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Propane Butane Mixtures - Evaporation Pressures

Evaporation pressures of propane butane mixtures

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It is common to distribute a mixture of propane (C_3H_8) and butane (C_4H_{10}) ([LPG](#)) for combustion purposes.

Propane is more suited to colder environments since it evaporates at $-44^\circ F$ ($-42^\circ C$) at atmospheric pressure. Butane evaporates at $33^\circ F$ ($0.6^\circ C$) at atmospheric pressure.

The vapor pressures for mixtures of the two products:

		Vapor Pressure (psig)				
Mixture	Propane (C_3H_8) (%)	100	70	50	30	0
	Butane (C_4H_{10}) (%)	0	30	50	70	100
Temperature ($^\circ F$)	-44	0	0	0	0	0
	-30	6.8	0	0	0	0
	-20	11.5	4.7	0	0	0
	-10	17.5	9	3.5	0	0
	0	24.5	15	7.6	2.3	0
	10	34	20.5	12.3	5.9	0
	20	42	28	17.8	10.2	0
	30	53	36.5	24.5	15.4	0
	40	65	46	32.4	21.5	3.1
	50	78	56	41	28.5	6.9
	60	93	68	50	36.5	11.5
	70	110	82	61	45	17
	80	128	96	74	54	23
	90	150	114	88	66	30
100	177	134	104	79	38	
110	204	158	122	93	47	

• $1 \text{ psi (lb/in}^2\text{)} = 144 \text{ psf (lb/ft}^2\text{)} = 6,894.8 \text{ Pa (N/m}^2\text{)} = 6.895 \times 10^{-3} \text{ N/mm}^2 = 6.895 \times 10^{-2} \text{ bar}$

Note that the evaporation temperature is not the only parameter that influences on evaporation of the propane butane mixture. Evaporation requires heat and if the heat transferred to the liquid gas is limited - the liquid cools down and the evaporation is reduced.

- Larger consumers requires heat exchangers fueled with hot water, electric heater or combustion of the propane butane mix itself to supply the evaporation heat.
- Smaller consumers requires propane butane mix containers with efficient heat transfer from the surroundings. By example - composite containers provides less heat transfer compared to steel containers and may cause problems at lower surroundings temperatures.

Propane Butane Mix Vapor Diagram - psig

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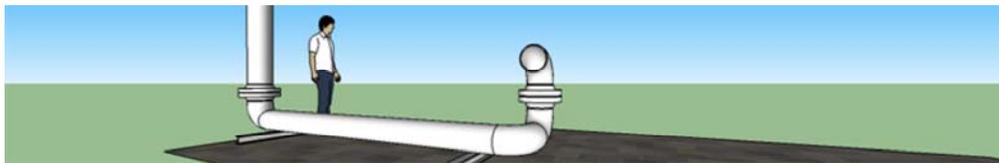
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0.0

°C

°F

Convert!

Length

1.0

m

km

in

ft

yards

miles

nautical miles

Convert!

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- liters
- in^3
- ft^3
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