714	0.0204043	0.0394801	0.0627303
3-Methylpentane	0.00148501	0.0107277	0.020757	0.0329809
C6Alkanes(dibranched)	0.000942844	0.00687377	0.0133	0.0211324
Decanes Plus	7.48174E-08	3.73274E-07	7.22242E-07	1.14758E-06

Index	Working and Standing Losses Mass Flows ton/yr			
Propane	0.35018			
Isobutane	0.12762			
n-Butane	0.617252			
n-Pentane	0.346015			
Cyclopentane	0			
Isopentane	0.245028			
n-Hexane	0.0881571			
Cyclohexane	0			
Heptane	0.0469746			
Octane	0.0136552			
Nonane	0.0026938			
Methylcyclohexane	0			
2,2,4-Trimethylpentane	0.00635516			
Benzene	0.0117273			
Toluene	0.00991219			
Ethylbenzene	0.00152874			
o-Xylene	0.00583995			
2-Methylpentane	0.0598844			
3-Methylpentane	0.0314847			
C6Alkanes(dibranched)	0.0201737			
Decanes Plus	1.09552E-06			

Warnings

ProMax:ProMax!Project!Flowsheets!Flowsheet1!Blocks!TANK-101
Warning: Vapor adjusted to ensure mass balance.

Remarks

Blocks
TANK-101
Tank Losses

Client Name:		Job:
Location:		Modified: 3:42 PM, 4/1/2025
Flowsheet:	Flowsheet1	Status: Solved 3:48 PM, 4/1/2025