

## Klea® 125 Data Sheet – SI Units

## Physical Property Data for Klea® 125

Property		Units	Value
Molecular Weight			120.02
Density (LIQ)	(25°C)	kg/l	1.190
Boiling Point	(1 atm)	°C	-48.25
Viscosity (LIQ)	(20°C)	cP	0.152
Surface Tension	(25°C)	mN/m	3.8
Vapour Pressure	(25°C)	bar	13.78
Specific Heat - liquid	(25°C)	kJ/kg.K	1.430
Specific Heat - ideal gas	(25°C)	kJ/kg.K	0.7997
Critical Temperature		°C	66.30
Critical Pressure		bar	36.43
Latent Heat Vaporisation	(25°C)	kJ/kg	112.6
Thermal Conductivity (LIQ)	(20°C)	W/m.K	0.0630
Trouton's Constant		kJ/kg.K	0.73072
Acentric Factor			0.302
Coeff. Vol. Therm. Exp (LIQ @ 20°C)			0.003989
Melting Point		°C	-103
Viscosity (VAP)	(20°C)	cP	0.0137
Thermal Cond (SAT VAPOUR)	(20°C)	W/m.K	0.0148
Critical Density		kg/l	0.5710
Density (SAT VAPOUR) at n Bpt		kg/m <sup>3</sup>	6.763

## Equation of State (Martin-Hou)

$$P_r = \frac{X T_r}{V_r - B} + \sum_{i=1, 4} \frac{(A_i + B_i T_r + C_i \exp(-K T_r))}{(V_r - B)^{(i+1)}}$$

Where :

$$\begin{aligned} T_r &= T/T_c, P_r = P/P_c, V_r = V/V_c \\ X &= 3.685762 \\ B &= 0.009513153 \\ K &= 5.475 \\ T_c, P_c, V_c &= 339.45(K), 36.43(Bar), 1.751312(L/kg) \end{aligned}$$

$$\begin{aligned} A_1, B_1, C_1 &= -7.748641802, 4.4996033087, -114.26505136 \\ A_2, B_2, C_2 &= 1.8088636988, -2.5593329642, -129.74457028 \\ A_3, B_3, C_3 &= 15.961648382, 0, 0 \\ A_4, B_4, C_4 &= 0, -9.9629079414, 0 \end{aligned}$$

### Extended Antoine Equation

$$\ln P = A + \frac{B}{C + T} + DT + E \ln(T)$$

A = 125.350822                      P = Vapour pressure bar  
 B = -5279.0166                     T = Temperature K  
 C = 0  
 D = 0.034879  
 E = -20.257816

### Latent Heat of Vaporisation

$$Dh_{\text{vap}} = A + Bx + Cx^2 + Dx^3 + Ex^4$$

Where  $x = (1 - (T/T_c))^{(1/3)}$

A = 0                                      T = Temperature K  
 B = 141.38271                        T<sub>c</sub> = Critical Temperature K  
 C = 265.38518  
 D = -185.8791                        dh<sub>vap</sub> = kJ/kg  
 E = 0

### Ideal Gas Heat Capacity

$$C_p(\text{ideal}) = A + BT + CT^2 + DT^3 + E/T^2$$

A = 0.1300002                        T = Temperature K  
 B = 2.903442E-3  
 C = -2.464006E-6                    C<sub>p</sub> (ideal) kJ/kg.K  
 D = 7.535681E-10  
 E = 275.9235

### Saturated Liquid Enthalpy

$$h_{\text{liq}} = A + Bx + Cx^2 + Dx^3 + Ex^4$$

where  $x = (1 - (T/T_c))^{(1/3)}$

A = 111.247356                        T = Temperature K  
 B = 735.97007                        T<sub>c</sub> = Critical Temperature K  
 C = -2204.192                        H<sub>liq</sub> kJ/kg  
 D = 2089.10320  
 E = -920.266

### Liquid Density

$$D_{liq} = A + Bx + Cx^2 + Dx^3 + Ex^4$$

Where  $x = (1 - (T/T_c))^{(1/3)}$

A = 0.571	T = Temperature K
B = 1.242204	T <sub>c</sub> = Critical Temperature K
C = -1.022325	D <sub>liq</sub> kg/l
D = 3.172936	
E = -2.182125	

### Liquid Viscosity

$$\ln(\mu)_{liq} = A + B/T + CT^2 + D/T^3$$

A = -7.960888	T = Temperature K
B = 2540.2298	$\mu_{liq}$ cP
C = -222149.2	
D = 0	

### Liquid Thermal Conductivity

$$K_{liq} = A + Bx + Cx^2 + Dx^3$$

A = 0.07332	T = Temperature K
B = -0.152878	T <sub>c</sub> = Critical Temperature K
C = 0.258195	K <sub>liq</sub> W/m.K
D = 0	

### Saturated Vapour Density

$$D_{vap} = A + Bx + Cx^2 + Dx^3 + Ex^4$$

Where  $x = (1 - (T/T_c))^{(1/3)}$

-50° TO 0°C	T = Temperature K
A = 0	T <sub>c</sub> = Critical Temperature K
B = 2811.8939	D <sub>vap</sub> kg/m <sup>3</sup>
C = -10220	
D = 12351.154	
E = -4959.483	

0° TO T <sub>c</sub>
A = 292.02525
B = 1210.5433
C = -7054.443
D = 9725.3037
E = -4216.572

**Vapour Viscosity (Saturated Vapour)**

$$\mu_{\text{vap}} = A + BT + CT^2 + DT^3$$

A = -0.019416  
B = 3.3454E-4  
C = -1.38032E-6  
D = 2.129395E-9

T = Temperature K  
 $\mu_{\text{vap}}$  cP

**Vapour Thermal Conductivity (Saturated Vapour)**

$$K_{\text{gas}} = A + BT + CT^2 + DT^3$$

A = -0.0654  
B = 8.63E-4  
C = -3.5575E-6  
D = 5.2763E-9

T = Temperature K  
K<sub>gas</sub> W/m.K

TEMP °C	LIQUID ENTH kJ/kg	LATENT HEAT kJ/kg	SAT.VAP ENTH kJ/kg	LIQUID Cp kJ/kgK	ID.GAS Cp kJ/kgK
-50	42.1214	165.18700	207.3084	0.085498	0.669121
-40	53.0845	160.18230	213.2668	0.107856	0.687624
-30	64.2947	154.74700	219.0417	0.135066	0.705795
-20	75.8053	148.81290	224.6181	0.168125	0.723632
-10	87.6808	142.29120	229.9721	0.208290	0.741130
0	100.0000	135.06320	235.0632	0.257139	0.758289
10	112.8589	126.96250	239.8214	0.316572	0.775109
20	126.3734	117.74450	244.1179	0.388565	0.791590
25	133.4175	112.60380	246.0213	0.429633	0.799704
30	140.6749	107.02060	247.9655	0.473778	0.807733
40	155.8710	94.10284	249.9739	0.564477	0.823540
50	171.8066	77.52339	249.3300	0.599041	0.839013
-50	42.1214	165.18700	207.3084	0.085498	0.669121
-40	53.0845	160.18230	213.2668	0.107856	0.687624
-30	64.2947	154.74700	219.0417	0.135066	0.705795

TEMP °C	VAPOUR PRESS bara	LIQUID DENSITY kg/l	LIQUID VISCOSITY cP	LIQ.THERM COND W/m.K	SAT VAP DENSITY kg/m <sup>3</sup>
-50	0.928812	0.503602	0.353960	0.092766	6.237766
-40	1.494127	0.472687	0.315897	0.088570	9.729920
-30	2.295098	0.439210	0.280497	0.084343	14.592670
-20	3.389672	0.402879	0.248358	0.080091	21.178340
-10	4.841111	0.363316	0.219643	0.075818	29.930480
0	6.718140	0.320020	0.194259	0.071537	41.418440
10	9.095364	0.272295	0.171975	0.067266	56.363180
20	12.054510	0.219112	0.152495	0.063040	79.367740
25	13.780040	0.190001	0.143709	0.060963	88.788650
30	15.685560	0.158836	0.135507	0.058926	103.250100
40	20.088730	0.088525	0.120706	0.055071	140.237700
50	25.376650	0.001720	0.107810	0.051864	193.453200

TEMP °C	C SAT. VAP VISCOSITY cP	SAT.VAP THERM COND W/m.K
-50	0.010164	0.008659
-40	0.010537	0.009297
-30	0.010931	0.009962
-20	0.011360	0.010684
-10	0.011837	0.011497
0	0.012374	0.012431
10	0.012983	0.013518
20	0.013679	0.014791
25	0.014062	0.015506
30	0.014472	0.016279
40	0.015377	0.018016
50	0.016406	0.020033

The correlations in this document should not be used outside the applicable ranges quoted.  
Please contact Mexichem for further advice.

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