Dehydrator Design Data Form

1.1 Quote Information

Customer Information			
Name		Company	
Business Title			
Email		Phone Number:	
Equipment Information			
Quantity:		Ship to Location (City, State, Zip)	
Proposal Due Date		Freight Terms	☐ EXW ☐ FCA ☐ FOB ☐ CIF ☐ Other _____
Potential Order Date:		Preferred Ship Date:	

Rank (1-4) Importance of the Following:							
Price:		Spec Compliance:		Delivery:		Quality/Reliability:	

Additional Comments

1.2 Process Conditions:

Process Data	Parameter	Dehy Typical Values
Inlet Pressure (PSIG)		800-1200
Inlet Temp (°F)		70-125
Design Pressure (PSIG)		1440
Gas Inlet Flowrate (MMSCFD)		5-150
Gas Inlet SG		0.57-0.8
Gas Inlet Water Conc. (#/MMSCFD)		Saturated
Gas Outlet Water Conc. (#/MMSCFD)		<7
Site Elevation (Ft)		
Inlet Fluid Composition		
Shop Capable Size	**Regen:** <2.5MMBTU/HR **Abs.:** <60"OD, <30'S/S, <1440#	**Required** **Requested**

1.3 Design Scope

TEG Dehydrator Design Data Form

Style	☐ Packed Trayed ☐ 8 Trayed ☐ 10 Trayed
Style	☐ Bare Vessel ☐ Vessel with Accessories
Paint	☐ Cimarron Standard SP-3/DTM 1 Coat, Color: Desert Tan ☐ Cimarron Standard SP-6/2 Coat, Color: Desert Tan ☐ Custom

Vessel Adders	Ship Loose Accessories	
☐ Internal Coating	Item:	OEM/Type Preference:
	☐ Concrete Blocks	
Corrosion Allowance: ☐ 1/32" ☐ 1/16" ☐ 1/8" ☐ 1/4"	☐ PSV	
	☐ Dump Valves	
	☐ Level Controller	
NACE Adders: ☐ Hardness Testing ☐ Materials	☐ Level Switch	
	Gauges (Level, PI, TI) ☐ Sight ☐ Transmitters	
☐ All Flanged Connections ☐ Pressure/Temperature Re-ratings ☐ Manway		

Additional Requests

Regenerator

Major Equipment	Accessories	
Filters: ☐ Full Flow Charcoal Filter ☐ Coded Filters	**Item:**	**OEM/Type Preference:**
	☐ Glycol Flow Meter	
Pumps: ☐ Electric Pumps w/VFD and Reboiler LLS	☐ Pressure Transmitters	
	☐ PDITs on Filters	
	☐ TSH on reboiler/stack	

Fuel Train: ☐ Scrubber Auto-Drain BMS Installed: ☐ ARC Premier ☐ Profire HBB 2100	☐ On-skid Electrical with J-Box	

Skid
☐ On-skid deck grating Containment: ☐ Containment Pan (Cookie Sheet) with Drain ☐ In-skid containment (sloped drip pans)

Additional Requests

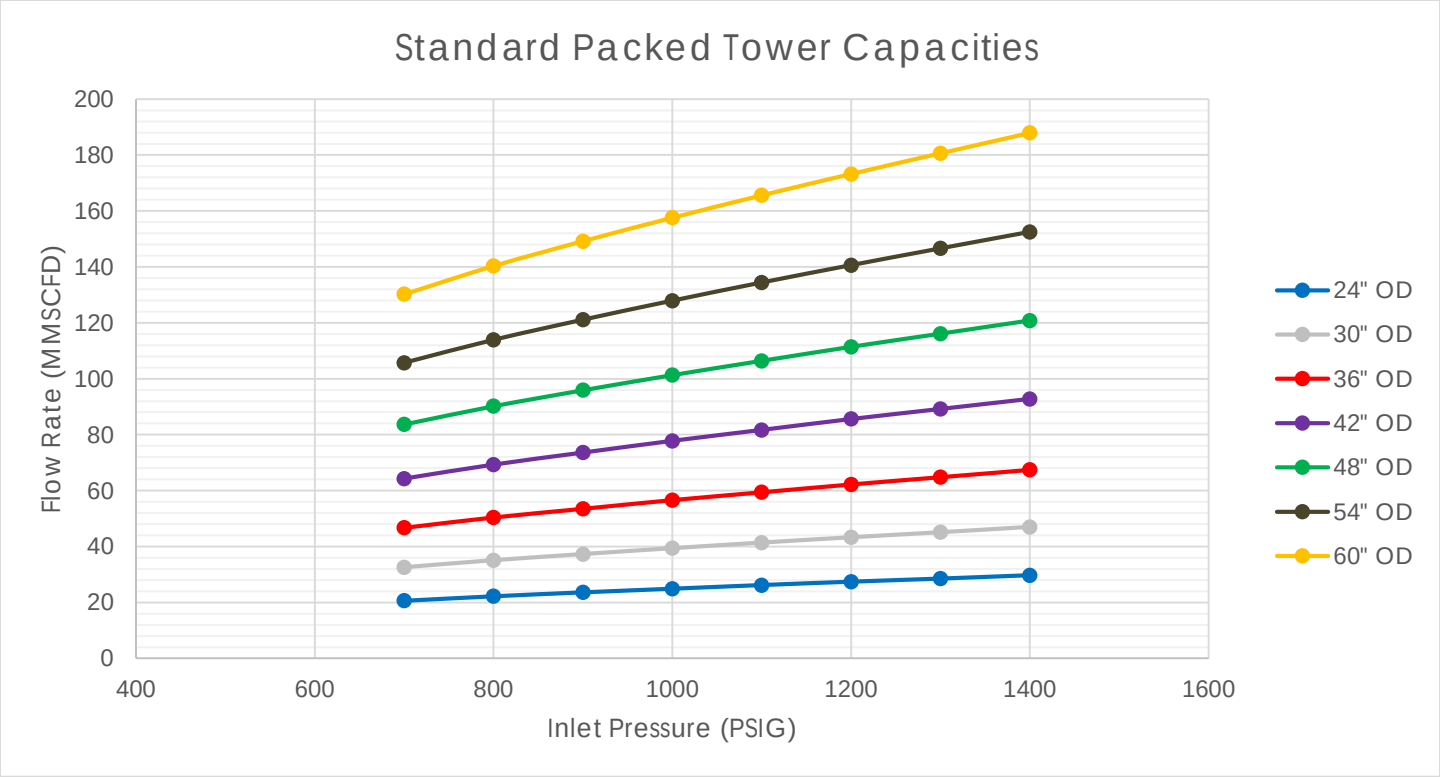
1.4 Application Guidance

Design Parameter Considerations:

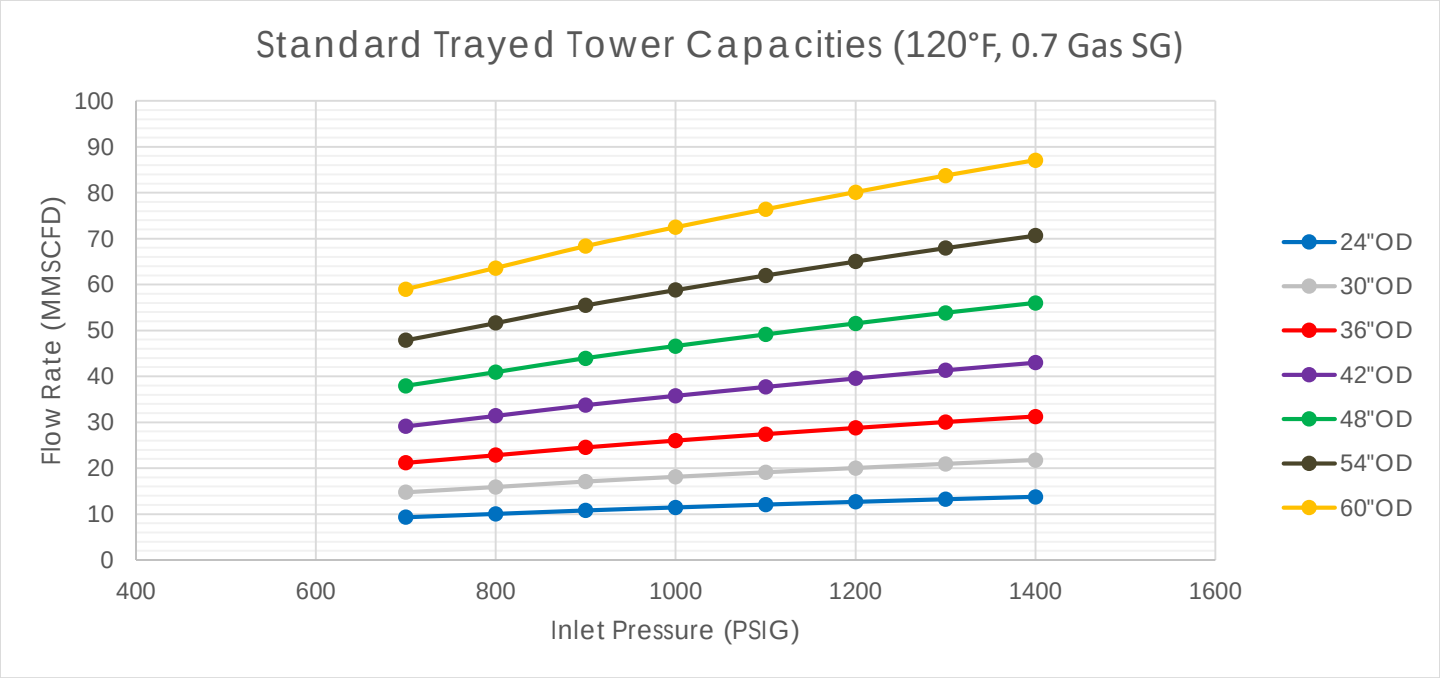
- Inlet Gas Temperature: The higher the inlet gas temperature, the higher water content of the inlet gas stream. For example, at 1000psia, 80°F gas will hold 34 lb/MMSCFD water and at 120°F for same pressure gas will hold 104 lb/MMSCFD water. Affects tower size and gas-glycol exchanger size.
- Contactor Pressure: Water content decreases as tower pressure increases for a given temperature. Typically dehydration pressures are between 600 and 1200 psig.
- Number of Trays (trayed tower): The more trays, the greater dew point depression. This affects glycol circulation rate which affects heat duty on reboiler. Therefore theoretically increases trays should reduce heat duty and therefore size on the reboiler unit (regenerator).
- Lean Glycol Temperatures: As lean glycol temperature entering the tower increases, glycol losses increase.
- Glycol Concentration: The higher the concentration of the lean glycol the greater dewpoint depression for a given circulation rate and number of trays. Therefore the higher the concentration of the lean glycol, less duty required and there fore a smaller reboiler unit.
- Glycol Reboiler Temperature: The higher the temperature in the reboiler, the higher purity of the glycol. Raising reboiler temperature increases heat duty and therefore increases fuel demand. TEG begins to degrade at temperatures > 400°F thereby setting a maximum.
- Reboiler Pressure: Generally kept at atmospheric. As pressure increases the, reboiler's ability to boil off glycol is drastically reduced.
- Stripping Gas: Stripping gas increases glycol purity. Requires additional fuel gas, but normally less than that required to heat the reboiler for the same effect.
- Glycol Circulation Rate: Generally as circulation rate increases, dew-point depression increases and therefore dehy performance increases. Circulation rate is normally 2 to 7 gal per lb water removed. A minimum circulation is needed to assure good glycol-gas contact. As 7 gal per lb water removed is exceeded the duty on the reboiler goes up. The heat required by the reboiler is directly proportional to glycol circulation rate.

1.5 Sizing Information

Standard Packed Tower Gas Capacities in MMSCFD												
		Inlet Pressure (PSIG)										
		400	500	600	700	800	900	1000	1100	1200	1300	1400
Vessel OD (in)	24	15.3	17.2	19	20.6	22.2	23.6	24.9	26.2	27.4	28.5	29.7
	30	24.2	27.2	30	32.6	35.1	37.3	39.4	41.4	43.3	45.1	47
	36	34.8	39.1	43	46.7	50.4	53.5	56.6	59.4	62.2	64.8	67.4
	42	47.9	53.8	59.2	64.3	69.3	73.6	77.8	81.7	85.6	89.2	92.8
	48	62.3	70	77.1	83.7	90.2	95.9	101.3	106.4	111.4	116.1	120.8
	54	78.7	88.4	97.3	105.7	113.9	121.1	127.9	134.4	140.6	146.6	152.5
	60	97.0	108.9	119.9	130.2	140.3	149.2	157.6	165.6	173.2	180.6	187.9



Standard Trayed Tower Gas Capacities													
		Inlet Pressure (PSIG)											
			400	500	600	700	800	900	1000	1100	1200	1300	1400
Vessel OD (in)	24	Capacity (MMSCFD)	7.2	8.0	8.8	9.3	10.1	10.8	11.5	12.1	12.7	13.2	13.8
		Regen (MBTU/Hr)	500	375	375	500	375	375	375	375	375	375	375
	30	Capacity (MMSCFD)	11.4	12.7	14.0	14.7	15.9	17.1	18.1	19.1	20.0	20.9	21.8
		Regen (MBTU/Hr)	750	500	750	750	500	375	375	375	375	375	375
	36	Capacity (MMSCFD)	16.3	18.2	20.1	21.2	22.8	24.5	26.0	27.4	28.8	30.1	31.3
		Regen (MBTU/Hr)	1000	750	1000	1000	750	500	500	500	375	375	375
	42	Capacity (MMSCFD)	22.4	25.1	27.6	29.1	31.4	33.7	35.8	37.7	39.6	41.3	43.0
		Regen (MBTU/Hr)	1500	1000	1500	1500	1000	750	750	750	500	500	375
	48	Capacity (MMSCFD)	29.2	32.7	35.9	37.9	40.9	43.9	46.6	49.1	51.5	53.8	56.0
		Regen (MBTU/Hr)	1500	1500	1500	1500	1500	1000	1000	750	750	500	500
	54	Capacity (MMSCFD)	36.9	41.2	45.4	47.9	51.6	55.5	58.8	62.0	65.0	68.0	70.7
		Regen (MBTU/Hr)	2000	2000	2000	2000	2000	1500	1000	1000	750	750	750
	60	Capacity (MMSCFD)	45.4	50.8	55.9	59.0	63.6	68.3	72.5	76.4	80.1	83.7	87.1
		Regen (MBTU/Hr)	2000	2000	2000	2000	2000	1500	1500	1500	1000	750	750


Standard Trayed Tower Capacities (120°F, 0.7 Gas SG)
Flow Rate (MMSCFD)
100
90
80
70
60
50
40
30
20
10
0
400
600
800
1000
1200
1400
1600
Inlet Pressure (PSIG)
24"OD
30"OD
36"OD
42"OD
48"OD
54"OD
60"OD

Standard Regen Capacities in MMSCFD (120°F Inlet Temp, 0.7 Gas SG)												
		Inlet Pressure (PSIG)										
		400	500	600	700	800	900	1000	1100	1200	1300	1400
Regen Size	0.375 MMBTU/HR	6.89	9.1	9.2	9.1	11.6	17.9	21.6	26.1	31.8	39.3	44.3
	0.5 MMBTU/HR*	9.84	13.0	13.2	13.1	16.6	25.6	30.8	37.3	45.4	56.1	63.3
	0.75 MMBTU/HR	14.76	19.4	19.7	19.6	24.8	38.4	46.2	55.9	68.1	84.1	94.9
	1 MMBTU/HR*	19.68	25.9	26.3	26.1	33.1	51.1	61.6	74.5	90.8	112.2	126.6
	1.5 MMBTU/HR	29.53	38.9	39.5	39.2	49.7	76.7	92.4	111.8	136.2	168.3	189.9
	2 MMBTU/HR	55.11	72.5	73.7	73.1	92.7	143.2	172.5	208.6	254.2	314.1	354.4
	* Spare pump must be put in operation to achieve max capacity