

SOLKANE® - INFORMATION SERVICE

Solkane® 407C Thermodynamics

SOLVAY FLUOR

Technical Service - Refrigerants -

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Units and Symbols

Symbol	Unit	Meaning/Definition
<i>A, B</i>	[-]	Parameters of the Wagner equation
<i>C</i>	[-]	Parameter of the equation for density of boiling liquid
<i>D</i>	[kJ/(kg K)]	Parameter of the equation for specific heat capacity in an ideal gas state
<i>E, F, G</i>	[-]	Parameter of the Martin-Hou equation
<i>H₀</i>	[kJ/kg]	Constant for the specific enthalpy equation
<i>I</i>	[-]	Parameter of the equation for dynamic viscosity of vapour
<i>J</i>	[-]	Parameter for the boiling liquid enthalpy equation
<i>K</i>	[kJ/(kg)]	Parameter for the boiling liquid entropy equation
<i>L</i>	[Pa s /K]	Parameter of the equation for dynamic viscosity of liquid
<i>M</i>	[W/(m K)]	parameter of the equation for thermal conductivity of the saturated liquid
<i>N</i>	[W/(m K)]	Parameter of the equation for thermal conductivity of the saturated vapour
<i>O</i>	[N/(m K)]	Parameter of the equation for surface tension
<i>P</i>	[kJ/(kg K)]	parameter of the equation for specific heat capacity of the saturated liquid
<i>R</i>	[bar m ³ /(kg K)]	Gas constant
<i>S₀</i>	[kJ/(kg K)]	Constant for the specific entropy equation
<i>b</i>	[m ³ /kg]	Parameter of the Martin-Hou equation
<i>c</i>	[kJ/(kg K)]	Specific heat capacity
<i>e</i>	[kJ/kg]	Specific exergy
<i>h</i>	[kJ/kg]	Specific enthalpy
<i>k</i>	[-]	Parameter of the Martin-Hou equation
<i>p</i>	[bar]	Pressure
<i>r</i>	[kJ/kg]	Enthalpy of vaporization
<i>s</i>	[kJ/(kg K)]	Specific entropy
<i>t</i>	[°C]	Temperature
<i>T</i>	[K]	Temperature
<i>v</i>	[m ³ /kg]	Specific volume
<i>η</i>	[Pa s]	Dynamic viscosity
<i>λ</i>	[W/(m K)]	Thermal conductivity
<i>ρ</i>	[kg/m ³]	Density
<i>σ</i>	[N/m]	Surface tension

Indices

'	liquid
''	vapour
<i>c</i>	critical value
<i>R</i>	reduced value
<i>i</i>	run index
<i>u</i>	ambient conditions
<i>p</i>	isobar
<i>v</i>	isochor
<i>0</i>	ideal gas

1 Introduction

The refrigerant Solkane®407C has been developed for the replacement of R22, in particular for air conditioning applications. As a matter of fact, even if the ozone depletion potential of the hydrochlorofluorocarbon (HCFC) R22 is drastically reduced to a fraction of the ODPs of chlorofluorocarbons (0.055 with the reference 1.0 for R11), its use will be gradually reduced and these products will finally be banned¹. Indeed, by 2030 (2025 for the European Community, with a freeze of production level of 1997 in 2000) the production of HCFCs will be phased out in developed countries¹. The uses, including refrigerants, is also regulated in EC; all types of new applications will be prohibited with HCFCs from 2004 and refilling of existing systems with virgin product forbidden from 2010.

Solkane®407C is a non-azeotropic (zeotrope) blend with a severe temperature glide of 7 K. It consists of 23 % R32 (CH₂F₂), 25 % R125 (CF₃CHF₂) and 52 % R134a (CF₃CH₂F) by weight. Due to its consistent temperature glide it cannot be considered and handled like a pure fluid. In particular, transfers must always be realized in liquid phase in order to avoid component fractionation. A specific document about handling R407C will be soon available². The hydrofluorocarbons (HFC) R32, R125, and R134a contain only carbon, fluorine and hydrogen. They do not contribute to the depletion of the stratospheric ozone layer. The global warming potential is significantly reduced compared to the CFCs.

Solkane®407C can be used in new equipment and also in some retrofitted R22 ones if absolutely necessary due to regulations.

Solkane®407C is non-flammable. Its toxicity is low and comparable to that of R22. The environmental behaviour and the safety data's of Solkane®407C are also described in the material safety data sheet³.

¹ In the sense of Montreal Protocol (1995 Vienna meeting)

² Order by Fax : +49 (0) 511 857 2146

³ Order by Fax : +49 (0) 511 857 2146

2 Thermophysical Values

2.1 Physical Data

Chemical name	[-]	Difluoromethane/ Pentafluoroethane/ 1,1,1,2-Tetrafluoroethane
Chemical formula	[-]	CH ₂ F ₂ /CHF ₂ -CF ₃ /CF ₃ CH ₂ F
CAS No.	[-]	158675-78-6
Molecular weight	[kg/kmol]	86.2
Boiling point ¹	[°C]	-43.8
Dew point ¹	[°C]	-36.7
Temperature glide	[K]	7.1
Freezing point ¹	[°C]	-101.0
Critical temperature	[°C]	86.4
Critical pressure	[bar]	46.3
Saturated liquid density ²	[kg/m ³]	1138.0
Saturated vapour density ²	[kg/m ³]	43.8
Vapour pressure ²	[bar]	10.19
Enthalpy of vaporization ²	[kJ/kg]	182.59
Liquid thermal conductivity ²	[W/mK]	84.66x10 ⁻³
Surface tension of liquid ²	[N/m]	6.512x10 ⁻³
Specific heat capacity of liquid ²	[kJ/(kgK)]	1.533
Specific heat capacity of vapour ¹	[kJ/(kgK)]	1.107
Liquid viscosity ²	[Pa s]	0.1516x10 ⁻³
Saturated vapour viscosity ²	[Pa s]	12.2282x10 ⁻⁶
Flammability limit in air ¹	[Vol.-%]	none ³

¹ at 1.013 bar

² at 25°C

³ according to DIN 51649 and UL 2128

2.2 Basis of Thermodynamic Calculation

The thermodynamic calculation equations have been adapted to ISO/DIS 17584, as at 12/2003. They fulfil this standard with the exception of the thermal capacities in a saturated state of $0.59 < T_R < 0.97$ and in an overheated state of $0.05\text{MPa} < p < 2.5\text{MPa}$ and $T_{\text{max}} = 500\text{K}$.

The Wagner equation

$$\ln p_R = (A_1(1-T_R) + A_2(1-T_R)^{B_1} + A_3(1-T_R)^{B_2} + A_4(1-T_R)^{B_3} + A_5(1-T_R)^{B_4} + A_6)/T_R \quad (1)$$

$$\text{where } T_R = \frac{T}{T_c} \text{ and } p_R = \frac{p}{p_c}$$

was chosen to describe the bubble and dew pressures. The constants and values for the critical pressure p_c and the critical pressure T_c are as follows:

	Bubble Pressure	Dew Pressure
A_1 [-]	-6.67037434	-8.98621316
A_2 [-]	-1.10792561	9.439788553
A_3 [-]	3.951222403	-21.8140917
A_4 [-]	-2.54270994	29.30787201
A_5 [-]	-2.42738451	-19.2595293
A_6 [-]	0.009471962	-0.01552538
B_1 [-]	1.5	1.5
B_2 [-]	2	2
B_3 [-]	2.5	2.5
B_4 [-]	3	3
T_c [K]	359.20	
p_c [bar]	46.34	

The density of the boiling liquid is described by the equation

$$\rho'_R = 1 + C_1(1-T_R)^{1/3} + C_2(1-T_R)^{2/3} + C_3(1-T_R) + C_4(1-T_R)^{4/3} \quad (2)$$

$$\text{where } \rho'_R = \frac{\rho'}{\rho_c}$$

The constants and the value for the critical density are:

C_1 [-]	1.453545534	C_4 [-]	1.430748774
C_2 [-]	2.148643936	ρ_c [kg/m ³]	510
C_3 [-]	-2.1691382		

The specific heat capacity under ideal gas conditions is represented by the equation

$$c_p^0 = D_1 + D_2T + D_3T^2 + D_4T^3 + D_5/T \quad (3)$$

The coefficients are:

D_1	[kJ/(kg K)]	5.16830E-01	D_4	[kJ/(kg K ³)]	-3.16270E-09
D_2	[kJ/(kg K ²)]	5.86760E-04	D_5	[kJ/kg]	-1.47650E+01
D_3	[kJ/kg]	2.94150E-06			

The equation of state according to Martin-Hou is

$$p = \frac{RT}{z} + \frac{E_1 + F_1T + G_1e^{-kT_R}}{z^2} + \frac{E_2 + F_2T + G_2e^{-kT_R}}{z^3} + \frac{E_3}{z^4} + \frac{E_4 + F_4T + G_4e^{-kT_R}}{z^5} \quad (4)$$

and is a good representation of the pvT relationship for Solkane®407C. The coefficients of the equation are:

E_1	[-]	-1.53162E-03	F_2	[-]	-1.15939E-09
E_2	[-]	1.61365E-06	F_4	[-]	2.05714E-15
E_3	[-]	-1.10524E-09	G_1	[-]	-3.58498E-02
E_4	[-]	-2.89196E-13	G_2	[-]	6.96084E-05
F_1	[-]	1.83562E-06	G_4	[-]	-2.25522E-11
B	[m ³ /kg]	1.46934E-04	K	[-]	5.475
R	[bar m ³ /(kgK)]	9.64505E-04			

with $z = v - b$. The equation for specific heat capacity under ideal gas conditions (3) and the thermal equation of state (4) form the basis of the specific enthalpy and entropy calculation.

$$h = H_0 + (pv - RT) + D_1T + D_2 \frac{T^2}{2} + D_3 \frac{T^3}{3} + D_4 \ln T + \frac{E_1}{z} + \frac{E_2}{2z^2} + \frac{E_3}{3z^3} + \frac{E_4}{4z^4} + e^{-kT_R} \cdot (1 + k \cdot T_R) \cdot \left(\frac{G_1}{z} + \frac{G_2}{2z^2} + \frac{G_4}{4z^4} \right) \quad (5)$$

and

$$s = S_0 + R \ln \left(\frac{zp_l}{RT} \right) + D_1 \cdot \ln T + D_2T + D_3 \frac{T^2}{2} - \frac{D_4}{T} - \left(\frac{F_1}{z} + \frac{F_2}{2z^2} + \frac{F_4}{4z^4} \right) + \frac{k}{T_c} e^{-kT_R} \left(\frac{G_1}{z} + \frac{G_2}{2z^2} + \frac{G_4}{4z^4} \right) \quad (6)$$

taking $p_1 = 1.013$ bar where :

$$\begin{array}{ll} H_0 & [\text{kJ/kg}] \quad 324.447 \\ S_0 & [\text{kJ}/(\text{kgK})] \quad -1.250 \end{array}$$

For the boiling liquid, enthalpy and entropy are calculated with the following equations :

$$\begin{aligned} h' = & J_1 + J_2(1 - T_R) + J_3(1 - T_R)^2 + J_4(1 - T_R)^3 \\ & + J_5(1 - T_R)^4 + J_6(1 - T_R)^5 \end{aligned} \quad (7)$$

$$s' = 1 + K_1 t + K_2 t^2 + K_3 t^3 + K_4 t^4 \quad (8)$$

The temperature t for the calculation of the entropy is in °C and the parameters for both integrated formulas are :

J_1	[-]	354.5759899	J_6	[-]	-16830.2093
J_2	[-]	-1012.66478	K_1	[kJ/(kgK ²)]	0.0051002991
J_3	[-]	3349.74003	K_2	[kJ/(kgK ³)]	3.8473716e-06
J_4	[-]	-12046.2997	K_3	[kJ/(kgK ⁴)]	4.9930206e-08
J_5	[-]	22699.89877	K_4	[kJ/(kgK ⁵)]	-2.2299175e-10

If neither the kinetic nor the potential energies are taken into account, the specific exergy may be found by the following equation:

$$e = h - h_u - T_u(s - s_u) \quad (9)$$

where the subscript u indicates ambient conditions.

The saturation pressure of the substance at $T_u = 290$ K serves as the reference pressure.

The integration constants h_u and s_u are found by letting

$$\begin{aligned} h'_{(t=0^\circ\text{C})} &= 200.0 \text{ kJ/kg} \\ s'_{(t=0^\circ\text{C})} &= 1.000 \text{ kJ}/(\text{kgK}) \end{aligned}$$

to be

$$\begin{aligned} h_u &= 224.22 \text{ kJ/kg} \\ s_u &= 1.0851 \text{ kJ}/(\text{kg K}) \end{aligned}$$

so the exergy is $e = 0$, according to existing agreements.

2.3 Transport Properties

2.3.1 Dynamic Viscosity of Saturated Liquid

The viscosity of the saturated liquid of Solkane®407C was measured within the temperature range of -50 to 60 °C. The following regression equation is valid for the liquid phase:

$$\ln\left(\frac{\eta'}{10^{-3}}\right) = L_0 + L_1 t + L_2 t^2 + L_3 t^3 \quad (10)$$

with t in °C and η' in 10^{-3} Pa s. The coefficients are:

$$\begin{array}{ll} L_0 = -1.5764 & [\text{Pa s}] \\ L_1 = -0.012445 & [\text{Pa s/K}] \\ L_2 = 4.5029\text{e-}6 & [\text{Pa s/K}^2] \\ L_3 = -1.1792\text{e-}7 & [\text{Pa s/K}^3] \end{array}$$

Saturated liquid viscosity η' in 10^{-3} Pa s

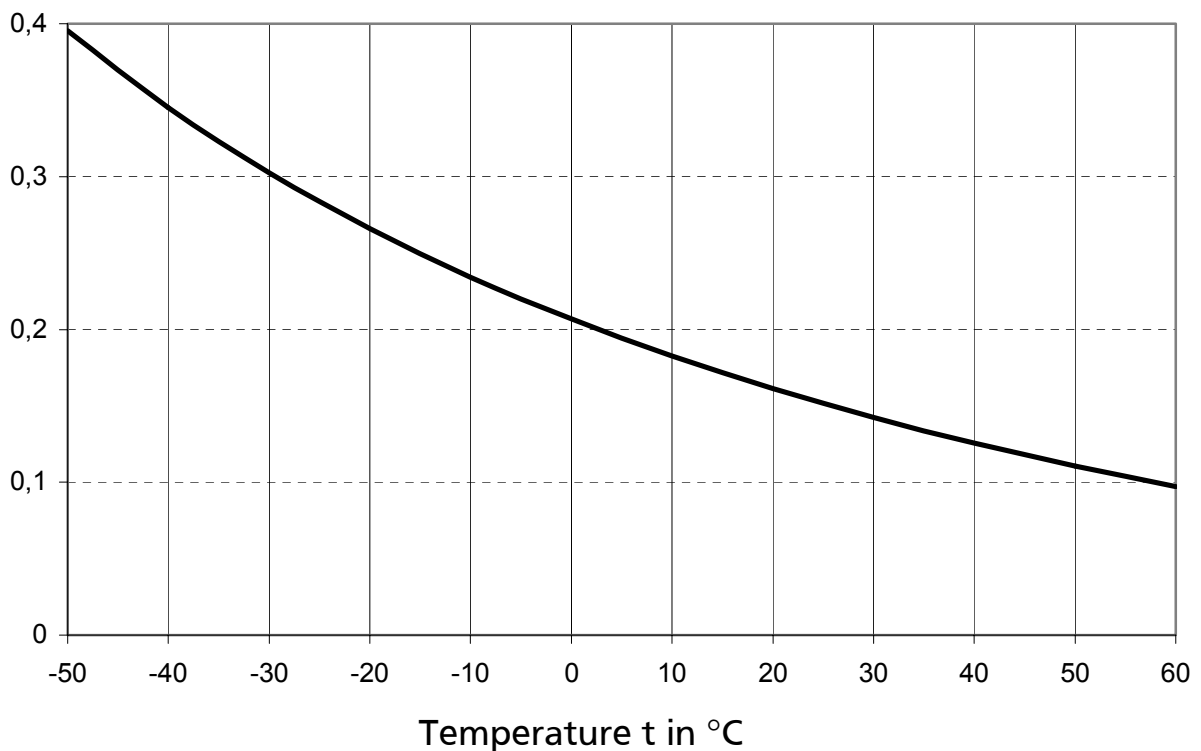


Figure 1: Dynamic saturated liquid viscosity

2.3.2 Dynamic Viscosity of Saturated and Superheated Vapour

The viscosity of the saturated and superheated vapour of Solkane®407C was measured in a temperature range of -50 to 50°C. The data can be represented by the following equations

$$\eta = \eta_0 + \Delta\eta \quad (11)$$

with

$$\eta_0 = 2.6696 \times 10^{-2} \times \frac{(MT)^{\frac{1}{2}}}{\sigma^2 \Omega_\eta T^*}, \quad T^* = \frac{kT}{\varepsilon} \text{ and}$$

$$\Omega(T^*) = \exp[0.45667 - 0.53955(\ln T^*) + 0.187265(\ln T^*)^2 - 0.03629(\ln T^*)^3 + 0.00241(\ln T^*)^4] \quad (12 \text{ a-c})$$

$$\Delta\eta = T_R^{2.2} [\ln(1.65 + \rho_{R0}^{0.8})]^{+1.6} \left[e^{\left(1 - \frac{0.78}{T_c}\right) \rho_{r0}} - 1 \right] (F \cdot z_c \cdot \zeta)^{-1}$$

$$z_c = \frac{p_c v_c}{RT_c} \quad \text{and} \quad \rho_{R0} = \frac{\rho - \rho_0}{\rho_c} \quad \text{and} \quad F = 1 \text{ for R407C as a light polar agent.} \quad (12 \text{ d-f})$$

In equation (12 d-f) the constants are as follows .

R the gas constant	= 8314	[J kg ⁻¹ K ⁻¹]
ρ_c the critical density	= 510.00	[kg/m ³]
ρ_0 the density at 1.013bar and temperature as defined by T		[kg/m ³]
T_c the critical temperature	= 359.55	[K]

The constants of equation (12 a-f) where determined to be

$$\begin{aligned} \zeta &= 39175.02 \text{ [1/(Pa s)]} \\ \sigma &= 0.4538 \text{ [nm]} \\ \varepsilon/k &= 339.72 \text{ [K]} \end{aligned}$$

Saturated vapor viscosity η'' in 10^{-6} Pa s

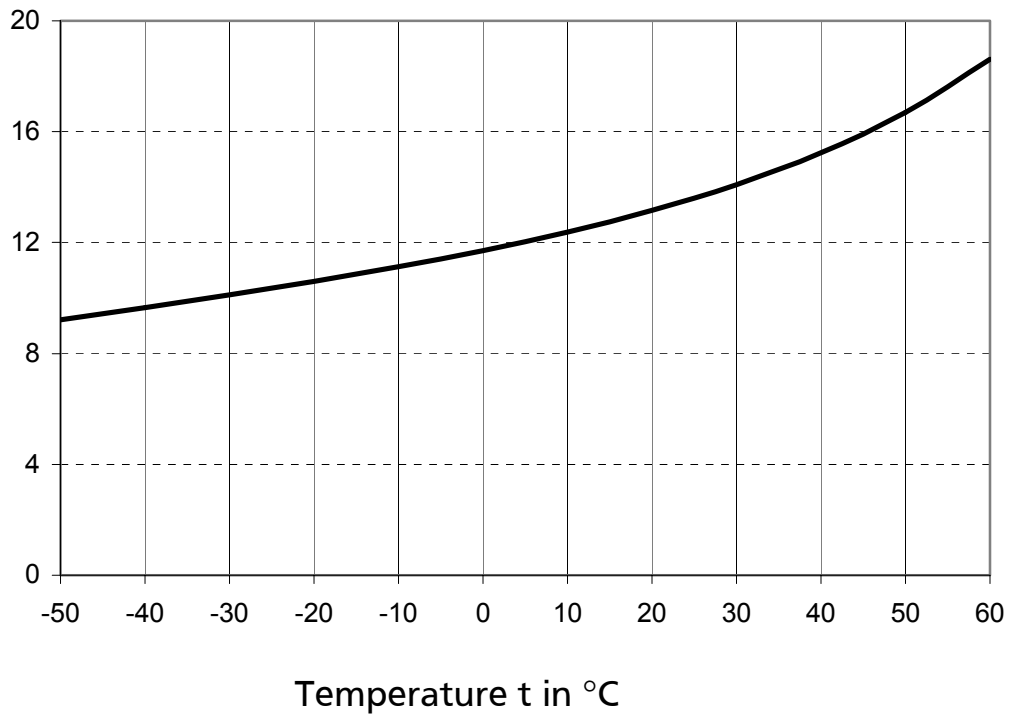


Figure 2: Dynamic viscosity of saturated vapour

2.3.3 Thermal Conductivity of Saturated Liquid

The thermal conductivity of saturated liquid can be expressed with the regression equation

$$\lambda' = M_0 + M_1 t \quad (13)$$

where t is in °C and λ' in $10^{-3}\text{W}/(\text{mK})$. The coefficients of the equation are:

$$M_0 = 96.197 \quad [10^{-3}\text{W}/(\text{mK})] \quad M_1 = -0.4615 \quad [10^{-3}\text{W}/(\text{mK}^2)]$$

Thermal conductivity of saturated liquid λ' in $10^{-3}\text{W}/(\text{mK})$

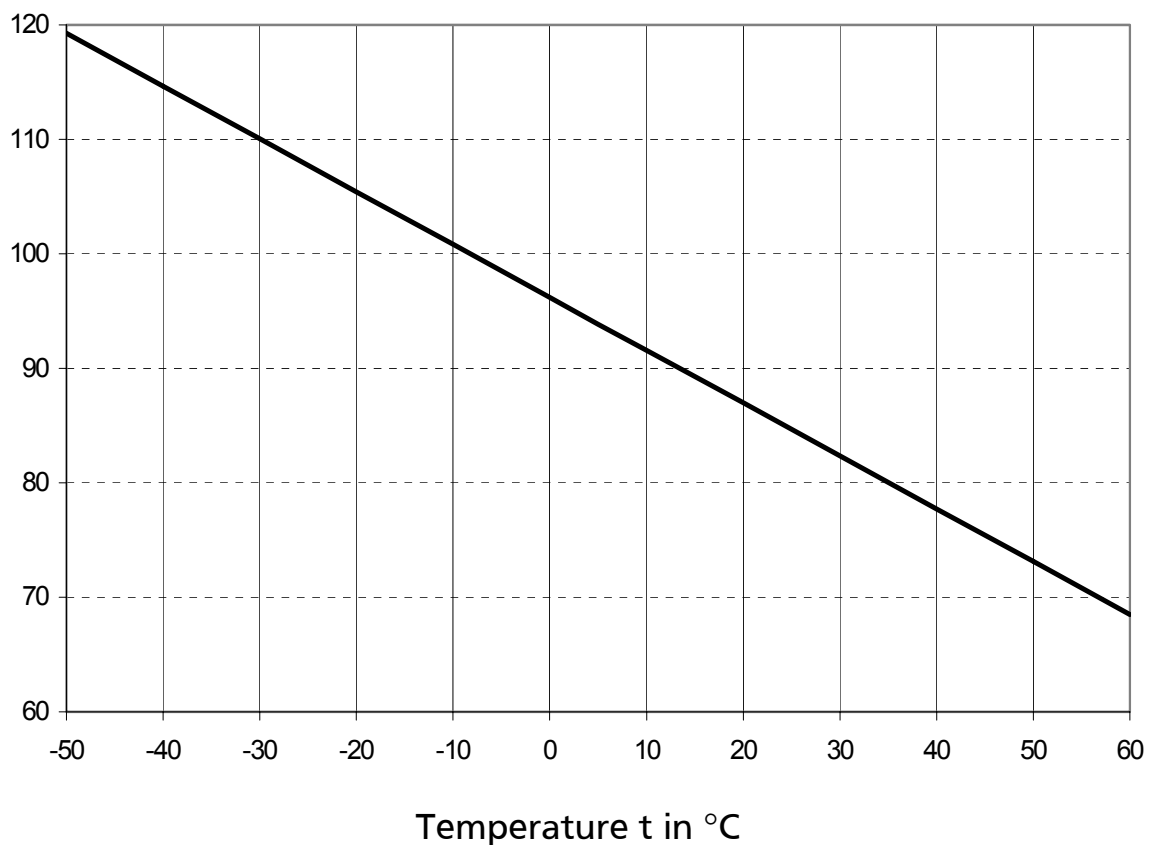


Figure 3: Thermal conductivity of saturated liquid

2.3.4 Thermal Conductivity of Saturated Vapour

The thermal conductivity of saturated vapour can be expressed using the regression equation

$$\lambda'' = N_0 + N_1 t + N_2 t^2 + N_3 t^3 + N_4 t^4 \quad (14)$$

where t is in °C and λ'' in 10^{-3} W/(m K). The coefficients of the equation are as follows:

$N_0 =$	12.515	$[10^{-3}\text{W}/(\text{mK})]$	$N_3 =$	1.9885e-6	$[10^{-3}\text{W}/(\text{m K}^4)]$
$N_1 =$	0.09413	$[10^{-3}\text{W}/(\text{mK}^2)]$	$N_4 =$	-1.5319e-8	$[10^{-3}\text{W}/(\text{m K}^5)]$
$N_2 =$	8.2873e-4	$[10^{-3}\text{W}/(\text{mK}^3)]$			

Thermal conductivity of saturated vapour λ'' in 10^{-3} W/(mK)

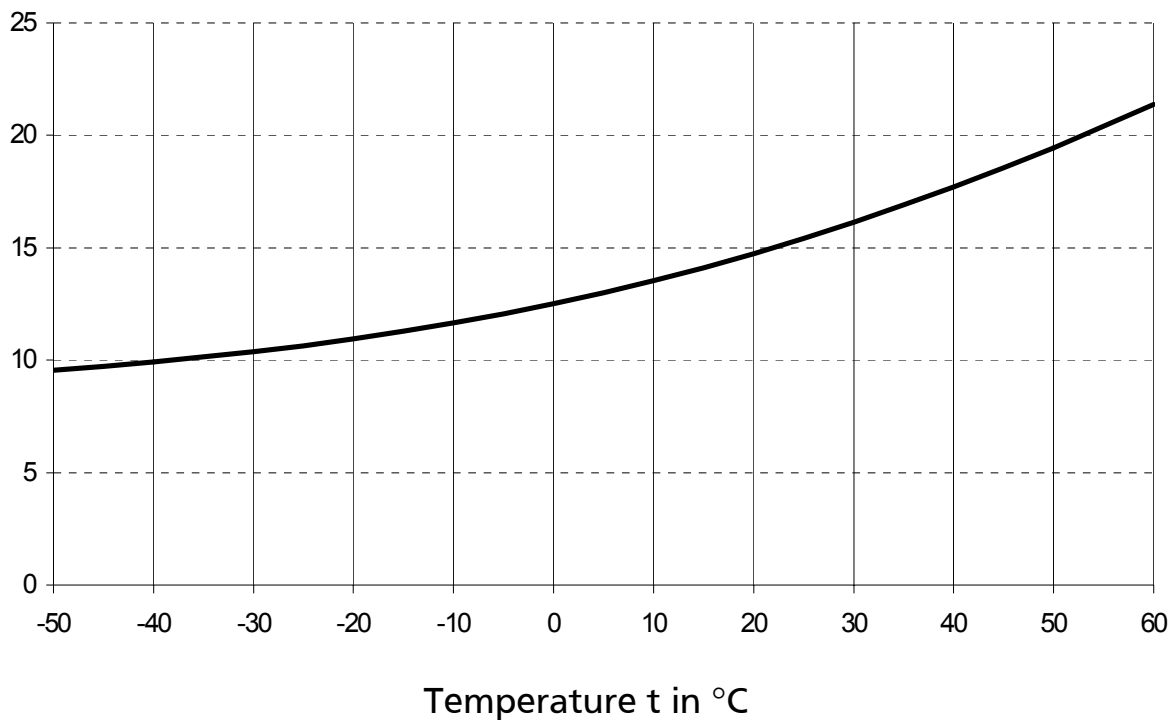


Figure 4: Thermal conductivity of saturated vapour

2.3.5 Surface Tension

The surface tension of the liquid can be expressed using the regression equation

$$\sigma = O_0 + O_1 t + O_2 t^2 + O_3 t^3 \quad (15)$$

where t is in °C and σ in 10^{-3} N/m. The coefficients of the equation are:

$$\begin{array}{llll} O_0 = 9.9969 & [10^{-3}\text{N/m}] & O_2 = 1.6445\text{e-}4 & [10^{-3}\text{N}/(\text{mK}^2)] \\ O_1 = -0.1444 & [10^{-3}\text{N}/(\text{mK})] & O_3 = 1.4304\text{e-}6 & [10^{-3}\text{N}/(\text{mK}^3)] \end{array}$$

Surface tension σ in 10^{-3} N/m

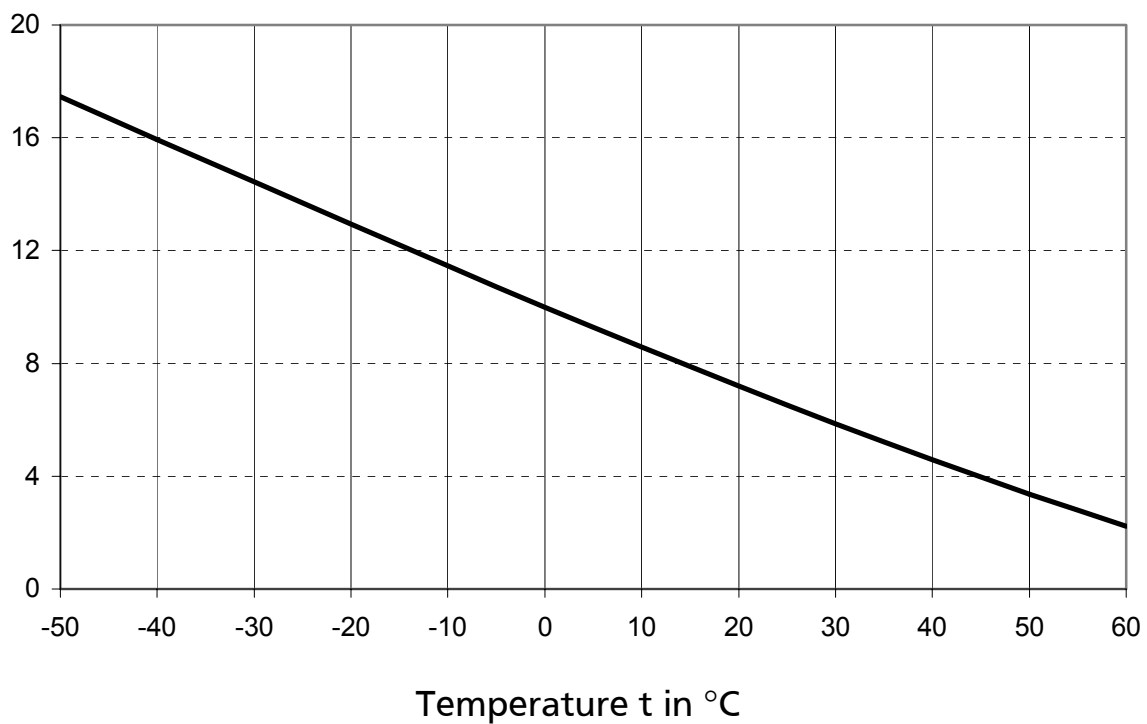


Figure 5: Surface tension

2.3.6 Specific Heat Capacity of Saturated Liquid

The specific heat capacity of saturated liquid can be expressed using the equation

$$c'_p = P_0 + P_1(1-T_R)^{1/9} + P_2(1-T_R)^{2/9} + P_3(1-T_R)^{3/9} + P_4(1-T_R)^{6/9} \quad (16)$$

where $T_R = \frac{T}{T_c}$, c'_p is in kJ/(kg K) and T is in K. The coefficients of the equation are as follows:

$$\begin{aligned} P_0 &= 309.36797 \quad [\text{kJ}/(\text{kg K})] & P_3 &= -977.084713 \quad [\text{kJ}/(\text{kg K})] \\ P_1 &= -1284.36142 \quad [\text{kJ}/(\text{kg K})] & P_4 &= 80.36186841 \quad [\text{kJ}/(\text{kg K})] \\ P_2 &= 1873.363029 \quad [\text{kJ}/(\text{kg K})] \end{aligned}$$

Specific heat capacity of saturated liquid c_p' in kJ/(kgK)

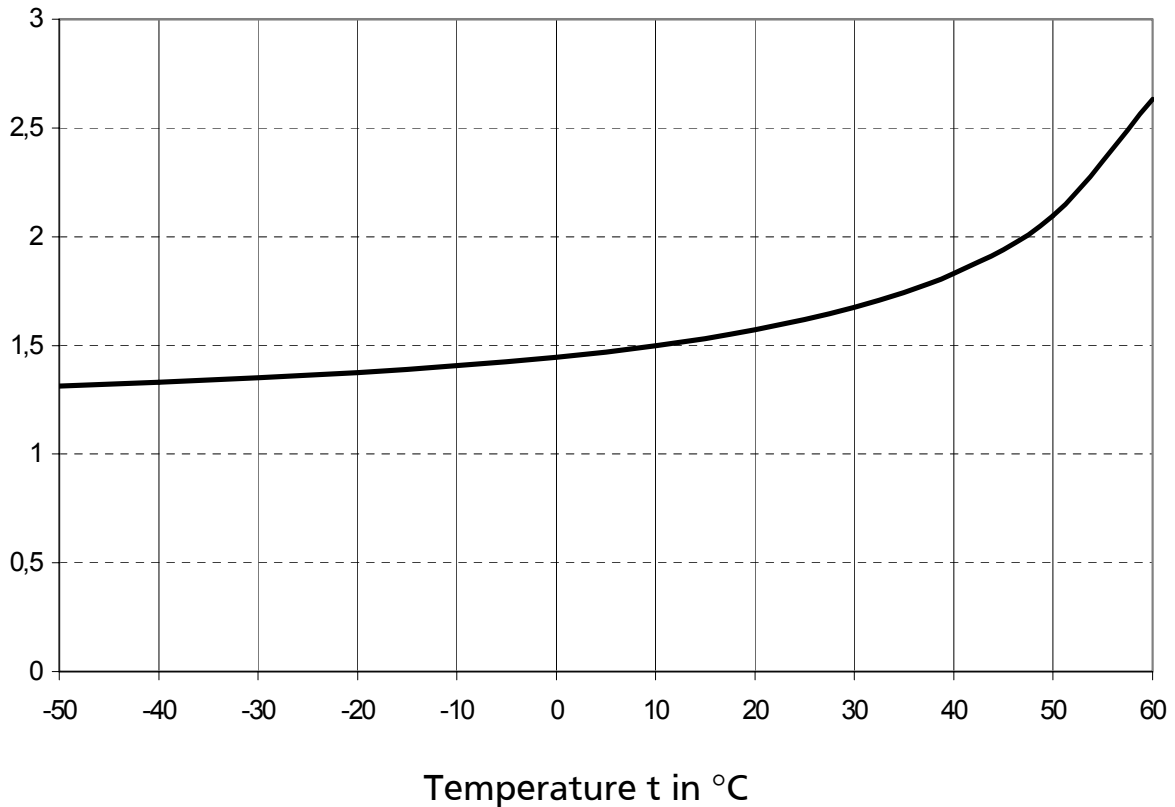


Figure 6: Specific heat capacity of saturated liquid

3 Compatibility of Materials

3.1 Elastomeres

The compatibility of the elastomeres that are normally used in refrigeration systems with Solkane®407C is generally good. Cold extraction tests that were carried out on CR (chlorbutadiene rubber or Neoprene®), NBR (acrylonitrilebutadienerubber) and HNBR (hydrated acrylnitrilbutadiene rubber) showed only slight swelling and yielded negligible amounts of extract. Fluorinated rubbers (FKM and FPM) are not recommended because of their considerable swelling and blistering when used with Solkane®407C or with other HFC refrigerants. Ethylenepropylenediene rubber is only to be recommended where the presence of mineral oil in the refrigeration cycle can be excluded.

The effect of the lubricant that is used must not be ignored. Recommendations made by the lubricant and compressor manufacturers must be followed.

3.2 Thermoplastics

Experience with CFC and HCFC has shown that only a limited number of plastics are resistant to fluorinated refrigerants. Polytetrafluoroethylene, polyacetale and polyamide might be taken into account for the use with Solkane®407C. It is again vital to take the effect of the lubricant into account.

3.3 Metals

Solkane®407C is generally used in conjunction with lubricants (Ester oils, PAG-oils) in refrigeration technology. In combination both materials are compatible with the metals and alloys usually found in machines and apparatus. Only zinc, magnesium, lead and aluminium alloys with more than 2% magnesium by mass should be avoided. The water content of refrigeration oil depending on oil type should especially be taken into account. Values of not more than 50 ppm are to be aimed at.

4 Refrigerant Oils

Like all fluorinated hydrocarbons, Solkane®407C is immiscible with mineral oils. Ester oils (POE) are normally used as lubricants. The solubility of these oils in Solkane®407C is a function of temperature and composition. The following diagrams show the solubility properties of various lubricants with Solkane®407C. Highly viscous lubricants tend to give large miscibility gaps.

The precise miscibility gaps of the individual oils can be obtained from the lubricant manufacturers.

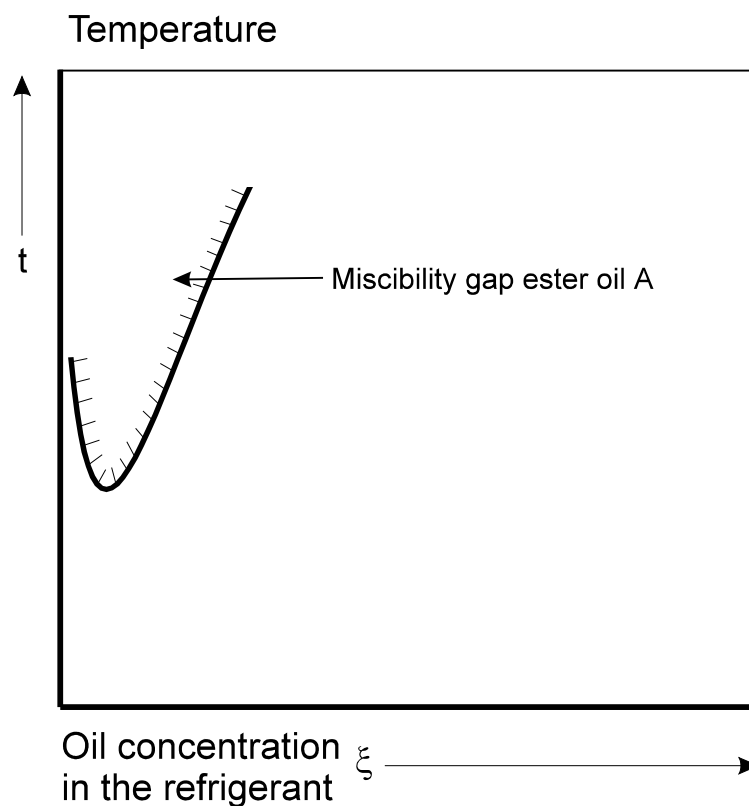


Figure 7: Miscibility behaviour of Solkane®407C and ester oil A

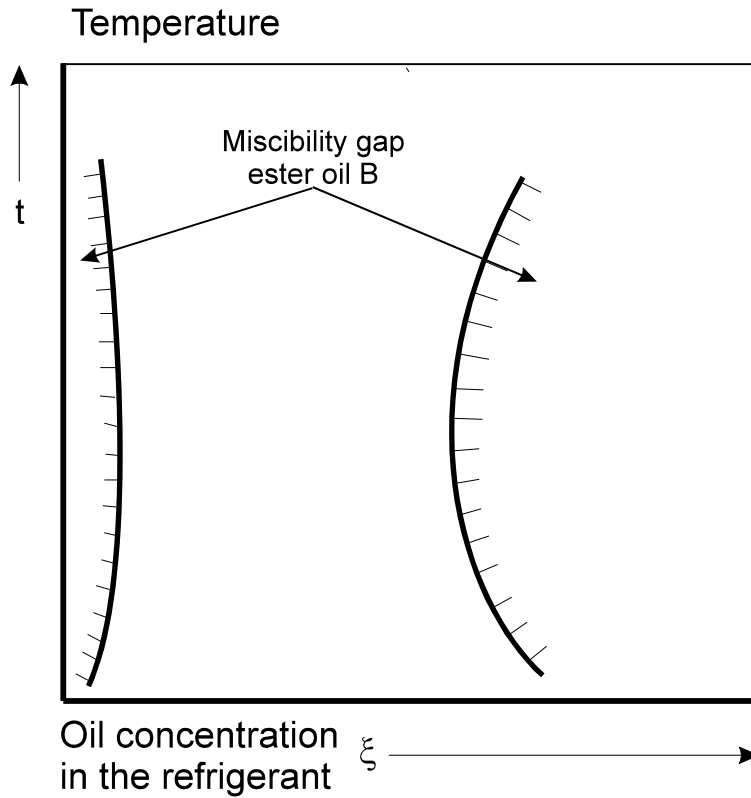


Figure 8: Miscibility behaviour of Solkane®407C and ester oil B

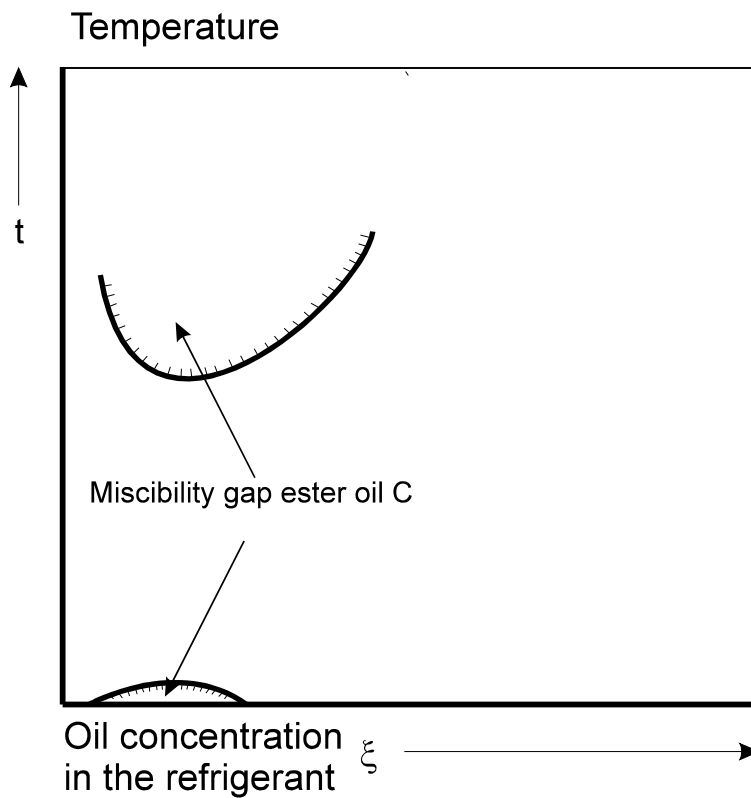


Figure 9: Miscibility behaviour of Solkane®407C and ester oil C

5 Flammability

SOLKANE®407C is non flammable according to the standard UL 2182, even if the explosion limits of R32 are 12.7 - 33.4 % by volume in air. However, R125 and R134a have no explosion limits. When blended 23/25/52 percent by weight the outcoming mixture has no explosion limits.

6 Toxicity

The toxicity of R32, R125 and R134a was extensively tested within the scope of the PAFT programme (Programme for Alternative Fluorocarbon Toxicity Testing). PAFT recommended an occupational exposure limit of 1000 ppm for all these products. The toxicity of Solkane®407C can therefore be regarded as low and comparable to the toxicity of R22.

7 Vapour Table, Wet Vapour Range Solkane® 407C

t	p'	p''	v'	v''	ρ'	ρ''	h'	h''	r	s'	s''
[°C]	[bar]	[bar]	[dm ³ /kg]	[dm ³ /kg]	[kg/dm ³]	[kg/m ³]	[kJ/kg]	[kJ/kg]	[kJ/kg]	[kJ/kg K]	[kJ/kg K]
-50	0.75	0.51	0.714	414.98	1.401	2.41	133.00	381.29	248.29	0.7305	1.8633
-49	0.79	0.53	0.715	393.79	1.398	2.54	134.28	381.89	247.61	0.7363	1.8607
-48	0.83	0.56	0.717	373.89	1.395	2.67	135.55	382.49	246.93	0.7420	1.8582
-47	0.87	0.60	0.718	355.19	1.392	2.82	136.83	383.08	246.25	0.7477	1.8557
-46	0.91	0.63	0.720	337.61	1.389	2.96	138.11	383.67	245.57	0.7534	1.8533
-45	0.96	0.66	0.722	321.06	1.386	3.11	139.39	384.27	244.88	0.7591	1.8509
-44	1.00	0.70	0.723	305.48	1.383	3.27	140.67	384.86	244.19	0.7647	1.8485
-43	1.05	0.74	0.725	290.80	1.380	3.44	141.96	385.45	243.49	0.7704	1.8462
-42	1.10	0.78	0.726	276.97	1.377	3.61	143.24	386.03	242.79	0.7760	1.8439
-41	1.16	0.82	0.728	263.92	1.374	3.79	144.53	386.62	242.09	0.7816	1.8416
-40	1.21	0.86	0.730	251.60	1.370	3.97	145.82	387.20	241.38	0.7872	1.8394
-39	1.27	0.91	0.731	239.97	1.367	4.17	147.12	387.78	240.67	0.7928	1.8373
-38	1.33	0.95	0.733	228.99	1.364	4.37	148.41	388.37	239.95	0.7984	1.8351
-37	1.39	1.00	0.735	218.60	1.361	4.57	149.71	388.94	239.23	0.8039	1.8330
-36	1.45	1.05	0.736	208.78	1.358	4.79	151.01	389.52	238.51	0.8094	1.8309
-35	1.52	1.10	0.738	199.49	1.355	5.01	152.32	390.10	237.78	0.8150	1.8289
-34	1.58	1.16	0.740	190.69	1.352	5.24	153.63	390.67	237.04	0.8205	1.8269
-33	1.66	1.21	0.742	182.36	1.349	5.48	154.94	391.24	236.30	0.8260	1.8249
-32	1.73	1.27	0.743	174.47	1.345	5.73	156.25	391.81	235.56	0.8314	1.8230
-31	1.80	1.33	0.745	166.98	1.342	5.99	157.57	392.38	234.81	0.8369	1.8211
-30	1.88	1.39	0.747	159.88	1.339	6.25	158.89	392.94	234.05	0.8424	1.8192
-29	1.96	1.46	0.749	153.14	1.336	6.53	160.22	393.51	233.29	0.8478	1.8174
-28	2.04	1.52	0.750	146.74	1.333	6.81	161.55	394.07	232.52	0.8532	1.8155
-27	2.13	1.59	0.752	140.66	1.329	7.11	162.88	394.63	231.75	0.8586	1.8138
-26	2.22	1.67	0.754	134.89	1.326	7.41	164.21	395.18	230.97	0.8640	1.8120
-25	2.31	1.74	0.756	129.40	1.323	7.73	165.55	395.74	230.18	0.8694	1.8102
-24	2.40	1.82	0.758	124.18	1.320	8.05	166.89	396.29	229.39	0.8748	1.8085
-23	2.50	1.90	0.760	119.21	1.316	8.39	168.24	396.84	228.60	0.8801	1.8069
-22	2.60	1.98	0.762	114.47	1.313	8.74	169.59	397.38	227.80	0.8855	1.8052
-21	2.70	2.06	0.764	109.97	1.310	9.09	170.94	397.93	226.99	0.8908	1.8036
-20	2.81	2.15	0.766	105.67	1.306	9.46	172.29	398.47	226.18	0.8961	1.8019
-19	2.92	2.24	0.767	101.58	1.303	9.84	173.65	399.01	225.36	0.9014	1.8004
-18	3.03	2.34	0.769	97.68	1.300	10.24	175.01	399.54	224.53	0.9067	1.7988
-17	3.14	2.43	0.771	93.96	1.296	10.64	176.38	400.08	223.70	0.9120	1.7972
-16	3.26	2.53	0.773	90.40	1.293	11.06	177.75	400.61	222.86	0.9172	1.7957
-15	3.39	2.64	0.775	87.01	1.289	11.49	179.12	401.14	222.02	0.9225	1.7942
-14	3.51	2.74	0.778	83.77	1.286	11.94	180.50	401.66	221.17	0.9277	1.7927
-13	3.64	2.85	0.780	80.68	1.283	12.40	181.88	402.18	220.31	0.9329	1.7913
-12	3.77	2.97	0.782	77.72	1.279	12.87	183.26	402.70	219.45	0.9382	1.7898
-11	3.91	3.08	0.784	74.89	1.276	13.35	184.64	403.22	218.58	0.9434	1.7884

Vapour Table, Wet Vapour Range Solkane®407C

t	p'	p''	v'	v''	ρ'	ρ''	h'	h''	r	s'	s''
[°C]	[bar]	[bar]	[dm ³ /kg]	[dm ³ /kg]	[kg/dm ³]	[kg/m ³]	[kJ/kg]	[kJ/kg]	[kJ/kg]	[kJ/kg K]	[kJ/kg K]
-10	4.05	3.20	0.786	72.18	1.272	13.85	186.03	403.73	217.70	0.9486	1.7870
-9	4.20	3.33	0.788	69.59	1.269	14.37	187.42	404.24	216.82	0.9538	1.7856
-8	4.34	3.45	0.790	67.12	1.265	14.90	188.82	404.75	215.93	0.9589	1.7843
-7	4.50	3.58	0.793	64.74	1.262	15.45	190.22	405.25	215.04	0.9641	1.7829
-6	4.65	3.72	0.795	62.47	1.258	16.01	191.62	405.75	214.14	0.9692	1.7816
-5	4.81	3.86	0.797	60.29	1.255	16.59	193.02	406.25	213.23	0.9744	1.7802
-4	4.98	4.00	0.799	58.20	1.251	17.18	194.43	406.75	212.31	0.9795	1.7789
-3	5.15	4.15	0.802	56.20	1.248	17.79	195.84	407.24	211.39	0.9847	1.7777
-2	5.32	4.30	0.804	54.28	1.244	18.42	197.26	407.72	210.47	0.9898	1.7764
-1	5.50	4.45	0.806	52.44	1.240	19.07	198.67	408.21	209.53	0.9949	1.7751
0	5.68	4.61	0.809	50.67	1.237	19.74	200.00	408.69	208.69	1.0000	1.7739
1	5.87	4.77	0.811	48.97	1.233	20.42	201.52	409.16	207.65	1.0051	1.7726
2	6.06	4.94	0.813	47.34	1.229	21.12	202.94	409.63	206.69	1.0102	1.7714
3	6.25	5.11	0.816	45.78	1.226	21.85	204.37	410.10	205.73	1.0153	1.7702
4	6.45	5.29	0.818	44.27	1.222	22.59	205.80	410.57	204.76	1.0203	1.7690
5	6.66	5.47	0.821	42.82	1.218	23.35	207.24	411.03	203.79	1.0254	1.7678
6	6.87	5.66	0.824	41.43	1.214	24.14	208.67	411.48	202.81	1.0305	1.7667
7	7.08	5.85	0.826	40.09	1.210	24.94	210.12	411.93	201.82	1.0355	1.7655
8	7.30	6.04	0.829	38.80	1.207	25.77	211.56	412.38	200.82	1.0406	1.7644
9	7.53	6.24	0.831	37.56	1.203	26.62	213.01	412.82	199.82	1.0456	1.7632
10	7.76	6.45	0.834	36.37	1.199	27.49	214.46	413.26	198.81	1.0507	1.7621
11	7.99	6.66	0.837	35.22	1.195	28.39	215.91	413.70	197.79	1.0557	1.7610
12	8.23	6.88	0.840	34.11	1.191	29.31	217.37	414.13	196.76	1.0607	1.7598
13	8.48	7.10	0.842	33.05	1.187	30.26	218.83	414.55	195.72	1.0658	1.7587
14	8.73	7.32	0.845	32.02	1.183	31.23	220.29	414.97	194.68	1.0708	1.7576
15	8.99	7.55	0.848	31.03	1.179	32.23	221.76	415.39	193.63	1.0758	1.7565
16	9.25	7.79	0.851	30.07	1.175	33.25	223.23	415.80	192.57	1.0808	1.7554
17	9.52	8.03	0.854	29.15	1.171	34.31	224.70	416.20	191.50	1.0859	1.7543
18	9.79	8.28	0.857	28.26	1.167	35.39	226.18	416.60	190.42	1.0909	1.7533
19	10.07	8.54	0.860	27.40	1.163	36.50	227.66	416.99	189.33	1.0959	1.7522
20	10.36	8.80	0.863	26.57	1.159	37.63	229.15	417.38	188.23	1.1009	1.7511
21	10.65	9.06	0.866	25.77	1.155	38.80	230.64	417.76	187.13	1.1059	1.7500
22	10.95	9.34	0.869	25.00	1.150	40.00	232.13	418.14	186.01	1.1109	1.7490
23	11.25	9.62	0.873	24.25	1.146	41.24	233.63	418.51	184.88	1.1159	1.7479
24	11.56	9.90	0.876	23.53	1.142	42.50	235.13	418.88	183.74	1.1210	1.7468
25	11.88	10.19	0.879	22.83	1.138	43.80	236.64	419.23	182.59	1.1260	1.7458
26	12.20	10.49	0.882	22.16	1.133	45.14	238.15	419.59	181.43	1.1310	1.7447
27	12.53	10.79	0.886	21.50	1.129	46.51	239.67	419.93	180.26	1.1360	1.7436
28	12.87	11.10	0.889	20.87	1.124	47.91	241.19	420.27	179.07	1.1410	1.7426
29	13.21	11.42	0.893	20.26	1.120	49.36	242.72	420.60	177.88	1.1460	1.7415

Vapour Table, Wet Vapour Range Solkane®407C

t	p'	p''	v'	v''	ρ'	ρ''	h'	h''	r	s'	s''
[°C]	[bar]	[bar]	[dm ³ /kg]	[dm ³ /kg]	[kg/dm ³]	[kg/m ³]	[kJ/kg]	[kJ/kg]	[kJ/kg]	[kJ/kg K]	[kJ/kg K]
30	13.56	11.75	0.897	19.67	1.115	50.84	244.26	420.92	176.67	1.1511	1.7404
31	13.92	12.08	0.900	19.10	1.111	52.37	245.80	421.24	175.44	1.1561	1.7394
32	14.28	12.42	0.904	18.54	1.106	53.93	247.34	421.55	174.20	1.1611	1.7383
33	14.65	12.76	0.908	18.00	1.102	55.54	248.90	421.85	172.95	1.1662	1.7372
34	15.03	13.12	0.912	17.48	1.097	57.19	250.46	422.14	171.68	1.1712	1.7361
35	15.41	13.48	0.916	16.98	1.092	58.89	252.02	422.42	170.40	1.1763	1.7350
36	15.80	13.84	0.920	16.49	1.087	60.64	253.60	422.70	169.10	1.1813	1.7339
37	16.20	14.22	0.924	16.02	1.083	62.43	255.18	422.96	167.79	1.1864	1.7328
38	16.61	14.60	0.928	15.56	1.078	64.28	256.77	423.22	166.45	1.1915	1.7317
39	17.02	14.99	0.932	15.11	1.073	66.17	258.37	423.47	165.10	1.1965	1.7305
40	17.45	15.39	0.937	14.68	1.068	68.12	259.98	423.71	163.73	1.2016	1.7294
41	17.88	15.80	0.941	14.26	1.063	70.13	261.59	423.93	162.34	1.2067	1.7283
42	18.31	16.21	0.946	13.85	1.058	72.19	263.22	424.15	160.93	1.2118	1.7271
43	18.76	16.64	0.950	13.46	1.052	74.31	264.86	424.36	159.50	1.2169	1.7259
44	19.21	17.07	0.955	13.07	1.047	76.49	266.50	424.55	158.04	1.2221	1.7247
45	19.67	17.51	0.960	12.70	1.042	78.74	268.16	424.73	156.57	1.2272	1.7235
46	20.14	17.96	0.965	12.34	1.036	81.06	269.83	424.90	155.07	1.2323	1.7223
47	20.62	18.42	0.970	11.98	1.031	83.44	271.52	425.06	153.54	1.2375	1.7210
48	21.11	18.88	0.975	11.64	1.025	85.90	273.21	425.20	151.99	1.2427	1.7197
49	21.60	19.36	0.981	11.31	1.020	88.43	274.92	425.33	150.41	1.2478	1.7184
50	22.10	19.85	0.986	10.98	1.014	91.04	276.64	425.45	148.81	1.2530	1.7171
51	22.62	20.34	0.992	10.67	1.008	93.74	278.38	425.55	147.17	1.2582	1.7158
52	23.14	20.85	0.998	10.36	1.002	96.52	280.13	425.63	145.50	1.2635	1.7144
53	23.67	21.36	1.004	10.06	0.997	99.39	281.90	425.70	143.80	1.2687	1.7130
54	24.21	21.88	1.010	9.77	0.990	102.35	283.68	425.75	142.07	1.2740	1.7116
55	24.75	22.42	1.016	9.49	0.984	105.41	285.48	425.78	140.30	1.2792	1.7101
56	25.31	22.96	1.023	9.21	0.978	108.58	287.30	425.80	138.50	1.2845	1.7086
57	25.88	23.52	1.029	8.94	0.972	111.86	289.13	425.79	136.66	1.2898	1.7070
58	26.45	24.08	1.036	8.68	0.965	115.25	290.99	425.76	134.77	1.2951	1.7055
59	27.04	24.66	1.043	8.42	0.958	118.76	292.86	425.71	132.85	1.3005	1.7038
60	27.63	25.24	1.051	8.17	0.952	122.41	294.76	425.64	130.88	1.3058	1.7021
61	28.23	25.84	1.059	7.92	0.945	126.19	296.67	425.54	128.86	1.3112	1.7004
62	28.85	26.45	1.067	7.69	0.937	130.11	298.61	425.41	126.80	1.3166	1.6986
63	29.47	27.07	1.075	7.45	0.930	134.19	300.58	425.26	124.69	1.3220	1.6967
64	30.10	27.70	1.084	7.22	0.923	138.44	302.56	425.08	122.52	1.3275	1.6948
65	30.75	28.35	1.093	7.00	0.915	142.86	304.57	424.86	120.29	1.3330	1.6928
66	31.40	29.01	1.102	6.78	0.907	147.48	306.61	424.61	118.00	1.3384	1.6908
67	32.07	29.68	1.112	6.57	0.899	152.30	308.67	424.32	115.65	1.3440	1.6886
68	32.74	30.36	1.123	6.36	0.891	157.34	310.76	424.00	113.23	1.3495	1.6863
69	33.43	31.06	1.134	6.15	0.882	162.62	312.88	423.63	110.74	1.3551	1.6840

Vapour Table, Wet Vapour Range Solkane®407C

t	p'	p''	v'	v''	ρ'	ρ''	h'	h''	r	s'	s''
[°C]	[bar]	[bar]	[dm ³ /kg]	[dm ³ /kg]	[kg/dm ³]	[kg/m ³]	[kJ/kg]	[kJ/kg]	[kJ/kg]	[kJ/kg K]	[kJ/kg K]
70	34.12	31.77	1.145	5.95	0.873	168.17	315.03	423.21	108.17	1.3606	1.6815
71	34.83	32.49	1.158	5.75	0.864	174.01	317.21	422.74	105.52	1.3663	1.6789
72	35.55	33.23	1.171	5.55	0.854	180.17	319.43	422.21	102.78	1.3719	1.6762
73	36.27	33.98	1.184	5.36	0.844	186.68	321.67	421.62	99.95	1.3776	1.6733
74	37.01	34.75	1.199	5.17	0.834	193.59	323.95	420.96	97.00	1.3833	1.6702
75	37.76	35.54	1.215	4.98	0.823	200.95	326.27	420.22	93.95	1.3890	1.6669
76	38.52	36.34	1.233	4.79	0.811	208.82	328.62	419.38	90.76	1.3948	1.6634
77	39.29	37.16	1.252	4.60	0.799	217.29	331.01	418.45	87.44	1.4005	1.6596
78	40.08	37.99	1.272	4.42	0.786	226.45	333.44	417.39	83.95	1.4064	1.6555
79	40.87	38.85	1.296	4.23	0.772	236.43	335.91	416.19	80.28	1.4122	1.6511
80	41.68	39.73	1.322	4.04	0.757	247.43	338.42	414.81	76.39	1.4181	1.6461
81	42.50	40.63	1.352	3.85	0.740	259.70	340.98	413.21	72.24	1.4240	1.6406
82	43.32	41.55	1.388	3.65	0.721	273.63	343.57	411.33	67.75	1.4300	1.6343

8 Vapour Table, Superheated Range Solkane® 407C

0.51bar -50.00°C

T	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-50	414.98	381.29	1.8633
-45	425.23	384.92	1.8794
-40	435.42	388.59	1.8953
-35	445.55	392.28	1.9110
-30	455.63	396.01	1.9264
-25	465.67	399.77	1.9418
-20	475.66	403.57	1.9569
-15	485.62	407.40	1.9719
-10	495.55	411.26	1.9867
-5	505.44	415.16	2.0014
0	515.31	419.10	2.0159
5	525.15	423.08	2.0304
10	534.97	427.09	2.0447
15	544.77	431.14	2.0588
20	554.56	435.23	2.0729
25	564.32	439.35	2.0869
30	574.07	443.52	2.1007
35	583.81	447.72	2.1145

0.70bar -44.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-44	305.48	384.86	1.8485
-40	311.51	387.83	1.8614
-35	319.00	391.58	1.8773
-30	326.44	395.35	1.8929
-25	333.83	399.16	1.9084
-20	341.18	402.99	1.9237
-15	348.48	406.86	1.9388
-10	355.76	410.75	1.9538
-5	363.00	414.69	1.9686
0	370.22	418.65	1.9833
5	377.41	422.65	1.9978
10	384.57	426.69	2.0122
15	391.72	430.76	2.0264
20	398.85	434.87	2.0405
25	405.96	439.01	2.0546
30	413.05	443.19	2.0685
35	420.14	447.41	2.0823
40	427.20	451.67	2.0960

0.95bar -38.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-38	228.99	388.37	1.8351
-35	232.39	390.66	1.8448
-30	238.02	394.49	1.8607
-25	243.60	398.35	1.8764
-20	249.14	402.24	1.8919
-15	254.64	406.15	1.9073
-10	260.10	410.09	1.9224
-5	265.54	414.06	1.9373
0	270.94	418.06	1.9521
5	276.32	422.10	1.9668
10	281.67	426.17	1.9812
15	287.00	430.27	1.9956
20	292.32	434.40	2.0098
25	297.61	438.57	2.0239
30	302.89	442.77	2.0379
35	308.16	447.01	2.0518
40	313.41	451.29	2.0655
45	318.65	455.60	2.0792

1.27bar -32.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-32	174.47	391.81	1.8230
-30	176.21	393.38	1.8295
-25	180.54	397.31	1.8455
-20	184.82	401.27	1.8613
-15	189.06	405.24	1.8768
-10	193.26	409.24	1.8922
-5	197.43	413.26	1.9073
0	201.57	417.31	1.9223
5	205.68	421.39	1.9371
10	209.77	425.50	1.9517
15	213.83	429.63	1.9662
20	217.88	433.80	1.9805
25	221.91	438.00	1.9947
30	225.93	442.24	2.0088
35	229.93	446.50	2.0228
40	233.91	450.80	2.0366
45	237.88	455.14	2.0503
50	241.85	459.51	2.0640

0.57 bar -48.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-48	373.89	382.49	1.8582
-45	379.44	384.68	1.8679
-40	388.63	388.36	1.8838
-35	397.77	392.07	1.8996
-30	406.85	395.81	1.9151
-25	415.88	399.58	1.9305
-20	424.88	403.39	1.9457
-15	433.84	407.23	1.9607
-10	442.76	411.11	1.9756
-5	451.65	415.02	1.9903
0	460.52	418.97	2.0049
5	469.36	422.95	2.0193
10	478.18	426.97	2.0336
15	486.98	431.03	2.0478
20	495.76	435.12	2.0619
25	504.52	439.25	2.0759
30	513.27	443.42	2.0898
35	522.00	447.63	2.1035

0.78 bar -42.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-42	276.97	386.03	1.8439
-40	279.71	387.53	1.8503
-35	286.52	391.30	1.8663
-30	293.28	395.09	1.8821
-25	299.99	398.91	1.8976
-20	306.65	402.76	1.9130
-15	313.29	406.64	1.9282
-10	319.88	410.55	1.9432
-5	326.44	414.50	1.9580
0	332.98	418.47	1.9727
5	339.49	422.48	1.9873
10	345.97	426.53	2.0017
15	352.44	430.61	2.0160
20	358.89	434.72	2.0301
25	365.32	438.88	2.0442
30	371.73	443.06	2.0581
35	378.13	447.29	2.0719
40	384.52	451.55	2.0856

1.05 bar -36.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-36	208.78	389.52	1.8309
-35	209.82	390.29	1.8342
-30	214.98	394.15	1.8502
-25	220.10	398.03	1.8660
-20	225.17	401.94	1.8816
-15	230.19	405.87	1.8970
-10	235.19	409.83	1.9122
-5	240.15	413.82	1.9272
0	245.08	417.83	1.9420
5	249.98	421.88	1.9567
10	254.87	425.96	1.9713
15	259.73	430.07	1.9856
20	264.57	434.22	1.9999
25	269.39	438.40	2.0140
30	274.20	442.61	2.0281
35	278.99	446.86	2.0419
40	283.77	451.14	2.0557
45	288.54	455.46	2.0694

1.39 bar -30.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-30	159.88	392.94	1.8192
-25	163.88	396.91	1.8354
-20	167.83	400.89	1.8512
-15	171.73	404.89	1.8669
-10	175.60	408.91	1.8823
-5	179.44	412.95	1.8975
0	183.25	417.02	1.9126
5	187.03	421.11	1.9274
10	190.78	425.24	1.9421
15	194.51	429.39	1.9566
20	198.23	433.57	1.9710
25	201.92	437.78	1.9853
30	205.60	442.03	1.9994
35	209.27	446.30	2.0134
40	212.92	450.61	2.0273
45	216.56	454.96	2.0410
50	220.19	459.34	2.0547
55	223.80	463.75	2.0682

0.63 bar -46.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-46	337.61	383.67	1.8533
-45	339.28	384.41	1.8565
-40	347.60	388.11	1.8725
-35	355.86	391.84	1.8883
-30	364.06	395.59	1.9040
-25	372.22	399.38	1.9194
-20	380.34	403.20	1.9346
-15	388.42	407.05	1.9497
-10	396.46	410.94	1.9646
-5	404.48	414.86	1.9794
0	412.46	418.82	1.9940
5	420.43	422.81	2.0085
10	428.37	426.83	2.0228
15	436.29	430.90	2.0370
20	444.19	435.00	2.0511
25	452.07	439.14	2.0651
30	459.94	443.31	2.0790
35	467.79	447.52	2.0928

0.86 bar -40.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-40	251.60	387.20	1.8394
-35	257.81	390.99	1.8555
-30	263.97	394.80	1.8713
-25	270.09	398.64	1.8870
-20	276.15	402.51	1.9024
-15	282.18	406.40	1.9176
-10	288.18	410.33	1.9327
-5	294.14	414.29	1.9476
0	300.08	418.28	1.9623
5	305.99	422.30	1.9769
10	311.87	426.35	1.9914
15	317.74	430.44	2.0057
20	323.58	434.57	2.0199
25	329.41	438.73	2.0340
30	335.22	442.92	2.0479
35	341.02	447.16	2.0618
40	346.81	451.42	2.0755
45	352.58	455.73	2.0891

1.16 bar -34.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-34	190.69	390.67	1.8269
-30	194.49	393.78	1.8398
-25	199.18	397.69	1.8557
-20	203.83	401.62	1.8714
-15	208.45	405.57	1.8869
-10	213.02	409.55	1.9021
-5	217.56	413.55	1.9172
0	222.07	417.58	1.9321
5	226.56	421.65	1.9468
10	231.02	425.74	1.9614
15	235.46	429.86	1.9758
20	239.89	434.02	1.9901
25	244.29	438.21	2.0043
30	248.68	442.43	2.0184
35	253.05	446.69	2.0323
40	257.41	450.98	2.0461
45	261.76	455.30	2.0598
50	266.10	459.66	2.0734

1.52 bar -28.00°C

t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK
-28	146.74	394.07	1.8155
-25	148.96	396.47	1.8253
-20	152.61	400.48	1.8413
-15	156.22	404.50	1.8570
-10	159.80	408.55	1.8725
-5	163.34	412.61	1.8879
0	166.85	416.70	1.9030
5	170.33	420.82	1.9179
10	173.79	424.96	1.9326
15	177.22	429.12	1.9472
20	180.63	433.32	1.9617
25	184.03	437.55	1.9760
30	187.41	441.80	1.9901
35	190.78	446.09	2.0041
40	194.13	450.41	2.0181
45	197.47	454.76	2.0318
50	200.80	459.15	2.0455
55	204.12	463.57	2.0591

Vapour Table, Superheated Range Solkane®407C

1.67 bar -26.00°C				2.15 bar -20.00°C				2.74 bar -14.00°C				3.45 bar -8.00°C			
t	v	h	s	t	v	h	s	t	v	h	s	t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK	°C	dm³/kg	kJ/kg	kJ/kgK	°C	dm³/kg	kJ/kg	KJ/kgK	°C	dm³/kg	kJ/kg	kJ/kgK
-26	134.89	395.18	1.8120	-20	105.67	398.47	1.8019	-14	83.77	401.66	1.7927	-8	67.12	404.75	1.7843
-25	135.57	395.99	1.8152	-15	108.38	402.63	1.8182	-10	85.53	405.10	1.8059	-5	68.20	407.41	1.7942
-20	138.96	400.03	1.8314	-10	111.05	406.80	1.8342	-5	87.69	409.39	1.8220	0	69.99	411.84	1.8106
-15	142.31	404.09	1.8472	-5	113.68	410.98	1.8499	0	89.82	413.68	1.8379	5	71.74	416.26	1.8266
-10	145.62	408.16	1.8629	0	116.28	415.17	1.8654	5	91.92	417.98	1.8535	10	73.45	420.68	1.8424
-5	148.89	412.25	1.8783	5	118.85	419.37	1.8807	10	93.98	422.29	1.8689	15	75.14	425.10	1.8579
0	152.14	416.36	1.8935	10	121.39	423.60	1.8957	15	96.03	426.61	1.8840	20	76.81	429.53	1.8731
5	155.35	420.50	1.9085	15	123.91	427.84	1.9106	20	98.05	430.95	1.8989	25	78.46	433.97	1.8881
10	158.54	424.65	1.9233	20	126.40	432.11	1.9253	25	100.05	435.31	1.9137	30	80.08	438.42	1.9029
15	161.71	428.84	1.9379	25	128.88	436.40	1.9398	30	102.03	439.68	1.9282	35	81.69	442.88	1.9175
20	164.86	433.05	1.9524	30	131.34	440.72	1.9542	35	104.00	444.08	1.9426	40	83.29	446.37	1.9320
25	167.99	437.29	1.9668	35	133.79	445.06	1.9684	40	105.95	448.51	1.9568	45	84.87	451.88	1.9462
30	171.10	441.56	1.9810	40	136.22	449.44	1.9824	45	107.89	452.95	1.9709	50	86.44	456.40	1.9604
35	174.20	445.86	1.9950	45	138.64	453.84	1.9964	50	109.81	457.43	1.9849	55	88.00	460.95	1.9743
40	177.28	450.19	2.0090	50	141.04	458.27	2.0102	55	111.73	461.93	1.9987	60	89.54	465.53	1.9882
45	180.35	454.56	2.0228	55	143.44	462.73	2.0239	60	113.63	466.46	2.0124	65	91.08	470.13	2.0019
50	183.41	458.95	2.0365	60	145.82	467.22	2.0375	65	115.53	471.02	2.0260	70	92.61	474.76	2.0155
55	186.46	463.38	2.0501	65	148.20	471.75	2.0510	70	117.42	475.61	2.0395	75	94.13	479.42	2.0289

1.82 bar- 24.00°C				2.34 bar- 18.00°C				2.97 bar- 12.00°C				3.72 bar -6.00°C			
t	v	h	s	t	v	h	s	t	v	h	s	t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK	°C	dm³/kg	kJ/kg	kJ/kgK	°C	dm³/kg	kJ/kg	KJ/kgK	°C	dm³/kg	kJ/kg	kJ/kgK
-24	124.18	396.29	1.8085	-18	97.68	399.54	1.7988	-12	77.72	402.70	1.7898	-6	62.47	405.75	1.7816
-20	126.70	399.55	1.8215	-15	99.20	402.07	1.8086	-10	78.54	404.44	1.7965	-5	62.81	406.65	1.7849
-15	129.81	403.64	1.8375	-10	101.69	406.27	1.8248	-5	80.58	408.78	1.8128	0	64.50	411.14	1.8015
-10	132.88	407.74	1.8533	-5	104.15	410.49	1.8406	0	82.58	413.11	1.8288	5	66.16	415.60	1.8177
-5	135.91	411.86	1.8688	0	106.57	414.71	1.8562	5	84.55	417.45	1.8445	10	67.78	420.06	1.8336
0	138.92	415.99	1.8840	5	108.97	418.94	1.8716	10	86.49	421.79	1.8600	15	69.38	424.52	1.8492
5	141.89	420.15	1.8991	10	111.33	423.19	1.8867	15	88.40	426.14	1.8752	20	70.95	428.99	1.8646
10	144.84	424.33	1.9140	15	113.68	427.46	1.9017	20	90.29	430.51	1.8903	25	72.50	433.46	1.8797
15	147.77	428.53	1.9287	20	116.00	431.75	1.9164	25	92.16	434.89	1.9051	30	74.02	437.94	1.8946
20	150.68	432.76	1.9433	25	118.30	436.06	1.9310	30	94.02	439.29	1.9197	35	75.54	442.43	1.9093
25	153.57	437.02	1.9577	30	120.59	440.40	1.9454	35	95.85	443.71	1.9342	40	77.03	446.94	1.9238
30	156.44	441.30	1.9719	35	122.86	444.76	1.9597	40	97.67	448.15	1.9485	45	78.52	451.47	1.9381
35	159.30	445.61	1.9860	40	125.11	449.15	1.9738	45	99.48	452.62	1.9626	50	79.99	456.02	1.9523
40	162.14	449.96	2.0000	45	127.35	453.56	1.9878	50	101.28	457.11	1.9766	55	81.44	460.58	1.9664
45	164.97	454.33	2.0139	50	129.58	458.01	2.0017	55	103.06	461.62	1.9905	60	82.89	465.18	1.9802
50	167.79	458.74	2.0276	55	131.80	462.48	2.0154	60	104.83	466.17	2.0042	65	84.33	469.80	1.9940
55	170.60	463.18	2.0413	60	134.01	466.98	2.0290	65	106.60	470.74	2.0179	70	85.76	474.44	2.0076
60	173.40	467.65	2.0548	65	136.21	471.52	2.0425	70	108.35	475.34	2.0314	75	87.18	479.11	2.0211

1.98 bar- 22.00°C				2.53 bar- 16.00°C				3.20 bar- 10.00°C				4.00 bar- 4.00°C			
t	v	h	s	t	v	h	s	t	v	h	s	t	v	h	s
°C	dm³/kg	kJ/kg	kJ/kgK	°C	dm³/kg	kJ/kg	kJ/kgK	°C	dm³/kg	kJ/kg	KJ/kgK	°C	dm³/kg	kJ/kg	kJ/kgK
-22	114.47	397.38	1.8052	-16	90.40	400.61	1.7957	-10	72.18	403.73	1.7870	-4	58.20	406.75	1.7789
-20	115.65	399.03	1.8117	-15	90.88	401.46	1.7990	-5	74.11	408.12	1.8035	0	59.49	410.38	1.7923
-15	118.55	403.15	1.8279	-10	93.22	405.71	1.8153	0	75.99	412.50	1.8197	5	61.06	414.90	1.8087
-10	121.40	407.29	1.8437	-5	95.52	409.96	1.8313	5	77.85	416.88	1.8356	10	62.59	419.41	1.8248
-5	124.23	411.43	1.8593	0	97.79	414.21	1.8470	10	79.67	421.25	1.8512	15	64.10	423.91	1.8406
0	127.02	415.60	1.8747	5	100.03	418.48	1.8625	15	81.47	425.64	1.8665	20	65.58	428.41	1.8560
5	129.78	419.78	1.8899	10	102.23	422.76	1.8778	20	83.24	430.04	1.8817	25	67.05	432.91	1.8713
10	132.51	423.98	1.9048	15	104.42	427.05	1.8928	25	84.99	434.44	1.8966	30	68.49	437.42	1.8863
15	135.22	428.20	1.9196	20	106.58	431.37	1.9076	30	86.73	438.87	1.9113	35	69.91	441.95	1.9011
20	137.91	432.45	1.9342	25	108.73	435.70	1.9223	35	88.44	443.31	1.9258	40	71.32	446.48	1.9157
25	140.59	436.72	1.9487	30	110.85	440.05	1.9368	40	90.15	447.77	1.9402	45	72.71	451.03	1.9301
30	143.24	441.02	1.9630	35	112.96	444.43	1.9511	45	91.84	452.26	1.9544	50	74.09	455.60	1.9444
35	145.88	445.35	1.9771	40	115.06	448.84	1.9653	50	93.51	456.77	1.9685	55	75.46	460.19	1.9584
40	148.51	449.71	1.9912	45	117.14	453.27	1.9793	55	95.18	461.30	1.9824	60	76.82	464.80	1.9724
45	151.12	454.09	2.0051	50	119.21	457.73	1.9932	60	96.83	465.86	1.9962	65	78.16	469.44	1.9862
50	153.72	458.51	2.0189	55	121.27	462.21	2.0070	65	98.48	470.44	2.0098	70	79.50	474.10	1.9999
55	156.32	462.96	2.0325	60	123.32	466.73	2.0207	70	100.11	475.06	2.0234	75	80.83	478.78	2.0134
60	158.90	467.45	2.0461	65	125.36	471.28	2.0342	75	101.74	479.70	2.0368	80	82.16	483.50	2.0269

Vapour Table, Superheated Range Solkane®407C

4.30 bar -2.00°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
-2	54.28	407.72	1.7764
0	54.89	409.56	1.7831
5	56.38	414.14	1.7998
10	57.84	418.70	1.8160
15	59.27	423.25	1.8319
20	60.68	427.79	1.8475
25	62.06	432.33	1.8629
30	63.42	436.88	1.8780
35	64.76	441.43	1.8929
40	66.09	445.99	1.9076
45	67.40	450.57	1.9221
50	68.70	455.16	1.9364
55	69.98	459.78	1.9506
60	71.26	464.41	1.9646
65	72.52	469.06	1.9785
70	73.78	473.74	1.9922
75	75.03	478.44	2.0058
80	76.27	483.17	2.0193

5.29 bar 4.0°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
4	44.27	410.57	1.7690
5	44.53	411.52	1.7725
10	45.80	416.27	1.7894
15	47.04	420.98	1.8059
20	48.24	425.67	1.8220
25	49.42	430.35	1.8378
30	50.58	435.01	1.8533
35	51.72	439.67	1.8686
40	52.85	444.33	1.8836
45	53.95	449.00	1.8984
50	55.05	453.68	1.9130
55	56.13	458.36	1.9274
60	57.19	463.07	1.9416
65	58.25	467.78	1.9556
70	59.30	472.52	1.9695
75	60.34	477.27	1.9833
80	61.38	482.05	1.9969
85	62.40	486.85	2.0104

6.45 bar 10.0°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
10	36.37	413.26	1.7621
15	37.47	418.20	1.7794
20	38.53	423.08	1.7962
25	39.56	427.93	1.8126
30	40.57	432.75	1.8286
35	41.56	437.55	1.8443
40	42.53	442.34	1.8597
45	43.48	447.12	1.8749
50	44.41	451.90	1.8898
55	45.34	456.68	1.9044
60	46.24	461.46	1.9189
65	47.14	466.26	1.9332
70	48.03	471.07	1.9473
75	48.91	475.89	1.9613
80	49.78	480.73	1.9751
85	50.65	485.59	1.9887
90	51.50	490.47	2.0023
95	52.36	495.37	2.0157

7.79 bar 16.00°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
16	30.07	415.80	1.7554
20	30.84	419.91	1.7696
25	31.76	424.99	1.7867
30	32.66	430.01	1.8034
35	33.53	434.99	1.8197
40	34.38	439.94	1.8357
45	35.22	444.86	1.8513
50	36.03	449.77	1.8666
55	36.83	454.67	1.8816
60	37.62	459.56	1.8964
65	38.39	464.45	1.9110
70	39.16	469.35	1.9254
75	39.91	474.25	1.9395
80	40.66	479.17	1.9536
85	41.40	484.10	1.9674
90	42.13	489.04	1.9811
95	42.85	494.00	1.9947
100	43.57	498.98	2.0081

4.61 bar 0.00°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
0	50.67	408.69	1.7739
5	52.10	413.33	1.7907
10	53.48	417.94	1.8072
15	54.84	422.54	1.8233
20	56.18	427.13	1.8391
25	57.48	431.71	1.8546
30	58.77	436.29	1.8698
35	60.04	440.88	1.8848
40	61.29	445.47	1.8996
45	62.53	450.08	1.9142
50	63.75	454.70	1.9286
55	64.96	459.33	1.9428
60	66.16	463.99	1.9569
65	67.35	468.66	1.9708
70	68.54	473.36	1.9846
75	69.71	478.07	1.9982
80	70.87	482.82	2.0118
85	72.03	487.58	2.0252

5.66 bar 6.00°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
6	41.43	411.48	1.7667
10	42.40	415.34	1.7804
15	43.59	420.12	1.7971
20	44.74	424.87	1.8135
25	45.87	429.59	1.8294
30	46.97	434.31	1.8451
35	48.06	439.01	1.8605
40	49.12	443.71	1.8756
45	50.17	448.41	1.8905
50	51.21	453.12	1.9052
55	52.23	457.84	1.9197
60	53.24	462.56	1.9340
65	54.24	467.30	1.9481
70	55.23	472.06	1.9621
75	56.22	476.84	1.9759
80	57.19	481.64	1.9896
85	58.16	486.45	2.0031
90	59.12	491.30	2.0166

6.88 bar 12.00°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
12	34.11	414.13	1.7598
15	34.75	417.13	1.7703
20	35.77	422.10	1.7874
25	36.76	427.02	1.8040
30	37.73	431.90	1.8203
35	38.68	436.75	1.8362
40	39.60	441.59	1.8517
45	40.51	446.41	1.8670
50	41.40	451.23	1.8820
55	42.28	456.05	1.8968
60	43.14	460.87	1.9114
65	44.00	465.69	1.9258
70	44.84	470.53	1.9400
75	45.67	475.38	1.9540
80	46.50	480.24	1.9679
85	47.32	485.12	1.9816
90	48.13	490.02	1.9952
95	48.94	494.93	2.0086

8.28 bar 18.00°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
18	28.26	416.60	1.7533
20	28.63	418.69	1.7604
25	29.53	423.86	1.7779
30	30.40	428.97	1.7949
35	31.24	434.02	1.8114
40	32.06	439.03	1.8276
45	32.85	444.01	1.8433
50	33.64	448.97	1.8588
55	34.40	453.91	1.8740
60	35.15	458.85	1.8889
65	35.89	463.78	1.9036
70	36.62	468.71	1.9181
75	37.34	473.65	1.9323
80	38.05	478.59	1.9464
85	38.76	483.54	1.9604
90	39.45	488.51	1.9741
95	40.14	493.49	1.9878
100	40.82	498.49	2.0013

4.94 bar 2.00°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
2	47.34	409.63	1.7714
5	48.16	412.46	1.7816
10	49.48	417.13	1.7983
15	50.78	421.79	1.8146
20	52.04	426.42	1.8305
25	53.29	431.05	1.8462
30	54.51	435.67	1.8616
35	55.71	440.30	1.8767
40	56.89	444.92	1.8916
45	58.06	449.56	1.9063
50	59.22	454.20	1.9208
55	60.36	458.86	1.9351
60	61.49	463.54	1.9492
65	62.61	468.23	1.9632
70	63.72	472.95	1.9770
75	64.83	477.69	1.9907
80	65.92	482.45	2.0043
85	67.01	487.23	2.0178

6.04 bar 8.00°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
8	38.80	412.38	1.7644
10	39.27	414.34	1.7713
15	40.41	419.19	1.7883
20	41.51	424.00	1.8048
25	42.59	428.79	1.8210
30	43.65	433.55	1.8369
35	44.68	438.30	1.8524
40	45.69	443.04	1.8677
45	46.69	447.78	1.8827
50	47.68	452.53	1.8975
55	48.64	457.27	1.9121
60	49.60	462.03	1.9264
65	50.55	466.80	1.9406
70	51.49	471.58	1.9547
75	52.42	476.38	1.9686
80	53.34	481.20	1.9823
85	54.25	486.03	1.9959
90	55.16	490.89	2.0094

7.32 bar 14.00°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
14	32.02	414.97	1.7576
15	32.22	415.99	1.7612
20	33.21	421.04	1.7785
25	34.17	426.04	1.7954
30	35.10	430.98	1.8119
35	36.01	435.90	1.8280
40	36.89	440.79	1.8437
45	37.76	445.66	1.8591
50	38.61	450.52	1.8743
55	39.45	455.38	1.8892
60	40.27	460.23	1.9039
65	41.09	465.09	1.9184
70	41.89	469.96	1.9327
75	42.68	474.83	1.9468
80	43.47	479.72	1.9607
85	44.24	484.62	1.9745
90	45.01	489.54	1.9881
95	45.78	494.48	2.0016

8.80 bar 20.00°C

t	v	h	s
°C	dm ³ /kg	kJ/kg	kJ/kgK
20	26.57	417.38	1.7511
25	27.45	422.66	1.7690
30	28.29	427.86	1.7862
35	29.10	432.99	1.8030
40	29.89	438.07	1.8194
45	30.66	443.11	1.8354
50	31.41	448.12	1.8510
55	32.15	453.12	1.8663
60	32.87	458.09	1.8814
65	33.58	463.07	1.8962
70	34.27	468.03	1.9108
75	34.96	473.00	1.9252
80	35.64	477.98	1.9393
85	36.31	482.96	1.9534
90	36.97	487.95	1.9672
95	37.63	492.96	1.9809
100	38.27	497.98	1.9944
105	38.92	503.02	2.0078

Vapour Table, Superheated Range Solkane®407C

9.34 bar 22.00°C					11.11 bar 28.00°C					13.11 bar 34.00°C					15.39 bar 40.00°C				
t	v	h	s		t	v	h	s		t	v	h	s		t	v	h	s	
°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	KJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK	
22	25.00	418.14	1.7490		28	20.87	420.27	1.7426		34	17.48	422.14	1.7361		40	14.68	423.71	1.7294	
25	25.51	421.37	1.7598		30	21.18	422.53	1.7500		35	17.62	423.33	1.7400		45	15.30	429.92	1.7491	
30	26.33	426.66	1.7775		35	21.91	428.08	1.7682		40	18.29	429.18	1.7588		50	15.89	435.93	1.7678	
35	27.12	431.88	1.7945		40	22.62	433.52	1.7857		45	18.93	434.88	1.7769		55	16.44	441.78	1.7858	
40	27.88	437.04	1.8111		45	23.29	438.88	1.8027		50	19.54	440.47	1.7943		60	16.97	447.51	1.8031	
45	28.62	442.15	1.8273		50	23.95	444.17	1.8192		55	20.13	445.96	1.8112		65	17.48	453.14	1.8199	
50	29.34	447.22	1.8431		55	24.59	449.40	1.8353		60	20.69	451.39	1.8276		70	17.98	458.69	1.8362	
55	30.05	452.27	1.8586		60	25.21	454.60	1.8510		65	21.24	456.75	1.8436		75	18.45	464.18	1.8521	
60	30.74	457.30	1.8739		65	25.81	459.77	1.8664		70	21.78	462.07	1.8592		80	18.92	469.63	1.8676	
65	31.42	462.31	1.8888		70	26.40	464.92	1.8815		75	22.30	467.36	1.8745		85	19.37	475.04	1.8828	
70	32.09	467.32	1.9035		75	26.98	470.05	1.8964		80	22.81	472.63	1.8895		90	19.82	480.42	1.8977	
75	32.75	472.32	1.9180		80	27.55	475.17	1.9110		85	23.31	477.87	1.9042		95	20.25	485.78	1.9124	
80	33.39	477.33	1.9323		85	28.12	480.29	1.9253		90	23.80	483.11	1.9188		100	20.68	491.12	1.9268	
85	34.03	482.34	1.9463		90	28.67	485.40	1.9395		95	24.29	488.33	1.9330		105	21.09	496.46	1.9410	
90	34.67	487.36	1.9603		95	29.21	490.52	1.9535		100	24.76	493.55	1.9471		110	21.51	501.79	1.9550	
95	35.29	492.39	1.9740		100	29.75	495.64	1.9674		105	25.23	498.78	1.9611		115	21.91	507.12	1.9689	
100	35.91	497.44	1.9876		105	30.29	500.78	1.9810		110	25.70	504.01	1.9748		120	22.32	512.45	1.9825	
105	36.52	502.50	2.0011		110	30.81	505.92	1.9945		115	26.15	509.25	1.9884		125	22.71	517.79	1.9960	

9.90 bar 24.00°C					11.75 bar 30.00°C					13.84 bar 36.00°C					16.21 bar 42.00°C				
t	v	h	s		t	v	h	s		t	v	h	s		t	v	h	s	
°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	KJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK	
24	23.53	418.88	1.7468		30	19.67	420.92	1.7404		36	16.49	422.70	1.7339		42	13.85	424.15	1.7271	
25	23.69	419.97	1.7505		35	20.39	426.61	1.7591		40	17.02	427.51	1.7494		45	14.22	427.98	1.7392	
30	24.49	425.38	1.7685		40	21.08	432.18	1.7770		45	17.65	433.35	1.7679		50	14.81	434.18	1.7585	
35	25.26	430.70	1.7859		45	21.74	437.63	1.7943		50	18.25	439.06	1.7857		55	15.35	440.18	1.7769	
40	26.00	435.94	1.8028		50	22.38	443.01	1.8110		55	18.82	444.66	1.8029		60	15.88	446.03	1.7947	
45	26.72	441.13	1.8192		55	23.00	448.33	1.8274		60	19.38	450.17	1.8196		65	16.38	451.77	1.8117	
50	27.42	446.27	1.8352		60	23.60	453.59	1.8433		65	19.91	455.62	1.8358		70	16.86	457.42	1.8283	
55	28.10	451.37	1.8509		65	24.18	458.82	1.8589		70	20.43	461.01	1.8516		75	17.33	462.99	1.8445	
60	28.77	456.45	1.8663		70	24.76	464.02	1.8741		75	20.93	466.36	1.8671		80	17.78	468.51	1.8602	
65	29.42	461.51	1.8814		75	25.32	469.20	1.8891		80	21.43	471.68	1.8823		85	18.22	473.98	1.8756	
70	30.06	466.56	1.8962		80	25.86	474.37	1.9038		85	21.91	476.98	1.8972		90	18.65	479.42	1.8907	
75	30.69	471.61	1.9108		85	26.40	479.52	1.9183		90	22.39	482.26	1.9118		95	19.07	484.83	1.9054	
80	31.31	476.65	1.9252		90	26.93	484.68	1.9326		95	22.85	487.52	1.9262		100	19.48	490.22	1.9200	
85	31.92	481.69	1.9393		95	27.46	489.83	1.9467		100	23.31	492.78	1.9404		105	19.88	495.60	1.9343	
90	32.52	486.74	1.9533		100	27.98	494.98	1.9606		105	23.76	498.04	1.9544		110	20.28	500.97	1.9484	
95	33.12	491.80	1.9672		105	28.49	500.15	1.9744		110	24.21	503.30	1.9682		115	20.67	506.34	1.9623	
100	33.71	496.87	1.9809		110	28.99	505.32	1.9880		115	24.65	508.57	1.9819		120	21.06	511.70	1.9761	
105	34.29	501.95	1.9944		115	29.49	510.50	2.0014		120	25.08	513.85	1.9954		125	21.44	517.07	1.9896	

10.49 bar 26.00°C					12.42 bar 32.00°C					14.60 bar 38.00°C					17.07 bar 44.00°C				
t	v	h	s		t	v	h	s		t	v	h	s		t	v	h	s	
°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	KJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK	
26	22.16	419.59	1.7447		32	18.54	421.55	1.7383		38	15.56	423.22	1.7317		44	13.07	424.55	1.7247	
30	22.78	424.01	1.7594		35	18.97	425.04	1.7497		40	15.82	425.69	1.7396		45	13.20	425.87	1.7289	
35	23.53	429.43	1.7771		40	19.65	430.73	1.7680		45	16.44	431.70	1.7586		50	13.78	432.28	1.7489	
40	24.25	434.77	1.7943		45	20.29	436.31	1.7857		50	17.03	437.55	1.7769		55	14.33	438.46	1.7678	
45	24.95	440.04	1.8110		50	20.92	441.78	1.8027		55	17.60	443.27	1.7944		60	14.84	444.46	1.7860	
50	25.62	445.25	1.8273		55	21.52	447.18	1.8193		60	18.14	448.88	1.8114		65	15.34	450.32	1.8034	
55	26.28	450.42	1.8431		60	22.10	452.52	1.8355		65	18.66	454.42	1.8279		70	15.81	456.07	1.8203	
60	26.92	455.55	1.8587		65	22.67	457.82	1.8512		70	19.16	459.89	1.8440		75	16.26	461.73	1.8367	
65	27.55	460.67	1.8739		70	23.22	463.08	1.8667		75	19.66	465.30	1.8596		80	16.70	467.33	1.8527	
70	28.17	465.76	1.8889		75	23.76	468.31	1.8818		80	20.13	470.68	1.8750		85	17.13	472.87	1.8682	
75	28.77	470.85	1.9036		80	24.29	473.52	1.8967		85	20.60	476.03	1.8900		90	17.55	478.37	1.8835	
80	29.36	475.93	1.9181		85	24.81	478.72	1.9113		90	21.06	481.36	1.9048		95	17.96	483.84	1.8984	
85	29.95	481.01	1.9323		90	25.32	483.91	1.9257		95	21.51	486.67	1.9193		100	18.36	489.28	1.9131	
90	30.53	486.09	1.9464		95	25.82	489.10	1.9399		100	21.95	491.97	1.9336		105	18.75	494.70	1.9276	
95	31.10	491.18	1.9604		100	26.31	494.29	1.9539		105	22.38	497.27	1.9477		110	19.13	500.11	1.9418	
100	31.66	496.27	1.9741		105	26.80	499.48	1.9677		110	22.81	502.56	1.9616		115	19.51	505.52	1.9558	
105	32.22	501.38	1.9877		110	27.29	504.68	1.9814		115	23.24	507.86	1.9754		120	19.88	510.92	1.9696	
110	32.77	506.50	2.0012		115	27.77	509.89	1.9949		120	23.65	513.16	1.9889		125	20.25	516.32	1.9833	

Vapour Table, Superheated Range Solkane®407C

17.96 bar 46.00°C					20.85 bar 52.00°C					24.08 bar 58.00°C					27.71 bar 64.00°C				
t	v	h	s		t	v	h	s		t	v	h	s		t	v	h	s	
°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK	
46	12.34	424.90	1.7223		52	10.36	425.63	1.7144		58	8.68	425.76	1.7055		64	7.22	425.08	1.6948	
50	12.80	430.21	1.7388		55	10.70	429.94	1.7276		60	8.90	428.93	1.7150		65	7.34	426.88	1.7002	
55	13.35	436.60	1.7584		60	11.22	436.80	1.7484		65	9.41	436.42	1.7373		70	7.85	435.29	1.7248	
60	13.87	442.76	1.7771		65	11.70	443.35	1.7679		70	9.87	443.46	1.7580		75	8.30	442.97	1.7471	
65	14.35	448.76	1.7949		70	12.15	449.67	1.7864		75	10.30	450.17	1.7774		80	8.71	450.17	1.7676	
70	14.82	454.62	1.8121		75	12.58	455.81	1.8042		80	10.70	456.64	1.7958		85	9.09	457.04	1.7869	
75	15.26	460.39	1.8288		80	12.99	461.81	1.8213		85	11.08	462.92	1.8135		90	9.45	463.66	1.8053	
80	15.69	466.07	1.8450		85	13.38	467.71	1.8379		90	11.44	469.07	1.8306		95	9.78	470.09	1.8229	
85	16.11	471.69	1.8608		90	13.76	473.52	1.8540		95	11.78	475.10	1.8470		100	10.11	476.37	1.8398	
90	16.52	477.26	1.8763		95	14.13	479.27	1.8697		100	12.12	481.04	1.8631		105	10.41	482.53	1.8562	
95	16.91	482.78	1.8914		100	14.49	484.96	1.8851		105	12.44	486.90	1.8787		110	10.71	488.60	1.8722	
100	17.30	488.28	1.9062		105	14.83	490.60	1.9001		110	12.76	492.71	1.8940		115	11.00	494.59	1.8877	
105	17.68	493.75	1.9208		110	15.17	496.21	1.9148		115	13.07	498.48	1.9089		120	11.28	500.52	1.9029	
110	18.05	499.21	1.9351		115	15.51	501.80	1.9293		120	13.36	504.20	1.9236		125	11.55	506.40	1.9177	
115	18.42	504.65	1.9492		120	15.83	507.37	1.9436		125	13.66	509.90	1.9380		130	11.81	512.24	1.9323	
120	18.78	510.09	1.9631		125	16.15	512.92	1.9576		130	13.95	515.58	1.9521		135	12.07	518.06	1.9467	
125	19.13	515.53	1.9769		130	16.47	518.46	1.9714		135	14.23	521.24	1.9661		140	12.33	523.84	1.9607	
130	19.48	520.96	1.9905		135	16.78	524.00	1.9851		140	14.51	526.89	1.9798		145	12.58	529.61	1.9746	

18.89 bar 48.00°C					21.88 bar 54.00°C					25.24 bar 60.00°C					29.01 bar 66.00°C				
t	v	h	s		t	v	h	s		t	v	h	s		t	v	h	s	
°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK	
48	11.64	425.20	1.7197		54	9.77	425.75	1.7116		60	8.17	425.64	1.7021		66	6.78	424.61	1.6908	
50	11.88	427.95	1.7283		55	9.88	427.25	1.7161		65	8.70	433.63	1.7259		70	7.22	431.88	1.7120	
55	12.43	434.58	1.7486		60	10.42	434.44	1.7379		70	9.17	441.01	1.7476		75	7.69	440.06	1.7357	
60	12.94	440.93	1.7678		65	10.90	441.24	1.7582		75	9.60	447.98	1.7678		80	8.11	447.62	1.7573	
65	13.42	447.09	1.7862		70	11.36	447.76	1.7773		80	10.01	454.65	1.7868		85	8.49	454.76	1.7774	
70	13.88	453.08	1.8038		75	11.78	454.06	1.7955		85	10.38	461.10	1.8050		90	8.85	461.59	1.7963	
75	14.32	458.96	1.8208		80	12.19	460.20	1.8130		90	10.74	467.38	1.8224		95	9.18	468.19	1.8144	
80	14.74	464.74	1.8373		85	12.57	466.22	1.8300		95	11.08	473.53	1.8392		100	9.50	474.61	1.8317	
85	15.15	470.44	1.8533		90	12.94	472.13	1.8463		100	11.41	479.57	1.8555		105	9.80	480.89	1.8484	
90	15.55	476.08	1.8689		95	13.30	477.96	1.8623		105	11.73	485.53	1.8713		110	10.10	487.07	1.8646	
95	15.93	481.68	1.8842		100	13.65	483.72	1.8778		110	12.04	491.42	1.8868		115	10.38	493.15	1.8804	
100	16.31	487.23	1.8992		105	13.99	489.43	1.8930		115	12.34	497.25	1.9019		120	10.65	499.16	1.8958	
105	16.67	492.76	1.9139		110	14.32	495.11	1.9080		120	12.63	503.04	1.9168		125	10.92	505.11	1.9108	
110	17.03	498.26	1.9284		115	14.65	500.75	1.9226		125	12.92	508.79	1.9313		130	11.18	511.02	1.9256	
115	17.39	503.75	1.9426		120	14.96	506.36	1.9370		130	13.20	514.52	1.9456		135	11.43	516.89	1.9400	
120	17.74	509.23	1.9567		125	15.27	511.96	1.9511		135	13.47	520.23	1.9597		140	11.68	522.73	1.9543	
125	18.08	514.70	1.9705		130	15.58	517.55	1.9650		140	13.74	525.92	1.9735		145	11.92	528.54	1.9683	
130	18.42	520.17	1.9841		135	15.88	523.13	1.9788		145	14.01	531.61	1.9872		150	12.16	534.34	1.9820	

19.85 bar 50.00°C					22.96 bar 56.00°C					26.45 bar 62.00°C					30.36 bar 68.00°C				
t	v	h	s		t	v	h	s		t	v	h	s		t	v	h	s	
°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK		°C	dm ³ /kg	kJ/kg	kJ/kgK	
50	10.98	425.45	1.7171		56	9.21	425.80	1.7086		62	7.69	425.41	1.6986		68	6.36	424.00	1.6863	
55	11.54	432.37	1.7384		60	9.64	431.84	1.7268		65	8.01	430.48	1.7137		70	6.59	427.93	1.6978	
60	12.06	438.95	1.7583		65	10.14	438.95	1.7480		70	8.50	438.30	1.7366		75	7.09	436.81	1.7235	
65	12.54	445.29	1.7772		70	10.60	445.70	1.7678		75	8.94	445.59	1.7577		80	7.52	444.82	1.7464	
70	12.99	451.44	1.7952		75	11.02	452.19	1.7866		80	9.35	452.50	1.7774		85	7.91	452.28	1.7673	
75	13.43	457.44	1.8126		80	11.42	458.48	1.8046		85	9.72	459.15	1.7961		90	8.27	459.35	1.7870	
80	13.84	463.32	1.8294		85	11.80	464.62	1.8218		90	10.08	465.59	1.8140		95	8.61	466.15	1.8055	
85	14.24	469.12	1.8457		90	12.17	470.64	1.8385		95	10.42	471.87	1.8311		100	8.92	472.73	1.8233	
90	14.63	474.84	1.8615		95	12.52	476.57	1.8547		100	10.74	478.02	1.8477		105	9.22	479.15	1.8404	
95	15.00	480.50	1.8770		100	12.86	482.42	1.8705		105	11.05	484.08	1.8639		110	9.51	485.44	1.8569	
100	15.37	486.12	1.8922		105	13.20	488.20	1.8859		110	11.36	490.05	1.8796		115	9.79	491.62	1.8729	
105	15.73	491.71	1.9070		110	13.52	493.94	1.9010		115	11.65	495.96	1.8949		120	10.06	497.72	1.8886	
110	16.08	497.26	1.9216		115	13.83	499.64	1.9158		120	11.94	501.81	1.9099		125	10.32	503.75	1.9038	
115	16.42	502.80	1.9360		120	14.14	505.31	1.9303		125	12.21	507.63	1.9246		130	10.57	509.72	1.9187	
120	16.76	508.32	1.9501		125	14.44	510.96	1.9446		130	12.49	513.41	1.9390		135	10.82	515.66	1.9333	
125	17.09	513.83	1.9641		130	14.74	516.59	1.9586		135	12.75	519.17	1.9532		140	11.06	521.55	1.9477	
130	17.41	519.34	1.9778		135	15.03	522.21	1.9725		140	13.02	524.91	1.9672		145	11.30	527.42	1.9618	
135	17.74	524.84	1.9914		140	15.32	527.82	1.9861		145	13.27	530.63	1.9809		150	11.53	533.27	1.9757	

Vapour Table, Superheated Range Solkane®407C

31.77 bar 70.00°C

<i>t</i>	<i>v</i>	<i>h</i>	<i>s</i>
°C	dm ³ /kg	kJ/kg	kJ/kgK
70	5.95	423.21	1.6815
75	6.50	433.10	1.7101
80	6.95	441.69	1.7346
85	7.35	449.55	1.7567
90	7.72	456.92	1.7772
95	8.05	463.95	1.7964
100	8.37	470.72	1.8147
105	8.67	477.29	1.8321
110	8.96	483.71	1.8490
115	9.23	490.00	1.8653
120	9.49	496.20	1.8812
125	9.75	502.31	1.8966
130	10.00	508.36	1.9118
135	10.24	514.36	1.9265
140	10.48	520.32	1.9410
145	10.71	526.24	1.9553
150	10.93	532.14	1.9693
155	11.16	538.02	1.9831

36.34 bar 76.00°C

<i>t</i>	<i>v</i>	<i>h</i>	<i>s</i>
°C	dm ³ /kg	kJ/kg	kJ/kgK
76	4.79	419.38	1.6634
80	5.28	429.30	1.6916
85	5.77	439.34	1.7199
90	6.17	448.11	1.7442
95	6.52	456.14	1.7662
100	6.85	463.67	1.7865
105	7.15	470.85	1.8056
110	7.43	477.77	1.8238
115	7.70	484.49	1.8412
120	7.95	491.04	1.8580
125	8.20	497.47	1.8742
130	8.43	503.79	1.8900
135	8.66	510.03	1.9054
140	8.88	516.21	1.9204
145	9.10	522.33	1.9351
150	9.31	528.40	1.9496
155	9.51	534.44	1.9638
160	9.72	540.45	1.9777

33.23 bar 72.00°C

<i>t</i>	<i>v</i>	<i>h</i>	<i>s</i>
°C	dm ³ /kg	kJ/kg	kJ/kgK
72	5.55	422.21	1.6762
75	5.90	428.75	1.6950
80	6.39	438.17	1.7219
85	6.81	446.54	1.7454
90	7.18	454.27	1.7669
95	7.53	461.57	1.7868
100	7.84	468.55	1.8057
105	8.14	475.30	1.8236
110	8.42	481.86	1.8409
115	8.70	488.28	1.8575
120	8.96	494.58	1.8737
125	9.21	500.79	1.8893
130	9.45	506.92	1.9047
135	9.69	513.00	1.9196
140	9.92	519.02	1.9343
145	10.14	525.01	1.9487
150	10.37	530.96	1.9628
155	10.58	536.89	1.9768

37.99 bar 78.00°C

<i>t</i>	<i>v</i>	<i>h</i>	<i>s</i>
°C	dm ³ /kg	kJ/kg	kJ/kgK
78	4.42	417.39	1.6555
80	4.70	423.27	1.6722
85	5.25	434.88	1.7049
90	5.68	444.46	1.7314
95	6.05	453.00	1.7548
100	6.38	460.90	1.7761
105	6.68	468.35	1.7960
110	6.96	475.49	1.8147
115	7.23	482.39	1.8326
120	7.48	489.09	1.8498
125	7.72	495.65	1.8663
130	7.96	502.08	1.8824
135	8.18	508.42	1.8980
140	8.40	514.68	1.9133
145	8.61	520.87	1.9282
150	8.81	527.02	1.9428
155	9.02	533.12	1.9571
160	9.21	539.18	1.9712

34.75 bar 74.00°C

<i>t</i>	<i>v</i>	<i>h</i>	<i>s</i>
°C	dm ³ /kg	kJ/kg	kJ/kgK
74	5.17	420.96	1.6702
75	5.30	423.44	1.6773
80	5.84	434.11	1.7078
85	6.28	443.17	1.7332
90	6.67	451.35	1.7559
95	7.02	458.98	1.7768
100	7.34	466.21	1.7963
105	7.64	473.16	1.8148
110	7.92	479.89	1.8325
115	8.19	486.45	1.8495
120	8.44	492.87	1.8659
125	8.69	499.18	1.8819
130	8.93	505.40	1.8974
135	9.16	511.56	1.9126
140	9.39	517.65	1.9274
145	9.61	523.70	1.9420
150	9.82	529.71	1.9563
155	10.03	535.69	1.9703

39.73 bar 80.00°C

<i>t</i>	<i>v</i>	<i>h</i>	<i>s</i>
°C	dm ³ /kg	kJ/kg	kJ/kgK
80	4.04	414.81	1.6461
85	4.72	429.50	1.6874
90	5.19	440.26	1.7173
95	5.58	449.48	1.7425
100	5.92	457.83	1.7651
105	6.23	465.63	1.7858
110	6.51	473.02	1.8052
115	6.78	480.12	1.8236
120	7.03	487.00	1.8412
125	7.27	493.70	1.8582
130	7.50	500.25	1.8745
135	7.72	506.70	1.8904
140	7.93	513.05	1.9059
145	8.14	519.33	1.9210
150	8.34	525.55	1.9358
155	8.54	531.72	1.9503
160	8.73	537.85	1.9645
165	8.92	543.94	1.9785

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